

Adaptimmune Therapeutics PLC
Form 10-Q
November 06, 2018
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM 10-Q

QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the quarterly period ended September 30, 2018

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

Commission File Number 001-37368

ADAPT IMMUNE THERAPEUTICS PLC

(Exact name of Registrant as specified in its charter)

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England and Wales

(State or other jurisdiction of incorporation or organization)

Not Applicable

(I.R.S. Employer Identification No.)

60 Jubilee Avenue, Milton Park

Abingdon, Oxfordshire OX14 4RX

United Kingdom

(44) 1235 430000

(Address of principal executive offices)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically, every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of large accelerated filer, accelerated filer and smaller reporting company and emerging growth company in Rule 12b-2 of the Exchange Act.

Large accelerated filer

Non-accelerated filer

Accelerated filer

Smaller reporting company

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standard provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

As of November 2, 2018 the number of outstanding ordinary shares par value £0.001 per share of the Registrant is 627,422,698.

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General information

In this Quarterly Report on Form 10-Q (Quarterly Report), Adaptimmune, the Group, the Company, we, us and our refer to Adaptimmune Therapeutics plc and its consolidated subsidiaries, except where the context otherwise requires.

Information Regarding Forward-Looking Statements

This Quarterly Report contains forward-looking statements that are based on our current expectations, assumptions, estimates and projections about us and our industry. All statements other than statements of historical fact in this Quarterly Report are forward-looking statements.

These forward-looking statements are subject to known and unknown risks, uncertainties, assumptions and other factors that could cause our actual results of operations, financial condition, liquidity, performance, prospects, opportunities, achievements or industry results, as well as those of the markets we serve or intend to serve, to differ materially from those expressed in, or suggested by, these forward-looking statements. These forward-looking statements are based on assumptions regarding our present and future business strategies and the environment in which we expect to operate in the future. Important factors that could cause those differences include, but are not limited to:

- our ability to successfully advance and fund our MAGE-A10, MAGE-A4 and AFP SPEAR T-cells through clinical development and the timing within which we can recruit patients and treat patients in our clinical trials;
- our ability to successfully and reproducibly manufacture SPEAR T-cells in order to meet patient demand;
- our ability to further develop our commercial manufacturing process for our SPEAR T-cells, transfer such commercial process to third party contract manufacturers, if required, and for such third party contract manufacturers or ourselves to manufacture SPEAR T-cells to the quality and on the timescales we require;
- the scope and timing of performance of our ongoing collaboration with GlaxoSmithKline (GSK) including nomination of further targets by GSK under the collaboration;
- our ability to successfully advance our SPEAR T-cell technology platform to improve the safety and effectiveness of our existing SPEAR T-cell candidates and to submit Investigational New Drug Applications, or INDs, for new SPEAR T-cell candidates;

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- the rate and degree of market acceptance of T-cell therapy generally, and of SPEAR T-cells;
- government regulation and approval, including, but not limited to, the expected regulatory approval timelines for SPEAR T-cells and the level of pricing and reimbursement for SPEAR T-cells, if approved for marketing;
- the existence of any third party patents preventing further development of any SPEAR T-cells, including, any inability to obtain appropriate third party licenses, or enforcement of patents against us or our collaborators;
- our ability to obtain granted patents covering any SPEAR T-cells and to enforce such patents against third parties;
- volatility in equity markets in general and in the biopharmaceutical sector in particular;
- fluctuations in the price of materials and bought-in components;
- our relationships with suppliers, contract manufacturing organizations or CROs and other third-party providers including fluctuations in the price of materials and services, ability to obtain reagents particularly where such reagents are only available from a single source, and performance of third party providers;

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- increased competition from other companies in the biotechnology and pharmaceutical industries including where such competition impacts ability to recruit patients in to clinical trials;
- claims for personal injury or death arising from the use of SPEAR T-cell candidates;
- our ability to attract and retain qualified personnel;
- a change in our status as an emerging growth company under the Jumpstart Our Business Start-ups Act of 2012, or JOBS Act; and
- additional factors that are not known to us at this time.

Additional factors that could cause actual results, financial condition, liquidity, performance, prospects, opportunities, achievements or industry results to differ materially include, but are not limited to, those discussed under "Risk Factors" in Part II, Item 1A in this Quarterly Report and in our other filings with the Securities and Exchange Commission (the "SEC"). Additional risks that we may currently deem immaterial or that are not presently known to us could also cause the forward-looking events discussed in this Quarterly Report not to occur. The words "believe," "may," "will," "estimate," "continue," "anticipate," "intend," "expect" and similar words are intended to identify estimates and forward-looking statements. Estimates and forward-looking statements speak only at the date they were made, and we undertake no obligation to update or to review any estimate and/or forward-looking statement because of new information, future events or other factors. Estimates and forward-looking statements involve risks and uncertainties and are not guarantees of future performance. Our future results may differ materially from those expressed in these estimates and forward-looking statements. In light of the risks and uncertainties described above, the estimates and forward-looking statements discussed in this Quarterly Report might not occur, and our future results and our performance may differ materially from those expressed in these forward-looking statements due to, inclusive of, but not limited to, the factors mentioned above. Because of these uncertainties, you should not make any investment decision based on these estimates and forward-looking statements.

Table of Contents**PART I FINANCIAL INFORMATION****Item 1. Financial Statements.****ADAPTIMMUNE THERAPEUTICS PLC****UNAUDITED CONDENSED CONSOLIDATED BALANCE SHEETS**

(In thousands, except share data)

	September 30, 2018	December 31, 2017
Assets		
Current assets		
Cash and cash equivalents	\$ 153,081	\$ 84,043
Marketable securities - available-for-sale debt securities	84,652	124,218
Accounts receivable, net of allowance for doubtful accounts of \$- and \$-	2,031	206
Other current assets and prepaid expenses (including current portion of clinical materials)	21,841	21,716
Total current assets	261,605	230,183
Restricted cash	4,163	4,253
Clinical materials	4,205	4,695
Property, plant and equipment, net	38,137	40,679
Intangibles, net	1,515	1,337
Total assets	309,625	281,147
Liabilities and stockholders equity		
Current liabilities		
Accounts payable	3,907	8,378
Accrued expenses and other accrued liabilities	24,314	27,201
Deferred revenue	1,345	38,735
Total current liabilities	29,566	74,314
Other liabilities, non-current	3,904	3,849
Total liabilities	33,470	78,163
Stockholders equity		
Common stock - Ordinary shares par value £0.001, 701,103,126 authorized and 627,222,076 issued and outstanding (2017: 701,103,126 authorized and 562,119,334 issued and outstanding)	939	854
Additional paid in capital	570,355	455,401
Accumulated other comprehensive loss	(12,813)	(21,641)
Accumulated deficit	(282,326)	(231,630)
Total stockholders equity	276,155	202,984
Total liabilities and stockholders equity	\$ 309,625	\$ 281,147

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See accompanying notes to unaudited condensed consolidated financial statements.

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ADAPTIMMUNE THERAPEUTICS PLC

UNAUDITED CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS

(In thousands, except share and per share data)

	Three months ended September 30,		Nine months ended September 30,	
	2018	2017	2018	2017
Development revenue	\$ 1,678	\$ 27,185	\$ 18,912	\$ 33,563
License revenue	39,114		39,114	
Total Revenue	40,792	27,185	58,026	33,563
Operating expenses				
Research and development	(23,484)	(24,034)	(75,500)	(62,240)
General and administrative	(10,290)	(8,111)	(32,785)	(22,284)
Total operating expenses	(33,774)	(32,145)	(108,285)	(84,524)
Operating income (loss)	7,018	(4,960)	(50,259)	(50,961)
Interest income	606	705	1,805	1,465
Other (expense) income, net	(2,249)	3,602	(10,525)	7,242
Income (loss) before income taxes	5,375	(653)	(58,979)	(42,254)
Income taxes	(133)	(225)	(362)	(621)
Net income (loss) attributable to ordinary shareholders	\$ 5,242	\$ (878)	\$ (59,341)	\$ (42,875)
Net income (loss) per ordinary share				
Basic	\$ 0.01	\$	\$ (0.10)	\$ (0.08)
Diluted	0.01		(0.10)	(0.08)
Weighted average shares outstanding:				
Basic	582,004,954	561,239,864	573,796,275	516,352,141
Diluted	621,764,201	561,239,864	573,796,275	516,352,141

See accompanying notes to unaudited condensed consolidated financial statements.

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ADAPT IMMUNE THERAPEUTICS PLC

UNAUDITED CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

(In thousands)

	Three months ended September 30,		Nine months ended September 30,	
	2018	2017	2018	2017
Net income (loss)	\$ 5,242	\$ (878)	\$ (59,341)	\$ (42,875)
Other comprehensive income (loss), net of tax				
Foreign currency translation adjustments, net of tax of \$-, \$-, \$- and \$-	1,521	(1,623)	5,103	(2,932)
Unrealized holding gains (losses) on available-for-sale debt securities, net of tax of \$-, \$-, \$- and \$-	85	(1,578)	1,252	(2,874)
Reclassification adjustment for losses on available-for-sale debt securities included in net loss, net of tax of \$-, \$-, \$- and \$-			2,473	
Total comprehensive income (loss) for the period	\$ 6,848	\$ (4,079)	\$ (50,513)	\$ (48,681)

See accompanying notes to unaudited condensed consolidated financial statements.

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ADAPTIMMUNE THERAPEUTICS PLC

UNAUDITED CONDENSED CONSOLIDATED STATEMENT OF CHANGE IN EQUITY

(In thousands, except share data)

	Common stock	Common stock	Additional paid in capital	Accumulated foreign currency translation adjustments	Accumulated other comprehensive loss Accumulated unrealized losses on available-for- sale debt securities	Accumulated deficit	Total stockholders equity
Balance as of 1 January 2018 (under previous guidance)	562,119,334	\$ 854	\$ 455,401	\$ (17,867)	\$ (3,774)	\$ (231,630)	\$ 202,984
Cumulative effect of applying new accounting standards						8,645	8,645
Balance as of 1 January 2018 (adjusted)		854	455,401	(17,867)	(3,774)	(222,985)	211,629
Net loss						(59,341)	(59,341)
Issuance of shares upon exercise of stock options	5,102,742	7	2,926				2,933
Issuance of shares upon completion of registered direct offering	60,000,000	78	99,575				99,653
Other comprehensive loss before reclassifications							
Foreign currency translation adjustments				5,103			5,103
Unrealized holding gains on available-for-sale debt securities, net of tax of \$-					1,252		1,252
Reclassification from accumulated other comprehensive loss of losses on available-for-sale debt securities included in net loss, net of tax of \$-					2,473		2,473
Share-based compensation expense			12,453				12,453
Balance as of September 30, 2018	627,222,076	\$ 939	\$ 570,355	\$ (12,764)	\$ (49)	\$ (282,326)	\$ 276,155

See accompanying notes to unaudited condensed consolidated financial statements.

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ADAPTIMMUNE THERAPEUTICS PLC

UNAUDITED CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS

(In thousands)

	Nine months ended September 30,	
	2018	2017
Cash flows from operating activities		
Net loss	\$ (59,341)	\$ (42,875)
<i>Adjustments to reconcile net loss to net cash used in operating activities:</i>		
Depreciation	5,248	3,418
Amortization	464	267
Share-based compensation expense	12,453	7,956
Realized loss on available-for-sale debt securities	2,473	
Unrealized foreign exchange gain (losses)	4,921	(6,886)
Other	262	606
<i>Changes in operating assets and liabilities:</i>		
(Increase) decrease in receivables and other operating assets	(4,140)	4,180
Decrease (increase) in non-current operating assets	490	(484)
(Decrease) increase in payables and deferred revenue	(35,533)	859
Net cash used in operating activities	(72,703)	(32,959)
Cash flows from investing activities		
Acquisition of property, plant and equipment	(3,823)	(22,791)
Acquisition of intangibles	(666)	(288)
Proceeds from disposal of property, plant and equipment		550
Maturity of short-term deposits		40,645
Investment in short-term deposits		(18,000)
Maturity or redemption of marketable securities	114,988	7,032
Investment in marketable securities	(75,545)	(93,218)
Net cash provided by (used in) investing activities	34,954	(86,070)
Cash flows from financing activities		
Proceeds from issuance of common stock, net of issuance costs \$347 and \$4,774	99,653	103,167
Proceeds from exercise of stock options	2,933	401
Net cash provided by financing activities	102,586	103,568
Effect of currency exchange rate changes on cash, cash equivalents and restricted cash	4,111	2,223
Net increase (decrease) in cash, cash equivalents and restricted cash	68,948	(13,238)
Cash, cash equivalents and restricted cash at start of period	88,296	162,796
Cash, cash equivalents and restricted cash at end of period	\$ 157,244	\$ 149,558

See accompanying notes to unaudited condensed consolidated financial statements.

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ADAPTIMMUNE THERAPEUTICS PLC

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

Note 1 - General

Adaptimmune Therapeutics plc is registered in England and Wales. Its registered office is 60 Jubilee Avenue, Milton Park, Abingdon, Oxfordshire, OX14 4RX, United Kingdom. Adaptimmune Therapeutics plc and its subsidiaries (collectively Adaptimmune or the Company) is a clinical-stage biopharmaceutical company focused on providing novel cell therapies to patients, particularly in solid tumors. The Company's comprehensive and proprietary SPEAR (Specific Peptide Enhanced Affinity Receptor) T-cell platform enables it to identify cancer targets, find and genetically engineer T-cell receptors (TCRs), and produce therapeutic candidates for administration to patients. Using its affinity engineered TCRs, the Company aims to become a fully integrated cell therapy company and to have the first TCR T-cell approved.

The Company is subject to a number of risks similar to other biopharmaceutical companies in the early stage of clinical development including, but not limited to, the need to obtain adequate additional funding, possible failure of preclinical programs or clinical programs, the need to obtain marketing approval for its SPEAR T-cells, competitors developing new technological innovations, the need to successfully commercialize and gain market acceptance of the Company's SPEAR T-cells, the need to develop a suitable commercial manufacturing process and protection of proprietary technology. If the Company does not successfully commercialize any of its SPEAR T-cells, it will be unable to generate product revenue or achieve profitability. The Company had an accumulated deficit of \$282.3 million as of September 30, 2018.

Note 2 - Summary of Significant Accounting Policies

(a) Basis of presentation

The condensed consolidated interim financial statements of Adaptimmune Therapeutics plc and its subsidiaries and other financial information included in this Quarterly Report are unaudited and have been prepared in accordance with generally accepted accounting principles in the United States of America (U.S. GAAP) and are presented in U.S. dollars. All significant intercompany accounts and transactions between the Company and its subsidiaries have been eliminated on consolidation.

The unaudited condensed interim financial statements presented in this Quarterly Report should be read in conjunction with the consolidated financial statements and accompanying notes included in the Company's Annual Report on Form 10-K filed with the SEC on March 15, 2018 (the Annual Report). The balance sheet as of December 31, 2017 was derived from audited consolidated financial statements included in the Company's Annual Report but does not include all disclosures required by U.S. GAAP. The Company's significant accounting policies are described in Note 2 to those consolidated financial statements.

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Certain information and footnote disclosures normally included in financial statements prepared in accordance with U.S. GAAP have been condensed or omitted from these interim financial statements. However, these interim financial statements include all adjustments, consisting only of normal recurring adjustments, which are, in the opinion of management, necessary to fairly state the results of the interim period. The interim results are not necessarily indicative of results to be expected for the full year.

On January 1, 2018, the Company adopted new guidance on revenue recognition, which has been codified within Accounting Standard Codification Topic 606, *Revenue from Contracts with Customers* (ASC 606). The comparative financial information for the three and nine months ended September 30, 2017 and as of December 31, 2017 has not been restated.

(b) Use of estimates in interim financial statements

The preparation of interim financial statements, in conformity with U.S. GAAP and SEC regulations, requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities at the date of the consolidated financial statements and reported amounts of revenues and expenses during the reporting period. Estimates and assumptions are primarily made in relation to the valuation of share options, valuation allowances relating to deferred tax assets, revenue recognition, estimating clinical trial expenses and estimating reimbursements from R&D tax and expenditure credits. If actual results differ from the Company's estimates, or to the extent these estimates are adjusted in future periods, the Company's results of operations could either benefit from, or be adversely affected by, any such change in estimate.

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(c) **Fair value measurements**

The Company is required to disclose information on all assets and liabilities reported at fair value that enables an assessment of the inputs used in determining the reported fair values. The fair value hierarchy prioritizes valuation inputs based on the observable nature of those inputs. The hierarchy defines three levels of valuation inputs:

Level 1 Quoted prices in active markets for identical assets or liabilities

Level 2 Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly

Level 3 Unobservable inputs that reflect the Company's own assumptions about the assumptions market participants would use in pricing the asset or liability

The carrying amounts of the Company's cash and cash equivalents, restricted cash, accounts receivable, accounts payable and accrued expenses approximate fair value because of the short-term nature of these instruments. The fair value of marketable securities, which are measured at fair value on a recurring basis is detailed in Note 6, *Fair value measurements*.

(d) **Revenue from contracts with customers**

On January 1, 2018, the Company adopted new guidance on revenue recognition, which has been codified within ASC 606. The accounting policy applicable from January 1, 2018 is described below and further details on the transition are available in Note 2(f). The comparative financial information for the three and nine months ended September 30, 2017 and as of December 31, 2017 has not been restated and is prepared in accordance with the accounting policies that are described in Note 2 to the consolidated financial statements included in the Annual Report.

The Company has one contract with a customer, which is the GSK Collaboration and License Agreement. The GSK Collaboration and License Agreement consists of multiple performance obligations, including the transition of the NY-ESO SPEAR T-cell program to GSK, the development of a second target, PRAME, and an exclusive license (the NY-ESO License) to research, develop, and commercialize the Company's NY-ESO SPEAR T-cell therapy program.

In September 2017, GSK exercised its option to obtain the NY-ESO License and the first tranche (\$26.6 million or £20 million) of the option exercise payment became payable to the Company. In connection with the option exercise, in September 2017, the GSK Agreement was amended to, among other things, include a detailed transition plan identifying the steps needed to complete transition of the Investigational New Drug Application (IND) process with the Food and Drug Administration (FDA) for the NY-ESO SPEAR T-cell program to GSK. On July 23, 2018, the transition activities were substantially completed and the IND for the NY-ESO SPEAR T-cell program transferred to GSK.

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The aggregate transaction price consists of an upfront payment of \$42,123,000 received in June 2014, development milestones achieved of \$66,404,000, an option exercise fee of \$39,785,000. There was no variable consideration at September 30, 2018.

The Company determines the variable consideration to be included in the transaction price by estimating the most-likely amount that will be received and then applies a constraint to reduce the consideration to the amount which is probable of being received. The determination of whether a milestone is probable includes consideration of the following factors:

- Whether achievement of a development milestone is highly susceptible to factors outside the entity's influence, such as milestones involving the judgment or actions of third parties, including regulatory bodies or the customer;
- Whether the uncertainty about the achievement of the milestone is not expected to be resolved for a long period of time;
- Whether the Company can reasonably predict that a milestone will be achieved based on previous experience; and.
- The complexity and inherent uncertainty underlying the achievement of the milestone.

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The Company may also be entitled to development and regulatory milestones upon successful development of the NY-ESO SPEAR T-cells by GSK. The amount of the milestones is dependent on the nature of the product that GSK further develops, the indication relevant to any product and the territory in relation to which the milestone is achieved. These amounts have not been included within the transaction price as of September 30, 2018 because they are not considered probable. The Company may also receive commercial milestones based on the indication and the territory and mid-single to low double-digit royalties on worldwide net sales. These amounts have not been included within the transaction price as of September 30, 2018 because they are sales or usage based royalties promised in exchange for a license of intellectual property, which will be recognized when the subsequent sale or usage occurs.

The Company may be entitled to one small-dollar development milestone for the pre-clinical development of PRAME, which is not included in the transaction price because it is not considered probable.

The payments to the Company under the contract are typically due upon achievement of milestones and within standard payment terms (approximating to 45 days). The contract does not include a significant financing component.

The upfront payment of \$42,123,000 was allocated between the performance obligations using the Company's best estimate of the relative selling price. In determining the best estimate, the Company considered internal pricing objectives it used in negotiating the contract, together with internal data regarding the cost and margin of providing services for each deliverable taking into account the different stage of development of each development program included in the contract. The variable consideration is allocated to the performance obligation to which it relates.

The amount of the transaction price allocated to the performance obligation is recognized as or when the Company satisfies the performance obligation. The Company satisfies the performance obligations relating to the transition of the NY-ESO SPEAR T-cell program and the development of a second target, PRAME, over time and recognizes revenue based on an estimate of the percentage of completion of the project determined based on the costs incurred on the project as a percentage of the total expected costs. The Company considers that this depicts the progress of the project, where the significant inputs are internal project resource and third-party clinical and manufacturing costs. The determination of the percentage of completion requires the Company to estimate the costs-to-complete the project. The Company makes a detailed estimate of the costs-to-complete on an annual basis as part of the Company's budgeting process, which is re-assessed every reporting period based on the latest project plan and discussions with project teams. If a change in facts or circumstances occurs, the estimate is adjusted and the revenue is recognized based on the revised estimate. The difference between the cumulative revenue recognized based on the previous estimate and the revenue recognized based on the revised estimate is recognized as an adjustment to revenue in the period in which the change in estimate occurs.

The Company has determined that the performance obligation relating to the NY-ESO License is recognized at a point-in-time, upon commencement of the license, which occurred in September 2018.

The Company recognizes a contract asset, when the value of satisfied (or part satisfied) performance obligations is in excess of the payment due to the Company, and deferred revenue (contract liability) when the amount of unconditional consideration is in excess of the value of satisfied (or part satisfied) performance obligations. Once a right to receive consideration is unconditional, that amount is presented as a receivable.

The timing and amount of milestone payments for the development and transition of the NY-ESO SPEAR T-cell program are intended to be commensurate with the cost and effort involved in achieving the milestones and therefore a contract asset would typically arise. The Company received \$26,610,000 of the option exercise fee in September 2017, which was included in deferred revenue at January 1, 2018 and this amount

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was recognized as revenue, along with a further option exercise fee of \$13,175,000, in September 2018 upon commencement of the license.

Changes in deferred revenue typically arise due to:

- adjustments arising from a change in the estimate of the cost to complete the project, which results in a cumulative catch-up adjustment to revenue that affects the corresponding contract asset or deferred revenue;
- a change in the estimate of the transaction price due to changes in the assessment of whether variable consideration is constrained because it is not considered probable of being received;
- the recognition of revenue arising from deferred revenue; and
- the reclassification of amounts to receivables when a right to consideration becomes unconditional.

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A change in the estimate of variable consideration constrained (for example, if a development milestone becomes probable of being received) could result in a significant change in the revenue recognized and deferred revenue.

(e) **Share-based compensation**

The Company has awarded share options to nonemployees for consultancy services. Prior to January 1, 2018, these share options were measured at the fair value of the goods/services received or the fair value of the equity instrument issued, whichever was more reliably measured, and then remeasured at the then-current fair values at each reporting date until the share options have vested and recognized as an expense over the requisite service period. The Company has adopted new guidance with effect from January 1, 2018, which requires that non-employee share-based payment transactions are measured at the grant-date fair value and are no longer remeasured at the then-current fair values at each reporting date until the share options have vested. Further details on the transition are available in Note 2(f).

(f) **New accounting pronouncements**

Adopted in the period

Revenue from Contracts with Customers

In May 2014, the FASB issued ASU 2014-09 - *Revenue from Contracts with Customers* (ASU 2014-09) which requires a new approach to revenue recognition and, in March, April, May and December 2016, the FASB issued additional clarification related to this guidance. This guidance has been codified within ASC 606. The core principle of the guidance is that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. To achieve that core principle, an entity should apply the following steps:

Step 1: Identify the contract(s) with a customer.

Step 2: Identify the performance obligations in the contract.

Step 3: Determine the transaction price.

Step 4: Allocate the transaction price to the performance obligations in the contract.

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Step 5: Recognize revenue when (or as) the entity satisfies a performance obligation.

The Company has adopted the guidance using the modified retrospective approach, with the cumulative effect of initially applying the guidance recognized as an adjustment to the opening balance of equity at January 1, 2018. Therefore, the comparative information has not been adjusted and continues to be reported under previous guidance. The quantitative impact of the changes on the statement of operations for the three months ended September 30, 2018 are set out below (in thousands):

	Under previous revenue guidance	Adjustment	As reported
Revenue	\$ 56,999	\$ (16,207)	\$ 40,792
Operating income	23,225	(16,207)	7,018
Income before income taxes	21,582	(16,207)	5,375
Net income attributable to ordinary shareholders	21,449	(16,207)	5,242
Net income per ordinary share - Basic	0.04		0.01
Net income per ordinary share - Diluted	0.03		0.01

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The quantitative impacts of the changes on the statement of operations for the nine months ended September 30, 2018 are set out below (in thousands):

	Under previous revenue guidance	Adjustment	As reported
Revenue	\$ 69,262	\$ (11,236)	\$ 58,026
Operating loss	(39,023)	(11,236)	(50,259)
Loss before income taxes	(47,743)	(11,236)	(58,979)
Net loss attributable to ordinary shareholders	(48,105)	(11,236)	(59,341)
Net loss per ordinary share - Basic and diluted	(0.08)		(0.10)

The quantitative impacts of the changes on the balance sheet as of September 30, 2018 are set out below (in thousands):

	Under previous revenue guidance	Adjustment	As reported
Deferred revenue	\$ 1,592	\$ (247)	\$ 1,345
Total current liabilities	29,813	(247)	29,566
Total liabilities	33,717	(247)	33,470
Accumulated other comprehensive loss	(15,651)	2,838	(12,813)
Accumulated deficit	(279,735)	(2,591)	(282,326)
Total stockholders' equity	275,908	247	276,155

The quantitative impacts of the changes on the statement of cash flows for the nine months ended September 30, 2018 are set out below (in thousands):

	Under previous revenue guidance	Adjustment	As reported
Net loss	\$ (48,105)	\$ (11,236)	\$ (59,341)
Decrease in payables and deferred revenue	(46,769)	11,236	(35,533)

The cumulative effect of adopting the guidance on our financial statements at January 1, 2018 is a credit to opening accumulated losses and corresponding decrease in deferred revenue of \$8,645,000.

The adoption of ASC 606 has had a material impact on the Company's financial statements due to the following:

- Under the GSK Collaboration and License Agreement, the Company will receive non-substantive milestone payments in the future upon achievement of specified development milestones. Non-substantive milestones are currently included within the transaction price upon achievement of the milestone and recognized over the period during which the Company is delivering services to GSK. ASC 606 requires an entity to estimate the amount of consideration to which the entity will be entitled in exchange for transferring the promised goods or services to a customer. This includes an estimate of variable consideration to the extent that it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved. This results in certain milestone payments being recognized earlier under ASC 606 than under existing guidance, if it is considered probable that the milestone will be achieved.

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- Upfront payments and non-refundable milestone payments were previously recognized in revenue using the proportional performance model ratably over the period that services are rendered, unless another attribution method more closely approximates the delivery of the goods or services to the customer. ASC 606 requires an entity to recognize revenue using a measure of progress that depicts the transfer of control of the goods or services to the customer. The Company considers that an input measure, such as costs incurred, relative to the total expected inputs is the appropriate measure to depict the transfer of control of the services under the GSK Collaboration and License Agreement, which impacts the timing of its revenue from the GSK Collaboration and License Agreement.

The Company has applied the practical expedient for contracts that were modified before the adoption of ASU 2014-09, which permits entities to not retrospectively restate the contract for those contract modifications. Instead, the aggregate effect of all modifications that occurred before the adoption date has been reflected when:

- a. Identifying the satisfied and unsatisfied performance obligations
- b. Determining the transaction price
- c. Allocating the transaction price to the satisfied and unsatisfied performance obligations.

ASC 606 requires an entity to provide financial statement users with sufficient information to understand the nature, amount, timing and uncertainty of revenue and cash flows arising from contracts with customers. To help achieve this objective, ASC 606 requires certain quantitative and qualitative disclosures included within Note 2(d) and Note 3, which are more extensive than the previously required revenue disclosures.

Recognition and Measurement of Financial Assets and Financial Liabilities

The Company has adopted ASU 2016-01 - *Financial Instruments - Overall: Recognition and Measurement of Financial Assets and Financial Liabilities*, which amended the guidance on the recognition and measurement of financial assets and financial liabilities. The new guidance requires that equity investments (except those accounted for under the equity method of accounting, or those that result in consolidation of the investee) are measured at fair value with changes in fair value recognized in net income. The guidance also requires the use of an exit price when measuring the fair value of financial instruments for disclosure purposes, eliminates the requirement to disclose the methods and significant assumptions used to estimate the fair value that is required to be disclosed for financial instruments measured at amortized cost and requires separate presentation of financial assets and financial liabilities by measurement category and form of financial asset. The guidance did not have a material impact on the Company's consolidated financial statements.

Improvements to Nonemployee Share-Based Payment Accounting

The Company has adopted ASU 2018-07 *Compensation - Stock Compensation - Improvements to Nonemployee Share-Based Payment Accounting*, which simplifies the accounting for nonemployee share-based payment transactions by expanding the scope of existing guidance on employee share-based payment transactions to include nonemployee transactions. Under the simplified guidance, nonemployee share-based payment transactions are measured at the grant-date fair value and are no longer remeasured at the then-current fair values at each reporting date until the share options have vested. The guidance has been adopted using a modified-retrospective approach, which requires that unsettled equity-classified awards for which a measurement date has not been established are measured at the adoption date fair value. The guidance did not have a material impact on the Company's consolidated financial statements.

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To be adopted in future periods

Accounting for Leases

In February 2016, the FASB issued ASU 2016-02 - Leases. The guidance requires that lessees recognize a lease liability, which is a lessee's obligation to make lease payments arising from a lease, measured on a discounted basis; and a right-of-use asset, which is an asset that represents the lessee's right to use, or control the use of, a specified asset for the lease term at the commencement date. The guidance also makes targeted improvements to align lessor accounting with the lessee accounting model and guidance on revenue from contracts with customers. The guidance is effective for the fiscal year beginning January 1, 2019, including interim periods within that fiscal year. Early application is permitted. The guidance must be adopted on a modified retrospective transition approach for leases existing, or entered into after, the beginning of the earliest comparative period presented in the financial statements. The FASB has issued ASU 2018-11 - Leases, which, in addition to the existing requirements to transition, permits an entity to transition to the new guidance by recognizing a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption without restating prior periods and the Company intends to adopt the guidance in this manner. The Company's assessment of the impact of the guidance on its consolidated financial statements is ongoing. We anticipate that the adoption of the guidance will have a material impact on the Company's consolidated balance sheet due to the recognition of a lease liability and corresponding right-of-use asset. We have not finalized the assessment of the amount of the lease liability and right-of-use asset but we anticipate that it will result in the recording of lease assets of approximately \$20 million and a corresponding lease liability of approximately \$25 million.

Measurement of Credit Losses on Financial Instruments

In June 2016, the FASB issued ASU 2016-13 *Financial Instruments - Credit losses*, which replaces the incurred loss impairment methodology for financial instruments in current GAAP with a methodology that reflects expected credit losses and requires consideration of a broader range of reasonable and supportable information to inform credit loss estimates. The guidance is effective for the fiscal year beginning January 1, 2020, including interim periods within that fiscal year. Early application is permitted for the fiscal year beginning January 1, 2019, including interim periods within that fiscal year. The guidance must be adopted using a modified-retrospective approach and a prospective transition approach is required for debt securities for which an other-than-temporary impairment had been recognized before the effective date. The Company is currently evaluating the impact of the guidance on its consolidated financial statements.

Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract

In August 2018, the FASB issued ASU 2018-15 *Intangibles - Goodwill and Other - Internal-Use Software (Subtopic 350-40) Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract*, which aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal use software license). The guidance is effective for the fiscal year beginning January 1, 2020, including interim periods within that fiscal year. Early application is permitted for the fiscal year beginning January 1, 2019, including interim periods within that fiscal year. The guidance may be applied either retrospectively or prospectively to all implementation costs incurred after the date of adoption. The Company is currently evaluating the impact of the guidance on its consolidated financial statements.

Changes to the Disclosure Requirements for Fair Value Measurement

In August 2018, the FASB issued ASU 2018-13 Fair Value Measurement (Topic 820) - Disclosure Framework Changes to the Disclosure Requirements for Fair Value Measurement, which modifies the disclosure requirements on fair value measurements in Topic 820, Fair Value Measurement. The guidance is effective for the fiscal year beginning January 1, 2020, including interim periods within that fiscal year. Early application is permitted. Certain amendments apply prospectively with the all other amendments applied retrospectively to all periods presented upon their effective date. The Company is currently evaluating the impact of the guidance on its consolidated financial statements.

(g) Related parties

In the three and nine months ended September 30, 2017, research and development expenses includes purchases of \$67,000 and \$781,000 from Immunocore Ltd (Immunocore). As described in Note 2(w) to the consolidated financial statements included in the Annual Report, the Company no longer considered Immunocore to be a related party with effect from January 1, 2018.

Table of Contents**(h) Accumulated other comprehensive income (loss)**

The following amounts were reclassified out of other comprehensive income during the three and nine months ended September 30, 2018 (in thousands):

Component of Accumulated Other Comprehensive Income	Amount reclassified		Affected line item in the Statement of Operations
	Three months ended September 30, 2018	Nine months ended September 30, 2018	
Unrealized gains (losses) on available-for-sale securities			
Reclassification adjustment for losses on available-for-sale debt securities	\$	\$ 2,473	Other income (expense), net

Note 3 Revenue

Revenue from contracts with customers arises from one customer, which is GSK, in one geographic location, which is the United Kingdom.

Revenue comprises the following categories (in thousands):

	Three months ended September 30, 2018	Nine months ended September 30, 2018
Development	\$ 1,678	\$ 18,912
Licenses	39,114	39,114
	\$ 40,792	\$ 58,026

The deferred revenue balance as of January 1, 2018 and September 30, 2018 is as follows (in thousands):

	September 30, 2018	January 1, 2018
Deferred revenue	\$ 1,345	\$ 30,090

Deferred revenue has decreased from \$30,090,000 at January 1, 2018 to \$1,345 at September 30, 2018 primarily due to the recognition of license revenue of \$39,114,000 for the NY-ESO License which commenced in September 2018, of which \$27,001,000 was included in the opening balance of deferred revenue. A further \$1,787,000 of the revenue recognized in the nine months ended September 30, 2018 was

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included in the opening balance of deferred revenue.

The impact of changes in variable consideration in the three and nine months ended September 30, 2018 was nil and a reduction in deferred revenue of \$10,396,000, respectively, and the impact of changes in the percentage of completion in the three and nine months ended September 30, 2018 was to increase deferred revenue by \$45,000 and \$5,027,000, respectively.

The aggregate amount of the transaction price, excluding variable consideration which is constrained to reduce the consideration to the amount which is probable of being received, allocated to the performance obligations that are unsatisfied (or partially satisfied) as of September 30, 2018 was \$1,345,000. This amount comprises \$88,000 of revenue allocated to partially satisfied performance obligations for the NY-ESO program and a further \$1,257,000 of revenue allocated to the partially satisfied performance obligations for the PRAME program.

The NY-ESO program transferred to GSK on July 23, 2018 which resulted in the revenue allocated to the NY-ESO License being recognized in the third quarter of 2018. The revenue allocated to the performance obligations for the NY-ESO program of \$88,000 will be recognized over the remainder of 2018.

The revenue allocated to the PRAME program of \$1,257,000 will be recognized over an estimated development period. As of September 30, 2018, this is estimated to be six months.

Table of Contents**Note 4 Other income (expense), net**

Other income (expense), net consisted of the following (in thousands):

	Three months ended September 30,		Nine months ended September 30,	
	2018	2017	2018	2017
Realized foreign exchange (losses) gains	\$ (179)	\$ 191	\$ (2,869)	\$ 703
Unrealized foreign exchange (losses) gains	(2,006)	3,680	(4,921)	6,887
Losses on redemption or maturity of available-for-sale debt securities			(2,473)	
Other	(64)	(269)	(262)	(348)
	\$ (2,249)	\$ 3,602	\$ (10,525)	\$ 7,242

Note 5 Loss per share

The numerator for the basic and diluted income (loss) per share is as follows (in thousands):

	Three months ended September 30,		Nine months ended September 30,	
	2018	2017	2018	2017
Net income (loss) attributable to ordinary shareholders	\$ 5,242	\$ (878)	\$ (59,341)	\$ (42,875)
Numerator for basic income (loss) per share	5,242	(878)	(59,341)	(42,875)
Numerator for diluted income (loss) per share	5,242	(878)	(59,341)	(42,875)

The denominator for the basic and diluted income (loss) per share is as follows:

	Three months ended September 30,		Nine months ended September 30,	
	2018	2017	2018	2017
Denominator for basic income (loss) per share - Weighted average shares outstanding	582,004,954	561,239,864	573,796,275	516,352,141
Effect of dilutive securities:				
Employee stock options	39,759,247			
Denominator for diluted income (loss) per share	621,764,201	561,239,864	573,796,275	516,352,141

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The dilutive effect of 2,791,651 and 75,087,783 stock options have been excluded from the diluted earnings (loss) per share calculation for the three months ended September 30, 2018 and 2017, respectively, because they would have an antidilutive effect on the earnings (loss) per share for the period. The dilutive effect of 88,869,497 and 69,136,398 stock options have been excluded from the diluted loss per share calculation for the nine months ended September 30, 2018 and 2017, respectively, because they would have an antidilutive effect on the income (loss) per share for the period.

Table of Contents**Note 6 Fair value measurements**

Assets and liabilities measured at fair value on a recurring basis based on Level 1, Level 2, and Level 3 fair value measurement criteria as of September 30, 2018 are as follows (in thousands):

	September 30, 2018	Fair value measurements using		
		Level 1	Level 2	Level 3
Assets:				
Marketable securities:				
Corporate debt securities	\$ 82,668	\$ 82,668	\$	\$
Commercial paper	1,984		1,984	
	\$ 84,652	\$ 82,668	\$ 1,984	\$

The Company estimates the fair value of available-for-sale debt securities with the aid of a third party valuation service, which uses actual trade and indicative prices sourced from third-party providers on a daily basis to estimate the fair value. If observed market prices are not available (for example securities with short maturities and infrequent secondary market trades), the securities are priced using a valuation model maximizing observable inputs, including market interest rates.

Note 7 Available-for-sale debt securities

As of September 30, 2018, the Company has the following investments in available-for-sale debt securities (in thousands):

	Maturity	Amortized cost	Gross unrealized gains	Gross unrealized losses	Aggregate estimated fair value
Marketable securities:					
Corporate debt securities	3 months to 1 year	\$ 82,717	\$	\$ (49)	\$ 82,668
Commercial paper	3 months to 1 year	1,984			1,984
		\$ 84,701	\$	\$ (49)	\$ 84,652

In the three and nine months ended September 30, 2018, realized losses recognized on the maturity of available-for-sale debt securities of nil and \$2,473,000, respectively, primarily arising due to foreign exchange movements, were reclassified out of accumulated other comprehensive loss.

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As of September 30, 2018 and December 31, 2017, the aggregate fair value of securities held by the Company in an unrealized loss position was \$ 79,485,000 and \$125,828,000, respectively, which consisted of 28 and 54 securities, respectively. No securities have been in an unrealized loss position for more than one year. As of September 30, 2018, the securities in an unrealized loss position are not considered to be other than temporarily impaired because the impairments are not severe, have been for a short duration and are due to normal market fluctuations. Furthermore, the Company does not intend to sell the debt securities in an unrealized loss position and it is unlikely that the Company will be required to sell these securities before the recovery of the amortized cost.

Note 8 Other current assets

Other current assets consisted of the following (in thousands):

	September 30, 2018	December 31, 2017
Corporate tax receivable	\$ 11,818	\$ 11,454
Prepayments	7,906	6,120
Clinical materials	1,190	3,760
Other current assets	927	382
	\$ 21,841	\$ 21,716

Table of Contents**Note 9 Accrued expenses and other current liabilities**

Accrued expenses and other current liabilities consisted of the following (in thousands):

	September 30, 2018	December 31, 2017
Accrued clinical and development expenditure	\$ 9,566	\$ 10,065
Accrued employee expenses	6,897	6,592
VAT	3,388	5,741
Other accrued expenditure	3,812	4,446
Other liabilities	651	357
	\$ 24,314	\$ 27,201

The Company typically has a receivable for VAT. As of December 31, 2017 and as of September 30, 2018, there was a VAT payable due to VAT arising on the milestone payments invoiced to GSK in 2017 and three months ended September 30, 2018.

Note 10 Share-based compensation

The following table shows the total share-based compensation expense included in the unaudited consolidated statements of operations (thousands):

	Three months ended September 30,		Nine months ended September 30,	
	2018	2017	2018	2017
Research and development	\$ 2,053	\$ 871	\$ 6,338	\$ 2,229
General and administrative	1,989	1,201	6,115	2,528
	\$ 4,042	\$ 2,072	\$ 12,453	\$ 4,757

There were 757,273 and 8,756,211 options over ordinary shares granted in the three months ended September 30, 2018 and 12,187,614 and 28,959,363 options over ordinary shares granted in the nine months ended September 30, 2018 and 2017, respectively, with a weighted average fair value of \$1.09, \$0.34, \$0.82 and \$0.34, respectively. Additionally, in the three and nine months ended September 30, 2018, 1,259,760 and 7,966,716 options were granted, which have a nominal exercise price (similar to a restricted stock unit (RSU)), with a weighted average fair value of \$1.67 and \$1.40, respectively.

The RSU-style options over ordinary shares in Adaptimmune Therapeutics plc were granted under the Adaptimmune Therapeutics plc Employee Share Option Scheme (adopted on January 14, 2016). These options have an exercise price equal to the nominal value of an ordinary share, of £0.001, and generally vest over four years, with 25% on the first, and each subsequent, anniversary of the grant date. The RSU-style options are not subject to performance conditions and the contractual term is ten years.

Note 11 Shareholders equity

On September 7, 2018, the Company completed a registered direct offering of its American Depositary Shares (ADSs) following its entry into a definitive agreement with Matrix Capital Management Company, LP, New Enterprise Associates 16, L.P., New Enterprise Associates 14, L.P. and Syncona Portfolio Limited. The Company sold 10,000,000 ADSs (representing 60,000,000 ordinary shares) at a price of \$10.00 per ADS. The net proceeds were \$99,653,000 after deducting offering expenses of \$347,000.

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Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

The statements in this discussion regarding industry outlook, our expectations regarding our future performance, liquidity and capital resources and other non-historical statements are forward-looking statements. These forward-looking statements are subject to numerous risks and uncertainties, including, but not limited to, the risks and uncertainties described in Risk Factors and Forward-Looking Statements in this Quarterly Report. Our actual results may differ materially from those contained in or implied by any forward-looking statements.

The following discussion should be read in conjunction with the unaudited consolidated financial statements and accompanying notes included elsewhere in this Quarterly Report and our consolidated financial statements and accompanying notes included within our Annual Report.

We are a clinical-stage biopharmaceutical company focused on novel cancer immunotherapy products based on our proprietary SPEAR T-cell platform. We have developed a comprehensive proprietary platform that enables us to identify cancer targets, find and genetically engineer TCRs, and produce TCR therapeutic candidates for administration to patients. We engineer TCRs to increase their affinity to cancer specific peptides in order to destroy cancer cells in patients.

Update on Clinical Pipeline Progress

Wholly owned SPEAR T-cells

We have Phase 1/2 clinical trials ongoing with our wholly owned MAGE-A10, MAGE-A4 and AFP SPEAR T-cells in a total of ten solid tumor types including non-small cell lung cancer (NSCLC), head and neck cancer, ovarian, urothelial, melanoma, hepatocellular, esophageal, gastric, synovial sarcoma and myxoid round cell liposarcoma (MRCLS) cancers.

• **MAGE-A10 SPEAR T-cell**

Phase 1 clinical trials are ongoing with our MAGE-A10 SPEAR T-cell in NSCLC, urothelial, melanoma and head and neck cancers in the United States, Canada, the United Kingdom and Spain. These trials are first-in-human, open-label studies utilizing a modified 3+3 design in up to 28 patients with escalating target doses of 100 million (Cohort 1), 1 billion (Cohort 2), and 5 billion (Cohort 3 and Expansion Phase) transduced SPEAR T-cells to evaluate safety, including dose limiting toxicities (DLTs) followed by a possible expansion phase with doses of up to 10 billion SPEAR T-cells. Patients are currently being enrolled in Cohort 3 in the NSCLC trial and Cohort 3 and Expansion Phase in the triple tumor (urothelial, melanoma and head and neck cancers) trial.

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Additional data on the safety and anti-tumor effects of the MAGE-A10 SPEAR T-cell in both clinical trials was presented at European Society for Medical Oncology (ESMO) in October 2018. As of September 4, 2018:

- 11 patients were treated across both studies in Cohort 1 (both NSCLC and triple tumour studies) and Cohort 2 (all NSCLC patients).
- Treatment of patients at the Cohort 1 and Cohort 2 dose levels has shown no evidence of toxicity related to off-target binding or alloreactivity and most adverse events were consistent with those experienced by cancer patients undergoing chemotherapy or other immunotherapies.
- In the three patients treated in Cohort 2:
 - One patient died of pneumonia (unrelated to T-cell therapy);
 - One patient had stable disease (SD) at Week 4, but then progressed; and
 - One patient had SD at Weeks 4 and 8, but progressed at Week 12.
- Transduced T-cells were detectable in peripheral blood in patients treated at the Cohort 1 and Cohort 2 dose levels.
- **MAGE-A4 SPEAR T-cell**

A Phase 1 clinical trial is ongoing in nine tumor indications namely urothelial, melanoma, head and neck, ovarian, NSCLC, esophageal and gastric cancers, synovial sarcoma and MRCLS. This trial is a first-in-human, open-label study utilizing a modified 3+3 design in up to 30 patients with escalating target doses of 100 million (Cohort 1), 1 billion (Cohort 2), and 5 billion (Cohort 3 and Expansion Phase) transduced SPEAR T-cells to evaluate safety, including dose limiting toxicities (DLTs) followed by a possible expansion phase with doses of up to 10 billion SPEAR T-cells. Patients are currently being enrolled in Cohort 3 and the Expansion Phase of the trial.

Additional data around the initial safety assessment of the MAGE-A4 SPEAR T-cell was presented at ESMO in October 2018. As of August 2, 2018:

- Three patients have been treated in Cohort 1 and three patients treated in Cohort 2;

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- Of the six patients treated, the best response was SD in four patients and progressive disease (PD) in two patients;
- The MAGE-A4 SPEAR T-cells showed no evidence of off-target toxicity or alloreactivity in the first two Cohorts; and
- Transduced T-cells were detectable in peripheral blood in patients treated at the Cohort 1 and Cohort 2 dose levels.

- **AFP SPEAR T-cell**

We are dosing in a Phase 1, open label, dose escalation study designed to evaluate the safety and anti-tumor activity of our alpha fetoprotein (AFP) therapeutic candidate in hepatocellular carcinoma (HCC). The trial is open in the United States, United Kingdom and Spain and is currently enrolling patients within the first dose cohort. The Phase 1 clinical trial will include a dose escalation to evaluate safety, including dose limiting toxicities (DLTs), followed by expansion of a tolerable dose to further explore safety and potential evidence of anti-tumor activity.

The NY-ESO SPEAR T-cell Program (now transitioned to GSK)

Transition of Program to GSK

The NY-ESO SPEAR T-cell program transitioned to GSK as of July 23, 2018. As a result of the transition, GSK has assumed full responsibility for future research, development, and potential commercialization of the NY-ESO SPEAR T-cell (referred to as GSK3377794 or GSK 794 by GSK).

Further clinical updates for MRCLS will be provided at SITC in November 2018 including in relation to the MRCLS study:

- 10 patients were enrolled in the study and treated with the NY-ESO SPEAR T-cell;
- All evaluable patients achieved tumour reduction;
- Eight patients were evaluable in accordance with RECIST criteria. Of these two patients have been assessed by Investigators as having confirmed Partial Responses (PR) in accordance with RECIST criteria and six patients were assessed by Investigators as having confirmed SD in accordance with RECIST criteria. This compares to previously reported three confirmed partial responses as assessed by Investigators and one unconfirmed partial response, where two of the partial responses were confirmed before the minimum 28 days required by RECIST

criteria. Two patients are non-evaluable according to RECIST criteria.

- The most frequent adverse events are consistent with those experienced by patients with cancer who are undergoing cytotoxic chemotherapy or other immunotherapies

Significant Events in the Three Months Ended September 30, 2018

On September 7, 2018, the Company completed a registered direct offering of its American Depositary Shares (ADSs). The Company sold 10,000,000 ADSs (representing 60,000,000 ordinary shares) at a price of \$10.00 per ADS. The net proceeds were \$99,653,000 after deducting offering expenses of \$347,000.

Financial Operations Overview

On January 1, 2018, the Company adopted new accounting guidance on revenue recognition, which has been codified within Accounting Standard Codification Topic 606, *Revenue from Contracts with Customers* (ASC 606). The comparative financial information for the three and nine months ended September 30, 2017 and as of December 31, 2017 has not been restated and is prepared in accordance with the previous accounting guidance.

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Revenue

Revenue arises from the GSK Collaboration and License Agreement. The contract consists of multiple performance obligations, including the transition of the NY-ESO SPEAR T-cell program to GSK, the pre-clinical development of a second target, PRAME, and the NY-ESO License.

The aggregate transaction price consists of an upfront payment of \$42.1 million in June 2014, development milestones achieved of \$66.4 million, an option exercise fee of \$39.8 million.

The transaction price is allocated to the performance obligation and recognized as or when the Company satisfies the performance obligation. The Company satisfies the performance obligations relating to the transition of the NY-ESO SPEAR T-cell program and the development of a second target, PRAME, over time and recognizes revenue based on an estimate of the percentage of completion of the project determined based on the costs incurred on the project as a percentage of the total expected costs.

The performance obligation relating to the NY-ESO License was recognized at a point-in-time, upon commencement of the license in September 2018.

Research and Development Expenses

Research and development expenses consist principally of the following:

- salaries for research and development staff and related expenses, including benefits;
- costs for production of preclinical compounds and drug substances by contract manufacturers;
- fees and other costs paid to contract research organizations in connection with additional preclinical testing and the performance of clinical trials;
- costs associated with the development of a process to manufacture and supply our lentiviral vector and SPEAR T-cells for use in clinical trials;

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- costs to develop manufacturing capability at our U.S. facility for manufacture of SPEAR T-cells for use in clinical trials;
- costs relating to facilities, materials and equipment used in research and development;
- costs of acquired or in-licensed research and development which does not have alternative future use;
- amortization and depreciation of property, plant and equipment and intangible assets used to develop our SPEAR T-cells; and
- share-based compensation expenses;

offset by:

- reimbursements from government grants; and
- reimbursable tax and expenditure credits from the U.K. government.

Research and development expenditures are expensed as incurred.

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Research and development expenditure is presented net of reimbursements from reimbursable tax and expenditure credits from the U.K. government. As a company that carries out extensive research and development activities, we benefit from the U.K. research and development tax credit regime for small and medium sized companies (SME R&D Tax Credit Scheme), whereby our principal research subsidiary company, Adaptimmune Limited, is able to surrender the trading losses that arise from its research and development activities for a payable tax credit of up to approximately 33.4% of eligible research and development expenditures. Qualifying expenditures largely comprise employment costs for research staff, consumables and certain internal overhead costs incurred as part of research projects for which we do not receive income. Subcontracted research expenditures are eligible for a cash rebate of up to approximately 21.7%. A large proportion of costs in relation to our pipeline research, clinical trials management and manufacturing development activities, all of which are being carried out by Adaptimmune Limited, are eligible for inclusion within these tax credit cash rebate claims.

Expenditures incurred in conjunction with the GSK Collaboration and License Agreement are not qualifying expenditures under the SME R&D Tax Credit Scheme but certain of these expenditures can be reimbursed through the U.K. research and development expenditure credit scheme (the RDEC Scheme). Under the RDEC Scheme tax relief is given at 12% of allowable R&D costs.

Our research and development expenses may vary substantially from period to period based on the timing of our research and development activities, which depends upon the timing of initiation of clinical trials and the rate of enrollment of patients in clinical trials. The duration, costs, and timing of clinical trials and development of our SPEAR T-cells will depend on a variety of factors, including:

- the scope, rate of progress, and expense of our ongoing as well as any additional clinical trials and other research and development activities;
- uncertainties in clinical trial enrollment rates;
- future clinical trial results;
- significant and changing government regulation;
- the timing and receipt of any regulatory approvals; and
- supply and manufacture of lentiviral vector and SPEAR T-cells for clinical trials.

For further detail please see Part II Item 1A Risk Factors Risks Related to the Development of our SPEAR T-cells of our Quarterly Report

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A change in the outcome of any of these variables may significantly change the costs and timing associated with the development of that SPEAR T cell. For example, if the FDA, or another regulatory authority, requires us to conduct clinical trials beyond those that we currently anticipate will be required for regulatory approval, or if we experience significant delays in enrollment in any of our clinical trials, we could be required to expend significant additional financial resources and time on the completion of clinical development.

General and Administrative Expenses

Our general and administrative expenses consist principally of:

- salaries for employees other than research and development staff, including benefits;
- business development expenses, including travel expenses;
- professional fees for auditors, lawyers and other consulting expenses;
- costs of facilities, communication, and office expenses;
- information technology expenses;
- amortization and depreciation of property, plant and equipment and intangible assets not related to research and development activities; and
- share-based compensation expenses.

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Other (Expense) Income, net

Other (expense) income, net comprises foreign exchange gains (losses). We are exposed to foreign exchange rate risk because we currently operate in the United Kingdom and United States. Our revenue from the GSK Collaboration and License Agreement is denominated in pounds sterling and is generated by our U.K.-based subsidiary, which has a pounds sterling functional currency. As a result, these sales are subject to translation into U.S. dollars when we consolidate our financial statements. Our expenses are generally denominated in the currency in which our operations are located, which are the United Kingdom and United States. However, our U.K.-based subsidiary incurs significant research and development costs in U.S. dollars and, to a lesser extent, Euros. Our U.K. subsidiary with a pound sterling functional currency holds our investment in marketable securities, which are predominately denominated in U.S. dollars. The entire change in the fair value of a foreign currency-denominated security, including the change due to foreign exchange, is included in other comprehensive income.

Our results of operations and cash flows will be subject to fluctuations due to changes in foreign currency exchange rates, which could harm our business in the future. We seek to minimize this exposure by maintaining currency cash balances at levels appropriate to meet foreseeable expenses in U.S. dollars and pounds sterling. To date, we have not used hedging contracts to manage exchange rate exposure, although we may do so in the future.

Taxation

We are subject to corporate taxation in the United Kingdom and the United States. We incur tax losses and tax credit carryforwards in the United Kingdom. No deferred tax assets are recognized on our U.K. losses and tax credit carryforwards because there is currently no indication that we will make sufficient taxable profits to utilize these tax losses and tax credit carryforwards.

We benefit from reimbursable tax credits in the United Kingdom through the SME R&D Tax Credit Scheme as well as the RDEC Scheme which are presented as a deduction to research and development expenditure.

Our subsidiary in the United States has generated taxable profits due to a Service Agreement between our U.S. and U.K. operating subsidiaries and is subject to U.S. federal corporate income tax of 21% for the year ended December 31, 2018. Due to its activity in the United States, and the sourcing of its revenue, the U.S. subsidiary is not currently subject to any state or local income taxes. The Company also benefits from the U.S Research Tax Credit and Orphan Drug Credit.

In the future, if we generate taxable income in the United Kingdom, we may benefit from the United Kingdom's patent box regime, which would allow certain profits attributable to revenues from patented products to be taxed at a rate of 10%. As we have many different patents covering our products, future upfront fees, milestone fees, product revenues, and royalties may be taxed at this favorably low tax rate.

U.K. Value Added Tax (VAT) is charged on all qualifying goods and services by VAT-registered businesses. An amount of 20% of the value of the goods or services is added to all relevant sales invoices and is payable to the U.K. tax authorities. Similarly, VAT paid on purchase invoices paid by Adaptimmune Limited and Adaptimmune Therapeutics plc is reclaimable from the U.K. tax authorities.

Critical Accounting Policies and Significant Judgments and Estimates

The preparation of our unaudited condensed consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities, and the revenues and expenses incurred during the reported periods. We base our estimates on historical experience and on various other factors that we believe are relevant under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. The accounting policies considered to be critical to the judgments and estimates used in the preparation of our financial statements are disclosed in the Management's Discussion and Analysis of Financial Condition and Results of Operations included in our Annual Report. There has been no change in the accounting policies considered to be critical accounting judgments and estimates other than the accounting judgments and estimates relating to revenue recognition, which have been changed from January 1, 2018 due to the adoption of ASC 606.

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Revenue Recognition

The Company has one contract with a customer, which is the GSK Collaboration and License Agreement. The GSK Collaboration and License Agreement consists of multiple performance obligations, including the transition of the NY-ESO SPEAR T-cell program to GSK, the development of a second target, PRAME, and the NY-ESO License.

The aggregate transaction price consists of an upfront payment, development milestones achieved, an option exercise fee and an estimate of variable consideration. The Company determines the variable consideration to be included in the transaction price by estimating the most-likely amount that will be received and then applies a constraint to reduce the consideration to the amount which is probable of being received. In estimating the amount of variable consideration to be included in the transaction price, the Company considers the latest project plan and other available information. The determination of whether a milestone is probable includes consideration of the following factors:

- Whether achievement of a development milestone is highly susceptible to factors outside the entity's influence, such as milestones involving the judgment or actions of third parties, including regulatory bodies or the customer;

- Whether the uncertainty about the achievement of the milestone is not expected to be resolved for a long period of time;

- Whether the Company can reasonably predict that a milestone will be achieved based on previous experience; and

- The complexity and inherent uncertainty underlying the achievement of the milestone.

The determination of whether future milestones are probable requires significant judgment and the impact of a change in the determination of whether a milestone is probable is recognized in the period the judgment is revised. This can significantly impact the revenue recognized. In the three and nine months ended September 30, 2018, revenue of nil and \$10.4 million, respectively, was recognized due to development milestones becoming probable in the period. As the development program progresses and the uncertainties underlying the milestones resolve, it is likely that further milestones will become probable.

The upfront payment of \$42.1 million was allocated between the performance obligations using the Company's best estimate of the relative selling price of each performance obligation. The best estimate of the selling price is determined after considering all reasonably available information, including internal pricing objectives used in negotiating the contract, together with internal data regarding the cost and margin of providing services for each deliverable taking into account the different stage of development of each development program. The variable consideration is allocated to the performance obligation to which it relates.

The amount of the transaction price allocated to the performance obligation is recognized as or when the Company satisfies the performance obligation. The Company satisfies the performance obligations relating to the transition of the NY-ESO SPEAR T-cell program and the development of a second target, PRAME, over time and recognizes revenue based on an estimate of the percentage of completion of the project determined based on the costs incurred on the project as a percentage of the total expected costs. The determination of the percentage of completion requires the Company to estimate the costs-to-complete the project. The Company makes a detailed estimate of the costs-to-complete on an annual basis as part of the Company's budgeting process, which is re-assessed every reporting period based on the latest project plan and discussions with project teams, when a change in facts or circumstances occurs, the estimate is adjusted and the revenue is recognized based on the revised estimate. The difference between the cumulative revenue recognized based on the previous estimate and the revenue recognized based on the revised estimate is recognized as an adjustment to revenue in the period in which the change in estimate occurs. In the three and nine months ended September 30, 2018, the estimate of the cost to complete for the performance obligation relating to the development and transition of the NY-ESO SPEAR T-cell program was revised, which resulted in a cumulative adjustment to reduce revenue of nil and \$5.0 million for the three and nine months ended September 30, 2018. Due to the inherent difficulties in determining the cost of completion for development programs, changes in the cost to complete are likely to continue to occur.

The performance obligation relating to the NY-ESO License was recognized at a point-in-time, upon commencement of the license in September 2018.

Table of Contents**Results of Operations***Comparison of Three Months Ended September 30, 2018 and 2017*

The following table summarizes the results of our operations for the three months ended September 30, 2018 and 2017, together with the changes to those items (in thousands).

	Three months ended September 30,		Increase/decrease	
	2018	2017		
Revenue	\$ 40,792	\$ 27,185	\$ 13,607	50%
Research and development expenses	(23,484)	(24,034)	550	(2)%
General and administrative expenses	(10,290)	(8,111)	(2,179)	27%
Total operating expenses	(33,774)	(32,145)	(1,629)	5%
Operating income (loss)	7,018	(4,960)	11,978	(241)%
Interest income	606	705	(99)	(14)%
Other (expense) income, net	(2,249)	3,602	(5,851)	(162)%
Income before income taxes	5,375	(653)	6,028	(923)%
Income taxes	(133)	(225)	92	(41)%
Income for the period	\$ 5,242	\$ (878)	\$ 6,120	(697)%

Revenue

Revenue increased by \$13.6 million to \$40.8 million in the three months ended September 30, 2018 compared to \$27.2 million for the three months ended September 30, 2017. Revenue comprises the following (in thousands):

	Three months ended September 30,		Increase/decrease	
	2018	2017		
Development revenue	\$ 1,678	\$ 27,185	\$ (25,507)	(94)%
License revenue	39,114		39,114	NM
	\$ 40,792	\$ 27,185	\$ 13,607	50%

Revenue arises from the GSK Collaboration and License Agreement. Development revenue relates to continued performance under the NY-ESO SPEAR T-cell transition program and the PRAME pre-clinical development program. License revenue relates to NY-ESO License.

Revenue for the three months ended September 30, 2018 has been recognized under ASC 606 which is effective January 1, 2018. Revenue in the comparative period of 2017 has been recognized under the previous guidance. Development revenue in the three months ended September 30, 2018 under the previous guidance would be \$17.9 million and license revenue would be \$39.1 million.

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Development revenue for the three months ended September 30, 2018 has decreased compared to the three months ended September 30, 2017. The development revenue for the three months ended September 30, 2018 has decreased due to the NY-ESO program having transferred to GSK on July 23, 2018. The development revenue for the three months ended September 30, 2017 benefited from cumulative revenue amortization of \$17.5 million in September 2017 due to a reduction in the estimate of the period over which we would be delivering services to GSK in relation to the NY-ESO SPEAR T-cell development program.

License revenue was \$39.1 million in the three months ended September 30, 2018 compared to nil in the three months ended September 30, 2017. License revenue is recognized upon commencement of the NY-ESO License which occurred in the third quarter of 2018.

Future revenues will fluctuate depending on the progress of the development program for PRAME, which is difficult to predict. However, we anticipate that a further \$1.3 million will be recognized over the next six months as the development of the second target, PRAME, progresses resulting in lower revenue in the year ended December 31, 2019 compared to the year ended December 31, 2018.

Table of Contents*Research and Development Expenses*

Research and development expenses decreased by 2% to \$23.5 million for the three months ended September 30, 2018 from \$24.0 million for the three months ended September 30, 2017. Our research and development expenses comprise the following (in thousands):

	2018	2017	Increase/decrease	
Salaries, materials, equipment, depreciation of property, plant and equipment and other employee-related costs(1)	\$ 15,213	\$ 12,371	\$ 2,842	23%
Subcontracted expenditure	10,016	12,292	(2,276)	(19)%
Share-based compensation expense	2,053	1,683	370	22%
Payments for in-process research and development		685	(685)	N/A
Reimbursements for research and development tax and expenditure credits	(3,798)	(2,997)	(801)	27%
	\$ 23,484	\$ 24,034	\$ (550)	(2)%

(1) These costs are not analyzed by project since employees may be engaged in multiple projects at a time.

The net decrease in our research and development expenses of \$0.6 million for the three months ended September 30, 2018 compared to the same period in 2017 was primarily due to the following:

- a decrease of \$2.3 million in subcontracted expenditures, including clinical trial expenses, contract research organization (CRO) costs and manufacturing expenses driven by decrease in manufacturing expenses and clinical trial costs due to the transfer of NY-ESO to GSK on July 23, 2018;
- a decrease in payments for in-process research and development of \$0.7 million; and
- an increase in reimbursements for research and development tax and expenditure credits of \$0.8 million.

offset by:

- an increase of \$2.8 million in salaries, materials, equipment, depreciation of property, plant and equipment and other employee-related costs. The driver for these is the increase in the average number of employees engaged in

research and development from 264 to 328; and

- an increase in share-based compensation expense of \$0.4 million.

Our subcontracted costs for the three months ended September 30, 2018 were \$10.0 million, compared to \$12.3 million in the same period of 2017. This includes \$6.0 million of costs associated with manufacturing of SPEAR T-cells and \$4.0 million of costs associated with clinical trials, including \$0.7 million for the NY-ESO SPEAR T-cells.

Our research and development expenses are highly dependent on the phases and progression of our research projects and will fluctuate depending on the outcome of ongoing clinical trials.

General and Administrative Expenses

General and administrative expenses increased by 27% to \$10.3 million for the three months ended September 30, 2018 from \$8.1 million in the same period in 2017.

The net increase of \$2.2 million was primarily due to an increase in personnel costs and share-based compensation expense, due to the addition of key management and other professionals, an increase in costs associated with developing our IT infrastructure, and an increase in other costs to support our growth.

We expect that our general and administrative expenses will continue to increase as we continue to expand our operations.

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Other Income (Expense), Net

Other income (expense), net was an expense of \$2.2 million for the three months ended September 30, 2018 compared to an income of \$3.6 million for the three months ended September 30, 2017. Other income (expense), net primarily relates to unrealized foreign exchange gains and losses on cash, cash equivalents and intercompany loans held in U.S. dollars by our U.K. subsidiary. Unrealized foreign exchange losses have increased primarily due to movements in foreign exchange rates and a decrease in our cash balances arising as a consequence of our investment of cash and cash equivalents into marketable securities. The unrealized foreign exchange gains (losses) arising on marketable securities are recognized within Other comprehensive income.

Income taxes

Income taxes decreased by 41% to \$0.1 million for the three months ended September 30, 2018 from \$0.2 million for the three months ended June 30, 2017. Income taxes arise in the United States due to our U.S. subsidiary generating taxable profits. We incur losses in the United Kingdom. Income taxes have decreased in the three months to September 30, 2018 due to the impact of US R&D tax credits and lower tax rates.

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Comparison of Nine months ended September 30, 2018 and 2017

The following table summarizes the results of our operations for the nine months ended September 30, 2018 and 2017, together with the changes to those items (in thousands).

	Nine months ended September 30,			Increase/decrease	
	2018	2017			
Revenue	\$ 58,026	\$ 33,563	\$ 24,463	73%	
Research and development expenses	(75,500)	(62,240)	(13,260)	21%	
General and administrative expenses	(32,785)	(22,284)	(10,501)	47%	
Total operating expenses	(108,285)	(84,524)	(23,761)	28%	
Operating loss	(50,259)	(50,961)	702	(1)%	
Interest income	1,805	1,465	340	23%	
Other (expense) income, net	(10,525)	7,242	(17,767)	(245)%	
Loss before income taxes	(58,979)	(42,254)	(16,725)	40%	
Income taxes	(362)	(621)	259	(42)%	
Loss for the period	\$ (59,341)	\$ (42,875)	\$ (16,466)	38%	

Revenue

Revenue increased by \$24.5 million to \$58.0 million in the nine months ended September 30, 2018 compared to \$33.6 million for the nine months ended September 30, 2017. Revenue comprises the following (in thousands):

	Nine months ended September 30,			Increase/decrease	
	2018	2017			
Development revenue	\$ 18,912	\$ 33,563	\$ (14,651)	(44)%	
License revenue	39,114		39,114	NM	
	\$ 58,026	\$ 33,563	\$ 24,463	73%	

Revenue arises from the GSK Collaboration and License Agreement. Development revenue relates to continued performance under the NY-ESO SPEAR T-cell transition program and the PRAME pre-clinical development program. License revenue relates to the NY-ESO License.

Revenue for the nine months ended September 30, 2018 has been recognized under ASC 606 which is effective January 1, 2018. Revenue in the comparative period of 2017 has been recognized under the previous guidance. Development revenue in the nine months ended September 30, 2018 under the previous guidance would be \$30.2 million and license revenue would be \$39.1 million.

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Development revenue of \$18.9 million in the nine months ended September 30, 2018 benefited from a change in the estimate of variable consideration of \$10.3 million due to additional development milestones being considered probable, which was partially offset by \$5.0 million arising due to a change in percentage of completion.

Development revenue of \$33.6 million in the nine months ended September 30, 2017, benefited from \$10.4 million of milestones being achieved in the nine months ended September 30, 2017 and an increase in cumulative revenue amortization of \$17.5 million in September 2017 upon the exercise of the NY-ESO Option. The cumulative revenue amortization arose due to the estimate of the period over which we would be delivering services to GSK in relation to the NY-ESO SPEAR T-cell development program being significantly reduced.

License revenue was \$39.1 million in the nine months ended September 30, 2018 compared to nil in the nine months ended September 30, 2017. License revenue was recognized upon commencement of the NY-ESO License which occurred in the third quarter of 2018.

Future revenues will fluctuate depending on the progress of the development program for PRAME, which is difficult to predict. However, we anticipate that a further \$1.3 million will be recognized over the next six months as the development of the second

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target, PRAME, progresses resulting in lower revenue in the year ended December 31, 2019 compared to the year ended December 31, 2018.

Research and Development Expenses

Research and development expenses increased by 21% to \$75.5 million for the nine months ended September 30, 2018 from \$62.2 million for the nine months ended September 30, 2017. Our research and development expenses comprise the following (in thousands):

Salaries, materials, equipment, depreciation of property, plant and equipment and other employee-related costs(1)	\$	45,809	\$	34,856	\$	10,953	31%
Share-based compensation expense		6,338		3,913		2,425	62%
Reimbursements for research and development tax and expenditure credits and government grants		(11,682)		(7,302)		(4,380)	60%

(1) These costs are not analyzed by project since employees may be engaged in multiple projects at a time.

The net increase in our research and development expenses of \$13.3 million for the nine months ended September 30, 2018 compared to the same period in 2017 was primarily due to the following:

- an increase of \$11.0 million in salaries, materials, equipment, depreciation of property, plant and equipment and other employee-related costs. The driver for these is the increase in the average number of employees engaged in research and development from 244 to 314;
- an increase of \$5.4 million in subcontracted expenditures, including clinical trial expenses, contract research organization (CRO) costs and manufacturing expenses driven by increased recruitment in our clinical trials, initiation of clinical trials for MAGE-A4, MAGE-A10 and AFP, and an increase in process development relating to manufacturing; and
- an increase in share-based compensation expense of \$2.4 million;

offset by:

- a decrease of \$1.2 million in payments made to Universal Cells for in-process research and development; and
- an increase in reimbursements for research and development tax and expenditure credits of \$4.4 million.

Our subcontracted costs for the nine months ended September 30, 2018 were \$35.0 million, compared to \$29.6 million in the same period of 2017. This includes \$20.8 million of costs associated with manufacturing for both the NY-ESO SPEAR T-cells and our internal pipeline, including our MAGE-A10 and MAGE-A4 and AFP SPEAR T-cells and \$14.2 million of costs associated with clinical trials, including \$3.3 million for the NY-ESO SPEAR T-cells.

Our research and development expenses are highly dependent on the phases and progression of our research projects and will fluctuate depending on the outcome of ongoing clinical trials.

General and Administrative Expenses

General and administrative expenses increased by 47% to \$32.8 million for the nine months ended September 30, 2018 from \$22.3 million in the same period in 2017.

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The net increase of \$10.5 million was primarily due to an increase in personnel costs and share-based compensation expense, due to the addition of key management and other professionals, an increase in costs associated with developing our IT infrastructure, and an increase in other costs to support our growth.

We expect that our general and administrative expenses will continue to increase as we continue to expand our operations.

Other Income (Expense), Net

Other income (expense), net was an expense of \$10.5 million for the nine months ended September 30, 2018 compared to an income of \$7.2 million for the nine months ended September 30, 2017. Other income (expense), net primarily relates to unrealized foreign exchange gains and losses on cash, cash equivalents and intercompany loans held in U.S. dollars by our U.K. subsidiary. Unrealized foreign exchange losses have increased primarily due to movements in foreign exchange rates and a decrease in our cash balances arising as a consequence of our investment of cash and cash equivalents into marketable securities. The unrealized foreign exchange gains (losses) arising on marketable securities are recognized within Other Comprehensive Income.

Income taxes

Income taxes decreased by 42% to \$0.4 million for the nine months ended September 30, 2018 from \$0.6 million for the nine months ended September 30, 2017 due to the impact of US R&D tax credits. Income taxes arise in the United States and we incur losses in the United Kingdom.

Liquidity and Capital Resources

Sources of Funds

Since our inception, we have incurred significant net losses and negative cash flows from operations. We financed our operations primarily through sales of equity securities, cash receipts under our GSK Collaboration and License Agreement, government grants and research and development tax and expenditure credits. From inception through to September 30, 2018, we have raised:

- \$513.5 million, net of issuance costs, through the issuance of shares, including \$99.7 million raised through a registered direct offering in September 2018;

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- \$148.3 million upfront fees, milestones and exercise fees under our GSK Collaboration and License Agreement;
- \$2.8 million of income in the form of government grants; and
- \$24.2 million in the form of reimbursable U.K. research and development tax credits and receipts from the U.K. RDEC Scheme.

We use a non-GAAP measure, Total Liquidity, which is defined as the total of cash and cash equivalents and marketable securities, to evaluate the funds available to us in the near-term. A description of Total Liquidity and reconciliation to cash and cash equivalents, the most directly comparable U.S. GAAP measure, are provided below under *Non-GAAP measures* .

As of September 30, 2018, we had cash and cash equivalents of \$153.1 million and Total Liquidity of \$237.7 million. We believe that our Total Liquidity and income from GSK upon transition of the NY-ESO program will be sufficient to fund our operations, based upon our currently anticipated research and development activities and planned capital spending, through to late 2020.

Cash Flows

The following table summarizes the results of our cash flows for the nine months ended September 30, 2018 and 2017 (in thousands).

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	Nine months ended September 30,	
	2018	2017
Net cash used in operating activities	\$ (72,703)	\$ (32,959)
Net cash provided by (used in) investing activities	34,954	(86,070)
Net cash provided by financing activities	102,586	103,568
Cash, cash equivalents and restricted cash	157,244	149,558

Operating Activities

Net cash used in operating activities increased by \$39.7 million to \$72.7 million for the nine months ended September 30, 2018 from \$33.0 million for the nine months ended September 30, 2017. The increase in cash used in operations was primarily the result of the increase in research and development costs due to the ongoing advancement of our preclinical programs and clinical trials and an increase in general and administrative expenses due to the expansion of our operations.

Net cash used in operating activities of \$72.7 million for the nine months ended September 30, 2018 comprised a net loss of \$59.3 million and a decrease in operating assets and liabilities of \$39.2 million, offset by noncash items of \$25.8 million. The decrease in operating assets and liabilities of \$39.2 million in the nine months ended September 30, 2018 is primarily driven by movements in deferred revenue due to the recognition of the revenue for the NY-ESO License. The noncash items consisted primarily of depreciation expense on plant and equipment of \$5.2 million, share-based compensation expense of \$12.5 million, a realized loss on sale of marketable securities of \$2.5 million and unrealized foreign exchange losses of \$4.9 million.

Investing Activities

Net cash provided by investing activities of \$35.0 million for the nine months ended September 30, 2018 and net cash used in investing activities of \$86.1 million for the nine months ended September 30, 2017, consisted of:

- purchases of property and equipment of \$3.8 million and \$22.8 million for the nine months ended September 30, 2018 and 2017, respectively;
- cash outflows from investment in marketable securities of \$75.5 million and \$93.2 million for the nine months ended September 30, 2018 and 2017, respectively, and cash inflows from maturity or redemption of marketable securities of \$115.0 million and \$7.0 million for the nine months ended September 30, 2018 and 2017, respectively; and
- investment in short-term cash deposits with maturities greater than three months but less than 12 months of \$40.6 million and cash inflows from maturity of short-term deposits of \$18.0 for the nine months ended September 30,

2017.

Financing Activities

Net cash from financing activities of \$102.6 million in the nine months ended September 30, 2018, consisted of proceeds from a registered direct offering in September 2018 of \$99.7 million and proceeds from share option exercises of \$2.9 million, and net cash from financing activities for the nine months ended September 30, 2017 of \$103.6 million consisted of proceeds from a follow-on public offering of ADSs of \$61.4 million in March 2017 and proceeds of \$41.8 million from a registered direct offering in April 2017 and proceeds from share option exercises of \$0.4 million.

Non-GAAP Measures

Total Liquidity (a non-GAAP financial measure)

Total Liquidity (a non-GAAP financial measure) is the total of cash and cash equivalents and marketable securities. Each of these components appears in the consolidated balance sheet. The U.S. GAAP financial measure most directly comparable to Total Liquidity is cash and cash equivalents as reported in the consolidated financial statements, which reconciles to Total Liquidity as follows (in thousands):

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	September 30, 2018	December 31, 2017
Cash and cash equivalents	\$ 153,081	\$ 84,043
Marketable securities	84,652	124,218
Total Liquidity	\$ 237,733	\$ 208,261

We believe that the presentation of Total Liquidity provides useful information to investors because management reviews Total Liquidity as part of its management of overall liquidity, financial flexibility, capital structure and leverage. The definition of Total Liquidity includes investments, which are highly-liquid and available to use in our current operations, such as marketable securities.

Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined in the rules and regulations of the SEC.

Contractual Obligations

For a discussion of our contractual obligations, see Part II, Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations in our 2017 Annual Report on Form 10-K. There have not been any material changes to our contractual obligations in the nine months ended September 30, 2018.

Safe Harbor

See the section titled Information Regarding Forward-Looking Statements at the beginning of this Quarterly Report.

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Item 3. Quantitative and Qualitative Disclosures about Market Risk.

For a discussion of our quantitative and qualitative disclosures about market risk, see Part II, Item 7A. Quantitative and Qualitative Disclosures about Market Risk in our 2017 Annual Report on Form 10-K. There have been no material changes in the nine months ended September 30, 2018.

Item 4. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, has evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e)) under the Securities and Exchange Act of 1934, as amended (Exchange Act) as of September 30, 2018. Based on such evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that, as of September 30, 2018, our disclosure controls and procedures were effective to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms, and is accumulated and communicated to our management, including our Chief Executive and Chief Financial Officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure.

Changes in Internal Control over Financial Reporting

In January 2018, the Company adopted new guidance on revenue recognition, which has been codified within Accounting Standard Codification Topic 606, *Revenue from Contracts with Customers* (ASC 606). As a consequence of the new guidance, the Company implemented several new internal controls, including controls to monitor the probability of achievement of contingent milestone payments and the pattern of performance of the performance obligation in the quarter ended March 31, 2018.

No changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) occurred during the quarter ended September 30, 2018 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

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PART II - OTHER INFORMATION

Item 1. Legal Proceedings.

As of September 30, 2018, we were not a party to any material legal proceedings.

Item 1A. Risk Factors.

Our business has significant risks. You should carefully consider the following risk factors as well as all other information contained in this Quarterly Report, including our condensed consolidated financial statements and the related notes, before making an investment decision regarding our securities. The risks and uncertainties described below are those significant risk factors currently known and specific to us that we believe are relevant to our business, results of operations and financial condition. Additional risks and uncertainties not currently known to us or that we now deem immaterial may also impair our business, results of operations and financial condition.

Risks Related to Our Financial Condition and Capital Requirements

We are a clinical-stage biopharmaceutical company with no commercial products and prediction of future performance is very difficult.

We are a clinical-stage biopharmaceutical company focused on novel cancer immunotherapy products. We have no products or therapeutics approved for commercial sale and have not generated any revenue from product supplies or royalties. Our therapeutic candidates are based on engineered TCRs and are new and largely unproven. Our limited operating history, particularly in light of the rapidly evolving cancer immunotherapy field, may make it difficult to evaluate our current business and predict our future performance. Investment in biopharmaceutical product development is highly speculative because it entails substantial upfront capital expenditures and significant risk that any potential product candidate will fail to demonstrate adequate effect or an acceptable safety profile, gain regulatory approval and become commercially viable. Our inability to address these risks successfully would have a materially adverse effect on our business and prospects.

We have incurred net losses every year since our inception and expect to continue to incur net losses in the future.

We have generated losses since our inception in 2008, during which time we have devoted substantially all of our resources to research and development efforts relating to our SPEAR T-cells (including the NY-ESO SPEAR T-cell), including engaging in activities to manufacture and supply our SPEAR T-cells for clinical trials in compliance with current good manufacturing practice, or cGMP, conducting clinical trials of our SPEAR T-cells, providing general and administrative support for these operations and protecting our intellectual property. We do not have any products approved for sale and have not generated any revenue from product supplies or royalties. Based on our current plans, we do not expect to generate product or royalty revenues unless and until we obtain marketing approval for, and commercialize, any of our SPEAR T-cells.

For the years ended December 31, 2017 and 2016 and six months ended December 31, 2015 and the year ended June 30, 2015, we incurred net losses of \$70.1 million, \$71.6 million, \$23.0 million and \$22.1 million, respectively. As of September 30, 2018, we had accumulated losses of \$282.3 million. We expect to continue incurring significant losses as we continue with our research and development programs and to incur general and administrative costs associated with our operations. The extent of funding required to develop our product candidates is difficult to estimate given the novel nature of our SPEAR T-cells and their un-proven route to market. Our profitability is dependent upon the successful development, approval, and commercialization of our SPEAR T-cells, further development of the NY-ESO SPEAR T-cells by GSK (given the NY-ESO program has now been transitioned to GSK), achieving GSK milestones (for both the NY-ESO program, the PRAME program and any future SPEAR T-cell programs under the GSK Collaboration and License Agreement) and achieving a level of revenues adequate to support our cost structure. We may never achieve profitability, and unless and until we do, we will continue to need to raise additional cash.

We have never generated any revenue from sales of our SPEAR T-cells and our ability to generate revenue from sales of our SPEAR T-cells and become profitable depends significantly on our success in a number of factors.

We have no SPEAR T-cells approved for commercial sale, have not generated any revenue from sales of our SPEAR T-cells (including the NY-ESO SPEAR T-cell), and do not anticipate generating any revenue from sales of our SPEAR T-cells until some time after we receive regulatory approval, if at all, for the commercial sale of a SPEAR T-cell. We intend to fund future operations through milestone payments under our collaboration and license agreement with GSK and through additional equity financings or other third party collaborations. Our ability to generate revenue and achieve profitability depends on our success in many factors, including:

- completing preclinical development and advancing our SPEAR T-cells to clinic;
- delivering on the clinical development strategy for our SPEAR T-cells;

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- progressing our clinical trials within predicted timeframes and without any substantial delays, for example as may be caused by delays in patient recruitment, regulatory requirements to hold or suspend any clinical trials or delays in obtaining approvals required to conduct clinical trials;
- demonstrating a favorable benefit (efficacy parameters): risk (safety) for our SPEAR T-cells and the NY-ESO SPEAR T-cell that translate into a differentiated product of value for patients;
- obtaining data from clinical trials which are ongoing for SPEAR T-cells other than the NY-ESO SPEAR T-cell;
- obtaining regulatory approvals and marketing authorizations for our SPEAR T-cells and the NY-ESO SPEAR T-cell for which we or our collaborator complete clinical trials;
- progressing our clinical trials within predicted timeframes and without any substantial delays, for example as may be caused by delays in patient recruitment, regulatory requirements to hold or suspend any clinical trials or delays in obtaining approvals required to conduct clinical trials;
- developing sustainable and scalable manufacturing and supply processes for our SPEAR T-cells, including establishing and maintaining commercially viable supply relationships with third parties and establishing our own commercial manufacturing capabilities and infrastructure;
- developing a reliable and commercially viable/cost effective commercial manufacturing process to enable commercial supply of our SPEAR T-cells;
- launching and commercializing SPEAR T-cells for which we obtain regulatory approvals and marketing authorizations, either directly or with a collaborator or distributor;
- obtaining market acceptance, pricing and reimbursement of our SPEAR T-cells as viable treatment options;
- addressing any competing technological and market developments;

- identifying, assessing, acquiring and/or developing new SPEAR T-cells;
- maintaining, protecting, and expanding our portfolio of intellectual property rights, including patents, trade secrets and know-how; and
- attracting, hiring and retaining qualified personnel.

Even if one or more of the SPEAR T-cells is approved for commercial sale whether by us or by a collaborator, we anticipate incurring significant costs associated with commercializing any approved SPEAR T-cell. Our expenses could increase beyond expectations if the FDA or any other regulatory agency requires changes to our manufacturing processes or assays, or for us to perform preclinical programs and clinical or other types of trials in addition to those that we currently anticipate. If we are successful in obtaining regulatory approvals to market one or more SPEAR T-cells, our revenue will be dependent, in part, upon the size of the markets in the territories for which we gain regulatory approval, the accepted price for the SPEAR T-cell, the ability to get reimbursement at any price, and whether we own the commercial rights for that territory. If the number of our addressable disease patients is not as significant as we estimate, the indication approved by regulatory authorities is narrower than we expect, or the reasonably accepted population for treatment is narrowed by competition, physician choice or treatment guidelines, we may not generate significant revenue from sales or supplies of such SPEAR T-cells, even if approved. If we are not able to generate revenue from the sale of any approved SPEAR T-cells, we may never become profitable.

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If we fail to obtain additional financing, we may be unable to complete the development and commercialization of our SPEAR T-cells.

Our operations have required substantial amounts of cash since inception. We expect to continue to spend substantial amounts to continue the development of our SPEAR T-cells, including future clinical trials. If we receive approval for any of our SPEAR T-cells, we will require significant additional amounts in order to launch and commercialize these therapeutic candidates.

As of September 30, 2018, we had \$153.1 million of cash and cash equivalents and \$84.7 million of marketable securities. We expect to use these funds to advance and accelerate the clinical development of our MAGE-A10, MAGE-A4 and AFP SPEAR T-cells, to further develop and enhance our manufacturing capabilities and secure a commercially viable manufacturing platform for all of our SPEAR T-cells, to advance additional SPEAR T-cells into preclinical testing and progress such SPEAR T-cells through to clinical trials as quickly as possible and to fund working capital, including other general corporate purposes. We believe that such proceeds, our existing cash, and cash equivalents and marketable securities together with milestones payments to us under the GSK Collaboration and License Agreement will be sufficient to fund our operations for the foreseeable future, including for at least the next 12 months. However, changing circumstances beyond our control, including changes to the scope and timing of the programs under the GSK collaboration (for example, completion of post-transition NY-ESO program activities and nomination of any further targets under the collaboration), may cause us to increase our spending significantly faster than we currently anticipate. We may require additional capital for the further development and commercialization of our SPEAR T-cells and may need to raise additional funds sooner if we choose to expand more rapidly than we presently anticipate.

We cannot be certain that additional funding will be available on acceptable terms, or at all. We have no committed source of additional capital and if we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the development or commercialization of our SPEAR T-cells or other research and development initiatives. Our license and supply agreements may also be terminated if we are unable to meet the payment obligations under these agreements. We could be required to seek collaborators for our SPEAR T-cells at an earlier stage than otherwise would be desirable or on terms that are less favorable than might otherwise be available or relinquish or license on unfavorable terms our rights to our SPEAR T-cells in markets where we otherwise would seek to pursue development or commercialization ourselves. Any of the above events could significantly harm our business, prospects, financial condition and results of operations and cause the price of our American Depositary Shares, or ADSs, to decline.

Risks Related to the Development of Our SPEAR T-cells

Our business is highly dependent on the NY-ESO SPEAR T-cell and our existing SPEAR T-cell candidates including the MAGE-A10 SPEAR T-cell, MAGE-A4 SPEAR T-cell and AFP SPEAR T-cell, which will require significant additional clinical testing before we can seek regulatory approval and begin commercialization of any of our SPEAR T-cells.

There is no guarantee that any SPEAR T-cells will achieve regulatory approval or proceed to the next stage of clinical programs. The process for obtaining marketing approval for any candidate is very long and risky and there will be significant challenges for us to address in order to obtain marketing approval, if at all.

There is no guarantee that the results obtained in current clinical trials for the NY-ESO SPEAR T-cell will be sufficient for GSK to plan one or more pivotal clinical trials and obtain regulatory approval or marketing authorization. Negative results in the NY-ESO SPEAR T-cell clinical program or in other investigator-initiated clinical programs utilizing the NY-ESO therapeutic candidate may also impact our ability to obtain regulatory approval for other SPEAR T-cells, either at all or within anticipated timeframes because, although the SPEAR T-cell may target a

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different cancer peptide, the underlying technology platform, manufacturing process and development process is the same for all of our SPEAR T-cells. Accordingly, a failure or delay in any one program may affect the ability to obtain regulatory approval to continue or conduct clinical programs for other SPEAR T-cells.

We may not be able to submit INDs, or the foreign equivalent outside of the United States, to commence additional clinical trials for other SPEAR T-cells on the timeframes we expect, and even if we are able to, the FDA or comparable foreign regulatory authorities may not permit us to proceed with planned clinical trials.

Progression of new SPEAR T-cells into clinical trials is inherently risky and dependent on the results obtained in preclinical programs, the results of other clinical programs and results of third-party programs that utilize common components, such as production of the lentiviral vector lot used for production and administration of our SPEAR T-cell. If results are not available when expected or problems are identified during SPEAR T-cell development, we may experience significant delays in development of pipeline products and in existing clinical programs, which may impact our ability to receive regulatory approval. This may also impact our ability to achieve certain financial milestones and the expected timeframes to market any of our SPEAR T-cells. Failure to submit further IND or the foreign equivalent and commence additional clinical programs will significantly limit our opportunity to generate revenue.

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There is no guarantee that the FDA, or any other regulatory authority, will approve any IND (or equivalent application) for any of our future SPEAR T-cells, or for new indications for our SPEAR T-cells already in clinical trials, or that amendments to existing protocols will not be required. For example, the FDA issued a partial clinical hold for our proposed MRCLS trial with NY-ESO following review of the IND submitted for the trial. The FDA notification was not based on safety concerns. In our correspondence the FDA requested additional Chemistry Manufacturing and Controls, or CMC, and clinical information prior to the commencement of the proposed trial. An amendment to the ADP-0011-007 protocol for the trial was filed with the FDA which converted the trial into a pilot trial (rather than the previously proposed pivotal trial design with a futility phase) and this amended protocol was approved by the FDA resulting in a lift of the partial clinical hold. The start of the MRCLS trial was delayed as a result of the FDA issued partial clinical hold and there is no guarantee that any later MRCLS pivotal trial or further SPEAR T-cell trial will be approved by the FDA.

We are continuing to expand our clinical trial foot print in Europe. This requires gaining the approval of country specific review bodies for GMO application and CTA. As this is not a harmonized process, the requirements can vary considerably and delays can be incurred at a country level.

In the USA, some institutional review boards, or IRBs, have requested that the Sponsor obtain Investigational Device Exemptions (IDE) from the FDA for the validated clinical trial assay being used to select patients. This has delayed the initiation of some sites and limited the ability to obtain high risk biopsies until an IDE has been granted. We plan to proactively seek IDEs for our SPEAR T-cell assays where appropriate.

Our SPEAR T-cells being developed may have potentially fatal cross-reactivity to other peptides or protein sequences within the body.

One of our prior SPEAR T-cells, designed to target an HLA-1 restricted MAGE-A3 cancer-specific peptide, recognized another unrelated peptide from a protein called TITIN, expressed within normal cardiac and other muscle tissues in patients. As a result of this cross-reactivity to the TITIN protein in the heart, two patients died during our MAGE-A3 clinical program, the program was put on pause, then formally placed on hold by the FDA, after which we terminated the program. We subsequently developed a preclinical safety testing program that identifies potential cross-reactivity risks but there may be gaps or other problems detected in the testing program at a later date. Even with the use of this testing program, there can be no guarantee that the FDA will permit us to begin clinical trials of any additional SPEAR T-cells other than those for which INDs already exist or that other off-target cross-reactivity will not be identified or present in any patient group. Failure to develop an effective preclinical safety testing program will prevent or delay clinical trials of any SPEAR T-cell. Detection of any cross-reactivity will halt or delay any ongoing clinical trials for any SPEAR T-cell and prevent or delay regulatory approval. Given that the underlying technology platform, manufacturing process and development process is similar for all of our TCR therapies, issues pertaining to cross-reactivity for one SPEAR T-cell may impact our ability to obtain regulatory approval for other SPEAR T-cells undergoing development and clinical trials, which would significantly harm our business, prospects, financial condition and results of operations.

Cross-reactivity or allo-reactivity (binding to peptides presented on other HLA types) could also occur where the affinity-enhanced engineered TCR contained within any SPEAR T-cell binds to peptides presented by HLAs other than the HLA type for which the relevant TCR was developed. We have developed a preclinical screening process to identify allo-reactivity risk. Where any allo-reactivity risk is identified, patients with the allo-reactive alleles will be excluded from the trial. Any allo-reactivity or other cross-reactivity that impacts patient safety could materially impact our ability to advance our SPEAR T-cells into clinical trials or to proceed to market approval and commercialization. In addition, there is no guarantee that exclusion of patients with the identified allo-reactive allele will successfully eliminate the risk of allo-reactivity, and serious side effects for patients may still exist. Given that the underlying technology platform, manufacturing process and development process are similar for all of our SPEAR T-cells, issues pertaining to allo-reactivity for one SPEAR T-cell may impact our ability or our collaborator's ability to obtain regulatory approval for other SPEAR T-cells undergoing development and clinical trials, which would significantly harm our business, prospects, financial condition and results of operations.

Our T-cell therapy, which is a type of cell therapy that uses gene therapy technology, represents a novel approach to cancer treatment that could result in heightened regulatory scrutiny, delays in clinical development, or delays in our or our collaborator's ability or inability to achieve regulatory approval or commercialization of SPEAR T-cells.

Use of any SPEAR T-cells to treat a patient requires the use of gene therapy technology, which involves combining a patient's T cells with our lentiviral delivery vector containing the gene for our affinity-enhanced engineered TCR. This is a novel treatment approach that carries inherent development risks. We are therefore constantly evaluating and adapting our SPEAR T-cells following the results obtained during development work and the clinical programs. Further development, characterization and evaluation may be required, depending on the results obtained, in particular where such results suggest any potential safety risk for

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patients. The need to develop further assays, or to modify in any way the protocols related to our SPEAR T-cells to improve safety or effectiveness, may delay the clinical program, regulatory approval or commercialization, if approved at all, of any SPEAR T-cell. Consequently, this may have a material impact on our ability to receive milestone payments and/or generate revenue from our SPEAR T-cells.

In addition, given the novelty of SPEAR T-cells, the end users and medical personnel require a substantial amount of education and training in their administration of SPEAR T-cells. Regulatory authorities have very limited experience with commercial engineered cell therapies and SPEAR T-cells for the treatment of cancer. As a result, regulators may be more risk adverse or require substantial dialogue and education as part of the normal regulatory approval process for each stage of development of any SPEAR T-cell. To date, only a limited number of gene therapy products have been approved in the United States and European Union. Consequently, it is difficult to predict and evaluate what additional regulatory hurdles may apply to the development of our SPEAR T-cells and whether additional investment, time or resources will be required to overcome any such hurdles.

Additionally, because our technology involves the genetic modification of patient cells *ex-vivo* using a viral vector, we are subject to many of the challenges and risks of gene therapy, including the following challenges:

- Regulatory requirements governing gene and cell therapy products have changed frequently and may continue to change in the future.
- Random gene insertion associated with retrovirus-mediated genetically modified products, known as insertional oncogenesis, could lead to lymphoma, leukemia or other cancers, or other aberrantly functioning cells. Insertional oncogenesis was seen in early gene therapy studies conducted outside of the United States in 2003. In those studies, insertional oncogenesis resulted in patients developing leukemia following treatment with the relevant gene therapy, with one patient dying. As a result of the data from those studies, the FDA temporarily halted gene therapy trials in the United States. The previous trials involved modification of stem cells rather than T cells and utilized a murine gamma-retroviral vector rather than a lentiviral vector. We cannot guarantee that insertional oncogenesis resulting from administration of our SPEAR T-cells will not occur.
- Although our viral vectors are not able to replicate, there may be a risk with the use of retroviral or lentiviral vectors that they could undergo recombination and lead to new or reactivated pathogenic strains of virus or other infectious diseases.
- There is the potential for delayed adverse events following exposure to gene therapy products due to persistent biological activity of the genetic material or other components of products used to carry the genetic material. In part for this reason, the FDA recommends a 15-year follow-up observation period for all surviving patients who receive treatment using gene therapies in clinical trials. We may need to adopt such an observation period for our therapeutic candidates; however, the FDA does not require that the tracking be complete prior to its review of the Biologics License Application, or BLA.

- Clinical trials using genetically modified cells conducted at institutions that receive funding for recombinant DNA research from the NIH may be subject to review by the NIH Office of Biotechnology Activities Recombinant DNA Advisory Committee, or RAC. The RAC review process can delay or impede the initiation of a clinical trial.

If adverse events of the type described above were to occur, further advancement of our clinical trials could be halted or delayed, which would have a material adverse effect on our business and operations. In addition, heightened regulatory scrutiny of gene therapy product candidates may result in delays and increased costs in bringing a product candidate to market, if at all. Delay or failure to obtain, or unexpected costs in obtaining, the regulatory approval necessary to bring a potential product to market could decrease our ability to generate revenue in the future.

In addition, results seen in third party clinical trials using other cell therapy products, for example CAR-T products, or in clinical trials conducted by our collaborators may impact on the further advancement of our clinical trials. Based on the data currently available to us in relation to our clinical trials there is no evidence that the type and severity of neurotox events observed with CD19-directed CAR-T cell treatments, in particular the fatal events observed in the NCT02535364 trial, occur with our SPEAR TCRs (including the NY-ESO SPEAR T-cell). However there is no guarantee that the FDA or other regulatory authorities will agree with that position and further education and discussion with regulatory authorities may be required.

Results seen in clinical trials using products that are used in our combination clinical trials, may impact on the further advancement of our clinical trials. For example, the FDA placed a clinical hold on three combination studies using KEYTRUDA (pembrolizumab), an anti-PD-1 therapy used to treat multiple myeloma. There is no guarantee that further reviews of safety data with KEYTRUDA or other anti-PD-1 therapies will not result in delays or holds to our clinical trials or the requirement to amend the protocol for such clinical trials.

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T-cell therapy is a novel approach to cancer treatment that creates significant increased risk in terms of side-effect profile, ability to satisfy regulatory requirements associated with clinical trials and the long-term viability of administered SPEAR T-cells.

Development of a pharmaceutical or biologic therapy or product has inherent risks based on differences in patient population and responses to therapy and treatment. The mechanism of action and impact on other systems and tissues within the human body following administration of SPEAR T-cell is not completely understood, which means that we cannot predict the long-term effects of treatment with SPEAR T-cells (whether by us or a collaborator). In addition it is not possible for any pre-clinical safety package to completely identify all potential safety risks.

We are aware that certain patients do not respond to our SPEAR T-cells and that other patients may relapse or cease to present the peptide being targeted by such SPEAR T-cells. The percentage of the patient population in which these events may occur is unknown, but the inability of patients to respond and the possibility of relapse may impact our or our collaborator's ability to conduct clinical trials, to obtain regulatory approvals, if at all, and to successfully commercialize any SPEAR T-cell.

Clinical trials and the investigator-initiated clinical trials using SPEAR T-cell therapeutics are still in the early stages, and it is difficult to predict the results that will be obtained by us or our collaborator in ongoing clinical trials or the next phase or phases of any clinical program. It is also difficult to predict the way in which SPEAR T-cells will interact with third-party products used in combination clinical trials. For example, data seen in third party combination trials with KEYTRUDA has resulted in certain combination trials with KEYTRUDA being placed on clinical hold by the FDA. Any undesirable side effects seen in combination trials may affect our ability or our or our collaborator's ability to continue with and obtain regulatory approval for any combination therapy, but may also impact our or our collaborator's ability to continue with and obtain regulatory approval for SPEAR T-cell therapies alone.

There is a significant risk at each stage of any clinical program that serious adverse events or low efficacy, as well as less favorable benefit:risk profiles, will prevent any SPEAR T-cells from proceeding further or will result in those programs being suspended or placed on hold (whether voluntarily or as a result of a regulatory authority requirement). For example, there is a risk that the target (or similar) peptide to which any SPEAR T-cell is directed may be present in both patients' cancer cells and other non-cancer cells and tissues. Should this be the case patients may suffer a range of side effects associated with the SPEAR T-cell binding to both the cancer cells and/or other cells and tissues and such side effects could cause patient death. The extent of these side effects will depend on which cells and tissues are affected as well as the degree to which the target (or similar) peptide is expressed in these cells and tissues. Serious adverse events seen with other immunotherapy products, such as the severe neurotoxic events observed with CD19-directed CAR-T cell treatments, may also occur at any stage of the clinical program. Further, following infusion of any SPEAR T-cells, there may be a transient inflammatory reaction of the disease to the treatment. Symptoms in any given subject would be dependent on the location and other characteristics of their tumor. For example, subjects with lung tumors may experience dyspnea. Cardiac toxicities may be observed in patients with pre-existing cardiac or pericardial masses. These inflammatory reactions and related symptoms may be mild and self-limited, but can be severe and require medical intervention.

As of September 4, 2018, adverse events considered by investigators to be possibly related to either MAGE-A4 or MAGE-A10 SPEAR T-cells and presented at ESMO in October 2018 include cytokine release syndrome (CRS), pyrexia, peripheral oedema, sinus tachycardia/tachycardia, increase in alanine aminotransferase, increase in amylase, increase in aspartate amino transferase, chills, delirium, dysphagia, dysphonia, haemoptysis, hyperhidrosis, hypotension, lymphopenia, leukopenia, neutropenia, pleural effusion, decreased appetite, fatigue, nausea, febrile neutropenia, thrombocytopenia, alopecia, encephalopathy, diarrhea, headache, hypoxia and tumour pain. As of September 4, 2018, serious adverse events seen in the MAGE-A4 and MAGE-A10 studies (whether considered related to the SPEAR T-cells or not) include CRS, dyspnea, abdominal pain, cardiac arrest, progressive disease, haemoptysis, neutropenia, pneumonia, respiratory arrest, respiratory failure, sepsis, thrombocytopenia, pancytopenia, atrial fibrillation, hyponatraemia, muscular weakness, encephalopathy, syncope and pleural effusion.

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Because administration of SPEAR T-cells is patient-specific, the process requires careful handling of patient-specific products and fail-safe tracking, namely the need to ensure that the tracking process is without error and that patient samples are tracked from patient removal, through manufacturing and re-administration to the same patient. Should the tracking process fail, whether at our own facility, a third party facility or at any point in the manufacturing and supply process, a patient could receive another patient's T-cells resulting in a patient fatality. We will need to invest in systems, such as bar coding, to ensure fail safe tracking. There is always a risk of a failure in any such system. Inability to develop or adopt an acceptable fail-safe tracking methodology and handling regime may delay or prevent us from receiving regulatory approval and/or result in a patient fatality if a patient receives another patient's T-cells. This risk may be increased where SPEAR T-cells are used in clinical programs that we do not control or sponsor and, should an error be made in the administration of our SPEAR T-cells in such clinical programs, this could affect the steps required in our own clinical programs and manufacturing process requiring the addition of further tracking mechanisms to ensure fail-safe tracking. The tracking systems required to ensure safe patient administration may also require

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increased administration to satisfy other regulatory requirements, for example data protection requirements in Europe. The need to ensure tracking systems are adequate and to comply with these additional regulatory requirements may result in delay to the start of trials or the need to obtain additional regulatory licenses or consents prior to starting such trials.

Validation of our SPEAR T-cells requires access to human samples but there is no guarantee that such samples can be obtained or, if they can be obtained, that the terms under which they are provided will be favorable to us.

Certain of the steps involved in validating and carrying out safety testing in relation to our SPEAR T-cells require access to samples (e.g., tissues samples or cell samples) from third parties. Such samples may be obtained from universities or research institutions and will often be provided, subject to satisfaction of certain terms and conditions. There can be no guarantee that we will be able to obtain samples in sufficient quantities to enable development of and use of the full preclinical safety testing program for all SPEAR T-cells undergoing development. In addition, the terms under which such samples are available may not be acceptable to us or may restrict our use of any generated results or require us to make payments to the third parties.

SPEAR T-cells and their application are not fully scientifically understood and are still undergoing validation and investigation.

Our SPEAR T-cells (including the NY-ESO SPEAR T-cell) and their potential associated risks are still under investigation. For example, there is a potential risk that, given that the TCR chains are produced separately and then assembled within patient T cells into full TCRs, the TCR chains from both transduced and naturally occurring T cells could be assembled into an unintended end TCR due to mis-pairing of TCR chains, which could create unknown recognition and cross-reactivity problems within patients. Although this phenomenon has not been reported in humans, it remains a theoretical risk for our SPEAR T-cells and is still being studied and investigated. This could delay regulatory approval, if any, for the relevant SPEAR T-cells. To the extent that any mis-pairing of TCR chains is identified, either in our or our competitors' clinical trials, additional investment may be required in order to modify relevant SPEAR T-cells and to further assess and validate the risk of such mis-pairing to patients. There is also no guarantee that following modification of the relevant SPEAR T-cell, such modified SPEAR T-cell will remain suitable for patient treatment, that it will eliminate the risk of mis-pairing of TCR chains or that regulatory approval will be obtained at all or on a timely basis in relation to such modified SPEAR T-cells. The occurrence of such events would significantly harm our business, prospects, financial condition and results of operations.

We may not be able to identify and validate additional target peptides or isolate and develop affinity-enhanced TCRs that are suitable for validation and further development.

The success of our SPEAR T-cells depends on both the identification of target peptides presented on cancer cells, which can be bound by TCRs, and isolation and affinity enhancement of TCRs, which can be used to treat patients if regulatory approval is obtained. There is an inherent risk that the number of target peptides that can be identified and/or our ability to develop and isolate suitable TCRs for affinity enhancement could be significantly lower than projected or that no additional SPEAR T-cells suitable for further development can be identified. Any failure to identify and validate further target peptides will reduce the number of potential SPEAR T-cells that we can successfully develop, which in turn will reduce the commercial opportunities available to us and increase our reliance on our existing SPEAR T-cells.

In addition, there is no guarantee that our attempts to develop further SPEAR T-cells will result in candidates for which the safety and efficacy profiles enable progression to and through preclinical testing. Failure to identify further candidates for progression into preclinical testing and clinical programs will significantly impact our commercial returns, increase our reliance on the success of our existing SPEAR T-cell programs

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and may significantly harm our business, prospects, financial condition and results of operations. If resources become limited or if we fail to identify suitable target peptides, TCRs or affinity-enhanced TCRs, our ability to submit INDs for further SPEAR T-cells may be delayed or never realized, which would have a materially adverse effect on our business. We have multiple research projects ongoing both internally and with third parties, for example Universal Cells, Inc. and Bellicum, Inc. The outcomes of these research projects are uncertain and such research projects may or may not generate next generation SPEAR T-cells with profiles suitable for further development or progression into clinical trials.

We may encounter substantial delays in our clinical trials or may not be able to conduct our trials on the timelines we expect.

Conduct of clinical trials is dependent on finding clinical sites prepared to carry out the relevant clinical trials, screening of patients by the clinical sites, recruitment of patients both in terms of number and type of patients and general performance of the relevant clinical site. It is difficult to predict how quickly we or our collaborators will be able to recruit suitable patients, find suitable sites, begin clinical programs and administer our SPEAR T-cells. The patient population in which any required peptide antigen is presented may be lower than expected which will increase the timescales required to find and recruit patients into the applicable clinical trial. Screening of a large number of patients is required to identify HLA and tumor antigen positive patients for most of our clinical trials. For example, it has taken longer to recruit patients into our NSCLC trials with both the NY-ESO SPEAR T-cell and

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MAGE-A10 SPEAR T-cell due to the low percentage expression of peptide antigen seen in the patient populations at the relevant clinical trial sites. With the NY-ESO SPEAR T-cell, presentation of the antigen occurs predominantly in certain sub-types of NSCLC and additional clinical sites may need to be initiated in order to identify patients with those certain NSCLC sub-types. With MAGE-A10, presentation of the peptide antigen is seen in a lower number of patients than anticipated and with our AFP SPEAR T-cells recruitment of patients remains difficult due to the nature of the patient population targeted for the trial. This has delayed recruitment of patients into trials and has resulted in the Company incurring additional costs associated with the need to find and initiate additional clinical trial sites. It is also difficult to predict whether changes may be required to any clinical trial design as our clinical trials progress. For example, initial results from current Phase 1/2 clinical trials with the NY-ESO SPEAR T-cell have suggested that fludarabine is required as part of any patient pre-conditioning regimen. This has required amendment to protocol designs, which did not previously include fludarabine, to include fludarabine.

Our and our collaborator's clinical trials will compete with other clinical trials that are in the same therapeutic areas as our SPEAR T-cells, which will reduce the number and types of patients available to us, because some patients who might have opted to enroll in our trials may instead opt to enroll in a trial being conducted by one of our competitors. Because the number of qualified clinical investigators is limited, we will conduct some of our clinical trials at the same clinical trial sites where competing trials are ongoing, which will reduce the number of patients who are available for our clinical trials at such clinical trial sites. Moreover, because our SPEAR T-cells represent a departure from more commonly used methods for cancer treatment, potential patients and their physicians may opt to use conventional therapies, such as chemotherapy and hematopoietic cell transplantation, rather than enrollment in any of our current or future clinical trials. This may also mean we cannot recruit patients at a suitable time in their disease progression. In addition, in relation to any indication, the standard of care for patients in that indication may change or further develop meaning that clinical sites are no longer prepared to continue with any clinical trial or require amendments to agreed protocols for clinical trials. For example, the standard of care in melanoma has changed since the start of our clinical trials in melanoma with the NY-ESO SPEAR T-cell and as a result the clinical trial has been halted due to anticipated unavailability of patients. Such circumstances can lead to the suspension of the relevant clinical trial at a site, inability to recruit further patients at that clinical site or a requirement to amend the protocol, all of which will delay or potentially halt progression of a SPEAR T-cell through clinical trials.

Even if we are able to enroll a sufficient number of patients in our clinical trials, delays in patient enrollment may result, and have resulted in, increased costs or may affect the timing or outcome of the planned clinical trials, which could prevent completion of these trials and adversely affect our and our collaborator's ability to advance the development of our SPEAR T-cells.

Comparability studies related to the manufacturing of any SPEAR T-cells may be required ahead of any pivotal trial start date or ahead of use in the European Union or alternatively in connection with any changes made to our manufacturing process. The requirement to carry out such comparability studies may delay the uptake of any changed process, start of any pivotal trial or use of the relevant SPEAR T-cells in Europe. If the results from the comparability studies are not acceptable, this may further delay the start of such trials or changed process and require re-evaluation of the process used to manufacture of such SPEAR T-cells. For example, comparability studies are ongoing in relation to changes made to the process for manufacture of the NY-ESO SPEAR T-cells. The results from these comparability studies may impact the start date for any registrational study or impact what data can be used for any marketing application for the NY-ESO SPEAR T-cells. Failure in such comparability studies may also impact other studies in which the modified process is already being used.

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We may not be able to develop or obtain approval for the analytical assays and companion diagnostics required for commercialization of our SPEAR T-cells.

Administration of our SPEAR T-cells requires the use of an immuno-chemistry or other screening assay in which patients are screened for the presence of the cancer peptide targeted by our SPEAR T-cells. This assay requires the identification of suitable antibodies which can be used to identify the presence of the relevant target cancer peptide.

If safe and effective use of a biologic product depends on an *in vitro* diagnostic, such as a test to detect patients with HLA type A2, then the FDA generally requires approval or clearance of the diagnostic, known as a companion diagnostic, concurrently with approval of the therapeutic product. To date, the FDA has generally required *in vitro* companion diagnostics that are intended for use in selection of patients who will respond to cancer treatment to obtain a pre-market approval, or PMA, which can take up to several years, for that diagnostic approval or clearance to occur simultaneously with approval of the biologic product.

We expect that, for all SPEAR T-cells, the FDA and similar regulatory authorities outside of the United States will require the development and regulatory approval of a companion diagnostic assay as a condition to approval. We also expect that the FDA may require PMA supplemental approvals for use of that same companion diagnostic as a condition of approval of additional SPEAR T-cells. We do not have experience or capabilities in developing or commercializing these companion diagnostics and plan to rely in large part on third parties to perform these functions.

If we or our collaborators, or any third parties that we engage to assist us, are unable to successfully develop companion diagnostic assays for use with any SPEAR T-cells, or are unable to obtain regulatory approval or experience delays in either development or obtaining regulatory approval, we may be unable to identify patients with the specific profile targeted by the relevant SPEAR T-cells for enrollment in our clinical trials. Accordingly, further investment may be required to further develop or obtain the required regulatory approval for the relevant companion diagnostic assay, which would delay or substantially impact our ability or our collaborators' ability to conduct further clinical trials or obtain regulatory approval.

Manufacturing and administering SPEAR T-cells is complex and we and our collaborators may encounter difficulties in production, particularly with respect to process development or scaling up of manufacturing capabilities. If we or our collaborators encounter such difficulties, our or our collaborators' ability to provide supply of our SPEAR T-cells for clinical trials or for commercial purposes could be delayed or stopped.

The process of manufacturing and administering SPEAR T-cells is complex and highly regulated. The manufacture of SPEAR T-cells involves complex processes, including manufacture of a lentiviral delivery vector containing the gene for our affinity-enhanced engineered TCR. Administration of SPEAR T-cells includes harvesting white blood cells from the patient, isolating certain T cells from the white blood cells, combining patient T cells with our lentiviral delivery vector through a process known as transduction, expanding the transduced T cells to obtain the desired dose, and ultimately infusing the modified T cells back into the patient. As a result of the complexities, our manufacturing and supply costs are likely to be higher than those at more traditional manufacturing processes and the manufacturing process is less reliable and more difficult to reproduce.

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Delays or failures in the manufacture of SPEAR T-cells (whether by us, any collaborator or our third party contract manufacturer) can result in a patient being unable to receive their SPEAR T-cells or a requirement to re-manufacture SPEAR T-cells which itself then causes delays in manufacture for other patients. Any delay or failure or inability to manufacture on a timely basis can adversely affect a patient's outcomes and delay the timelines for our clinical trials. Such delays or failure or inability to manufacture can result from:

- A failure in the manufacturing process itself for example by an error in manufacturing process (whether by us or our third party contract manufacturing organization), equipment or reagent failure (including failure in the bags the Company uses to freeze), differences in patient material, failure in any step of the manufacturing process, failure to maintain a GMP environment, contamination during process;
- A lack of reliability or reproducibility in the manufacturing process itself leading to variability in end manufacture of SPEAR T-cells. Should the process be unreliable, the relevant regulatory agency (for example the FDA in the United States) may place a hold on a clinical trial or request further information on the process which could in turn result in delays to the clinical trials;
- Variations in patient starting material resulting in less product than expected or product which is not viable or can not be manufactured;
- Product loss or failure due to logistical issues including issues associated with the differences between patients' white blood cells or characteristics, interruptions to process, contamination, failure to supply patient apheresis material within required timescales (for example as a result of an import or export hold-up) or supplier error;

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- Inability to obtain manufacturing slots from third party contract manufacturers or to have enough manufacturing slots (including those at our Navy Yard facility) to manufacture SPEAR T-cells for patients as and when those patients require manufacture;
- Inability to procure starting materials or to manufacture starting materials (including at our UK vector facility), for example vector required for SPEAR T-cell manufacture;
- Inability to procure manufacturing slots from third party manufacturers (whether for SPEAR T-cell manufacture or for starting materials manufacture, including vector) at all or on a timely basis. Even where manufacturing slots are agreed in advance with third party manufacturers we cannot guarantee they will not be delayed or cancelled or that any manufacturing process will be successful;
- Loss of or close-down of any manufacturing facility used in the manufacture of SPEAR T-cells. For example we will be manufacturing MAGE-A10 and MAGE-A4 SPEAR T-cells at our Navy Yard manufacturing facility. Should there be a contamination event at the facility resulting in the close-down of that facility it may not be possible to find alternative manufacturing capability for the MAGE-A10 and MAGE-A4 SPEAR T-cells within the timescales required for ongoing clinical trials;
- Loss or contamination of patient starting material, requiring the starting material to be obtained again from the patient or the manufacturing process to be re-started; and
- A requirement to modify or make changes to any manufacturing process. Such changes may additionally require comparability testing which then may reduce the amount of manufacturing slots available for manufacture of patient SPEAR T-cells. Delays in our ability to make the required modifications or perform any required comparability testing within currently anticipated timeframes or that such modifications or comparability testing, when made, will obtain regulatory approval or that the new processes or modified processes will successfully be transferred to the third party contract suppliers within currently anticipated timeframes can also impact timelines for manufacture.

The requirements for manufacture and supply of SPEAR T-cells for clinical trials in Europe have additional complexities and the manufacture and supply of SPEAR T-cells is raising issues which have not previously been regulated or observed by the relevant regulatory authorities. For example, supply of SPEAR T-cells for European clinical trials will either require manufacture of SPEAR T-cells in the United States or use of a new CMO in Europe. Where manufacture continues in the United States, there is a need to transfer patient product from clinical sites in Europe to the manufacturer in the United States, for the patient product to be converted into our end SPEAR T-cell product, for that product to be released for use in Europe and then for that SPEAR T-cell product to be transported back to the site in Europe for administration to the patient. The supply and manufacturing chain required to achieve this is very complex and could be subject to failures at any point in the supply and manufacturing chain. Any inability to set up acceptable manufacturing and supply chains to enable treatment of patients in Europe could result in a delay to those trials starting in Europe or could result in a delay in patient treatment, requirement to re-apherese a patient or a requirement to

re-manufacture patient material.

As our SPEAR T-cells progress through preclinical programs and clinical trials towards approval and commercialization, it is expected that various aspects of the manufacturing and administration process will be altered in an effort to optimize processes and results. We have already identified some improvements to our manufacturing and administration processes, but these changes may not achieve the intended objectives, may not be transferable to third parties or able to be used at larger scales and could cause our SPEAR T-cells to perform differently or affect the results of planned clinical trials or other future clinical trials. In addition, such changes may require amendments to be made to regulatory applications or comparability tests to be conducted which may further delay the timeframes under which modified manufacturing processes can be used for any SPEAR T-cell. If SPEAR T-cells manufactured under the new process has a worse safety or efficacy profile than the prior investigational product or the process is less reproducible than the previous process, we may need to re-evaluate the use of that manufacturing process, which could significantly delay or even result in the halting of our clinical trials.

Developing a commercially viable process is a difficult and uncertain task, and there are risks associated with scaling to the level required for advanced clinical trials or commercialization, including, among others, increased costs, potential problems with process scale-out, process reproducibility, stability issues, lot consistency, loss of product, and timely availability of reagents or raw materials or contract manufacturing services or facilities. A failure to develop such a commercially viable process within anticipated timescales may prevent or delay progression of our T-cell therapies into pivotal clinical trials and ultimately commercialization. In addition, we may ultimately be unable to reduce the expenses associated with our SPEAR T-cells to levels that will allow us to achieve a profitable return on investment. We have entered into an alliance with Universal Cells, Inc. that, if successful, will enable us to treat patient populations with an off-the-shelf product. However, there is no guarantee that the research program with Universal

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Cells, Inc. will be successful, will be carried out within the timescales currently anticipated or that even if successful it will result in a SPEAR T-cell that can be used to treat patients or that such SPEAR T-cell will allow us to achieve a profitable return on investment.

We have insurance to cover certain business interruption events, particularly research and development expenditure (capped at £10 million) and committed costs (capped at £250,000). However, because our level of insurance is capped, it may be insufficient to fully compensate us if any of these events were to occur in the future.

Our manufacturing process needs to comply with FDA regulations and foreign regulations relating to the quality and reliability of such processes. Any failure to comply with relevant regulations could result in delays in or termination of our clinical programs and suspension or withdrawal of any regulatory approvals.

In order to commercially produce our products, we will need to comply with the FDA's cGMP requirements at both our Navy Yard facility and at our third party contract manufacturing facilities. We may encounter difficulties in achieving quality control and quality assurance and may experience shortages in qualified personnel. We and our third party contract manufacturers are subject to inspections by the FDA and comparable agencies in other jurisdictions to confirm compliance with applicable regulatory requirements once the process has been approved. Any failure to follow cGMP or other regulatory requirements, reliably manufacture product or delay, interruption or other issues that arise in the manufacture, fill-finish, packaging, or storage of our SPEAR T-cells as a result of a failure of our facilities or the facilities or operations of third parties to comply with regulatory requirements or pass any regulatory authority inspection could significantly impair our ability to develop and commercialize our SPEAR T-cells, including leading to significant delays in the availability of our SPEAR T-cells for our clinical trials or the termination of or suspension of a clinical trial, or the delay or prevention of a filing or approval of marketing applications for our SPEAR T-cells. Significant non-compliance could also result in the imposition of sanctions, including warning letters, fines, injunctions, civil penalties, failure of regulatory authorities to grant marketing approvals for our SPEAR T-cells, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of products, operating restrictions and criminal prosecutions, any of which could damage our reputation and our business.

We now manufacture SPEAR T-cells at our own US manufacturing facility and intend in the future to manufacture vector at our UK vector facility. There is no guarantee that regulatory authorities will not raise non-compliance issues or that regulatory authorities may require us to make changes to the way in which either facility is operated. This may result in a delay in our ability to manufacture SPEAR T-cells at our own facility or in our ability to supply vector material for use in the SPEAR T-cell manufacturing process. In addition, there is no guarantee that any SPEAR T-cells or vector produced in any of our facilities will be able to meet regulatory requirements or that we will be able to recruit and maintain sufficient staff to enable manufacture of products within required timescales. Any failure to meet regulatory requirements or produce SPEAR T-cells and vector according to regulatory requirements could result in delays to our clinical programs, potential side effects and even fatalities to patients and may result in withdrawal of regulatory approval for our manufacturing facility.

The outcome of clinical trials is uncertain and clinical trials may fail to demonstrate adequately the safety and efficacy of any SPEAR T-cells which would prevent or delay regulatory approval and commercialization.

There is a risk in any clinical trial (whether sponsored by us, a collaborator, or investigator-initiated) that side effects from SPEAR T-cells will require a hold on, or termination of, clinical programs or further adjustments to clinical programs in order to progress any SPEAR T-cell. The SPEAR T-cells are novel and unproven and regulators will therefore require evidence that the SPEAR T-cells are safe before permitting clinical trials to commence and evidence that the SPEAR T-cells are safe and effective before granting any regulatory approval. In particular, because our SPEAR T-cells are subject to regulation as biological products, we will need to demonstrate that they are safe, pure and potent for use in each target indication. The SPEAR T-cell must demonstrate an acceptable benefit:risk profile in its intended patient population and for its

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intended use. The benefit:risk profile required for product licensure will vary depending on these factors and may include not only the ability to show tumor shrinkage, but also adequate duration of response, a delay in the progression of the disease and/or an improvement in survival. For example, response rates from the use of the SPEAR T-cells may not be sufficient to obtain regulatory approval unless we or our collaborators can also show an adequate duration of response.

The regulatory authorities (including the FDA) may issue a hold on our or our collaborators' clinical trials as a result of safety information and data obtained in third party clinical trials or in relation to third party products. Any such hold will require addressing by us and our collaborators and will inevitably delay progression of the clinical trials concerned, if such clinical trials progress at all.

Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the clinical trial process. Success in preclinical programs and early clinical trials does not ensure that later clinical trials will be successful. Moreover, the results of preclinical programs and early clinical trials of SPEAR T-cells may not be predictive of the results of later-stage clinical trials. To date, we have only obtained interim results from Phase 1/2 clinical trials that are uncontrolled, involve small sample sizes and are of shorter duration than might be required for regulatory approval. There may be

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other reasons why our early clinical trials are not predictive of later clinical trials. In addition, the results of trials in one set of patients or line of treatment may not be predictive of those obtained in another and protocols may need to be revised based on unexpected early results. For example, in our ovarian cancer trial with the NY-ESO SPEAR T-cell, the first patient treated experienced a grade 3 cytokine release syndrome at day seven post-infusion, concomitant with a significant proliferation of the engineered T cells that constituted nearly 100% of the peripheral blood at day 14. As another example, in both the European investigator-initiated clinical program in gastro-esophageal cancer and in our own sponsored synovial sarcoma trial there has been one patient death considered to be related to treatment according to the investigator.

We expect there may be greater variability in results for SPEAR T-cells which are administered on a patient-by-patient basis than for off-the-shelf products, like many other biologics. There is typically an extremely high rate of attrition from the failure of any products proceeding through clinical trials. SPEAR T-cells in later stages of clinical trials may fail to show the desired safety and efficacy profile despite having progressed through preclinical programs and initial clinical trials. A number of companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or unacceptable safety issues, notwithstanding promising results in earlier trials. Most biologic candidates that begin clinical trials are never approved by regulatory authorities for commercialization. We cannot therefore guarantee that we will be successful in demonstrating the required efficacy and safety profile from the performance of any of our clinical programs.

Certain of our clinical trials include dose escalation studies in which the dose of SPEAR T-cells administered to patients is varied or initial studies in which the pre-treatment regimen may be varied, for example a regimen with and without fludarabine. The outcome of such dose escalation or initial studies will inform the clinical study going forward. However, the need to carry out dose escalation or other initial studies may result in delays in data from such clinical programs while the most suitable dose or regimen is assessed. For example, the trial design for our MAGE-A4, MAGE-A10 and AFP trials includes dose escalation and therefore efficacy data may not be obtained from initial patients treated in such studies.

In addition, even if such trials are successfully completed, we cannot guarantee that the FDA or foreign regulatory authorities will interpret the results as we or our collaborators do. Accordingly, more trials may be required before we can submit any SPEAR T-cell for regulatory approval. To the extent that the results of the trials are not satisfactory to the FDA or foreign regulatory authorities for support of a marketing application, we may be required to expend significant resources, which may not be available to us, to conduct additional trials in support of potential approval of our SPEAR T-cells. We cannot predict whether any SPEAR T-cells will satisfy regulatory requirements at all or for indications in which such SPEAR T-cells are currently being evaluated as part of any clinical programs.

We have limited experience conducting clinical trials which may cause a delay in any clinical program and in the obtaining of regulatory approvals.

Although we have recruited a team that has significant experience with clinical trials, as a company we have limited experience in conducting clinical trials and no experience in conducting clinical trials through to regulatory approval. In part because of this lack of experience, we cannot be certain that planned clinical trials will begin or be completed on time, if at all. Large-scale trials would require significant additional financial and management resources, and reliance on third-party clinical investigators, contract research organizations, or CROs, or consultants. Relying on third-party clinical investigators, consultants or CROs may force us to encounter delays that are outside of our control.

SPEAR T-cells may have undesirable side effects or have other properties that could halt their clinical development, prevent their regulatory approval, limit their commercial potential or otherwise result in significant negative consequences.

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Where any SPEAR T-cell has undesirable side effects, regulatory approval for such therapeutic may be delayed or suspended, or alternatively may be restricted to particular disease indications or states that are more limited than desirable. This could result in the failure of any products reaching the market or a reduction in the patient population for which any SPEAR T-cell can be used.

As of September 4, 2018, adverse events considered by investigators to be possibly related to either MAGE-A4 or MAGE-A10 SPEAR T-cells and presented at ESMO in October 2018 include cytokine release syndrome (CRS), pyrexia, peripheral oedema, sinus tachycardia/tachycardia, increase in alanine aminotransferase, increase in amylase, increase in aspartate amino transferase, chills, delirium, dysphagia, dysphonia, haemoptysis, hyperhidrosis, hypotension, lymphopenia, leukopenia, neutropenia, pleural effusion, decreased appetite, fatigue, nausea, febrile neutropenia, thrombocytopenia, alopecia, encephalopathy, diarrhea, headache, hypoxia and tumour pain. As of September 4, 2018, serious adverse events seen in the MAGE-A4 and MAGE-A10 studies (whether considered related to the SPEAR T-cells or not) include CRS, dyspnea, abdominal pain, cardiac arrest, progressive disease, haemoptysis, neutropenia, pneumonia, respiratory arrest, respiratory failure, sepsis, thrombocytopenia, pancytopenia, atrial fibrillation, hyponatraemia, muscular weakness, encephalopathy, syncope and pleural effusion.

In our SPEAR T-cell trials, CRS has been reported in subjects. A subset of these reported CRS events have been Grade 3 or 4 in severity. Subjects with more severe CRS symptoms have generally responded to treatment with the anti-IL6R antibody,

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tocilizumab. All Adaptimmune protocols now allow for use of tocilizumab for treatment of cytokine release syndrome. Tocilizumab has been shown to control cytokine release syndrome likely without abrogating the anti-tumor response.

Any unacceptable toxicities arising in ongoing clinical programs could result in suspension or termination of those clinical programs. Any suspension or termination may affect other SPEAR T-cells and thereby impact our ability to recognize any product revenues. Any side effects may also result in the need to perform additional trials, which will delay regulatory approval for such SPEAR T-cell, if at all, and require additional resources and financial investment to bring the relevant SPEAR T-cell to market.

In addition, the impact of SPEAR T-cells may vary from patient to patient and this may affect the number of patients who can be successfully treated with our SPEAR T-cells. Depending on the nature of the indication, certain patients may need to be excluded from treatment, which could also impact our ability to recruit patients to utilize such therapies or to recruit patients to conduct clinical trials in general for our SPEAR T-cells.

Use of SPEAR T-cells in combination with other third party products or therapies, for example use in combination with Merck's PD-1 inhibitor, KEYTRUDA® (pembrolizumab) in patients with multiple myeloma may increase or exacerbate side effects that have been seen with our SPEAR T-cells alone or may result in new side effects that have not previously been identified with our SPEAR T-cells alone. Any undesirable side effects seen in combination trials may affect our ability to continue with and obtain regulatory approval for the combination therapy, but may also impact our ability to continue with and obtain regulatory approval for SPEAR T-cell therapies alone.

Clinical trials are expensive, time-consuming and difficult to implement.

Clinical trials, depending on the stage, can be costly as well as difficult to implement and define, particularly with technologies that are not tried and tested, such as our SPEAR T-cells. These factors can lead to a longer clinical development timeline and regulatory approval process, including a requirement to conduct further or more complex clinical trials in order to obtain regulatory approval. Regulatory authorities may disagree with the design of any clinical program, and designing an acceptable program could lead to increased timeframes for obtaining of approvals, if any. In addition, progression of clinical trials depends on the ability to recruit suitable patients to those trials and delay in recruiting will impact the timeframes of such clinical trials and as a result the timeframes for obtaining regulatory approval, if any, for the relevant SPEAR T-cells.

In particular, eligible patients must be screened for the target peptide and HLA type, which may reduce the number of patients who can be recruited for any clinical program. For example, low target peptide expression levels in the NY-ESO SPEAR T-cell and MAGE-A10 SPEAR T-cell programs affected speed of patient recruitment. The ability to administer SPEAR T-cells to patients in accordance with set protocols for the clinical trials and the results obtained depends on patient participation for the duration of the clinical trial, which many of these patients are unable to do because of their late-stage cancer and limited life expectancy.

Although the initial results in our clinical trials to date may suggest a promising tolerability profile, these results may not be indicative of results obtained in later and larger clinical trials. Long-term follow-up of patients from earlier trials may also result in detection of additional side effects or identification of other safety issues. There is no guarantee of success in any clinical trial and there is a very high attrition rate for pharmaceutical or biological compounds entering clinical trials. Any side effects or negative safety issues identified at any stage of clinical development will require additional investigation and assessment which can result in additional costs and resource requirements that could delay or potentially terminate our clinical trials.

We may face difficulty in enrolling patients in our clinical trials.

We or our collaborators may find it difficult to enroll patients in our clinical trials. For example, in our Phase 1/2 melanoma trial with the NY-ESO SPEAR T-cell, there was a delay in enrollment as a result of competition from other emerging therapies. Identifying and qualifying patients, including testing of patients for appropriate target peptides and HLA type, to participate in clinical trials of our SPEAR T-cells are critical to our success. The patient population in which any required peptide antigen is presented may be lower than expected which will increase the timescales required to find and recruit patients into the applicable clinical trial. The timing of clinical trials depends on the speed at which we or our collaborators can recruit patients to participate in testing of the SPEAR T-cells. If patients are unwilling to participate in trials because of negative publicity from adverse events or for other reasons, including competitive clinical trials for similar patient populations, negative results seen in competitive third party clinical trials utilizing similar cell therapy products, the timeline for recruiting patients, conducting trials and obtaining regulatory approval of potential products may be delayed or prevented. These delays could result in increased costs, delays in advancing product development, delays in testing the effectiveness of our technology or termination of the clinical trials altogether. We or our collaborators may not be able to identify, recruit and enroll a sufficient number of patients, or those with required or desired characteristics to achieve sufficient diversity in a given trial in order to complete our clinical trials in a timely manner. Successful execution of patient treatment and assessment of outcomes is affected by several factors including:

- eligibility criteria for the trial in question, in particular, presenting the correct HLA type and expression levels of the target antigen;

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- ability to detect required expression levels of target antigens in any patient population;

- ability to detect required target antigens in any patient population and to set detection levels at an appropriate level to facilitate patient recruitment;

- severity of the disease under investigation and the type of patient being recruited into the clinical trial;

- design of the trial protocol;

- size of the patient population;

- perceived risks and benefits of the SPEAR T-cell under trial;

- novelty of the SPEAR T-cell and acceptance by oncologists;

- proximity and availability of clinical trial sites for prospective patients;

- availability of competing therapies and clinical trials and ability to obtain patient insurance coverage;

- efforts to facilitate timely enrollment in clinical trials and to provide manufactured product on a timely basis;

- patient referral practices of physicians;

- changes in the underlying standard of care applicable or treatments available for the relevant indication for which a patient is being treated; and

- ability to monitor patients adequately during and after treatment, for example where patients decide not to attend follow-up appointments.

If we have difficulty enrolling a sufficient number of patients to conduct our clinical trials as planned, we may need to delay, limit or terminate ongoing or planned clinical trials, any of which would have an adverse effect on our business.

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Our SPEAR T-cells for which we intend to seek approval as biologic products may face competition sooner than anticipated.

The enactment of the Biologics Price Competition and Innovation Act of 2009, or BPCIA, created an abbreviated pathway for the approval of biosimilar and interchangeable biological products. The abbreviated regulatory pathway establishes legal authority for the FDA to review and approve biosimilar biologics, including the possible designation of a biosimilar as interchangeable based on its similarity to an existing reference product. Under the BPCIA, an application for a biosimilar product cannot be approved by the FDA until 12 years after the original branded product is approved under a BLA. On March 6, 2015, the FDA approved the first biosimilar product under the BPCIA. However, the law is complex and is still being interpreted and implemented by the FDA and as a result, its ultimate impact, implementation and meaning are subject to uncertainty. While it is uncertain when such processes intended to implement BPCIA may be fully adopted by the FDA, any such processes could have a material adverse effect on the future commercial prospects for our biological products.

There is a risk that the FDA will not consider our SPEAR T-cells to be reference products for competing products, potentially creating the opportunity for generic competition sooner than anticipated. Additionally, this period of regulatory exclusivity does not apply to companies pursuing regulatory approval via their own traditional BLA, rather than via the abbreviated pathway. Moreover, the extent to which a biosimilar, once approved, will be substituted for any one of our reference products in a way that is similar to traditional generic substitution for non-biological products is not yet clear, and will depend on a number of marketplace and regulatory factors that are still developing.

Foreign countries also have abbreviated regulatory pathways for biosimilars and hence even where the FDA does not approve a biosimilar biologic, a biosimilar could be approved using an abbreviated regulatory pathway in other markets where our SPEAR T-cells are approved and marketed.

Risks Related to Government Regulation

The FDA regulatory approval process is lengthy and time-consuming, and we may experience significant delays in the clinical development and regulatory approval of our SPEAR T-cells.

We have not previously submitted a BLA to the FDA, or similar approval submissions to comparable foreign authorities. A BLA must include extensive preclinical and clinical data and supporting information to establish the SPEAR T-cell's safety and effectiveness for each desired indication. The BLA must also include significant information regarding the chemistry, manufacturing and controls for the product. We expect the novel nature of our SPEAR T-cells to create additional challenges in obtaining regulatory approval, if at all. For example, the FDA has limited experience with commercial development of T-cell therapies for cancer. Accordingly, the regulatory approval pathway for our SPEAR T-cells may be uncertain, complex, expensive and lengthy, and approval may not be obtained. For example, in relation to the NY-ESO SPEAR T-cell in synovial sarcoma, the FDA requested certain additional information be made available as part of the Company's application to conduct a pivotal study in synovial sarcoma, including a requirement to assess comparability between the manufacturing process used for the initial synovial sarcoma trials and the commercial-ready manufacturing process intended to be used in pivotal trials. The FDA also recommended that we file a SPA in relation to the design of the pivotal study. Such requirements and requests for additional information can delay the start of any pivotal or other trial and there is no guarantee that the FDA will not continue to require further or additional information ahead of approving any trial whether from our collaborators for the NY-ESO SPEAR T-cells or from us for other SPEAR T-cells.

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We or our collaborators could also encounter delays if physicians encounter unresolved ethical issues associated with enrolling patients in clinical trials of our SPEAR T-cells in lieu of prescribing existing treatments that have established safety and efficacy profiles. Further, a clinical trial may be suspended or terminated by us, a collaborator, the sponsor of an investigator-initiated trial, IRBs for the institutions in which such trials are being conducted, the Data Monitoring Committee for such trial, or by the FDA or other regulatory authorities due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by the FDA or other regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a SPEAR T-cell, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial. If we or our collaborators experience termination of, or delays in the completion of, any clinical trial of our SPEAR T-cells, the commercial prospects for our SPEAR T-cells will be harmed, and our ability to generate product revenue will be delayed. In addition, any delays in completing our clinical trials will increase our costs, slow our product development and approval process and jeopardize our ability to commence product sales and generate revenue.

Many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may ultimately lead to the denial of regulatory approval of our SPEAR T-cells.

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The FDA regulatory process can be difficult to predict, in particular whether for example accelerated approval processes are available or further unanticipated clinical trials are required will depend on the data obtained in our ongoing clinical trials.

The regulatory approval process and the amount of time it takes us to obtain regulatory approvals for our SPEAR T-cells will depend on the data that are obtained in our ongoing clinical trials and in one or more future registration or pivotal clinical trials. We may attempt to seek approval on a per indication basis for our SPEAR T-cells on the basis of a single pivotal trial. While the FDA requires in most cases two adequate and well-controlled pivotal clinical trials to demonstrate the efficacy of a product candidate, a single pivotal trial with other confirmatory evidence may be sufficient in rare instances where the trial is a large multicenter trial demonstrating internal consistency and a statistically very persuasive finding of a clinically meaningful effect on mortality, irreversible morbidity or prevention of a disease with a potentially serious outcome and confirmation of the result in a second trial would be practically or ethically impossible. Depending on the data we obtain, the FDA or other regulatory authorities may require additional clinical trials to be carried out or further patients to be treated prior to the granting of any regulatory approval for marketing of our SPEAR T-cells. It is difficult for us to predict with such a novel technology exactly what will be required by the regulatory authorities in order to take our SPEAR T-cells to market or the timeframes under which the relevant regulatory approvals can be obtained.

We obtained breakthrough therapy status for the NY-ESO SPEAR T-cell for the treatment of certain patients with inoperable or metastatic synovial sarcoma who have received prior chemotherapy. Following exercise of the option over the NY-ESO SPEAR T-cell program by GSK, it is not known whether such breakthrough therapy status will continue or whether GSK will apply for and obtain any accelerated approval for the NY-ESO SPEAR T-cell. In addition, depending on the data that is obtained by us in our current and future clinical trials for our wholly owned SPEAR T-cells, we may seek breakthrough therapy or fast track designation or accelerated approval from the FDA for our SPEAR T-cells and equivalent accelerated approval procedures in other countries. However, given the novel nature of our SPEAR T-cells, it is difficult for us to predict or guarantee whether the FDA or other regulatory authorities will approve such requests or what further clinical or other data may be required to support an application for such accelerated approval procedures.

The process of obtaining marketing approvals, both in the United States and abroad, is expensive, may take many years if additional clinical trials are required, if approval is obtained at all, and can vary substantially based upon a variety of factors, including the type, complexity and novelty of the SPEAR T-cells involved. Changes in marketing approval policies during the development period, changes in or the enactment of additional statutes or regulations, or changes in regulatory review for each submitted product application, may cause delays in the approval or rejection of an application. The FDA and foreign regulatory authorities also have substantial discretion in the drug and biologics approval process. The number and types of preclinical programs and clinical trials that will be required for regulatory approval varies depending on the SPEAR T-cell, the disease or condition that the SPEAR T-cell is designed to address, and the regulations applicable to any particular SPEAR T-cell. Approval policies, regulations or the type and amount of clinical data necessary to gain approval may change during the course of a SPEAR T-cell's clinical development and may vary among jurisdictions, and there may be varying interpretations of data obtained from preclinical programs or clinical trials, either of which may cause delays or limitations in the approval or the decision not to approve an application. In addition, approval of our SPEAR T-cells could be delayed or refused for many reasons, including the following:

- the FDA or comparable foreign regulatory authorities may disagree with the design or implementation of our or our collaborators' clinical trials;
- we or our collaborators may be unable to demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities that our SPEAR T-cells have a beneficial risk: benefit profile for any of their proposed indications;

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- the results of clinical trials may not meet the level of statistical significance required by the FDA or comparable foreign regulatory authorities for approval;
- the FDA or comparable foreign regulatory authorities may disagree with our interpretation of data from preclinical programs or clinical trials;
- the data collected from clinical trials of SPEAR T-cells may not be sufficient to the satisfaction of the FDA or comparable foreign regulatory authorities to support the submission of a BLA or other comparable submission in foreign jurisdictions or to obtain regulatory approval in the United States or elsewhere;
- our manufacturing processes or facilities or those of the third-party manufacturers we use may not be adequate to support approval of our SPEAR T-cells; and

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- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our clinical data insufficient for approval.

It is possible that no SPEAR T-cells will ever obtain the appropriate regulatory approvals necessary to commercialize the TCR therapeutics. Any delay in obtaining, or failure to obtain, required approvals would materially adversely affect our ability to generate revenue from the particular SPEAR T-cell, which would result in significant harm to our business.

Obtaining and maintaining regulatory approval of our SPEAR T-cells in one jurisdiction does not mean that we will be successful in obtaining regulatory approval of our SPEAR T-cells in other jurisdictions.

Obtaining and maintaining regulatory approval of our SPEAR T-cells in one jurisdiction does not guarantee that we or our collaborators will be able to obtain or maintain regulatory approval in any other jurisdiction, while a failure or delay in obtaining regulatory approval in one jurisdiction may have a negative effect on the regulatory approval process in others. For example, even if the FDA grants marketing approval of a SPEAR T-cell, comparable regulatory authorities in foreign jurisdictions must also approve the manufacturing, marketing and promotion of the SPEAR T-cell in those countries. Approval procedures vary among jurisdictions and can involve requirements and administrative review periods different from, and greater than, those in the United States, including additional preclinical programs or clinical trials as clinical trials conducted in one jurisdiction may not be accepted by regulatory authorities in other jurisdictions. In many jurisdictions outside the United States, a SPEAR T-cell must be approved for reimbursement before it can be approved for sale in that jurisdiction. In some cases, the price that we or our collaborators intend to charge for SPEAR T-cells is also subject to approval.

We or our collaborators may also submit marketing applications in other countries. Regulatory authorities in jurisdictions outside of the United States have requirements for approval of SPEAR T-cells with which we must comply prior to marketing in those jurisdictions. Obtaining foreign regulatory approvals and compliance with foreign regulatory requirements could result in significant delays, difficulties and costs for us and could delay or prevent the introduction of our SPEAR T-cells in certain countries. If we fail to comply with the regulatory requirements in international markets and/or receive applicable marketing approvals, our target market will be reduced and our ability to realize the full market potential of our SPEAR T-cells will be harmed.

We plan to seek breakthrough therapy or fast track designations and may pursue accelerated approval for some or all of our current SPEAR T-cells, but we may be unable to obtain such designations or, in the case of NY-ESO, maintain its breakthrough therapy designation or, obtain or maintain the benefits associated with such designations.

We obtained breakthrough therapy status in the United States and Europe for the NY-ESO SPEAR T-cell for the treatment of certain patients with inoperable or metastatic synovial sarcoma who have received prior chemotherapy. We may seek breakthrough therapy or fast track designations for our other SPEAR T-cells in the United States or equivalent regulations elsewhere in the world.

In 2012, the FDA established a breakthrough therapy designation which is intended to expedite the development and review of products that treat serious or life-threatening diseases when preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. The designation of a SPEAR T-cell as a breakthrough therapy provides potential benefits that include more frequent meetings with the FDA to discuss the development plan for the SPEAR T-cell and ensure collection of appropriate data needed to support approval; more

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frequent written correspondence from the FDA about things such as the design of the proposed clinical trials and use of biomarkers; intensive guidance on an efficient drug development program, beginning as early as Phase 1; organizational commitment involving senior managers; and eligibility for rolling review and priority review.

Breakthrough therapy designation does not change the standards for product approval. There can be no assurance that we will receive breakthrough therapy designation for any SPEAR T-cell or any particular indication. Additionally, other treatments from competing companies may obtain the designations and impact our ability to develop and commercialize our SPEAR T-cells, which may adversely impact our business, financial condition or results of operation.

We may also seek fast track designation. If a drug or biologic candidate is intended for the treatment of a serious or life-threatening condition or disease and the drug demonstrates the potential to address unmet medical needs for the condition, the sponsor may apply for fast track designation. Under the fast track program, the sponsor of a new drug or biologic candidate may request that the FDA designate the candidate for a specific indication as a fast track drug or biologic concurrent with, or after, the submission of the IND for the candidate. The FDA must determine if the drug or biologic candidate qualifies for fast track designation within 60 days of receipt of the sponsor's request. Even if we do apply for and receive fast track designation, we may not experience a faster development, review or approval process compared to conventional FDA procedures. The FDA may withdraw fast track designation if it believes that the designation is no longer supported by data from our clinical development program.

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We may also seek accelerated approval under the FDA's fast track and accelerated approval programs, the FDA may approve a drug or biologic for a serious or life-threatening illness that provides meaningful therapeutic benefit to patients over existing treatments based upon a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. For drugs granted accelerated approval, post-marketing confirmatory trials have been required to describe the anticipated effect on irreversible morbidity or mortality or other clinical benefit. These confirmatory trials must be completed with due diligence. Moreover, the FDA may withdraw approval of our SPEAR T-cell or indication approved under the accelerated approval pathway if, for example:

- the trial or trials required to verify the predicted clinical benefit of our SPEAR T-cell fail to verify such benefit or do not demonstrate sufficient clinical benefit to justify the risks associated with the drug;
- other evidence demonstrates that our SPEAR T-cell is not shown to be safe or effective under the conditions of use;
- we fail to conduct any required post approval trial of our SPEAR T-cell with due diligence; or
- we disseminate false or misleading promotional materials relating to the relevant SPEAR T-cell.

Even if we receive regulatory approval of our SPEAR T-cells, we will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense as well as significant penalties if we fail to comply with regulatory requirements or experience unanticipated problems with our SPEAR T-cells.

Any regulatory approvals that we receive for our SPEAR T-cells will require surveillance to monitor the safety and efficacy of the SPEAR T-cell. The FDA may also require a risk evaluation and mitigation strategy in order to approve our SPEAR T-cells, which could entail requirements for a medication guide, physician communication plans or additional elements to ensure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. In addition, if the FDA or a comparable foreign regulatory authority approves our SPEAR T-cells, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion, import, export and recordkeeping for our SPEAR T-cells will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, registration and listing, as well as continued compliance with cGMPs and cGCPs for any clinical trials that we conduct post-approval. We and our contract manufacturers will be subject to periodic unannounced inspections by the FDA to monitor and ensure compliance with cGMPs. We must also comply with requirements concerning advertising and promotion for any SPEAR T-cells for which we obtain marketing approval. Promotional communications with respect to prescription drugs, including biologics, are subject to a variety of legal and regulatory restrictions and must be consistent with the information in the product's approved labeling. Thus, we will not be able to promote any SPEAR T-cells we develop for indications or uses for which they are not approved. Later discovery of previously unknown problems with our SPEAR T-cells, including adverse events of unanticipated severity or frequency, or with our third-party manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in, among other things:

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- restrictions on our ability to conduct clinical trials, including full or partial clinical holds on ongoing or planned trials;
- restrictions on such products' manufacturing processes;
- restrictions on the marketing of a product;
- restrictions on product distribution;
- requirements to conduct post-marketing clinical trials;
- untitled or warning letters;
- withdrawal of the products from the market;
- refusal to approve pending applications or supplements to approved applications that we submit;
- recall of products;
- fines, restitution or disgorgement of profits or revenue;

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- suspension or withdrawal of regulatory approvals;
- refusal to permit the import or export of our products;
- product seizure;
- injunctions;
- imposition of civil penalties; or
- criminal prosecution.

The FDA's and other regulatory authorities' policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our SPEAR T-cells. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the United States or abroad. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained and we may not achieve or sustain profitability.

In addition, if following any pivotal clinical trial we were able to obtain accelerated approval of any of our SPEAR T-cell, the FDA will require us to conduct a confirmatory trial or trials to verify the predicted clinical benefit and additional safety studies. The results from the confirmatory trial or trials may not support the clinical benefit, which would result in the approval being withdrawn.

We may seek a conditional marketing authorization in Europe for some or all of our current SPEAR T-cells, but we may not be able to obtain or maintain such authorization.

As part of its marketing authorization process, the EMA may grant marketing authorizations for certain categories of medicinal products on the basis of less complete data than is normally required, when doing so may meet unmet medical needs of patients and serve the interest of public health. In such cases, it is possible for the Committee for Medicinal Products for Human Use, or CHMP, to recommend the granting of a marketing authorization, subject to certain specific obligations to be reviewed annually, which is referred to as a conditional marketing authorization. This may apply to medicinal products for human use that fall under the jurisdiction of the EMA, including those that aim at the treatment, the prevention, or the medical diagnosis of seriously debilitating diseases or life-threatening diseases and those designated as orphan medicinal products.

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A conditional marketing authorization may be granted when the CHMP finds that, although comprehensive clinical data referring to the safety and efficacy of the medicinal product have not been supplied, all the following requirements are met:

- the risk: benefit balance of the medicinal product is positive;
- it is likely that the applicant will be in a position to provide the comprehensive clinical data;
- unmet medical needs will be fulfilled; and
- the benefit to public health of the immediate availability on the market of the medicinal product concerned outweighs the risk inherent in the fact that additional data is still required.

The granting of a conditional marketing authorization is restricted to situations in which only the clinical part of the application is not yet fully complete. Incomplete preclinical or quality data may only be accepted if duly justified and only in the case of a product intended to be used in emergency situations in response to public-health threats. Conditional marketing authorizations are valid for one year, on a renewable basis. The holder will be required to complete ongoing trials or to conduct new trials with a view to confirming that the benefit-risk balance is positive. In addition, specific obligations may be imposed in relation to the collection of pharmacovigilance data.

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Granting a conditional marketing authorization allows medicines to reach patients with unmet medical needs earlier than might otherwise be the case and will ensure that additional data on a product are generated, submitted, assessed and acted upon. Although we may seek a conditional marketing authorization for one or more of our SPEAR T-cells by the EMA, the EMA or CHMP may ultimately not agree that the requirements for such conditional marketing authorization have been satisfied and hence delay the commercialization of our SPEAR T-cells.

We or our collaborators may not be able to obtain or maintain orphan drug exclusivity for our SPEAR T-cells.

Regulatory authorities in some jurisdictions, including the United States and Europe, may designate drugs or biologics for relatively small patient populations as orphan drugs. Under the Orphan Drug Act, the FDA may designate a product as an orphan drug if it is a drug or biologic intended to treat a rare disease or condition, which is generally defined as a patient population of fewer than 200,000 individuals in the United States.

Generally, if a product with an orphan drug designation subsequently receives the first marketing approval for the indication for which it has such designation, the product is entitled to a period of marketing exclusivity, which precludes the EMA or the FDA from approving another marketing application for the same drug for that time period. The applicable period is seven years in the United States and 10 years in Europe. The European exclusivity period can be reduced to six years if a drug no longer meets the criteria for orphan drug designation or if the drug is sufficiently profitable so that market exclusivity is no longer justified. Orphan drug exclusivity may be lost if the FDA or EMA determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the drug to meet the needs of patients with the rare disease or condition.

Orphan drug designation for the NY-ESO SPEAR T-cell for the treatment of soft tissue sarcoma was granted by the FDA in March 2016. Some of our other SPEAR T-cells or the indications which our SPEAR T-cells are used to treat may be eligible for orphan drug designation. In the United States, under the Orphan Drug Act, the FDA may grant orphan designation to a drug intended to treat a rare disease or condition. Such diseases and conditions are those that affect fewer than 200,000 individuals in the United States or, if they affect more than 200,000 individuals in the United States, there is no reasonable expectation that the cost of developing and making a drug product available in the United States for these types of diseases or conditions will be recovered from sales of the product. If the FDA grants orphan drug designation, the identity of the therapeutic agent and its potential orphan use are disclosed publicly by that agency. Orphan drug designation does not convey any advantage in or shorten the duration of the regulatory review and approval process, but it can lead to financial incentives, such as opportunities for grant funding toward clinical trial costs, tax advantages in-lieu of R&D tax credits and user-fee waivers. If a product that has orphan drug designation subsequently receives the first FDA approval for the disease or condition for which it has such designation, the product is entitled to orphan drug marketing exclusivity for a period of seven years. Orphan drug marketing exclusivity generally prevents the FDA from approving another application, including a full BLA, to market the same drug for the same indication for seven years, except in limited circumstances, including if the FDA concludes that the later drug is clinically superior to the approved drug.

Orphan drug designation for the NY-ESO SPEAR T-cell for the treatment of soft tissue sarcoma, a solid tumor cancer has also been granted by the European Union. Orphan drug designation provides certain regulatory and financial incentives for companies to develop and market therapies that treat a life-threatening or chronically debilitating condition affecting no more than five in 10,000 persons in the European Union, and where no satisfactory treatment is available. The designation provides incentives for companies seeking protocol assistance and scientific advice from the EMA during the product development phase and a 10-year period of marketing exclusivity in the European Union following product approval.

A drug is clinically superior if it is safer, more effective or makes a major contribution to patient care. Orphan drug marketing exclusivity rights in the United States may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is

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unable to assure sufficient quantity of the drug to meet the needs of patients with the rare disease or condition. There can be no assurance that any SPEAR T-cell will be eligible for orphan drug designation in the United States or in other jurisdictions or that it will obtain orphan drug marketing exclusivity upon approval or that we or GSK will not lose orphan drug designation for the NY-ESO SPEAR T-cell. Inability to obtain orphan drug designation for a specific SPEAR T-cell or loss of such designation for the NY-ESO SPEAR T-cell in the future would prevent any ability to take advantage of the financial benefits associated with orphan drug designation and would preclude us from obtaining marketing exclusivity upon approval, if any. Even if we obtain orphan drug exclusivity for a product, that exclusivity may not effectively protect the product from competition because different drugs can be approved for the same condition. The extent of market exclusivity which is obtained may also be affected if the indication for any relevant registration or pivotal trial is narrower than the orphan designation granted. Even after an orphan drug is approved, the FDA can subsequently approve another drug for the same condition if the FDA concludes that the later drug is clinically superior in that it is shown to be safer, more effective or makes a major contribution to patient care.

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Any failure by us to comply with existing regulations could harm our reputation and operating results.

The production of SPEAR T-cells is highly regulated and subject to constant inspection. The regulatory environment may also change from time to time. Any failure to comply with regulatory requirements, whether in the United States or in other countries in which our SPEAR T-cells are supplied, may result in investigation by regulatory authorities, suspension of regulatory authorizations and, as a result, suspension of clinical programs or ability to supply any of our SPEAR T-cells and potentially significant fines or other penalties being imposed in relation to any breach. Any failure may also harm our reputation and impact our ability going forward to obtain regulatory approvals for other SPEAR T-cells or require us to undertake additional organizational changes to minimize the risk of further breach. A failure to comply may apply to any part of our business, for example to the processes used for manufacture of our SPEAR T-cells (including the reliability of the process) or to the processes used for treatment of patients (including tracking of patient product and supply of patient specific product).

Our research and development activities utilize hazardous, radioactive and biological materials. Should such materials cause injury or be used other than in accordance with applicable laws and regulations, we may be liable for damages.

We use, hazardous and biological reagents and materials in our research and development at our U.K. site. We also use radioactive reagents and materials in our research and development in the United Kingdom. We have obtained the appropriate certification or ensured that such certification has been obtained as required for the use of these reagents but our use is subject to compliance with applicable laws and there is a risk that should any third party or employee suffer injury or damage from radioactive, hazardous or biological reagents that we may incur liability or obligations to compensate such third parties or employees. We have employer's liability insurance capped at £10.0 million per occurrence and public liability insurance capped at £3.0 million per occurrence; however, these amounts may be insufficient to compensate us if these events actually occur in the future.

We are subject to the U.K. Bribery Act, the U.S. Foreign Corrupt Practices Act and other anti-corruption laws, as well as export control laws, customs laws, sanctions laws and other laws governing our operations. If we fail to comply with these laws, we could be subject to civil or criminal penalties, other remedial measures, and legal expenses, which could adversely affect our business, results of operations and financial condition.

Our operations are subject to anti-corruption laws, including the U.K. Bribery Act 2010, or Bribery Act, the U.S. Foreign Corrupt Practices Act, or FCPA, and other anti-corruption laws that apply in countries where we do business. The Bribery Act, the FCPA and these other laws generally prohibit us and our employees and intermediaries from bribing, being bribed or making other prohibited payments to government officials or other persons to obtain or retain business or gain some other business advantage. Under the Bribery Act, we may also be liable for failing to prevent a person associated with us from committing a bribery offense. We and our commercial partners may operate in a number of jurisdictions that pose a high risk of potential Bribery Act or FCPA violations, and we participate in collaborations and relationships with third parties whose actions, if non-compliant, could potentially subject us to liability under the Bribery Act, FCPA or local anti-corruption laws. In addition, we cannot predict the nature, scope or effect of future regulatory requirements to which our international operations might be subject or the manner in which existing laws might be administered or interpreted.

We are also subject to other laws and regulations governing our international operations, including regulations administered by the governments of the United Kingdom and the United States, and authorities in the European Union, including applicable export control regulations, economic sanctions on countries and persons, anti-money laundering laws, customs requirements and currency exchange regulations, collectively referred to as the Trade Control laws.

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However, there is no assurance that we will be completely effective in ensuring our compliance with all applicable anti-corruption laws, including the Bribery Act, the FCPA or other legal requirements, including Trade Control laws. If we are not in compliance with the Bribery Act, the FCPA and other anti-corruption laws or Trade Control laws, we may be subject to criminal and civil penalties, disgorgement and other sanctions and remedial measures, and legal expenses, which could have an adverse impact on our business, financial condition, results of operations and liquidity. Likewise, any investigation of any potential violations of the Bribery Act, the FCPA, other anti-corruption laws or Trade Control laws by U.K., U.S. or other authorities could also have an adverse impact on our reputation, our business, results of operations and financial condition.

If we are found in violation of federal or state fraud and abuse or other health care laws, we may be required to pay a penalty and/or be suspended from participation in federal or state health care programs, which may adversely affect our business, financial condition and results of operations.

If we obtain marketing approval for our products in the United States, if at all, we will be subject to various federal and state health care fraud and abuse and other health care laws. Healthcare providers, physicians and third-party payors play a primary role in the recommendation and use of pharmaceutical products that are granted marketing approval. Accordingly, arrangements with third-party payors, existing or potential customers and referral sources are subject to broadly applicable fraud and abuse and other healthcare laws and regulations, and these laws and regulations may constrain the business or financial arrangements and relationships through which manufacturers market, sell and distribute the products for which they obtain marketing approval.

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Such restrictions under applicable federal and state healthcare laws and regulations include the following:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons from knowingly and willfully soliciting, receiving, offering or paying remuneration, directly or indirectly, in cash or kind, in exchange for, or to induce, either the referral of an individual for, or the purchase, order or recommendation of, any good or service for which payment may be made under federal healthcare programs such as the Medicare and Medicaid programs. This statute has been interpreted to apply to arrangements between pharmaceutical manufacturers, on the one hand, and prescribers, purchasers and formulary managers on the other. Cases have been brought under false claims laws alleging that off-label promotion of pharmaceutical products or the provision of kickbacks has resulted in the submission of false claims to governmental health care programs. The Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively, the Healthcare Reform Act, amended the intent requirement of the federal Anti-Kickback Statute. A person or entity no longer needs to have actual knowledge of this statute or specific intent to violate it. Under federal government regulations, some arrangements, known as safe harbors, are deemed not to violate the federal Anti-Kickback Statute and analogous state law requirements;
- the federal False Claims Act, or FCA, which prohibits, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment from Medicare, Medicaid or other third-party payors that are false or fraudulent. Federal Anti-Kickback Statute violations and certain marketing practices, including off-label promotion, also may implicate the FCA. In addition, private individuals have the ability to bring actions on behalf of the government under the FCA and under the false claims laws of several states;
- federal criminal laws that prohibit executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;
- the federal Physician Payment Sunshine Act, which requires certain manufacturers of drugs, devices, biologics and medical supplies to report annually to the Centers for Medicare & Medicaid Services, or CMS, information related to payments and other transfers of value to physicians, other healthcare providers and teaching hospitals, and ownership and investment interests held by physicians and other healthcare providers and their immediate family members. The CMS publishes the reported data in a searchable form on an annual basis;
- The Health Insurance Portability and Accountability Act of 1996 (HIPAA) imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, which governs the conduct of certain electronic healthcare transactions and protects the security and privacy of protected

health information; and

- state and foreign law equivalents of each of the above federal laws, such as anti-kickback and false claims laws which may apply to: items or services reimbursed by any third-party payor, including commercial insurers; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance issued by the federal government or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts. California and a few other states have passed laws that require pharmaceutical companies to comply with the April 2003 Office of Inspector General Compliance Program Guidance for Pharmaceutical Manufacturers and/or the Pharmaceutical Research and Manufacturers of America Code on Interactions with Healthcare Professionals. In addition, several states impose other marketing restrictions or require pharmaceutical companies to make marketing or price disclosures to the state. There are ambiguities as to what is required to comply with these state requirements and if we fail to comply with an applicable state law requirement we could be subject to penalties.

Neither the government nor the courts have provided definitive guidance on the application of fraud and abuse laws to our business. Law enforcement authorities are increasingly focused on enforcing these laws. Although we seek to structure our business arrangements in compliance with all applicable requirements, these laws are broadly written, and it is often difficult to determine precisely how the law will be applied in specific circumstances. Accordingly, it is possible that, once we begin marketing our product(s) some of our practices may be challenged under these laws. While we intend to structure our business arrangements to comply with these laws, it is possible that the government could allege violations of, or convict us of violating, these laws. Violation