Immuno-Oncology Deal Making:

Over exuberance or transforming future treatments in oncology forever?

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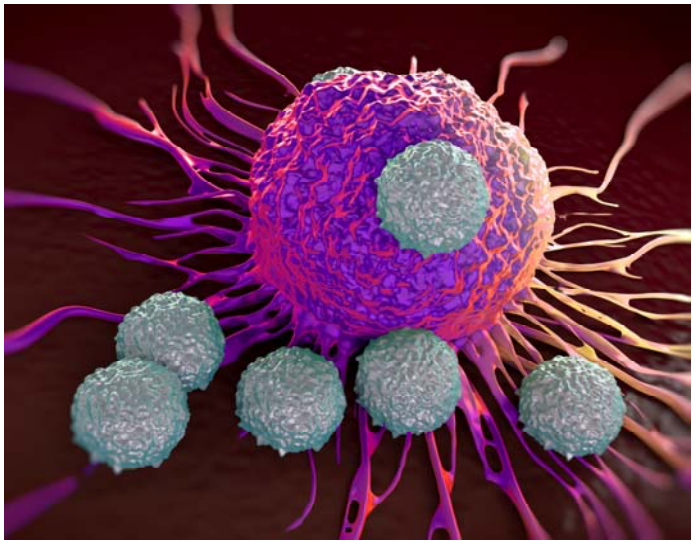


Introduction and the emergence of immuno-oncology

Oncology has always been an active area for research and development in academia, biotech and pharma, however what is unprecedented is the recent volume of deals in this space, fuelled almost entirely by the game-changing area of immuno-oncology (IO). The clinical and market success of the leading IO therapies has no doubt been a key factor in the emergence of IO deal making.

Rather than targeting the driving factors of cancer directly by interfering with specific molecules that are involved in the growth and progression of certain cancers (targeted therapy), IO is different and acts by targeting a cancer patient's own immune system to help fight and destroy the cancer. IO therapies broadly work by either 'taking the brakes off' the immune system, by inhibiting the so-called 'checkpoints' (proteins that need to be de-activated to start an immune response), or boosting the immune system's ability to detect and destroy tumours – the so-called 'putting the gas on' effect, e.g. through the use of cancer vaccines or engineered T-cells. Examples of IO therapeutic approaches are summarised in Table 1.

Table 1 Examples of IO therapeutic approaches

Therapeutic approach	Comments	Examples of therapeutic entities
Checkpoint modulators	Blocking the activity of checkpoint proteins e.g. PD-1, CTLA-4, TIM3, LAG3, IDO, to enhance the body's immune response to cancer cells (i.e. the tumour cells are no longer "under the radar")	• Antibody-based therapies, e.g, Opdivo and Yervoy (BMS), Keytruda (Merck & Co) • Some small molecules approaches
Engineered T-cells	Chimeric antigen receptor (CAR) T-cell therapy	• Autologous and allogeneic engineered T-cells
Cancer vaccines	Vaccines containing or expressing specific antigens designed to stimulate the immune system to attack cancer cells	• Autologous tumour or dendritic cells, e.g. Provenge (Dendreon/Valeant) • Peptide antigens • Engineered viruses, VLPs • Nucleic acids
Oncolytic viruses	Viruses genetically engineered to boost the immune response that can infect and kill mainly cancer cells	• Imlygic or T-VEC (Amgen), engineered from herpes simplex virus 1 (HSV-1)
TCR-based approaches	TCRs (T-cell receptors) activate a highly potent and specific T-cell response to recognise and destroy cancer cells	• Engineered proteins
Immune modifying agents	Boosting the immune response against cancer cells	• Early generation mAbs e.g. Campath (Genzyme) • Cytokines, e.g. interferons, interleukins

Abbreviations:
PD-1, programmed cell death protein 1 **CTLA-4**, cytotoxic T lymphocyte associated protein 4
TIM3, T-cell immunoglobulin and mucin-domain containing molecule-3 **LAG3**, Lymphocyte-activation gene 3
IDO, indoleamine 2,3-dioxygenase **VLPs,** virus-like particles

This article provides an overview of the deal making environment in the IO field with a specific focus on the business development activity around checkpoint modulator therapies and the drive to develop the most efficacious treatment regimens for a range of cancers.

The IO deal making environment

It is no surprise given the promise of IO in the treatment of cancer to see a very buoyant deal making environment for potential IO therapeutics. Our analysis of Deal Watch data for 2015 and the first half of 2016 illustrates that large pharmaceutical companies are committing significant sums to access a range of IO assets. Of the 356 deals we reviewed during 2015, 62 transactions with financials terms disclosed focused on IO and the majority of these (53) were licensing-based deals. Given that IO is a relatively young but rapidly growing area, 43 of the IO transactions covered assets at non-clinical stages of development. Table 2 demonstrates the diverse range of therapeutic entities that are covered by the term IO. The most popular therapeutic entities under development as future potential IO treatments are antibody-based molecules and cell-based therapeutics, such as chimeric antigen receptor engineered T-cells (known as CAR T-cells). However there are also small molecule approaches to IO in early stage development.

Table 2 Numbers of IO deals in 2015 by development stage

Therapeutic entity	Discovery/ platform	Preclinical	Phase 1/2	Phase 2	Phase 3	Pre-reg	Approved
Biologics *	11	9	5	1	1		
Cell based	10		3	1	1		1
Small	3	6					
Vaccine/VLPs/virus	3		1		1		1
Nucleic acid related	1		1			2	

Based on Deal Watch data for transactions with financials disclosed

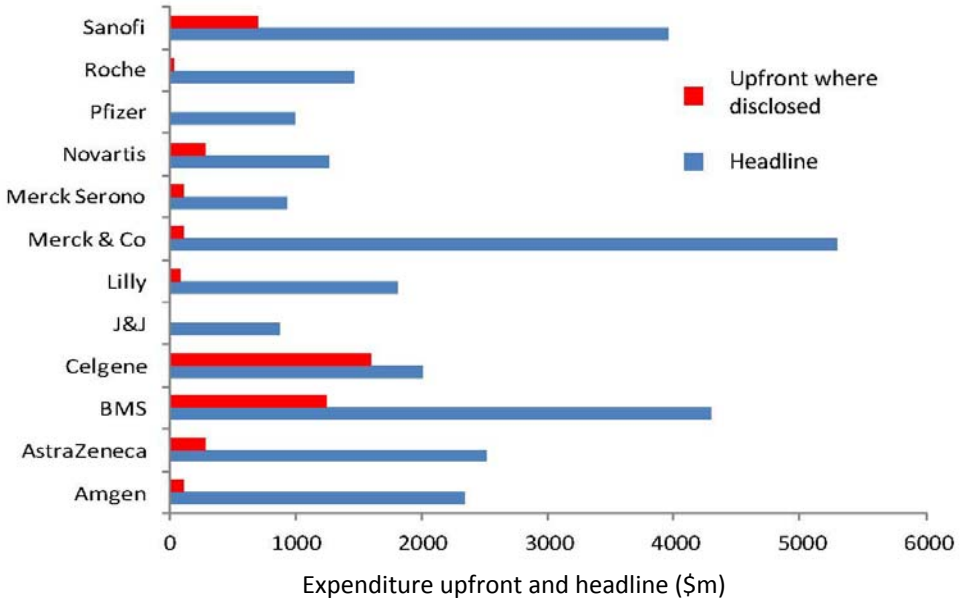
* includes antibody-based therapeutics and other proteins

An indicator of the enormous interest in the IO field is how much the large pharmaceutical companies are prepared to spend to secure rights to IO assets. Deal Watch reviewed the aggregate headline values for the IO transactions entered into by the most active companies licensing or acquiring in this space during 2015 and these are illustrated in Figure 1. Because there are differences in the approaches companies use to report deal financials, the data provided in Figure 1 are not meant to serve as a direct comparison but rather an overall indicator of companies' IO expenditure.

Typically a more meaningful figure in assessing the value of IO deals is the upfront payment made to secure the asset. As most early stage deals are very back-loaded and may include multiple targets and programmes, the upfront payment is frequently the only unconditional payment. However not all of the most active licensees and acquirers in the IO field divulge the upfront payments. This is particularly evident in Figure 1 where Pfizer did not disclose the upfront payments for its IO deals during 2015. Other companies including Eli Lilly, J&J, Roche, Novartis and Merck & Co did not publish the upfront payments in all the deals they disclosed.

Looking at the headline values, Merck & Co's IO deal making spend during 2015 was largely driven by the four year extension of its 2014 alliance with Ablynx, which added up to 12 additional Nanobody programmes focused on immune checkpoint targets. Whilst the upfront payment seemed fairly modest at approximately $14.3m, the overall headline value could be around $4.5bn if all 12 programmes are successful and achieve all the development, regulatory and commercial milestones of $374m per programme.

Figure 1 Aggregate headline and upfront IO spend by the most active IO licensees/ acquirers in 2015



Footnote: In reviewing the headline values it is important to consider that some of the deals are multi-programme transactions which can make it difficult to assess the real overall value, i.e. all the programmes have to be successful to achieve the deal headline quoted. Some companies quote headline values covering all the programmes e.g. the financials for the Xencor-Amgen deal were $1.75bn in total for six programmes. Other companies report financials on a per programme basis, e.g. the extension of the Ablynx-Merck & Co collaboration refers to $374m in milestones per programme for up to 12 programmes; if all 12 programmes are successful the headline value for that deal alone could be around $4.5bn.

In terms of upfront spend, and in keeping with its existing commitment to the area, Bristol-Myers Squibb (BMS) was one of the biggest spenders in IO during 2015, not only through several licensing agreements but also through its acquisition of Flexus Biosciences for lead preclinical candidate F001287, an IDO1 inhibitor and the biotech's broad IDO/TDO discovery programme (TDO is tryptophan 2,3-dioxygenase). BMS paid $800m upfront for Flexus; a further $450m is linked to the successful achievement of development milestones.

Celgene continued in its appetite for IO assets and creative deal making, including its 10 year immunotherapy collaboration with Juno Therapeutics in IO and autoimmune disease with an initial focus on developing therapies based on CAR T and T-Cell Receptor (TCR) technologies. The hefty $1bn upfront included ~$846m in equity and $150m cash.

Perhaps in catch up mode, Sanofi was also a big IO spender last year with its collaboration and licence with BioNTech for up to five cancer immunotherapies based on synthetic mRNAs, paying $60m upfront and $300m milestones per programme. Sanofi's other big commitment was to its existing partner, Regeneron, for an IO alliance centred on a phase 1 stage PD-1 inhibitor. Paying $640m upfront, Sanofi is also due to commit over $1bn in R&D funding and a potential future $375m sales milestone.

And deal activity in 2016....?

During the first six months of 2016, we have reviewed 14 IO deals with financials disclosed. The pattern in terms of therapeutic entities is similar to that seen for the full year 2015, with the majority of deals focused on biologics/ antibody-based molecules, but there are also transactions for cell-based therapies, small molecules, nucleic acid therapeutics and oncolytic viruses. Also in June Celgene announced the establishment of a consortium with four National Cancer Institute (NCI) institutions to discover and develop novel cancer therapeutics and diagnostics over 10 years, no doubt including potential IO approaches. Paying $12.5m to each institution, Celgene has the option to enter into future development and commercialisation agreements for new cancer therapeutics created through the consortium, in return for licensing fees on a per programme basis. Celgene's appetite for IO deals continues into H2 2016; the financials for its recent multi-programme, option based collaboration with Jounce Therapeutics include $225m upfront, $36m in equity investment and a potential $2.3bn in milestones if all programmes are successful.

Based on the frenetic IO deal making activity in 2015, IO deal numbers appear to be down in the first six months of this year, at least based on the deals with financials. This trend may be more a reflection of the need for pharma licensees/ acquirers to now focus and progress the assets they already have. Whilst companies such as Celgene, Sanofi, Roche and Novartis have continued their IO deal making into H1 2016, AbbVie, GSK and Baxalta, which is new to the area in terms of deal activity, have also been in IO transaction mode over the last few months (Table 3). In January this year Merck & Co bought IOmet Pharma, a UK company focused on small molecules focused on cancer immunotherapy and cancer metabolism for an undisclosed price. More recently Merck & Co paid $200m upfront to enter into a collaboration with Moderna Therapeutics to develop mRNA-based personalised cancer vaccines that will also be evaluated in combination studies with Keytruda.

Table 3 Examples of IO deals announced in HI 2016

Licensor / Licensee	Product / Technology	Deal type	Headline $m (Upfront)
Xencor/ Novartis	T-cell engaging XmAb bispecific antibodies: XmAb 14045 for AML and XmAb 13676 for B-cell malignancies (preclinical) with cost share and Xencor maintaining US rights; includes broader collaboration using XmAb platform for Novartis targets with Novartis having global rights, Xencor has certain US co-pro options	collaboration, licence, options	2,560 (150)
Symphogen/ Baxalta	Antibody therapies against 6 checkpoint targets; Baxalta has excl option at end phase 1 to complete late stage development/ commercialisation (preclinical)	collaboration, options	1,775 (175)
Precision Biosciences/ Baxalta	Allogeneic CAR T-cell therapies using ARCUS genome editing technology for up to 6 targets; Baxalta has excl right at phase 2 to opt in for late stage development/ commercialisation; Precision has 50/50 co-dev/ co-pro option in US (discovery)	collaboration, options	1,705 (105)
Blueprint Medicines/ Roche	Up to 5 small molecule therapeutics targeting kinases for cancer immunotherapy; Blueprint to retain US rights for 2 programmes (discovery)	collaboration, licence, options	1,010 (45)
arGEN-X/ AbbiVie	ARGX-115 antibody programme targeting GARP protein; arGEN-X has co-pro option for EU and Switzerland (preclinical)	exclusive option to license	685 (40)
Adaptimmune Therapeutics/ GSK	TCR engineered T-cell therapies inc NY-ESO-1 in synovial sarcoma (phase 1/2) + up to 8 combination studies + 4 other progs	expanded 2014 collaboration, options	~500 milestones for NY-ESO prog; other financials nd
Innate Pharma/ Sanofi	Bi-specific antibody formats engaging natural killer (NK) cells to kill tumour cells through the activating receptor NKp46; generation/ evaluation of up to 2 bispecific NK cell engagers (discovery)	collaboration, licence	436
Agios Pharma/ Celgene	New collaboration in metabolic immuno-oncology and other areas; Agios receives $200m research fees for 4 yrs; Celgene has options for co-development and co-commercialisation rights, cost/ profit share arrangements (discovery)	collaboration/ amendment to 2010 deal, options	399-616/ programme depending on programme
Moderna Therapeutics/ Merck & Co	mRNA-based personalised cancer vaccines and exclusivity for Keytruda combinations; following human POC studies, Merck & Co has the option to make an additional undisclosed payment to extend the collaboration with a 50:50 cost/profit share; Moderna has US co-pro options (discovery)	collaboration, licence, options	200 upfront; further payments nd

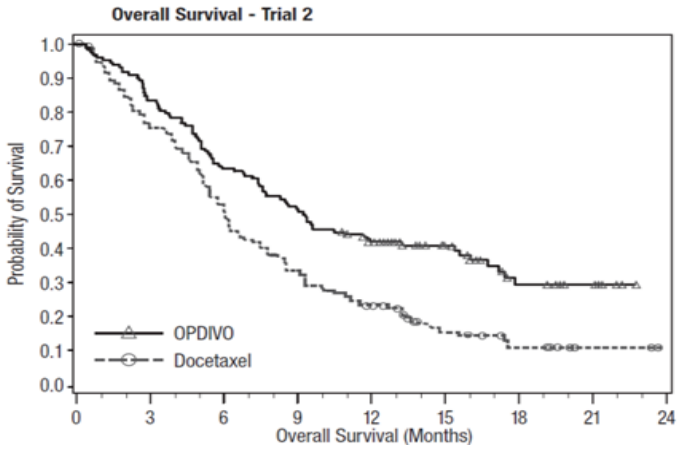
nd - not disclosed

No discussion of deal making activity in the IO field would be complete without reviewing the unprecedented level of co-operation and collaboration between pharmaceutical companies in pooling their assets and resources, often with competitors, to evaluate different clinical combinations of their therapies to define the best regimen for treating a specific cancer. Many of these clinical collaborations are based on IO checkpoint modulators. The scientific rationale for such combination therapy approaches is reviewed in the following sections.

First generation checkpoint modulators and the clinical promise

The first generation of IO checkpoint modulator therapies target the CTLA-4 and PD-1 checkpoint receptors (or the associated ligand PD-L1) and have become standards of care in multiple tumour types, such as non-small cell lung cancer (NSCLC), melanoma, renal cell carcinoma (RCC) and just recently both classical Hodgkin's Lymphoma (cHL) and bladder cancer. Other indications are likely to follow over the next one to two years, where multiple PD-1/PD-L1 agents have the coveted FDA breakthrough designation based on their step change efficacy profiles shown to date.

Figure 2 Extract from Opdivo's label



The first two cancer-fighting PD-1 drugs, Merck & Co's Keytruda (pembrolizumab) and BMS's Opdivo (nivolumab), both hit the market in late 2014 and just recently in May, Tecentriq (atezolizumab) from the Genentech Inc unit of Roche became the first PD-L1 inhibitor to be approved by the FDA. Others will soon follow, including AstraZeneca/MedImmune's durvalumab and Pfizer/Merck KGaA's avelumab, both PD-L1 targeted agents. The uptake of Opdivo in the market has been quite remarkable, already achieving blockbuster status in the handful of indications where it is approved; with BMS slating quarter one 2016 sales of $704m and therefore expected global sales for the whole of 2016 in excess of $3bn.

'Lifting the tail' – long term 'cures'

The rapid uptake and unprecedented interest in IO lies in the emerging data shown in the Kaplan–Meier graph (Figure 2), taken directly from Opdivo's FDA approved label in 2nd line NSCLC versus the current standard of care in this setting, an old chemotherapy drug, docetaxel.

This significant finding, showing that Opdivo increases both (i) median overall survival (by around three months) and (ii) long term survival after 2+ years for 20-30% of patients, enabled the rapid regulatory review and approval of Opdivo in 2nd line lung cancer, and since then, many other indications.

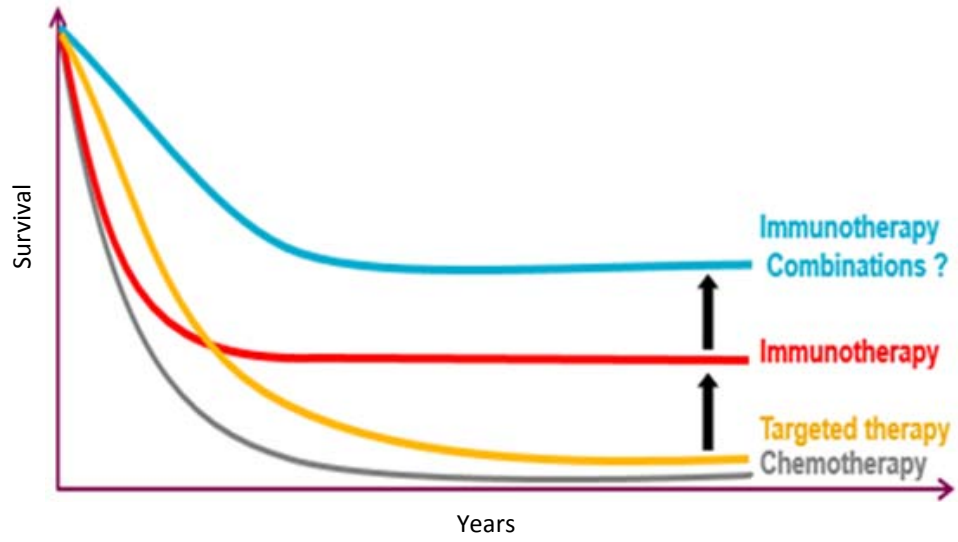
Historically, targeted therapies (agents that target a particular genetic abnormality or mutation driving the disease), represented by the yellow line in Figure 3, typically show high response rates leading to enhanced progression free survival and sometimes overall survival vs chemotherapy (grey line). However, resistance mechanisms inevitably cause all patients to experience disease progression and the curves ultimately end up converging. The brand new IO agents, represented by the red line, cause a 'lifting' or 'tailing' of the Kaplan-Meier curve that means that 20-30% of patients have a long term and highly durable response, providing clinical validation of the memory effect that our immune systems have in keeping cancer away. These astonishing findings have even led people to start using the term 'cure', which is unprecedented in the area of oncology based on previously generated data.

Next generation IO – combinations, combinations, combinations

Whilst checkpoint inhibitor monotherapies have resulted in dramatic responses in some individuals, not every person responds, and the responses often are not durable.

The challenge now rests firmly with next generation combination regimens in an attempt to increase both response rates and the durability of response without substantially increasing side effects. This concept is shown in blue in Figure 3, where the curve is both lifted and shifted significantly out towards the right.

Figure 3 Graphical representation of the future of combinations



The industry however is faced with a cornucopia of potential combination options as the science around them continues to evolve rapidly. The number of different tumour types further complicates this, and when overlaid with the different biological hypotheses, makes for a very complex matrix.

Pharmaceutical and biotech companies are therefore being thoughtful about where to make their IO investments. The ultimate strategy is to fill in the entire matrix as far as is practically possible, with the aim of allowing all cancer patients to benefit from new, potentially game-changing IO treatments.

This has created the perfect environment for collaboration and sharing of ideas, and is directly responsible for the high levels of deal making activity that we are seeing in the industry.

The simple truth however is that no-one knows what the 'killer' combinations will be, hence the apparent 'spread-betting' seen across the industry, but with each player being very disciplined and focused on rational combinations. A common strategy, for example, involves testing the PD-1/PD-L1 checkpoint inhibitors with a variety of marketed targeted therapies with well-categorised activity, capitalising on the fact that we now know that these immune checkpoints are both safe and efficacious and are therefore sound foundations - or the so-called 'backbone' - for combinations.

Following the science – finding the right combinations

At AstraZeneca our decisions are guided by clear, biological hypotheses and strong preclinical data, leveraging internal subject matter expertise.

Whether a combination includes two (or more) IO therapies or IO agents alongside chemotherapy or other targeted oncology medicines is a decision made only with the backing of data and a sound hypothesis. For example, it is common practice to look for preclinical evidence that a combination will trigger an immune response by looking for evidence of CD4+ and CD8+ T-cell modulation/ infiltration.

It is still very early days however and we eagerly await further data. There is no crystal ball and the jury is still firmly out on what the most efficacious combinations might be, given the number of available options. Even older chemotherapies (therapies that do not discriminate in killing healthy versus cancerous cells) may be combined with new IO agents - when cytotoxic chemotherapies kill cancer cells they shed antigen(s) that can then be recognised by an army of T-cells (white blood cells) and prompt an immune response, allowing these T-cells to infiltrate the tumour and then destroy it. Combining a checkpoint inhibitor with an older chemotherapy could therefore be additive, or even potentially synergistic.

BMS, AstraZeneca and Roche are all following this strategy across multiple tumour types, as well as looking at combinations of two IO agents, such as CTLA-4 and PD-1/ PD-L1 where mechanistically such an approach is quite compelling based upon data to date.

Bring on the deal making deluge (with no strings attached)

It is no surprise, given their place as a potential backbone of the IO universe, that those companies with marketed or clinical stage PD-1 or PD-L1 immune checkpoint assets find such agents to be in great partnering demand.

Alongside the M&A, licensing, strategic alliances and option deals discussed in earlier sections of this article, so called 'no-strings-attached' clinical trial partnerships and collaborations have driven combination therapy trials in IO. These deals, and there are literally dozens of them, are typically limited to two companies agreeing to test their assets together in the clinic, without significant downstream commitment in terms of future development and commercialisation rights and responsibilities. The very nature of these deals means that financial terms are not disclosed and it is most likely that the two partners will share the clinical trial costs, or at the very least one party supplies the other with its proprietary agent free of charge to enable the hypothesis to be tested in the fastest possible time. It is assumed that each party always maintains its commercial rights and interests to the respective agent that it contributes to the combination being investigated.

In AstraZeneca's own experience, clinical trial partnerships can take weeks to put in place, rather than months as is common for traditional alliances. The driving force behind this is a simple one: competition. These deals enable companies to rapidly test clinical hypotheses by sharing the risks together.

Preclinical data can be predictive, but rarely perfectly so, hence many companies are adopting a common sense approach to assessing combination therapies by moving directly into the clinical to optimally test a particular hypothesis. As an industry we are working to ask all the right scientific questions and seeking answers in the most efficient way possible, for the benefit of patients. IO has really brought the industry together and the amount of collaboration is both breathtaking and inspiring to see.

The deal making frenzy all began back in 2014 when Incyte Corporation slated four major pharma alliances in a period of just six months, all focussed on combining its IDO-1 targeted agent (epacadostat) with the PD-1/PD-L1 class - and all with apparently no strings attached or non-exclusive in nature (Table 4).

Table 4 Speed dating in action – IDO combinations with immune checkpoints

PD-1/PD-L1 agent	Tumour types	Date announced
Nivolumab (BMS)	Melanoma, NSCLC, ovarian, colorectal (CRC), squamous cell carcinoma of the head and neck (SCCHN) and diffuse large B-cell lymphoma (DLBCL)	May 2014
Durvalumab (AstraZeneca)	Metastatic melanoma, NSCLC, SCCHN and pancreatic cancer	May 2014
Pembrolizumab (Merck & Co)	Metastatic and recurrent NSCLC, among other advanced or metastatic cancers	February 2014
Atezolizumab (Roche/Genentech)	Not disclosed	July 2014

Then, just in October last year Incyte and Merck & Co both announced an expansion of their relationship, to take the nivolumab and epacadostat combination into a phase 3 study in melanoma, this time on an exclusive basis for a period of two years, presumably reflecting the significantly higher level of investment in such a pivotal study versus the earlier, and non-exclusive, signal searching efforts previously announced. The phase 3 trial, the ECHO-301 study, is being co-funded by Incyte and Merck & Co but no financial terms were disclosed. Incyte announced on 22 June that the first patient had been treated.

AstraZeneca's PD-L1-directed antibody, durvalumab, has also formed the foundations of a broad range of IO deals, such as a strategic alliance with Eli Lilly. This deal will see durvalumab tested in combination with several of Lilly's experimental IO candidates and was announced in May 2015 and subsequently expanded in October 2015 (Table 5).

This approach to testing multiple combinations is particularly attractive as a number of hypotheses can be tested simultaneously with the added benefit of synergies in doing these efforts in parallel.

However not every clinical trial partnership is designed to enable 'dating' multiple partners. For example, in a deal with Pfizer and Merck KGaA that was announced in January, Syndax Pharmaceuticals plans to test its drug, entinostat, a small molecule histone deacetylase (HDAC) inhibitor, with avelumab (another PD-L1 antibody) in individuals with heavily pre-treated recurrent ovarian cancer. That deal is exclusive with regards to the tumour type, and Syndax will combine entinostat only with avelumab. However Syndax can, and has, combined its HDAC inhibitor with other IO assets, such as Merck & Co's Keytruda, in different indications (this particular combination is being tested in NSCLC and melanoma under a deal made in March 2015).

Table 5 Multiple combinations will be investigated by AstraZeneca and Lilly on a non-exclusive basis

AstraZeneca agent	Lilly agent	Tumour types
Durvalumab (PD-L1)	CSF-1R antibody	Not disclosed
Tremelimumab (CTLA-4)	CSF-1R antibody	Not disclosed
Durvalumab	Galunisertib (TGF-β)	Not disclosed
Durvalumab	CYRAMZA, ramucirumab (VEGFR-2)	Gastric, gastroesophageal, NSCLC and hepato-cellular cancer
Durvalumab	CXCR-4 peptide antagonist	Not disclosed

Abbreviations: CSF1R, colony stimulating factor 1 receptor
VEGFR, vascular endothelial growth factor receptor
TGF-β, transforming growth factor beta
CXCR-4, C-X-C chemokine receptor type 4

Further examples of clinical collaborations are emerging with exclusivity arrangements. At the end of June BMS and UK-based PsiOxus Therapeutics announced an exclusive clinical collaboration agreement to evaluate enadenotucirev, a phase 1 stage, intravenously administered oncolytic adenovirus, with Opdivo to treat a range of tumour types in late stage cancer patients. Enadenotucirev is an oncolytic virus that selectively replicates in tumour cells but not in normal cells. BMS is paying $10m upfront to gain an exclusive position on enadenotucirev and the companies will share development costs. This also allows BMS exclusivity covering other anti-PD-1/PD-L1 antagonist antibody with enadenotucirev combination regimens. The agreement provides BMS with an exclusive right of negotiation for future commercial rights to enadenotucirev during a certain undisclosed term.

We patiently await the verdict of the jury

While the jury reaches its verdict and more data become available, we continue to see new combinations announced every week. IO is an area of research that lends itself extremely well to partnering based on the data to date, building on the solid foundations laid by the first generation IO agents and attempting to add shelf life to what would otherwise be superseded agents due to this new armamentarium redefining the medical text book.

Such IO combinations, if the right balance of efficacy versus tolerability is reached, could mean fast-to-market strategies and 'leap frogging', reducing the shelf life of other standards of care by many years. The competition is fierce, the data are telling us clearly that combinations are the way forward and therefore there is no reason why - in the near term at least - there will be any slowdown in clinical combinations and the necessary deal making in order to deliver upon them.

Footnotes:

The deal financials in this review are based on the Medius monthly Deal Watch articles which review the top pharmaceutical deals as announced by headline value plus other deals of note. Deals are recorded in the month of announcement. The headline value is as quoted in the various press releases, i.e. it is based on the sum of initial (upfront/ signature) payments, option fees, R&D funding, development milestone payments, sales threshold and other success or contingent payments, as cash or equity. This does not include royalty payments.

Whilst this review is not meant to be an exhaustive treatise of every deal announced in IO, our aim is to capture key trends and highlight novel approaches that may help the business development / licensing professional. Every effort is made to ensure that the information provided is accurate. The views expressed in this report are those of the authors.

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Author Bios

Chris Sheldon has worked in the UK at AstraZeneca for 14 years and is currently Head of Oncology Search & Evaluation in AstraZeneca's Global Product & Portfolio Strategy Team. Chris and his team are responsible for leading the technical evaluation of new M&A, in-licensing, out-licensing (divestment) and collaboration opportunities in clinical stage oncology. Most recently, he led the evaluation of AstraZeneca's recent majority stake investment in Acerta Pharma, as well as multiple novel immuno-oncology combination deals for AstraZeneca's checkpoint inhibitors, durvalumab and tremelimumab.

Jill Ogden has over 29 years of commercial and R&D experience in the biopharmaceuticals and healthcare industries from roles in biotechs and mid-caps. Her main areas of focus have included product and technology deals covering biologics, drug delivery and other platforms in a range of therapeutic areas. She has led and been involved in a wide range of transactions including licensing, divestment deals and corporate M&A. As a member of the Medius Deal Watch team, Jill contributes articles on the pharmaceutical deal making environment on a regular basis.