

Data page: An update on antibody deals

With the help of BioCentury, *Biopharma Dealmakers* is providing a mid-year update on the annual deal-trends analysis that appears in the September issue of the supplement.

By the end of 2014, the number of partnering deals involving a therapeutic antibody, antibody drug conjugates or any other type of next generation antibody asset reached 94, marking a spike in the total number of deals in recent years. The four previous years hovered in the range between 60 to 75 deals (Fig. 1). The BCIQ database also showed 38 deals took place before the end of April 2015, which may indicate that the peak observed in 2014 may mark a new level of activity for deal making in the sector.

An additional indication that 2015 promises to be another year of growth may be gleaned, with caution, from a look at reported up-front

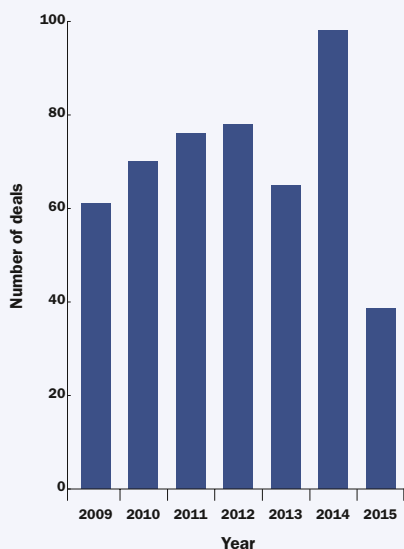


Figure 1: Number of antibody and ADC partnership deals.

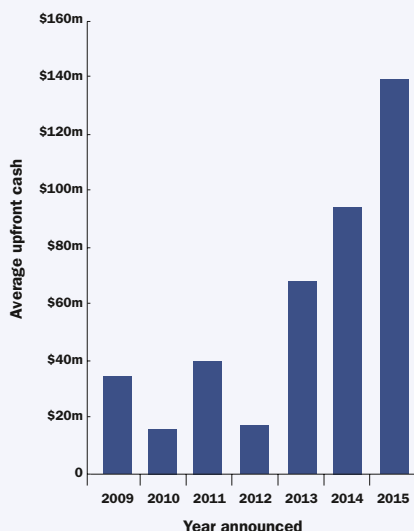


Figure 2: Average up-front cash payments for antibody and ADC partnership deals January 2009 to April 2015.

payment values. At close to \$140million, this year's average has exceeded the reported average, up-front payment values for 2014 (Fig. 2). Skewing the graph are: Celgene paying \$450million to Astra Zeneca's Medimmune, Astra Zeneca paying \$250million to Innate Pharma and Eli Lilly paying \$56million up-front to Innovent.

Celgene is expanding treatment options for hematological malignancies using Medimmune's phase 3, checkpoint inhibitor asset, MEDI4736, in combination with its pipeline. In turn, Astra Zeneca (Medimmune's parent company) licensed the phase 2 asset, IPH2201 (an antibody targeting checkpoint receptor NKG2A), from Innate Pharma to broaden its development in combination with MEDI4736. Eli Lilly is making forays emerging markets throwing in with the Chinese antibody company, Innovent, starting from the early stage development of three antibodies for immuno-oncology targets.

The largest up-front payment reported in 2014 was the \$850million, Merck received from Pfizer, for yet another checkpoint inhibitor asset licensed with the intent of using it in combination with other anticancer agents. Most deals go unreported therefore the robustness indicated by the average up-front payments through April 2015 may also simply indicate a bias toward those companies more likely to report upfront values being busy at the start to the year. Even so, the limited reporting exposes a trend that

stems from the expanded use of immune-checkpoint inhibitors for new indications and treatment combinations.

Acquisition activity in 2014 includes three companies with bi-specific antibody discovery platforms, consolidation of companies and two reverse mergers followed by fundraisings (Table 1). Two biosimilar companies were acquired by large pharmaceutical companies: Pfizer bought Hospira and Russia's leading pharma company, Pharmstandard (along with the investment company Millhouse), acquired a 70% stake in Biocad.

A bit of role reversal took place in 2014 when biosimilar giant Teva acquired a company with a novel asset once owned by Pfizer. LBR-101, is a calcitonin gene-related peptide (CGRP) antibody for the treatment of migraine, Pfizer obtained after acquiring Rinat Biosciences. While in phase 2, the asset's development was stalled due to restructuring at Pfizer and Labrys was created to follow through on its development. Johnson & Johnson also ventured further afield of oncology (the dominant deal indication for antibodies) acquiring the Cambridge University spin out, XO1. XO1. XO1 was created to develop, a recombinant human antibody that induces anticoagulation without creating a predisposition to bleeding.

All data courtesy of BioCentury.

Table 1. Selected mergers and acquisitions from January 2014 to April 2015.

Date	Companies	Indication or platform type	Terms
March 2015	Johnson & Johnson acquired XO1	Cardiovascular	The Janssen Pharmaceuticals unit of Johnson & Johnson acquired single-asset holding, Cambridge University spin-out, XO1, for an undisclosed amount.
February 2014	Pfizer acquired Hospira	Autoimmune (biosimilar)	Pfizer acquired Hospira for about \$17 billion one year following launch of the company's first biosimilar product (infiximab).
December 2014	Roche acquired Dutalys	Bi-specific antibodies	Roche acquired the next generation antibody discovery company, Dutalys for \$133.8million in up-front cash and up to \$355 million in milestones.
August 2014	J&J acquired Covagen	Bi-specific antibodies	Johnson & Johnson's Cilag acquired Covagen for an undisclosed amount. Covagene's platform uses proteins to link antibodies and has focused development efforts on immunomodulation.
August 2014	Enumeral Biomedical conducted a reverse merger from the Cerulean Group	Bi-specific antibodies	Following a reverse-merger for Enumeral raised \$21.5million by selling 21.5million of its shares before it began trading on the OTCQB venture stage marketplace.
July 2014	Teva acquired Labrys Biologics	Chronic migraine	Teva acquired Labrys for \$200million in up-front cash plus up to \$625 million in developmental milestones for its LBR-101, a calcitonin gene-related peptide antibody being developed for migraines.
July 2014	Millhouse and Pharmstandard acquired majority share of Biocad	Antibody drug candidates (biosimilar)	The investment firm and leading Russian pharmaceutical company acquired a combined 70% stake in Russian biosimilar company.
July 2014	MabVax conducted a reverse merger with Telik	Oncology	MabVax reverse-merged with Telik to acquire 85% of the combined company's stock. Trading publicly as MabVax Therapeutics Holdings Inc, the company raised about \$11.6million from a private placement in April 2015.
February 2014	Novartis acquired CoStim	Oncology	Novartis acquired CoStim for an undisclosed amount. CoStim was founded in 2012 based on an assembled portfolio of agents directed at multiple T cell regulatory targets.
February 2014	Agenus acquired 4-Antibody	Oncology	Agenus acquired 4-Antibody for \$10million up front in stock, plus \$40million in contingent payments. The acquisition follows on from Agenus' use of 4-Antibody's Retrocyte display technology platform to discover six checkpoint inhibitor targeted antibodies.