NEWS IN BRIEF

Novartis secures first CRISPR pharma collaborations

Two deals from Novartis show that industry is ready to embrace the gene-editing CRISPR–Cas9 technology into its target-screening, target-validation and therapeutic tool-box.

In a deal with Intellia Therapeutics, Novartis gained exclusive rights to use Intellia's CRISPR gene-editing technology to engineer chimeric antigen receptor T-cells (CAR-Ts) and haematopoietic stem cells (HSCs). Novartis, a leader in the CAR-T field, is already developing its CTL019 CAR-T treatment, which is made up of autologous T-cells that express the CD19-specific CAR, in Phase II trials in chronic lymphocytic leukaemia, acute lymphocytic leukaemia and diffuse large B-cell lymphoma. Novartis has also been expanding into the HSC space, and last year bought into Gamida Cell, who are developing a $CD133^+$ HSC product for use in leukaemia, lymphoma and sickle-cell disease.

Separately, Novartis partnered with Caribou Biosciences, gaining access to Caribou's CRISPR–Cas9 platform "to research new CRISPR-based drug target screening and validation technologies". Caribou, which is developing CRISPR–Cas9 research tools for multiple sectors, including industrial and agricultural biotech, is a co-founder of Intellia.

Novartis has not disclosed financial terms of either deal.

The CRISPR–Cas9 patent landscape remains treacherous, however, with three firms battling for control of the gene-editing technology. One of the seminal papers in this field was published in *Science* in 2012 (*Science* **337**, 816–821; 2012), but the corresponding authors of this paper are now working at odds to one another. Whereas Jennifer Doudna, of the University of California, Berkeley, USA, assigned her intellectual property to Caribou, Emmanuelle Charpentier, of Umeå University, Sweden, assigned her rights to CRISPR Therapeutics. Editas Medicine, meanwhile, is staking its claim on the basis of work by Feng Zhang, of the Broad Institute, Massachusetts, USA. Editas Medicine announced in December that it had also secured exclusive licences to CRISPR–Cas9 and TALEN gene-editing technologies from the Broad Institute, Harvard, Massachusetts General Hospital and Duke University.

Asher Mullard

Zafgen charts unique path to obesity approval

A Phase II trial of Zafgen's beloranib met its primary end point, helping patients with hypothalamic-injury-associated obesity (HIAO) shed up to 6 kg after 8 weeks of treatment. Zafgen says it is now on track to pursue an unconventional route to approval for its anti-obesity drug. Zafgen will first apply for approval for the treatment of Prader–Willi syndrome (PWS), a genetic disorder of chromosome 15 that can lead to excessive eating and obesity. The company initiated a Phase III trial in PWS last year. It will then pursue a supplemental new drug application for HIAO, a rare form of surgically induced obesity that can occur after the resection of tumours from the hypothalamus. Phase II trials in a general population of obese patients are also ongoing, but the firm hopes to get to market faster by focusing on narrower obesity indications first. Beloranib is a methionine aminopeptidase 2 (METAP2) inhibitor. It was originally studied as an anticancer agent owing to its putative anti-angiogenic activity, but is now thought to modulate fat- and cholesterol-metabolism.

The obesity market remains difficult to capture. In 2012, the US Food and Drug Adminstration (FDA) approved Arena and Eisai's lorcaserin as well as Vivus' combination of phentermine and topiramate, the first new obesity drugs to make it to market in years. Yet, sales of these drugs in 2013 were US$25 million and $23 million, respectively. Neither drug was approved in Europe.

The difficult-to-tap market is also crowding up. Last December, the FDA approved Novo Nordisk's liraglutide for obesity. Because the glucagon-like peptide 1 (GLP1) inhibitor was initially developed and approved for type 2 diabetes, its obesity approval was backed by a particularly large set of safety data and patient experience. Novo Nordisk is also expecting a decision from the European Medicines Agency (EMA) on the obesity indication for liraglutide by the end of 2015. In 2014, the FDA and the EMA both also approved Orexigen Therapeutics' combination of bupropion and naltrexone. The FDA had rejected the combination in 2011 owing to concerns over its cardiovascular safety profile, but Orexigen and its partner Takeda addressed these with interim data from an ongoing cardiovascular outcomes trial.

Asher Mullard

EMA recommended approval for 40 new drugs in 2014

The European Medicines Agency (EMA) approved 40 new agents in 2014, up from 34 in 2013. This left the European regulators only one approval behind the US Food and Drug Administration (FDA) last year (see *Nature Rev. Drug Discov.* **14**, 77–81; 2015 for detailed analysis of the FDA's approvals in 2014). Both regulatory bodies set records with orphan-drug approvals, with each giving the green light to 17 agents for rare diseases.

Although there was considerable overlap between the EMA- and FDA-approval lists, the European regulators did act on a few agents before their US equivalents. The EMA is billing Chiesi Farmaceutici's Holoclar, an autologous human corneal epithelial cell product that includes stem cells for the treatment of limbal stem-cell deficiency, as the first stem-cell therapy to be approved in the European Union. The EMA also approved PTC Therapeutics' nonsense-mutation read-though small molecule ataluren for the treatment of muscular dystrophy, following a previous rejection and appeal from the drug company (*Nature Biotech.* **32**, 706; 2014). The EMA also approved Clinuvel's afamelanotide, a synthetic peptide analogue of α-melanocyte-stimulating hormone, a potentially life-changing drug for patients with erythropoietic protoporphyria (*Nature Biotech.* **33**, 7; 2015).

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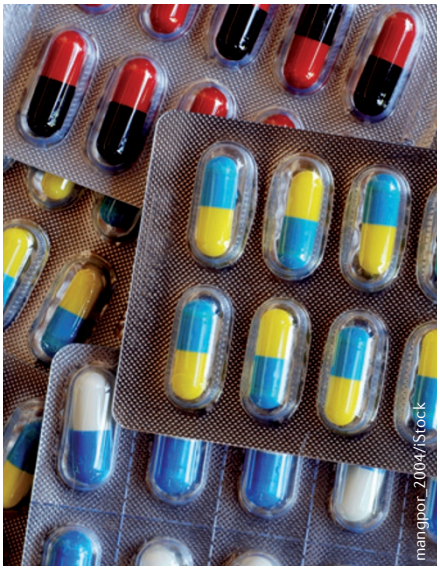

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