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Deal Watch: Biogen, AbCellera Team To Find Novel Way To Cross Blood-Brain Barrier

by Joseph Haas

Plus deals involving BiomX/Adapative Phage, One/NEX-I, Shionogi/FunPep, Taiho/Haihe, Kinnate/Pierre Fabre, StemCell Technologies/SQZ and more, as well as tech transfer agreements.

Scrip regularly covers business development and deal making in the biopharmaceutical industry. Deal Watch is supported by deal intelligence from Biomedtracker.

Biogen's Pact With AbCellera Will Focus On Novel Neuroscience Target

Antibody discovery specialist *AbCellera Biologics Inc.* said on 11 March that it will partner with *Biogen, Inc.*, to discover antibody candidates against a novel target that could enable drug delivery across the blood-brain barrier for neuroscience indications.

Specific financial details were not disclosed but Biogen will make an upfront cash payment to AbCellera and could pay out research, development and commercial milestones as well as sales royalties if a resulting antibody candidate reaches market.

AbCellera said the work could unlock multiple new approaches to getting biotherapeutics across the BBB, which it called one of the most important and longstanding challenges in neuroscience. While the alliance with Biogen is its first collaboration of 2024, the Vancouver biotech inked partnerships around antibody discovery in 2023 with *Prelude Therapeutics Incorporated*, *Incyte Corporation*, *Confo Therapeutics* and *RQ Biotechnology Ltd.* (Also see "*Deal Watch: Moderna, Immactics Team Up To Combine mRNA Technology With Cancer Cell Therapy*" - Scrip, 15 Sep, 2023.)

Biogen's current neuroscience development pipeline includes Phase II candidates for essential

tremor, Parkinson's disease, frontotemporal dementia and two drug candidates for multiple sclerosis. The biotech also is partnered with *Ionis Pharmaceuticals, Inc.* on Phase I/II antisense candidates for Alzheimer's disease and amyotrophic lateral sclerosis. (Also see "*Biogen Re-Ups With Ionis In Search Of A Neuroscience 'Innovation Engine'*" - Scrip, 20 Apr, 2018.)

BiomX To Acquire Adaptive Phage In All-Stock Transaction

BiomX Inc. inked a definitive merger agreement on 6 March with privately held *Adaptive Phage Therapeutics Inc*. to bring in its pipeline of phage-based therapies to combat bacterial infections and related technology. The stock-for-stock transaction is structured so that all outstanding equity interests of Adaptive Phage will be exchanged for 9.2 million shares of BiomX common stock, 40,500 shares of Series X Preferred Stock convertible into 40.5 million shares of BiomX common stock, and warrants exercisable for 2.1 million shares in the Israeli biopharma.

Following closing, expected in the next 30 days, Adaptive Phage will become a wholly owned subsidiary of BiomX.

Concurrent with the merger agreement, BiomX entered into a private placement agreement of newly created, non-voting convertible preferred stock and warrants to purchase shares of BiomX common stock with expected gross proceeds of $50m.

Adaptive Phage was founded in 2010 to convert research conducted at the US Naval Medical Research Center into commercial therapeutics for multi-drug resistant infections. The Maryland biotech since has developed a library of systematically discovered and curated phages, which include candidates for diabetic foot osteomyelitis, prosthetic joint infection and cystic fibrosis-related lung infection. The big pharma-backed AMR Action Fund topped off what was a $41m series B financing for Adaptive Phage in 2021 with an additional $20m in funds. (Also see "*Finance Watch: VC Enthusiasm For Biopharma Continues As 5AM Ventures Raises $750m*" - Scrip, 6 Apr, 2022.)

Ono Gets License NEX-I's Cancer Immunotherapy Candidates

Ono Pharmaceutical Company, Ltd. announced a licensing agreement with South Korea's NEX-I, Inc. on 6 March conferring rights to NXI-101, a first-in-class antibody candidate that targets factor ONCOKINE-1. Ono said the candidate discovered by NEX-I could be effective against multiple cancer types including those resistant to cancer immunotherapy.

The Japanese pharma will get exclusive global rights to develop and commercialize NXI-101 and its backup antibodies. It will pay NEX-I an undisclosed amount of upfront cash with potential for development and commercial milestone payments, along with sales royalties.

NEX-I signed a memorandum of understanding with Xsphera Biosciences last November to assess the efficacy of its candidates, saying at the time that it planned to bring NXI-101 into

Phase I studies in 2024.

Shionogi Collaborates With FunPep On Seasonal Allergy Vaccine

Shionogi & Co. Ltd. and *FunPep Co. Ltd.*, a spinout from Japan's *Osaka University* focused on functional peptides, announced an option agreement on 4 March that will give Shionogi the right to license FPP004X, a vaccine candidate in development for seasonal allergic rhinitis related to pollen allergy. Based on trial results, Shionogi can obtain exclusive, global rights to research, develop and commercialize the anti-IgE antibody-induced peptide.

Shionogi will make a one-time payment of JPY0.3bn (about $2.03m) to FunPep, which can be followed by an undisclosed licensing fee if the option is exercised, and development and sales milestones up to JPY17.8bn (about $120.2m) with sales royalties. The firm will also invest JPY0.2bn (about $1.35m) in FunPep.

Taiho Obtains Japanese Rights To Haihe's NSCLC Drug Gumarontinib

Otsuka Pharmaceutical Co. Ltd. subsidiary *Taiho Pharmaceutical Co. Ltd.* signed a licensing deal on 1 March with Haihe Biopharma for gumarotinib, a small molecule MET inhibitor that was filed for approval in Japan last September for unresectable, advanced or recurrent non-small cell lung cancer with MET exon 14 (METex14) skipping mutations.

Headquartered in Shanghai, Haihe obtained the first approval for the drug in China in March 2023 for the treatment of NSCLC with METex14 mutations. Taiho will obtain the right to develop, manufacture and commercialize gumarotinib in Oceania and Asia, excluding China, in exchange for an undisclosed upfront payment, potential development and commercial milestones, and sales royalties.

Pierre Fabre Obtains Pan-RAF Candidates From Kinnate

Pierre Fabre entered into an asset purchase agreement on 1 March to acquire *Kinnate Biopharma, Inc.*'s investigational pan-RAF inhibitor exarafenib (being studied in solid tumors) and other pan-RAF program assets. (Also see "*Kinnate Zeroes In On BRAF Subpopulation For Exarafenib Development Strategy*" - Scrip, 19 Apr, 2023.)

The sale followed Kinnate's announcement last November that it is exploring strategic alternatives. (Also see "*Finance Watch: Though Flush With Cash, Theseus Seeks Alternatives, Gets Two Quick Offers*" - Scrip, 27 Nov, 2023.) Separately, Kinnate announced on 16 February that it had agreed to be acquired by *XOMA Corporation* via a tender offer that has not yet closed. (Also see "*Deal Watch: AbbVie Adds To Immunology Pipeline Through Deal With OSE*" - Scrip, 28 Feb, 2024.)

Under the asset transfer, Pierre Fabre will assume 100% of the ongoing costs associated with

these assets. In return, Kinnate will receive up to $31m, consisting of $500,000 at closing, and a $30.5m contingent payment, with the French firm also agreeing to assume up to $5m of trade payables for the transferred assets.

The larger cash payment will be contingent on the earliest of three possible clinical development milestones: initiation of the first pivotal trial for exarafenib or any other acquired asset; application for US Food and Drug Administration accelerated approval for exarafenib or any other acquired asset; or the submission of a marketing application for exarafenib or any other acquired asset.

StemCell Acquires SQZ

Following an asset purchase agreement signed this past December, Canada's *StemCell Technologies Inc.* agreed to acquire *SQZ Biotechnologies Company* for $11.8m on 29 February.

With the deal, StemCell has acquired substantially all of SQZ's assets including its entire portfolio of over 400 patents and trademarks, other intellectual property such as copyrights and trade secrets, proprietary equipment, and its license with the *Massachusetts Institute of Technology*. In 2020, StemCell licensed exclusive rights to SQZ's patent portfolio to develop and commercialize the CellPore Transfection System and associated CellPore Transfection Kits in the research use market. Under the new agreement, StemCell said it will be able to exclusively commercialize these products for use in all markets, including clinical applications.

SQZ, whose shareholders have approved the sale, was founded in 2013 to advance a new generation of cell therapies utilizing the company's Cell Squeeze platform technology, a method of introducing various therapeutic cargo into cells by squeezing them (mechanoporation) rather than using electricity (electroporation).

Tech Transfer:

- EVerZom, a Université Paris Cité spinout focused on exosome biotherapies, signed an exclusive license agreement on 5 March with French tech transfer group Erganeo for the development of EVerGel for treatment of fistulas and fibrosis of the digestive tract. EVerGel is composed of naïve exosomes derived from stem cells encapsulated in a gel and has demonstrated promising efficacy in eight animal models, according to EVerZom. The candidate should be ready to move into preclinical studies by the end of 2024 and clinical trials in early 2026, the firm predicted. Under a 2019 agreement, Erganeo previously transferred IP to EVerZom related to the extracellular vesicle bioproduction procedure technology platform for industrial production.

- Cambridge, UK-based *bit.bio* unveiled a multi-year collaboration on 5 March with the *Michael J. Fox Foundation for Parkinson's Research* for the development and delivery of a range of human cell products relevant to Parkinson's disease. Under the agreement, both wild-type

human cells and physiologically relevant disease model cells can be generated through individual project agreements. Funding to bit.bio will be allocated on a project-by-project basis. The first project will prioritize discovery of transcription factor combinations for a relevant human cell type in PD and the development of that cell type into a product for the research community.

- *Biomunex Pharmaceuticals SAS* signed a license agreement on 4 March with *Institut Curie* under which the former will obtain exclusive rights for the identification, discovery, development and exploitation of bi- and multi-specific antibodies capable of specifically targeting and engaging MAIT cells (Mucosal Associated Invariant T-cells), a subpopulation of T-cells that could lead to the killing of cancer cells. Biomunex, already a co-inventor and 50% co-owner of this approach under an existing development relationship, now holds full worldwide rights. The company plans to initiate a Phase I trial of its first MAIT engager in the treatment of solid tumors with high unmet medical need and where MAIT cells are particularly present (such as colorectal, liver, gastric, lung and esophageal cancers). Biomunex said MAIT engagers are capable of redirecting MAIT lymphocytes to eliminate cancer cells and induce the destruction of tumors, particularly solid tumors, while reducing dose-limiting toxicity.

In Brief:

- Toronto's *Fibrocor Therapeutics L.P.* entered a research and development collaboration with the Otsuka-affiliated *McQuade Center for Strategic Research & Development, Inc.*, on 5 March to advance its antibody candidate FIB918 for the treatment of Alport syndrome. FIB918 currently is in the investigational new drug (IND)-enabling phase, with Phase I trials targeted to start in late 2025. The agreement includes a $1m upfront payment and additional funding to cover study costs through Phase Ib.

- Delaware-based Eilean Therapeutics acquired Ness Therapeutics on 4 March in an all-equity transaction. Ness was founded in 2020 to develop best-in-class PTPN2 inhibitors, potential immuno-oncological agents with an improved safety and tolerability profile. The San Diego biotech's lead molecules demonstrate sub-nanomolar PTPN2/PTPN1 inhibitory activity and better than 1000-fold selectivity against all other phosphatases, exhibit high oral bioavailability and good safety, according to Ness. In addition, lead candidates can induce tumor cells' susceptibility to type 2 interferon and suppress their growth with high efficacy, the firm added.

- Greek biopharma *GENESIS Pharma S.A.* acquired rights on 1 March to distribute *Regeneron Pharmaceuticals, Inc.*'s anti-PD-1 agent Libtayo (cemiplimab) in its home country as well as Cyprus and Malta. In the US, the checkpoint inhibitor is approved to treat non-small cell lung cancer and two forms of skin cancer. In the EU, Libtayo is approved for NSCLC, basal cell carcinoma, squamous cell cancer and cervical cancer. No financial terms were disclosed.

- California-headquartered *Arcutis Biotherapeutics, Inc.* and Japan's *Sato Pharmaceutical Co., Ltd.* announced a collaboration and licensing agreement on 28 February for the development, manufacture and commercialization of topical roflumilast in Japan. Sato will obtain exclusive license for cream and foam formulations of topical roflumilast, a next-generation phosphodiesterase type 4 (PDE4) inhibitor, for multiple dermatological conditions including plaque psoriasis, seborrheic dermatitis, atopic dermatitis, and potential additional indications. Under the agreement, Arcutis will get $25m up front and could earn $40m in regulatory and sales milestones, as well as tiered sales royalties.

Stay tuned for the next edition of Deal Watch. You can read more about other deals that have been covered in depth by Scrip and Generics Bulletin in recent days below:

(Also see "*Boehringer Marches On In Mental Health With Sosei Heptares Pact*" - Scrip, 11 Mar, 2024.)	Boehringer Ingelheim's legacy lies in the cardiometabolic space but it has been building a pipeline across a range of neuropsychiatric diseases. The collaboration with Sosei Heptares, which has been sealed with a upfront payment of €25m, will focus on schizophrenia.
(Also see "*Sandoz Swallows Up Remainder Of Rowex To 'Expand Fully' Into Ireland*" - Generics Bulletin, 8 Mar, 2024.)	Sandoz has a goal of increasing generic penetration in Ireland, which lags behind its European neighbors. As part of that objective, the firm has opted to take full control of its Rowex joint venture, based in County Cork.
(Also see "*Richter Takes Control Of German JVs To Wrap Up Teriparatide Biosimilar*" - Generics Bulletin, 8 Mar, 2024.)	Gedeon Richter is putting its hand back in its wallet following its recent investment in Formycon, opting to take control of a pair of joint ventures established with German firm Helm.
(Also see "*Merck KGaA Wants Your Drugs*" - Scrip, 7 Mar, 2024.)	Still reeling from the loss of evobrutinib, Merck KGaA needs to buy innovation.
(Also see "*Gilead's Trispecific Alliance With Merus Continues Its Push In Novel Cancer Tech*" - Scrip, 6 Mar, 2024.)	Gilead adds to its pipeline of multispecific antibodies for cancer, while Merus gets a first partner for its trispecific platform.
(Also see "*Akari, Peak Bio Hatch Merger Plan To Survive Together*" - Scrip, 5 Mar, 2024.)	Akari, which has stayed afloat through small financings in recent years, and Peak Bio, after going public via the SPAC route in 2022, will merge as equals and then prioritize their pipeline.

(Also see "*Merck KGaA Is Latest Partner For C4 Therapeutics' Protein Degradation*" - Scrip, 5 Mar, 2024.)	New deal shows growing big pharma interest in protein degradation, with C4 expecting multiple in-house updates this year.
(Also see "*Sandoz Completes Coherus Biosimilar Acquisition*" - Generics Bulletin, 4 Mar, 2024.)	Sandoz has closed its deal to acquire the Cimerli US ranibizumab biosimilar business from Coherus "ahead of anticipated timelines."
(Also see "*Bayer Bets Big On External Innovation With BridgeBio Acoramidis Pact*" - Scrip, 4 Mar, 2024.)	Bayer's internal R&D fortunes in the cardiovascular space have been mixed, with asundexian faltering in a recent atrial fibrillation trial, so getting hold of the European rights to BridgeBio's recently-filed ATTR-CM therapy is a timely boost.
(Also see "*China In-Licensing Crossroads: Zai Lab, Everest March Towards Market But BioNova Returns Rights*" - Scrip, 1 Mar, 2024.)	China's Zai Lab and Everest are still pursuing profitability on the commercialization of in-licensed assets, while BioNova and others have already bowed out of the game.
(Also see "*Apotex Gains Canadian Rights To Five Eye Assets From Harrow*" - Generics Bulletin, 28 Feb, 2024.)	Harrow has handed the licensing rights to Apotex for five of its ophthalmic assets in Canada that are in different phases of commercialization and development.