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Deal Watch: Moderna, ElevateBio Subsidiary To Combine mRNA With Gene Editing

by Joseph Haas

Moderna and Life Edit will team up to develop transformative or curative therapies for challenging genetic diseases. Erytech and Pherecydes unveil plan to merge and extend runway into 2024.

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

Busy Moderna Inks Gene-Editing Pact With Life Edit

Moderna, Inc. continues to funnel the revenue and exposure gained from its COVID-19 vaccine SpikeVax into business development; a collaboration with *Life Edit Therapeutics, Inc.* announced on 22 February is its eighth outside the pandemic-response field since the start of 2021. In its new tie-up, Moderna will pair its mRNA platform capabilities with Life Edit's gene-editing technology in an effort to develop transformative or curative therapies for what the companies call "the most challenging genetic diseases."

One of the companies derived from *ElevateBio, LLC*'s "hub-and-spoke" model, Life Edit focuses on next-generation gene-editing technology, including base-editing capabilities. (Also see "*ElevateBio Raises $525m To Expand Cell And Gene Therapy Expertise*" - Scrip, 15 Mar, 2021.) The Durham, NC-based firm and Moderna plan to discover and develop *in vivo* mRNA gene-editing therapies against a select but undisclosed set of targets.

With its library of base editors and RNA-

Moderna Teases M&A Interest As Pandemic Expected To Wind Down

By Alaric DeArment

04 May 2022 Spikevax revenues beat expectations but analysts are bracing for the eventuality of lower vaccine revenues as COVID-19 becomes endemic. Moderna will have four new vaccines in Phase III this quarter. *Read the full article here*

guided nucleases – including short sequences called Protospacer Adjacent Motifs (PAMs) that determine which DNA segments a nuclease can bind to – Life Edit claimed its technology can offer better genomic access for targeting disease than can be accomplished with a single-nuclease approach.

Under the agreement, the companies will collaborate on research and preclinical studies that will be funded by Moderna. In return, the Cambridge, MA-based firm will hold options to develop, manufacture and commercialize candidates resulting from the research. Life Edit will receive an undisclosed upfront payment with the potential for development, regulatory and commercial milestones as well as net sales royalties on products reaching market.

Erytech To Merge With Pherecydes, Focus On Phage Anti-Infectives

French biotechs *ERYTECH Pharma S.A.* and *Pherecydes Pharma SA* announced their intention to merge on 15 February, bringing their programs and focus on addressing antimicrobial resistance under a single roof. Troubled and focused on out-licensing since it suspended development of Graspa (L-asparaginase entrapped into human homologous red blood cells) in pancreatic cancer last August, Erytech said the combination with Pherecydes would give the resulting company financial runway into Q3 2024, with about €41m (about $43.6m) on hand as of the end of 2022.

The combined company would focus mainly on AMR efforts underway at Pherecydes, including the Phase II PhagoDAIR study of a phage therapy in *S. aureus* infections in hip or knee prosthetics, the companies said. The company would also initiate Phase II studies in *S. aureus*-related endocarditis in mid-2023 and in complex urinary tract infections due to *E. coli* in Q1 2024.

The merger would combine both companies' workforces in a single location in Lyon and result in each company owning about 49% of the new entity. Under a memorandum of understanding, the transaction would result in Pherecydes shareholders receiving 15 shares in Erytech for every four Pherecydes shares they hold.

Merck Pairs Up With Sweden's Aqilion In Autoimmune/Inflammatory Disease

Sweden's *Aqilion AB* entered a license and research collaboration agreement on 16 February with *Merck & Co., Inc.* to discover, develop and commercialize small molecule inhibitors of the transforming growth factor-β-activated kinase 1 (TAK1) protein. The companies said the tie-up will build on Aqilion's experience and know-how in the discovery of selective TAK1 inhibitors together with Merck's expertise in drug discovery and development.

According to Biomedtracker, Aqilion has one pipeline candidate, AQ280, an anti-inflammatory agent that targets JAK1, in ex-US development. The deal centers on proprietary inhibitors resulting from Aqilion's in-house drug discovery efforts. The partners will aim to develop differentiated TAK1 therapeutics for a range of autoimmune and inflammatory indications,

including neurological diseases. Aqilion will design and synthesize candidates, while Merck will lead preclinical development.

Under the agreement, Merck will make an upfront payment of €10m ($10.7m) to Aqilion, which also could earn development and commercial milestones up to over €950m (about $1.02bn) and tiered sales royalties.

LegoChem, Elthera To Develop, Commercialize ADC In License Deal

LegoChem Biosciences, Inc. announced a license agreement on 13 February with Switzerland's *Elthera AG*, a to develop and commercialize a novel antibody-drug conjugate (ADC) that uses a monoclonal antibody developed by the latter company.

Elthera said its antibody addresses a target expressed in a variety of solid tumors including pancreatic, ovarian, breast, lung and colorectal cancers. Under the agreement, South Korea's LegoChem will be responsible for the future development and commercialization of any products incorporating this antibody.

Elthera will receive an upfront payment and can realize development and regulatory milestone payments as well as cumulative commercial milestone payments, plus royalties on net product sales. Details of financial terms were not disclosed.

Jiangsu Hengrui Collaborates With Treeline Biosciences On EZH2 Inhibitor

Shanghai-listed *Jiangsu Hengrui Medicine Co., Ltd.* has sold the exclusive rights outside of Greater China for SHR2554, an enhancer of zeste homolog 2 (EZH2) inhibitor, to US biotech *Treeline Bioscience Inc.* for up to $706m, the Chinese drug maker disclosed on 13 February.

Stamford, CT-based Treeline obtains rights to develop, manufacture and commercialize SHR2554 in exchange for $11m up front to Hengrui, plus development milestones of up to $45m and sales milestones of up to $650m. In addition, Hengrui could earn 10%-12.5% royalties on annual net sales of SHR2554.

The drug candidate, from the same class as *Epizyme, Inc.*/*Ipsen SA*'s Tazverik (tazemetostat), is being evaluated in Phase I studies in Chinese patients with hematological malignancies including relapsed/refractory peripheral T-cell lymphoma and follicular lymphoma. (Also see "*Epizyme's Tazverik Gets To Market In Rare Sarcoma, Paving Way To Bigger Indications*" - Scrip, 24 Jan, 2020.)

CSPC Out-Licenses Nectin-4 ADC To Corbus Pharmaceuticals

A subsidiary of Hong Kong-listed *CSPC Pharmaceutical Group Limited* has inked a licensing deal with *Corbus Pharmaceuticals Holdings, Inc.* for ex-China rights to SYS6002, a Nectin-4-targeted

antibody-drug conjugate. Under the deal announced on 13 February, Nasdaq-listed Corbus gets rights to develop and commercialize SYS6002 in the US, EU, UK, Canada, Australia, Iceland, Liechtenstein, Norway and Switzerland.

CSPC gets $7.5m up front and can earn up to $130m in potential development and regulatory milestones and up to $555m in potential sales milestones, in addition to tiered royalties based on annual net sales of SYS6002. The ADC candidate is cleared for a Phase I trial in patients with advanced solid tumors in China.

In Brief:

- Carlsbad, CA-based *Lineage Cell Therapeutics, Inc.* unveiled an exclusive option and license agreement on 22 February with *Eterna Therapeutics Inc.* for the development of novel beta 2 microglobulin (B2M)-deficient induced pluripotent stem cell (iPSC) lines, which Lineage will evaluate for development into differentiated cell transplant therapies for central nervous system indications. Eterna plans to use its mRNA cell engineering platform to generate novel gene-edited iPSC lines for neurological applications, and provide materials to Lineage for evaluation. Financial terms were not disclosed.

- *LISCure Biosciences Co., Ltd.* entered a multi-year R&D collaboration on 20 February with *Celltrion, Inc.* to develop a novel microbiome therapy for Parkinson's disease. Under the agreement between the South Korea-based firms, LISCure will receive research funding and is eligible to receive additional payments as the project progresses. Celltrion will be responsible for further clinical and regulatory development.

- In a deal between Chinese biotechs, *Clover Therapeutics* agreed on 20 February with *Adimmune Corporation* to commercialize AdimFlu-S (QIS) in mainland China, where is already approved. The deal also covers commercialization of the vaccine in Bangladesh, Brazil and the Philippines, contingent on regulatory approvals, and includes an alliance to develop additional vaccine candidates, including next-generation influenza vaccines.

- Building upon a January 2022 agreement in which *Nippon Shinyaku Co., Ltd.* acquired US development and distribution rights to *Capricorn Pharma Inc*'s immunomodulatory and regenerative candidate for Duchenne muscular dystrophy, CAP-1002, Kyoto-based Nippon Shinyaku has added rights in its home market of Japan. (Also see "*Asia Deal Watch: Nippon Shinyaku Acquires US Rights To Capricor's DMD Drug*" - Scrip, 27 Jan, 2022.) Under the deal expansion announced on 16 February, California-based Capricor gets $12m up front and can earn up to $89m in milestones and a double-digit share of product revenue for the Phase III stem cell-based candidate.

- *Coya Therapeutics, Inc.* revealed on 15 February that it has exercised its option under an August 2022 agreement with ARScience Biotherapeutics to license intellectual property for

two patent formulations of recombination IL-2 for use in its drug candidate COYA 301. Coya has now obtained global rights to develop and commercialize COYA 301 as monotherapy and as a component of combination drug COYA 302 in multiple autoimmune diseases as an anti-inflammatory agent.

- Taiwan-headquartered *Formosa Pharmaceuticals Inc.* announced a collaboration agreement on 15 February with *Eyenovia, Inc.* for the development of novel ophthalmic therapeutics. The partnership seeks to combine Formosa's APNT nanoparticle formulation platform with Eyenovia's Optejet delivery system. Eyenovia said Optejet utilizes Microdose Array Print (MAP) technology to deliver 6mL-8mL of drug product, consistent with the capacity of the eye's tear film. Formosa said its proprietary APNT formulation platform improves dissolution and bioavailability of active pharmaceutical ingredients via a mild and efficient particle size-reduction technique optimized for topical, oral or inhaled administration routes.

- *ReviR Therapeutics* and China's Asieris Pharmaceuticals entered into a research collaboration and option-to-license agreement on 8 February aimed at discovering and developing innovative treatments for genitourinary (GU) tumors and other related serious diseases. The tie-up will leverage ReviR's proprietary RNA-targeted technologies and focus on multiple oncology targets. Under the agreement, Asieris will deploy ReviR's RNA-modulation technologies, named BindeR and SpliceR, to identify and develop new therapeutics that target RNA to treat cancer.

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 "*Cue Biopharma Brings Autoimmune Back To The Fore With Ono Deal*" - Scrip, 22 Feb, 2023.)	Cue's pipeline is heavy on oncology, but it partnered with Merck on autoimmune in 2017 and while that work has shifted to cancer, the Ono partnership puts the focus back on autoimmune disease.
(Also see "*Biogen's Return Of Rights To InnoCare Deals Blow To Made In China Innovation*" - Scrip, 22 Feb, 2023.)	Biogen's return of rights to the BTK inhibitor orelabrutinib to originator InnoCare signals an ongoing tough reality for Chinese biotechs with go-global ambitions.
(Also see "*Xbrane Eyes Positive Cash Flow In 2024 – But Out-Licensing Oncology Key*" - Generics Bulletin, 22 Feb, 2023.)	Xbrane has spelled out ambitious cash goals beginning next year, which hinge largely on it finding a partner for its pre-clinical oncology candidates, as it continues to shoulder heavy development and regulatory costs for its suite of biosimilars.

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(Also see "*Nestlé Ponders Least Painful Exit From Peanut Allergy Misfire*" - Scrip, 17 Feb, 2023.)	Heralded as a potential blockbuster, Nestlé's acquisition of Palforzia has proved to be a very expensive mistake.
(Also see "*Similis Bio Strikes Again, Penning Deal With Chicago's Novel351k*" - Generics Bulletin, 17 Feb, 2023.)	Less than a year after its inception, Simis Bio has found another partner for biosimilar development and planned commercialization.
(Also see "*Arrowhead Eager To Take On 'Straightforward' NASH Approach Abandoned By J&J*" - Scrip, 15 Feb, 2023.)	J&J pipeline review results in return of PNPLA3-targeted NASH candidate optioned under 2018 alliance to Arrowhead, but the fate of a hepatitis B candidate included in that deal is undetermined so far.
(Also see "*Bavarian Nordic Thinks Big With Emergent Travel Vaccines Buy*" - Scrip, 15 Feb, 2023.)	With the money coming in from monkeypox product Jynneos, Bavarian Nordic has decided to pursue its goal of becoming one of the largest pure-play vaccine companies by acquiring jabs for cholera and typhoid from Emergent.
(Also see "*GSK Ends Pact with Vir For New COVID Treatments*" - Scrip, 14 Feb, 2023.)	Its Xevudy partner GSK is pulling out but Vir is going to carry on looking for new COVID-19 solutions independently, or with other partners.
(Also see "*Business Development Remains Top Priority For Ipsen*" - Scrip, 10 Feb, 2023.)	CEO David Loew tells *Scrip* that Ipsen's prodigious dealmaking over the past couple of years is set to continue, on top of the acquisition of Albireo announced last month.
(Also see "*Rest In Peace SPACs And Pseudo-Platforms: What Lies Ahead For Biotechs Going Public In 2023*" - Scrip, 7 Feb, 2023.)	Panelists at the BIO CEO and Investor Conference foresee some changes coming as biotech investors become more judicious about where they park their money.
(Also see "*Deals, Divestitures In Store As Dr Reddy's Stays Course To Top 5 India League*" - Scrip, 7 Feb, 2023.)	Investments in differentiated and specialty products and collaborations, alongside divestitures, are part of Dr Reddy's plans as it seeks to move up the rankings in India. Momentum in China, including an alliance with Sunflower Pharma for orphan diseases, is also being keenly watched.
(Also see "*Hyloris Partner Signs To Market Maxigesic IV In Central And Eastern Europe*" - Generics Bulletin, 7 Feb, 2023.)	Hyloris' partner AFT has signed an exclusive licensing and distribution agreement with Salus Pharmaceuticals covering nine central and eastern European countries. Meanwhile,

	Hyloris has also struck an in-licensing deal for a new blood phosphorus deficiency treatment.