Antibody News You Should Know

April 1 - 15, 2023

Business news

On April 3, 2023, **BioNTech SE and Duality Biologics announced** that the companies entered into exclusive license and collaboration agreements for two antibody-drug conjugate (ADC) assets to develop, manufacture and commercialize the two assets globally, excluding Mainland China, Hong Kong Special Administrative Region and Macau Special Administrative Region. As part of the collaboration, BioNTech will gain access to DualityBio's

lead candidate, DB-1303, which is currently in a Phase 2 clinical trial, and DB-1311, which is in preclinical studies.

- DB-1303 is a topoisomerase-1 inhibitor-based ADC directed against HER2.
- DB-1311 is a topoisomerase-1 inhibitor-based ADC directed against an undisclosed antigen.

On April 3, 2023, **Innate Pharma SA announced** that it entered into an exclusive license agreement with Takeda under which Innate grants Takeda exclusive worldwide rights to research and develop ADCs using a panel of selected Innate antibodies against an undisclosed target, with a primary focus in celiac disease. Under the terms of the license agreement, Innate will receive a $5m upfront payment and is eligible to receive up to $410m in future development, regulatory and commercial milestones if all milestones are achieved during the term of the agreement, plus royalties on potential net sales of any commercial product resulting from the license.

On April 4, 2023, **NaturalAntibody S.A. announced** a strategic collaboration with Boehringer Ingelheim to develop and apply digital methods for the development of therapeutic monoclonal antibodies with the aim of accelerating the discovery of new biotherapeutics in areas of high unmet patient need. The new collaboration combines NaturalAntibody's innovative digital solutions with Boehringer Ingelheim's experience in data generation and laboratory validation to develop and benchmark novel methods for computational antibody discovery, characterization, and development, potentially benefitting Boehringer Ingelheim's therapeutic antibody development.

On April 13, 2023, **Alentis Therapeutics announced** $105 million in Series C financing. The funding round was led by Jeito Capital together with Novo Holdings A/S and RA Capital Management with participation from existing investors including BB Pureos Bioventures, Bpifrance through its InnoBio 2 fund and Schroders Capital. The financing will support Phase II and Phase I programs of Alentis' lead investigational products ALE.F02 and ALE.C04, respectively, as well as the CLDN1 platform development. The platform is used to engineer CLDN1 ADCs and bispecific antibodies.

Preclinical data for CUSP06 presented

On April 11, 2023, **OnCusp Therapeutics announced** that **preclinical data on its lead program CUSP06** will be presented on April 19, 2023, at the American Association for Cancer Research Annual Meeting 2023, taking place in Orlando, Florida. The company plans to initiate a Phase 1 first-in-human clinical trial in the second half of 2023.

- CUSP06 is a preclinical-stage CDH6 ADC composed of a proprietary antibody with high CDH6 binding affinity, a protease cleavable linker, and an exatecan payload. The linker is specially designed to complement the exatecan payload, generating a highly stable and homogenous ADC. The payload is a weak substrate for BCRP/Pgp.

Phase 1 studies to start

On April 4, 2023, details were posted on clinicaltrials.gov for a Phase 1/2 study (**NCT05797168**) of ascending doses of AZD5335 monotherapy and in combination with anti-cancer agents in participants with solid tumors. Sponsored by AstraZeneca, the FONTANA study is designed to determine if experimental treatment with AZD5335, alone, or in combination with anti-cancer agents is safe, tolerable, and has anti-cancer activity in patients with advanced tumors. The study's estimated enrollment is 150 participants and estimated start date is May 10, 2023.

- AZD5335 is an anti-folate receptor alpha ADC.

On April 11, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT05808634**) of BA3182 in patients with advanced adenocarcinoma. Sponsored by BioAtla, Inc., the study's estimated enrollment is 168 participants and estimated start date is in April 2023.

- BA3182 is a conditionally active biologic (CAB)-bispecific T-cell engager antibody construct targeting EpCAM and CD3.

Phase 1 studies started

On April 3, 2023, **Kodiak Sciences announced** that the first patient has been treated in the Phase 1 study of KSI-501, which is the second product candidate built on Kodiak's Antibody Biopolymer Conjugate Platform to enter the clinic. The Phase 1 study of KSI-501 is being conducted in the USA as an open-label, multiple ascending dose study and initially is enrolling patients with diabetic macular edema. The primary objectives of the Phase 1 study are to evaluate ocular and systemic safety and to establish a maximum tolerated dose.

- KSI-501, an investigational bispecific antibody biopolymer conjugate targeting both VEGF and IL-6.

On April 4, 2023, **Mythic Therapeutics announced** that the first subject has been dosed in the Phase 1 KisMET-01 clinical trial (**NCT05652868**) of MYTX-011. The study will evaluate the safety, tolerability, pharmacokinetics, and preliminary effectiveness of MYTX-011 in patients with locally advanced, recurrent or metastatic non-small cell lung cancer.

- MYTX-011 is a cMET-targeting ADC.

Registrational study of ABC008 started

On April 3, 2023, **Abcuro, Inc. announced** initiation of a registrational, randomized, double-blind, placebo-controlled, Phase 2/3 study (**NCT05721573**) of ABC008 in inclusion body myositis (IBM). The study will enroll an estimated 231 participants. The US Food and Drug Administration (FDA) has granted Orphan Drug Designation to ABC008 for the treatment of IBM.

- ABC008 is a first-in-class anti-killer cell lectin-like receptor G1 antibody capable of selectively depleting highly cytotoxic T cells, while sparing regulatory and central memory T cells.

FDA actions in the news

On April 4, 2023, **FDA issued an emergency use authorization** for the use of Gohibic (vilobelimab) injection for the treatment of COVID-19 in hospitalized adults when initiated within 48 hours of receiving invasive mechanical ventilation or extracorporeal membrane oxygenation (artificial life support). The recommended dosage of Gohibic is 800 mg administered by intravenous infusion after dilution, given up to six times over the treatment period.

- GOHIBIC is a recombinant chimeric monoclonal IgG4 antibody that specifically binds to the soluble human complement split product C5a after cleavage from C5 to block its interaction with the C5a receptor.

On April 13, 2023, **Eli Lilly and Company announced** the U.S. FDA has issued a complete response letter for the mirikizumab biologic license application for the treatment of ulcerative colitis (UC). In the letter, the FDA cited issues related to the proposed manufacturing of mirikizumab, with no concerns about the clinical data package, safety, or label for the medicine.

Lilly recently received approval for mirikizumab as a first-in-class treatment for adults with moderately to severely active UC in Japan. In addition, the European Medicines Agency's Committee for Medicinal Products for Human Use has issued a positive opinion for mirikizumab as a first-in-class treatment for adults with moderately to severely active UC who have had an inadequate response with, lost response to, or were intolerant to either conventional therapy or a biologic treatment. Regulatory decisions are anticipated in additional markets around the world in 2023.

- Mirikizumab (Omvoh) is a hinge-stabilized, humanized anti-IL23p19 IgG4 antibody with Fc mutations that reduce effector functions.

Antibody News You Should Know

April 15 - May 1, 2023

Business news

On April 16, 2023, **Merck and Prometheus Biosciences, Inc. announced** that the companies have entered into a definitive agreement under which Merck, through a subsidiary, has agreed to acquire Prometheus for $200.00 per share in cash for a total equity value of approximately $10.8 billion. Under the terms of the acquisition agreement, Merck, through a subsidiary, will acquire all of the outstanding shares of Prometheus. The acquisition is subject to Prometheus Biosciences shareholder approval. The closing of the proposed transaction will be subject to certain conditions, including the expiration of the waiting period under the Hart-Scott-Rodino Antitrust Improvements Act and other customary conditions. The transaction is expected to close in the third quarter of 2023. Prometheus Biosciences' lead candidate, PRA023, is a humanized monoclonal antibody directed to tumor necrosis factor-like ligand 1A, a target associated with both intestinal inflammation and fibrosis.

On April 17, 2023, **Genmab A/S and argenx announced** that the companies have entered into a collaboration agreement to jointly discover, develop and commercialize novel therapeutic antibodies with applications in immunology, as well as in oncology therapeutic areas. The multiyear collaboration will leverage the antibody engineering expertise and knowledge of disease biology of both companies to accelerate the identification and development of novel antibody therapeutic candidates with a goal to address unmet patient needs in immunology and cancer.

On April 20, 2023, **Tubulis GmbH and Bristol Myers Squibb announced** that they have entered into a strategic license agreement to develop differentiated antibody-drug conjugates (ADCs). Through the license agreement, Bristol Myers Squibb will gain exclusive rights to access Tubulis' Tubutecan payloads in combination with Tubulis' proprietary P5 conjugation platform for the development of a selected number of highly differentiated ADCs to treat solid tumors. P5 and Tubutecans facilitate the generation of ultra-stable ADCs that have the potential to actively reduce unwanted target-independent toxicities and are optimized for on-target delivery of potent topoisomerase-1 inhibitors.

On April 20, 2023, **Abdera Therapeutics announced** it raised $142 million in combined Series A and B financing. Versant Ventures and Amplitude Ventures led the Series A round, with participation from Northview Ventures as well as founding partners of Abdera, adMare BioInnovations and AbCellera. The Series B round was led by venBio Partners with participation from existing investors as well as new investors including Viking Global Investors, Qiming Venture Partners USA and RTW Investments.
Abdera's Radio Optimized Vector Engineering (ROVEr™) platform allows the company to design novel antibody-based radiopharmaceuticals with high affinity antigen binding domains to cancer targets and an engineered Fc domain that fine tunes the antibodies' PK to best suit the delivery of therapeutic isotopes.

Abdera's lead program targets delta-like ligand 3 (DLL3), a protein in the Notch pathway that is upregulated and specifically expressed in small cell lung cancer and other solid tumors, with very rare expression on nonmalignant cells. The company's DLL3 program is advancing through preclinical development, and Abdera expects to submit an investigational new drug application to the U.S. Food and Drug Administration (FDA) in 2024.

On April 20, 2023, **Twist Bioscience Corporation announced** a collaboration with Astellas Pharma US Pharma Inc. by which Astellas will license a suite of Twist's VHH antibody libraries to be used by Astellas for drug discovery and development. Under the terms of the agreement, Astellas will license a suite of Twist's VHH libraries for a period of five years and will use the libraries to conduct research and development activities. Twist will receive an upfront payment and will be eligible to receive annual maintenance fees and fees per product through payments associated with specific clinical and commercial milestones. Twist will also be eligible to receive royalty payments on product sales.

FDA designations granted

On April 17, 2023, **Agenus Inc. announced** the company was granted Fast Track Designation from the FDA for the investigation of the combination of botensilimab (AGEN1181) and balstilimab (AGEN2034). The designation is for patients with non-microsatellite instability-high (MSI-H)/deficient mismatch repair metastatic colorectal cancer with no active liver involvement.

- Botensilimab is a human IgG1, Fc-engineered anti-CTLA-4 monoclonal antibody.
- Balstilimab is a human IgG4 anti-PD-1 antagonist antibody.

On April 24, 2023, **Avidity Biosciences, Inc. announced** that the FDA granted Fast Track designation to AOC 1044 for the treatment of Duchenne muscular dystrophy (DMD) in people with mutations amenable to exon 44 skipping. AOC 1044 is being assessed in the Phase 1/2 EXPLORE44™ clinical trial for people living with DMD44 and is the first of multiple AOCs the company is developing for DMD. Avidity plans to share results from the healthy volunteer portion of the EXPLORE44 trial in the second half of 2023.

- AOC 1044 consists of a proprietary monoclonal antibody that binds to the transferrin receptor 1 conjugated with a phosphorodiamidate morpholino oligomers targeting exon 44.

First Phase 1 studies planned or started

On April 18, 2023, details were posted on clinicaltrials.gov for a first-in-human study (**NCT05817058**) of AFM28. This Phase 1, open label, non-randomized, multi-center, multiple ascending dose escalation study is evaluating AFM28 as a monotherapy in subjects with relapsed/refractory CD123-positive acute myeloid leukemia. Sponsored by

Affimed, the study is recruiting an estimated 50 participants and has an estimated primary completion date in March 2025.

- AFM28 is a bispecific tetravalent monoclonal antibody targeting the interleukin-3 receptor subunit alpha (IL3RA, CD123) on leukemic cells and leukemic stem cells and the low affinity immunoglobulin gamma Fc region receptor III-A (FCGR3A, CD16A) on NK cells and macrophages.

On April 20, 2023, details were posted on clinicaltrials.gov for a first-in-human Phase 1/2 study (**NCT05821777**) of LB101 in patients with advanced solid tumors. Sponsored by Centessa Pharmaceuticals (UK) Limited, the study is recruiting an estimated 180 participants and has an estimated primary completion date in January 2027.

- LB101 is a tetravalent, bispecific antibody targeting PD-L1 and CD4 via constitutive Fabs (anti-PD-L1) that drive tumor enrichment and contingent Fabs (anti-CD47) that are unlocked in the tumor microenvironment by natural processes.

On April 21, 2023, details were posted on clinicaltrials.gov for a Phase 1 open-label, multicenter study (**NCT05824663**) to evaluate the safety, tolerability, pharmacokinetics, and anti-tumor activity of HBM1020 in subjects with advanced solid tumors. Sponsored by HARBOUR BIOMED, the study has an estimated enrollment of 50 participants and an estimated start date in May 2023.

- HBM1020, a first-in-class fully human monoclonal antibody targeting B7H7. HBM1020 was generated from the Harbour Mice® H2L2 transgenic mice platform.

Phase 2 study of livmoniplimab to start

On April 21, 2023, details were posted on clinicaltrials.gov for a Phase 2 randomized study (**NCT05822752**) to evaluate the optimized dose, safety, and efficacy of livmoniplimab in combination with anti-PD-1 antibody budigalimab for locally advanced or metastatic hepatocellular carcinoma (HCC) patients who have progressed after an immune checkpoint inhibitor containing regimen in first-line HCC. Sponsored by AbbVie, the study has an estimated enrollment of 120 participants and an estimated start date in July 2023.

- Livmoniplimab (ABBV-151, ARGX-115) binds to the GARP-TGFβ1 complex and blocks TGFβ1 release. Glycoprotein-A repetitions predominant (GARP) regulates membrane-bound transforming growth factor β1 (TGFβ1), an immunosuppressive cytokine.

Phase 3 study of lemzoparimab started

On April 24, 2023, **I-Mab Biopharma announced** that the first patient was treated with lemzoparlimab in a registrational trial (**NCT05709093**) in China. The Phase 3 trial is a randomized, controlled, open-label, multi-center study to evaluate the efficacy and safety

of lemzoparlimab in combination with azacitidine versus azacitidine monotherapy as first-line therapy in subjects with higher-risk MDS. This is the first approved Phase 3 trial for anti-CD47 therapies in mainland China.

- Lemzoparlimab is a human IgG4 antibody that targets CD47. Although many anti-CD47 antibodies are in clinical development, only two, lemzoparlimab and magrolimab, have advanced into Phase 3 clinical studies.

ANTIBODY SOCIETY

Antibody News You Should Know

May 1 - 15, 2023

The Jackson Laboratory will host an exclusive series of symposia on the use of humanized mice in drug development. These symposia will take place in four vibrant European cities from **June 12 to June 19, 2023**. Pioneers in humanized mouse models will showcase the latest advancements in this field and explore their applications in antibody development and preclinical drug testing. These symposia offer a unique opportunity to engage with leading experts in the field, share knowledge, and network with like-minded professionals.The symposia will feature insightful presentations by experts from drug developers such as Novartis and Roche and leading academic institutions such as the University of Southampton and the University of Massachusetts, followed by discussions on key topics in humanized mouse models.

Participation in these symposia is free, but registration is mandatory due to limited availability.

Business news

On May 2, 2023, **Alloy Therapeutics, Inc.**, a biotechnology ecosystem company, announced it is collaborating with Lundbeck, a global pharmaceutical company specializing in brain diseases, in the discovery of novel biologics therapies. Through this agreement, Lundbeck will gain access to Alloy's Antibody Discovery Services and its SeqImmune™ discovery module, which is a sequence-first workflow for early-on repertoire capture and generation of maximum initial diversity. Lundbeck has licensed Alloy's ATX-Gx™ humanized transgenic mouse platform since 2020, and this partnership reflects a deepening of the relationship between the companies, with Lundbeck looking to Alloy for complementing capabilities to its biologics discovery efforts.

On May 5, 2023, **Araris Biotech AG announced** that Innosuisse, the Swiss innovation agency committed to promote science-based innovation in the interest of the economy and society in Switzerland, has supported Araris with CHF 2.5M non-dilutive grant funding through the Swiss Accelerator program for the development and advancement of its ADC candidates. Innosuisse received 752 project applications. Of those, 53 projects were selected for approval after a three-stage assessment process. The Swiss Accelerator program's total funding grant amounted to CHF 112M (~$125 million) with support per project amounting to a maximum of CHF 2.5M (~$2.8 million).

FDA Fast Track designation granted to AntiBKV

On May 2, 2023, **Memo Therapeutics AG** announced that the U.S. Food and Drug Administration (FDA) granted Fast Track designation to AntiBKV, the company's lead antibody therapeutic that targets a viral infection commonly seen in renal transplant patients. AntiBKV has successfully completed a Phase 1 clinical study and has started actively recruiting patients for a pivotal Phase 2/3 clinical trial.

- AntiBKV is a human, highly neutralizing antibody targeting BK virus. The antibody was derived from clinically selected convalescent BKV patients.

First Phase 1 studies planned or started

On May 1, 2023, details were posted on clinicaltrials.gov for an open-label Phase 1 study (**NCT05836324**) of INCA33890 in participants with select advanced or metastatic solid tumors. Sponsored by Incyte Corporation, the study has an estimated enrollment of 100 participants and an estimated start date in June 2023.

- INCA33890 is a dual PD-1 and TGFβR2 binding bispecific Biclonics® antibody, developed to antagonize the TGFβ signaling pathway specifically in cells co-expressing PD-1 and TGFBR2.

On May 3, 2023, details were posted on clinical trials.gov for a first-in-human Phase 1/2 study (**NCT05839626**) evaluating SAR445514 as monotherapy in participants with relapsed/refractory multiple myeloma and relapsed/refractory light chain amyloidosis. Sponsored by Sanofi, the study has an estimated enrollment of 101 participants and an estimated start date of April 24, 2023, (status not yet recruiting when first posted on May 3).

- IPH6401/SAR'514 is a BCMA-targeting NK cell engager using Sanofi's proprietary CROSSODILE® multi-functional platform, which comprises the Cross-Over-Dual-Variable-Domain (CODV) format. It induces a dual targeting of the NK activating receptors, NKp46 and CD16, for an optimized NK cell activation, based on Innate's ANKETTM proprietary platform.

On May 8, 2023, **Arxx Therapeutics announced** that the first cohort of healthy volunteers have successfully been dosed with AX-202. Preclinical studies have demonstrated the ability of AX-202 to prevent and treat fibrosis

and modify the disease-specific activation of fibroblasts, the key effector cells driving progression of fibrosis. Arxx aims to develop AX-202 as a disease-modifying agent for systemic sclerosis and other rare fibrotic diseases.

- AX-202 is a monoclonal antibody targeting S100A4, which plays a dual role in driving both inflammation and fibrosis.

On May 9, 2023, **Boehringer Ingelheim announced** that it has launched clinical development of BI 765423 with a Phase 1 study (NCT05658107) to assess the safety, tolerability, and pharmacokinetics in healthy volunteers. The IL-11 inhibitor antibody is the first of its kind to reach clinical development stage and is based on a partnership between the Company and Enleofen Bio Pte. Ltd. (Enleofen), with a goal to improve patient outcomes.

- BI 765423 is a monoclonal antibody that inhibits IL-11.

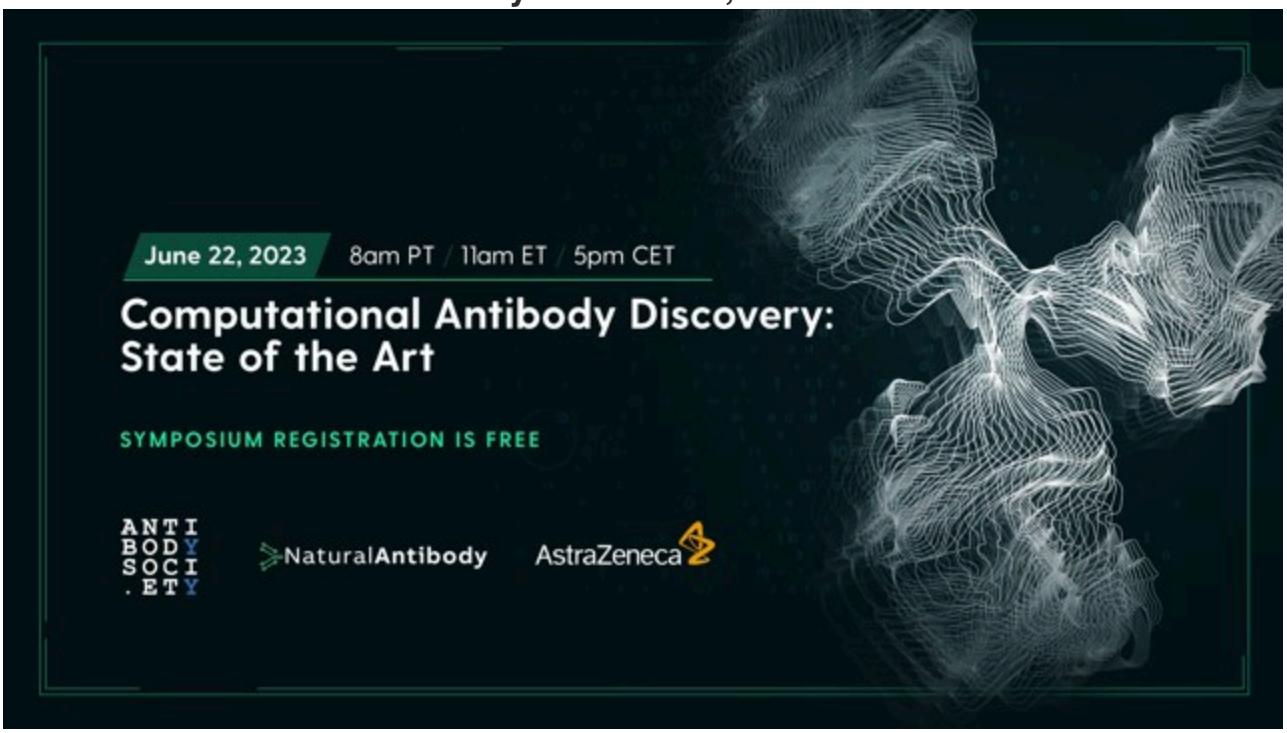
Positive Phase 3 study results for donanemab announced

On May 3, 2023, **Eli Lilly and Company announced** positive results of the TRAILBLAZER-ALZ 2 Phase 3 study showing that donanemab significantly slowed cognitive and functional decline in people with early symptomatic Alzheimer's disease. Donanemab met the primary endpoint of change from baseline until 18 months on the integrated Alzheimer's Disease Rating Scale (iADRS). The primary endpoint of iADRS measures cognition and activities of daily living such as managing finances, driving, engaging in hobbies, and conversing about current events. All secondary endpoints of cognitive and functional decline were also met and showed highly statistically significant clinical benefits with similar magnitude. Based on these results, Lilly will proceed with global regulatory submissions as quickly as possible and anticipates making a submission to the FDA yet this quarter. The FDA previously issued a complete response letter for the accelerated approval submission of donanemab for the treatment of early symptomatic Alzheimer's disease due to the limited number of patients with at least 12 months of drug exposure data provided in the submission. No other deficiencies in the application were noted.

- Donanemab is a monoclonal antibody that targets amyloid beta.

Antibody News You Should Know

May 15 - June 1, 2023



Business news

On May 18, 2023, **Oncomatryx Biopharma announced** that it has acquired Tube Pharmaceuticals GmbH, the developer of the Cytolysin toxic payload. The multimillion €uros transaction culminates a decade-long alliance that has already rendered clinical-

stage investigational drugs targeting the tumor microenvironment. Oncomatryx's immunotoxin OMTX705, which incorporates the cytolysin toxic payload developed by Tube, is being evaluated in a clinical trial of patients with metastatic solid tumors. This study is ongoing in seven hospitals in Spain and USA.

- OMTX705 is composed of a humanized anti-fibroblast activation protein IgG1 antibody fused with Cytolysin.

On May 24, 2023, **Pyxis Oncology, Inc. and Apexigen, Inc. announced** a definitive agreement by which Pyxis Oncology will acquire Apexigen in an all-stock transaction for an implied value of $0.64 per Apexigen share. For each share of Apexigen, Pyxis Oncology will issue 0.1725 shares of its common stock, par value $0.001 per share, for a total enterprise value of approximately $16 million. With the agreement, Pyxis acquires sotigalimab and APXiMAB, Apexigen's proprietary antibody discovery platform, which leverages rabbit monoclonal antibody and Mutation Lineage Guided humanization technologies.

- Sotigalimab is a differentiated, potentially best-in-class anti-CD40 IgG1 antibody in clinical development for liposarcoma, melanoma, and other cancers.

FDA grants Orphan Drug designation for LMN-201

On May 17, 2023, **Lumen Bioscience announced** that the U.S. Food and Drug Administration (FDA) has granted Fast Track Designation for LMN-201, an investigational, orally delivered biologic drug to treat and prevent C. difficile infection. LMN-201 combines four therapeutic proteins, including VHH antibodies, that act synergistically to neutralize both the C. difficile bacterium and the toxin that causes its virulence directly in the patient's gastrointestinal tract.

First Phase 1 studies planned

On May 17, 2023, details were posted on clinicaltrials.gov for a first-in-human, dose escalation and dose-expansion study (**NCT05862012**) of single-agent ISB 2001 in patients with relapsed/refractory multiple myeloma. Sponsored by Ichnos Sciences SA, the study's estimated start date is May 2023 and the estimated enrollment is 80 participants.

- ISB 2001 is a "Trispecific Engagement by Antibodies based on the TCR" (TREAT) antibody that combines three proprietary fragment antigen-binding arms, each targeting a different antigen, with one arm binding to the epsilon chain of CD3 on T cells, and the other two binding BCMA and CD38 on myeloma cells. Its Fc domain was fully silenced to suppress Fc effector functions.

On May 24, 2023, **BioRay Pharmaceutical Co., Ltd. announced** that the Investigational New Drug (IND) application for the clinical trial of its proprietary molecule BRY812 for the

treatment of advanced malignant tumors has been accepted by the China National Medical Products Administration.

- BRY812 is a novel antibody-drug conjugate (ADC) targeting human LIV-1, also known as SLC39A6 or ZIP6, which is a multi-pass transmembrane protein with zinc transporter and metalloproteinase activity.

On May 25, 2023, details were posted on clinicaltrials.gov for a Phase 1/2, first-in-human, dose-escalation and dose-expansion study (**NCT05875168**) of DS-3939a in patients with advanced solid tumors. Sponsored by Daiichi Sankyo, Inc., the study has an estimated enrollment of 430 participants and an estimated start date in September 2023.

- DS-3939a is an ADC targeting TA-MUC1.

On May 22, 2023, **Immunovant announced** that it received clearance of the IND application for IMVT-1402 from the FDA and initiated a Phase 1 clinical trial of IMVT-1402 in healthy volunteers in New Zealand after approval of the CTA by the regulatory authority, MEDSAFE. The clinical trial will evaluate the safety, tolerability and pharmacodynamic profiles of IMVT-1402. In the multiple-ascending dose (MAD) portion of the study, Immunovant plans to evaluate subcutaneous doses of 300 mg and 600 mg, at a concentration of 150 mg/mL vs. placebo.

- IMVT-1402 is a novel, human monoclonal antibody that targets the neonatal Fc receptor (FcRn).

First Phase 1 study started

On May 15, 2023, **Numab Therapeutics AG announced** that the first subject has been dosed in the Phase 1 clinical study of NM26-2198 for the treatment of moderate-to-severe atopic dermatitis. NM26-2198 is designed to simultaneously block itch and inflammation, with the aim of improving quality of life relative to current standard of care treatment. NM26-2198 inhibits three key pathways involved in disease pathogenesis of AD. While standard of care blocks IL-4 and IL-13, NM26-2198 also blocks IL-31.

- NM26-2198 is a first-in-class bispecific antibody targeting IL-4Rα (type I and type II receptors) and IL-31.

Brazikumab development in IBD terminated

On June 1, 2023, **AstraZeneca announced** the discontinuation of the brazikumab inflammatory bowel disease (IBD) development program, which included the Phase IIb/III INTREPID trial in Cohn's disease and the Phase II EXPEDITION trial in ulcerative colitis, and their respective open-label extension trials. The decision to discontinue brazikumab's IBD development follows a recent review of brazikumab's development timeline and the context of a competitive landscape that has continued to evolve. The timeline was

impacted by delays that could not be mitigated following global events. No safety concerns were identified for patients in these trials.

- Brazikumab is an anti-IL-23 monoclonal antibody.

NDA submitted to FDA for anti-PD-1 camrelizumab / rivoceranib combo in hepatocellular carcinoma

On May 17, 2023, **Elevar Therapeutics announced** it submitted a New Drug Application to the FDA for its investigational drug rivoceranib, an oral TKI, in combination with camrelizumab, an anti-PD-1 antibody, as a first-line treatment option for unresectable hepatocellular carcinoma. In February 2023, the combination therapy of rivoceranib and camrelizumab was approved by the National Medical Products Administration as a first-line treatment for liver cancer in China.

FDA issues complete response letter for [vic-]trastuzumab duocarmazine BLA

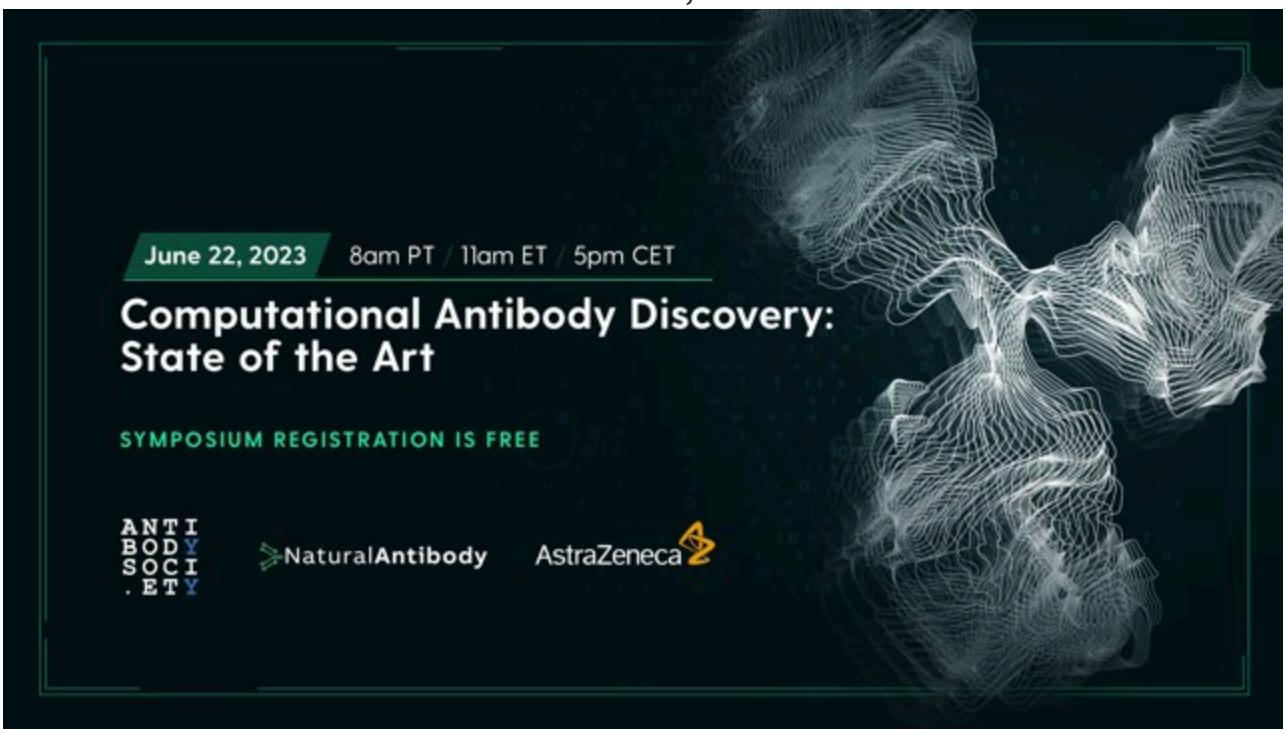
On May 15, 2023, **Byondis B.V. announced** that the FDA has issued a complete response letter for the Biological License Application (BLA) for [vic-]trastuzumab duocarmazine (SYD985). With this BLA, Byondis sought approval for its anti-HER2 ADC in HER2-positive unresectable locally advanced or metastatic breast cancer, a disease with a high unmet medical need. According to the complete response letter, the FDA suspends the decision on the product's approvability. The agency requested additional information that requires time and resources that extend beyond the current evaluation period.

FDA approves EPKINLY™ (epcoritamab-bysp)

On May 19, 2023, **Genmab A/S announced** that the FDA approved EPKINLY™ (epcoritamab-bysp) as the first and only T-cell engaging bispecific antibody for the treatment of adult patients with relapsed or refractory (R/R) diffuse large B-cell lymphoma (DLBCL), not otherwise specified, including DLBCL arising from indolent lymphoma, and high-grade B-cell lymphoma, after two or more lines of systemic therapy. EPKINLY was approved under accelerated approval based on response rate and durability of response. EPKINLY is being co-developed and co-commercialized by Genmab and AbbVie as part of the companies' oncology collaboration.

Antibody News You Should Know

June 1 - 15, 2023



Business news

On June 1, 2023, **Lonza announced** it has acquired Synaffix BV, a biotechnology company focused on commercializing its clinical-stage technology platform for the development of antibody-drug conjugates (ADCs). The acquisition comprises an initial

financial consideration of €100 million in cash and up to €60 million in additional performance-based consideration. The acquisition will further strengthen Lonza's bioconjugates offering through the integration of the industry-leading proprietary Synaffix technology platform and R&D capabilities, including payload and site-specific linker technology. Lonza and Synaffix will continue to expand their Center of Excellence for bioconjugate technology development, with a focus on out-licensing bioconjugates technologies for cytotoxic ADCs, targeted gene therapy, immune cell engagers applications and beyond.

On June 7, 2023, **AbTherx, a privately held biotech company with novel technologies that accelerate antibody discovery, announced** a license agreement with Gilead Sciences, Inc. The license agreement will provide AbTherx rights to Gilead's recently acquired novel transgenic mouse technologies, which were developed by three of the AbTherx founders. AbTherx will commercialize these technologies as Atlas™ Mice. The licensed technologies enable the development of a clinically validated bispecific antibody format most similar to native antibodies, use natural mechanisms to generate long CDR3 antibodies to improve the chance of success against challenging drug targets such as GPCRs and ion channels, and increase access to transgenic mice expressing full human antibody diversity. AbTherx intends to further develop these technologies and partner with global pharmaceutical and biotechnology companies to deliver innovative medicines. The agreement also provides Gilead with non-exclusive rights to future AbTherx-developed transgenic mouse technologies, which will add to Gilead's existing portfolio of antibody discovery technologies.

On June 7, 2023, **AbTherx, Inc. announced** the launch of its next-generation human antibody discovery platform. AbTherx's novel transgenic mouse technologies, Atlas™ Mice, include a clinically validated bispecific antibody format most similar to a native antibody configuration and a long CDR3 antibody technology using native human sequences that improves results against challenging targets such as GPCRs and ion channels. AbTherx is also increasing access to transgenic mice expressing full human antibody diversity. Through technology licensing and research collaborations, AbTherx partners with drug developers of all sizes to overcome the most demanding challenges for advancing innovative medicines.

On June 7, 2023, **Bitterroot Bio** announced a $145 million Series A financing round co-led by ARCH Venture Partners and Deerfield Management with participation from GV, Koch Disruptive Technologies, Alexandria Venture Investments, and others. The company, founded in 2021 but announced publicly on June 7th, is focused on developing and delivering innovative therapeutics that harness the power of immune modulation to treat cardiovascular disease,

- BRB-002, a biologic that targets the CD47/SIRPα pathway to address the underlying causes of atherosclerosis and vascular inflammation, is the company's lead product,.

On June 6, 2023, **BiVictriX Therapeutics plc announced** the nomination of a clinical candidate for its lead BVX001 program, following strong in vivo efficacy data. The data showed significant tumor regressions with no observed adverse effects in a murine model of acute myeloid leukemia.

- BVX001 is a first-in-class Bi-Cygni® antibody drug conjugate engineered to target the cancer-specific twin antigen fingerprint of CD7+CD33+.

First Phase 1 studies planned

On June 2, 2023, **BioInvent International AB announced** it received Investigational New Drug approval for BI-1910, which was generated through BioInvent's proprietary F.I.R.S.T™ technology platform. The planned Phase 1/2a clinical study will be conducted in the US and Europe and will have an innovative, adaptive design to allow for ideal dose optimization. Exploratory cohorts are planned in hepatocellular carcinoma and non-small cell lung cancer and initial investigations will be as both a single agent and in combination with pembrolizumab.

- BI-1910 is monoclonal antibody that targets tumor necrosis factor receptor 2 (TNFR2). BI-1910 offers a differentiated, agonist approach to cancer treatment compared to BI-1808, BioInvent's first-in-class anti-TNFR2 antibody which is currently in a Phase 1/2a trial.

On June 6, 2023, details were posted on clinicaltrials.gov for a Phase 1/1b study (**NCT05891171**) to evaluate the safety and tolerability of AB598 monotherapy and combination therapy in participants with advanced malignancies. Sponsored by Arcus Biosciences, the study has an estimated enrollment of 81 participants and an estimated study start date of June 30, 2023.

- AB598 is an IgG1 Fc-silent antibody that blocks CD39 (ENTPD1) enzymatic activity. The target is highly expressed on immune and stromal cells within the tumor microenvironment and is responsible for the conversion of adenosine triphosphate into adenosine monophosphate.

First Phase 1 study started

On June 13, 2023, details were posted on clinicaltrials.gov for a Phase 1, first-in-human, randomized, double-blind, placebo-controlled, single ascending dose study (**NCT05901883**) to assess the safety, tolerability, and pharmacokinetics of CEL383 when administered intravenously to healthy adult subjects. Sponsored by Celsius Therapeutics,

Inc., the study has an estimated enrollment of 48 participants and is currently recruiting patients.

- CEL383 is a potential first-in-class anti-TREM1 antibody for the treatment of inflammatory bowel disease (IBD). TREM1 is a myeloid target with a central role in IBD.

Marketing application for zolbetuximab submitted in Japan

On June 9, 2023, **Astellas Pharma Inc. announced** the submission of a New Drug Application to Japan's Ministry of Health, Labour and Welfare for zolbetuximab for first-line treatment of patients with locally advanced unresectable or metastatic HER2-negative gastric or gastroesophageal junction adenocarcinoma whose tumors are CLDN18.2-positive. If approved, zolbetuximab would be the first Claudin 18.2 (CLDN18.2)-targeted therapy available in Japan for these patients.

- Zolbetuximab is a chimeric anti-CLDN18.2 IgG1 monoclonal antibody.

Nirsevimab approval supported by FDA advisory committee

On June 10, 2023, **Sanofi announced** that U.S. Food and Drug Administration (FDA) Antimicrobial Drugs Advisory Committee voted unanimously 21 to 0 that Sanofi and AstraZeneca's nirsevimab has a favorable benefit risk profile for the prevention of respiratory syncytial virus (RSV) lower respiratory tract disease in newborns and infants born during or entering their first RSV season. The Committee also voted 19 to 2 in support of nirsevimab's favorable benefit risk profile for children up to 24 months of age who remain vulnerable to severe RSV disease through their second RSV season. The FDA accepted the Biologics License Application for nirsevimab in 2022 and the agency has indicated it will work to expedite its review. The Prescription Drug User Fee Act date is in the third quarter of 2023. If approved by that time, nirsevimab will be available in the U.S. ahead of the 2023-2024 RSV season.

- Nirsevimab is a human anti-RSV IgG1 monoclonal antibody engineered for extended half-life (YTE mutations).

BRIUMVI® (ublituximab-xiiy) approved in the European Union for multiple sclerosis

On June 1, 2023, **TG Therapeutics, Inc. announced** that the European Commission has granted approval of BRIUMVI® (ublituximab-xiiy) for the treatment of adult patients with relapsing forms of multiple sclerosis (RMS) with active disease defined by clinical or imaging features. BRIUMVI was granted approval by the U.S. FDA on December 28, 2022, for the treatment of RMS in adults. BRIUMVI is the first and only anti-CD20 monoclonal antibody approved in the U.S. and now the European Union (EU) for adult

patients with RMS that can be administered in a one-hour infusion following the starting dose.

- Ublituximab is a chimeric anti-CD20 IgG1 monoclonal antibody produced with low levels of fucose, which enhances its ADCC activity.

BIMZELX® (bimekizumab) receives supplemental approvals in the EU

On June 7, 2023, **UCB announced** that the European Commission granted marketing authorisation for BIMZELX® (bimekizumab) for the treatment of adults with active psoriatic arthritis (PsA) and adults with active axial spondyloarthritis (axSpA) including non-radiographic axSpA (nr-axSpA) and ankylosing spondylitis (AS), also known as radiographic axSpA. These approvals in the EU represent the first marketing authorizations for bimekizumab in PsA and axSpA worldwide, and the second and third indications for bimekizumab in the EU, following its approval for the treatment of moderate to severe plaque psoriasis in August 2021.

- Bimekizumab is a humanized IgG1 monoclonal antibody that neutralizes the biologic function of both IL-17A and IL-17F.

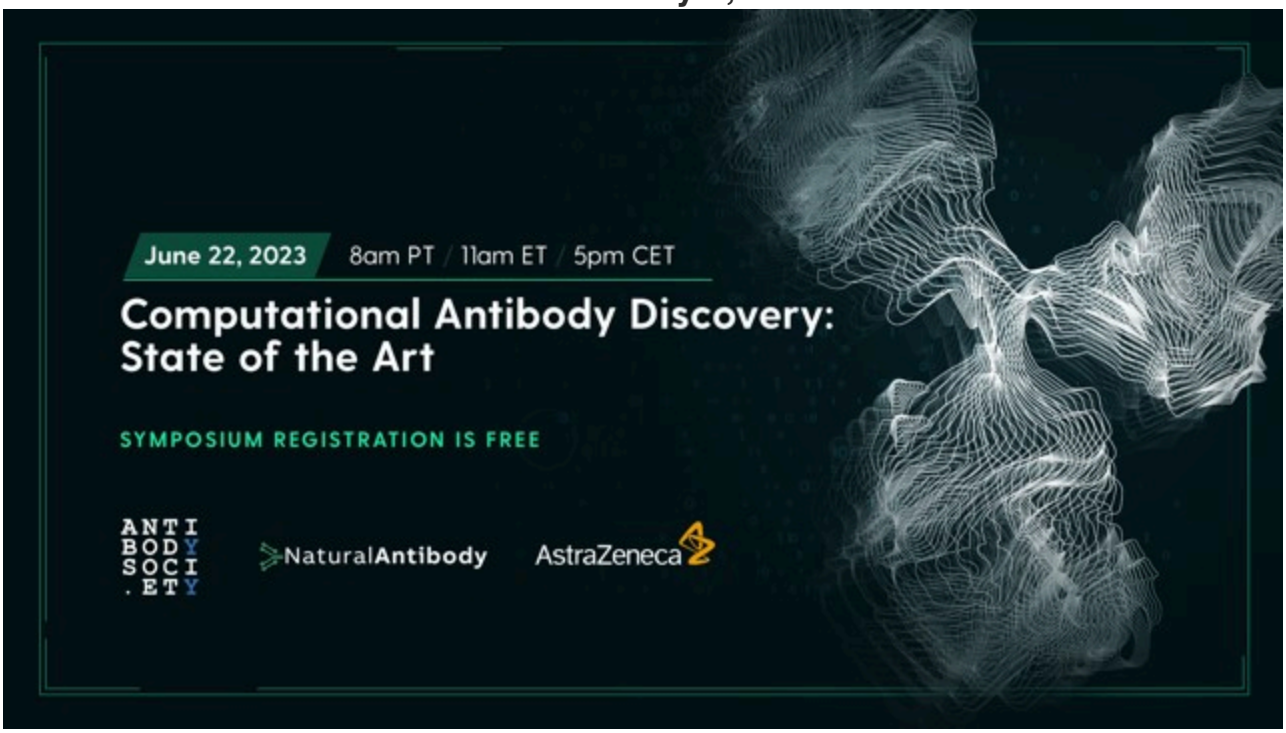
Glofitamab approved by FDA

On June 15, 2023, the **FDA approved Columvi™ (glofitamab-gxbm)** for the treatment of adult patients with relapsed or refractory (R/R) diffuse large B-cell lymphoma (DLBCL) not otherwise specified or large B-cell lymphoma (LBCL) arising from follicular lymphoma, after two or more lines of systemic therapy.

- Columvi is the first FDA-approved fixed duration CD20xCD3 T-cell engaging bispecific antibody.

Antibody News You Should Know

June 15 - July 1, 2023



Business news

On June 15, 2023, **Confo Therapeutics announced** that it entered into a research collaboration with AbCellera for the discovery of therapeutic antibody candidates targeting

two undisclosed GPCR targets. Confo will apply its proprietary ConfoBody® technology to stabilize the selected GPCRs in their disease-relevant conformations, which will then be used as antigens to enable antibody discovery and development. Confo will be entitled to upfront payments, milestones, and tiered royalties on net product sales.

On June 16, 2023, **Coherus BioSciences, Inc. and Surface Oncology Inc. announced** that the companies have entered into a definitive merger agreement providing that, at the closing, Coherus will acquire Surface Oncology. The Surface acquisition adds two differentiated clinical stage assets to Coherus' novel I-O pipeline, SRF388 and SFR114. The transaction was unanimously approved by the boards of directors of both companies and is expected to close in the third quarter of 2023.

- SRF388 is a novel IL-27-targeted antibody currently being evaluated in Phase 2 clinical trials in lung cancer and liver cancer.
- SFR114 is a CCR8-targeted antibody currently in a Phase 1/2 study as a monotherapy in patients with advanced solid tumors.

On June 20, 2023, **Alamar Biosciences, Inc. and Frazier Life Sciences, announced** the launch of Attovia Therapeutics, a newly formed company focused on creating a pipeline of biotherapeutics in immune-mediated disease and cancer. The company, based on Attobody™, Alamar's novel proprietary biparatopic nanobody platform, concurrently closed a $60 million Series A financing led by Frazier and joined by venBio and Illumina Ventures. The Attobody platform generates small format binders (referred to as "Attobodies") with ultra-high affinity, enhanced internalization and fast tissue penetration. These properties make Attobodies ideal binders for hard-to-drug targets such as G-protein-coupled receptors, and enable broad applicability across a number of modalities such as antibody-drug conjugate, radioconjugate or multi-specific biologics development. The biparatopic binding mode of Attobodies, combined with the high-throughput, evolution-driven method of discovering binders, significantly expands druggable epitope and target space.

On June 22, 2023, **Tagworks Pharmaceuticals BV announced** a $65 million Series A financing led by Ysios Capital and Gilde Healthcare with participation from Novartis Venture Fund, New Enterprise Associates (NEA), and Lightstone Ventures. They join existing investors including Meneldor and Oost NL. In conjunction with the financing, Thomas Harth (Ysios Capital), Edwin de Graaf (Gilde Healthcare), Marianne Uteng, Ph.D. (Novartis Venture Fund), Michele Park, Ph.D. (NEA) and Christina Isacson, Ph.D. (Lightstone Ventures) joined the Board of Directors. The financing will support the advancement of TGW101, Tagworks' lead click-cleavable antibody-drug conjugate (ADC) program, and the company's proprietary Click-to-Release platform. Tagworks' platform enables controlled drug release induced by an in vivo click reaction with a trigger

molecule. When applied to ADCs the triggered on-target release expands the scope to non-internalizing targets, affording a high bystander effect for the killing of tumors with heterogenous target expression. The platform also enables the on-target activation of immunomodulators, and the off-target deactivation of radiopharmaceuticals, enhancing their safety and therapeutic index.

On June 27, 2023, **ImmunoGenesis, Inc. and Cancer Focus Fund, LP, announced** that Cancer Focus Fund plans to invest $4.5 million to support the Phase 1a/1b clinical trial of ImmunoGenesis' lead candidate, IMGS-001. The investment will support the portion of the IMGS-001 Phase 1a/1b multi-site clinical trial being conducted at MD Anderson. It coincides with ImmunoGenesis' Series A financing, which is expected to close in the third quarter.

- IMGS-001 is a dual-specific PD-L1/PD-L2 antibody designed to treat immune-excluded tumors, which are resistant to existing immunotherapy.

On June 29, 2023, **Immunome, Inc.**, a biopharmaceutical company utilizing a proprietary human memory B-cell platform to discover and develop antibody therapeutics to improve patient care, and MorphImmune, a private biotechnology company focused on developing targeted oncology therapeutics, announced that they have entered into a definitive merger agreement. The investment will be used to continue development of the lead assets in Immunome's combined pipeline, to continue to advance the company's platforms, and for general working capital purposes. The combined pipeline includes a novel anti-IL-38 mAb derived from Immunome's discovery engine, as well as a folate receptor-targeted TLR7 agonist (FA-TLR7a) and FAP-targeted radioligand (177Lu-FAP). The company expects to submit three investigational new drug applications within 18 months following the closing, including the anti-IL-38 program, which is now slated for submission in Q1 2024.

First Phase 1 study of anti-SARS-CoV2 antibody planned

On June 28, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT05923424**) of REGN17092, an anti-SARS-CoV-2 antibody, in adult healthy volunteers. Sponsored by Regeneron, the study's estimated enrollment is 128 participants and estimated start date is August 11, 2023.

- REGN17092 is differentiated vs. prior anti-SARS-CoV2 antibody approaches due to: 1) Binding site outside of immunodominant, highly variable RBD and NTD regions, lowering risk of losing activity against future variants; 2) Targeted epitope highly conserved, with over 99.9% conservation since beginning of the pandemic; 3) Demonstrated high neutralization potency against all known SARS-CoV-2 variants and lineages to date.

Zenocutuzumab granted Breakthrough Therapy Designation

On June 29, 2023, **Merus N.V. announced** that the U.S. Food and Drug Administration (FDA) granted Breakthrough Therapy Designation (BTD) for zenocutuzumab for the treatment of patients with advanced unresectable or metastatic NRG1 fusion (NRG1+) pancreatic cancer following progression with prior systemic therapy or who have no satisfactory alternative treatment options. This designation for zenocutuzumab follows a Fast Track Designation for the treatment of patients with metastatic solid tumors harboring NRG1 gene fusions (NRG1+ cancer) that have progressed on standard of care therapy on January 7, 2021 and Orphan Drug Designation for the treatment of patients with pancreatic cancer on July 27, 2020.

- Zenocutuzumab is an ADCC-enhanced, full-length IgG bispecific antibody that simultaneously targets the growth factor receptors HER2 and HER3.

Marketing application for batoclimab submitted in China

On June 29, 2023, **HARBOUR BIOMED announced** that the National Medical Products Administration (NMPA) of China has accepted the biologics license application (BLA) of batoclimab (HBM9161) for the treatment of generalized myasthenia gravis. This is the first BLA accepted by NMPA since Harbour BioMed's establishment. Batoclimab (HBM9161) blocks FcRn-IgG interactions, accelerating the degradation of autoantibodies and leads to the treatment of pathogenic IgG-mediated autoimmune diseases.

- Batoclimab (HBM9161) is a human anti-FcRn monoclonal antibody.

FDA review of bimekizumab continues

On June 26, 2023, **UCB announced** that the BLA for bimekizumab for the treatment of adults with moderate to severe plaque psoriasis remains under review with the FDA. UCB previously communicated the FDA action was expected in Q2, 2023. UCB now anticipates the FDA action in Q3, 2023. There are no open Information Requests from the FDA regarding the BLA for bimekizumab.

- Bimekizumab is a humanized IgG1 monoclonal antibody that neutralizes IL-17A and IL-17F. Among IL-17 family members, IL-17F is closest in sequence to IL-17A, sharing ~50% structural homology.

FDA approves VYVGART Hytrulo and RYSTIGGO

On June 20, 2023, **argenx SE announced** that the FDA approved VYVGART® Hytrulo (efgartigimod alfa and hyaluronidase-qvfc). VYVGART Hytrulo is an injection for subcutaneous (SC) use for the treatment of generalized myasthenia gravis (gMG) in adult patients who are anti-acetylcholine receptor (AchR) antibody positive. These patients represent approximately 85% of the total gMG population.
Marketing authorization applications for SC efgartigimod are under review by the

European Medicines Agency with a decision expected by the end of 2023, and Japan's Pharmaceuticals and Medical Devices Agency with a decision expected by the first quarter of 2024.

- Efgartigimod, an IgG1 Fc fragment, is designed for increased affinity for FcRn.

On June 27, 2023, **UCB announced** RYSTIGGO® (rozanolixizumab-noli) has been approved by the FDA for the treatment of gMG in adult patients who are AchR or anti-muscle-specific tyrosine kinase (MuSK) antibody positive. Rozanolixizumab-noli is the only FDA-approved treatment in adults for both anti-AChR and anti-MuSK antibody-positive gMG, the two most common subtypes of gMG.

- Rozanolixizumab-noli is a humanized IgG4 monoclonal antibody that binds to the neonatal Fc receptor, resulting in the reduction of circulating IgG.

Antibody News You Should Know

July 1 - 15, 2023

Business news

On July 5, 2023, **Biocytogen announced** an antibody license agreement with Pheon Therapeutics, a leading antibody-drug conjugate (ADC) specialist developing next-generation ADCs for a wide range of hard-to-treat cancers. Under the terms of the agreement, Pheon will develop and commercialize an antibody developed using Biocytogen's proprietary RenMice™ platforms. Biocytogen will receive an upfront payment and is eligible for development and commercial milestone payments, as well as single-digit royalties on net sales. Pheon launched in March 2022 with a $68 million Series A financing led by a strong leadership team of specialists in targeted oncology therapies and ADCs.

On July 5, 2023, **F-star, an invoX company, announced** that it entered into a strategic discovery collaboration and license agreement with Takeda. The collaboration will leverage F-star's proprietary fully-human Fcab™ and

tetravalent mAb² ™ platforms to research and develop next-generation multi-specific immunotherapies for patients with cancer. Under the terms of the agreement, F-star and Takeda will jointly research and develop novel Fcab domains against undisclosed immuno-oncology targets. Takeda will receive a worldwide, exclusive royalty-bearing license to research, develop, and commercialize antibodies incorporating Fcab domains arising from the collaboration, and F-star will retain the right to research, develop, and commercialize antibodies incorporating certain other Fcab domains. F-star will receive an undisclosed upfront payment as well as research funding for the period of the collaboration. F-star is also eligible to receive potential future development and commercialization milestone payments of up to approximately $1 billion if all milestones across multiple programs are reached during the term of the agreement, plus royalties on potential annual net sales of any commercial product resulting from the license.

On July 5, 2023, **Evotec SE announced** that the U.S. Department of Defense has awarded Evotec's Seattle-based subsidiary, Just - Evotec Biologics, a contract valued up to $74 m for the rapid development of monoclonal antibody-based drug product prototypes targeting orthopoxviruses. Under the contract, Just – Evotec Biologics will develop drug product prototype(s) from discovery through the execution of Phase I first-in human clinical trials. Discovery activities will include both discovery of new mAbs using AI-driven de novo antibody design and evaluation of existing mAbs. A first contract under the Accelerated Antibodies Program for the development of mAbs against plague was awarded to Just – Evotec Biologics in September of 2022.

On July 11, 2023, **Crossbow Therapeutics, Inc.**, a biotechnology company developing a novel class of potent and precise antibody therapies to treat a broad range of cancers, announced an $80 million Series A funding round led by MPM BioImpact and Pfizer Ventures, with participation from Polaris Partners, BVF Partners, Eli Lilly and Company, Mirae Asset Venture Investment, and Mirae Asset Capital. The Series A financing will allow Crossbow to advance the development of novel therapies that potently target peptide-loaded major histocompatibility complexes on cancer cells, using antibodies that mimic T-cell receptors (TCR-mimetics). Using proprietary technology, Crossbow develops TCR-mimetic antibodies with both high affinity and specificity for cancer cells. Crossbow incorporates these TCR-mimetics into off-the-shelf, easy-to-assemble T-cell engagers and other immunotherapies. The resulting products, known as T-Bolt™ molecules, can be adapted to address a broad range of cancers.

FDA designations for trispecific antibody ISB 2001 and for AR-301

On July 7, 2023, **Ichnos Sciences Inc. announced** it has been granted orphan drug designation by the U.S. Food and Drug Administration (FDA) for its first-in-class T-cell engaging trispecific antibody, ISB 2001, for the treatment of multiple myeloma. Ichnos is preparing to initiate a Phase 1 first-in-human dose-escalation dose-expansion study of ISB 2001 later this summer, after securing approval from the Human Research Ethics Committee in Australia and IND clearance from the FDA.

- ISB 2001 is the company's first BCMA x CD38 x CD3 TREATTM1 trispecific antibody based on the company's proprietary BEAT® platform.

On July 12, 2023, **Aridis Pharmaceuticals company announced** that the FDA granted Qualified Infectious Disease Product Designation under the Generating Antibiotic Incentives Now Act for AR-301, which is currently in Phase 3 clinical development as an adjunctive therapy for pneumonia caused by gram-positive *Staphylococcus aureus* in critically ill hospitalized patients. Aridis received positive feedback from the FDA in May 2023 on the Company's proposed single confirmatory Phase 3 study of AR-301. In addition to agreeing to the study required to support the submission of a Biologics License Application (BLA), the FDA agreed to the proposed expansion of the confirmatory Phase 3 study in S. aureus VAP patients to include ventilated hospital-acquired pneumonia and ventilated community-acquired pneumonia patients.

- AR-301 (tosatoxumab) is a human IgG1 monoclonal antibody targeting *Staphylococcus aureus* alpha-toxin.

Phase 1 studies planned or started

On July 12, 2023, details were posted on clinicaltrials.gov for a first-in-human, Phase 1/2 study (**NCT05941507**) to evaluate LCB84 alone and in combination with an anti-PD-1 antibody in patients with advanced solid tumors. Sponsored by LegoChem Biosciences, the estimated enrollment is 300 patients and the study start date is in September 2023.

- LCB84 is composed of monomethyl auristatin E conjugated to the Hu2G10 (by Mediterranea Theranostic) humanized IgG1 antibody that selectively targets the ADAM10-activated Trop-2 protein selectively expressed in transformed cancer cells.

On July 7, 2023, details were posted on clinicaltrials.gov for a first-in-human, multicenter, open-label, dose escalation and dose expansion Phase 1 study (**NCT05934539**) in patients with advanced solid tumors to evaluate the safety of intravenously administered ALG.APV-527. The study was started in December 2022 and has an estimated enrollment of 56 patients. ALG-APV-527 is co-developed and jointly owned by Aptevo Therapeutics Inc and Alligator Bioscience AB.

- ALG.APV-527 is a bispecific antibody that targets 5T4 and 4-1BB. Mutations to eliminate FcgammaR and complement binding were introduced in the Fc region.

On July 11, 2023, **Innate Pharma SA announced** that the first patient was dosed in a Sanofi-sponsored Phase 1/2 clinical trial (NCT05839626) evaluating SAR'514 / IPH6401 in relapsed/refractory (r/r) multiple myeloma and r/r light-chain amyloidosis. The start of the trial has triggered a milestone payment from Sanofi to Innate, which is part of a previously announced research collaboration with Sanofi.

- SAR'514 is a trifunctional anti-BCMA NKp46xCD16 natural killer (NK) cell engager, using Sanofi's proprietary CROSSODILE® multi-functional platform, which comprises the Cross-Over-Dual-Variable-Domain (CODV) format. It induces a dual targeting based on Innate's ANKET® (Antibody-based NK cell Engager Therapeutics) proprietary platform.

Marketing applications for zolbetuximab submitted to FDA and EMA

On July 6, 2023, **Astellas Pharma Inc. announced** that the FDA accepted and granted Priority Review for the company's BLA for zolbetuximab for first-line treatment of patients with locally advanced unresectable or metastatic HER2-negative gastric or gastroesophageal junction adenocarcinoma whose tumors are CLDN18.2-positive. If approved, zolbetuximab would be the first CLDN18.2-targeted therapy available in the U.S. for these patients. The FDA has set a target action date of January 12, 2024. The FDA reviewed the application under its Real-Time Oncology Review program, which aims to explore a more efficient review process to ensure that safe and effective treatments are available to patients as early as possible.

- Zolbetuximab is a first-in-class investigational Claudin 18.2-targeted monoclonal antibody.

On July 13, 2023, **Astellas Pharma Inc. announced** the European Medicines Agency has accepted for regulatory review the company's marketing authorization application for zolbetuximab for first-line treatment of patients with locally advanced unresectable or metastatic HER2-negative gastric or gastroesophageal junction adenocarcinoma whose tumors are CLDN18.2-positive. The anticipated recommendation by the Committee for Medicinal Products for Human Use of the EMA regarding the MAA and subsequent European Commission decision are expected in calendar year 2024.

Columvi® (glofitamab) granted approval in the EU

On July 11, 2023, **Roche announced** that the European Commission granted conditional marketing

authorization for their bispecific antibody Columvi® (glofitamab) for the treatment of adult patients with r/r diffuse large B-cell lymphoma after two or more lines of systemic therapy. Glofitamab was previously approved in Canada and the US.

- Columvi is a CD20xCD3 T-cell-engaging bispecific antibody designed to target CD3 on the surface of T-cells and CD20 on the surface of B-cells. Columvi was designed with a novel 2:1 structural format.

Leqembi (lecanemab-irmb) granted full approval in the US
On July 6, 2023, the **FDA converted Leqembi** (lecanemab-irmb), indicated to treat adult patients with Alzheimer's Disease, to traditional approval following a determination that a confirmatory trial verified clinical benefit. The drug works by reducing amyloid plaques that form in the brain, a defining pathophysiological feature of the disease. Leqembi was approved in January under the FDA's Accelerated Approval pathway.

- Leqembi is a humanized IgG1 monoclonal antibody that selectively binds to Aβ protofibrils.

Antibody News You Should Know

July 15 - Aug 1, 2023

Business news

On July 18, 2023, **Twist Bioscience Corporation**, a company enabling customers to succeed through its offering of high-quality synthetic DNA using its silicon platform, and Cancer Research Horizons, the innovation engine at the core of one of the world's largest private funders of cancer research, Cancer Research UK announced an agreement under which Cancer Research Horizons will license the entire Twist Biopharma Solutions Library of Libraries. Under the terms of the agreement, Cancer Research Horizons will license Twist's Library of Libraries, an expansive collection of synthesized antibody libraries designed based on naturally occurring sequences that harness innovative structural and developability features to cover a wide range of antibody drug targets, for a period of five years. Twist will receive a library access fee and will be eligible to receive annual maintenance fees as well as a share of revenue from any assets sold or transferred.

On July 19, 2023, **YUMAB announced** its collaboration with InSCREENeX under the “exPDITE” funding project. The goal of the collaboration is to enable improved drug development for the individual treatment of patients with pancreatic cancer. To this end, patient-specific tissues will be propagated in the laboratory using InSCREENeX’s CI-SCREEN technology to identify new tumor targets using YUMAB’s proprietary antibody databases. The "exPDITE" project has received 1.1 million euros in support from the German Federal Ministry of Education and Research, making the 1.8 million euro project possible until 2026. The innovative approach involves amplifying tumor samples alongside healthy tissues from the same patient, preserving their original properties for study. YUMAB will leverage these expanded patient-derived tumors (exPDT) and their human antibody libraries to find drug candidates that selectively target diseased cells while sparing healthy tissue.

On July 19, 2023, **Biotheus Inc. announced** that it entered into a strategic research collaboration, option and worldwide license agreement with BioNTech SE. Under the terms of the agreement, Biotheus will grant BioNTech worldwide, exclusive options to a preclinical-stage bispecific antibody and a clinical-stage monoclonal antibody for cancer therapy. In addition, Biotheus will grant BioNTech exclusive licenses to existing panels of VHH binders against multiple targets along with options to request Biotheus to generate new panels of VHH binders against targets nominated by BioNTech. In exchange, BioNTech will provide Biotheus with an upfront payment and following option exercise on Biotheus' preclinical-stage bispecific antibody, Biotheus will also be eligible for clinical, regulatory, and commercial milestone payments and tiered single digit royalties.

On July 24, 2023, **ImmunoGen, Inc. announced** a multi-target license and option agreement to research novel, first-in-class antibody-drug conjugates with ImmunoBiochem Corporation, a privately-held biopharmaceutical company focused on the discovery of unique tumor targets and development of novel biological therapeutics. The collaboration will combine ImmunoGen's proprietary linker-payload technology with ImmunoBiochem's antibodies directed against specific targets. Under the terms of the agreement, ImmunoBiochem will receive an upfront payment in exchange for providing ImmunoGen with an exclusive license to existing antibodies directed against a specific undisclosed target. ImmunoBiochem will be eligible to receive milestone payments and royalties based on the achievement of pre-specified development, regulatory, and commercial milestones. ImmunoGen will collaborate with ImmunoBiochem on preclinical activities and assume responsibility for the program's future clinical development and commercialization activities. ImmunoGen will also have the option to select additional targets and antibodies to license based on certain preclinical work undertaken by ImmunoBiochem.

Fast track designation for ADC AX517

On July 19, 2023, **Ambrx announced** that the U.S. Food and Drug Administration (FDA) granted Fast Track designation to Ambrx’s, for the treatment of patients with metastatic castration-resistant prostate cancer (mCRPC) upon progression on an androgen receptor pathway inhibitor. ARX517 is currently being studied in APEX-01, a Phase 1/2, first-in-human, open label dose escalation and dose expansion trial enrolling patients with mCRPC whose tumors have progressed on at least two prior FDA approved treatments for prostate cancer.

- ARX517 is an antibody-drug conjugate (ADC) composed of an anti-PSMA mAb linked to AS269, a proprietary and potent microtubule inhibitor.

Phase 1 studies planned or started

On July 17, 2023, **Adcentrx Therapeutics announced** that the FDA cleared the company’s Investigational New Drug application (IND) of ADRX-0706 for the treatment of select advanced solid tumors. The antibody component targets Nectin-4, a cell surface adhesion protein over-expressed in multiple human cancers and associated with poor disease prognosis.

- ADRX-0706 is manufactured using a proprietary technology that conjugates a novel tubulin inhibitor payload to an anti- Nectin-4 antibody to generate an ADC with DAR 8.

On July 27, 2023, **Cessation Therapeutics, Inc., announced** that the FDA authorized the company to initiate a clinical trial in the U.S. for CSX-1004, a monoclonal antibody designed specifically to prevent fentanyl overdose. CSX-1004 is the first antibody-based therapy against fentanyl to gain IND approval.

- CSX-1004 is a recombinant human IgG1λ monoclonal antibody specific for fentanyl (MW = 336) and related synthetic opioids.

On July 25, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT05958199**) of NPX267, which targets HHLA2, a receptor that may control evasion of the immune response in tumors. The goal of the trial is to learn whether NPX267 is safe and tolerable in patients whose cancers are known to express HHLA2 including EGFR mutant non-small cell lung cancer. Sponsored by NextPoint Therapeutics, Inc., the study is due to start in July 2023.

- NPX267 is an antibody drug targeting HHLA2, the inhibitory receptor for B7-H7.

BLA submission for donenemab expected

On July 17, 2023, **Eli Lilly and Company announced** that they presented full results from the Phase 3 TRAILBLAZER-ALZ 2 study showing that donanemab significantly slowed cognitive and functional decline in people with early symptomatic Alzheimer's disease. The data were shared at the 2023 Alzheimer's Association International Conference as a featured symposium and simultaneously published in the Journal of the American Medical Association. Donanemab has been shown to lead to plaque clearance in treated patients. An FDA submission was completed in Q2 and regulatory action is expected by the end of 2023.

- Donanemab is a humanized antibody that specifically targets deposited amyloid plaque.

Updates on antibody therapeutics in regulatory review

At its July 17-30, 2023 meeting, **EMA's human medicines committee (CHMP) recommended** 3 new antibody therapeutics for approval by the European Commission.

Talvey* (talquetamab) received a positive opinion for the treatment of adult patients with relapsed and refractory multiple myeloma, a rare cancer of the bone marrow that affects plasma cells, a type of white blood cell that produces antibodies. Talvey was supported through EMA's priority medicines (PRIME) scheme, which provides early and enhanced scientific and regulatory support for medicines that have a particular potential to address patients' unmet medical needs.

- Talquetamab is a T-cell engaging bispecific antibody targeting GPRC5D and CD3 derived from Genmab's Duobody platform.

Tepkinly* (epcoritamab) received a positive opinion for the treatment of adult patients with relapsed or refractory diffuse large B-cell lymphoma, a fast-growing cancer of the lymphatic system.

The European Commission's decisions based on CHMP's opinions are normally issued 67 days from adoption of the opinion.

- Epcoritamab is a T-cell engaging bispecific antibody targeting CD20 and CD3 derived from Genmab's Duobody platform.

Tevimbra* (tislelizumab) received a positive opinion from the CHMP for the treatment of adult patients with unresectable, locally advanced or metastatic esophageal squamous cell carcinoma after prior platinum-based chemotherapy.

- Tislelizumab is a humanized anti-PD-1 antibody.

On July 27, 2023, **Chugai Pharma USA, Inc. confirmed** that anti-complement C5 recycling antibody crovalimab was filed in Japan, the U.S., and Europe in addition to filing in China, for paroxysmal nocturnal hemoglobinuria.

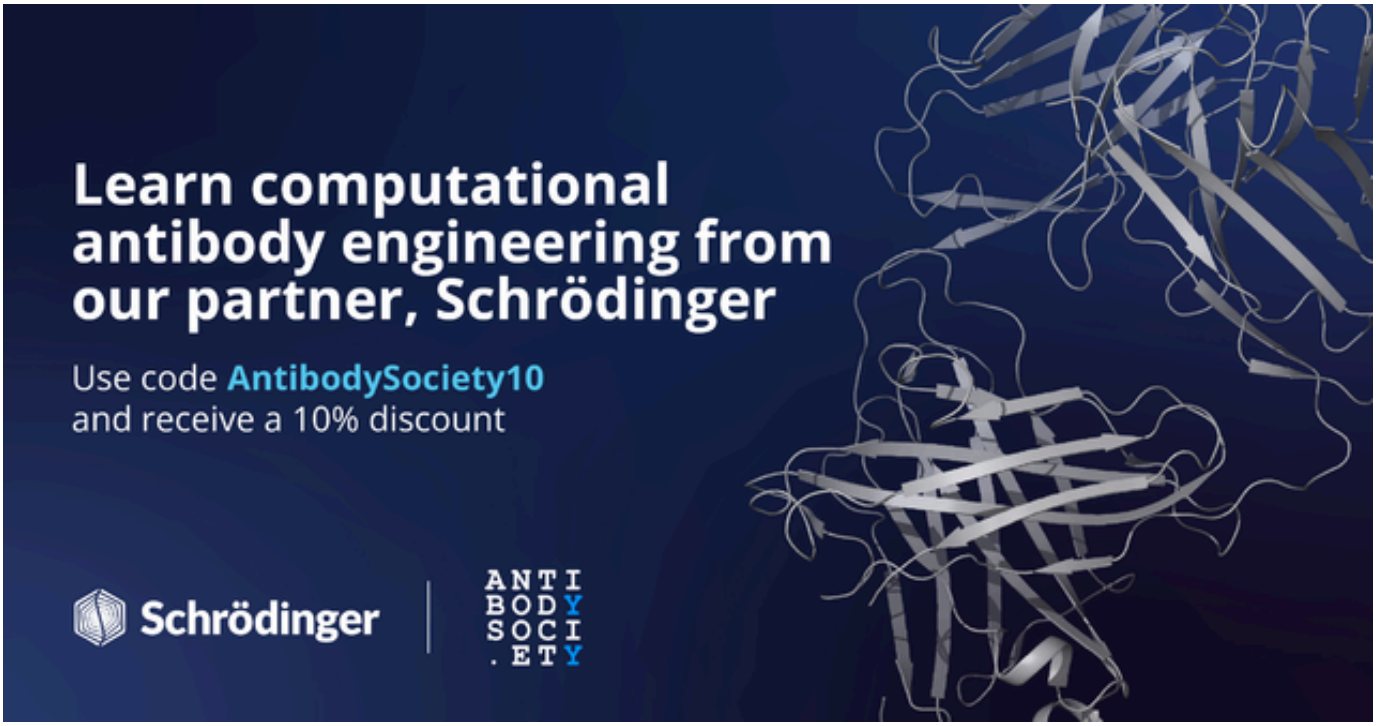
FDA approves Beyfortus

On On July 17, 2023, the **FDA approved** Beyfortus (nirsevimab-alip) for the prevention of Respiratory Syncytial Virus (RSV) lower respiratory tract disease in neonates and infants born during or entering their first RSV season, and in children up to 24 months of age who remain vulnerable to severe RSV disease through their second RSV season. One dose of Beyfortus, administered as a single intramuscular injection prior to or during RSV season, may provide protection during the RSV season.

- Beyfortus is a human anti-RSV monoclonal antibody engineered for extended half-life (YTE; mAb-M252Y, S254T, T256E).

Antibody News You Should Know

Aug 1 - 15, 2023



Upcoming course dates:

September 12th, 2023 - October 18th, 2023
September 19th, 2023 - October 25th, 2023
October 3rd, 2023 - November 8th, 2023
October 17th, 2023 - November 19th, 2023
October 31st, 2023 - December 13th, 2023

Business news

On August 8, 2023, **Heidelberg Pharma AG announced** that its partner Takeda reached a development milestone for starting a GLP (Good Laboratory Practice) toxicology study for an Antibody-Targeted Amanitin Conjugate (ATAC). Upon achievement of the milestone, Heidelberg Pharma received a milestone payment. In 2022, Takeda exclusively licensed the worldwide development and commercialization rights from Heidelberg Pharma for the use of the ATAC technology with an antibody directed to a defined target and the resulting product candidates.

On August 15, 2023, **Gilead Sciences, Inc. and Tentarix Biotherapeutics announced** that the companies established three multi-year collaborations leveraging Tentarix's proprietary Tentacles™ platform to discover and develop multi-functional, conditional protein therapeutics for oncology and inflammatory diseases. Designed to enhance both therapeutic benefit and safety, these molecules have the potential to conditionally target immune cells related to disease pathways without activating other immune cells that may create adverse events. Across the three collaborations, Tentarix will receive upfront payments and an equity investment from Gilead totaling $66 million. In addition, Gilead has the option to acquire up to three select Tentarix subsidiaries containing the programs developed under the collaborations for $80 million per subsidiary.

Fast track designation for Merus' petosemtamab

On August 7, 2023, with their Q2 2023 results and a pipeline update, **Merus announced**.petosemtamab was granted Fast Track Designation for the treatment of patients with recurrent or metastatic head & neck squamous cell carcinoma. Merus plans on initiating a Phase 3 trial of petosemtamab monotherapy in previously treated head and neck squamous cell carcinoma in mid-2024.

- Petosemtamab (MCLA-158) is an ADCC-enhanced Biclonics® designed to bind to cancer stem cells expressing leucine-rich repeat-containing G protein-coupled receptor 5 (Lgr5) and epidermal growth factor receptors.

Phase 1 studies planned or started

On August 9, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT05983133**) of LAVA Therapeutics N.V.'s LAVA-1223 (SGN-EGFRd2). Sponsored by Seagen, this study will test the safety of SGN-EGFRd2 in participants with advanced solid tumors. In September 2022, Seagen received an exclusive global license for SGN-EGFRd2 and the opportunity to exclusively negotiate rights to apply LAVA's proprietary Gammabody™ platform.

- SGN-EGFRd2 is a gamma-delta bispecific T-cell engager for EGFR-expressing solid tumors.

On August 11, 2023, **Zumutor Biologics announced** that the FDA has granted the company's Investigational New Drug application for the novel drug ZM008 to initiate a Phase 1, first-in-human, clinical study for the treatment of multiple solid cancers. FDA also accepted the "safety first" staggered parallel clinical design of ZM008 combination arm with pembrolizumab to benefit a wider range of patients whose immune response could be boosted with ZM008 followed by Pembrolizumab treatment to obtain favorable disease responses.

- ZM008 is a human IgG1 monoclonal antibody against LLT1 (CLEC2D), which disrupts the interaction of LLT1-CD161 between human immune cells and tumor cells resulting in antitumor effects of ZM008 in monotherapy.

On August 9, 2023, **Cullinan Oncology announced** that the first patient has been dosed in the Phase 1 clinical trial evaluating CLN-978 for the treatment of relapsed/refractory (r/r) B-cell non-Hodgkin lymphoma (B-NHL). The study is an open-label, dose-escalation, dose-expansion, and first-in-human study designed to evaluate the safety, tolerability, pharmacokinetics, pharmacodynamics, and preliminary efficacy of subcutaneously administered CLN-978. The study will enroll adult patients with r/r B-NHL for whom there is no available approved standard therapy.

- CLN-978 is a novel, highly potent, half-life extended CD19xCD3 T cell engager construct. CLN-978 contains two single-chain variable fragments, one binding with very high affinity the CD19 target on malignant cells and the other binding CD3 on T cells.

FDA approves TALVEY (talquetamab-tgvs)

On August 9, 2023, the **FDA granted accelerated approval of TALVEY™** (talquetamab-tgvs), a first-in-class bispecific antibody for the treatment of adult patients with r/r multiple myeloma (MM) who have received at least four prior lines of therapy, including a proteasome inhibitor, an immunomodulatory agent, and an anti-CD38 antibody. This indication is approved under accelerated approval based on response rate and durability of response. Continued approval for this indication is contingent upon verification and description of clinical benefit in confirmatory trial(s).

- TALVEY™ binds to the CD3 receptor on the surface of T cells and G protein-coupled receptor class C group 5 member D (GPRC5D) expressed on the surface of multiple myeloma cells, non-malignant plasma cells and healthy tissue such as epithelial cells in keratinized tissues of the skin and tongue.

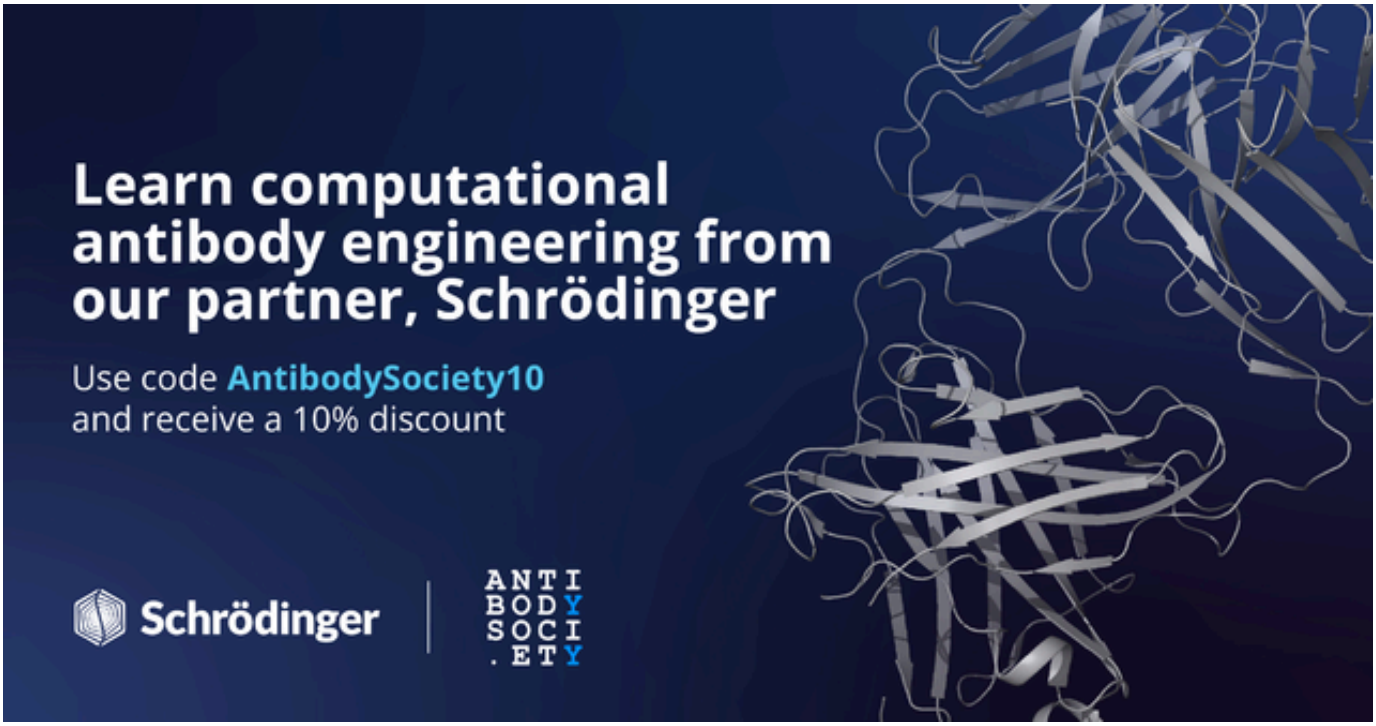
FDA approves Elrexfio (elranatamab-bcmm)

On August 14, 2023, the **FDA granted accelerated approval to Elrexfio** (elranatamab-bcmm) for adults with r/r MM who have received at least four prior lines of therapy, including a proteasome inhibitor, an immunomodulatory agent, and an anti-CD38 monoclonal antibody. The biologics license application (BLA) for elranatamab was granted priority review, breakthrough designation and orphan drug designation by FDA.

- Elranatamab (PF-06863135) is a humanized IgG2a T cell-engaging bispecific antibody designed to target BCMA, which is highly expressed on tumor cells, and CD3 found on the T cell surface.

Antibody News You Should Know

Aug 15 - Sep 1, 2023



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Business news

On August 31, 2023, **Twist Bioscience Corporation announced** a drug discovery agreement with Ono Pharmaceutical Co., Ltd. to discover and develop novel antibodies for the treatment of autoimmune diseases. Under the terms of the agreement, Twist will utilize the Twist Biopharma Solutions Library of Libraries to conduct research activities to discover novel antibodies against targets identified by Ono. Twist's Library of Libraries is an expansive collection of synthesized antibody libraries based on naturally occurring sequences that harness innovative structural and developability features to cover a wide range of drug targets. Twist will receive research fees, success-based clinical and regulatory milestones, as well as royalties on product sales. As part of the strategic collaboration, Ono will also utilize the scientific expertise of the Biopharma Solutions team and Twist's Premium Project Management services to evaluate new targets and generate comprehensive discovery campaigns. Ono will be responsible for the development, manufacturing and commercialization of any products resulting from the collaboration.

Orphan drug designations granted

On August 15, 2023, **Avidity Biosciences, Inc.,** which develops Antibody Oligonucleotide Conjugates, announced that the U.S. Food and Drug Administration (FDA) has granted Orphan Drug designation to AOC 1044, the company's clinical-stage therapy in development for the treatment of Duchenne muscular dystrophy (DMD) in people with mutations amenable to exon 44 skipping. AOC 1044 is designed to deliver phosphorodiamidate morpholino oligomers to skeletal muscle and heart tissue to specifically skip exon 44 of the dystrophin gene to enable dystrophin production in people living with DMD with mutations amenable to exon 44 skipping.

- AOC 1044 consists of a proprietary monoclonal antibody that binds to the transferrin receptor 1 (TfR1) conjugated with PMO targeting exon 44.

On August 21, 2023, **Alligator Bioscience AB announced** that the European Medicines Agency (EMA) has granted Orphan Designation to its lead asset mitazalimab for the treatment of pancreatic cancer. Mitazalimab is designed to sensitize tumors to chemotherapy and induce immune-mediated tumor killing by activating dendritic cells, B cells, and macrophages. Mitazalimab is currently being evaluated in OPTIMIZE-1 (NCT04888312), a Phase 2 open-label, multi-center study to assess its safety and efficacy in combination with chemotherapy, mFOLFIRINOX, in previously untreated patients with metastatic pancreatic ductal adenocarcinoma.

- Mitazalimab is a monoclonal antibody targeting CD40.

Phase 1 studies planned or started

On August 15, 2023, **OnCusp Therapeutics announced** the clearance of its Investigational New Drug Application for antibody-drug conjugate (ADC) CUSP06 by the FDA. CUSP06's payload is a weak substrate for BCRP/P-gp, which are drug efflux pumps that drive chemoresistance to many therapies. The Phase 1 clinical trial will assess the safety and tolerability of escalating doses of CUSP06 to determine the maximum tolerated dose and/or recommended dose for expansion in patients with platinum-refractory/resistant ovarian cancer and other advanced solid tumors.

- CUSP06, a CDH6-targeting ADC, is composed of a proprietary antibody with high cadherin-6 binding affinity, a protease-cleavable linker, and an exatecan payload.

On August 16, 2023, **Sonnet BioTherapeutics, Inc. announced** that SB221 (NCT05756907), the Phase 1b/2a clinical trial of SON-1010(IL12-FHAB) in combination with Roche's anti-PD-L1 checkpoint inhibitor, atezolizumab, has been accepted by the FDA, and the study can begin in the US for the treatment of platinum-resistant ovarian cancer. The trial consists of a modified 3+3 dose-escalation design in Part 1 to establish the maximum tolerated dose of SON-1010 with a fixed dose of atezolizumab.

- SON-1010 is a single-chain human IL-12 cytokine linked to a single-chain variable region known as the FHAB.

On August 17, 2023, **Pieris Pharmaceuticals, Inc. announced** that the company achieved an undisclosed milestone payment from Boston Pharmaceuticals. The milestone is based on dosing the first patient in a Boston Pharmaceutical-

sponsored Phase 1/2 study of BOS-342, which was discovered by Pieris and licensed to Boston Pharmaceuticals, and designed to provide a potent costimulatory bridge to exert tumor killing activity through the recruitment of T cells.

- BOS-342 (formerly PRS-342)is a 4-1BB/GPC3 immuno-oncology antibody-Anticalin fusion (Mabcalin™) bispecific protein.

On August 18, 2023, details were posted on clinicaltrials.gov for a first-in-human study of Xencor's **Fc fusion protein XmAb662**. The Phase 1, open-label, multicenter dose escalation study (**NCT05996445**) with cohort expansion at one or more recommended dose(s) is designed to evaluate the safety and tolerability of XmAb662 monotherapy or in combination with pembrolizumab in subjects with selected solid tumors that have progressed after standard/approved therapies, or for which there are no effective available therapies. The study is currently recruiting an estimated 210 participants.

- XmAb662 is a potency-reduced IL12-Fc fusion protein designed to increase anti-tumor activity.

On August 22, 2023, details were posted on clinicaltrials.gov for a Phase 1/2 study of AZD5863. Sponsored by AstraZeneca, **NCT06005493** is a first-in-human, modular Phase 1/2, open-label multicenter study of AZD5863 monotherapy administered intravenously (Module 1), or AZD5863 monotherapy administered subcutaneously (Module 2) in patients with advanced or metastatic solid tumors. Each module contains dose-escalation (Part A) and dose-expansion (Part B). The study is currently recruiting an estimated 200 participants.

- AZD5863 is a T cell-engaging bispecific antibody that targets Claudin 18.2 and CD3.

Marketing application for odronextamab submitted
On August 17, 2023, **Regeneron announced** that EMA has accepted for review the Marketing Authorization Application for odronextamab to treat adult patients with relapsed/refractory (R/R) follicular lymphoma (FL) or R/R diffuse large B-cell lymphoma (DLBCL), who have progressed after at least two prior systemic therapies. EMA previously granted odronextamab Orphan Drug Designation for FL and DLBCL.

- Odronextamab is an investigational CD20xCD3 bispecific antibody designed to bridge CD20 on cancer cells with CD3-expressing T cells to facilitate local T-cell activation and cancer-cell killing.

FDA approves Veopoz
On August 18, 2023, **FDA approved Veopoz (pozelimab-bbfg)** injection, a complement inhibitor, for the treatment of adult and pediatric patients 1 year of age and older with CD55-deficient protein-losing enteropathy (PLE), also known as CHAPLE disease. Veopoz is the first FDA-approved treatment for CHAPLE disease. An initial dose of Veopoz is administered intravenously, followed by weekly injections given subcutaneously by a health care provider. CHAPLE disease is a rare disease, with fewer than 100 patients diagnosed worldwide.

- Pozelimab is a human IgG4 antibody that targets complement component 5.

TALVEY approved in the European Union
On August 22, 2023, **Janssen announced** that the European Commission has granted conditional marketing authorisation of TALVEY®(talquetamab) as monotherapy for the treatment of adult patients with relapsed and refractory multiple myeloma who have received at least three prior therapies, including an immunomodulatory agent, a proteasome inhibitor, and an anti-CD38 antibody and have demonstrated disease progression on the last therapy. Talquetamab is approved as a weekly or biweekly subcutaneous injection, after an initial step-up phase.

- Talquetamab is a bispecific T-cell engaging antibody that binds to CD3, on the surface of T-cells, and G protein-coupled receptor class C group 5 member D.

Antibody News You Should Know

September 1 - 15, 2023

Business news

On September 5, 2023, **Star Therapeutics announced** the closing of an oversubscribed $90 million Series C financing to continue growth of its first-in-class antibody therapies and portfolio companies. Proceeds from the financing will support clinical advancement of VGA039, which is currently being evaluated in a Phase 1 study (**NCT05776069**) for von Willebrand disease. This novel therapy is being developed by Vega Therapeutics, a Star portfolio company focused on underserved blood disorders. The US Food and Drug Administration (FDA) granted the company orphan drug designation for VGA039 for the treatment of the von Willebrand disease.

- VGA039 is a first-in-class anti-Protein S antibody.

On September 6, 2023, **Cidara Therapeutics announced** that responsibility for future development, manufacturing and commercialization activities of CD388 will be assumed by Janssen, which intends to transfer its rights and obligations under the agreement to another entity. Janssen had previously announced its intention to discontinue internal development of the majority of its infectious disease pipeline, including JNJ-0953 (CD388).

- CD388 is composed of an Fc domain of human IgG1 conjugated to neuraminidase inhibitor.

On September 7, 2023, **Nurix Therapeutics announced** that it has entered into a multi-year, multi-target strategic collaboration agreement with Seagen Inc. to advance a new class of medicines called Degrader-Antibody Conjugates for use in cancer. Under the terms of the agreement, Nurix will receive an upfront payment of $60 million and has the potential to receive up to approximately $3.4 billion in research, development, regulatory and commercial milestone payments across multiple programs. As part of the multi-year collaboration, Nurix will use its proprietary DELigase platform to develop a suite of targeted protein degraders against multiple targets nominated by Seagen that are suitable for antibody conjugation. Seagen will be responsible for conjugating these degraders to antibodies to make DACs and advancing these DAC drug candidates through preclinical and clinical development and commercialization.

On September 12, 2023, **Pierre Fabre Group announced** the acquisition of Vertical Bio AG, a developer of novel cancer therapies. This first acquisition of a biotechnology company allows Pierre Fabre Laboratories to add VERT-002 to its oncology discovery pipeline. Deal terms were not disclosed. VERT-002 is in preclinical studies, with the first-in-human studies expected to begin in 2024.

- VERT-002 is a monoclonal antibody acting as a degrader of c-MET, which is a known disease driver in non-small cell lung patients with mutations or amplification of MET.

On September 12, 2023, **Traverse Biotech, Inc announced** that it has signed a license agreement with Genmab under which Traverse will develop and commercialize a bispecific antibody for cancer immunotherapy. This next-generation antibody was created using Genmab's proprietary DuoBody® bispecific antibody technology platform as a targeted treatment candidate for cancers expressing an undisclosed tumor-associated antigen. Targeting this tumor-associated antigen with the bispecific antibody will direct T cell-mediated cytotoxicity against both solid and liquid tumors.

On September 13, 2023, **AbCellera announced** that it has entered into a strategic collaboration with Incyte to discover and develop therapeutic antibodies in oncology. Under the financial terms of the agreement, Incyte has the right to develop and commercialize therapeutic antibodies resulting from the collaboration. AbCellera will receive research payments and is eligible to receive downstream clinical and regulatory milestone payments and royalties on net sales of products.

On September 14, 2023, **Generate:Biomedicines**, a clinical-stage biotherapeutics company pioneering a machine-learning-powered generative biology platform, announced that it has raised $273 million in Series C financing. Since the company's Series B financing round in 2021, Generate:Biomedicines has made notable progress as a leader in the field of generative biology. Specific achievements include:

- Initiated its first-in-human trial for GB-0669, a monoclonal antibody targeting a highly conserved region of the spike protein, in SARS-CoV-2. Insights gleaned from these efforts enable the company to respond to future pandemics and develop more effective treatments targeting COVID variants.

- Positioned to file a Clinical Trial Application by early Q4 2023 for its anti-TSLP monoclonal antibody, in asthma, which is expected to enter clinical trials shortly thereafter.
- Entered into collaboration agreements with Amgen and The University of Texas MD Anderson Cancer Center.
- Expanded The Generate Platform into new modalities, including into bi-specifics, enzymes, T-cell engagers, and cell therapy, as well as achieved the structural confirmation of its first de novo generated binders.

Orphan drug designation granted

On September 12, 2023, **Affimed N.V. announced** that the FDA granted fast track designation to the combination of its innate cell engager AFM13 with AlloNK® for the potential treatment of relapsed/refractory Hodgkin lymphoma. The combination treatment will be investigated in Affimed's Phase 2 LuminICE-203 study (**NCT05883449**).

- AFM is a tetravalent bispecific molecule composed of antibody variable domains with two binding sites for CD30 and for FcgammaRIIIa.
- AlloNK® (also known as AB-101) is a non-genetically modified, cord blood-derived, allogeneic, cryopreserved, ADCC-enhancing NK cell therapy candidate.

First Phase 1 studies started

On September 7, 2023, **Daiichi Sankyo, Inc. announced** that the first patient has been dosed in a first-in-human Phase 1/2 trial (NCT05875168) evaluating DS-3939 in patients with several types of advanced solid tumors, including non-small cell lung, breast, urothelial, ovarian, biliary tract, and pancreatic cancer. Initiated in August 2023, the study will enroll an estimated 430 patients.

- DS-3939 is a specifically engineered potential first-in-class tumor-associated mucin-1 directed antibody-drug conjugate (ADC) designed using Daiichi Sankyo's proprietary DXd ADC technology.

On September 13, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT06036121**) of the ADC ADRX-0706. Sponsored by Adcentrx Therapeutics and currently recruiting patients, the study will assess safety, tolerability, and pharmacokinetics, and identify the optimal dose of ADRX-0706 in an estimated 114 patients with select advanced solid tumors.

- ADRX-0706 targets Nectin-4, a cell surface adhesion protein over-expressed in multiple human cancers and associated with poor disease prognosis. The ADC is manufactured using a proprietary conjugation technology and novel tubulin inhibitor payload to generate an ADC with a drug-antibody ratio of eight (DAR 8).

Antibody News You Should Know

September 15 - October 1, 2023

Business news

On September 19, 2023, **Mage Biologics announced** that the company plans to manufacture clinical-grade material this year, with the aim to file a clinal trial application in 2024, for a humanized monoclonal antibody that is bioengineered for optimal potency and tissue penetration and will be orally administered. The focus indication will be ulcerative colitis, a chronic inflammatory bowel disease that impacts millions of patients all over the world. The antibody technology was in-licensed from Inven2, based on research carried out in Professor Jan Terje Andersen's lab.

On September 20, 2023, **Alloy Therapeutics**, a biotechnology ecosystem company, announced the formation of its scientific advisory board (SAB) that includes a group of renowned experts in fields spanning immunology, protein engineering, T cell receptor (TCR) modalities, and more. Alloy's SAB members have been instrumental in developing Alloy's technical roadmap as the company has developed cutting-edge technologies and services across antibodies, bispecifics, TCRs and TCR mimics, genetic medicines, cell therapies, peptides, and drug delivery technologies. The SAB's collaboration with Alloy will inform new areas of platform development and innovation, as well as identify promising areas of disease biology that can benefit from Alloy's established portfolio of platforms, services, and company creation capabilities. SAB members are:

- Matthew DeLisa, PhD, William L. Lewis Professor of Engineering and Director of the Institute of Biotechnology at Cornell University
- Sai Reddy, PhD, Associate Professor of Systems and Synthetic Immunology at ETH Zurich
- Darrell Irvine, PhD, Professor at the MIT Koch Institute for Integrative Cancer Research, Howard Hughes Medical Institute Investigator
- Christopher Love, PhD, Professor in Chemical Engineering at the MIT Koch Institute for Integrative Cancer Research
- Jeff Molldrem, MD, Professor and Chair of the Department of Hematopoietic Biology and Malignancy at the University of Texas MD Anderson Cancer
- Randolph Noelle, PhD, Emeritus Professor of Microbiology and Immunology at Dartmouth University,
- Kai Toellner, PhD, Professor of Adaptive Immunology at the University of Birmingham
- Andrew Sewell, PhD, Professor at the Systems Immunity Research Institute at Cardiff University

On September 20, 2023, **AbCellera announced** that it has expanded its existing multi-target collaboration with Regeneron to discover therapeutic antibodies for up to eight targets selected by Regeneron, increased from the original four. The collaboration, which began in March 2020, leverages

AbCellera's antibody discovery engine and Regeneron's VelocImmune® mice to identify novel therapeutic antibodies. AbCellera has initiated programs for all four of the original targets, with Regeneron exercising its rights to advance antibody candidates into further preclinical development for the two programs that have been completed.

On September 27, 2023, **Twist Bioscience Corporation and IMIDomics Inc. announced** a multi-program collaboration whereby Twist will utilize its antigen development capabilities and Library of Libraries to conduct antibody discovery activities against targets identified by IMIDomics. The targets were identified using IMIDomics' proprietary Clinical Discovery Engine™, a multidimensional, integrated, and data-driven platform for uncovering the underlying mechanisms of IMIDs. Under the terms of the collaboration, Twist will receive an upfront and project-specific fees and will be eligible to receive payments associated with specific clinical and commercial milestones, as well as royalty payments on product sales. IMIDomics will receive human antibodies against several of its priority targets from Twist.

Fast track designation granted

On September 26, 2023, **Mythic Therapeutics, Inc. announced** that the U.S. Food and Drug Administration (FDA) granted Fast Track designation to Mythic's antibody-drug conjugate (ADC) MYTX-011 for the treatment of patients with non-small cell lung cancer (NSCLC) with cMET overexpression. This designation encompasses NSCLC patients with any level of cMET overexpression, including low and intermediate. MYTX-011 leverages Mythic's innovative FateControl™ technology, which is designed to allow ADCs to actively navigate inside of cells.

- MYTX-011 is an investigational ADC composed of a pH-dependent anti-cMET antibody and the potent anti-microtubule drug monomethyl auristatin E.

First Phase 1 studies started

On September 18, 2023, **PharmAbcine Inc. announced** that the company received approval from the Human Research Ethics Committee in Australia for the Phase 1a/b trial (NCT05957081; MarkV-01 Trial) of PMC-309. The primary objective of the study is to evaluate the safety, tolerability, and determine the recommended RP2D (Recommended Phase 2 dose) in both parts. The second objective is to evaluate pharmacokinetics and clinical efficacy, including overall response rate, disease control rate, and progression-free survival.

- PMC-309 is an anti-VISTA (V-domain Ig Suppressor of T cell Activation) antibody candidate.

On September 25, 2023, details were posted on clinicaltrials.gov for a Phase 1/2 study of Bolt Biotherapeutics' BDC-3042. **NCT06052852** is a first-in-human study using BDC-3042 as a single agent and in combination with pembrolizumab in patients with advanced malignancies. An estimated 167 patients are being recruited.

- BDC-3042 is an agonist antibody that stimulates Dectin-2, a novel target found on tumor-associated macrophages across a broad range of solid tumors.

On September 26, 2023, details were posted on clinicaltrials.gov for a Phase 1/2 study (**NCT06054477**) of Alentis Therapeutics' ALE.C04 in patients with head and neck cancer. The purpose of the study is to evaluate the safety profile of ALE.C04 monotherapy and in combination with pembrolizumab, to characterize pharmacokinetics profile of ALE.C04, recommended Phase II dose for ALE.C04 in combination with pembrolizumab and as monotherapy and to assess anti-tumor activity of ALE.C04 monotherapy and in combination with pembrolizumab in patients with head and neck cancer.

- ALE.C04 is an anti-CLDN1 antibody that has been designed with an effector function directly targeting cancer while silencing CLDN1-mediated carcinogenic signaling and opening up the stiff extracellular matrix in tumors with immune evasive properties.

Regulatory news

On September 19, 2023, **UCB provided** an update on FDA's progress with the review of the biologics license application for bimekizumab, which is ongoing. A pre-license inspection conducted in April 2023 at the Belgium manufacturing facility was successfully closed, but the agency has not communicated timelines required to take action on the application. At this time, UCB no longer anticipates FDA action in Q3, 2023. The next update for the bimekizumab BLA will be shared at the time of the FDA action.

- Bimekizumab is a humanized monoclonal IgG1 antibody that is designed to selectively inhibit both interleukin 17A and interleukin 17F, two key cytokines driving inflammatory processes.

On September 25, 2023, **Genmab announced** the Japan Ministry of Health, Labour and Welfare has also approved EPKINLYTM (epcoritamab) as the first and only T-cell engaging bispecific antibody treatment in Japan of adult patients with certain types of relapsed or refractory large B-cell lymphoma, including diffuse large B-cell lymphoma (DLBCL), high-grade B-cell lymphoma, primary mediastinal large B-cell lymphoma, and follicular lymphoma grade 3B, after two or more lines of systemic therapy. Epcoritamab, which is derived from Genmab's DuoBody technology, is being co-developed by Genmab and AbbVie as part of the companies' oncology collaboration.
Genmab also announced that the European Commission has granted conditional marketing authorization for TEPKINLY® (epcoritamab) as a monotherapy for the treatment of adult patients with relapsed or refractory DLBCL after two or more lines of systemic therapy.

- Epcoritamab is a humanized bispecific antibody targeting CD20 and CD3.

Antibody News You Should Know

October 1 - 15, 2023

Business news

On October 3, 2023. **Vir Biotechnology, Inc. announced** that the Biomedical Advanced Research and Development Authority, part of the U.S. Department of Health and Human Services' Administration for Strategic Preparedness and Response, has awarded Vir approximately $50 million in new funding to advance the development of novel monoclonal antibody candidates and delivery solutions to widen the applicability of mAbs in COVID-19 and in pandemic preparedness and response. The new funding will support research and development of novel alternative mAb delivery technologies that have the potential to revolutionize mAb delivery by increasing expression relative to existing technologies. Such delivery could widen the breadth of administration options and shorten development and manufacturing timelines.

On October 4, 2023, **Sanofi and Teva Pharmaceuticals announced** a collaboration to co-develop and co-commercialize asset TEV'574, currently in Phase 2b clinical trials for the treatment of ulcerative colitis and Crohn's disease, two types of inflammatory bowel disease. Under the terms of the new collaboration agreement, Teva will receive an upfront payment of €469 million ($500 million) and up to €940 million ($1 billion) in development and launch milestones. Each company will equally share the development costs globally and net profits and losses in major markets, with other markets subject to a royalty arrangement and Sanofi will lead the development of the Phase 3 program. Teva will lead commercialization of the product in Europe, Israel and specified other countries, and Sanofi will lead commercialization in North America, Japan, other parts of Asia and the rest of the world. The

transaction will become effective after customary closing conditions are met. Initial program results are expected to be available in 2024.

- TEV-48574 targets vascular endothelial growth inhibitor, also known as TNF-like ligand 1A and TNF superfamily member 15.

On October 5, 2023, **Twist Bioscience Corporation announced** an antibody discovery, option and license agreement with Bayer. Under the terms of the agreement, Twist Biopharma Solutions, a division of Twist Bioscience, will leverage its Library of Libraries to conduct antibody discovery campaigns against targets to be determined by Bayer. Bayer will have the option to license antibodies discovered under the collaboration. Twist will receive payments connected with the initiation of research and will be eligible to receive fees associated with research milestones and the exercise of licensing options. The antibody leads discovered under the collaboration that enter clinical development qualify for certain success-based clinical and commercial milestone payments as well as royalties from product sales. In total, Twist is eligible to receive up to $188 million in clinical and commercial milestone payments plus royalties. In return, Bayer receives exclusive rights to license the antibodies for commercialization in all global territories.

On October 5, 2023, **Wheeler Bio, Inc. announced** the grand opening of their state-of-the-art drug substance Current Good Manufacturing Practices facility inside the Ziggurat building (Echo Investment Capital) in Oklahoma City, OK. By partnering uniquely with venture capital, Wheeler helps to ease the translational process from discovery to clinic for clients in biologics innovation. Founded by Dr. Jesse McCool, Christian Kanady of Echo, and Errik Anderson of Alloy Therapeutics, Inc. and 82VS in 2021, the first-in-class CDMO was designed to provide accelerative development services to biotech startups and emerging biopharma innovators at a fair price.

On October 5, 2023, **Lonza announced** an extension of a long-term collaboration with a major global biopharmaceutical partner. The extended agreement will increase the current dedicated bioconjugation capacity fourfold by adding two new bioconjugation suites for the commercial supply of ADCs at Lonza's Ibex® Dedicate Biopark in Visp (CH). The extension will occupy 1500m2 of manufacturing space, and will connect to key infrastructure supporting the containment of highly potent drug linkers and the handling of bioconjugates in a highly automated, high-throughput environment. The two dedicated manufacturing areas are expected to comprise one of the largest bioconjugation facilities globally. The new suites are expected to be operational in 2026 and will generate approximately 180 jobs upon completion.

On October 5, 2023, **Integral Molecular announced** that it has been awarded NIH funding totaling $896,000. The NIH has identified 230 GPCRs and ion channels as underexplored targets with potential to impact human health as part of its project, Illuminating the Druggable Genome. Funding awarded by NIH enables Integral Molecular to discover antibodies against many of these targets. To enable better models of human disease, Integral Molecular has also received NIH funding to discover antibodies that target highly conserved proteins across species.

On October 10, 2023, **Swedish biotech company Salipro Biotech AB and Estonian biotechnology company Icosagen Group** announced that they entered into a multi-target antibody research agreement to advance drug discovery programs against several challenging membrane proteins, including G protein-coupled receptors and solute carrier transporters. The partnership between Salipro Biotech and Icosagen will build on Salipro's track record of establishing multiple collaboration and licensing agreements with leading pharma and biotech companies to enable drug discovery against complex membrane protein targets, ranging from small molecule drug discovery programs to structural biology and antibody discovery.

Fast track designation granted

On October 3, 2023, **Boehringer Ingelheim and Oxford BioTherapeutics announced** that the U.S. Food and

Drug Administration (FDA) has granted Fast Track designation to BI 764532 for the treatment of extensive stage small cell lung cancer whose disease has progressed following at least two prior lines of treatment including platinum-based chemotherapy, and of advanced or metastatic extrapulmonary neuroendocrine carcinomas whose disease has progressed following at least one prior line of treatment including platinum-based chemotherapy. The discovery of BI 764532 was enabled through a successful partnership initiated in 2013, leveraging OBT's proprietary OGAP® drug discovery platform for identification of the DLL3 antigen and Boehringer Ingelheim's longstanding expertise in oncology and development of biotherapeutics.

- BI 764532 is an DLL3/CD3 IgG-like T-cell engager.

First Phase 1 studies started

On October 10, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT06074705**) of DS-1471a. Sponsored by Daiichi Sankyo, Inc., this first-in-human study will assess the safety, preliminary efficacy, pharmacokinetics, and immunogenicity of DS-1471a in participants with advanced or metastatic solid tumors. The study is recruiting an estimated 80 patients and has a primary completion date in June 2027.

- DS-1471a is an anti-CD147 antibody.

Phase 3 results announced

On October 12, 2023, **Eli Lilly and Company announced** that mirikizumab met the co-primary and all major secondary endpoints compared to placebo in VIVID-1, a Phase 3 study evaluating the safety and efficacy of mirikizumab for the treatment of adults with moderately to severely active Crohn's disease. The double-blind, treat-through trial included mirikizumab, placebo and active control (ustekinumab) arms. Lilly plans to submit a marketing application for mirikizumab in Crohn's disease to the FDA, followed by submissions to other regulatory agencies around the world, in 2024. Full data from the Phase 3 VIVID program will be disclosed in publications and at upcoming congresses.

- Mirikizumab is a hinge-stabilized, humanized IgG4 antibody targeting interleukin-23p19. Mirikizumab was approved for marketing in the European Union and Japan in March and May 2023, respectively, as a treatment for ulcerative colitis.

Antibody News You Should Know

October 15 - November 1, 2023

Business news

On October 16, 2023, **LegoChem Biosciences Inc. and Glycotope GmbH announced** the companies entered into an exclusive worldwide licensing agreement to develop an antibody-drug conjugate (ADC) by combining LCB's proprietary ADC technology with one of Glycotope's investigational antibodies, building on a previously announced 2022 collaboration and license agreement. Under the terms of the licensing agreement, LCB has worldwide exclusive rights to develop and commercialize the selected antibody as an ADC. Glycotope will receive an upfront payment and is eligible for clinical, regulatory and sales milestone payments, as well as royalties on net sales worldwide from LCB.

On October 18, 2023, **Mablink Bioscience, a pre-clinical biotechnology company pioneering the development of next-generation ADCs via its PSARLink™ proprietary platform, announced** an agreement to be acquired by Eli Lilly and Company. PSARlink™, an innovative hydrophilic linker using a polysarcosine arm, holds potential for broadening the therapeutic index of ADCs. Mablink is based in Lyon, France.

On October 20, 2023, **Daiichi Sankyo, Inc. and Merck announced** the companies have entered into a global development and commercialization agreement for three of Daiichi Sankyo's DXd ADC candidates: patritumab deruxtecan (HER3-DXd), ifinatamab deruxtecan (I-DXd) and raludotatug deruxtecan (R-DXd). The companies will jointly develop and potentially commercialize these ADC candidates worldwide, except in Japan where Daiichi Sankyo will maintain exclusive rights. Daiichi Sankyo will be solely responsible for manufacturing and supply. Merck will pay Daiichi Sankyo a $4 billion upfront payment in addition to $1.5 billion in continuation payments over the next 24 months, and may make additional payments of up to $16.5 billion contingent upon the achievement of future sales milestones, for a total potential consideration of up to $22 billion.

On October 20, 2023, **GSK plc and Jiangsu Hansoh Pharmaceutical Group Co., Ltd. announced** that they have entered into an exclusive license agreement for HS-20089, a B7-H4 targeted ADC currently in Phase I (NCT05263479) clinical trials in China. Under the agreement, GSK will obtain exclusive worldwide rights (excluding China's mainland, Hong Kong, Macau, and Taiwan) to progress development and commercialization of HS-20089.

On October 26, 2023, **Triveni Bio, a biotech company pioneering a genetics-informed precision medicine approach to develop functional antibodies for the treatment of inflammation and immunology (I&I) disorders, announced** a $92 million series A financing co-led by Atlas Venture and Cormorant Asset Management, with participation from OrbiMed, the private equity business of Viking Global Investors, Invus, Polaris Partners, Alexandria Venture Investments, and other investors. Triveni Bio's lead antibody program (TRIV-509) targets kallikreins 5 and 7 (KLK5/7), promising targets for the treatment of atopic dermatitis, asthma, and other I&I indications.

On October 30, 2023, **Jiangsu Hengrui Pharmaceuticals Co., Ltd. announced** a licensing agreement with Merck KGaA, Darmstadt, Germany. The agreement includes an option to an exclusive license for its innovative Claudin-18.2 ADC SHR-A1904, as well as a PARP1 (poly (ADP-ribose) polymerase 1) inhibitor, HRS-1167. Merck KGaA will receive exclusive rights to develop, manufacture and commercialize HRS-1167 worldwide, outside of mainland China, an exclusive option to develop, manufacture and commercialize SHR-A1904 worldwide, outside of mainland China, and an option to co-promote HRS-1167 and SHR-A1904 in mainland China.

First Phase 1 studies to start soon

On October 16, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT06084598**) of Bristol Myers Squibb's anti-tau antibody BMS-986446 (PRX005) in healthy participants. The antibody's target has recently been shown to correlate well with tau accumulation as measured by TauPET imaging and cognitive impairment. BMS plans to initiate a proof of concept study in Alzheimer's disease in 1H 2024.

- BMS-986446 targets a tau fragment (MTBR-Tau 243) and binds with high affinity to both the 3R and 4R isoforms of tau.

On October 18, 2023, details were posted on clinicaltrials.gov for a first-in-human Phase 1/2 study (**NCT06088654**) of IPH6501as a treatment of B-cell non-Hodgkin lymphoma (NHL). Sponsored by Innate Pharma, the study will enroll an estimated 184 patients and will evaluate the safety profile, tolerability of IPH6501, and determine the recommended phase 2 dose (RP2D) for patients with B-Cell NHL.

- IPH6501, an antibody-based NK cell engager therapeutics (ANKET), is a single tetraspecific molecule engaging two NK cell activating receptors NKp46 and CD16a (FcγRIIIa), the β chain (CD122) of the interleukin-2 receptor (IL-2R), and the CD20 antigen expressed on malignant B cells.

On October 19, 2023, details were posted on clinicaltrials.gov for a first-in-human dose-escalation and expansion Phase 1/2 study (**NCT06090266**) of OR502. Sponsored by OncoResponse, the study is designed to determine the safety, tolerability, pharmacokinetics, pharmacodynamics, and preliminary anti-tumor activity of OR502 administered as a monotherapy and in combination with cemiplimab in subjects with advanced solid tumors.

- OR502 is an IgG1 monoclonal antibody that binds specifically to LILRB2.

On October 23, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT06095089**) of JNJ-87189401 combined with JNJ-78278343 for advanced prostate cancer. Sponsored by The Janssen Pharmaceutical Companies of Johnson & Johnson, the study will enroll an estimated 110 patients and will determine the recommended regimen for Phase 2 (RP2Rs) of the combination of JNJ-87189401 with JNJ-78278343 (Part 1: dose escalation) and further evaluate the safety at RP2Rs (Part 2: dose expansion) in participants with advanced prostate cancer.

- JNJ-87189401 is a bispecific antibody targeting PSMA and CD28.
- JNJ-78278343 is a bispecific antibody targeting KLK2 and CD3.

On October 30, 2023, **SparX Biopharmaceutical Corp. announced** that its investigational new drug application for SPX-303 has been allowed by the U.S. Food and Drug Administration (FDA). The company plans to launch a Phase 1 clinical study, aiming to assess the safety, tolerability, and preliminary efficacy of SPX-303 in patients with advanced or refractory solid tumors.

- SPX-303 is a bispecific antibody targeting LILRB2 and PD-L1.

First Phase 1 study started

On October 19, 2023, **Numab Therapeutics AG announced** that the first patient has been dosed in the multiple ascending dose (MAD) study of the Phase 1a/b clinical trial (NCT05859724) of NM26 for the treatment of moderate-to-severe atopic dermatitis (AD). The MAD study in AD patients is a planned continuation of the company's ongoing single ascending dose portion of the Phase 1a/b trial in healthy volunteers. NM26 is designed to simultaneously block itch and inflammation by inhibiting the three key cytokine-signaling pathways involved in disease pathogenesis of AD: IL-4, IL-13, and IL-31.

- NM26-2198 is a bispecific antibody targeting IL-4Rα (type I and type II receptors) and IL-31.

Pivotal study results announced

On October 16, 2023, **Philogen S.p.A. announced** that Nidlegy™, developed as intralesional treatment for patients with advanced locoregional melanoma and non-melanoma skin cancers, met the Phase 3 PIVOTAL trial's primary objective. Intratumoral Nidlegy™ followed by surgery significantly improved the Recurrence-Free Survival compared to surgery alone. Philogen plans to submit marketing applications for Nidlegy™ based on these study results.

- Nidlegy™ is a combination of the immunocytokines L19IL2 and L19TNF; the scFc L19 antibody is specific to the extra-domain B of fibronectin.

On October 23, 2023, **Merus N.V. reported** positive clinical data for bispecific antibody zenocutuzumab (Zeno) in patients with neuregulin 1 fusion (NRG1+) cancer. The reported data are from the phase 1/2 eNRGy trial and observations include:

- 37% ORR and 14.9 months median DOR in 78 evaluable NRG1+ NSCLC patients
- 42% ORR and 9.1 months median DOR in 33 evaluable NRG1+ PDAC patients

The company anticipates that sufficient clinical data expected in 1H24 may support potential BLA submissions.

- Zenocutuzumab is a bispecific IgG1 antibody targeting HER2 and HER3.

MAA accepted by EMA

On October 27, 2023, **ImmunoGen announced** that the European Medicines Agency accepted the Marketing Authorization Application for mirvetuximab soravtansine (ELAHERE®) for the treatment of patients with folate receptor

alpha (FRα)-positive, platinum-resistant epithelial ovarian, fallopian tube, or primary peritoneal cancer. ELAHERE was approved by the FDA in November 2022 for treatment of adult patients with FRα-positive, platinum-resistant epithelial ovarian, fallopian tube, or primary peritoneal cancer, who have received one to three prior systemic treatment regimens.

- Mirvetuximab soravtansine is an ADC composed of a humanized anti-FRα antibody conjugated to the cytotoxic drug DM4 via a cleavable linker.

FDA approvals

On October 18, 2023, **UCB announced that FDA approved BIMZELX® (bimekizumab-bkzx)** for the treatment of moderate to severe plaque psoriasis in adults who are candidates for systemic therapy or phototherapy. This monoclonal antibody is the first and only approved psoriasis treatment designed to selectively inhibit two key cytokines driving inflammatory processes – interleukin 17A (IL-17A) and interleukin 17F (IL-17F).1 The approval of bimekizumab is supported by data from three Phase 3, multicenter, randomized, placebo and/or active comparator-controlled trials (BE READY, BE VIVID and BE SURE), which evaluated the efficacy and safety of bimekizumab in 1,480 adults with moderate to severe plaque psoriasis.

On October 26, 2023, **Eli Lilly and Company announced that the FDA has approved Omvoh™ (mirikizumab-mrkz)** infusion (300 mg/15 mL)/injection (100 mg/mL), the first and only interleukin-23p19 (IL-23p19) antagonist for the treatment of moderately to severely active ulcerative colitis in adults. Lilly received approval for Omvoh in Japan and the European Union earlier this year and expects regulatory decisions in additional markets around the world in the coming months.

On October 27, 2023, **Coherus BioSciences, Inc. and Shanghai Junshi Biosciences Co Ltd announced that the FDA approved LOQTORZI™ (toripalimab-tpzi)** in combination with cisplatin and gemcitabine for the first-line treatment of adults with metastatic or recurrent locally advanced NPC, and as monotherapy for the treatment of adults with recurrent, unresectable, or metastatic NPC with disease progression on or after platinum-containing chemotherapy. The approval was based on results of the JUPITER-02 Phase 3 study and the POLARIS-02 Phase 2 study and is irrespective of a patient's PD-L1 status. LOQTORZI is a next-generation, programmed death receptor-1 (PD-1) monoclonal antibody that blocks PD-1 ligands PD-L1 and PD-L2 with high potency at a unique site on the PD-1 receptor, enabling the immune system to activate and kill the tumor.

Antibody News You Should Know

November 1 - 15, 2023

After this Friday, November 17, passes will rise to full price.
Don't let this opportunity slip away!

Business news

On November 1, 2023, **Prelude Therapeutics Incorporated and AbCellera announced** a multi-year, multi-program partnership to discover, develop, and commercialize potentially first-in-class treatments for patients with cancer. The collaboration combines Prelude's expertise in targeted protein degradation, medicinal chemistry, and clinical development with AbCellera's antibody discovery and development engine to generate novel precision antibody-drug conjugates (ADCs). The first program, which benefits from a lead panel of antibodies previously discovered by AbCellera, is focused on ADCs to broaden the reach of Prelude's small molecule SMARCA2-selective degraders to address a larger patient population.

On November 6, 2023, **Orum Therapeutics**, a clinical-stage private biotechnology company pioneering Dual-Precision Targeted Protein Degradation (TPD² ™) and Targeted Protein Stabilization (TPS² ™), announced that they have entered into a definitive agreement under which Bristol Myers Squibb has acquired Orum's ORM-6151 program. ORM-6151 has received clearance from the US Food and Drug Administration (FDA) for a Phase 1 study of ORM-6151 for the treatment of patients with acute myeloid leukemia or high-risk myelodysplastic syndromes.

- ORM-6151 is a first-in-class, anti-CD33 antibody-enabled GSPT1 degrader.

On November 6, 2023, **Biotheus Inc. announced** that the company has entered into an exclusive global license and collaboration agreement under which BioNTech will be developing, manufacturing and commercializing PM8002 globally ex-Greater China, whereas Biotheus retains the rights to exploit PM8002 in Greater China. PM8002 is currently being tested in Phase 2 studies in China to evaluate the efficacy and safety of the candidate as a monotherapy or in combination with chemotherapy in patients with advanced solid tumors.

- PM8002 is a bispecific antibody candidate with humanized anti-PD-L1 single heavy-chain variable (VHH) domains fused to an anti-VEGF-A IgG1 antibody containing Fc-silencing mutations.

On November 13, 2023, **VectorY Therapeutics**, a biotech company developing innovative vectorized antibody therapies for the treatment of neurodegenerative diseases, announced the close of a €129 million ($138 million) Series A financing to advance its vectorized antibody programs in neurodegenerative diseases. VectorY will use the proceeds to support the clinical development of VTx-002, its lead vectorized antibody program targeting TDP-43 for the treatment of amyotrophic lateral sclerosis. The company will also accelerate the development of its vectorized antibody platform and additional pipeline programs targeting proteinopathies causing other neurodegenerative diseases.

Breakthrough Therapy designation granted

On November 2, 2023, **I-Mab Biopharma and HI-Bio announced** that the FDA has granted Breakthrough Therapy designation for felzartamab for the treatment of primary membranous nephropathy. Based on a licensing agreement between MorphoSys and I-Mab signed in November 2017, I-Mab owns the exclusive rights for development and commercialization of felzartamab for all indications in Greater China, which encompasses Mainland China, Hong Kong, Macao, and Taiwan. HI-Bio in-licensed felzartamab from MorphoSys in June 2022, and holds exclusive worldwide rights for felzartamab with the exception of Greater China.

- Felzartamab is an investigational therapeutic human monoclonal antibody directed against CD38, a protein expressed on mature plasma cells.

Clinical study of antibody for canines started

On November 2, 2023, **Vetigenics**, a clinical-stage biopharmaceutical company advancing antibody-based therapies for pets, announced that the first canine patient with stage 4 oral melanoma has received his first dose of VGS-001 following standard of care radiation therapy. VGS-001 was derived from Vetigenics' proprietary fully canine single chain variable fragment phage display library. The trial is fully funded by the National Cancer Institute.

- VGS-001 is a fully canine anti-CTLA4 monoclonal antibody.

First Phase 1 studies planned or started

On November 7, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT06120504**) open-label, multicenter study designed to characterize the safety, tolerability, pharmacokinetics, pharmacodynamics, and

antitumor activity of SGN-35T in adults with select relapsed/refractory lymphomas. Sponsored by Seagen, the estimated study start date is in January 2024. Seagen shared preclinical data for SGN-35T at the Society for Immunotherapy of Cancer 38th Annual Meeting, held November 3-5, 2023, in San Diego.

- SGN-35T is a CD30-directed ADC that uses a novel tripeptide linker.

On November 3, 2023, **Igyxos announced** the dosing of the first healthy volunteer in the first-in-human Phase 1 clinical trial for IGX12, a pioneering monoclonal antibody with the potential to revolutionize infertility treatment for both men and women. IGX12 is a humanized mAb with a unique mechanism of action that enhances the activity of follicle stimulating hormone.

Phase 2 study started

On November 9, 2023, **Trishula Therapeutics, Inc. announced** they initiated a randomized Phase 2 trial to evaluate the efficacy and safety of TTX-030. The trial will evaluate TTX-030 in combination with chemotherapy, with or without budigalimab (an investigational anti-PD-1 antibody), compared to chemotherapy alone, as first-line treatment for metastatic pancreatic ductal adenocarcinoma patients. At the conclusion of this Phase 2 study, AbbVie will have an exclusive option to license TTX-030 for further development.

- TTX-030 is a first-in-class inhibitory anti-CD39 antibody that prevents ATP processing and increases T-cell activation.

Rystiggo receives positive opinion from CHMP

On November 9, 2023, the European Medicines Agency's **CHMP adopted a positive opinion**, recommending the granting of a marketing authorisation for the medicinal product Rystiggo (rozanolixizumab), intended for the treatment of Myasthenia Gravis. The applicant for this medicinal product is UCB Pharma.

- Rozanolixizumab is a humanized IgG4k monoclonal antibody that binds to the neonatal Fc receptor.

Antibody News You Should Know

November 15 - December 1, 2023

Business news

On November 20, 2023, **Cantai Therapeutics announced** its formation and the completion of a seed financing co-led by Agent Capital and 82VS (the affiliated venture studio of Alloy Therapeutics, Inc.) with additional participation from Tellus BioVentures. The proceeds will be used to develop drug candidates to treat autoimmune and inflammatory disorders by developing cytokine-targeting bispecific antibodies that meaningfully improve the status quo for the millions of patients suffering from immune-mediated and autoimmune diseases. s part of the financing, Alloy will perform services to advance Cantai programs using Alloy's broad suite of human antibody discovery technologies, including the ATX-CLC (Common Light Chain) mouse platform for the discovery of bispecific antibody therapeutics.

On November 21, 2023, **Genentech announced** a multi-year strategic research collaboration with NVIDIA that couples Genentech's artificial intelligence (AI) capabilities, extensive biological and molecular datasets, and research expertise with NVIDIA's world-leading accelerated computing capabilities and AI to speed up drug discovery and development. The collaboration is designed to significantly enhance Genentech's advanced AI research programs by transforming its generative AI models and algorithms into a next-generation AI platform, expediting the discovery and delivery of novel therapies and medicines to people. The companies will join forces to accelerate and optimize Genentech's proprietary machine learning algorithms and models on NVIDIA DGX Cloud, which provides a training-as-a-service platform built on dedicated NVIDIA AI supercomputing and software, including NVIDIA BioNemo for generative AI applications in drug discovery. NVIDIA will share its computing

expertise with Genentech's teams of computational scientists with the goal of optimizing and scaling Genentech's models, and in that process, may improve or enhance NVIDIA's platforms.

On November 27, 2023, **Oncoteq AG announced** the expansion of its development pipeline by in-licensing the potential best-in-class antibody-drug conjugate (ADC) TEQ102 from Tubulis GmbH for the treatment of patients with CD30-positive lymphomas, including, but not limited to, T-cell and Hodgkin's lymphomas. TEQ102 (formerly TUB-010) is a highly stable ADC with favorable drug properties. It consists of a well-characterized anti-CD30 antibody, the innovative TubTag® technology linker and the clinically well-established cytotoxic agent monomethyl-auristatin E.

On November 28, 2023, **Boehringer Ingelheim and IBM announced** an agreement that will enable Boehringer to use IBM's foundation model technologies to discover novel candidate antibodies for the development of efficient therapeutics. Boehringer will use an IBM-developed, pre-trained AI model that will be further fine-tuned on additional Boehringer proprietary data.

On November 30, 2023, **AbbVie Inc. and ImmunoGen, Inc. announced** a definitive agreement under which AbbVie will acquire ImmunoGen. Under the terms of the transaction, AbbVie will acquire all outstanding shares of ImmunoGen for $31.26 per share in cash. The transaction values ImmunoGen at a total equity value of approximately $10.1 billion. The boards of directors of both companies have approved the transaction. This transaction is expected to close in the middle of 2024, subject to ImmunoGen shareholder approval, regulatory approvals, and other customary closing conditions.

FDA designations granted

On November 15, 2023, **Xentria, Inc., announced** that its lead candidate, XTMAB-16, has been granted Orphan Drug Designation by the European Medicines Agency (EMA). The company also announced that the first US patient has been enrolled in its global study to evaluate XTMAB-16 as treatment for the rare disease sarcoidosis. Xentria Inc. and Meitheal Pharmaceuticals, Inc. have an exclusive multi-year licensing agreement to commercialize XTMAB-16.

- XTMAB-16 is a chimeric anti-TNF monoclonal antibody in development as a treatment for pulmonary sarcoidosis with or without extra pulmonary involvement.

On November 15, 2023, **Chemomab Therapeutics Ltd. announced** that the U.S. Food and Drug Administration (FDA) has granted CM-101 Fast Track designation for the treatment in adult patients of primary sclerosing cholangitis (PSC), a fibrotic liver disease that can result in liver transplant, cancer and early death. CM-101 has Orphan Drug designation from the FDA and Europe's EMA and is currently being evaluated in PSC patients in the Phase 2 SPRING trial.

- CM-101 is a humanized monoclonal antibody that neutralizes CCL24, a soluble protein that helps drive the inflammatory and fibrotic pathways central to many fibro-inflammatory diseases.

First Phase 1 study to start

On November 29, 2023, details were posted on clinicaltrials.gov for **NCT06150157**, a first-in-human, Phase 1 study of the safety, pharmacokinetics, and pharmacodynamics of JNJ-88549968 in patients who are positive for a calreticulin (CALR) driver mutation of essential thrombocythemia or myelofibrosis. Due to start in December, the study will characterize safety and determine the recommended Phase 2 dose (RP2D(s)) and optimal dosing schedule(s) of JNJ-88549968 in part 1 (Dose Escalation) and characterize the safety of JNJ- 88549968 at RP2D(s) in part 2 (Cohort Expansion). An estimated 100 patients with myeloproliferative disorders, essential thrombocythemia, neoplasms, or myelofibrosis will be recruited.

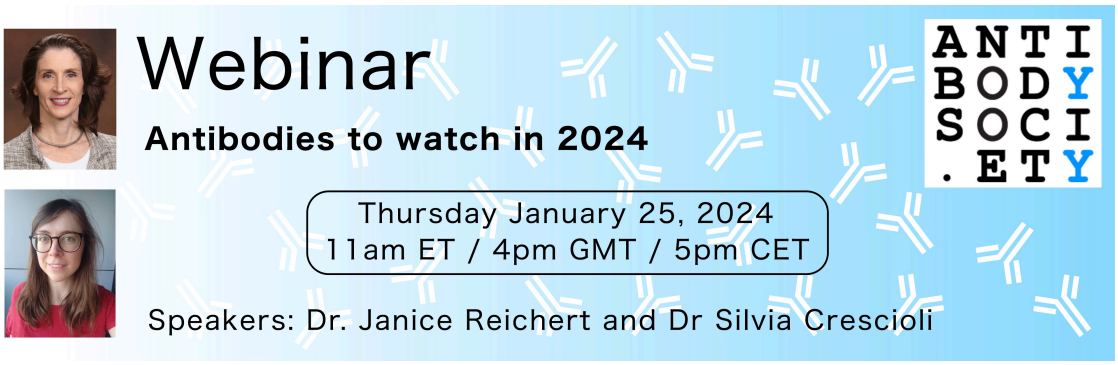
- JNJ-88549968 is a T-cell redirecting bispecific antibody for CALR-mutated myeloproliferative neoplasms.

EBLYSS approved in the European Union

On November 17, 2023, **Almirall S.A. announced** that the European Commission approved EBGLYSS (lebrikizumab) for the treatment of adult and adolescent patients (12 years and older with a body weight of at least 40 kg) with moderate-to-severe atopic dermatitis (AD), who are candidates for systemic therapy. Almirall will first start the commercial launch in Germany. The company will continue the rollout in further European countries throughout 2024.

- Lebrikizumab is a monoclonal antibody that binds IL-13 with high affinity to specifically prevent the formation of the IL-13Rα1/IL-4Rα heterodimer complex and subsequent signalling, thereby inhibiting the biological effects of IL-13.

Antibody News You Should Know



For complete details, download the full article **"Antibodies to Watch in 2024" published in *mAbs* on January 5, 2024**.

Antibody News December 1-31, 2023

In this edition of Antibody News, we summarize key events that were announced in December 2023, with a focus on regulatory submissions and actions.

IND submitted for GTB-3650

On December 4, 2023, **GT Biopharma, Inc. announced** the submission of an Investigational New Drug application with the U.S. Food and Drug Administration (FDA) for the development of GTB-3650, a 2nd generation nanobody TriKE® for the treatment of patients with CD33+ leukemia, including relapsed/refractory acute myelogenous leukemia and high-risk myelodysplastic syndrome.

- TriKE therapeutic agents currently under development consist of three functional moieties: a camelid nanobody that binds the CD16 receptor on natural killer cells, a single-chain variable fragment that recognizes a marker expressed on the tumor cell, and a human interleukin

(IL)-15 cross-linker. The IL-15 component of TriKE provides a self-sustaining signal that activates NK cells and enhances their ability to kill tumor cells.

Sanofi ends tusamitamab ravtansine clinical studies program

On December 21, 2023, **Sanofi announced** discontinuation of the global clinical development program of tusamitamab ravtansine. The decision is based on the outcome of a prespecified interim analysis of the Phase 3 CARMEN-LC03 trial evaluating tusamitamab ravtansine as monotherapy compared to docetaxel in previously treated patients with metastatic non-squamous non-small cell lung cancer whose tumors express high levels of carcinoembryonic antigen-related cell adhesion molecule 5 (CEACAM5). An Independent Data Monitoring Committee found that tusamitamab ravtansine as a monotherapy did not meet its dual primary endpoint of progression-free survival (PFS) compared to docetaxel. Sanofi will continue exploring the potential of tusamitamab-based ADCs and CEACAM5 research in several types of cancer.

- Tusamitamab ravtansine (SAR408701) is a humanized IgG1□ antibody targeting CEACAM5 conjugated to DM4, an anti-tubulin maytansinoid agent.

Antibody therapeutics enter first regulatory review

On December 11, 2023, **Pfizer announced** that both the FDA and European Medicines Agency (EMA) have accepted marketing applications for marstacimab for the treatment of hemophilia A and B. The FDA has set a Prescription Drug User Fee Act action date in the fourth quarter of 2024, and a decision from the European Commission is anticipated by the first quarter of 2025. If approved in the U.S. and European Union, marstacimab is expected to become the first once-weekly subcutaneous treatment for people living with hemophilia B and the first treatment administered as a flat dose for people living with hemophilia A or B.

- Marstacimab is a human monoclonal IgG1 targeting tissue factor pathway inhibitor.

On December 13, 2023 **Amgen announced** that the FDA has granted Priority Review to Amgen's tarlatamab Biologics License Application (BLA) for

advanced small cell lung cancer. Based on the Priority Review designation, the Prescription Drug User Fee Action (PDUFA) date for tarlatamab is June 12, 2024.

- Tarlatamab is a potential first-in-class, investigational delta-like ligand 3 (DLL3) targeting Bispecific T-cell Engager (BiTE®) therapy for the treatment of adult patients with advanced SCLC with disease progression on or after platinum-based chemotherapy.

On December 14, 2023, **CSL announced** the FDA has accepted the company's BLA for garadacimab (CSL312) as a once-monthly prophylactic treatment for hereditary angioedema (HAE). The company also announced the EMA has accepted the submission for CSL's Marketing Authorization Application for garadacimab. If approved, garadacimab would become the first treatment for HAE in the U.S. and EU to target activated Factor XII (FXIIa).

- Garadacimab is a novel, first-in-class, recombinant monoclonal antibody targeting activated FXII. FXIIa is a plasma protein that initiates the kallikrein-kinin cascade of HAE attacks.

On December 22, 2023, **Daiichi Sankyo and Merck announced** that the FDA has accepted and granted Priority Review to the BLA for patritumab deruxtecan (HER3-DXd) for the treatment of adult patients with locally advanced or metastatic EGFR-mutated non-small cell lung cancer previously treated with two or more systemic therapies. The Prescription Drug User Fee Act (PDUFA) date, the FDA action date for their regulatory decision, is June 26, 2024. The Priority Review follows receipt of Breakthrough Therapy Designation granted by the FDA in December 2021.

- Patritumab deruxtecan (HER3-DXd, U3-1402) is an antibody-drug conjugate consisting of a human IgG1k monoclonal antibody targeting human epidermal growth factor receptor 3 (HER3) conjugated to DXd/DX-8951, which is a topoisomerase I inhibitor payload, via a stable tetrapeptide (GGFG)-based cleavable linker.

FDA issues a complete response letter for cosibelimab BLA

On December 18, 2023, **Checkpoint Therapeutics, Inc.** announced that the FDA has issued a complete response letter (CRL) for the cosibelimab BLA for the treatment of patients with metastatic or locally advanced cutaneous squamous cell carcinoma who are not candidates for curative surgery or

radiation. The CRL only cites findings that arose during a multi-sponsor inspection of Checkpoint's third-party contract manufacturing organization as approvability issues to address in a resubmission. The company anticiptates that it can address the feedback in a resubmission to enable marketing approval in 2024.

- Cosibelimab (CK-301) is a human anti-PD-L1 IgG1 antibody.

Elranatamab approved in the EU

On December 8, 2023, **Pfizer Inc. announced** the European Commission granted conditional marketing authorization for ELREXFIO® (elranatamab). ELREFXIO is a targeted immunotherapy for the treatment of adult patients with relapsed and refractory multiple myeloma (RRMM) who have received at least three prior therapies, including a proteasome inhibitor, an immunomodulatory agent, and an anti-CD38 antibody and have demonstrated disease progression on the last therapy. Authorization was based on data from cohort A of the Phase 2 MagnetisMM-3 study (NCT04649359) showing meaningful responses among heavily pretreated RRMM patients who received ELREXFIO as their first BCMA-directed therapy. In August 2023, ELREXFIO was approved by the FDA under its Accelerated Approval Program.

- Elranatamab (Elrexfio™, PF-06863135) is a humanized IgG2 bispecific T cell-engaging antibody targeting CD3 on the surface of T cells and B-cell maturation antigen (BCMA), which is highly expressed on the surface of myeloma cells.