Antibody News You Should Know

January 1 - 15, 2023

Business news

On January 5, 2023, **WuXi Biologics announced** a license agreement with GSK plc under which GSK will have exclusive licenses for up to four bi- and multi-specific T-cell engaging (TCE) antibodies developed using WuXi Biologics' proprietary technology platforms. Under the terms of the agreement, GSK will be granted an exclusive global license for the research, development, manufacturing, and commercialization of a pre-clinical bispecific antibody that crosslinks tumor cells and T cells by targeting a tumor-associated antigen on tumor cells and CD3 expression on T cells and up to three additional pre-clinical TCE antibodies currently at an earlier discovery stage. WuXi Biologics will receive a $40 million upfront payment and up to $1.46 billion in additional payments for research, development, regulatory and commercial milestones across the four TCE antibodies. WuXi Biologics is also eligible to receive tiered royalties on net sales.

On January 6, 2023, **AbbVie and Immunome, Inc. announced** a worldwide collaboration and option agreement directed to the discovery of up to 10 novel antibody-target pairs arising from three specified tumor types using Immunome's Discovery Engine. Immunome will receive $30M upfront payment with potential for further platform access and option payments as well as development, commercial, and sales-based milestones, and tiered royalties.

On January 9, 2023, **ATP and NYU Langone Health launched Aethon Therapeutics** to create novel antibodies designed to eliminate drug resistance by enabling the immune system to find and kill persistent cancer cells. Aethon is funded with $30 million in Series A financing, $25 million of which comes from ATP. NYU Langone Health also participated in this funding round and holds equity in Aethon. Aethon's novel anti-drug-peptide conjugate/MHC antibodies, engineered using the company's proprietary HapImmune™ platform, are designed to be used in combination with targeted covalent inhibitors of RAS, EGFR, and other oncogenic driver mutations, to mount immune attacks to selectively kill residual cancer cells.

First Phase 1 studies planned or started

On January 3, 2023, **ProfoundBio** announced that they received clearance from the U.S. Food and Drug Administration (FDA) to initiate a Phase 1 clinical trial evaluating their antibody-drug conjugate (ADC) PRO1160. In addition, they announced dosing has initiated in the Phase 1/2 first-in-human clinical trial (**NCT05579366**) of another ADC candidate, PRO1184, in patients with locally advanced and/or metastatic solid tumors.

- PRO1160 is an ADC comprising a CD70-directed antibody conjugated to the exatecan payload with ProfoundBio's novel, proprietary hydrophilic linker.
- PRO1184 is an ADC comprising a folate receptor alpha-directed antibody conjugated to the exatecan payload with ProfoundBio's novel, proprietary hydrophilic linker.

On January 6, 2023, **HiFiBiO Therapeutics announced** that the FDA has cleared the company's Investigational New Drug application for HFB200603. HFB200603 is designed to reverse immune suppressive effects mediated by Herpesvirus entry mediator (HVEM), a member of the TNFR superfamily, and induce the production of inflammatory cytokines in various solid tumors selected by HiFiBiO's proprietary Drug Intelligence Science platform.

- HFB200603 is a novel monoclonal antibody against the immune checkpoint BTLA that blocks the interaction with its ligand HVEM.

On January 6, 2023, details were posted on clinicaltrials.gov for a first-in-human Phase 1/2 study (**NCT05673057**) of MP0533 in patients with relapsed/refractory acute myeloid leukemia (AML) or myelodysplastic syndrome. Sponsored by Molecular Partners, this open-label, dose escalation study is currently recruiting patients.

- MP0533 is a DARPin T-cell engager that engages CD3 on T cells while binding up to three tumor-associated antigens (CD33, CD70, and CD123) on AML cells.

On January 13, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT05685173**) to assess the safety and tolerability of REGN5837 in combination with Odronextamab, an anti-CD20 x anti-CD3 bispecific antibody, in patients with aggressive B-Cell NHL (ATHENA-1). Sponsored by Regeneron, the study is due to start in March 2023. Preclinical data data demonstrate that REGN5837 can markedly enhance the antitumor activity of odronextamab in preclinical NHL models, and the combination of these two bispecific antibodies

may provide a chemotherapy-free approach for the treatment of DLBCL.

- REGN5837 is an anti-CD22 x anti-CD28 costimulatory bispecific antibody.

First Phase 2 studies planned
On January 3, 2023, details were posted on clinicaltrials.gov for a Phase 2 study (**NCT05669599**) of AMG 133 in adult participants with overweight or obesity, with or without Type 2 diabetes. Sponsored by Amgen, the study has an estimated enrollment of 570 patients and an estimated start date of January 30, 2023. Recently released Phase 1 results showed up to 14.5% reduction in body weight at the highest dose (420mg Q4W) after 12 weeks.

- AMG 133 is a bispecific glucose-dependent insulinotropic polypeptide receptor antagonist and glucagon-like peptide-1 receptor agonist molecule.

On January 9, 2023, **IGM Biosciences, Inc. announced** plans to progress IGM-8444 based on positive results of a Phase 1 study. The company is initiating a randomized trial in second-line patients with metastatic colorectal cancer to assess the additional benefit of IGM-8444 combined with the current standard of care regimen of FOLFIRI and bevacizumab. This open label trial is planned to begin in Q1 2023. The target DR5 is a member of the tumor necrosis factor receptor superfamily and is often expressed on the surface of cancer cells. Strong activation of the DR5 pathway requires multiple receptors to be cross-linked simultaneously by an antibody or other binding agent to create an apoptotic death signal to the cell.

- IGM-8444 is an anti-DR5 IgM antibody.

Marketing applications submitted in the EU and US
On January 3, 2023, The **Janssen Pharmaceutical Companies of Johnson & Johnson announced** the submission of a Marketing Authorisation Application to the European Medicines Agency (EMA) seeking approval of talquetamab for the treatment of patients with relapsed or refractory multiple myeloma (RRMM). The application to the EMA follows a Biologics License Application (BLA) submitted to the FDA in December 2022 seeking approval of talquetamab for the treatment of RRMM.

- Talquetamab is a bispecific T-cell engager antibody targeting both GPRC5D, a novel drug target that is on some normal cells but overexpressed on myeloma cells, and CD3 on T-cells.

On January 4, 2023, **Checkpoint Therapeutics Inc. announced** the submission of a BLA to the FDA for the approval of cosibelimab, its investigational anti-PD-L1 antibody, as a treatment for patients with metastatic cutaneous squamous cell carcinoma (cSCC) or locally advanced cSCC who are not candidates for curative surgery or radiation. The BLA submission is based on positive efficacy and safety results from Checkpoint's ongoing registration-enabling, multi-regional, multicohort clinical trial evaluating cosibelimab administered as fixed doses of either 800 mg every two weeks or 1200 mg every three weeks in patients with selected recurrent or metastatic cancers, including pivotal cohorts in metastatic and locally advanced cSCC.

- Cosibelimab is an anti-PD-L1 IgG1 antibody.

On January 5, 2023, **AstraZeneca announced** that a BLA for nirsevimab has been accepted for review by the FDA for the prevention of respiratory syncytial virus (RSV) lower respiratory tract disease in newborns and infants entering or during their first RSV season, and for children up to 24 months of age who remain vulnerable to severe RSV disease through their second RSV season. The FDA's first action date on the application is in Q3 2023. Nirsevimab, which was approved as Beyfortus in the EU in November 2022, is being developed and commercialized by AstraZeneca in collaboration with Sanofi.

- Nirsevimab is an anti-RSV IgG1 antibody.

On January 6, 2023, **UCB announced** that the FDA has accepted the company's BLA for rozanolixizumab for the treatment of adults with generalized myasthenia gravis (gMG) who are anti-acetycholine receptor or anti-muscle-specific tyrosine kinase antibody positive, and that the Agency has granted Priority Review. The FDA's goal is to take action on an application within 6 months. The EMA previously validated a Marketing Authorization Application for rozanolixizumab in adults with gMG.

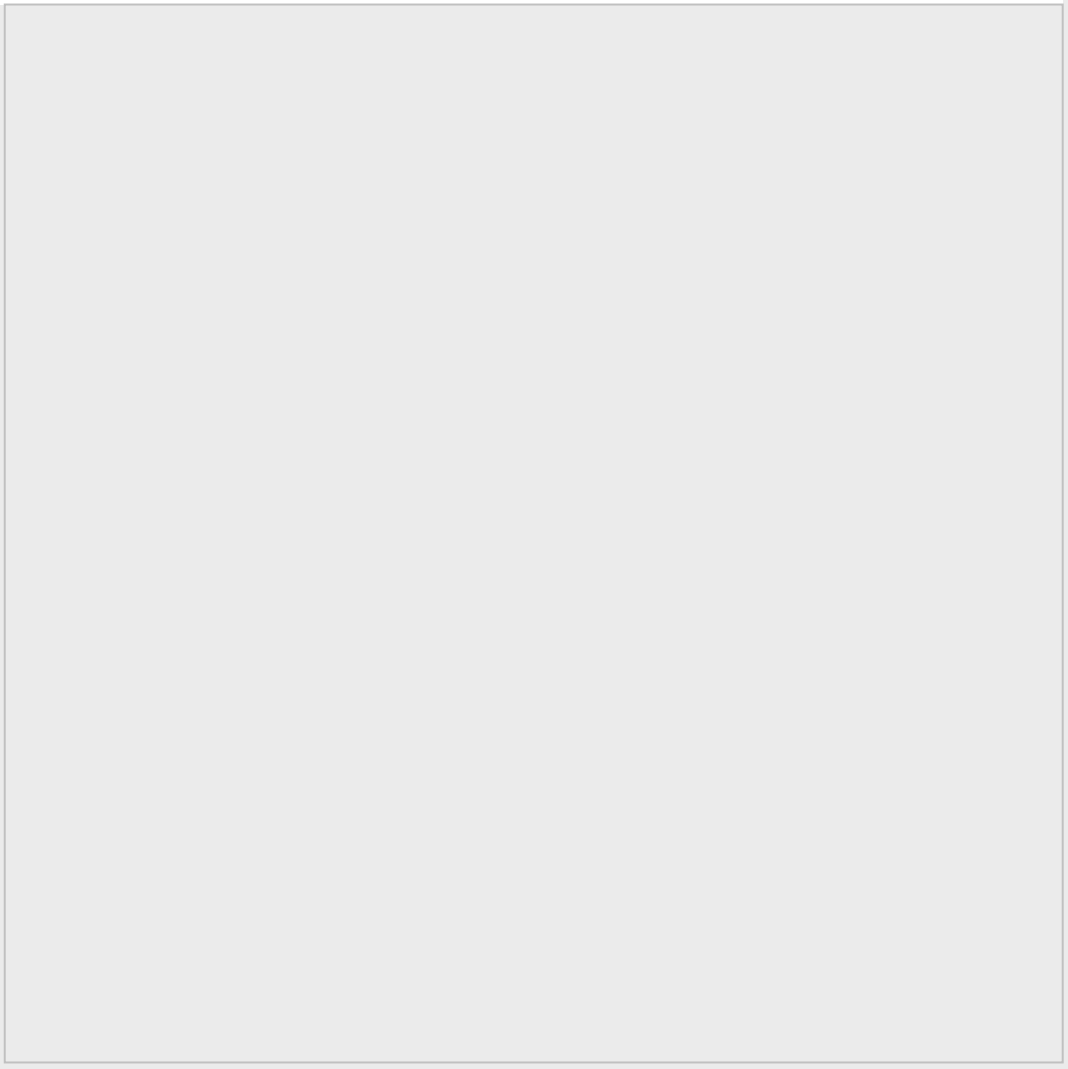
- Rozanolixizumab is a subcutaneous monoclonal antibody targeting the neonatal Fc receptor.

Lecanemab granted accelerated approval; traditional approval requested
On January 6, 2023, the **FDA approved Leqembi (lecanemab-irmb)** via the Accelerated Approval pathway for the treatment of Alzheimer's disease. Leqembi is the second of a new category of medications approved for Alzheimer's disease that target the fundamental pathophysiology of the

disease. These medications represent an important advancement in the ongoing fight to effectively treat Alzheimer's disease.

- Leqembi is an anti-amyloid beta antibody.

On January 6, 2023, **Eisai announced** that the company has submitted a supplemental BLA to FDA for traditional approval of LEQEMBI™ (lecanemab-irmb) for the treatment of Alzheimer's disease. This submission for follows FDA accelerated approval of LEQEMBI on the same day, and is based on data from the confirmatory Phase 3 Clarity AD clinical trial.



Antibody News You Should Know

January 15 - February 1, 2023

Business news

On January 26, 2023, **Evotec SE announced** that the company has entered into a strategic collaboration and license agreement with Janssen Biotech, Inc., one of the Janssen Pharmaceutical Companies of Johnson & Johnson. The collaboration focuses on the development of first-in-class targeted immune-based therapies for oncology, which will ultimately be commercialized by Janssen. The agreement was facilitated by Johnson & Johnson Innovation. The collaboration leverages Evotec's integrated discovery and development capabilities and manufacturing optimization processes, including an option for the GMP manufacture of the immune-based therapies. Evotec will collaborate closely with Janssen during the pre-clinical R&D phase while Janssen will assume full responsibility for the clinical development and commercialization.

DB-1303 receives Fast Track designation

On January 20, 2023, **Duality Biologics announced** that the U.S. Food and

Drug Administration (FDA) granted Fast Track Designation to the antibody-drug conjugate DB-1303 for the treatment of patients with advanced, recurrent or metastatic endometrial carcinoma with HER2 overexpression who have progressed on or after standard systemic treatment. DB-1303 is designed to have potent anti-tumor activity and bystander killing effect, high plasma stability, low free payload in circulation and wide therapeutic index.

- DB-1303 is composed of an anti-HER2 monoclonal antibody, enzymatically cleavable peptide-linker, and a proprietary topoisomerase I inhibitor P1003.

Clearance to start clinical studies received

On January 17, 2023, **ImmunOs Therapeutics AG announced t**hat the company received full ethical institutional approval from the Human Research Ethics Committee and regulatory approval from the Therapeutic Goods Administration (TGA) to conduct a Phase 1 trial of its lead program IOS-1002 (formerly iosH2) in Australia. The first patients are expected to be enrolled in Q1, 2023.

- IOS-1002 is a multi-functional agent based on a naturally occurring human leukocyte antigen that targets multiple immune checkpoints (LILRB1 (ILT2), LILRB2 (ILT4) and KIR3DL1) to activate both innate and adaptive immune cells. IOS-1002 is described as an IgG4-HLA-57 open conformer molecule.

On January 24, 2023, **Cullinan Oncology announced** the FDA has cleared its Investigational New Drug (IND) application for CLN-978. Cullinan Oncology will initially evaluate CLN-978 in a Phase 1 trial for the treatment of relapsed/refractory B-cell non-Hodgkin lymphoma.

- CLN-978 is a bispecific, anti-CD19/CD3 T-cell engaging antibody construct with a human serum albumin binding domain to increase serum half-life.

On January 26, 2023, **Centessa Pharmaceuticals plc announced** that it has received clearance of its IND from the FDA to initiate a Phase 1/2a first-in-human, clinical trial of LB101 for the treatment of solid tumors. LB101 is the first product candidate developed using the company's proprietary LockBody technology which is designed to selectively drive potent effector function activity, such as CD47, in the tumor microenvironment while avoiding systemic toxicity.

- LB101 is a conditionally tetravalent anti-PD-L1xCD47 LockBody® bispecific monoclonal antibody.

Phase 1 studies started

On January 17, 2023, **Asher Biotherapeutics announced** that the first patient has been dosed with AB248 in a Phase 1 first-in-human study (NCT05653882). AB248 is Asher Bio's lead compound and first to enter the clinic for the treatment of patients with solid tumors.

- AB248 is a novel CD8+ T cell-selective IL-2 generated by fusing a reduced potency IL-2 mutein to an anti-CD8β antibody.

On January 23, 2023, **AltruBio Inc. announced** that it has dosed the first patient in a Phase 1 study evaluating ALTB-268 in healthy volunteers. ALTB-268's target, PSGL-1, plays a key role in regulating late-stage, chronically activated T-cells.

- ALTB-268 is a next-generation PSGL-1 antibody agonist that acts as an immune checkpoint enhancer that downregulates chronically activated T-cells by inhibiting the T-cell effector function, promoting T-cell exhaustion and apoptosis.

On January 27, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT05702424**) of IGM-7354 in patients with relapsed and/or refractory cancer. Sponsored by IGM Biosciences, the study is recruiting an estimated 50 patients.

- IGM-7354 is a high affinity, high avidity anti-PD-L1 pentameric IgM antibody with an IL-15Rα chain and IL-15 fused to the joining (J) chain, designed to deliver IL-15 to PD-L1 expressing tumors for enhancing anti-tumor immune responses.

MAA for lecanemab undergoing review by EMA

On January 27, 2023, **Eisai US Co., Ltd. and Biogen Inc. announced** that the European Medicines Agency has accepted a marketing authorization application for lecanemab (Brand Name in the U.S.: LEQEMBI™) for the treatment of early Alzheimer's disease (mild cognitive impairment due to Alzheimer's disease (AD) and mild AD dementia) with confirmed amyloid pathology, for review following a standard timeline.

Lecanemab is an anti-amyloid beta protofibril antibody.

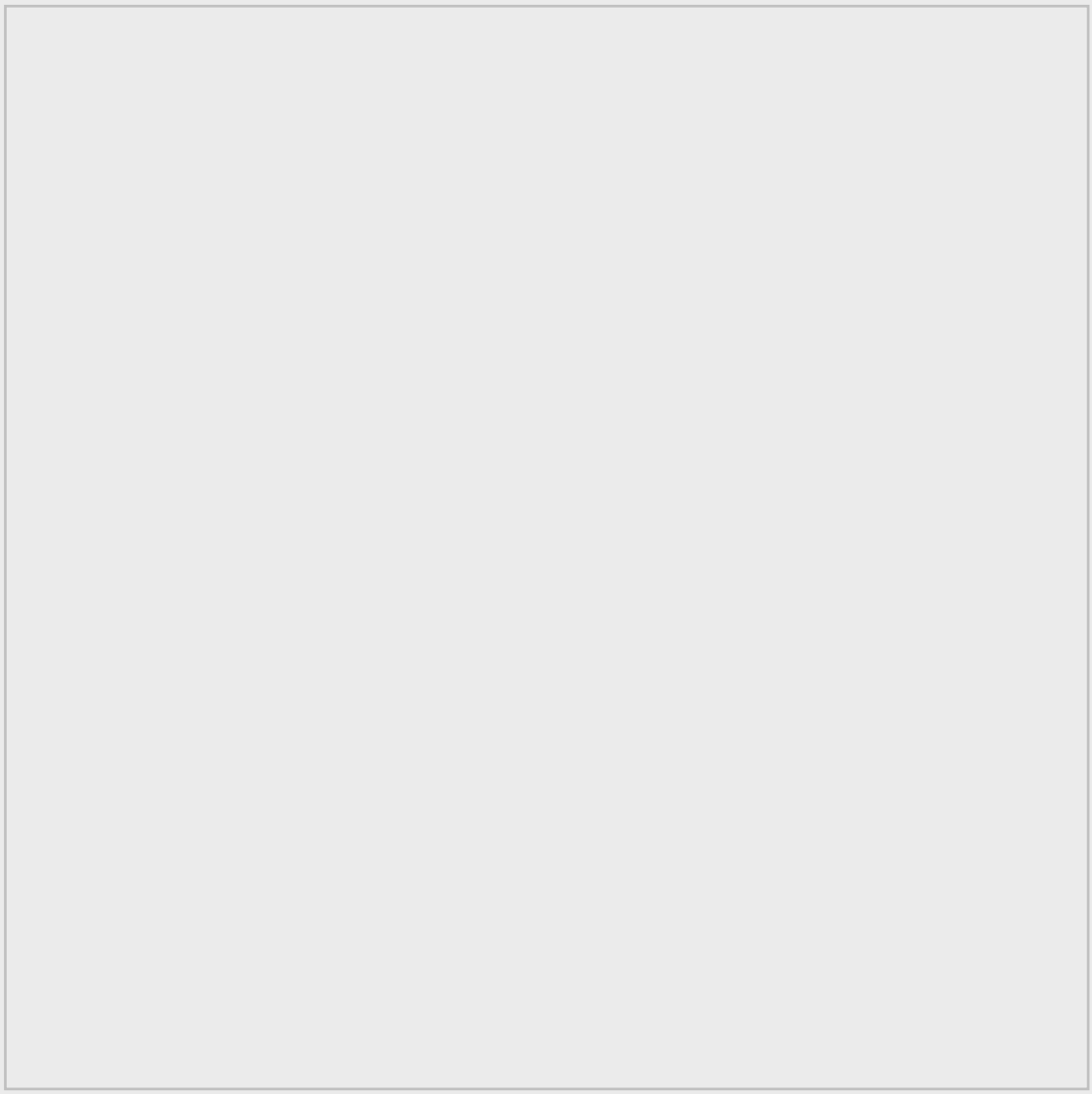
FDA issues a complete response letter for donanemab

On January 19, 2023, **Eli Lilly and Company announced** that the FDA has issued a complete response letter (CRL) for the accelerated approval submission of donanemab for the treatment of early symptomatic Alzheimer's disease. The CRL was based on the limited number of patients with 12-month drug exposure data in the accelerated approval submission; no other deficiencies were identified. The confirmatory Phase 3 TRAILBLAZER-ALZ 2 trial remains ongoing, with topline data read-out expected in Q2 2023, and will form the basis of donanemab's application for traditional approval shortly thereafter.

- Donanemab is a monoclonal antibody that targets amyloid beta.

Antibody News You Should Know

February 1 - 15, 2023



Business news

On February 1, 2023, **Cidara Therapeutics and WuXi XDC** announced an expansion of their existing collaboration under which WuXi XDC will provide investigational new drug-enabling chemistry, manufacturing and controls development services for Cidara's CD73 oncology drug-Fc conjugates (DFCs). Cidara's Cloudbreak platform couples potent drugs to a human antibody Fc. The resulting DFCs are designed to inhibit specific disease targets while simultaneously

engaging the immune system. In addition to its oncology program, Cidara is advancing its antiviral DFC CD388 through Phase 1 and Phase 2a clinical trials in partnership with Janssen for the universal prevention and treatment of influenza.

On February 9, 2023, **Ablexis, LLC,** which focuses on licensing its AlivaMab Mouse technology for antibody drug discovery, announced a license agreement with Adimab, LLC. The non-exclusive license grants Adimab rights to implement select strains of AlivaMab Mouse into its proprietary yeast-based technology for antibody drug discovery for its clients. Financial terms of the license were not disclosed. Ablexis, LLC created and offers AlivaMab Mouse, a growing suite of unique, patented next generation transgenic mice, as a foundational platform for successful human antibody drug discovery and development. Ablexis' sister company, AlivaMab Discovery Services, led by scientists with over a cumulative century of experience in antibody drug discovery, provides an integrated antibody therapeutic discovery and engineering platform using the AlivaMab Mouse technologies.

On February 10, 2023, **Nona Biosciences** announced that it has entered into a collaboration agreement with Mythic Therapeutics, Inc. a biotechnology company focused on the development of antibody-drug conjugate-based (ADC) therapies for the treatment of a wide range of cancers. Through the collaboration, Nona Biosciences will provide Mythic Therapeutics with access to its proprietary fully human heavy chain only antibody transgenic mice platform and antibody generation services to serve as input for Mythic Therapeutics' proprietary FateControl™ antibody engineering approach to generate next-generation ADCs for a wide range of cancers.

On February 13, 2023, **Cullinan Oncology and HARBOUR BIOMED** announced that Cullinan Oncology has entered into an exclusive license with Harbour BioMed for the development and commercial rights of HBM7008 (CLN-418) in the U.S. CLN-418/HBM7008 is a B7H4 x 4-1BB bispecific immune activator developed from next-gen heavy chain only antibody (HCAb)-based multi-specific antibody discovery platform HBICE®, currently in a Phase 1 clinical study being conducted at U.S. and Australian sites in patients with advanced solid tumors.

Clearance to start clinical studies received

On February 1, 2023, **Antengene Corporation Limited** announced that the filing of the first clinical trial of ATG-022 in patients with advanced or metastatic solid tumors (CLINCH Trial) has been approved by the Bellberry Human Research Ethics Committee in Sydney, and Clinical Trial Notification has been acknowledged by the Therapeutic Goods Administration.

- ATG-022 is an anti-Claudin 18.2 ADC.

Phase 1 studies queued or started
On February 1, 2023, details were posted on clinicaltrials.gov for a first-in-human, Phase 1/2 dose escalation, and dose expansion study (**NCT05708950**) of KVA12123 alone or combined with pembrolizumab in patients with advanced solid tumors. Sponsored by Kineta Inc., the study will enroll an estimated 314 participants and is due to start in February 2023.

- KVA12123 is a human engineered IgG1 monoclonal antibody that was designed to bind to VISTA through a unique epitope.

On February 8, 2023, details were posted on clinicaltrials.gov for a first-in-human Phase 1 study (**NCT05718557**) of PYX-106 in patients with advanced solid tumors. Sponsored by Pyxis Oncology, Inc., the study will enroll an estimated 45 participants and is currently recruiting.

- PYX-106 a humanized anti-Siglec-15 monoclonal antibody. Siglec-15 is an immune suppressor and potential target for normalization cancer immunotherapy, it is upregulated in multiple solid tumors.

On February 9, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT05719558**) of ASP1002 in patients with metastatic or locally advanced solid tumors. The clinical trials record indicates that subjects will be adults with locally advanced or metastatic solid tumors with high levels of Claudin-4. Sponsored by Astellas Pharma, the study will enroll an estimated 210 participants and is due to start in March 2023.

- ASP1002 is a bispecific antibody, presumably targeting Claudin-4, **developed in-house by Astellas**.

On February 1, 2023, **Aulos Bioscience** announced that the first patient has been dosed in the United States in its Phase 1/2 clinical trial (NCT05267626) evaluating AU-007 for the treatment of solid tumors. The company states the dosing marks the first time a computationally designed monoclonal antibody has entered human trial in the U.S. The clinical study will enroll an estimated 69 participants and started in April 2022 at trial sites in Australia.

- AU-007 is an anti-IL-2 human monoclonal antibody computationally designed by Biolojic Design.

On February 13, 2023, **Alligator Bioscience AB and Aptevo Therapeutics Inc** announced the dosing of the first patient in the companies' first-in-human Phase 1

trial evaluating ALG.APV-527 for the treatment of solid tumors expressing the tumor-associated antigen 5T4. The ALG.APV-527 Phase 1 trial is a multi-center, multi-cohort, open-label trial that will include six cohorts in a 3+3 design. The trial will be conducted at up to 10 sites in the U.S. among adult patients with multiple solid tumor types/histologies likely to express the 5T4 antigen, including non-small cell lung cancer, gastric/gastro-esophageal cancer and head and neck cancer.

- ALG.APV-527 is a bispecific conditional 4-1BB agonist, only active upon simultaneous binding to 4-1BB and 5T4.

EB06 Phase 2 study planned

On February 1, 2023, **Edesa Biotech, Inc.** announced that it has received approval from Health Canada for a Phase 2 clinical study of the company's EB06 monoclonal antibody candidate as a treatment for vitiligo, an autoimmune disease that causes skin to lose its color in patches. Edesa's drug targets autoreactive T cells that destroy the pigment-producing cells of the epidermis.

- EB06 is a CXCL10-targeted human monoclonal antibody originally developed by Light Chain Bioscience | Novimmune SA as NI-0801.

Nipocalimab Phase 2 study results reported

On February 6, 2023, **The Janssen Pharmaceutical Companies of Johnson & Johnson** announced positive topline results from the proof-of-concept Phase 2 open-label UNITY clinical trial for the treatment of pregnant adults at high risk for severe hemolytic disease of the fetus and newborn (HDFN). Nipocalimab was granted Fast Track designation in July 2019 and orphan drug status in June 2020 by the U.S. Food and Drug Administration, and orphan medicinal product designation by the European Medicines Agency in October 2019 for HDFN. Janssen is planning a Phase 3 study of nipocalimab in HDFN. Nipocalimab is currently being evaluated in Phase 2/3 or Phase 3 studies as a possible treatment for myasthenia gravis, polyradiculoneuropathy, and warm autoimmune hemolytic anemia.

- Nipocalimab is a human aglycosylated, effectorless IgG1 monoclonal antibody that targets the IgG-binding site of FcRn. The antibody antagonizes FcRn binding of IgGs and rapidly diminishes circulating levels of IgG antibodies, the primary pathogenic agent in a number of autoimmune diseases.

Antibody News You Should Know

February 15 - March 1, 2023

Business news

On February 21, 2023, **Hemab Therapeutics**, a clinical-stage biotechnology company developing the first prophylactic therapeutics for serious, underserved bleeding and thrombotic disorders, announced the closing of an oversubscribed $135 million Series B financing. Access Biotechnology led the round, with participation from new investors Deep Track Capital, Avoro Ventures, Invus, Rock Springs Capital, and Maj Invest Equity, as well as all current investors Novo Holdings, RA Capital Management, and HealthCap. The financing will support Hemab's scientific and corporate growth plans through 2025, including completion of an ongoing Phase 1/2 clinical study of lead candidate HMB-001 in Glanzmann Thrombasthenia, initiation of pivotal studies, start and completion of Phase 1/2 clinical evaluation for HMB-VWF in von Willebrand disease, and future pipeline evolution in accordance with the company's Hemab 1-2-5™ strategic guidance—targeting development of 5 clinical assets by 2025.

- HMB-001 is a bispecific antibody, with one arm binding FVIIa and the other arm binding TLT-1 present on the surface of the activated platelet; this effectively, and specifically, recruits FVIIa to the surface of the activated platelet.

On February 21, 2023, **Abilita Bio, Inc.** announced that it raised $7.5M in equity financing from Two Bear

Capital. The funds will help propel the company's existing preclinical therapeutic programs, initiate efforts on additional targets, grow the team, and expand operations in San Diego. Abilita Bio, Inc. is a privately held, innovation-driven biotechnology company focused on discovering and developing therapeutic antibodies targeting the most challenging and medically important multi-span membrane proteins.

On February 22, 2023, **Jounce Therapeutics, Inc.** announced that it is reducing its workforce by approximately 57 percent. The decision to reduce its workforce was made as Jounce believes advancement of its clinical programs, JTX-8064 and vopratelimab, requires funding and a scope that the company cannot pursue on its own and will be seeking business development opportunities for both programs.

- JTX-8064 is a LILRB2 (ILT4) receptor antagonist.
- Vopratelimab is a monoclonal antibody that binds to and activates ICOS.

On February 23, 2023, **AstraZeneca and KYM Biosciences Inc.** announced that they have entered into a global exclusive license agreement for CMG901. KYM Biosciences is a joint venture established by affiliates of Keymed Biosciences and Lepu Biopharma. Under the license agreement, AstraZeneca will be responsible for the research, development, manufacture and commercialization of CMG901 globally. CMG901 is currently being evaluated in a Phase 1 clinical trial for the treatment of Claudin 18.2-positive solid tumors, including gastric cancer.

- CMG901 is an antibody-drug conjugate targeting Claudin 18.2 and consists of an anti-Claudin 18.2 monoclonal antibody, a protease-degradable linker, and a cytotoxic small molecule monomethyl auristatin E.

On February 28, 2023, **AION Labs**, the first-of-its-kind innovation lab spearheading the adoption of AI technologies and computational science to solve therapeutic challenges, announced today the formation of DenovAI, the lab's second startup approved by the Israel Innovation Authority. The new company will develop an AI-powered biophysics solution that can discover potential antibodies completely de novo, and then suggest candidates likely to make effective drugs. DenovAI is the second company to be formed by Israel-based alliance of AstraZeneca, Merck, Pfizer, Teva, Israel Biotech Fund and Amazon Web Services, powered by BioMed X. DenovAI will combine advanced machine learning and computational biophysics to discover antibodies with broader scope, faster and less expensively, and to improve the probability of success for drug candidates.

Phase 1 studies queued or started

On February 21, 2023, details were posted on clinicaltrials.gov for a first-in-human study (**NCT05737628**) that will evaluate BYON4228 alone and in combination with rituximab in patients with relapsed/refractory CD20-positive B-cell non-Hodgkin's lymphoma. Sponsored by Byondis, the estimated study start date is April 1, 2023 and an estimated 100 participants will be enrolled.

- BYON4228 is a humanized monoclonal antibody directed against SIRPα.

On February 27, 2023, **Elpiscience Biopharmaceuticals, Inc**. announced that the first patient has been dosed in a Phase 1 clinical trial (NCT05717348) of ES014, an antibody that simultaneously targets two major immunosuppressive mechanisms in the tumor microenvironment. The study will evaluate ES014 administered in patients with locally advanced or metastatic solid tumors. An estimated 100 participants will be enrolled.

- ES014 is a bifunctional antibody–ligand trap created by fusing the TGFβ receptor II ectodomain to an antibody targeting CD39.

Phase 3 study of tarlatamab to start

On February 23, 2023, details were posted on clinicaltrials.gov for a Phase 3 study (**NCT05740566**) of tarlatamab with standard of care in patients with relapsed small cell lung cancer after platinum-based first-line chemotherapy. Sponsored by Amgen, the estimated study start date is in June 2023 and the study will enroll an estimated 700 participants.

- Tarlatamab (AMG 757) is an extended half-life BiTE® (bispecific T cell engager) antibody that targets DLL3

and CD3.

BLA for pozelimab receives FDA priority review

On February 21, 2023, **Regeneron Pharmaceuticals, Inc.** announced the U.S. Food and Drug Administration (FDA) has accepted for priority review the biologics license application (BLA) for pozelimab as a treatment for adults and children as young as 1 year of age with CHAPLE disease (also known as CD55 deficiency with Hyperactivation of complement, Angiopathic thrombosis and Protein Losing Enteropathy or CD55-deficient protein-losing enteropathy). There are currently no approved treatments for CHAPLE, an ultra-rare and life-threatening hereditary immune disease driven by an overactivation of the complement system. The target action date for the FDA decision is August 20, 2023.

- Pozelimab is a human monoclonal antibody that targets complement factor C5, a protein involved in complement system activation.

BLA for elranatamab receives FDA priority review

On February 22, 2023, **Pfizer Inc.** announced that the FDA has granted priority review for the company's BLA for elranatamab for the treatment of patients with relapsed or refractory multiple myeloma. A decision by FDA would typically be expected within 6 months. The European Medicines Agency (EMA) has also accepted elranatamab's marketing authorization application. The company is working closely with the EMA to facilitate their review and will provide updates on timing as appropriate.

- Elranatamab is a T-cell engaging bispecific antibody that targets B-cell maturation antigen and CD3.

Antibody News You Should Know

March 1 - 15, 2023

Bioworkshops is a CDMO specializing in antibody products. We delivery fully integrated CMC services for development and cGMP manufacturing of drug substance and drug product. A proven track record of compliance with FDA and EMA regulations, highly-flexible capacity for phase I through to commercial launch, and focus on our clients' needs, make **Bioworkshops** your ideal CDMO.

Business news

On March 2, 2023, **MorphoSys AG announced** that the company will stop work and operations on its pre-clinical research programs to optimize its cost structure. While the data from these pre-clinical programs are promising, MorphoSys would need to make substantial investments to bring these programs into the clinic. The company will reduce its workforce at the company's headquarters in Planegg, Germany, by approximately 17%. The steps taken over the past year will enable MorphoSys to focus resources on its mid- to late-stage oncology pipeline.

On March 6, 2023, **Bicara Therapeutics announced** that it completed an oversubscribed $108 million Series B financing to advance its lead program BCA101 and its pipeline of investigational candidates to treat solid tumor cancers. The financing was co-led by Red Tree Venture Capital and RA Capital Management, with participation from existing investors, including F-Prime Capital, Eight Roads Ventures, Invus, Piper Heartland Healthcare Capital and Premji Invest. New investors include Omega Funds, Bioqube Ventures, Acorn Bioventures and Janus Henderson Investors. The company previously reported promising efficacy and safety data from its

ongoing Phase 1/1b clinical trial and intends to present additional data at an upcoming medical conference in 2023. Additionally, the company continues to advance Investigational New Drug-enabling studies for BCA356, a second precision tumor modulator program.

- **BCA101** is a dual-action bifunctional antibody designed to inhibit EGFR and disable TGF-b directly at the tumor site, achieving superior anti-tumor response with an improved therapeutic window.

On March 13, 2023, **Sanofi and Provention Bio, Inc. announced** that they entered into an agreement under which Sanofi has agreed to acquire Provention Bio, Inc., for $25.00 per share in cash, representing an equity value of approximately $2.9 billion. The transaction adds TZIELD, an innovative, fully owned, first-in-class therapy in type 1 diabetes, to Sanofi's core asset portfolio in General Medicines and further drives its strategic shift toward products with a differentiated profile.

- **TZIELD** (teplizumab-mzwv) was approved in the U.S. last year as the first and only therapy to delay the onset of Stage 3 type 1 diabetes (T1D) in adults and pediatric patients aged 8 years and older with Stage 2 T1D.

On March 9, 2023, **UCB and Cancer Research UK** announced a clinical development collaboration to advance two of UCB's investigational oncology antibody candidates through clinical trials. The collaboration focuses on the development of two investigational antibody candidates, UCB6114 and UCB4594 by bringing together the oncology-focused translational research and clinical development capabilities of Cancer Research UK, and UCB's renowned antibody discovery expertise.

- **UCB6114** is a clinical-stage, potential first-in-class antibody targeting gremlin-1, a glycoprotein secreted by the tumour stroma.
- **UCB4594** is an antibody targeting the immune checkpoint, human leukocyte antigen G, also known as HLA-G.

On March 13, 2023, **Pfizer announced** it will acquire Seagen for $229 per Seagen share in cash, for a total enterprise value of approximately $43 billion. Seagen is a pioneer in ADC technology, with four of the 12 total FDA-approved and marketed antibody-drug conjugates (ADCs) using its technology industry-wide. The companies expect to complete the transaction in late 2023 or early 2024, subject to fulfillment of customary closing conditions, including approval of Seagen's stockholders and receipt of required regulatory approvals.

On March 14, 2023, **Synaffix BV announced** the expansion of its license agreement with MacroGenics, Inc. MacroGenics currently has the option to pursue up to seven ADC programs under the expanded deal, which includes three programs from the original collaboration. MacroGenics may combine both its proprietary antibody and bispecific DART® technologies with Synaffix's linker-payload technologies. The expanded collaboration includes up to $2.2 billion in total potential payments plus tiered royalties on net sales.

Phase 1 studies queued or started

On March 3, 2023, details were posted on clinicaltrials.gov for a first-in-human Phase 1 study (**NCT05753722**) of PRTH-101 alone or in combination with pembrolizumab in adults with advanced or metastatic solid tumors. Sponsored by Parthenon Therapeutics, the study has an estimated start date of March 3, 2023 and an estimated enrollment of 270 patients.

- **PRTH-101** is a humanized IgG1 monoclonal antibody that targets discoidin domain receptor 1 to punch holes in the mechanical barrier that characterizes immune-excluded tumors, thereby making them vulnerable to attack by the immune system.

On March 7, 2023, **Enthera Pharmaceuticals announced** the start of a Phase 1 first-in-human clinical trial with its lead candidate Ent001. The trial in healthy volunteers will evaluate Ent001's safety and tolerability and establish optimal dose levels for subsequent trials in patients with IBD and T1D, the target indications for the next stage of Ent001's clinical development.

- **Ent001** is an anti-TMEM219 monoclonal antibody that disrupts the IGFBP3/TMEM219 pathway, which

plays a critical role in both inflammatory bowel disease and type 1 diabetes.

On March 13, 2023, **Bio-Thera Solutions announced** the first patient was dosed in a Phase 1 study of BAT8007. The multicenter, open-label Phase 1 clinical study in patients with advanced solid tumors aims to evaluate the safety and tolerability of BAT8007. Key objectives of the study are to determine the maximum tolerated dose, recommended Phase 2 dose, and to evaluate the pharmacokinetics and preliminary efficacy in patients with advanced solid tumors.

- **BAT8007** is an ADC targeting Nectin-4 developed using Bio-Thera's proprietary ADC linker-payload that includes a cleavable but systemically stable linker, a small molecule topoisomerase I inhibitor and high DAR.

Phase 1 study on hold

On March 13, 2023, **Mersana Therapeutics, Inc. announced** that the Phase 1 trial of XMT-2056 h has been placed on clinical hold by the U.S. Food and Drug Administration (FDA). This action follows the company's communication to FDA that Mersana was voluntarily suspending the trial due to a recent Grade 5 (fatal) serious adverse event (SAE) that was deemed to be related to XMT-2056. The SAE occurred in the second patient who had been enrolled at the initial dose level in the dose escalation portion of the Phase 1 trial in previously treated patients with HER2+ recurrent or metastatic solid tumors. The SAE and its cause remain under investigation.

- **XMT-2056** is a systemically administered Immunosynthen STING agonist ADC (DAR 8) that is designed to target a novel HER2 epitope and locally activate STING signaling in both tumor-resident immune cells and in tumor cells, providing the potential to treat patients with HER2-high or -low tumors as monotherapy or in combination with standard-of-care agents.

Late-stage clinical study of PM8002 to start

On March 7, 2023, details were posted in clinicaltrials.gov for a Phase 2/3 study (**NCT05756972**) of PM8002 in non-small cell lung cancer patients (NSCLC). The study will evaluatte PM8002 in combination With chemotherapy in patients with EGFR-mutant advanced non-squamous NSCLC who failed to respond to EGFR-TKI treatment. Sponsored by Biotheus Inc., the study is due to start in March 2023 and has an estimated enrollment of 374 patients.

- **PM8002** is a bispecific antibody targeting PD-L1 and VEGF.

Development of solanezumab terminated

On March 8, 2023, **Eli Lilly and Company announced** that solanezumab did not slow the progression of cognitive decline due to Alzheimer's disease pathology when initiated in individuals with amyloid plaque but no clinical symptoms of the disease. The treatment did not clear plaque or halt accumulation of amyloid in participants treated with the drug in the Anti-Amyloid Treatment in Asymptomatic Alzheimer's disease (A4) Study. The company has concluded clinical development of solanezumab.

- **Solanezumab** is a humanized IgG1 antibody targeting soluble amyloid beta.

BLA for cosibelimab submitted

On March 2, 2023, **Checkpoint Therapeutics Inc announced** that the FDA accepted for filing the Biologics License Application for cosibelimab as a treatment for patients with metastatic cutaneous squamous cell carcinoma (cSCC) or locally advanced cSCC who are not candidates for curative surgery or radiation. The FDA has set a Prescription Drug User Fee Act goal date of January 3, 2024.

- **Cosibelimab** is a human IgG1 anti-PD-L1 monoclonal antibody.

Antibody News You Should Know
March 15 - April 1, 2023

Business news

On March 15, 2023, **ImmunoPrecise Antibodies announced** that Talem Therapeutics LLC, an independently operating subsidiary of IPA, and LiberaBio S.L., have signed a collaboration agreement to jointly address intracellular targets. Talem and Libera Bio will jointly develop novel antibodies for use with Libera's Multifunctional Polymeric Nanocapsules delivery, with the goal of offering them to larger pharma companies to conduct late-stage development and commercialization. The work launches with the investigation of two intracellular targets with very high unmet patient needs to offer options to the oncologists treating them.

On March 20, 2023, **BioNTech SE and OncoC4, Inc. announced** that they have entered into an exclusive worldwide license and collaboration agreement to develop and

commercialize OncoC4's next-generation anti-CTLA-4 monoclonal antibody candidate, ONC-392, as monotherapy or combination therapy in various cancer indications. The transaction is expected to close in the first half of 2023, subject to customary closing conditions and regulatory clearances. BioNTech and OncoC4 will co-develop ONC-392 as monotherapy or in combination with anti-PD1 in various solid tumor indications, with a randomized Phase 3 trial planned to start in 2023.

On March 22, 2023, **Checkmab S.r.l. announced** a collaboration and license agreement with Boehringer Ingelheim to develop a first-in-class monoclonal antibody for cancer immunotherapy in a broad variety of cancers. The antibody therapy selectively targets tumor-infiltrating regulatory T-cells (Tregs) without affecting other immune cells outside of the tumor. After an initial period of joint research, Boehringer Ingelheim will assume all development and commercial responsibilities. The company will also receive an exclusive, worldwide license to develop target specific antibodies and other molecules for all purposes from CheckMab, in exchange for an upfront payment, and a series of milestone related payments up to EUR 240 millions.

On March 22, 2023, **EpiBiologics launched** with $50 million in Series A funding. This biotechnology company is building a next-generation antibody-based protein degradation platform for membrane and extracellular drug targets. EpiBiologics' proprietary EpiTAC platform expands the targeted protein degradation landscape to the extracellular space, enabling the company to target both membrane proteins and secreted proteins through the use of genetically encoded bifunctional antibodies.
The funding was co-led by Mubadala Capital and Polaris Partners, with participation from Vivo Capital and GV. The company's technology platform is based on the scientific work of EpiBiologics' co-founder and renowned antibody engineer Dr. Jim Wells of the University of California, San Francisco (UCSF), and the platform intellectual property has been exclusively licensed from UCSF.

Orphan drug designation granted
On March 21, 2023, **Ichnos Sciences Inc. announced** the company was granted orphan drug designation by the U.S. Food and Drug Administration (FDA) for ISB 1442 for the treatment of relapsed/refractory multiple myeloma. The company began dosing patients in a first-in-human Phase 1 study (NCT05427812) in Australia in September 2022, and U.S. sites are expected to open in the second quarter of this year.

- ISB 1442 is a biparatopic 2+1 BEAT® bispecific antibody targeting CD38 and CD47.

Preclinical data to be presented
On March 23, 2023, **ImmunoPrecise Antibodies announced** that their wholly owned subsidiary, Talem Therapeutics, will present a scientific poster with their latest data on the development of bispecific T-cell engagers targeting TrkB at the annual AACR meeting in Orlando, Florida, which is held from April 14 to 19, 2023. We are not aware of any other antibodies targeting Trk-B that are in clinical studies. Thus it is true that, with this

advanced development to target TrkB-expressing tumor cells, IPA differentiates itself from other organizations developing immunotherapeutics to treat malignant solid tumors.

IND for SNS-101 submitted

On March 21, 2023, **Sensei Biotherapeutics, Inc. announced** the submission of an Investigational New Drug application to the FDA for a Phase 1/2 clinical trial of SNS-101 in patients with solid tumors. Sensei plans to evaluate SNS-101 as a novel treatment for patients with solid cancers, as both a monotherapy and in combination with other therapies.

- SNS-101 is a conditionally active VISTA-blocking antibody.

Phase 1 studies queued or started

On March 16, 2023, **Pyxis Oncology, Inc. announced** dosing of the first subject in a Phase 1 trial of PYX-201. Licensed from Pfizer, the antibody targets the extradomain-B (EDB) of fibronectin, a non-internalizing antigen that is an integral component of the extracellular matrix in tumors. EDB fibronectin is overexpressed in many solid tumors and minimally expressed in most normal adult tissues. The company anticipates preliminary data from this trial in early 2024.

- PYX-201 is a novel antibody-drug conjugate product candidate.

On March 29, 2023, details were posted on clinicaltrials.gov for a Phase 1 study (**NCT05789069**) of HFB200603 as a single agent and in combination with tislelizumab in patients with advanced cancers. Sponsored by HiFiBiO Therapeutics, the study will enroll an estimated 83 participants and has an estimated start date in March 2023.

- HFB200603 is a novel monoclonal antibody against the immune checkpoint BTLA that blocks the interaction with its ligand, HVEM. HFB200603 is designed to reverse HVEM-mediated immune suppressive effects and induce the production of inflammatory cytokines in various solid tumors selected by HiFiBiO's proprietary Drug Intelligence Science (DIS™) platform.

First approvals for retifanlimab and glofitamab

On March 22, 2023, **Incyte announced** FDA approval of Zynyz™ (retifanlimab-dlwr), for the treatment of metastatic or recurrent locally advanced Merkel cell carcinoma (MCC). FDA's approval was based on data from the Phase 2 POD1UM-201 trial (NCT03599713), an open-label, multiregional, single-arm study that evaluated Zynyz in adults with metastatic or recurrent locally advanced MCC who had not received prior systemic therapy for their advanced disease.

- Retifanlimab is a humanized, hinge-stabilized IgG4k monoclonal antibody targeting programmed death receptor-1.

On March 25, 2023, **Hoffmann-La Roche Limited (Roche Canada) announced** that

on March 24, 2023, Health Canada authorized COLUMVI® (glofitamab for injection) for the treatment of adult patients with relapsed or refractory diffuse large B-cell lymphoma (DLBCL) not otherwise specified, DLBCL arising from follicular lymphoma, or primary mediastinal B-cell lymphoma, who have received two or more lines of systemic therapy and are ineligible to receive or cannot receive CAR-T cell therapy or have previously received CAR-T cell therapy. COLUMVI has been issued marketing authorization with conditions, pending the results of trials to verify its clinical benefit.

- Glofitamab (RO7082859) is a full-length IgG1λ/κ bispecific T cell redirecting antibody targeting CD20 on malignant B cells and CD3 on T cells.
