Adimab
The power of integration.

February 23, 2017

Adimab Publishes Biophysical Performance Metrics that Predict Drug-like Properties of Antibody-based Therapeutics

Lebanon, New Hampshire - February 23, 2017 - Adimab, LLC, the global leader in the discovery and optimization of fully human monoclonal and bispecific antibodies, today announced the publication of a study focused on the biophysical characterization of 137 clinical-stage and approved antibody drugs. The research was published in the Proceedings of the National Academy of Sciences (PNAS).

"Developability of antibody therapeutics has been an important focus at Adimab," stated Yingda Xu, Director of Protein Analytics at Adimab. "Many antibodies enter clinical testing yet fail to become drugs because of poly-specificity, expressibility, and aggregation issues. Our work provides practical guidelines for applying biophysical assays early in the antibody discovery process to focus on leads that are likely to succeed."

"We have had Lipinski's rule of five providing general guidance of what successful small-molecule drugs typically look like. However, up to this point, we have not had such a rule set for antibody-based therapeutics. This work begins to close that gap," commented Dane Wittrup, co-founder of Adimab.

"Adimab spends more than 5 million annually to advance new technologies and capabilities. One of our focus areas over the past couple of years has been developability and understanding the reasons why antibodies fail in development. This publication helps to provide a framework for assessing the likelihood of an antibody or bispecific molecule becoming an actual drug," said Tillman Gerngross, co-founder and CEO of Adimab.

The abstract of the PNAS paper entitled "Biophysical properties of the clinical-stage antibody landscape" reads:

Antibodies are a highly successful class of biological drugs, with over 50 such molecules approved for therapeutic use and hundreds more currently in clinical development. Improvements in technology for the discovery and optimization of high-potency antibodies have greatly increased the chances for finding binding molecules with desired biological properties; however, achieving drug-like properties at the same time is an additional requirement that is receiving increased attention. In this work, we attempt to quantify the historical limits of acceptability for multiple biophysical metrics of "developability." Amino acid sequences from 137 antibodies in advanced clinical stages, including 48 approved for therapeutic use, were collected and used to construct isotype-matched IgG1 antibodies, which were then expressed in mammalian cells. The resulting material for each source antibody was evaluated in a dozen biophysical property assays. The distributions of the observed metrics are used to empirically define boundaries of drug-like behavior that can represent practical guidelines for future antibody drug candidates.

The manuscript can be obtained at:

PNAS link: http://www.pnas.org/content/early/2017/01/11/1616408114.full.pdf

Additional recent Adimab publications:

"Rapid assessment of oxidation via middle-down LCMS correlates with methionine side-chain solvent-accessible surface area for 121 clinical stage monoclonal antibodies." Yang, R., Jain, T., Xu, Y., et al. *mAbs* (2017).

"Rapid profiling of RSV antibody repertoires from the memory B cells of naturally infected adult donors." Gilman, M., Castellanos, C.A., Walker, L.M., et al. *Science Immunology* (2016).

"Broad epitope coverage of a human in vitro antibody library." Sivasubramanian, A., Abdiche, Y., et al. *mAbs* (2016).

"Isolation of potent neutralizing antibodies from a survivor of the 2014 Ebola virus outbreak." Bornholdt, Z.A., Walker, L.M., et al. *Science* (2016).

"Addressing polyspecificity of antibodies selected from an in vitro yeast presentation system: a FACS-based, high-throughput selection and analytical tool." Xu, Y., Krauland, E., et al. *PEDS* (2013).

About Adimab

Adimab has established antibody discovery collaborations with many leading pharmaceutical companies, such as Merck, Novo Nordisk, Biogen, GSK, Roche, Novartis, Eli Lilly, Genentech, Celgene, Gilead, Kyowa Hakko Kirin, Takeda and Sanofi. In addition, Adimab has partnered with several smaller publicly traded companies, such as Acceleron, Merrimack, Kite, Five Prime, as well as leading venture-backed companies including Jounce, Mersana, Alector, Surface Oncology, Potenza, Tizona, Tusk and several academic institutions such as Memorial Sloan Kettering and MD Anderson. The Adimab antibody discovery and optimization platform has also been internalized by several large pharma partners; *Adi-inside* partners include Merck, Novo Nordisk, Biogen and GSK.

Adimab's integrated antibody discovery and optimization platform provides unprecedented speed from antigen to purified, full-length human IgGs. Adimab offers fundamental advantages by delivering diverse panels of therapeutically relevant antibodies that meet the most aggressive standards for affinity, epitope coverage, species cross-reactivity and developability. Adimab enables its partners to rapidly expand their biologics pipelines through a broad spectrum of technology access arrangements. For more information, please visit the Adimab website at http://www.adimab.com.

Adimab Contact

Guy Van Meter
VP of Business Development
Adimab, LLC
(603) 653-5775