



Cloud-Based Discovery Platform Identifies Hundreds of Diverse SARS-CoV-2 Antibodies

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Therapeutic antibodies, used to treat a variety of diseases, are the fastest growing class of pharmaceuticals projected to grow to ~\$240 billion by 2025¹. Isolation of individual antibodies for biophysical screening can be performed by a variety of technologies ranging from animal immunization², advanced methods harnessing the immune response³⁻⁵ and *in vitro* display technologies⁶⁻⁸. In most, if not all, of these cases, antibody engineers must sequence the outputs, using low- (e.g., Sanger) and/or high-throughput (e.g., next generation sequencing (NGS)) to gain a deeper understanding of critical features including scaffold distribution, complementarity determining region (CDR) composition, physicochemical similarity, sequence and/or structure-based biophysical properties, and population-based NGS metrics. At Specifica, we routinely combine Sanger and NGS to broaden the scope of selected antibody diversity for characterization. The goal is to minimize redundancy and maximize epitope coverage by selecting antibody representatives from distinct CDR classes. To achieve this, Specifica built a comprehensive bioinformatics software package readily suited for the identification of therapeutic leads from next generation sequencing (NGS), which even allows for the efficient ranking of low-throughput clones identified by random picking. After teaming up with OpenEye Scientific, we have integrated this antibody discovery pipeline into Orion™ to empower the antibody engineering community with a cloud-based solution for the efficient identification of therapeutic candidates for screening. This talk describes how we used this discovery software to identify a panel of leads with broad specificity, including many highly potent neutralizers against SARS-CoV-2 Spike protein.

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About Specifica

Specifica is headquartered in Santa Fe, New Mexico, and provides antibody discovery services to the pharmaceutical and biotech industries. Specifica's flagship technology, the Generation 3 Antibody Discovery Platform, is centered around a suite of novel patented in vitro phage and yeast display library technologies which consistently yield antibodies with broad diversities, extremely high affinities, and the relative absence of biophysical liabilities. The Generation 3 platform may be accessed by engaging Specifica to carry out antibody discovery or optimization campaigns, or by full transfer of the platform within an end-to-end matrix that includes the critical tools required to generate a broad set of drug-like antibody leads that require minimal optimization. Libraries can be based on Specifica's in-house design or customized to suit customer preferences. As part of its in-house antibody discovery services, Specifica developed AbXtract, a modular bioinformatic platform designed to easily analyze next generation sequencing antibody datasets to facilitate lead selection. This platform is now being co-marketed with OpenEye for broader access to the biotech and pharma community.



About OpenEye

OpenEye Scientific is an industry leader in computational molecular design through rapid, robust, and scalable software, consulting services, and Orion®, the only cloud-native fully integrated software-as-a-service molecular modeling platform. Combining unlimited computation and storage with powerful tools for data sharing, visualization and analysis in a flexible development platform, Orion offers unprecedented capabilities for the advancement of pharmaceuticals, biologics, agrochemicals, and flavors and fragrances. Founded in 1997, OpenEye is a privately held company headquartered in Santa Fe, N.M., with offices in Boston, Mass.; Cologne, Germany; and Tokyo, Japan. For more information, go to www.openeye.inc.



About Orion

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- Integrate third-party or in-house tools.
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