MODELED AFTER THE BEST. READY FOR THE RACE AHEAD.

mAbs v BENCHMARK

BASED ON AN INCREDIBLE TRUE STORY

PRESENTED BY single cell TECHNOLOGY AND CASE STUDY CINEMAS

single cell TECHNOLOGY

mAbs v BENCHMARK:

Competition assay to quickly profile hits

The Problem

You've got a benchmark or even a clinical antibody with desired function. Now you want to discover antibodies that compete with the benchmark.

In this case study, human cells from donors who recently received their seasonal flu shot were deep mined with AbTheneum screening, targeting antibodies cross-reactive to highly diverse hemagglutinin (HA) proteins and competing with a clinical stage flu neutralizing antibody, MEDI8852.

The Solution

AbTheneum combines multiple assays during each antibody campaign.

After obtaining activated memory B cells from human PBMCs, cells were deposited onto a picoliter device. 3 capture slides were generated to screen all antibodies for binding to 4 HA proteins and competition with MEDI8852. The 4 HA proteins from a different viral subtype were selected based on their vastly divergent sequences: A/California/7/2009 HA, A/Vietnam/ 1194/2004 HA, A/California/7/2004, and A/Shanghai/ 1/2013 HA, which are named in this work H1N1, H3N2, H5N1, and H7N9, respectively.

Over 2,000 anti-HA antibody hits were discovered from 100M donor PBMCs, with 15 mAbs cross-reactive to all 4 HAs. AbTheneum screened for cross-reactivity to all 4 HA proteins and MEDI8852 competition (Fig. 1).

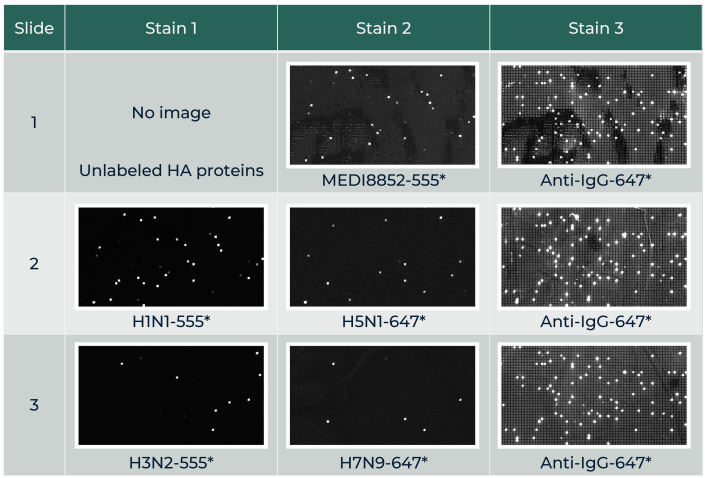

Figure 1. Screening plan and small cropped region from the same area on all 3 slides across 8 screening conditions. Slides were scanned on a fluorescent slide scanner and aligned across all slides and images.

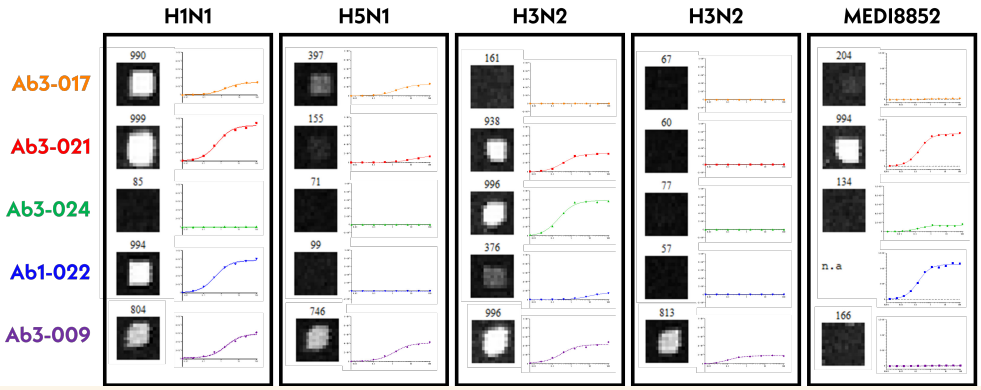

Figure 2. Five antibodies with diverse binding profiles were expressed and tested by ELISA against all HA proteins and competition with MEDI8852. Small image cutout shows AbTheneum screening result compared to curves generated by ELISA. Negative MEDI8852 screening result means antibody blocks/competes with MEDI8852.

All sequences are captured in AbTheneum and sequenced by NGS. 5 unique mAbs were expressed (Fig. 2) with diverse binding profiles. The cross-reactivity screening results against the 4 HA proteins was 100% confirmed by ELISA. The competition assay against MEDI8852 antibody also confirmed. Ab3-009 (Fig. 2, purple) shows cross-reactivity against all 4 HA proteins in the study and competes with MEDI8852, meeting target goals.

This case study demonstrates AbTheneum enables rapid filtering from thousands of antibodies to find mAbs with rare properties. It also offers the advantage of layering multiple screens, delivering layers of data on top of the natively paired full-length sequences from human cells. The ELISA data confirmed the screening data captured by AbTheneum, showcasing the predictive power of the cross-reactivity and competition assays.

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