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Doing more with less: Automated workflows for high throughput micro-scale antibody purification

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Due to the revolutionary impact of monoclonal antibodies in the field of therapeutics and diagnostics, more pharmaceutical companies are expanding their antibody discovery efforts. In early research, various types of IgGs from multiple species are generated through hybridoma, phage library and other antibody discovery technologies. In large campaigns, thousands of antibodies are often expressed in micro-scale (~1mL) by high throughput (HTP) hybridoma culture or transient expression in 96 well culture blocks. Availability of purified antibodies significantly improves the reliability of “hit identification” from HTP screening assays. To improve efficiency and consistency, we have developed automated HTP workflows using two liquid handling platforms, resulting purification capacity of ~2000 antibodies in a single day with just one operator. In addition to supporting antibody discovery or engineering campaigns with thousands of purified proteins, these HTP work flows have also enabled rapid in-parallel testing of purification conditions using design of experiment (DOE) principles. For instance, purification of certain antibody formats (such as Fabs) and some murine or rat antibodies (such as Rat IgG2a) necessitates pH and/or salt adjustment with commonly used resins (Protein A or G), making the process impractical for HTP implementation. Using our HTP approaches we have identified a commercially available, engineered protein G resin that can capture all rat IgGs under physiological conditions and have optimized elution conditions to maximize antibody recovery.

Biography

Peng Luan has worked on Protein Therapeutics for 20 years in the biotech/pharmaceutical industry. He holds a Master of Science degree from University of Nebraska-Lincoln and is currently a Sr. Scientific Researcher at Genentech, Inc. His recent work has been involved in developing high throughput purifications that enable large antibody discovery campaigns. He is a co-inventor on five issued US patents and had several journal publications on therapeutic protein engineering and productions.

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