

USP Biologics Roundtable on Performance Standards Development for Chromatographic Column Qualifications-- November 2, 2018--U.S. Headquarters, Rockville, MD

Executive Summary

USP met with scientists from leading pharmaceutical companies to discuss challenges in qualification of chromatographic columns for analytical testing in biologics and develop solutions and performance standards to address unmet needs.

The objective of this roundtable was to identify common gaps and areas where performance standards could be useful throughout the product life cycle, discuss the possibility of publication and/or blog article on best practices, and develop an action plan for collaborative development of performance standards.

Participants shared the challenges they encountered in their own organizations, raised important questions and concerns, and discussed potential approaches for the path forward. The group accomplished a major objective by compiling a list of potential performance standards for qualification of chromatographic columns used in different analytical methods for biologics sample testing and then prioritizing these standards based on potential impact and probability of success. In addition to the tangible outcomes of the meeting, USP reaffirmed its ongoing commitment to partnering with industry as well as with column and instrument manufacturers.

Challenges for analytical chromatographic column qualification

- Column is always a major variable during Robustness testing
- Column variability can be vendor-to-vendor, lot-to-lot, and within lot
- Column variability also impacts instrumentation and qualification of new instrumentation
- Vendor qualification often does not reflect the use in biologics
- Lack of transparency and traceability with vendors is a major challenge

Utility of performance standards for column qualification

- Qualification by vendors (column and instrument) for use in biologics
- Qualification by biologics manufacturers
- Training
- Tech transfer, in-country testing

Prioritization of performance standards for column qualification

Participants discussed potential performance standards for a variety of column types and prioritized those with the most potential benefit to the industry and highest probability of success to develop. The group reached a consensus on the following standards which they considered most feasible and beneficial to industry. Participants also identified key attributes for the material and discussed potential sources of bulk materials.

- Ion Exchange (IEX) column: Two potential performance standards derived from monoclonal antibodies with appropriate isoelectric point (pI) and charge distribution for anion exchange and cation exchange columns.
- Size Exclusion Chromatographic (SEC) column: Two potential performance standards consisting of monoclonal antibodies with known amounts of aggregates and fragments. One standard could include aggregates and larger fragments and the other would include smaller fragments.
- Reverse phase (RP) column: Two potential performance standards, including a panel of peptides with different properties (size, hydrophobicity, etc.) as well as an intact protein with post-translational modifications
- Hydrophobic Interaction Chromatography (HIC) column: Monoclonal antibody with different modifications and hydrophobicities.

Next steps include:

- Additional focused discussions (roundtables/panels) to engage column and instrument vendors and subject matter experts in the prioritized topics.
- Identify suitable sources of material for the performance standards.
- Initiate studies to characterize and evaluate performance standards for column qualification.
- Convene follow-up discussion on a potential publication on best practices for column and instrumentation hygiene.

USP will continue to seek industry input, perspective, collaborative development opportunities, and material sponsorships for biologics performance standards. We look forward to further interactions and collaborations to help ensure that USP is delivering solutions that meet the needs of the biologics community. Please contact Huiping Tu at hpt@usp.org, if you are interested in getting involved with next steps, or have questions.