Dhanesh Gadre et al., J Proteomics Bioinform 2017, 10:10 (Suppl)
DOI: 10.4172/0974-276X-C1-103

Endotoxin reduction in protein solutions using octyl β-D-1-thioglucopyranoside wash on chromatography media

Dhanesh Gadre and **Ellen T O'Connor**
MedImmune LLC, USA

Endotoxins are complex molecules and a significant impurity risk present in the downstream purification processes. Trace amounts of endotoxins can cause immune responses in humans resulting in fever or hypertensive shock. Endotoxins also interfere with the cell based activity assays, impacting the selection of biopharmaceutical drug candidates. For these reasons, it is very important for academic, research and development labs and manufacturing facilities to ensure that protein samples and products are free of endotoxins. During biopharmaceutical production, endotoxins are usually cleared during the downstream purification process. However, if endotoxins interact with a protein of interest through electrostatic or hydrophobic interactions, they can become difficult to remove. Triton X-100 has showed promise in breaking the endotoxins-proteins interactions. However, in some cases Triton X-100 becomes ineffective at breaking these interactions and is therefore unable to remove endotoxins. In this study, we were able to identify a wash condition on chromatography media using a non-ionic detergent octyl-β-D-1-thioglucopyranoside (OTG). This detergent wash can reduce endotoxins from protein solutions to lower levels than Triton X-100 with similar or better protein recovery. Different classes of proteins were bound to different modes of chromatography media and then washed with a variety of detergents. OTG showed the most promising data among these detergents in reducing endotoxin levels with high protein recovery. We examined the mechanism of action to determine why OTG showed better endotoxin clearance ability than Triton X-100. Triton X-100 affects only hydrophobic interactions but OTG can affect hydrophobic as well as electrostatic interactions between proteins and endotoxins. We also showed the impact of the robust OTG on research cell based assays.

Biography

Dhanesh Gadre works in the Purification Process Sciences Department at MedImmune LLC, USA. He designs, develops and executes protein purification processes for the development of biopharmaceutical products such as humanized monoclonal antibodies and recombinant proteins. He performs purification and biophysical characterization and formulation of antibodies and protein reagents in response to the needs of several departments using protein biochemistry and chromatography principles and methods. He also has expertise in analytical biochemistry techniques such as HPLC, gel electrophoresis etc. He has Master of Science degree in Chemical Engineering from Syracuse University, USA.

gadred@medimmune.com

Notes: