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Characterizing interaction of chromatographic beads with *Hansenula polymorpha* by force spectroscopy and XDLVO

Cristina Chiotu, Vikas Yelemene, Alexander Neveshkin, Marcelo Fernandez-Lahore and Jurgen Fritz
Jacobs University Bremen, Germany

Project aims to quantify the interactions that occur at nanoscale between biomass and chromatographic beads in real-life expanded bed adsorption. Force spectroscopy can be probed with AFM between single chromatographic beads and a cellular layer of *Hansenula polymorpha* or a thin film of mannan sugar. The work included in this presentation focused on probing interaction of Source S (negative) and Source Q (positive) beads with *Hansenula polymorpha* in phosphate buffer of different NaCl concentration. The results of force spectroscopy are compared against XDLVO calculations obtained from contact angle and zeta potential measurements. The beads (Fastline or Source) were tested with AFM on a clean silicon surface before performing the measurements on cells. The beads showed good reproducibility and stability regarding electrostatic repulsion or attraction. Characterization of beads at nanoscale as well as a detailed analysis of their behavior when interacting with biomass may lead to higher efficiency and performance in downstream processing biotechnology.

cristina.chiotu@kaust.edu.sa
cristinachiutu@yahoo.com