The Centre for Blood Research Seminar Series

CBR

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Wednesday, July 17th, 2013
LSC 3 - Life Sciences Centre
2350 Health Sciences Mall
12-1pm

"Toward Solvent Free Precipitation of Plasma Proteins"

It is well appreciated that every year millions of liters of human plasma are processed for the purification of plasma proteins. Much is initially processed via Cohn Fractionation (CF) methods based on ethanol mediated precipitation. CF gives lower than desired yields of some proteins, is time consuming, and involves significant amounts of solvent. The latter represents challenges in regard to cost, safety, ecological friendliness, and process equipment complexity. It is also a hurdle to adaptation of single use technology for plasma processing. Various precipitation-free processes have been developed however the natural tendencies of major plasma proteins to differentially precipitate argues in favor of precipitation methods, if they are not solvent dependent. The ability of polyacids such as polyacrylic acid (PAA) to precipitate plasma proteins has long been appreciated. However related operations can involve batch to batch adjustment of the ratio of polymer to protein, and may result in precipitates that aredifficult to re-suspend. In previous work we showed that including >50 mM salts such as NaCitrate with 8 to 10% (w/w) solutions of PAA allowed for almost complete precipitation of antibodies over a wide range of protein concentration. The precipitates formed dissolved readily in 1:1 (v/v) mixtures of aqueous buffers for ease of follow on chromatography. Subsequent work has extended this approach to differential precipitation of plasma protein fractions rich in fibrinogen, antibodies, albumin and other proteins. The method requires little plasma feed dilution and appears robust in regard tomany process variables, such as plasma feed pre-treatment, variations in temperature, and pH, as well as polyacid type or molecular weight.