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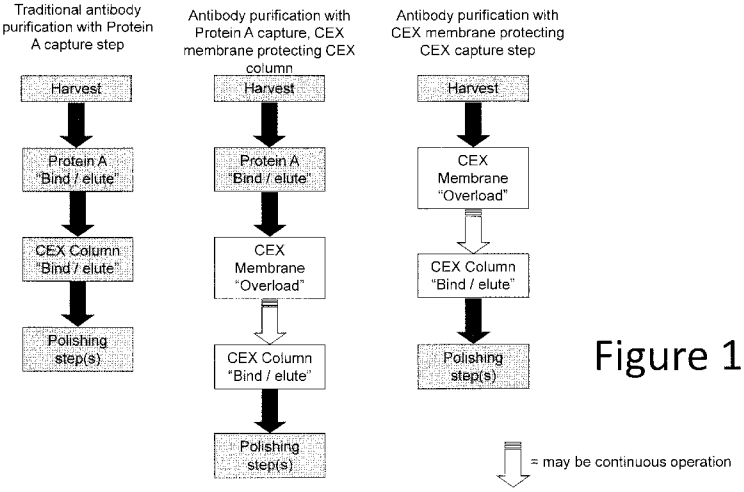


Figure 1

(57) Abstract: Methods of enhancing efficiency of downstream chromatography steps for purification of proteins comprising: (a) passing a composition comprising a polypeptide of interest and various contaminants through an ion exchange membrane, wherein the polypeptide and the membrane have opposite charge, at operating conditions comprised of a buffer having a pH sufficiently distinct from the pI of the polypeptide to enhance the charge of the polypeptide and a low ionic strength effective to prevent the shielding of charges by buffer ions, which cause the membrane to bind the polypeptide and at least one contaminant, (b) overloading the ion exchange membrane such that at least one contaminant remains bound to the membrane while the polypeptide of interest is primarily in the effluent; (c) collecting the effluent from the ion exchange membrane comprising the polypeptide of interest; (d) subjecting the membrane effluent comprising the polypeptide of interest to a purification step of similar charge as the previous membrane, and (e) recovering the purified polypeptide from the effluent of the charged ion exchange chromatography purification step.

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