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Purification of interferon alpha 2b-based biopharmaceuticals using ionic liquid-based technologies

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Protein biopharmaceuticals, among which interferon alpha-2b (IFN α -2b) that can be used in the treatment of chronic hepatitis C, have become an indispensable product of current medicine. Aiming at finding new cost-effective, efficient and sustainable technologies for recombinant IFN α -2b purification, ionic liquids were investigated as adjuvants in polymer-polymer aqueous two-phase systems (ATPS) or as chromatographic ligands covalently attached in silica (Supported ionic liquids, SILs). The application of ionic liquids as adjuvants in ATPS composed of polyethylene glycol (PEG 600 g/mol) and polypropylene glycol (PPG 400 g/mol) enhanced the purity of IFN α -2b recovered in the PEG-rich phase. On the other hand, SILs exhibited promising results toward IFN α -2b purification both in conditions favouring ionic or hydrophobic interactions, reinforcing the multimodal character of these novel stationary phases. Also, the secondary structure of IFN α -2b is preserved with both purification processes, as appraised by circular dichroism and western-blot studies. Overall, our results demonstrate the high potential exhibited by ionic liquids toward the preparative purification of the recombinant IFN α -2b biopharmaceuticals.

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