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High resolution monolithic columns - enabling tool for understanding viral structures and their purity

Aleš Štrancar

BIA Separations, Slovenia

HPLC is one of the key methods to analyse the concentration of molecules and substantially help to study their structures. Although being vastly used for small molecules and for most of biomolecules the HPLC has not been much applied for viral (such as viral vectors, viral particle based vaccines, phages, VLPs) analytics. Viral based structures can be, from the point of their chromatographic properties, regarded as very big protein, and as such analysed. From this point of view, the HPLC could easily be applied for the tasks. It was the chromatographic resin structure with diffusive end pores, too small to allow most of viral structures to enter, which was limiting the use of the HPLC in this field. Introduction of monolithic resins with open channels and no diffusive pores enabled the HPLC to be extensively applied for viral structures separations. Entrapment of the viral structures and carry-over has been dumped and time of the analysis accelerated. Surprisingly also the resolution power has been greatly improved when compared to traditional chromatographic resins. As result, the HPLC columns based on CIM monolithic chromatographic supports are not only able to determine the ratio of full and empty viral capsids but can further separate and analyse subpopulations of the capsids, as will be shown in this presentation. This feature is opening new era in the study of viral structures and understanding of their properties, efficiency and safety.



Biography

Aleš Štrancar is the CBDO of the BIA Separations and one of the main inventors of the CIM Convective Interaction Media®. He is author and co-author of more than 60 scientific papers dealing with separation and purification technologies, a co-author of five granted USA patents and their foreign equivalents in the field of biomolecule separations and purification and a co-author of several book chapters dealing with novel chromatography technologies for biomolecule separation. He co-developed several industrial scale purification processes. He was the President of Technology Council of Ministry of Economy of the Republic of Slovenia and Member of Science and Technology Council of the Republic of Slovenia.

ales.strancar@biaseparations.com

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