

€5.8 million to start a new era in vaccine purification

The DiViNe initiative, a joint European collaboration of renowned experts, convinced the European Commission. Its main concept is “positive” vaccines purification by affinity chromatography based on 2 innovative nanotechnologies for higher yield and lower footprint. The six participating partners from research and industry will receive more than €5.8 million in financial support from the new EU's Horizon 2020 Framework Program.

A “positive” purification to drastically reduce manufacturing costs

Purification steps account for up to 80% of manufacturing costs of most biological drugs, such as antibodies and proteins. In the vaccine industry, purification processes are particularly complex as vaccines aim at protecting healthy people. « Any contaminant must be removed via multiple elimination steps which comes at the expense of product recovery: yields are low, product costs are high » says Project Coordinator Manuel Carrondo, Professor of Chemical and Biochemical Engineering and Director of iBET. Technically, this is partly due to the lack of specific capture systems for « positive » separation of the vaccine from its environment.

The EU co-funded project DiViNe will tackle these technical and cost issues with innovative nanotechnology-based answers, gathering the competencies of 6 partners from 5 different EU countries, coordinated by iBET. The activities will last 60 months, costing €7.6 million, of which €5.8 million will be covered by EU funds.

The partners will adopt affinity chromatography, a potent way to separate one active compound from its environment almost exclusively used for purification of monoclonal antibodies with protein A. Novel affinity ligands, Nanofitins[®], bear all the features to extend affinity chromatography for purification of most biologics starting with vaccines: tailored affinity and elution parameters, easy conjugation to resins, low cost-of-goods... Merck Millipore will develop Nanofitin[®]-based chromatographic materials.

A water-friendly process broadening access to vaccines for emerging countries

Vaccines purification comes with large water-consuming elution steps. By using innovative membranes coated with naturally filtering Aquaporins, water will be purified by consuming only small amounts of energy and will be reused in the process for a minimal environmental footprint and huge cost-savings. « Today, emerging-country manufacturers produce about 50% of vaccines purchased by United Nations agencies for use in the developing world. They operate under environmental conditions which require specific handling of water-based products due to limited resources» says Mikkel Nissum, Head of Bacterial Drug Substance Development at GSK (former Novartis Vaccines). Such partner involvement ensures that purification processes developed under DiViNe project meet industrial needs and expectations.

Through such demonstration on vaccines, the DiViNe consortium will establish a sustainable platform to design affordable, industry-compliant and environment-friendly purification processes for other complex biological drugs, such as recombinant proteins and blood products.

More information on www.divineproject.eu

The full list of participants in the DiViNe consortium is: iBET (Portugal), Affilogic (France), Aquaporin (Denmark), Merck Millipore KGaA (Germany), Genlbet Biopharmaceuticals (Portugal), GSK (Italy).

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