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AFFINITY RESINS ENABLE A MULTI-VACCINE/PLATFORM PURIFICATION PROCESS AND RAPID RESPONSE TO NEW VIRUSES

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Established platform processes applicable to a range of recombinant sub-unit vaccines and VLPs will enable rapid response as well as easy adaption to seasonal variants. Affinity purification has the ability to provide a platform purification process affording a standard high purity, high yield purification step towards different vaccines. We describe several affinity resins that we have developed that enables this platform approach for different vaccine modalities, some of which can be considered custom affinity resins, whilst the others open access catalog resins.

The approach used is based on targeting elements or domains that are common to a vaccine technology and generating affinity resin towards these domains. For example, many vaccines are based upon trimeric virus fusion proteins and incorporate a trimerization domain to ensure correct folding and presentation. By targeting the trimerization domain a platform affinity resin can be developed that yields a platform production process irrespective of which virus protein is fused to the domains. This purification approach can be applied to many trimerization domains irrespective if the domain is proprietary and or with freedom to operate and in public use, and to other domains encourage the formation of larger protein particles (nanoparticles) to elicit immune responses.

We present a custom affinity resin towards a proprietary domain that has wide applicability to many sub-unit vaccines within a company's pipeline. We also present an open access resin that is under development that targets the T4 foldon trimerization domain. The foldon domain is the most widely used trimerization domain in academia and industry and has been used in a multitude of protein subunit vaccines.

We further extend this catalog resin platform approach towards whole virus particles for which we have developed an affinity resin that binds to the phospholipid on the outer surface of the lipid membrane. It is our hope and also the intention of the companies that we collaborate with, that these resins will enable producers of these traditional vaccine modalities to effect rapid process development and enable them access to the timescale of development exhibited by mRNA vaccines.