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Monoliths in the mRNA vaccine purification process the silica resin and other composite materials: The carbon content

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Aim of this work is to verify the role played in chromatographic technique by innovative MONOLITHS in mRNA vaccine production: Material used technology and products for large scale production. The fact that a great producer use carbon composite in monoliths is of great interest: carbon fiber reinforcement embedded into epoxy thermoset resin. It is also verified the role played by silica products for chromatographic use and its origin (synthetic or from natural product like Rice). Related the product from Rice it is used as pharmaceutical excipient.

Also in this cases other great chemicals producer in its website for SILICA GEL for chromatography report a reference related the production of silica form Rice, (Not only synthetic so) of interest the profile of impurity of this product if used in resins column for purification biopharmaceutical and in particular the carbon content.

Discussion:

In last decades various purification methods was and are used to purify mRNA In research and testing field are currently used magnetic beads also covered with graphene or carbon dots. The same are used membrane or chromatographic technique (resin).

Today are also used monoliths with composite materials. The process used for purification reported in literature includes various phases: TFF, affinity of ion exchange chromatography, followed by ultrafiltration/diafiltration. The materials used are often: plastic material for TFF filtration, silica products or other polymer. For ultrafiltration and diafiltration various materials for the membrane are used. Of interest that a great producer of monoliths use carbon fibre reinforcement embedded into epoxy thermoset resin (carbon fibre composite); Related silica column and resin it is possible to see that there is an pharmaceutical use and the synthetic one meet this quality property as required by the pharmacopeia better the from rice. But the same some producers provide this silica product from Rice as pharma excipient.

There are also works that show that the production form rice can respect the quality required by a pharmacopeia. This silica from rice varies in the purity from an example 80-99% and show impurity (also carbon product in example 1% or more). The cost of this 2 kind of product can explain the motivation to use or not a product.

Conclusion:

Ribonucleic acid purification: related resin: Exemplary materials that can be used as a surface include, but are not limited to acrylics, carbon (graphite, carbon-fiber). But also the role played by silica in purification of the mRNA (resins, monoliths) or by other polymeric molecule. A great producer report into its products monoliths based on carbon composite material for purifying RNA (Carbon fibre reinforcement embedded into epoxy thermoset resin), of great interest also to verify if the origin of this silica if used and if carbon coated or not. If of synthetic origin or form natural product (form Rice or algae). Because due by the production process are used also real high temperature carbon content can be found in this resin. The silica from rice are also used in pharmaceuticals as excipients and literature report way to produce in high % (94-99%) with variable concentration of impurities (1% or more).

After seeing all reported in this work it is relevant to verify:

1. If are used in purification of mRNA for vaccine magnetic beads or resin graphene coated or monoliths of carbon composite materials.

2. What kind of silica is used (synthetic or form rice or other natural product).

3. The level of graphene impurity in this chromatographic stationary phase.

All this make possible to verify the role played by this phenomena in the profile of impurity in biopharmaceutical production. This is relevant for regulatory, toxicological and pathological and safety need.

Biography

Mauro Luisetto is an independent researcher Pc 29121. He is an applied pharmacologist, Spec. Applied pharmacologist (PhD lev), Pharm d-Clinical ph. advanced university course, Pc Italy, Turin and Pavia University. He is currently Head of IMA Academy Research Centre, Italy.

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