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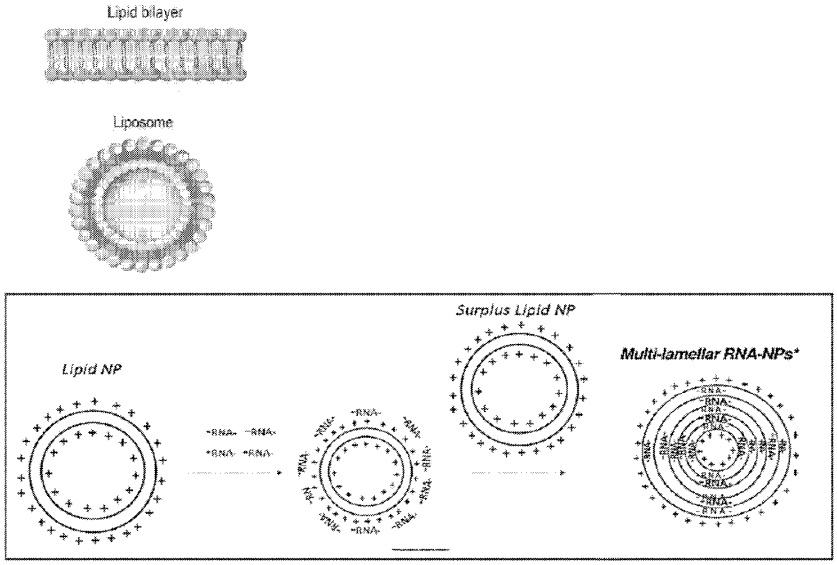
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WO 2021/202772 A1

(54) Title: MULTILAMELLAR RNA NANOPARTICLE VACCINE AGAINST SARS-COV-2

FIGURE 1A



(57) Abstract: The present disclosure provides a nanoparticle comprising a positively-charged surface and an interior comprising (i) a core and (ii) at least two nucleic acid layers, wherein each nucleic acid layer is positioned between a cationic lipid bilayer, wherein the nanoparticle comprises RNA molecules encoding a SARS-CoV-2 protein. Methods of making such nanoparticles are further provided herein. Additionally, related cells, populations of cells, pharmaceutical compositions comprising the presently disclosed nanoparticles are provided. Methods of increasing an immune response against a tumor in a subject, methods of delivering RNA molecules to an intra-tumoral microenvironment, lymph node, and/or a reticuloendothelial organ in a subject, and methods of treating a subject with a disease are furthermore provided.

[Continued on next page]

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