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Editorial

# Editorial note on covid drug and vaccine delivery systems

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## EDITORIAL NOTE

Vaccines are the formation given to patients to evoke immune responses leading to the construction of antibodies (humoral) or cell-mediated responses that will combat infectious agents or noninfectious conditions such as malignancies. Alarming safety profile of live vaccines, powerless immunogenicity of sub-unit vaccines and immunization, failure due to poor patient compliance to booster doses which should potent prime doses are few strong reasons, which necessitated the development of modern generation of prophylactic and therapeutic vaccines to uphold effective immunization. Attempts are being built to deliver vaccines through carriers as they limitation the spatial and temporal presentation of antigens to immune system thus leading to their sustained discharge and targeting. Hence, lower doses of powerless immunogens can be effectively directed to stimulate immune responses and eliminate the need for the administration of first and booster doses as a part of conventional vaccination regimen. This paper reviews carrier systems like as liposomes, microspheres, nanoparticles, dendrimers, micellar systems, ISCOMs, plant-derived viruses which are now being investigated and advanced as vaccine delivery systems. This paper also describes different aspects of "needle-free technologies" used to administer the vaccine delivery systems through different routes into the human body.

Vaccination is the most powerful means of controlling infectious disease-related morbidity and mortality. The World Health Organization (WHO) estimates that vaccination prevents across 2.5 million child deaths each year worldwide. A vaccine is a biological preparation that better immunity to a particular disease. The traditional types of vaccines that have been utilized to date clinically are vaccines that contain either dead or live-attenuated microorganisms, inactivated toxins (Toxoid), protein subunits, and polysaccharide antigen or conjugates. A number of innovative vaccines are in development such as recombinant vector and DNA vaccines. These agents resemble a disease-causing microorganism and stimulate the body's immune system to recognize the agent as foreign, destroy it, and "remember" it, so that the immune system can more easily challenge these microorganisms upon subsequent encounters.

Immunostimulatory adjuvants:

Conserved molecular patterns of pathogen stimulate immunity as they are identified by pattern recognition receptors like "Toll" receptors located mainly on B-cells, dendritic cells of mammals (e.g., unmethylated CpG containing DNA).

Vaccine is a material that induces an immunologically mediated resistance to a disease but not necessarily an infection. Vaccines are generally composed of killed or attenuated organisms or subunits of organisms or DNA encoding antigenic proteins of pathogens. Sub-unit vaccines though exceptionally selective and specific in reacting with antibodies often fail to show such reactions in circumstances such as shifts in epitopic identification middle of antibody and are poorly immunogenic. Delivery of antigens from oil-based adjuvants such as Freunds adjuvant manage to a reduction in the number of doses of vaccine to be administered but due to toxicity concerns like inductions of granulomas at the injection site, such adjuvants are not widely utilized.

Immunization failure with conventional immunization regimen involving prime doses and booster doses, as patients ignore the latter.

Vaccines delivery systems on the other hand:

Allow for the incorporation of doses of antigens so that booster doses are no longer necessary as antigens are discharged slowly in a controlled manner.

Control the spatial and temporal presentation of antigens to the immune system there by uphold their targeting straight to the immune cells.

Keywords: Edible vaccines, microneedles, microparticulates, needle-free delivery, TLRs, vaccine delivery systems, vaccine

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