Enhancing the immune response through next generation polymeric vaccine adjuvants

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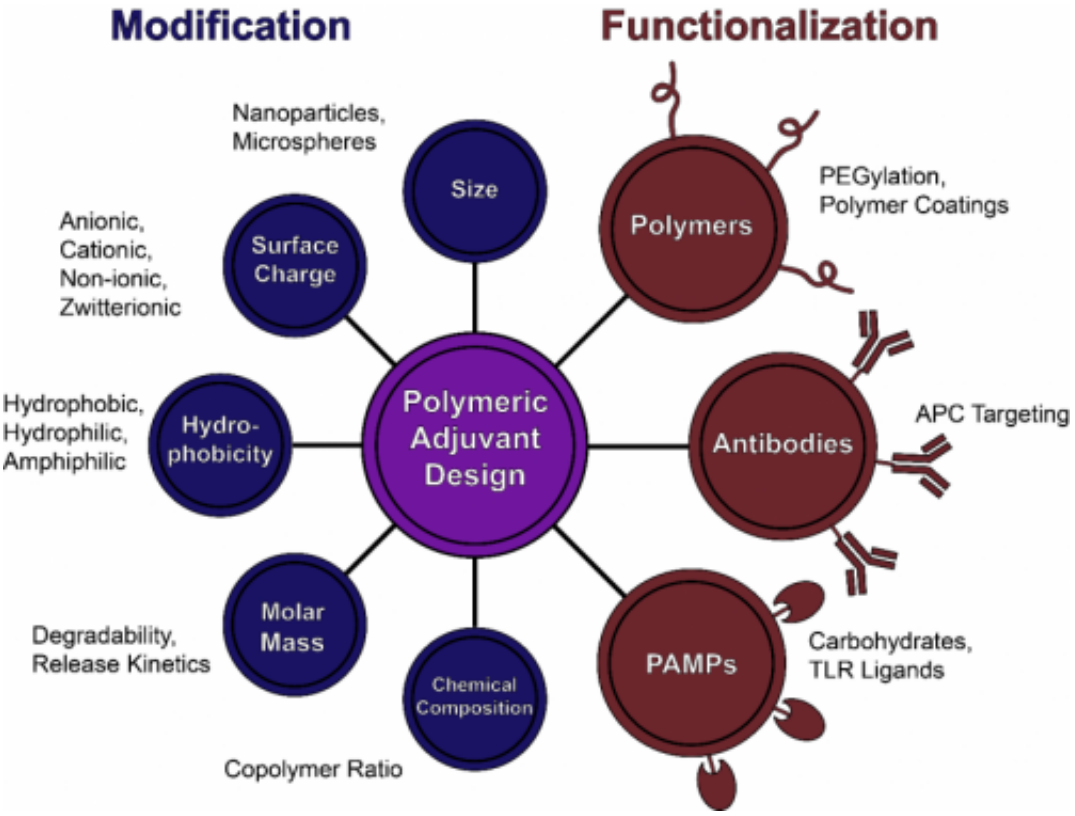

The easily modifiable properties of polymers and their potential for functionalization, shown in blue and red respectively, make them attractive candidates for replacing conventional adjuvants. Credit: *Technology* journal

Adjuvants, such as aluminum salts, have been integrated into vaccines for more than 70 years to augment the body's immune response to pathogens. Adjuvants are especially necessary to boost the immune

response for subunit vaccines. However, conventional adjuvants are limited by their toxicity and limited cellular immune responses. Polymeric adjuvants in the form of nanoparticles, matrices or micelles have the ability to prompt strong adaptive immune responses without sacrificing biocompatibility.

The great success of vaccines over the past two centuries as a preventive medicine has led to a significant reduction in morbidity and death caused by controllable infectious diseases. The effectiveness of vaccines is dependent on their ability to induce a protective immune response in recipients. Adjuvants, such as aluminum salts, have been integrated into vaccines for more than 70 years to augment the body's immune response to patho-gens. Adjuvants are especially necessary to boost the immune response for subunit vac-cines. However, conventional adjuvants are limited by their toxicity and limited cellular immune responses. Polymeric adjuvants in the form of nanoparticles, matrices or micelles have the ability to prompt strong adaptive immune responses without sacrificing biocompatibility.

This review article appearing in Technology and submitted by researchers from Iowa State University investigates the potential of polymeric adjuvants, both natural and synthetic. In addition to a comprehensive study of their use in vaccines, this article sum-marizes the benefits and challenges associated with the use of these polymer systems as adjuvants.

More information: www.worldscientific.com/doi/pd … 42/S2339547814300017

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