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Rational design of Synthetic Vaccine Particles (SVP) for therapeutic treatment of chronic diseases

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Abstract

Vaccines for the prophylaxis of infectious diseases have been one of the most effective interventions for improving human health. Recent advances in immunology and vaccine technology have opened the door to novel vaccine-based therapies for the therapeutic treatment of chronic diseases. We have developed a flexible and modular Synthetic Vaccine Particle (SVP) technology that enables the rational design of both stimulatory vaccines and tolerogenic immune therapies. Our targeted SVPs (tSVP) have been designed and optimized to promote efficient cross-presentation of antigen and stimulate robust cellular immunity for the treatment of cancer and chronic infections, while our tolerogenic targeted SVPs (t^2SVP) are designed to induce immune tolerance for the treatment of autoimmune diseases, allergies, and immunogenicity of biological therapies. We will describe the general design principles of these synthetic, self-assembling nanoparticles and provide examples for use in various disease settings.

Biography

Dr. Kishimoto is the Chief Scientific Officer of Selecta Biosciences, a biotechnology company developing synthetic vaccines based on a novel self-assembling nanoparticle technology. Prior to joining Selecta, he was Vice President of Research at Momenta Pharmaceuticals where he led a multidisciplinary team in advancing both novel and complex generic products. Previously he held leadership positions at Millennium Pharmaceuticals and Boehringer Ingelheim. Dr. Kishimoto has published over 50 peer-reviewed articles, including articles in Nature, Science, Cell, and the New England Journal of Medicine. Dr. Kishimoto received his doctoral degree in Immunology from Harvard University and his post-doctoral training at Stanford University.