

poziva Vas na predavanje

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## Drug delivery technology for single injection vaccines

Many vaccines, such as the inactivated polio vaccine (IPV), must be administered in several doses for full efficacy. Because patient access is a major challenge for vaccination efforts in developing countries, the current necessity of multiple doses per patient is impractical in those areas. Single-administration vaccines would greatly improve efforts to vaccinate populations in Third World countries, and the World Health Organization (WHO) Expanded Program for Immunization describes an ideal vaccine as one that is heat-stable, requires only one shot, and is easy to administer. Two vaccine examples will be presented highlighting the use of polymer based controlled release technology for immunizations. In the first example, poly(lactic-co-glycolic acid) (PLGA) based microsphere formulations will be described that can encapsulate IPV along with stabilizing excipients and release D-antigen active IPV over the course of weeks, at therapeutic relevant doses. In the second example, PLGA microparticles that release HIV envelope glycoprotein continuously over a period of 2-4 weeks, with or without co-encapsulation of aluminum-based adjuvant will be shown. Dose-response studies done with our formulation and bolus controls showed that the binding antibody response to our formulation without adjuvant was equivalent to a bolus at 10-fold higher dosage with adjuvant. By minimizing the number of administrations of vaccines and increasing the generated immune response, this technology can be a tool to aid in the eradication of infectious diseases such as polio and could serve as a platform technology applicable to other infectious diseases for the improvement of global health.

**Dr. Ana Jaklenec** is a Research Scientist at the Massachusetts Institute of Technology (MIT) in the Langer Lab, Department of Chemical Engineering and David H Koch Institute for Integrative Cancer Research. Her group is focused on formulation, stability and release of biologics from controlled release polymer systems. Dr. Jaklenec was born in Zagreb and attended elementary school in Rakov Potok. She then moved to NYC and completed her primary schooling at St. Joseph's Academy and graduated St. Francis Preparatory school in 1994. She received her Bachelor of Science degree in Biomedical Engineering from Boston University in 1998 and her Doctorate of Philosophy in Biomedical Engineering from Brown University in 2007. She was awarded the competitive Ruth L. Kirschstein National Research Service Award (NRSA) from National Institute of Health in 2007 and completed her postdoctoral training with Institute Professor Robert Langer at MIT.

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