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Enhanced delivery of DNA-based vaccines and immunotherapeutics through next-generation electroporation devices

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It is well established that injection of naked DNA vaccines alone is insufficient to generate clinically relevant immune responses due to inefficient cellular uptake. Over the past two decades, researchers have attempted to improve *in vivo* DNA delivery through multiple physical or chemical methods including *in vivo* electroporation (EP). Inovio Pharmaceuticals has recently demonstrated the potential of EP delivery technology for a therapeutic DNA vaccine in a Phase II clinical trial for HPV-associated cervical dysplasia. Therapeutic vaccination of CIN2/3 patients with VGX-3100, a highly optimized HPV-16/18 DNA vaccine administered by CELLECTRA® EP device resulted in robust cellular and humoral immune responses, significant viral clearance and importantly significant regression to CIN1 or no disease. Inovio is currently developing additional EP devices for DNA delivery to a variety of tissues such as muscle, skin and adipose tissue. Here we will discuss the impact of these devices on *in vivo* DNA uptake and how different EP strategies can be used to optimize delivery of DNA-based vaccines and immunotherapeutics for a variety of therapeutic indications.

Biography

Stephanie Ramos obtained her BS degree in Molecular Biology at the University of California, San Diego and her PhD in Molecular Biology, Genetics and Biochemistry at the University of California, Irvine. She has a broad background in immunology and research and development of small molecule and DNA-based therapeutics for a variety of indications including autoimmune disorders, cancers and viral infections. She is currently a Senior Scientist at Inovio Pharmaceuticals where her particular area of focus is preclinical research and development of DNA-based therapeutics and optimization of *in vivo* DNA delivery strategies.

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