

9th Global Summit and Expo on **Vaccines & Vaccination**

November 30-December 02, 2015 San Francisco, USA

Single-cycle replicating adenovirus vectors

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Replication-competent adenoviral (RC-Ad) vectors generate exceptionally strong gene expression and vaccine responses by amplifying the transgenes they carry up to 10,000-fold. While they are potent, they also risk causing adenovirus infections in patients or health care workers. More common replication-defective Ad (RD-Ad) vectors with deletions of E1 avoid this risk. However, RD-Ads do not replicate transgene and generate markedly weaker expression. We recently engineered “single-cycle” adenovirus (SC-Ad) vectors that still replicate their genomes and the transgenes they carry, but that do not generate infectious progeny. Tests in animal models demonstrate SC-Ads mediate more robust expression and immune responses than RD-Ads. In primary human cells, SC-Ads require 33-fold fewer vectors to equal expression mediated by an RD-Ad. These Ads replicate transgenes in mice, hamsters, ferrets, bovine, sheep, non-human primates, and of course humans. This suggests that they may have utility as vaccines or therapies against infectious agents, cancer, and other applications in an array of species.

Biography

Michael A Barry received his PhD from Dartmouth working on Apoptosis with Alan Eastman. He performed his Post-doctoral fellowship on Genetic Immunization and Vector targeting at UT Southwestern Medical Center with Stephen Johnston. He spent 10 years with a joint appointment in the Center for Cell and Gene Therapy at Baylor College of Medicine and in Bioengineering at Rice University prior to moving to Mayo Clinic. He is currently working on gene therapy, genetic vaccines, oncolytic viruses and basic virology.

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