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## **Vaccinia virus as recombinant viral vectors: are we ready to use them? Insights from the field and from the lab**

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Poxvirus-based vaccines constitute the solo historical example of utter success achievement in relation to attempts to control an infectious disease using prophylactic interventions. This is the case of smallpox, which was declared eradicated in 1980 after a successful campaign that relied on the use of *Vaccinia virus* (VACV) as a live vaccine. After the smallpox demise, the use of recombinant poxviruses as vectors to deliver unrelated antigens appeared as a promising approach to improve existing vaccines or to generate new ones. Nowadays, however, zoonotic poxvirus infections are on the rise among human populations. Could that be a threat to the use of recombinant poxvirus vaccines? Our group has been involved in the study of VACV zoonotic outbreaks taking place in Brazil. In one such study, human patients acutely infected were recruited their immunological responses were evaluated. Analysis of the overall immune responses generated in VACV infected persons revealed signs of virus-induced immune modulation. The possible induction of immunological down modulation by VACV raises another question: are current VACV vectors also able to modulate host responses? In order to look into that, we have analyzed immune responses generated against the attenuated *Modified Vaccinia virus Ankara* (MVA), a popular poxvirus vectors, and compared the results to those obtained with infections caused by other VACV strains: the Lister (LST) and Western Reserve (WR) strains. We observed a down-modulation in the cell activation profile in VACV-WR infected mice. On the other hand, cells from the MVA-infected group presented a profile similar to mock-infected mice. The VACV LST generated responses that were intermediate between MVA and VACV-WR infections. The MVA inability to generate modulation of the host immune responses is a desirable characteristic for a good vaccine vector.

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### **Biography**

Dr. Flávio da Fonseca obtained his PhD at the Federal University of Minas Gerais (UFMG), Brazil, after developing part of his doctorate project in the Laboratory of Viral Diseases (LVD), NIAID, National Institutes of Health (NIH) in Bethesda, MD, USA. Upon graduation, Dr. da Fonseca returned to complete his training at the LVD/NIAID/NIH, under supervision of Dr. Bernard Moss. He returned to Brazil in 2004, when obtained a positions as Associate Professor at the UFMG and as Associate Researcher at the René Rachou Institute (IRR-FIOCRUZ), both in Belo Horizonte, MG, Brazil. Since then, Dr. da Fonseca has worked with diverse aspects of Poxvirus infections and use as vaccine.