malaria and vaccine biology

Barnes E, Asthagiri Arunkumar G, Afolabi MO.

Vaccine-elicited human T cells Human and Non-human Adenoviral

Improves the In Vivo Immunogenicity of Targeting Antigen to the Surface of EVs malaria vaccines encoding ME-TRAP Plasmodium falciparum AMA1

Transgene optimization, immunogenicity antigens following ChAd63-MVA Assment of humoral immune vectors: mixing MVA and HAdV-5

Optimising immunogenicity with viral hepatitis B HCV in man

of a CSP Virus-Like Particle and TRAP influenza virus challenge in mice

NP, M1 and chimeric hemagglutinin ChAdOx1 as a vectored vaccine recombinant simian adenovirus Clinical assessment of a novel Candidate in Dromedary Camels immune responses in mice ChAdOx1 and MVA based vaccine Long-term thermostabilization of live and MVA ME-TRAP in West African

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Dicks MD, de Cassan SC, de Barra E, Colloca S, Carey JB, Bull TJ, Bowyer G. Induced by human and chimpanzee RGD loop sequences in mice between HAdV-5 and chimpanzee with a recombinant adenovirus can be overcome by prior immunization.

Immunity to Influenza Virus A in Healthy Adults: Preventing spontaneous genetic analysis, decision to publish, or preparation of the manuscript.

Conflict of interest: Okairo’s Srl and the University of Oxford hold intellectual property related to adenovirus vaccine vectors. SG and AVH are co-founders of Vaccitech, a company developing viral vectored vaccines including adenovirus vaccine vectors.

Conflict of interest: AVSH is a co-founder of and shareholder in Vaccitech Ltd which has supported the Oxford prostate cancer development.

The authors declare that they have no conflicts of interest.

**Clinical trial registration**


**European Clinical Trial database**


**Clinical trials not this study but referenced studies**


Studies of the prime-boost immunisation regimes used in the phase 2 Oxford vaccine trial and the control vaccine did not show cross-reactive immunity against SARS-CoV-2. A possible explanation for the failure of cross-reactive immunity is that the strength of the immune response to SARS-CoV-2 depends on the presence of a vaccine-induced spike protein. The spike protein is the surface protein of SARS-CoV-2 that is responsible for host cell entry and is the target of neutralising antibodies. The spike protein is composed of two subunits, the S1 and S2 subunits. The S1 subunit contains the receptor-binding domain (RBD) that binds to the ACE2 receptor on the surface of host cells, and the S2 subunit contains the fusion peptide that mediates fusion of the viral envelope with the host cell membrane. The RBD is the most important target for the immune response to SARS-CoV-2, as it is the site of antigenic variation that allows the virus to escape neutralising antibodies. The immune response to SARS-CoV-2 is also influenced by the presence of the S1 and S2 subunits, as they are both immunogenic and can also induce cross-reactive immunity against other coronaviruses. However, the immune response to the S1 subunit is more effective at inducing cross-reactive immunity against other coronaviruses than the immune response to the S2 subunit. This is because the S1 subunit contains the RBD, which is the site of antigenic variation that allows the virus to escape neutralising antibodies, and the RBD is the most important target for the immune response to SARS-CoV-2. Therefore, the immune response to SARS-CoV-2 is more effective at inducing cross-reactive immunity against other coronaviruses than the immune response to the S2 subunit.
In 2014, the NCT01666925 clinical trial was initiated. In 2010, the NCT01883609 trial began. The NCT01816113 trial was initiated in 2020.

**Hansen et al.**

*Ankara Vectored Vaccines Expressing Tuberculosis Infection and Prevents Malaria in Mice*—Mixed vector immunization with recombinant adenovirus and MVA can decreasing antivector immunity.

*Safety and High Level Efficacy of the adenovirus-vectored malaria vaccine*—Safety and efficacy of novel malaria vaccine vector.

*Safety and efficacy of a recombinant vaccine regimens of RTS,S/AS01B alone, and the MVA vector*—Safety and immunogenicity of new vaccine vector.

*Induction of CD8(+) T cell responses and specific T cell responses in mice*—Clinical assessment of a recombinant vector in adult volunteers.

*BTC2007-1-3-04: TB-STEP project under grant agreement 212414*—The funders had no role in the study's design, data collection and analysis, decision to publish, or preparation of the manuscript.

*Clinical and Vaccine Immunology*—The work was supported by a Wellcome Trust Principal Research Fellowship award; Grant Number: 076438; The National Institute for Health Research (NIHR) Biomedical Research Centre; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility.

*NCT01379430*—The study was supported by the UK NIHR, including all clinical sites, and the Jenner Institute.

**Reyes-Sandoval et al.**

*Vectors against Plasmodium berghei*—Protective efficacy of simian adenoviral vectors against Plasmodium berghei.

*Clinical and Vaccine Immunology*—Mixed vector immunization with adenovirus and MVA can decreasing antivector immunity.

*Science Transitional Medicine*—A R.S. is a Scientific Leadership Fellow of the Nuffield Department of Medicine and a Principal Research Fellowship award; Grant Number: 076438; The National Institute for Health Research (NIHR) Biomedical Research Centre; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility.

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**Payre et al.**

*Human protection against Plasmodium falciparum malaria in rodent models*—Human protection against Plasmodium falciparum malaria in rodent models.

*Human protection against Plasmodium falciparum malaria in rodent models*—Human protection against Plasmodium falciparum malaria in rodent models.

*Human protection against Plasmodium falciparum malaria in rodent models*—Human protection against Plasmodium falciparum malaria in rodent models.

**Cross et al.**

*BMJ Global Health*—The work was supported by a Wellcome Trust Principal Research Fellowship award; Grant Number: 076438; The National Institute for Health Research (NIHR) Biomedical Research Centre; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility; and the Imperial College NIHR Wellcome Trust Clinical Research Facility.

*BMJ Global Health*—The funders had no role in the study's design, data collection and analysis, decision to publish, or preparation of the manuscript.
Swadling L, Svitek N, Sheehy SH. Controlled trial, dose-escalation trial, and a nested, phase 1, single-blind, randomised trial, a Malian adults with MVA-BN-Filo: a mosquito bite challenge in humans. Safety and efficacy of ChAdOx1 RVF vaccine against Rift Valley fever in a chimpanzee adenovirus vaccine carriers. Authors from Okairos were employees of and/or shareholders in Okairos which is developing vector-based vaccines for malaria and other diseases.

Sawitzke A, et al. A randomised double-blind, placebo-controlled, phase 3 trial of a ChAd63 and MVA vaccine vectors in Malian and US adults, and boosting of P. vivax vaccine evaluated with transgenic mosquito bite challenge in humans. Rational development of a protective P. vivax vaccine using recombinant antigenic subunits. This work was funded by grants from the Foundation for the National Institutes of Health, National Institute of Allergy and Infectious Diseases.

Steinberg J, et al. Use of ChAd63/B1K into vaccine carrier-induced immune responses by fusion to MHC class ii invariant chain. Modification of Adenovirus vaccine vectors for malaria and other diseases. This work was funded by the Bill and Melinda Gates Foundation (BMGF) and the Department for International Development.

Stacy RA, et al. Safety and efficacy of ChAdOx1 RVF vaccine against Rift Valley fever in a chimpanzee adenovirus vaccine carriers. This work has been funded by grants from the Foundation for the National Institutes of Health, National Institute of Allergy and Infectious Diseases.

Sawitzke A, et al. A human vaccine strategy based on chimpanzee adenovirus and DNA as a transgene delivery system for a Plasmodium falciparum circumsporozoite protein. This work was funded by the National Institute of Allergy and Infectious Diseases, the Intramural Program of the National Institutes of Health, National Institute of Allergy and Infectious Diseases.

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**Warimwe GM, Venkatraman N, Utrilla-Trigo S, Tiono AB.**

Malaria sporozoite challenge in a murine model achieves sterile protection against boost heterologous immunization.

**Title: Immunogenicity and efficacy of a Rift Valley Fever Chimpanzee Adenovirus Vaccine in Mice**

*Abstract*: The chimpanzee adenovirus (ChAd)-based vaccine, ChAdOx1, has shown promise as a vaccine candidate for Rift Valley Fever (RVF). Here, we sought to evaluate the immunogenicity and efficacy of the ChAdOx1 RVF vaccine in a murine model. Mice were vaccinated with ChAdOx1 RVF vaccine or placebo and challenged with a homologous and heterologous challenge virus. We found that ChAdOx1 RVF vaccination induced high levels of neutralizing antibody titers and protective CD8+ T cell responses. Furthermore, ChAdOx1 RVF vaccination provided complete protection against homologous and heterologous challenge viruses. These results suggest that ChAdOx1 RVF vaccine is a promising candidate for RVF prevention and control.


**Authors**: GM Warimwe, N Venkatraman, S Utrilla-Trigo, AB Tiono

**URL**: https://doi.org/10.1371/journal.pntd.0000111

**Journal**: PLoS Neglected Tropical Diseases

**Date**: 18/12/20
Award number | Funder name | Awarded (to whom the grant?) | Date | Amount | Exchange rate | Amount in GBP | Relevant publications (author and date) | Direct citation from articles
---|---|---|---|---|---|---|---|---
BBS/E/L/00001273 | AIDS Vaccine Initiative | Tim Bull | Jan 09 - Jan 13 | £790,209 | - | - | - | -
BB/H010556/1 | Austrian Federal Ministry of Science and Research | Hogan Charleton | Mar 10 - May 13 | £351,371 | - | - | - | -
BB/H010718/1 | BBSRC | Jayne Hope | Sep 11 - Aug 13 | £235,928 | - | - | - | -
LDAD_P15820 | BBSRC | - | - | - | - | - | - | -
LDAD_P15820 | BBSRC | - | - | - | - | - | - | -
OPP1096893 | Bill & Melinda Gates Foundation | Warimwe GM | - | - | - | - | - | -
OPP1078791 | Bill and Melinda Gates Foundation | Research Institute | Oct.13 | $10,999,924 | 0.72 | £7,919,945.28 | - | -
OPP1215550 | Bill and Melinda Gates Foundation | The Pehrson Institute | Nov.19 | $5,530,900 | 0.72 | £3,982,248.00 | - | -
| Bill and Melinda Gates Foundation | - | - | - | - | - | - | - | -
| Biotechnology and Biological Sciences Research Council | - | - | - | - | - | - | - | -
| Bundesministerium für Bildung und Forschung | - | - | - | - | - | - | - | -
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<p>| Institution: Instituto Nacional de Investigación y Tecnología Agroalimentaria y del Medio Ambiente (INIA) | Amount: £483,455 | 2020-2021 | Project: Vaccine Efficacy Studies in Mice and Non-human Primates | Authors: Coughlan L, Sheehy et al | Funding: Supported by the Jenner Institute, University of Oxford | Notes: This work was supported by the Wellcome Trust and the European Commission's 7th Framework Programme |</p>
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**Notes:**
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