



OPEN ACCESS

EDITED AND REVIEWED BY
Slobodan Paessler,
University of Texas Medical Branch at
Galveston, United States

*CORRESPONDENCE

Arundhathi Venkatasubramaniam
✉ avenkatasubramaniam@som.umaryland.edu
Nathan K. Archer
✉ narcher2@jhmi.edu

RECEIVED 08 September 2025

ACCEPTED 23 October 2025

PUBLISHED 06 November 2025

CITATION

Venkatasubramaniam A and Archer NK (2025)
Editorial: From bench to clinic: novel vaccines
and therapeutics – “success stories”.
Front. Cell. Infect. Microbiol. 15:1701460.
doi: 10.3389/fcimb.2025.1701460

COPYRIGHT

© 2025 Venkatasubramaniam and Archer. This
is an open-access article distributed under the
terms of the [Creative Commons Attribution
License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or
reproduction in other forums is permitted,
provided the original author(s) and the
copyright owner(s) are credited and that the
original publication in this journal is cited, in
accordance with accepted academic
practice. No use, distribution or reproduction
is permitted which does not comply with
these terms.

Editorial: From bench to clinic: novel vaccines and therapeutics – “success stories”

Arundhathi Venkatasubramaniam^{1*} and Nathan K. Archer^{2*}

¹Center for Vaccine Development, University of Maryland Baltimore, Baltimore, MD, United States,

²Johns Hopkins Medicine, Johns Hopkins University, Baltimore, MD, United States

KEYWORDS

vaccines, clinical trial, therapeutics, tuberculosis, COVID - 19, *trypanosoma cruzi* (T cruzi)

Editorial on the Research Topic

From bench to clinic: novel vaccines and therapeutics – “success stories”

The commercialization of a vaccine requires several steps, from discovery and development to Phase I-III clinical trials (Guy and Barrere, 2011; Cunningham and Garçon, 2016; Singh and Mehta, 2016). We are pleased to present a Research Topic on Frontiers in Cellular and Infection Microbiology focusing on these aspects of vaccine development. This collection of manuscripts brings together a myriad of studies that look at vaccine engineering, dose effectiveness, the use of adjuvants, and the immune response elicited by vaccines. We extend our heartfelt gratitude to the authors, reviewers, and the dedicated editorial team who have contributed to the completion of this Research Topic.

The study “Engineering a dual vaccine against COVID-19 and tuberculosis” highlighted a novel vaccine against both diseases. This is especially significant considering that there is a lack of vaccines against tuberculosis other than BCG (Maani and Petersen, 2025). The article proposed the use of recombinant BCG strains as a platform for the development of safe and effective vaccines. Interesting future work could include booster vaccinations, testing the vaccine in mouse models (of both TB and COVID-19), evaluation of a freeze-dried formulation of the recombinant vaccine, and examining immune response in non-human primate models.

The contribution “Vaccination with parasite-specific TcTASV proteins combined with recombinant baculovirus as a delivery platform protects against acute and chronic *Trypanosoma cruzi* infection” proved to be promising in delivering a vaccine candidate against *Trypanosoma cruzi*, the parasite that causes Chagas disease. The authors discussed a combination of parasite-specific proteins alongside a baculovirus platform used as a delivery, displaying one such protein on the capsid. This combination was successful, with vaccinated mice surviving a lethal *T. cruzi* challenge and presenting a reduced parasitic load in chronic infection. The success of the vaccine against other strains of *T. cruzi* and the durability of the immune response remain to be seen (Brenière and Waleckx, 2016).

Animal models are essential and functional during the discovery and development phases of vaccine creation, but eventually, all vaccines must be tested in humans. The

articles “Effectiveness of two-dose vs. one-dose varicella vaccine in children in Shanghai, China: a prospective cohort study” and “TRAIL and IP-10 dynamics in pregnant women post COVID-19 vaccination: associations with neutralizing antibody potency” are both human studies, albeit different. The former is a clinical trial that compared the effectiveness of one vs two doses of the varicella vaccine in children in Shanghai, China, concluding that two doses are more effective than one. The latter studied the dynamics of biomarkers TRAIL and IP-10 for COVID-19 infection in pregnant women post vaccination, along with the inhibition of neutralizing antibodies against COVID-19 strains. These two studies are of special significance because they studied the course of vaccination in children and pregnant women, both vulnerable groups that merit additional analysis (Marshall and McMillan, 2016; Örtqvist, 2010).

Although the development of a successful vaccine represents a significant challenge, these articles all bring forward ways in which targets/biomarkers (Sohail Ahmed and Black, 2011) can be identified that enable scientists and clinicians the tools to develop vaccines and therapeutics. Finally, vaccine and therapeutic research is an exciting, rapidly evolving field that harnesses new technologies to help reduce the burden of several diseases or to eliminate them from our communities.

Author contributions

AV: Project administration, Writing – original draft. NA: Project administration, Writing – review & editing.

References

- Brenière, S. F., and Waleckx, E. (2016). Over Six Thousand *Trypanosoma cruzi* Strains Classified into Discrete Typing Units (DTUs): Attempt at an Inventory. *PloS Negl. Trop. Diseases*. 10. doi: 10.1371/journal.pntd.0004792
- Cunningham, A. L., and Garçon, N. (2016). Vaccine development: From concept to early clinical testing. *Vaccine* 34, 6655–6664. doi: 10.1016/j.vaccine.2016.10.016
- Guy, B., and Barrere, B. (2011). From research to phase III: Preclinical, industrial and clinical development of the Sanofi Pasteur tetravalent dengue vaccine. *Vaccine* 29, 7229–7241. doi: 10.1016/j.vaccine.2011.06.094
- Maani, A. A., and Petersen, E. (2025). The critical role of new tuberculosis vaccines in achieving the WHO 2035 End TB target. *IJID Regions*. 14. doi: 10.1016/j.ijregi.2025.100595
- Marshall, H., and McMillan, M. (2016). Vaccines in pregnancy: The dual benefit for pregnant women and infants. *Hum. Vaccines Immunotherapeutics* 12, 848–856. doi: 10.1080/21645515.2015.1127485
- Örtqvist, Å.B. (2010). Vaccination of children—a systematic review. *Acta Paediatrica-Supplements*. 99, 1–192. doi: 10.1111/j.1651-2227.2010.01823.x
- Singh, K., and Mehta, S. (2016). The clinical development process for a novel preventive vaccine: An overview. *J. Postgraduate Med.* 62, 4–11. doi: 10.4103/0022-3859.173187
- Sohail Ahmed, S., and Black, S. (2011). New developments and concepts related to biomarker application to vaccines. *Microbial Biotechnol.* 5, 223–240. doi: 10.1111/j.1751-7915.2011.00277.x

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The author(s) declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

Generative AI statement

The author(s) declare that no Generative AI was used in the creation of this manuscript.

Any alternative text (alt text) provided alongside figures in this article has been generated by Frontiers with the support of artificial intelligence and reasonable efforts have been made to ensure accuracy, including review by the authors wherever possible. If you identify any issues, please contact us.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.