

## **Comment on QRB Discovery journal's publication of Biovacc-19: A Candidate Vaccine for Covid-19**

This paper, published this week, has been discussed by Sir Richard Dearlove and Charles Moore in the Daily Telegraph. It has grabbed attention for the fact that colleagues and I have highlighted that the COVID virus does not look like it evolved naturally, contra to what most scientists had believed to date.

We stumbled on this finding whilst trying to design a COVID vaccine that would avoid the common errors in vaccine design. These errors mean that we still don't have an effective HIV vaccine after 36 years of intense and expensive development.

The paper reports on our optimal design for such a vaccine whilst implying that current COVID vaccines such as the Oxford candidate are unlikely to be effective.

We were praised by the referees for considering the importance of the adjuvant (the substance required to make the vaccine antigens visible to the immune system) first, and not as an after-thought. Indeed, all the adjuvants in common use are unlikely to work with COVID because increasingly all the unravelling research shows that this is a virus controlled by T cells and not B cells. We therefore decided to use IMM-101 which is the best booster of anti viral T cell responses I have used to date in my work as an oncologist. We already have evidence that it is likely to be protective alone.

HIV vaccines have failed because they have used a large variable protein that induces a very strong immune response that is not helpful. My long-term collaborator, Birger Sorenson from Bionor, Norway, and I have designed a successful HIV vaccine called Vacc4x which has been overlooked as a serious candidate. It is far more effective even in HIV infected people than any other approach bar the standard drug regimens which have to be taken daily. The secret of this was to avoid large proteins and focus on core conserved epitopes as the heart of the vaccine.

COVID has similar issues with a very large "spike" protein which everyone else is using whole. Birger applied the HIV approach to COVID and realised that this spike was not natural as it has too many positively charged amino acids which do not occur naturally. This will cause immune confusion if used as a vaccine and together with the fact that 80% of this spike has human or HIV like sequences means that any immune response will not be specific enough to contain the virus.

Indeed, these vaccines based on the spike are likely to be worse than no vaccine at all as they will induce antibodies which will enhance infectivity.

Our vaccine will not only induce a strong protective T cell response but exclude the bad guys lurking in the spike and enhance and highlight those parts crucial to the virus replicating. Birger and I were voices in the wilderness warning that the HIV approach using its spike called the envelope, would end up in failure and it is no solace that we turned out to be right. It's devastating given the fact that the MRC, Wellcome and Gates turned us down many many times stating our approach was interesting but not necessary!

We cannot afford to let the scientific and industrial elite get it wrong again.

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