Review of: "A live measles-vectored COVID-19 vaccine induces strong immunity and protection from SARS-CoV-2 challenge in mice and hamsters"

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The current SARS-CoV-2 pandemic is shaking the world to its foundations and the loss in human lives is enormous. Thanks to barrier measures, lockdown and the recent availability of vaccines, the situation, although still frightening, has slightly improve. Nevertheless, the epidemic situation in low income countries and the appearance of new variants are urging us to develop and manufacture new vaccines in order to get a better control of the virus dissemination, to undertake worldwide mass vaccination and, ultimately, to get rid of the threat brought by the COVID-19.

In the paper “A live measles-vectored COVID-19 vaccines induces strong immunity and protection from SARS-CoV-2 challenge in mice and hamsters” by Phanramphoei N. frantz et al , the authors described a new recombinant measles virus expressing the prefusion-stabilized S antigen of SARS-CoV-2 which triggers a strong Th1 T cell response as well as eliciting high neutralizing titers. This vaccine candidate protects mice and Golden Syrian hamsters from the SARS-CoV-2 infection and the antibodies elicited neutralize the ancestral strain as well as the variants of concern which were circulating when the experimental work was undertaken.

The main discoveries of this paper are:

1. The prefusion-stabilized membrane-anchored full length S protein (SF-2P-dER) is the antigen of choice
2. The additional transcription unit ATU2 is the promoter of choice to obtain high level of antigen expression
3. The recombinant MV-ATU2-SF-2P-dER is a stable recombinant virus at least after 10 passages
4. MV-ATU2-SF-2P-dER induces in mice a robust Th1-drivel T-cell immune response to SARS-CoV-2
5. MV-ATU2-SF-2P-dER elicits a high level of neutralizing antibodies which persist in mice up to three months
6. MV-ATU2-SF-2P-dER confers protection in mice after intranasal challenge with a mouse-adapted SARS-CoV-2
7. MV-ATU2-SF-2P-dER confers protection in Golden Syrian hamsters after intranasal challenge with SARS-CoV-2. The animals did not exhibit any lung damages nor any sign of pathological changes
8. The antibodies elicited by MV-ATU2-SF-2P-dER neutralize in vitro the SARS-CoV-2 Alpha, Beta and Gamma variants

This paper presents strong data of efficacy of this recombinant MV-ATU2-SF-2P-dER in relevant preclinical animal models. This vaccine candidate is a recombinant virus derived from the live pediatric Measles vaccine which exhibit a long history of safety, a long duration of protection, no deep-freezer cold chain infrastructure needed and the easy manufacturing at large scale, even for low income countries, which make mass vaccination feasible. Considering the advantage of using live virus vectors as vaccines, this recombinant MV-ATU2-SF-2P-dER deserves to be developed as a new vaccine candidate for humans.