Grant agreement **Start date: 01/04/20** **End Date: 31/03/22**	
Project Title	OPENCORONA
WP number, deliverable number, and Title	WP1, deliverable 1.2. Evaluation of immunogenicity of vaccine candidates
Responsible partner name and contact	Partner number: 1 Organisation: KI Name: Matti Sällberg Email: matti.sallberg@ki.se
Nature R-Report P-Prototype D-Demonstrator O=-Other	Report
Dissemination level **PU**-public **PP**-restricted to otherprogramme participants RE-restricted to a group of partners **CO**-only for consortium members	PU
Delivery Month Planned	M6, September 2020
Actual delivery date (dd/mm/yy)	13 November 2020

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101003666

Description of deliverable

- **COMPLETED**

- The vaccine candidates from D1.1 have all been produced in house in quantities and of purity sufficient for immunization of rabbits and mice. Both C57BL/6 and BALB/c mice have been used. Of the original candidates, several were found to induce strong T cell response, in particular OC2 that contains the RBD, the M and the N protein. However, no detectable neutralizing antibodies were induced by OC2 whereby two modified genes were generated based on OC2, termed OC2.2 and OC2.3. The OC2.3 was found to induce both T cells to all proteins in the construct as well as high levels of antibodies to S and RBD that could neutralise SARS-CoV-2 in vitro. The OC2.3 was therefore selected as the vaccine candidate and has been forwarded to Cobra Biologics for production according to GMP.

- **STILL ONGOING**

- Challenge studies in hACE2 mice and ferrets has been initiated and ongoing. SA macaque study is in the planning stage. Preliminary data from the ferret study show that the OC2 and OC12 (N) constructs induce T cell responses that can limit virus replication. This suggests that T cells alone can limit SARS-CoV-2 replication. The ferret and the hACE2 mouse studies will be completed around January 2021. The macaque study is planned to be completed in January or February 2021.

- **PUBLICATIONS**

- **Ahlén G, Frelin L, Nekoyan N, Weber F, Höglund U, Larsson O, Westman M, Tuvesson O, Gidlund EK, Cadossi M, Appelberg S, Mirazimi A, and Sallberg M.** 2020. The SARS-CoV-2 N protein is a good component in a vaccine. J Virology 94(18):e01279-20.

- **Varnaite R, García M, Glans H , Maleki KT, Sandberg JT, Tynell J, Christ W, Lagerqvist N, Asgeirsson H, Ljunggren HG, Ahlén G, Frelin L, Sällberg M, Blom K, Klingström J, Gredmark-Russ S**. 2020. Expansion of SARS-CoV-2-specific Antibody-secreting Cells 1 and Generation of Neutralizing Antibodies in Hospitalized COVID-19 Patients. J Immunology 205(9):2437-2446.

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