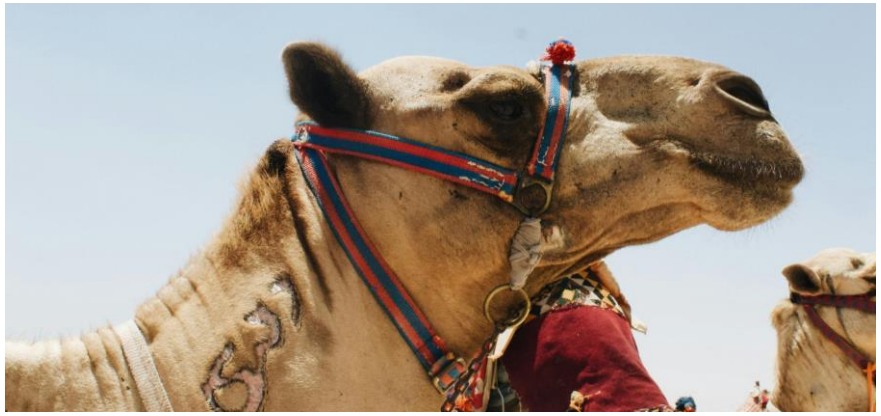
Technology Offer CSIC/AH/038

Therapeutic antibodies against SARS-CoV-2 based on camelid nanobodies



A panel of high affinity nanobodies (Nb) binding to diverse SARS-CoV-2 RBD epitopes of spike protein, and a set of nanobody-derived neutralizing heavy chain antibodies (hcAbs) have been identified. They have potential as therapy against SRAS-CoV-2 for immunocompromised or non-responding to vaccines individuals.

Intellectual Property

3 PCT applications filed

Intended Collaboration

Licensing and/or co-development

Stage of development

Preclinical: in vivo proof of concept in mouse model of infection

Contact

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Market need

The COVID-19 pandemic is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and is a major threat to global public health that has caused over millions of deaths. Although several COVID-19 vaccines have been authorized in different countries, as well as some SARS-CoV-2 neutralizing antibodies generated from COVID-19 convalescent individuals there are still few therapeutics on the market.

CSIC solution

A panel of nanobodies (MW ≈ 14 KDa) clones and human IgG1 heavy chain Fc-fused molecules (MW ≈ 80 KDa). The molecules have been humanized and can be expressed in mammalian-cells and purified from culture media.

Their therapeutic potential has been proven in vivo showing that they can protect hACE2-transgenic mice after infection with a lethal dose of SARS-CoV-2.

Competitive advantages

- Show potent neutralization capacity for different SARS-CoV-2 virus variants.
- Present very high affinity (subnanomolar range) to receptor binding domain (RBD) of spike SARS-CoV-2 protein and compete with the RBD-ACE2 human receptor interaction.
- A cocktail based on a few of the antibodies identified has the potential to become a new therapy against SARS-CoV-2 variants for immunocompromised or high-risk severe disease subjects.