# MARATONA DA SAÚDE

## ADDITIONAL INFORMATION FOR PROJECT PROPOSAL

MIGUEL PRUDÊNCIO

## REFERENCES

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## FIGURES

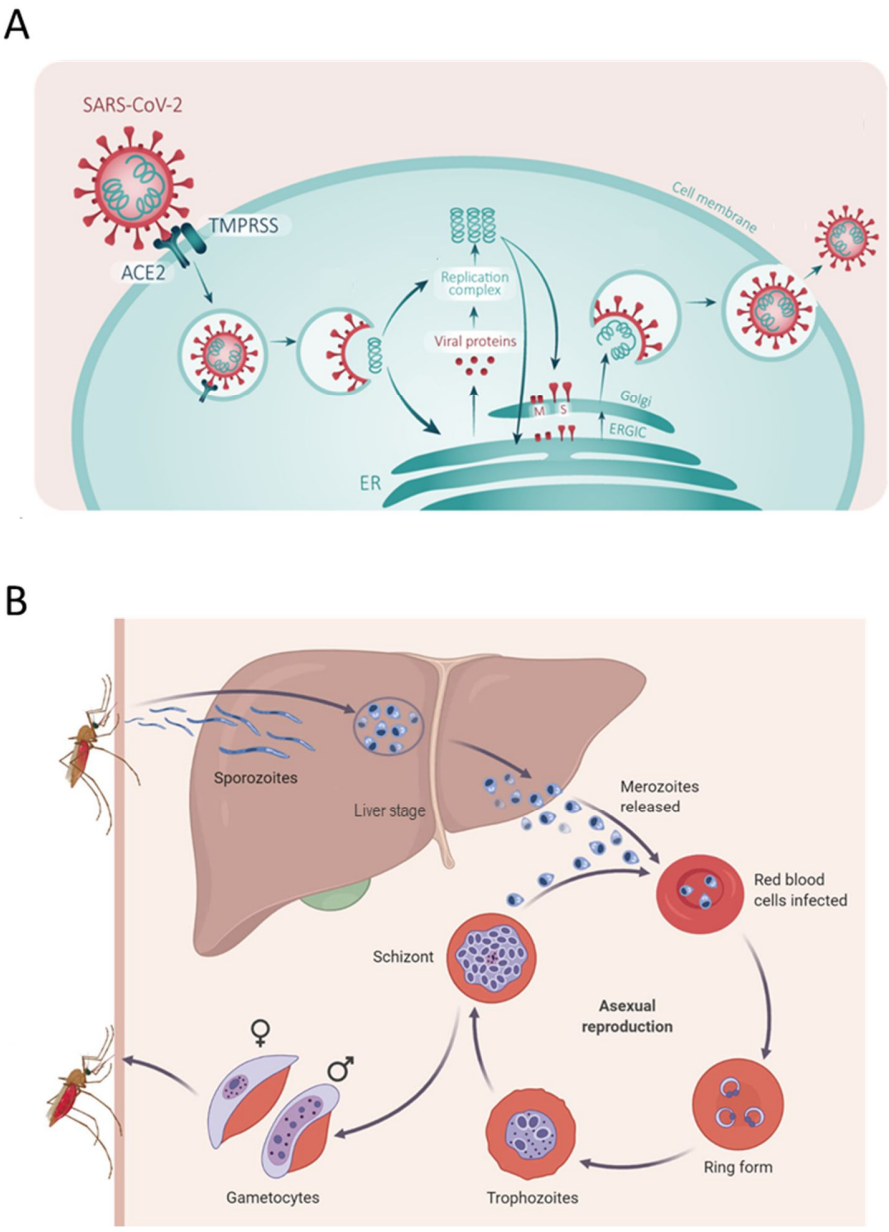


**Figure 1. Replicative cycle of SARS-CoV-2 (A) and life cycle of *Plasmodium* parasites (B). (A)** The virion consists of positive-sense single-stranded RNA (+ssRNA) encapsulated by the nucleocapsid protein and an envelope containing the membrane and spike proteins. The virus attaches to cellular factors, such as angiotensin-converting enzyme 2 (ACE2) and transmembrane serine protease 2 (TMPRSS2) through S protein interactions, promoting viral uptake and fusion with cell membranes. Inside the cell, uncoating and release of the genetic material occurs, allowing translation by the host machinery. The resulting non-structural proteins will then participate in viral genome replication and transcription inside perinuclear vesicles. **(B)** The bite of an infected female *Anopheles* mosquito deposits sporozoites into the mammalian host's skin, which will travel to the liver and infect hepatocytes. The liver stage development of the parasite results in the formation of merosomes containing multiple merozoites that are released into the blood stream, infecting red blood cells. Inside these cells, asexual replication occurs, perpetuating the infection inside the mammal host. Some blood stage parasites undergo sexual differentiation, giving rise to gametocytes that are ingested by uninfected mosquitoes during a blood meal, where they undergo sexual replication, producing sporozoites that migrate to the salivary glands, renewing the cycle of infection.

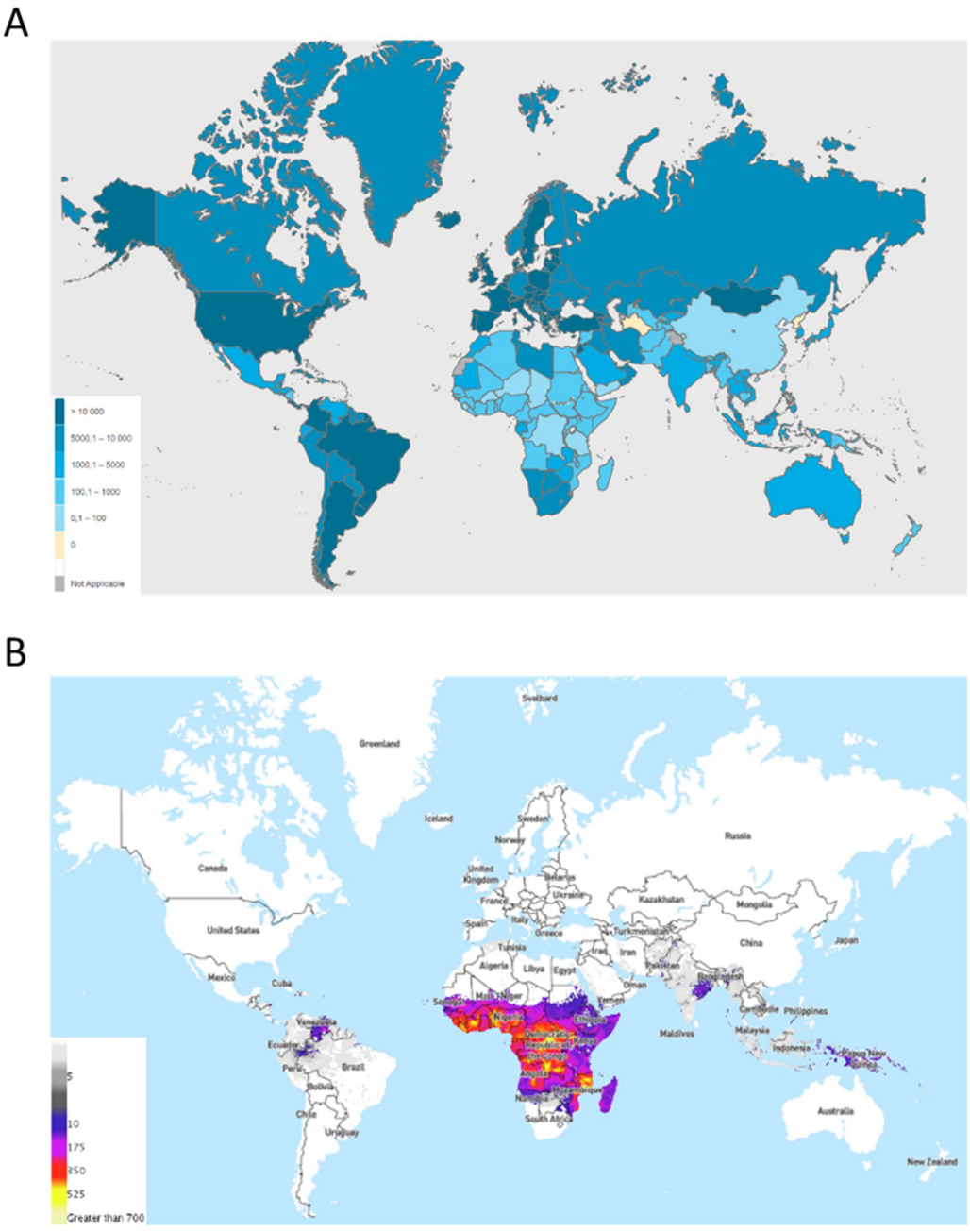


**Figure 2. Health burden of COVID-19 (A) and malaria (B). (A)** COVID-19 cases per 100.000 population, 2022 (*WHO Coronavirus (COVID-19) Dashboard. Published 2022. Accessed January 11, 2022. https://covid19.who.int/*). **(B)** *P. falciparum* malaria cases per 1.000 population at risk, 2000-2019 (*World Health Organization Collaborating Centre in Geospatial Disease Modelling. The Malaria Atlas Project*).

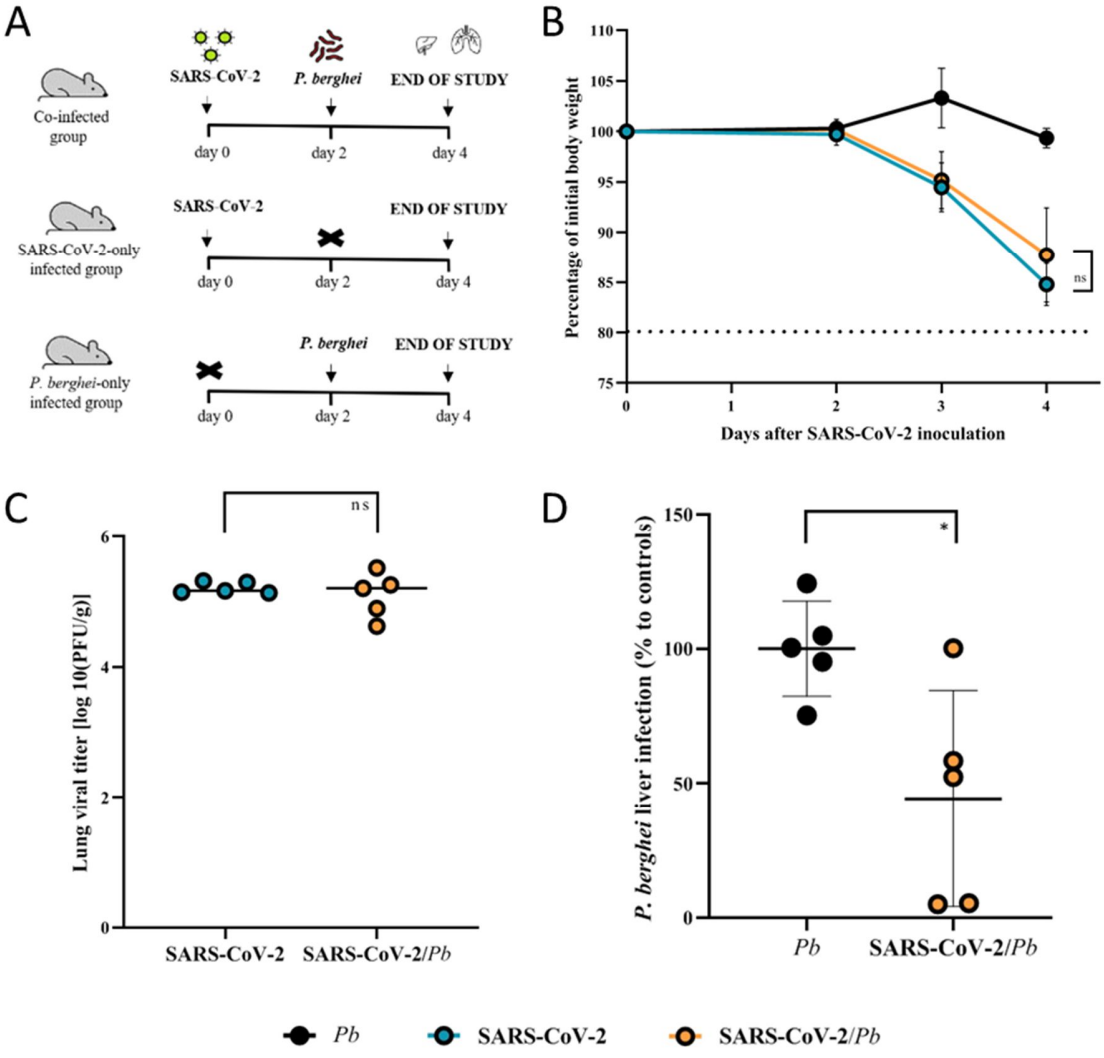


**Figure 3. Impact of an ongoing SARS-CoV-2 infection on a subsequent infection by *P. berghei* sporozoites.** **(A)** Experimental setup. **(B)** Clinical progression as assessed by mouse body weight shows a similar pattern for co-infected and SARS-CoV-2-single infected mice. **(C)** Quantification of lung viral titers at euthanasia shows that *P. berghei* infection has no impact on a previously established SARS-CoV-2 lung infection. **(D)** Quantification of the *P. berghei* burden in the livers of infected mice shows that a primary SARS-CoV-2 infection significantly attenuates a subsequent *P. berghei* liver infection. (**B**): The 2Way-ANOVA test was employed to assess the statistical significance of differences between experimental groups (ns, not significant); (**C, D**) The Mann-Whitney test was employed to assess the statistical significance of differences between experimental groups (ns, not significant, * $P < 0.05$).