

IGC's expertise to contribute to the SC1-PHE-CORONAVIRUS-2020- 2 Expression of Interest

SC1-PHE-CORONAVIRUS-2020-2D

The IGC is a **partner in “The COVID-19 Host Genetics Initiative”** (COVID19hg@IGC.PT; <https://www.covid19hg.org/partners/>)

The IGC has access to highly exposed individuals namely a **hospital-based cohort** in the central hospitals in the Lisbon region.

- A collection of health professionals in Lisbon region hospitals: we are set to **collect ~ 3.000 subjects in a prospective study with viral diagnosis, sero-conversion and epidemiological data**. IGC interest is to use this collection to joint genotyping and exome seq. efforts of the pan-european cohorts project.
- A population-based collection focused on **antibody responses and associated genetic factors** (aim **4.000 people**). IGC is engaging national health authorities in the project. It is planned to entail collections of specific sub-populations (e.g. first responders, elderly). IGC interest is to joint genotyping and exome seq. efforts.

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The IGC is developing a mhealth project that compile all existing data from ELISA and LFAs currently available in the market and can predict the best serological test that should be used adapted to a specific population and its infection rate. Further and in collaboration with a national start-up, the IGC is developing an app to follow-up on the frontline healthcare workers that are being tested.

The **Instituto Gulbenkian de Ciência** (IGC, <https://gulbenkian.pt/ciencia/>) given its wide expertise and advanced technological platforms in the fields of **immunology, genomics, virology and host-microbe evolution** has implemented an action plan to fight COVID-19 at different fronts: short-term (diagnosis and serology) and long-term (research-based).

Further, the IGC is **collaborating with several national** (Portuguese) and regional (Lisbon) **initiatives and international entities** (through the EU-LIFE and LifeTime alliances, Institutions in PALOP countries and India) to mitigate the COVID-19 crisis.

In the short-term front, the IGC has been focusing on **diagnostics**

1) The IGC can successfully detect, by RT-PCR, Sars-Cov2 in oropharyngeal and nasopharyngeal swabs from patients' samples (from frontline healthcare staff and nursing homes). The IGC has ongoing protocols with private and public hospitals having easy access to human samples. The IGC has a capacity for viral detection of **450 samples/day**.

2) Regarding serological surveillance, the IGC has developed, in collaboration with other academic national partners, an ELISA test that has proven to be as sensible and specific as the best commercially ones (100% and 99.4%, respectively). The IGC has a capacity on seroprevalence studies is 500 samples/day. In collaboration with national pharma, the IGC is also engaged in developing a Lateral Flow Assay (LFA) prototype for rapid detection of coronavirus IgG/IgM antibodies against SARS-CoV-2.

In the long-term (**research-based**), building on its intrinsic broad research expertise and capacity in biological and biomedical science the IGC is determined to contribute to filling the current enormous gap in scientific knowledge related to SARS.CoV2 / COVID-19. Research projects are being implemented to

1) determining the genetic risk factors that identify the most vulnerable individuals and the genetic basis for differences in **host susceptibility**,

2) to understanding the **immune response** to the virus and how to promote it,

3) to understanding the mechanisms of **viral adaptation** to different hosts.

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