

Covid19 host genetics, 1MG-NL, 4 May, 2020,

5.1.2e

Genetic Research in relation to covid

>> UK Twin study demonstrates 50% heritability for covid19 (5.1.2e et al. BioArchive 2020)

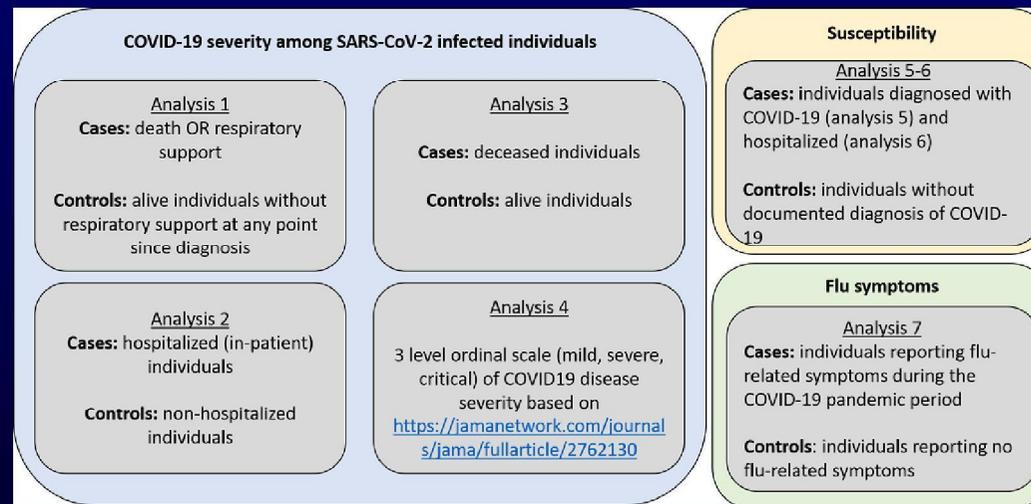
>Local/Netherlands (some activities, so far...):

- 1.Array/GWAS Genotyping nose swab collection (Erasmus MC; 5.1.2e 5.1.2e)
- 2.Array/GWAS genotyping covid IC cases (Erasmus MC, AMC,...)
- 3.Array/GWAS in cohorts with covid-questionnaires: LifeLines (5.1.2e), NTR (5.1.2e), ERGO+GenR (5.1.2e 5.1.2e), Maastricht (...)

>Global:

- International initiative (covid19HGI) led by Finnish Institute for Molecular Medicine (FIMM, Helsinki; 5.1.2e 5.1.2e) to perform large scale meta-analyses of GWAS: www.covid19hg.org
- Erasmus is involved through genotyping service HuGeF, and by providing data from 1-3 (5.1.2e)

>>Proposed types of analyses in covid19HGI (ongoing discussion):



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Covid19 Host Genetics Initiative (HGI), some background:

-Mid March FIMM, [5.1.2e] [5.1.2e] initiated covidHGI, including offering [5.1.1c] genotyping

-We at HuGeF thought this was a good idea, and talked with FIMM to align efforts

-As HuGeF we contacted Illumina and Thermo Fisher to negotiate discount

-We are able to offer [5.1.1c] genotyping for hospitalized covid patients, and [5.1.1c] discount on covid-related samples for array and sequencing (e.g., controls, cohorts with covid data collection)

[5.1.1c] sample for GSA

[5.1.1c] sample for Whole Exome Sequencing (WES)

-We made a website page with more information (www.glimdna.org; next slide)

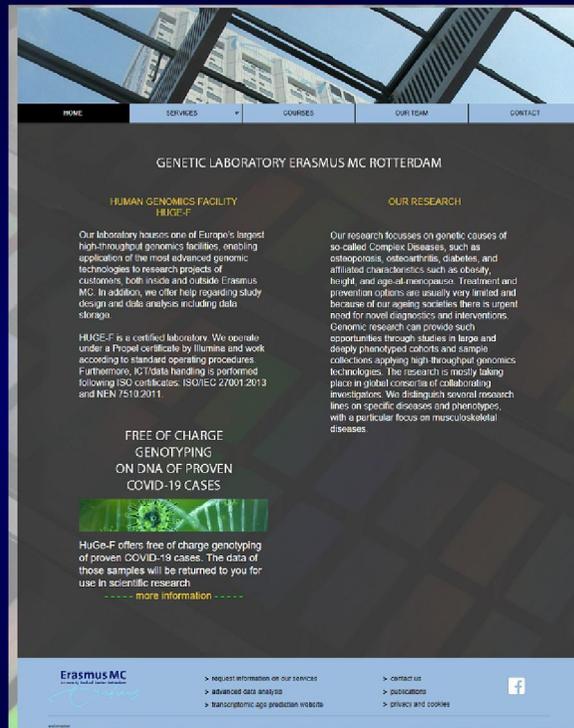
Source material:

-We take "normal" DNA (e.g. from blood/sputum) but also developed a protocol to work with DNA derived from nose swabs, which are used massively for virus testing. There is little human host DNA in there (0.1-20ng; in covid-cases a bit more) but this is sufficient to obtain very good genotype calls on the array (>99% call rate) on >90% of samples.

Since DNA collections from these nose swabs might be readily available (at your virology testing dept; RIVM), this can be a rich source of data for this effort.

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Please visit website : www.glimdna.org



GENETIC LABORATORY ERASMUS MC ROTTERDAM

HUMAN GENOMICS FACILITY HUGe-F

Our laboratory houses one of Europe's largest high-throughput genomics facilities, enabling application of the most advanced genomic technologies to research projects of customers, both inside and outside Erasmus MC. In addition, we offer help regarding study design and data analysis including data storage.

HUGe-F is a certified laboratory. We operate under a Procel certificate by Illumina and work according to standard operating procedures. Furthermore, ICT data handling is performed following ISO certifications: ISO/IEC 27001:2013 and NEN 7510:2011.

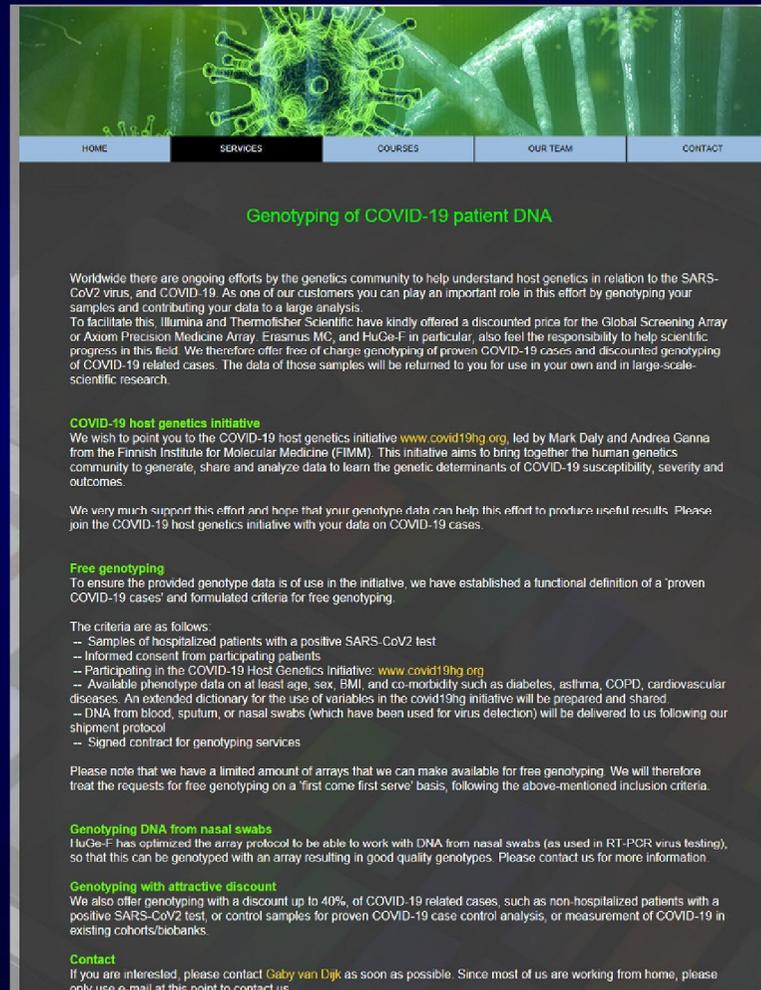
FREE OF CHARGE GENOTYPING ON DNA OF PROVEN COVID-19 CASES

HUGe-F offers free of charge genotyping of proven COVID-19 cases. The data of those samples will be returned to you for use in scientific research.

[----- more information -----](#)

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Genotyping of COVID-19 patient DNA

Worldwide there are ongoing efforts by the genetics community to help understand host genetics in relation to the SARS-CoV2 virus, and COVID-19. As one of our customers you can play an important role in this effort by genotyping your samples and contributing your data to a large analysis.

To facilitate this, Illumina and ThermoFisher Scientific have kindly offered a discounted price for the Global Screening Array or Axiom Precision Medicine Array. Erasmus MC, and HUGe-F in particular, also feel the responsibility to help scientific progress in this field. We therefore offer free of charge genotyping of proven COVID-19 cases and discounted genotyping of COVID-19 related cases. The data of those samples will be returned to you for use in your own and in large-scale scientific research.

COVID-19 host genetics initiative

We wish to point you to the COVID-19 host genetics initiative www.covid19hg.org, led by Mark Daly and Andrea Ganna from the Finnish Institute for Molecular Medicine (FIMM). This initiative aims to bring together the human genetics community to generate, share and analyze data to learn the genetic determinants of COVID-19 susceptibility, severity and outcomes.

We very much support this effort and hope that your genotype data can help this effort to produce useful results. Please join the COVID-19 host genetics initiative with your data on COVID-19 cases.

Free genotyping

To ensure the provided genotype data is of use in the initiative, we have established a functional definition of a 'proven COVID-19 cases' and formulated criteria for free genotyping.

The criteria are as follows:

- Samples of hospitalized patients with a positive SARS-CoV2 test
- Informed consent from participating patients
- Participating in the COVID-19 Host Genetics Initiative: www.covid19hg.org
- Available phenotype data on at least age, sex, BMI, and co-morbidity such as diabetes, asthma, COPD, cardiovascular diseases. An extended dictionary for the use of variables in the covid19hg initiative will be prepared and shared.
- DNA from blood, sputum, or nasal swabs (which have been used for virus detection) will be delivered to us following our shipment protocol.
- Signed contract for genotyping services.

Please note that we have a limited amount of arrays that we can make available for free genotyping. We will therefore treat the requests for free genotyping on a 'first come first serve' basis, following the above-mentioned inclusion criteria.

Genotyping DNA from nasal swabs

HUGe-F has optimized the array protocol to be able to work with DNA from nasal swabs (as used in RT-PCR virus testing), so that this can be genotyped with an array resulting in good quality genotypes. Please contact us for more information.

Genotyping with attractive discount

We also offer genotyping with a discount up to 40%, of COVID-19 related cases, such as non-hospitalized patients with a positive SARS-CoV2 test, or control samples for proven COVID-19 case control analysis, or measurement of COVID-19 in existing cohorts/biobanks.

Contact

If you are interested, please contact [Gaby van Dijk](mailto:Gaby.van.Dijk@erasmusmc.nl) as soon as possible. Since most of us are working from home, please only use e-mail at this point to contact us.

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***Erasmus MC covid19 host genetics efforts:**

- Rotterdam Study has sent out 9,000 questionnaires; mostly genotyped already
- GenR will be sending out ~10k questionnaires; mostly genotyped already
- Dept Virology has done NL centralized virus typing by rtPCR in nose swabs and has a collection of ~10k DNA extracts from those nose swabs, including ~2k SARS-CoV2 positives
- Erasmus MC IC has biobanked ~300 covid patients

***Dutch covid19 host genetics efforts:**

- Prof. 5.1.2e has circulated questionnaires among 50k participants of LifeLines study already and has done GWAS
- Dutch cohort/biobank initiative started to harmonize questionnaires and genotyping involving LifeLines, Rotterdam Study Generation R, Dutch Twin Register, Maastricht Study, Leiden Longevity Study....