Title	Understanding the SARS-CoV-2 (COVID) virus neutralisation capacity of the breast milk.
Group	Systems and Synthetic Biology / Food Quality and Design
Project type	thesis
Credits	36
Supervisor(s)	Dr. Edoardo Saccenti (SSB), Kaspar Hettinga
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Begin date	Open

Used skills: Statistics and programming; Relating results to existing or novel biological knowledge

Requirements: Ability to program in R and (basic) statistics and biological knowledge as well are desired skills.

Description:

Breastfeeding can provide nutrition and bioactive components for infants. During the last two years, several studies have determined that the immunoglobulins in human milk can act against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and reduce the infection rate for infants. However, some general immune components in human milk that may potentially be acting against COVID-19 remains unknown. Therefore, we performed proteomics analysis using human milk samples from mothers that were, or were not, previously infected with SARS-CoV-2. Non-targeted proteomics was used to compare human milk from these mothers in two perspectives: (1) prior covid infection (2) SARS-CoV-2 virus neutralisation capacity of the breast milk.

The aim of the project is characterize human milk with relation to COVID infection and to understand its capacity of virus neutralization.

In this project you will deploy an array a statistical and machine learning tools in combination with the reconstruction of biological networks and analysis to highlight key milk components involved in shaping the virus neutralisation capacity of the breast milk.

This project is in collaboration between the Laboratory of Systems and Synthetic Biology and the Food Quality and Design group.

References

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3. Pieter M. Dekker, Sjef Boeren, Johannes B. van Goudoever, Jacques J. M. Vervoort, and Kasper A. Hettinga. Exploring Human Milk Dynamics: Interindividual Variation in Milk Proteome, Peptidome, and Metabolome. J. Proteome Res. https://doi.org/10.1021/acs.jproteome.1c00879
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