SYSCID – A Systems medicine approach to chronic inflammatory diseases

**SYSCID E-Newsletter: 7/2020**

We are pleased to present the 7th e-newsletter of the SYSCID consortium which unites internationally renowned experts from 9 countries with the ambition to pave the way for a systems medicine approach to chronic inflammatory diseases. We would like to provide you with a short update of our work progress and interesting news from the field. This includes:

- SYSCID work progress
- Recent Recent publications
- EC measures regarding Covid-19
- Syscid annnual progress meeting
- News from the team

In addition, scientists of SYSCID have been successful in applying tools and algorithms developed for chronic inflammatory disorders to COVID-19. In part, this also allowed continuation of work during lockdown phases. Check out the highly visible results in the publication section of the newsletter

## SYSCID work progress

This edition of the newsletter comes with a long delay – we all are aware of the grave circumstances and problems of the past months. Some of us have worked in hospitals with COVID19 patients, others have supported lab work and diagnostics and probably all of us have dealt with the crisis in the private space, including lockdown and home-schooling. We have to face the fact that despite all those efforts the pandemic crisis is still present throughout Europe and in virtually all parts of the World. I hope that you and your families will remain safe throughout these times.

Science and the way how we pursue our daily life as scientists have changed and we will be facing ongoing challenges to plan and conduct collaborative work. Although we all got used to virtual meetings, a lot of us probably feel that face-to-face meetings are an important part of collaborations and sometimes the ideas originating from a brainstorming with a glass of wine (or a drink of choice) in a remote place are direly missing. It is our responsibility to preserve this spirit of science and to find other ways to communicate, especially for the younger generation of scientists and students. Whatever crazy idea you have in SYSCID to foster exchange and mutual project work, we will be happy to support. Despite the unclear prospect and delays due to partial and complete lockdowns, still we have achieved quite a lot this year. With our periodic project report submitted and a virtual annual meeting we can be proud about the progress.

Production of most Omics data sets for patient and control populations of several longitudinal and cross-sectional experiments aiming to address predictors and mechanisms of disease severity and outcome across CID has been concluded. Several manuscripts are currently prepared, and some initial studies e.g. on microbiota and therapy response have been published this year.

The project is now at its apex and several large- scale analytical tasks are currently ongoing, which include a large cross-sectional comparative multi-Omics map of all CIDs under investigation in SYSCID as well as single -cell resolved maps of therapy response in RA and IBD. Despite all

uncertainties ahead, we are confident that we are able to tackle these challenges and to provide exciting insights into important clinical questions around CIDs.

## Recent publications

- Scherer M et al., Reference-free deconvolution, visualization and interpretation of complex DNA methylation data using DecompPipeline, MeDeCom and FactorViz. Nature Protocols 2020, doi: 10.1038/s41596-020-0369-6
  **https://pubmed.ncbi.nlm.nih.gov/32978601/**
  DNA methylation is a cell-type-specific epigenetic mark, which poses challenges for the analysis of bulk tissue samples. To alleviate this problem, computational deconvolution tools can be used, which require high-quality input data. In this publication, we present a three-stage computational pipeline to perform deconvolution of complex, bulk tissue samples. The three stages include thorough data processing, computational deconvolution using MeDeCom, and interpretation of deconvolution results. In this project, we applied the protocol to lungadenocarcinoma data from TCGA and found indications of tumor infiltration with immune cells. For SYSCID, the computational deconvolution will be required to dissect complex tissues such as whole blood or bowel biopsies, and the presented protocol facilitates routine application of computational deconvolution in any epigenomic study.
- Warnat-Herresthal S et al. Swarm learning as a privacy-preserving machine learning approach for disease classification. bioRxiv 2020, doi.org/10.1101/2020.06.25.171009
  **https://www.biorxiv.org/content/10.1101/2020.06.25.171009v1.full**
- Schulte-Schrepping J et al., Severe COVID-19 is marked by a dysregulated myeloid cell compartment. CellPress 2020, in press. doi.org/10.1016/j.cell.2020.08.001
  **https://www.sciencedirect.com/science/article/pii/S0092867420309922?via%3Dihub**
- Bernardes JP et al., Longitudinal multi-omics analyses identify responses of megakaryocytes, erythroid cells and plasmablasts as hallmarks of severe COVID-19 trajectories. Immunity, 2020, in press. doi.org/10.1016/j.immuni.2020.11.017
  **https://doi.org/10.1016/j.immuni.2020.11.017**

## EC measures regarding Covid-19

With the start of the COVID-19 pandemic the European citizens and governments faced challenging times. Those also affected projects and consortia within the Horizon 2020 program. As a reaction to the pandemic, the European Commission took various measures to face the difficulties the virus caused.

From the funding perspective, the EC unlocked new grant funds and released COVID-19 specific tenders to advance knowledge for the clinical and public health response to the 2019-nCoV epidemic. All information on actions against COVID-19 and tenders can be found on the newly implemented **"European Research Area (ERA) corona platform"** on the funding & tenders portal (https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/covid-19).

Current projects receiving funding within the Horizon 2020 program are confronted with various challenges caused by the virus. Consortia are unable to continue their work on the projects as planned due to closed institutions and laboratories, contact restrictions, increased workload in the health care sector and travel restrictions all over the globe. The EC is eager to provide the most possible flexibility within the rules and guidelines of the Horizon 2020 program to solve the issues that consortia are confronted with.

The EC regularly publishes and updates **Frequently Asked Questions (FAQs)** on the funding & tenders portal. The latest FAQs can be accessed over the **"European Research Area (ERA) corona platform"**. Beneficiaries can quickly find answers to common questions e.g. on delays in project implementation, reports and deliverables, travel costs, the clause on "force majeure" in relation

to COVID-19, extension of project duration, postponement of the project starting date and many more. In every case and for more specific project relevant matters regarding COVID-19 the Project Officers are the first contact point for beneficiaries and will help to find the best possible solution that benefits the success of the project.

Recently the EC published a COVID-19 research manifesto, it provides guiding principles for beneficiaries of EU research grants for coronavirus prevention, testing, treatment and vaccination to ensure that their research results will be accessible for all and guarantee a return on public investment. This will aim to ensure that no one is left behind in the fights against Covid-19, and that solutions will be developed, produced and deployed to every single corner of the world.

## Syscid annual progress meeting

Given the current conditions of restricted travel and physical interactions, the SYSCID consortium conducted its annual meeting in full virtual mode on 21st April 2020 instead of meeting up in Geneva.

After a warm welcome by coordinator Philip Rosenstiel, the partners dived into work right away. In a very efficient atmosphere, the consortium members discussed the presented status updates and current challenges of the project. Of course, Syscid is also affected of the global corona virus pandemic. The resources for research activities are thus very limited - and if not highly urgent – postponed. The non-clinical consortium partners confirmed that they are still able to perform their tasks in SYSCID as planned and the whole consortium, also the clinical partners, are still working closely together to keep the project progressing and mitigate the effects of COVID-19. The overall effect on the project can not yet be measured and will be assessed on a regular basis.

However, all in all, the coordinator and the project partners are pleased with the progress and achievements the project made since the last meeting.

## News from the team

**Postponement: SYSCID Symposium & IHEC Annual Meeting 2020 – 23-25 September 2020, Kiel/Germany**

In view of the ongoing coronavirus pandemic causing severe disruptions and travel restrictions around the world, the SYSCID team in collaboration with the IHEC 2020 Organizing Committee has decided to postpone the SYSCID Symposium & IHEC Annual Meeting 2020 originally scheduled to take place in Kiel from 23 to 25 September 2020.

The safety and health of all those attending as well as delivering the conference is our top priority. It is for this reason we no longer believe that it will be responsible on our part to hold the conference in September, 2020 as previously planned. A new date in 2021 has yet to be confirmed. We are closely monitoring the situation, and plan to provide additional details in the coming months on the timing of the conference in the next year.

We will keep you informed about any updates on this website, and sincerely hope you, your family, friends and colleagues are keeping well in these challenging times.

## Your contact persons

Should you have questions or suggestions for our newsletter, please get in touch with:

**Project Coordination**
Kiel University, Institute of Clinical Molecular Biology
Prof. Dr Philip Rosenstiel
Phone: +49(0)431 / 500 15111

**Project Management**
European Research and Project Office GmbH (Eurice)
Jennifer Krill
Phone: +49 (0) 6894 / 3881332
Email : j.krill@eurice.eu

SYSCID has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 733100.