PRESS RELEASE

MICROB-PREDICT - €15 million EU funded microbiome research project kicks off

22 European institutions join forces to tackle end-stage liver disease and liver failure with personalised microbiome-based treatment strategies

- *Worldwide, 1.2 million people die of liver cirrhosis every year, and less than 10% of the research in the field is focused on decompensated cirrhosis and acute-on-chronic liver failure (ACLF). It is crucial to develop novel treatments and help affected individuals.*
- *In the 6-year-long EU-funded MICROB-PREDICT project, world-leading microbiome experts, technology leaders, clinical specialists, patient organisations (ELPA) and the European Association for the Study of the Liver (EASL) join forces to understand how the human microbiome contributes to the development of liver decompensation and ACLF.*
- *High-quality data of more than 10,000 subjects from three existing EU-funded projects (GALAXY, LIVERHOPE, PREDICT) will be analysed to design novel, microbiome-based tests and diagnostic tools.*
- *The 75-month project aims to develop improved and more personalized therapies for patients suffering from cirrhosis and ACLF.*

The fatal course of decompensated cirrhosis & ACLF

End-stage chronic liver disease (cirrhosis) is a major cause of morbidity and mortality, and has a large socioeconomic impact because of high health care costs and the patients' inability to work or seek employment. Patients show symptoms, start suffering, and eventually die of chronic liver cirrhosis when the body essentially can't compensate the mis- or dysfunctional liver condition any longer. That's why it's called decompensated (as opposed to compensated) cirrhosis. Decompensated cirrhosis is defined by accumulation of fluid in the abdomen (ascites), impaired brain function (hepatic encephalopathy), and often also bleeding in the digestive tract (gastrointestinal haemorrhage). Eventually, it progresses to acute-on-chronic liver failure (ACLF) and death.

Genetic predisposition and/or infections can increase the risk for decompensated cirrhosis and worsen its prognosis. The gut microbiome consists of all bacteria, viruses, parasites, fungi and archaea bacteria that colonize the gastrointestinal tract. Aberrations in the gut microbiome, a damaged gut-body barrier, excess bacteria crossing that barrier (microbial translocation), and systemic inflammation can trigger decompensated cirrhosis and its progression to ACLF. A recent multi-centre study by the European Foundation for the study of Chronic Liver Failure (EF-CLIF, Barcelona) demonstrated that bacterial infections are common precipitating events for ACLF in Western countries, and confirmed the high mortality rate of ACLF.

How patients with cirrhosis and ACLF will benefit from MICROB-PREDICT

MICROB-PREDICT aims to develop **personalised, microbiome-based treatment strategies to prevent and treat ACLF and reduce mortality** by investigating the human gut microbiome. The goal is to identify predictors and mechanisms associated with the development of decompensated cirrhosis and its progression to ACLF. The need for personalised treatment strategies becomes apparent when considering that there are substantial, yet still largely unexplained, individual differences in developing decompensated cirrhosis and ACLF. At the same time, this observation bears the chance for more effective, more individualised and more targeted treatments.

The pan-European research project will integrate microbiome results and other patient data from previous large-scale studies, such as GALAXY, LIVERHOPE and PREDICT, combining more than 200,000 data points from about 10,000 subjects. A comprehensive data base will be generated, including data from stool, blood, saliva, mucosa and urine samples over the course of the disease, allowing for a novel longitudinal analysis, thereby clearly providing added value over the previous studies. MICROB-PREDICT will identify and validate microbiome-based individual biomarkers and predictors of a) healthy, low-risk conditions, b) decompensated cirrhosis and progression to ACLF, and c) treatment response. In addition, the role of environmental factors (e.g. exposure to pollutants), lifestyle (e.g. smoking), diet (e.g. alcohol consumption), comorbidities, ageing, geographic differences and socio-economic factors will also be taken into account.

Gained knowledge will be translated into **clinical tests for doctors and every-day tools for liver-disease patients**, such as point-of-care (POC) diagnostic tests and state-of-the-art nanobiosensors for smartphone-based patient self-monitoring. MICROB-PREDICT also tries to identify and validate "biomarker signatures" that reliably predict the therapeutic response to treatment with human albumin in a randomized clinical trial (ALB-TRIAL). In short, the 6-year-long project focusses on **factual and guided, rather than symptom-based treatment**, and aims to develop personalized, effective and well-targeted treatment approaches to reduce the burden on both the patients as well as the health care system.

Introducing the MICROB-PREDICT consortium

Professor Dr. Dr. med. Jonel Trebicka (member of EF-CLIF, Barcelona, and professor for hepatology at the Goethe University Frankfurt) spearheads and coordinates MICROB-PREDICT. The 22 institutions that collaborate in this multi-centre project are spread throughout Europe, and include microbiome-, technology-, and clinical experts as well as leading patient organisations. The multidisciplinary team will ensure high-impact dissemination of scientific results and appropriate implementation in clinical guidelines. The consortium plans to safeguard and patent relevant intellectual property (IP) for commercial exploitation of any newly validated biomarkers because potential drug targets will be of interest for several MICROB-PREDICT project partners. However, the consortium may also approach external diagnostic companies.

Team leaders will meet in person at least twice a year to discuss the project's progress. The Kick-Off Meeting took place at the end of the month, from January 28th to 30th 2019, in Barcelona, Spain.

- Academisch Ziekenhuis Leiden (Leiden University Medical Center, LUMC)
- Biobyte Solutions GmbH (Biobyte)
- Commissariat à l'Energie Atomique et aux Energies Alternatives (CEA)
- concentris research management GmbH (concentris)
- Debreceni Egyetem (University of Debrecen, UNIDEB)
- European Association for The Study of the Liver (EASL)
- European Foundation for The Study of Chronic Liver Failure (EF-CLIF)
- European Liver Patients Association (ELPA)
- European Molecular Biology Laboratory (EMBL)
- Fundació Clínic per a la Recerca Biomèdica (FCRB)
- Fundació Institut Català de Nanociència i Nanotecnologia (ICN2)
- Institut National De La Recherche Agronomique (INRA)
- Johann Wolfgang Goethe-Universität Frankfurt Am Main (GUF)
- Katholieke Universiteit Leuven (KUL)
- King's College London (KCL)
- Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V. (MPG)
- Odense Universitetshospital (OUH)
- Universitat de Barcelona (UB)
- Universitetet I Oslo (UiO)
- University College London (UCL)
- University of Copenhagen (UCPH)
- Vaiomer SAS (Vaiomer)

Barcelona, Spain, 1 February 2019

www.microb-predict.eu

Contact

Dr. Minneke Coenraad
Dissemination Manager
m.j.coenraad@lumc.nl
+31 (0) 651 236 479

Dr. Nina Donner
Project Dissemination
nina.donner@concentris.de
+49 (0) 8141 6252 8584

Dr. Ameli Schwalber
Project Manager
ameli.schwalber@concentris.de
+49 (0) 8141 6252 8571

Funding

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No. 825694. This press release reflects only the view of the author or authors (scientific coordinator and contact & translating personnel), and the *European Commission* is not responsible for any use that may be made of the information it contains. Reproduction is authorised provided the source is acknowledged.