

Launch of New EU Project “IMMEDIATE”: Unravelling Key Factors of Chronic Inflammation and Predicting Health-to-Disease Transitions

Led by Charité – Universitätsmedizin Berlin, the international research team aims to develop personalised prediction strategies for non-communicable diseases caused by chronic inflammations. Through artificial intelligence algorithms, the consortium will determine the individual impact of dietary habits on the microbiome, the metabolome, and the immune system.

Berlin/Germany, 15 February 2023 – An unhealthy lifestyle, including a pro-inflammatory “Western diet”, physical inactivity, work-related stress, and other environmental factors have a major impact on our health. Going by the name of ‘exposome’, they are proven to largely drive chronic inflammation, resulting finally in organ dysfunction and clinical manifestations such as obesity, chronic kidney disease, cardiovascular disease, type 2 diabetes, and brain damage. To prevent non-communicable diseases, it is essential to identify individual biomarkers of risk and resilience against chronic inflammations as early as in the pre-symptomatic stage. Since the gut controls the regulation of inflammatory responses and dietary habits have emerged as the most relevant factor for health-to-disease transitions, the interface of diet, microbiota, and host is crucial to unravelling key factors for chronic inflammation. Yet, this so-called “diet-microbiome-metabolite-immune axis” still widely constitutes a “blind range of imminent disease”. Coordinated by Charité – Universitätsmedizin Berlin, the new EU research project “IMMEDIATE” aims to utilise and explore this axis as a sensor for health-to-disease transition to further our understanding of the mechanisms and molecular pathways underpinning disease and ultimately provide citizens with novel prevention strategies and tools. Bringing together 12 partner institutions from Europe, the UK, and Israel, the project is funded by the European Union’s Framework Programme for Research and Innovation “Horizon Europe” with a total budget of 6.2 Mio EUR over the next four years.

Gaining insights into the “blind range of imminent disease”

Many of the environmental factors driving chronic inflammation and, thus, most non-communicable diseases are modifiable with great potential to benefit a person’s health. However, in most cases, healthcare providers still act too far downstream in the health-to-disease transition process. Citizens usually do not seek medical help before a manifested organ dysfunction results in clinical symptoms. Moreover, individual risk and resilience profiles for health-to-disease transition are largely unknown and cannot be simply inferred from visible factors (such as age, sex, BMI, smoking etc.). Against this backdrop, research into the blind range of imminent disease holds great potential for identifying more accurate, personalised risk/resilience profiles.

“Taking advantage of cutting-edge omics technologies in combination with ample clinical data and biospecimens from ongoing observational cohort studies, the IMMEDIATE research team will shed light on this blind range – a pre-disease stage during which end-organ damage and clinically symptomatic disease can presumably still be successfully prevented by appropriate interventions including dietary and lifestyle modifications”, says Prof. Friedemann Paul, Coordinator of the IMMEDIATE project at Charité – Universitätsmedizin Berlin.



From large-scale data analyses and proof-of-concept to personalised prevention strategies

The combined effects of lifestyle, nutrition, occupation, social, psychosocial, and genetic factors on health-to-disease transitions can only be studied effectively in trials conducted on large, statistically representative cohorts and over a sufficiently long period of time. IMMEDIATE will therefore apply machine learning and artificial intelligence (AI) to three existing large prospective studies: 10k (Israel), NAKO, and KTX360°C (Germany). The AI-based analysis of these cohorts will provide significantly large datasets regarding populations with diverse ancestries that live in different geographic regions, and have different lifestyle habits (e.g., diet, smoking and alcohol consumption), thereby enabling the definition of risk and resilience profiles for chronic inflammation.

In order to test the beneficial, anti-inflammatory effect of a microbial intervention, IMMEDIATE will then conduct a proof-of-concept human study on a population of healthcare professionals (e.g., physicians, nurses, and paramedics) who are exposed to high and regular levels of stress. The goal is to demonstrate the improvement of health outcomes on the risk profiles for chronic inflammation identified in the prospective studies. Moreover, the study will enable the optimisation of mobile apps designed by the IMMEDIATE consortium to offer personalised lifestyle recommendations and to help citizens manage their own health proactively.

“As society and the environment change, we need novel prevention strategies for staying healthy,” adds Prof. Paul. “By expanding the overall understanding of chronic inflammation and health-to-disease transitions, we strive to provide citizens with personalised health guidance and innovative technological tools to reduce their risk of developing chronic diseases.”

Key Facts

Full Name: Imminent Disease Prediction and Prevention at the Environment Host Interface (IMMEDIATE)

Start Date: 1 January 2023

Duration: 48 months

Budget: 6.2 Mio €

Coordinator: Charité – Universitätsmedizin Berlin

Website: www.immediate-project.eu

Social Media: [LinkedIn](#)

Project Partners

Belgium

- The Akkermansia Company

Germany

- Charité – Universitätsmedizin Berlin
- Max-Delbrück-Centrum für Molekulare Medizin
- Universitätsklinikum Erlangen
- Universitätsklinikum Essen
- Bundesverband Niere e.V.

- EURICE - European Research and Project Office GmbH

Israel

- Weizmann Institute of Science

Italy

- Zadig srl

Poland

- Sanprobi Sp. z o.o. sp.k
- Pomorski Uniwersytet Medyczny w Szczecinie

United Kingdom

- Imperial College of Science, Technology and Medicine

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