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# Major EU project will harness AI and genomics for disease prevention

*An international collaboration project to develop and implement novel genome-based disease prediction tools has received over 10 million euros from the EU Horizon 2020 Research and Innovation program. The project aims to demonstrate the potential and benefits of powerful artificial intelligence (AI) technologies on the generation of genetic predictive scores and to test their clinical validity*.

Genomics has the potential to revolutionize healthcare, but novel research is required to leverage the large pool of genomic and health data in Europe and beyond to advance personalised medicine.

The INTERVENE project aims to develop and test next generation tools for prevention, diagnosis and personalised treatment of both common and rare diseases by using advanced AI-based approaches on a large pool of genomic and longitudinal health data currently stored in biobanks and medical repositories.

The project focuses on developing improved genetic risk scores and testing their clinical validity. Genetic risk scores are statistical tools generated based on genome-wide profiling of individuals and the effects of each genetic variant on a risk of each disease.

Significant advances have been made in this field recently. Increasing evidence shows genetic scores to offer predictive potential that is similar or, in some cases, even better than conventional clinical risk factors in diseases such as cardiovascular diseases and common cancers and for many diseases we are currently lacking tools to identify high-risk individuals.

In the INTERVENE project, life-long clinical and laboratory measurement data will be integrated with the genetic scores to create powerful predictive tools and to identify individuals at high risk of getting the disease. For three diseases with tremendous public health burden - cardiovascular disease, type 2 diabetes and breast cancer - the utility of AI-empowered tools will be tested in clinical settings in Finland, Estonia and Italy.

INTERVENE will also build a new European platform that will allow researchers and clinicians to easily calculate genetic scores with the goal to enable a wide adoption of genetic risk scores as a gold standard in clinical research. To do this, the INTERVENE consortium has united leading experts from academia, industry, health care providers and patient advocacy groups.

“There is a pressing need for developing efficient development and testing platforms to enhance clinical validation of these powerful algorithms. To solve this need, INTERVENE brings together the leaders in AI methods development, biobanks, clinical research, IT infrastructures, and ethical, legal and societal impact

in Europe and beyond", says Professor **Samuli Ripatti** from the University of Helsinki, the organization coordinating the project.

"Furthermore, we need the novel tools to be able to automatically calculate the scores in different ancestry groups and to communicate the risk information to clinicians and to citizens in an understandable manner."

Despite the fast accumulating scientific evidence, the predictive value of genetic risk scores has not been tested in clinical practice for many preventable diseases. In the INTERVENE project, the newly developed tools will be taken into clinical environment and their real-world benefits will be evaluated together with clinical experts, European patients advocate groups and medical societies.

By giving special emphasis to the regulatory and ethical implications, a framework for legally and ethically responsible translation into wider clinical practice will be developed.

"We are very excited to have gathered so many brilliant and dedicated experts, very impressive datasets and world-class data analysis platform in this unprecedented joint effort to transform clinical research and precision medicine," says Dr. **Andrea Ganna**, who is co-leading the project.

The results of the project will hopefully provide unprecedented precision in personalized prediction models and thus more effective prevention and better treatment options for patients suffering from a variety of complex and rare diseases.

*The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101016775. The INTERVENE (International consortium for integrative genomics prediction) project will run for 5 years, starting on January 1, 2021. The University of Helsinki, Finland, is the coordinator of the project. The complete partner list can be found at the end of the press release.*



**More information:**

For more information, please visit the project website at www.interveneproject.eu or contact the project coordination office at the University of Helsinki:

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**Project partners:**

University of Helsinki, Finland

IBM Research, Switzerland

European Molecular Biology Laboratory

University of Siena, Italy

Norwegian University of Science and Technology, Norway

Queen Mary University of London, United Kingdom (agreed to participate)

University of Tartu, Estonia

Biobanks and Biomolecular Resources Research Infrastructure Consortium

Technical University of Munich, Germany,

CSC – IT Center for Science, Finland

Hasso Plattner Institute, Germany

Aalto University, Finland

Helsinki University Hospital, Finland

University of Cambridge, United Kingdom

Massachusetts General Hospital, USA

University of Turin, Italy

European Cancer Patient Coalition, Belgium

Ttopstart, the Netherlands