

## **Researchers make a ‘molecular manual’ for hundreds of inherited diseases.**

**Researchers have created a catalogue of tissue-specific processes involved in hundreds of inherited diseases. These results could help treat diseases such as breast cancer, Parkinson disease, heart diseases and autism, and is the result of a collaboration between nine scientists from The Technical University of Denmark, Massachusetts General Hospital, and Harvard Medical School.**

The results – which are published in the prestigious American journal ‘Proceedings of the National Academy of Sciences – constitute the first molecular catalogue of tissue-specific processes involved in hundreds of human diseases, and will facilitate the study of fundamental tissue-specific processes involved in diseases. This could lead to new or better treatments in specific diseases.

”Disease processes in humans are far from being exhaustively understood and characterized, in part because they are the result of complex interactions between many molecules, and often take place in specific tissues or organs. These interactions are hard to study in humans because it would require extensive experiments in patients, which of course is not possible. This creates a bottleneck in our understanding of how diseases arise and which molecules and genes are involved”, says project leaders Kasper Lage from Harvard Medical School, Massachusetts General Hospital and Niclas Tue Hansen from Center for Biological Sequence Analysis (CBS), Technical University of Denmark. ”We chose a new approach by letting supercomputers model biological processes in tissues across the human organism, based on the knowledge from millions of already published articles. In this way we were able to create an extensive map the interactions of molecules in many diseases – a sort of molecular manual to hundreds of diseases – without carrying out experiments in patients”.

The diseases will most likely be easier to investigate for doctors and researchers and the catalogue has been made freely available from the CBS webpage. “This is a crucial step in our understanding of inherited diseases. We have shown that using supercomputers we can circumvent some of the bottlenecks in experimental disease research. We let the computers integrate a lot of available clinical data and searched for new patterns that are important for the tissue-specific disease processes”, says Thomas Skøt Jensen Assistant Professor at CBS. He continues: “This ‘molecular manual’ will possibly help choose better targets for therapeutic drugs, and can in the long run lead to the development of new treatments in some of these serious disorders.”

The results are a collaboration between nine researchers from Center for Biological Sequence Analysis, Technical University of Denmark; Novo Nordisk Foundation Center for Protein Research, University of Copenhagen; Massachusetts General Hospital, Boston; Harvard Medical School, Boston; Stockholm Bioinformatics Center, Stockholm University; MIT, Boston; and Childrens Hospital, Boston.

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