



ETRIKS

European Translational Information & Knowledge Management System

Through the eTRIKS project, the University of Luxembourg has benefited from European research funding.

The data healers

1 Countless medical trials have been performed for drug research over the years and have generated huge collections of data, however with almost no compatibility between them. Yet, lying dormant within them are valuable clues for new therapeutic approaches, waiting to be discovered – if only we could make the data comparable and interpretable. With the EU project eTRIKS, the Luxembourg Centre for Systems Biomedicine (LCSB) of the University of Luxembourg is helping to uncover this treasure of knowledge.

As head of the Bioinformatics Core Facility of the LCSB, Dr Reinhard Schneider ensures that the data generated during research projects at the LCSB exploited as deeply as possible. His team of computer specialists, physicists, mathematicians, bioinformaticians and biologists provides the scientific and technical requirements for this task. Every scientist at the LCSB is aware of the importance of including the Bioinformatics Core Facility in research projects at an early stage: preferably already in the planning of the experiments as well as in the design of the data structures in order to ensure that the needed infrastructure, such as data storage and compute power, will be available to run the analyses smoothly.

Exploiting industry data

Dr Schneider also receives requests for collaboration from outside, for instance from the pharmaceutical industry. “Industry has entire mountains of data waiting to be reanalysed with modern bioinformatics techniques,” Dr Schneider says. How so? Big pharmaceutical companies are research establishments in their own right whose activities cover the entire spectrum of drug development, from identifying targets for new drugs to developing active substances and conducting preclinical and clinical trials. Different companies will often study the same disease and collect

relevant data independently from each other. Since they are competitors, they have no concerted or uniform way of structuring and analysing the data collected. “A valuable treasure of information is waiting if we can only uncover it,” Dr Schneider confirms.

The European Commission agrees and wants to help reveal this treasure to improve healthcare and bring new drugs onto the market. Hence the creation of the Innovative Medicines Initiative (IMI), a public-private partnership in which the public sector and companies collaborate on different projects such as eTRIKS. The eTRIKS consortium brings together large pharmaceutical companies – from Johnson & Johnson to Astra-Zeneca, Bayer and Sanofi-Aventis – with research institutes such as the Imperial College of Science, Technology and Medicine, CNRS in Lyon, and the LCSB. “The collaboration takes place in the precompetitive phase, of course,” Dr Schneider stresses, given that nobody wants to share knowledge that offers a competitive edge.

Cross-study analyses

Dr Schneider describes the basic intentions of eTRIKS as follows: “Each company involved has studied numerous diseases. It is obvious that substantially more information can be found through analysing the entirety of their data instead of looking at individual studies one by one. Together with our eTRIKS partners, we have developed the standards, methods and techniques for meaningfully combining the existing data and making them ready for new analyses.” In 2014, eTRIKS joined forces with other initiatives to develop a common software platform for knowledge management in pharmaceutical research called tranSMART. “This platform provides various technologies that can considerably accelerate drug research,” he says.

In the scope of eTRIKS, Dr Schneider’s team is responsible for preparing the data – “data curation”, as he describes it: “You can imagine it as if a truck had dumped tons of data in the yard. These data have to be standardised, ordered and stored away neatly labelled for bioinformatics to be able to do anything with them.” A Sisyphean task, Dr Schneider admits, but a rewarding one. “We benefit in three ways from eTRIKS,” he says. “Firstly, by obtaining knowledge to use in our scientific work to progress more rapidly in the LCSB’s core research fields of neurodegenerative diseases and Parkinson’s disease. Secondly, by getting new bioinformatical tools with which we can better analyse our own data. And thirdly, through insights into how we should design experiments in order to make them compatible with other ones and gain more from larger data sets.”

Now that the eTRIKS methodology is publically available on tranSMART, medical development in general can also benefit. “The pharmaceutical industry has invested considerably in IMI and contributed its own developments to tranSMART,” Dr Schneider reports. “It now has the opportunity to plough through its existing data once more and find new research approaches for new active substances.” The hope is that this will lead to better drugs at reasonable development costs.



The Seventh Framework Programme for Research and Technological Development (FP7) was the European Union’s main financial instrument to support European research during the 2007-2013 period. The funding programme continues under Horizon 2020, the Framework Programme for Research and Innovation, supporting a wide range of research domains with a budget of €79 billion (2014-2020).