Speeding up precision medicine with Barcelona Supercomputing Center

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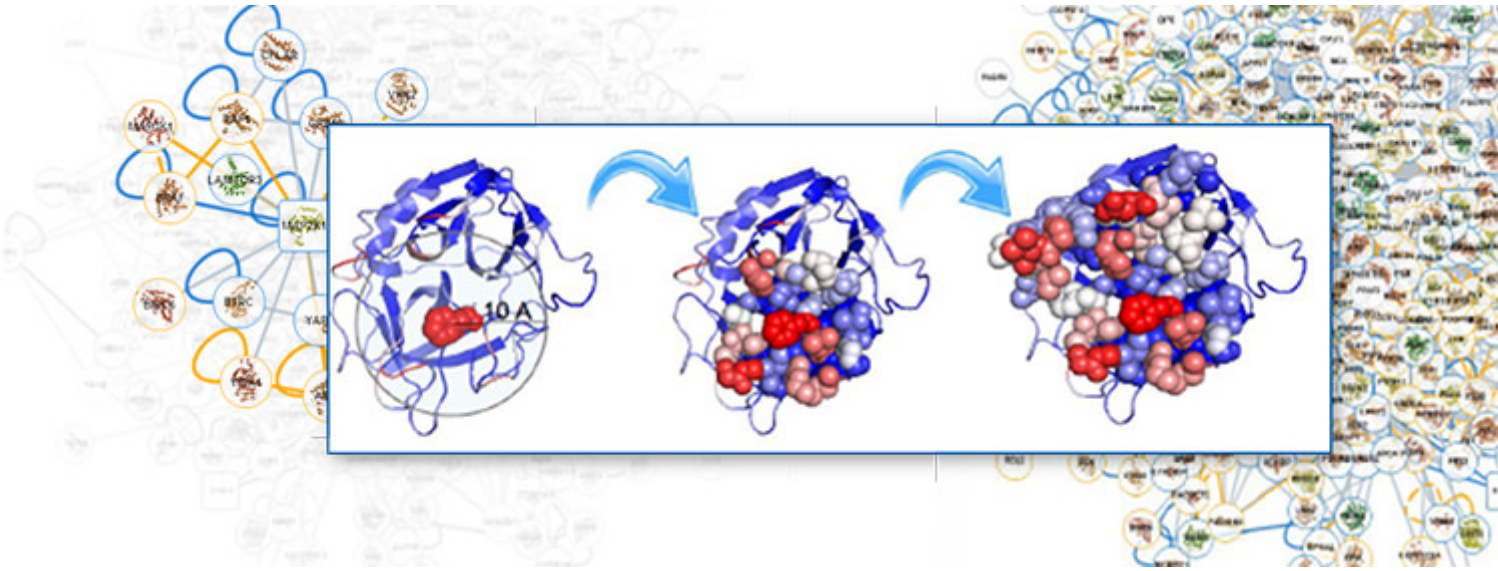

(via OpenPower Foundation)

By Mateo Valero and Enric Banda, Barcelona Supercomputing Center

The last decade has seen a worldwide increasing interest in Precision Medicine (PM). As a result, a number of computing platforms have been set up in different centres and countries following different strategies and road maps.

A common challenge that all these initiatives face has to do with the management and analysis of genomic data. For this reason, the improvements and developments around the computing resources devoted to this goal have increased recently. The search for optimal software-hardware relationships to develop robust, efficient and accurate systems and environments for PM is one such example.

Most public administrations have, therefore, paid attention to Precision Medicine either to give it momentum as a key part of biomedical research, such as the US, or to start introducing it into the public health system, like the United Kingdom. In Spain, the recent example comes from the Catalan Government, as recently expressed by the Department of Health in “Catalonia Crafts Strategic Framework for Personalised Medicine” published by the Personalised Medicine Coalition in its fall 2016 issue.

The Barcelona Supercomputing Center has the conditions and skills to be a leading agent in Precision Medicine. Its Life Sciences department has long and successful experience in international genomic research projects such as those promoted by the International Cancer Genome Consortium. Its advanced research

groups in high performance computing are specialists in managing big amounts of data, introducing cognitive techniques for its analysis and the development of computational technologies to apply to the most diverse scientific fields. Together, they are constructing hardware-software platforms to optimize the flows and pipelines of genomic variations analysis. It goes without saying that the BSC also has the appropriate infrastructure in terms of computing capacity as well as storage of massive amounts of data.

Together with our experience of working closely with hospitals and clinicians, a fundamental part of the project and the one closest to patient's interests, this combination makes our centre a perfect ecosystem for the development and application of computational approaches for clinical genomics. A recent competitive call for proposals on PM from the Catalan Government has shown that the BSC is centralizing the computing needs, as it is involved in most projects that are being carried near Barcelona. One of the most active hubs in biomedical research in Europe, the BSC is ready to tackle the opportunity to become a key element in PM projects in Spain.

Needless to say, the complexity of the challenge makes the multi-stakeholder alliance a prerequisite. A platform is being designed within the BSC and will be shortly put in place to bind together the main actors and stakeholders in both research and health care. Having industrial technological partners willing to collaborate on the project is also a sine qua non. This is why BSC decided to join the OpenPOWER Foundation. The complementary knowledge provided by the foundation and the cooperation from IBM, with its new architectures and the huge capacity of IBM Watson, is undoubtedly a valuable asset. Pharmaceutical companies also have an essential role in this science, technology and health chain. Together, they form a chain to be woven as quickly and accurately as the health of the present and future generations deserves.

For more information, see the presentation we recently shared at the OpenPOWER Summit Europe.

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