"We feel very much at home in Basel"

The Department of Biosystems Science and Engineering (D-BSSE) is unique in being the only ETH department based outside of Zurich. As D-BSSE prepares to celebrate its 10th anniversary, we spoke to Professor Renato Paro, who has shaped D-BSSE from the outset.

Text Fabio Bergamin Photo Pino Covino

Professor Paro, ETH Zurich has had a presence in Basel for the last ten years with the Department of Biosystems Science and Engineering (D-BSSE). How does ETH benefit from this site?

Our department, which specialises in systems biology and synthetic biology, is a very good match for Basel. We have one of the world's largest life science clusters here, with top-class researchers and large pharmaceutical companies. As ETH researchers in Basel, we benefit from being part of this scientific community.

You travel to Zurich regularly for lectures and meetings. Do you find that difficult?

It's not that far, and it's very easy to get to the main building. Obviously it's easier for me if meetings are held there. In the Spring Semester I give lectures on the Hönggerberg campus, and it takes quite a bit longer to get there. You just have to be organised.

Right from the beginning, D-BSSE's approach has united biologists, engineers and theorists under one roof. Is that still your philosophy ten years on?

These three pillars form the basis of our department and are also part of our future mission. Modern biology needs biologists to carry out experiments on living organisms and cells. Engineers help to develop new tools and measuring systems so that we can study biological issues more efficiently and precisely. And last but not least, bioinformatics experts and theorists analyse the extensive data sets and model biological processes. If you can model a biological process exactly, that's a good indication that you have understood it properly. Having all three types of researcher working in one building is a major advantage of D-BSSE. You bump into colleagues from the other disciplines every day. In other places, there are looser forms of cooperation for systems biology and synthetic biology – the networks tend to have more of a virtual nature.

Can you explain the aims of systems biology and synthetic biology?

Systems biologists study all of the biochemical elements of a cell as a whole – not just the function of an individual gene, but the interactions between all of the genes, proteins, metabolites, and so on. And they try to describe all of these processes using a holistic approach. Synthetic biology uses this knowledge to generate complex biological systems with new properties for the benefit of biotechnology and medicine.

What direction will D-BSSE take in future?

Our research over the next few years will be focusing on personalised medicine, data science and molecular systems engineering. We are already working on several projects with the university and the university hospital in Basel. Our department will be working more closely with the field of medicine in future – to develop patient-specific treatments, for example. I am convinced that reprogrammed cells will play a major role in treatments in the future. Our department is developing extensive expertise in this field. In D-BSSE, we are working to improve molecular descriptions of cells and to reprogramme them in order to regenerate defective organs or detect and kill destructive cancer cells. We have the opportunity to create a strong axis between Zurich and Basel in this field of research with a critical mass of excellent researchers. This will also serve as a counterpoint to Lausanne and Geneva, two cities which are also stepping up their collaboration.

And D-BSSE is the basis for that axis?

Yes. Personal contacts and short distances ensure productive collaborations. We have good contacts in both cities. Some of the professors in D-BSSE are also affiliated with another ETH department in Zurich and are involved in crossdepartment academic networks. And I am very happy that ETH is investing in a new building for our department – right next to the life science research building of the university and university hospital. This shows that our department is well-established in Basel and that ETH Zurich is nurturing its Basel site on a long-term basis.

New building in Basel

ETH Zurich is constructing a new building for 600 employees and 100 students on the Schällemätteli site, investing around 200 million Swiss francs. Construction will start this year and the building is set to open in 2021. www.bsse.ethz.ch → Renato Paro, the first Head of D-BSSE, sees his department becoming part of a Zurich–Basel axis in medicine. Paro has been Professor of Biosystems at ETH since 2006.

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