Aim higher

CO-FUNDED BY EUREKA MEMBER COUNTRIES AND THE EUROPEAN UNION HORIZON 2020 FRAMEWORK PROGRAMME.

NATIONAL RESEARCH, DEVELOPMENT AND INNOVATION OFFICE HUNGARY

PROJECT FINANCED FROM THE NRDI FUND

MOMENTUM OF INNOVATION

Novel genomic switches for 2nd generation in vivo models of human disease (SwitchItOn)

The aim of this collaboration was to develop novel ON-type gene expression systems based on the currently available, OFF-type E-Rex and PEACE systems. The term "ON-type" means that gene expression is switched on in the presence, and off in the absence of the relevant drugs (erythromycin, phloretin). Turning these OFF-type systems into ON-type (i.e. achieving reverse molecules) has also included and required development of a novel computational modelling methodology for such systems. Further aim of the project was to improve the recently developed, already ON-type RuX system (regulated by RU486).

The SwitchItOn consortium consisted of four participants including **PolyGene AG** ("PG", Switzerland, coordinator, http://www.polygene.ch/), **University of Zürich, Department of Molecular Mechanisms of Disease, research group of PD Dr. Raffaella Santoro** ("UniZH", Switzerland, http://www.dmmd.uzh.ch/en/research/santoro.html), **Nostrum Biodiscovery** ("NBD", Spain, https://www.nostrumbiodiscovery.com/) and **TargetEx Kft.** ("TGX", Hungary, http://targetex.com/).

The participants perfectly complemented each other in terms of exchange of knowledge and experience, as well as parallel development of innovative technologies. There was a clear distribution of tasks aiming the partners to reach the project goals.

PG contributed the intellectual property on the novel genome switches. In addition, PG had expertise dedicated in the cloning of molecules and the purification of proteins. NBD gave its experience in computational chemistry and data management. They applied genetic algorithms (artificial intelligence) for the prediction of reverse molecules. UniZH had already worked on the development of E-Rex and characterized the DNA- and drug binding affinities of candidate molecules (Kd-values) in standardized EMSA approaches, while TGX whose scientific background had been tightly linked to production of various recombinant proteins and cell biology analysed the characteristics of each candidate on a cellular background. TGX, as a typical future client, also had the task to challenge the project from the future client's point of view.

With the SwitchItOn consortium, the needed expertise and knowledge was combined to bring novel switches for the 2nd generation of models of human disease to the market.

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Project Data:
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