Innovative genomics

Pioneering the validation of new targets for drug discovery, through a new model of academic–industrial collaboration.

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The Structural Genomics Consortium at the University of Oxford is developing new molecules that could lead to novel treatments for diseases such as cancer, diabetes, obesity, and neuro-psychiatric and inflammatory diseases. The Consortium has built a unique open innovation collaboration with major pharmaceutical companies; they make all their research results publically available, immediately. This vastly reduces duplication and wastage of resources (in both academia and industry) and will inevitably accelerate the delivery of new medicines to patients.

Discovering a new drug and getting it through the required clinical trials is a momentous task that can take several years. 90% of new potential drugs fail in the late stages of clinical trials when the drug is discovered not to work as planned, or to have toxic effects. Competing pharmaceutical companies will often be trying to develop similar molecules effecting the same molecular target without sharing information, making the system very inefficient.

The Structural Genomics Consortium (SGC), is an international collaboration between the Universities of Oxford and Toronto, and Karolinska Institutet, Stockholm. The Oxford group is led by Dr Chas Bountra, who believes that drug discovery is too big a challenge for just one laboratory or organisation and that working in open collaboration with the best scientists in the world will produce the best innovations. SGC is developing a new generation of small molecules in collaboration with some of the biggest pharmaceutical companies to facilitate preclinical and clinical validation of new targets. This is important because society desperately needs new agents for major global health issues associated with aging and modern lifestyles such as neurodegenerative and cardiovascular diseases.

The collaboration between SGC and pharmaceutical companies GlaxoSmithKline, Merck, Novartis, Pfizer, and Eli-Lilly is revolutionary because their research is shared openly in the public domain. With no intellectual property at stake, open innovation flourishes. By taking the fight for ownership out of the equation, new drugs are developed faster without wasting time and money on parallel testing of similar molecules modulating the same target. The high quality reagents developed by the SGC are in the public domain and free from restriction on use – these include human proteins, their 3D structures, small molecule inhibitors, and antibodies.

The SGC is collaborating with the some of the best people in academia and industry to accelerate science and hence drug discovery. The primary focus is on generating quality reagents for novel targets, to enable the global biomedical community to deliver new medicines to the people who need them.

'This collaboration exemplifies our thinking with respect to public–private collaboration that facilitate "blue sky" research between industry and academia. It is hoped that combining forces in this way will lead to the rapid development and deployment of research tools. This should help us understand the role that this important group of gene families plays in human disease and should aid the overarching goal of providing effective medicines to patients.'

Dr Mark Bunnage, Vice President, Head of Chemistry, BioTherapeutics Research at Pfizer

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Funded by: The Wellcome Trust, National Institutes of Health, GlaxoSmith-Kline, Merck, Novartis, Pfizer, and Eli-Lilly.