

STRUCTURAL BIOLOGY ACCELERATING DRUG DISCOVERY

- Medicon Valley is home to the game-changing MAX IV facility and ESS
- 3D images of molecules and their interactions are crucial in drug discovery
- Combining expertise in structural biology with world-class infrastructure will lead to ground-breaking results

What is structural biology?

Structural biology is the field of science seeking to visualize the structure of biological molecules, such as proteins, in order to understand their functions and properties. There is a strong emphasis on proteins in structural biology as they carry out many of the key functions in living organisms.

By using various techniques such as x-rays or neutron scattering, structural biologists can obtain a three-dimensional picture of a protein involved in a disease i.e. a target protein. Knowing the structure of the target protein helps predict which drugs will either inhibit or stimulate it. This greatly optimizes the drug discovery process – without information about the target molecule, drug discovery is a bit like trying to find a needle in a haystack.

Why focus on structural biology?

All companies involved in drug discovery today have a high interest in structural biology. Knowing the structure of both the target related to a disease and the structure of the possible new compound to treat it is essential in drug discovery. Missing either could have tremendous economic consequences.

The structure of some proteins currently remains unknown despite an almost exponential growth in discovered protein structures over the past twenty years.

Membrane proteins, for instance, are key to understanding cell physiology, but it is notoriously difficult to obtain their structural information. Macromolecular complexes, such as protein-protein interactions, present another big challenge.

Once the structure of such molecules is known, there is huge potential for developing new ways to treat several diseases such as diabetes, obesity and cancer. The MAX IV facility and the ESS will be game-changers in this respect, as they will make it possible to visualize the structures of these molecules.

Strongholds in Medicon Valley

Medicon Valley is home to several excellent research centers and facilities directly related to structural biology such as the Novo Nordisk Foundation Center for Protein Research at the University of Copenhagen, the Department of Systems Biology at the Technical University of Denmark and the Department of Biochemistry & Structural Biology at Lund University.

Once the state-of-the-art technologies in the MAX IV facility and the ESS are up and running, Medicon Valley will be in a unique position to push the scientific boundaries within structural biology, especially by fostering greater collaboration between academia and industry.



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