

The overall strategic objective of the current proposal aim to strengthen and broaden the scientific reach and socio-economic impact of the University of Patras (UPAT) through the creation of a Regional Centre of Excellence for Structural Biology that emphasizes the characterization and development of bioactive molecules with therapeutic potential. This will be accomplished by the establishment of a multi-disciplinary platform of high-level scientific research that focuses on the development of bioactive molecules targeting important biochemical processes in cancer, cardiovascular and neurodegenerative diseases.

The above targets will be achieved when **the existed S&T Infrastructures and expertise (Figure 1)** can be integrated in a unique scientific platform in Greece and SouthEastern EU region consisting of the following modules:

- ▣ **SEE-PROT: Production of protein & peptides and screening/optimization of polypeptide samples** , for structural and functional studies either by NMR or by X-ray and other biophysical techniques. NMR will be used to screen polypeptide samples to be used for solid-state conformational analysis, and will significantly increase the success rates of proposal applications for access to high-cost Large RIs for X-ray & High-Field NMR studies.

- ▣ **SEE-STRUCT: Conformational dynamics, interactions & biophysical characterization**, to provide atomic-level insight on individual proteins and protein-protein/drug candidates interaction, to identify new protein-protein interactions and to investigate the physicochemical properties (dynamics, affinity, kinetics, etc) of these interactions, based on NMR methods, automated crystallization and other complementary techniques.

- ▣ **SEE-PHARM: Disease-modelling** cell-based assays including live cell imaging techniques, complemented by ex vivo and in vivo screening, to test protein-protein/peptide and protein-drug lead interactions, evaluate efficacy of candidate molecules, determine new biomolecular interactions and study the effects of the leads on basic cellular pathways. SEE-PHARM's role will therefore be to use all its available tools to test bio-molecules developed on NMR structure-based information and provide valuable feedback regarding their optimization

Objectives

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