CRystallography and Protein Engineering Unit

Inda Muñoz
UNi Head

Jorge Luis Martinez
Staff Scientist

BASIC reSEARCH

with studies on protein thermal stability (thermofluor assay), fragments, is routinely done in our laboratory in combination high-resolution (atomic) by X-ray crystallography, and at low-/vitro proteins for different types of biochemical/biophysical/target proteins work. With this purpose in mind, we produce of proteins, we help our users to further comprehend how inclusion of new targetable sites in proteins, speeding up the identification of new targetable sites in protein-drug discovery projects.

Overview

The Crystallography and Protein Engineering Unit (XTPEU unit) is a core facility created to provide on-demand services at different levels to fulfill the needs of our users. By offering services ranging from protein cloning to solving the 3D structures of proteins, we help our users to further comprehend how target proteins work. With this purpose in mind, we produce proteins for different types of biochemical/biophysical/in vitro/in vivo assays and for monoclonal antibody production, also offering macromolecular structural determination at high-resolution (atomic) by X-ray crystallography, and at low-resolution in solution by small-angle X-ray scattering (SAXS).

Protein co-crystallisation, in the presence of inhibitors or small ligands, is routinely done in our laboratory in combination with studies on protein thermal stability (thermofluor assay), to accelerate the guided drug discovery process.

“By fragment screening on crystals, we visualise direct interactions between small molecules and proteins, speeding up the identification of new targetable sites in drug discovery projects.”

RESEARCH HIGHLIGHTS

Our Unit works closely with the Experimental Therapeutics Programme on several projects. To fulfill the need of recombinant proteins, we produced, throughout the year, full-length and kinase domain human MASTL, full-length mouse TRF1 and human TRF1 dimerization domain, for biochemical, in vitro, thermo-stability and structural analyses. Furthermore, to support drug discovery projects, we performed several thermal shift assays (thermofluor) in the presence of compounds developed and tested at the Medicinal Chemistry Section and the Biology Section, respectively.

We also continued our close collaboration with the CNIO Monoclonal Antibodies Unit on the production of proteins to generate highly specific antibodies against several cancer-associated proteins such as HASP/ANK, CB85C, CB85G and CB85J, and other protein tools such as Cas9. Additionally, we ran a number of internal collaborations with other CNIO Groups and Units, providing them with recombinant proteins for biochemical and/or cell-based functional assays; this was the case, for example, with the Telomerases and Telomerase Group, the Experimental Oncology Group, the Genomic Instability Group, the Cell Division and Cancer Group, the Melanoma Group, the H2O2-CNIO Lung Cancer Clinical Research Unit, the Macromolecular Complexes in DNA Damage Response Group, the H2O2-CNIO Haematological Malignancies Clinical Research Unit, and the Transformation and Metastasis Group.

The Unit maintained collaborations with various external groups: the Environmental Biology Department, CIB-CSIC, Spain; the Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology and Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the Department of Biomedicine, University of Bergen, Norway; the Department of Structural Biology, Instituto de Biomedicine, University of Bergen, Norway; the Department of Pharmacology and Therapeutics Department, Roswell Park Cancer Institute, USA; the...