

Protein crystallography

SENIOR SCIENTISTS:

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Research Field and Subjects

X-ray diffraction analysis by mono-crystals leads to the knowledge of the three-dimensional structure of the molecules. From the diffraction data, it is possible to build a picture of the electron density in the crystal and this picture provides an accurate access to the molecular geometry. Such structural data are often extremely important for understanding chemical and biochemical properties at a molecular level.

From its establishment, the laboratory of crystallography has contributed to the development of powerful methods involved in data collection and in crystal structure analysis. A large number of national and international collaborations was the natural result of this research.

In the field of protein crystallography, the results achieved during the last five years concerned the following topics: crystallization under micro-gravity conditions in the space shuttle, in the MIR space station and in the International Space Station (ISS), application to parvalbumins, to S-layer proteins, protein crystallography at atomic resolution, structures of new enzymes (bacteriophage lambda lysozyme and a new human peroxiredoxin).

Products and Services

- ▶ Crystallization of proteins
- ▶ Structure determination by X-ray diffraction

Main Equipment

- ▶ Rotating anode generator Rigaku Ultra X18
- ▶ Imaging plate detector MAR345
- ▶ Äkta prime for protein purification

Representative References

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- ▶ H. CLAUS, E. AKCA, T. DEBAERDEMAEKER, C. EVRARD, J.P. DECLERCQ & H. KÖNIG (2002) Primary structure of selected archaeal mesophilic and extremely thermophilic outer surface layer proteins. *System. Appl. Microbiol.*, 25, 3-12.

Patents

▶ J-P. DECLERCQ, B. KNOOPS, CH. EVRARD, A. CLIPPE, D. VANDER STRICHT & A. BERNARD (2001) Crystal structure of peroxiredoxin 5 and its use for design of structural homologues. No. 01870016.1.

Partnership

- ▶ European Space Agency (ESA)
- ▶ National Aeronautic and Space Administration (NASA)
- ▶ Prof. H. König, Institut für Mikrobiologie und Weinforschung, Univ. Mainz
- ▶ Dr J. Parello, Faculté de pharmacie, Montpellier
- ▶ Prof. J. Fastrez, *Unité de biochimie*, UCL
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