

INFRAIA H2020



iNEXT

integrated

NMR

EM

X-rays

Translational research

The Call

- ❖ **Research Infrastructures for translating research on biological structures into innovation in biomedicine.** This activity should expand the availability of structural biology services (such as X-ray and neutron scattering, advanced NMR and advanced imaging technologies) to **new communities of users**, and in particular to **scientists with backgrounds other than structural biology**, including from SMEs, to **benefit translational research** in drugs discovery, informed drugs and vaccine design and other fields like biotechnology and biomaterials. Synergies with relevant ESFRI Infrastructures, such as **INSTRUCT**, **EUROBIOIMAGING**, **EU-OPENSREEN**, and **EATRIS**, should be duly exploited.

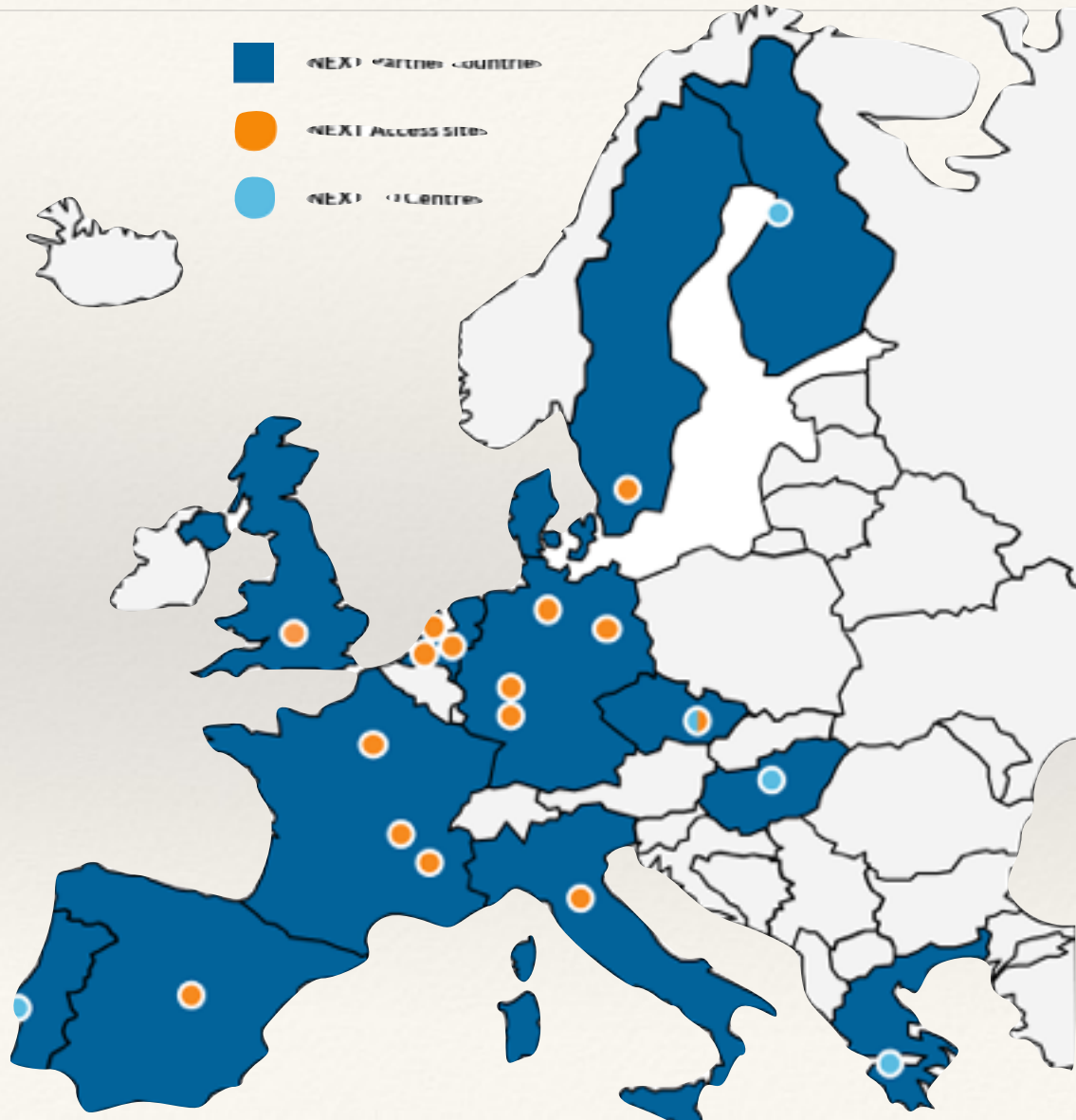


The Partnership

- ❖ 23 Partners from 14 Countries
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- ❖ NMR centres
 - ❖ Berlin, Brno, Florence, Frankfurt, Lyon, **Utrecht (coordinator)**
 - ❖ Six synchrotron sites
 - ❖ Diamond, EMBL-HH, EMBL-GR, ESRF, MAX IV, Soleil
 - ❖ Five EM facilities
 - ❖ Brno, Diamond, EMBL-HD, Leiden, Madrid
 - ❖ Protein interactions *in vivo* and *in vitro*
 - ❖ **Amsterdam (deputy coordinator)**, EMBL-HD
 - ❖ Training centres
 - ❖ Brno, Budapest, Lisboa, Oulou, Patras, Rehovot
 - ❖ Research Partners
 - ❖ Aarhus, Lund (ESS)



Geographic spread



iNEXT

Aims

- ❖ User access to macromolecular X-ray crystallography, solution scattering, NMR, EM and advanced light microscopy.
- ❖ Show the possibilities offered by the ESS
- ❖ Linking in vitro studies to in-cell interaction studies
- ❖ Reach out to industry by collaborative research, networking, trainings and showcasing of new opportunities.



Three Themes of Access

1. Structural Audit
2. Enhanced Support
3. High-End Data Collection



Structural Audit

- ❖ A sample of a macromolecule (or complex) is evaluated for
 - ❖ Purity
 - ❖ Stability and aggregation in different buffer formulations
 - ❖ Multimeric state by MALLS
 - ❖ SAXS data collection for low resolution shape determination
 - ❖ Crystallisation
 - ❖ NMR HSQC (if labeled)
 - ❖ Utility for EM (if >200kD)
- ❖ Results are combined in a Structural Audit Report



Enhanced Support

- ❖ Guided access involves training and active participation of guests
- ❖ Structure determination by X-ray crystallography, EM, SAXS or NMR
- ❖ Ligand and fragment screening
- ❖ Study of in vitro or in-cell macromolecular interactions



High-END: “Traditional” Access

- ❖ Synchrotron Data Collection
 - ❖ Applications for single translation research theme
 - ❖ One or more group leaders under a common team
 - ❖ No Biostruct-type BAGS, but research-theme based
- ❖ High-field NMR data collection
 - ❖ HSQC characterisation required
- ❖ Advanced cryo-EM data collection
 - ❖ Only if initial data are available to establish grid quality



Enhanced Support Modalities

- ❖ X-ray structural analysis (EMBL-GR / ESRF, EMBL-HH)
- ❖ NMR Structure analysis (UU, Florence, Frankfurt)
- ❖ EM sample optimisation (EMBL-HD)
- ❖ Ligands and Fragment Screening (EMBL-GR, Diamond)
- ❖ Macromolecular Interactions Platform (NKI)
- ❖ Advanced Light Imaging (EMBL-HD)



Training

- ❖ Integrating X-ray techniques and EM
- ❖ Combining X-Rays and Neutrons for Crystallography and Scattering
- ❖ Combining solution methods: NMR - SAXS - Biophysics
- ❖ Structural biology for drug development
- ❖ The toolkit to study macromolecular interactions
- ❖ Integrated methodologies and approaches for Structural Biology
- ❖ Training centra in Brno, Budapest, Lisboa, Oulou, Patras, Rehovot

Joint Research Applications

1. Structure-based small molecule inhibitor discovery (ligand screening)
2. Integrated study of membrane proteins.
3. Study of macromolecules and their complexes in cells.



Networking

- ❖ Involving and training new scientific communities and the general public.
- ❖ Gateways to industry.
- ❖ Strengthening the iNEXT community.
- ❖ Data Management and links with e-Infrastructures.



Website: www.inext-eu.org



The screenshot shows the homepage of the iNEXT website. At the top left is the iNEXT logo, which consists of a stylized green and blue molecular structure next to the text "iNEXT". To the right of the logo is a navigation menu with links: "About", "Access", "Training", "Teams", "News", "Partners", "Contact", and "User Dashboard". Further right is a search bar with the text "Search" and a magnifying glass icon. Below the navigation menu is a green button labeled "Submit Proposal". The main content area features a large blue-tinted image of a scientific instrument, likely an X-ray diffractometer. Overlaid on this image is a green box containing the text "Integrating infrastructures for Structural Biology" and a paragraph describing iNEXT as a consortium funded by the Horizon2020 program. Below this text is a white button labeled "More Information". At the bottom of the page, there is a white banner with the text "iNEXT: Infrastructure for NMR, EM and X-rays for Translational Research".

iNEXT

About Access Training Teams News Partners Contact User Dashboard

Submit Proposal

Integrating infrastructures for Structural Biology

iNEXT is a consortium funded by the Horizon2020 program to offer European researchers access to a wide range of advanced structural biology technologies, including X-ray technologies, NMR spectroscopy, Electron Microscopy and Biophysics, in large European infrastructures.

More Information

iNEXT: Infrastructure for NMR, EM and X-rays for Translational Research