



The European Research Infrastructure Consortium for structural biology research



Research visits



Training



Internships



R&D funding

 instruct-eric.org

 admin@instruct-eric.org

 [@instructhub](https://twitter.com/instructhub)





What is Structural Biology?

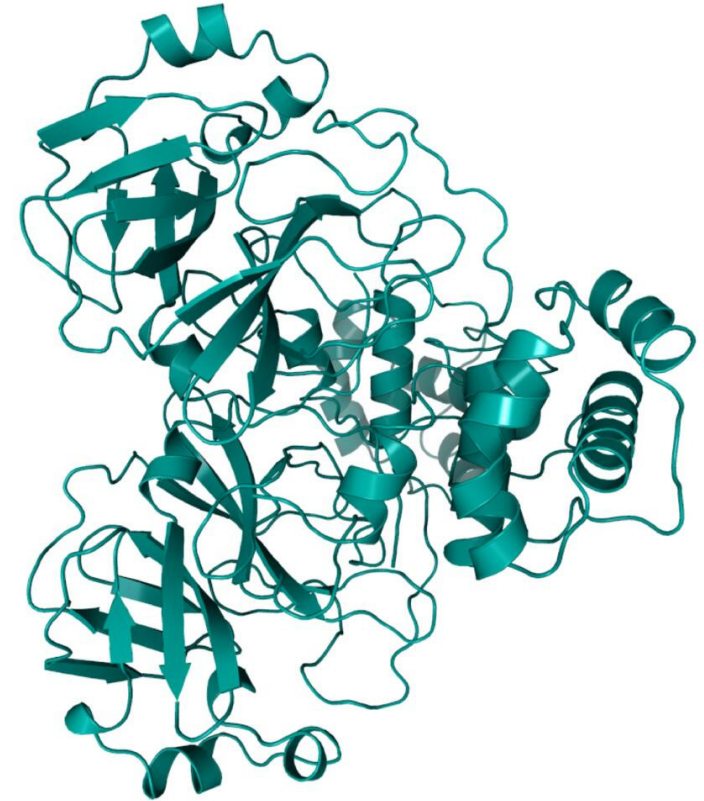
The study of the building blocks of life: cells, proteins and nucleic acids and their context to each other.

Structural Biology aims to understand more about the normal processes in our body, our health and wellbeing, and what happens during disease or illness.

It is central to the development of essential pharmaceuticals and vaccines – invaluable in the fight against COVID-19.

Advances in protein production, imaging, and microscopy have led to significant developments in the ever-changing field of structural biology.

Specialist equipment, technology and laboratories are required for cutting-edge research.



[instruct-eric.org](https://www.instruct-eric.org)



admin@instruct-eric.org



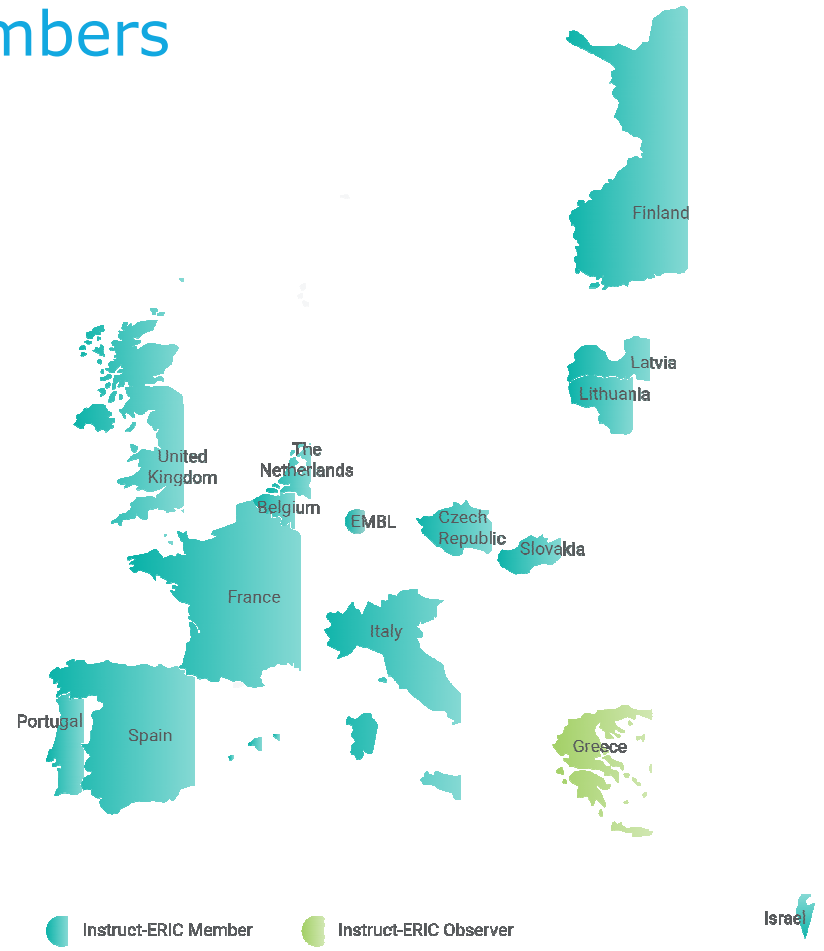
[@instructhub](https://twitter.com/instructhub)



What is Instruct-ERIC? Members

Instruct-ERIC is the single point of access to technology and expertise for structural biology research.

Instruct has 15 Members that each pay an annual subscription to allow their scientists to access the range of services that are available through Instruct.



Belgium



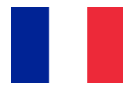
Czech Republic



EMBL



Finland



France



Israel



Italy



Latvia



Lithuania



Netherlands



Portugal



Slovakia



Spain



UK



Instruct-ERIC Member



Instruct-ERIC Observer



Israel



instruct-eric.org



admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)



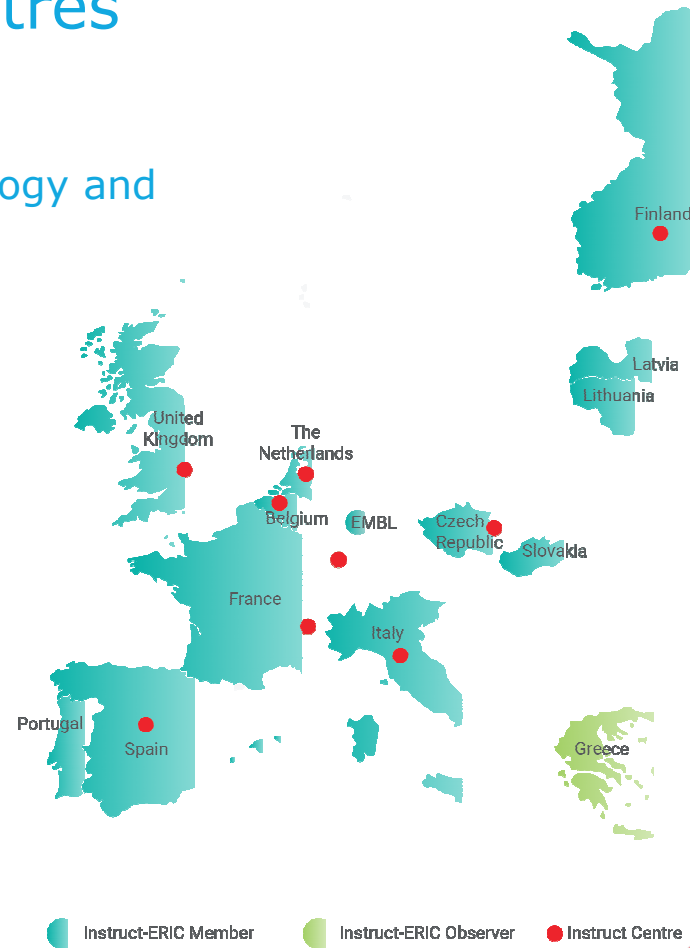


What is Instruct-ERIC? Centres

Instruct-ERIC is the single point of access to technology and expertise for structural biology research.

The Instruct consortium comprises **eleven Instruct Centres** that offer access to **27 facilities** across Europe.

Instruct Centre BE	Nanobodies4Instruct, Robotein
Instruct Centre CZ	BIOCEV, CEITEC
Instruct Centre EMBL	EMBL Grenoble, EMBL Hamburg, EMBL Heidelberg
Instruct Centre ES	Instruct Image Processing Centre I2PC, CSIC-CNB
Instruct Centre FI	University of Eastern Finland, University of Helsinki, University of Oulu
Instruct Centre FR1	IGBMC
Instruct Centre FR2	IBS-ISBG
Instruct Centre IL	Centre for Bioinformatics Tel Aviv, ISPC (WIS) Israel
Instruct Centre IT	CERM
Instruct Centre NL	Bijvoet Centre, NeCEN, NKI
Instruct Centre UK	Astbury, Diamond, Molecular Biophysics Suite, Oxford Mass Spec, Oxford Particle Imaging, Harwell, STRUBI



■ Instruct-ERIC Member
 ■ Instruct-ERIC Observer
 ● Instruct Centre



Research Visits

More than

80

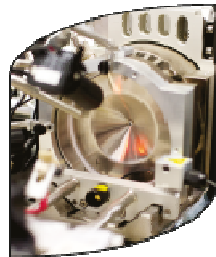
Instruct
services

Instruct's extensive service catalogue encourages a **multidisciplinary approach** to structural biology research.



Sample Preparation

- Crystallisation
- Nanobody Discovery
- Protein Production



Biomolecular Analysis

- Imaging
- Mass Spectrometry
- Molecular Biophysics



3D Structural Analysis

- Electron Microscopy
- Magnetic Resonance
- X-ray Techniques



instruct-eric.org



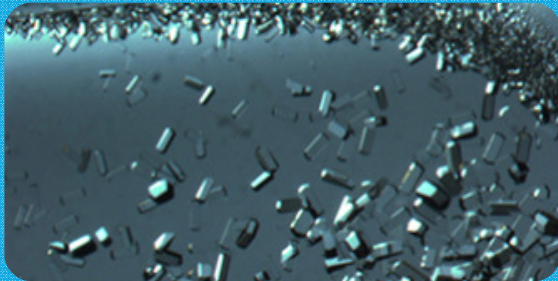
admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)



Sample Preparation



Crystallisation

Macromolecular crystallisation
Membrane protein
crystallisation



Nanobody Discovery

Domain-Specific Nanobodies
Megabodies



Protein Production

Cell-free expression
E. coli
Insect cells
Mammalian cells
Library-based screening



instruct-eric.org



admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)



Biomolecular Analysis



Imaging

Confocal Microscopy
Time-Lapse Microscopy
Super-Resolution Microscopy
(stochastic and deterministic)
Flow cytometry



Mass Spectrometry

Native MS
Proteomic MS
HDX MS



Molecular Biophysics

Biophysical Characterisation
Surface Plasmon Resonance
Thermal Shift Assay
Analytical Ultracentrifugion
Calorimetry
Circular Dichroism
Microscale Thermophoresis



instruct-eric.org



admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)



3D Structural Analysis



Electron Microscopy

Cryogenic - EM
Scanning - EM
Transmission - EM
Image Processing



Magnetic Resonance Techniques

Nuclear Magnetic Resonance
Electron Paramagnetic Resonance
Solid State NMR
Solution NMR
Relaxometry



X-Ray Techniques

Bio-SAXS
X-Ray Diffraction



instruct-eric.org



admin@instruct-eric.org

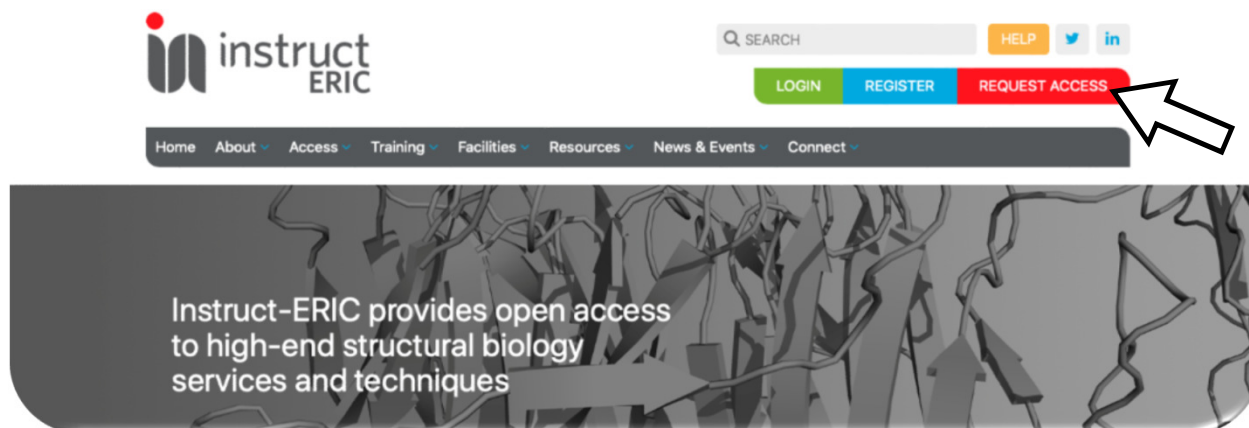


[@instructhub](https://twitter.com/instructhub)

Research Visits

Applying for access to technologies or services

Research proposals are submitted via the **ARIA** web-portal on the Instruct-ERIC website. The proposal outlines a scientific case and the selection of services that a user needs.



Proposals are subject to **peer review**, with accepted proposals allocated funds to support the work, and a time frame is agreed with the host Instruct Centre.

Researchers from member countries can receive funding for:



Access to Instruct services



Consumables



Travel



Accommodation

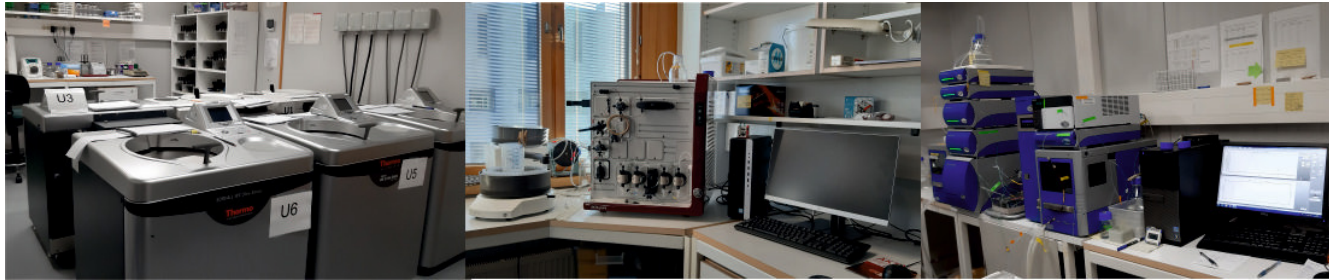


Remote Access

Applying for remote access to Instruct-ERIC research facilities

The COVID-19 outbreak has heightened the need for remote access opportunities to be available for researchers across Europe and other regions, as physical travel and visits may not be possible.

Many Instruct-ERIC services are available via remote access, where samples can be sent for analysis without the need for researchers to travel.



Researchers from member countries can receive funding for:



Access to Instruct services



Consumables

61 Instruct services available remotely

Proposals are subject to **peer review**, with accepted proposals allocated funds to support the work, and a time frame is agreed with the host Instruct Centre.



instruct-eric.org



admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)



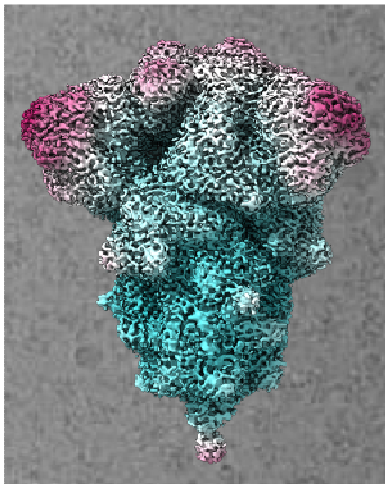


Instruct-ERIC Covid-19

All 11 Instruct centres have been central to enhancing understanding of the SARS-CoV-2 virus – the structure, binding domains, the success of variants, and vaccine development.

Examples of COVID-19 research studies available on the [Instruct-ERIC website](#).

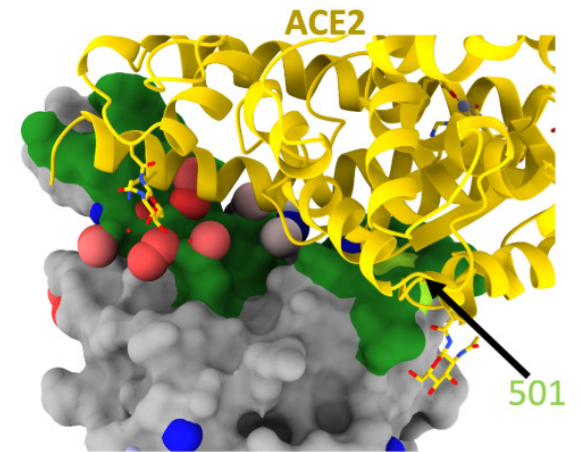
[Instruct Centre NeCEN collaborates with Janssen Vaccines & Prevention B.V in the development of a new SARS-CoV-2 vaccine](#)



[The antigenic anatomy of SARS-CoV-2 receptor binding domain](#)



[Reduced neutralization of SARS-CoV-2 B.1.1.7 variant by convalescent and vaccine sera](#)



instruct-eric.org



admin@instruct-eric.org




[@instructhub](https://twitter.com/instructhub)








Training

Instruct offers training in a range of core and emerging methods, including **virtual workshops** delivered by international experts.

View the full Instruct training programme at:
instruct-eric.org/instruct-training-events-annual



Instruct-ERIC Training Programme 2021

	IUCr 2021 Computing School Online - Satellite of the IUCr congress IUCr, Prague, Czech Republic	1 - 3 Sept
	Virtual CCP4 Protein Crystallography Summer School 2021 United Kingdom	6 - 10 Sept
	South American Macromolecular Crystallography School in Association with Diamond Light Source Institut Pasteur Montevideo, Uruguay	20 Sept - 2 Oct
	Structural Bioinformatics Training course EMBL-EBI, United Kingdom	11 - 15 Oct
	FEBS Course: Computational approaches to understanding and engineering enzyme catalysis FBMM, University of Oulu, Finland	19 - 22 Oct
	Instruct virtual course on Electron Tomography by CryoEM CSIC, Madrid, Spain	Nov 2021
	Instruct UK CryoEM Sample Preparation Workshops United Kingdom	TBC

 Find out more at instruct-eric.org/training

 instruct
ERIC



instruct-eric.org



admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)

 instruct
ERIC

Internships

The Instruct Internship Programme **funds research visits** of 3 to 6 months to an Instruct Centre in Europe.

Internships facilitate collaborations with Instruct research groups, and offers experience of techniques that are not available in the applicant's laboratory.



instruct-eric.org/internships

R&D Funding

Periodically, Instruct publishes a call for small-scale pilot research projects in integrated structural biology. Instruct awards **fund researchers to obtain preliminary data** that might lead to a grant from a major funder.



instruct-eric.org/rd-pilot-project-awards



instruct-eric.org



admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)





Horizon2020 Collaborations

In addition to the core activities, Instruct-ERIC is actively working in **partnership** with others across the Life Sciences field. These partners share expertise and work together on **European projects** which will benefit the Life Science community more generally, by **improving research infrastructure, data and training**.



ISIDORe
By-COVID
eRImote

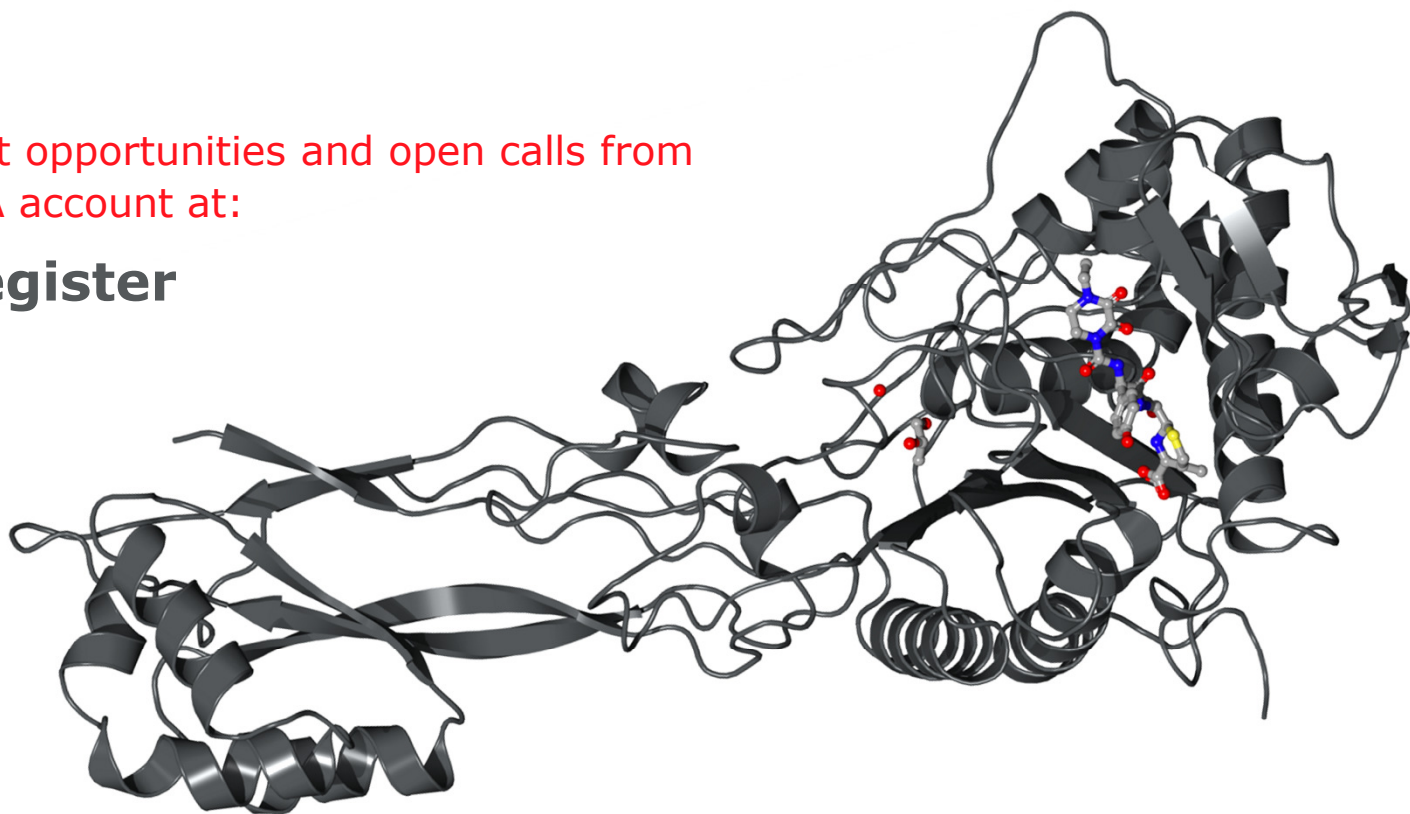


For more information about funded research opportunities,
visit the Instruct-ERIC website.

instruct-eric.org

To stay informed of the latest opportunities and open calls from
Instruct, register for an ARIA account at:

instruct-eric.org/register



instruct-eric.org

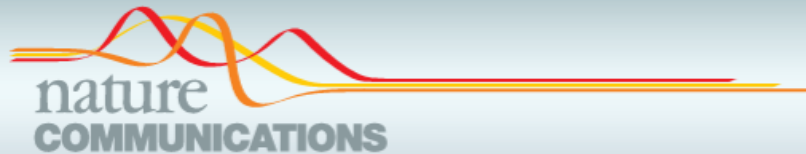


admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)

Personalized medicine



ARTICLE

<https://doi.org/10.1038/s41467-019-13038-z>

OPEN

Cryo-EM structure of a transthyretin-derived amyloid fibril from a patient with hereditary ATTR amyloidosis

Matthias Schmidt¹, Sebastian Wiese², Volkan Adak¹, Jonas Engler¹, Shubhangi Agarwal³, Günter Fritz^{3,4}, Per Westermark⁵, Martin Zacharias⁶ & Marcus Fändrich^{1*}



instruct-eric.org



admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)



Personalized medicine

ARTICLE

NATURE COMMUNICATIONS | <https://doi.org/10.1038/s41467-019-13038-z>

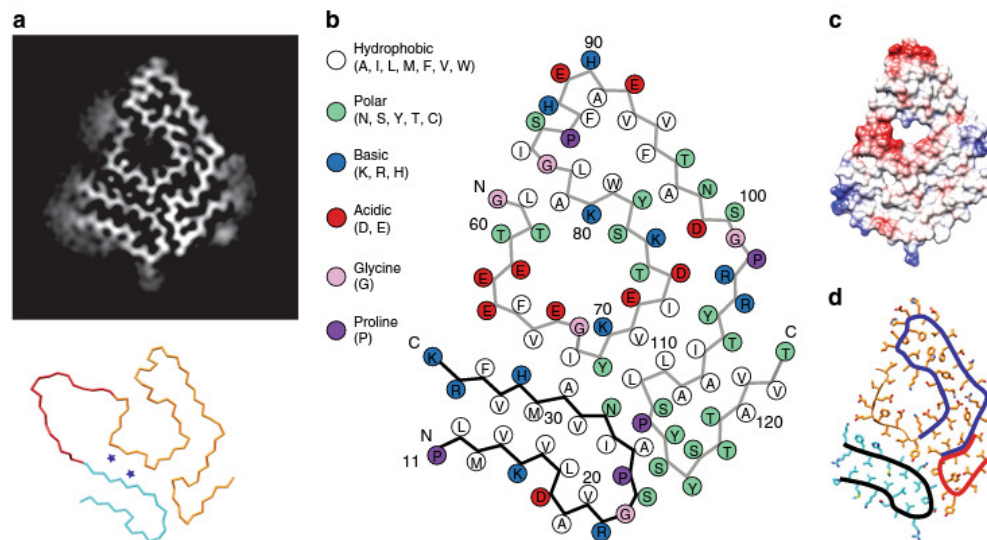


Fig. 2 Packing and overall fold of the fibril protein. **a** Top: cross-sectional view of a 5-Å thick slice of the 3D map; bottom: α -trace of TTR residues Pro11-Lys35 (cyan) and Gly57-Thr123 (orange). Residues Ala36-His56 are modelled in an arbitrary conformation, showing the ability of this segment to connect the N- and C-terminal segment. The blue asterisks indicate the position of two density features not captured by our model. **b** Packing scheme of one cross-sectional layer. **c** Electrostatic surface profile of one molecular layer. **d** The fibril protein contains arches at residues Pro11-Lys35 (black), Lys70-Leu111 (blue) and Thr106-Thr123 (red)



[instruct-eric.org](https://www.instruct-eric.org)



admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)



Personalized medicine

ARTICLE

NATURE COMMUNICATIONS | <https://doi.org/10.1038/s41467-019-13038-z>

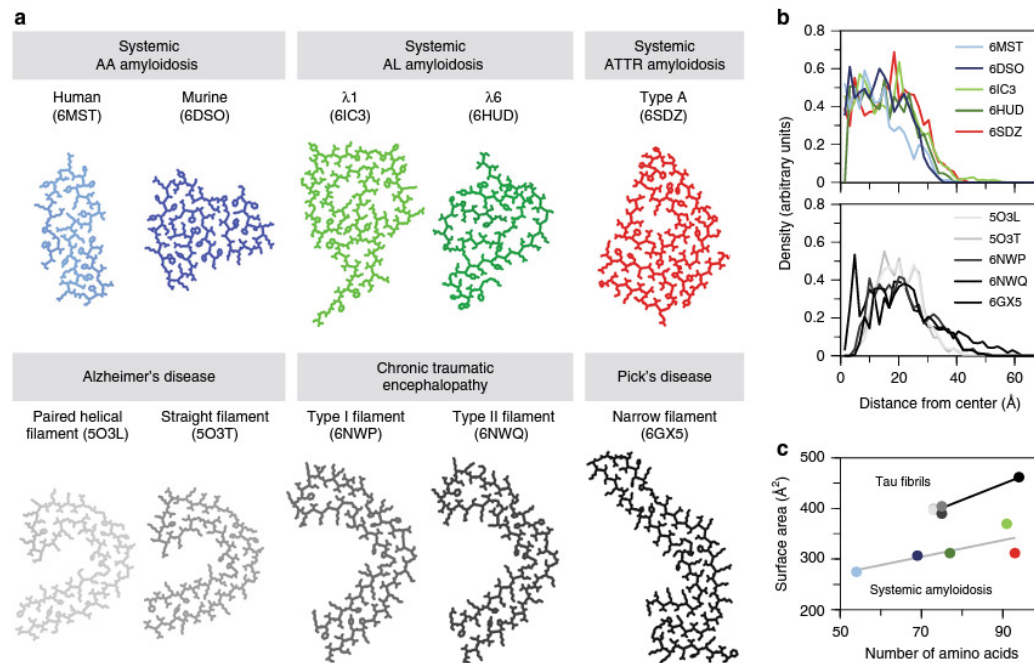


Fig. 5 Comparison of amyloid fibrils from systemic amyloidosis with tau-derived fibrils. **a** Views of the cross-sectional layers of five fibrils from systemic AA³⁶, AL^{37,38} and ATTR amyloidosis and tau-derived fibrils from Alzheimer's³⁹, chronic traumatic encephalopathy⁴¹ and Pick's disease⁴⁰. **b** Radial mass distributions of one protein stack. **c** Surface area of one protein stack plotted against the number of amino acids in the fibril core. A linear fit was added to guide the eye. The colour coding is kept consistent in all panels. Source data are provided as a Source Data file



[instruct-eric.org](https://www.instruct-eric.org)



admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)



Personalized medicine

Nanoscale



PAPER

[View Article Online](#)

[View Journal](#) | [View Issue](#)



Cite this: *Nanoscale*, 2021, **13**, 7285

Microchip-based structure determination of low-molecular weight proteins using cryo-electron microscopy†

Michael A. Casasanta,^{a,b} G. M. Jonaid,^{a,c} Liam Kaylor,^{a,d} William Y. Luqiu,^{b,e} Maria J. Solares,^{a,d} Mariah L. Schroen,^b William J. Dearnaley,^{a,b} Jarad Wilson,^f Madeline J. Dukes^g and Deborah F. Kelly^{id} *^{a,b}



instruct-eric.org



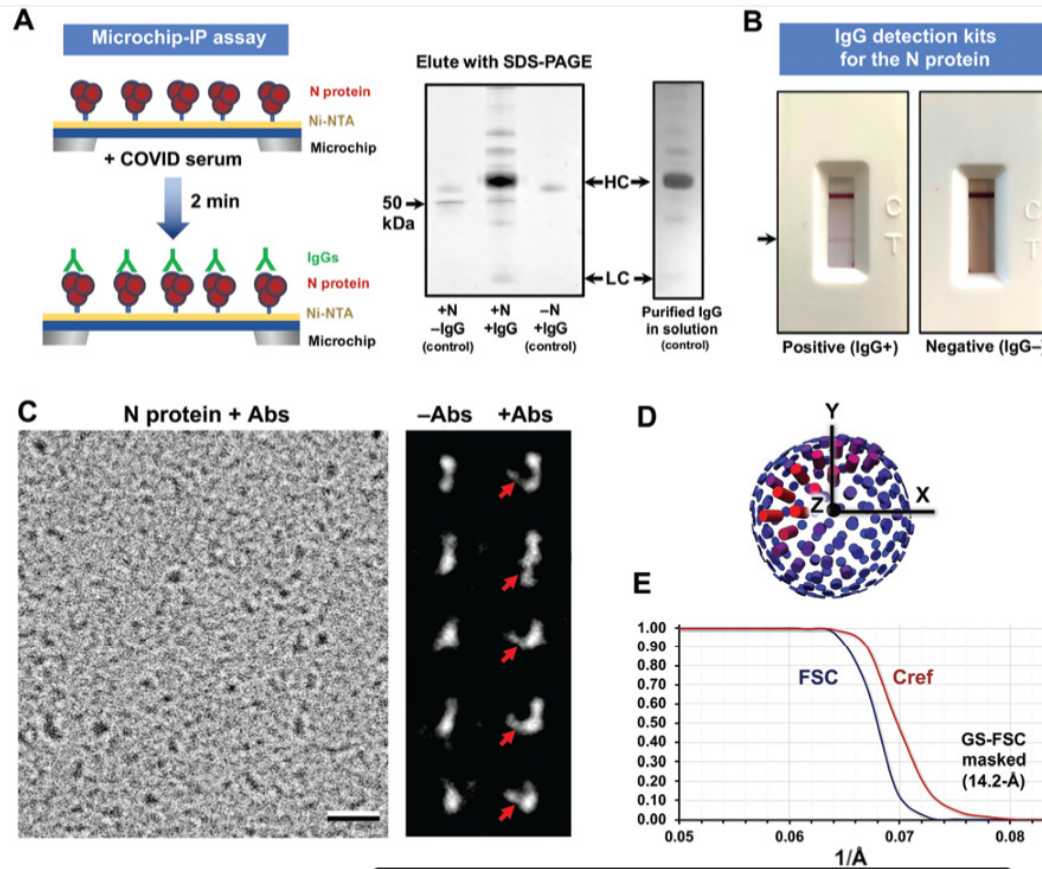
admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)



Personalized medicine



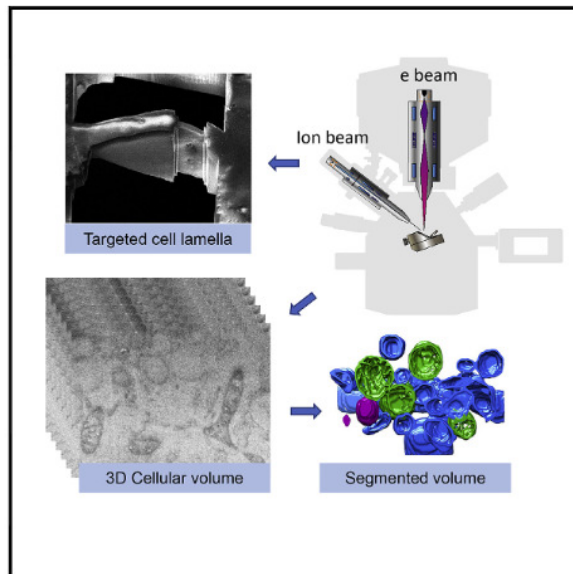
Personalized medicine

Short Article

Structure

Serial cryoFIB/SEM Reveals Cytoarchitectural Disruptions in Leigh Syndrome Patient Cells

Graphical Abstract



Authors

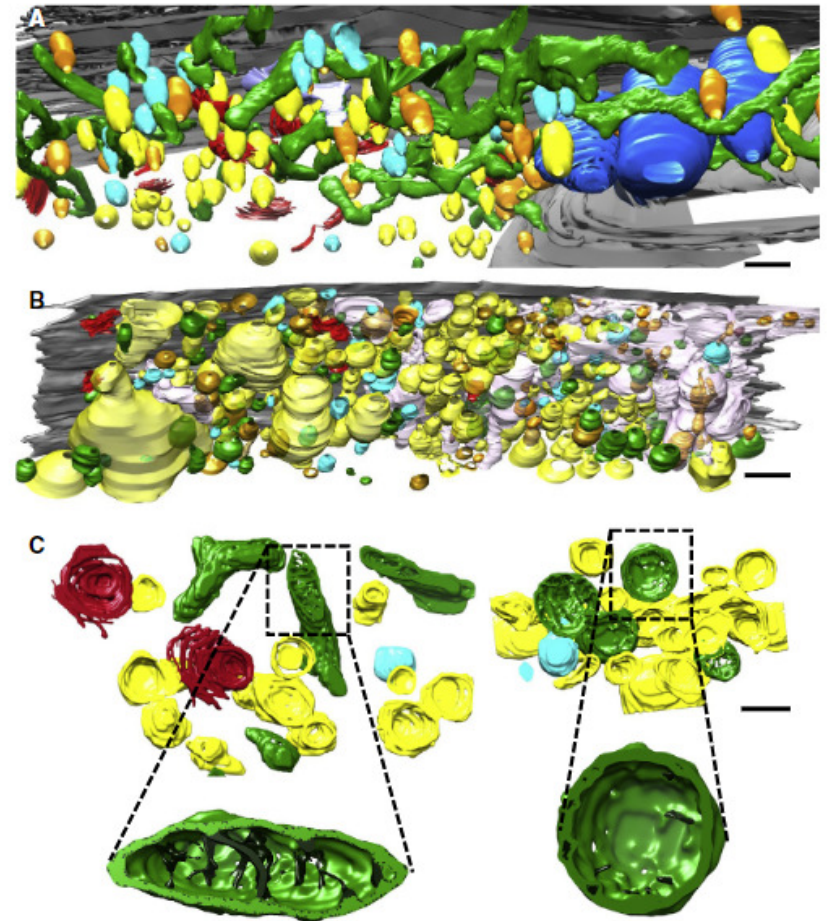
Yanan Zhu, Dapeng Sun,
Andreas Schertel, ...,
Marisa L. Martin-Fernandez,
Zachary Freyberg, Peijun Zhang

Correspondence

peijun@strubi.ox.ac.uk

In Brief

Serial cryoFIB/SEM offers new opportunities for structural analysis of cells and tissues under near-native conditions. Zhu et al. developed and optimized a serial cryoFIB/SEM volume imaging workflow for visualization of entire vitreous cells in 3D, and demonstrated its potential for clinical and pathological applications with primary Leigh syndrome patient cells.



instruct-eric.org



admin@instruct-eric.org



[@instructhub](https://twitter.com/instructhub)



The European Research Infrastructure Consortium for structural biology research



Research visits



Training



Internships



R&D funding

 instruct-eric.org

 admin@instruct-eric.org

 [@instructhub](https://twitter.com/instructhub)

