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Towards an integral, FAIR and cloud-enabled solution for cryoEM data acquisition and processing

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Instruct is the pan-European Research Infrastructure for structural biology, centered in bringing high-end technologies and methods to European researchers. The Instruct Image Processing Center (I2PC) has actively been promoting FAIR practices for cryoEM data acquisition and processing workflows. Efforts carried in the scope of projects such as EOSC-Life, BY_COVID and EOSC-Synergy are driving the implementation of the Data Management Plan of Instruct-ERIC and defining the future of an integrated CryoEM workflow. The image acquisitions at the microscope facilities are controlled by SmartScope (an open-source software used in the field) and registered in a Laboratory Information Management System (LIMS) while the project details and metadata will be FAIR-ly available through ARIA (the project management application developed inside Instruct) and the information is stored through a data space (with distributed tools such as iRODS). The processing can easily be deployed in federated computing infrastructures (such as EGI Cloud Compute or the IFCA cloud) by using ScipionCloud. Eventually, the data is made publicly available through EMPIAR (the electron microscopy public archive). The effort will culminate with a fully-connected and integrated system, offering a solution for the whole pipeline in CryoEM (and other) techniques, respecting FAIR principles and ensuring the availability of information.

Primary authors: Mr GARCÍA MENA, Alberto (Biocomputing Unit @ CNB-CSIC); Prof. KRENEK, Ales (CEITEC-MU); Prof. SORZANO SÁNCHEZ, Carlos Óscar (Biocomputing Unit @ CNB-CSIC); Mr MARCHÁN TORRES, Daniel Alejandro (Biocomputing Unit @ CNB-CSIC); Mrs SÁNCHEZ LÓPEZ, Irene (Biocomputing Unit @ CNB-CSIC); Dr NOVACEK, Jiri (CEITEC-MU); Prof. CARAZO GARCÍA, José María (Biocomputing Unit @ CNB-CSIC); Ms DEL CAÑO NOVALES, Laura (Biocomputing Unit @ CNB-CSIC); ICETA TENA, Mikel (Biocomputing Unit @ CNB-CSIC); Mr VEVERKA, Radek (CEITEC-MU); SVOBODA, Tomas (Masaryk University)

Presenter: ICETA TENA, Mikel (Biocomputing Unit @ CNB-CSIC)

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