

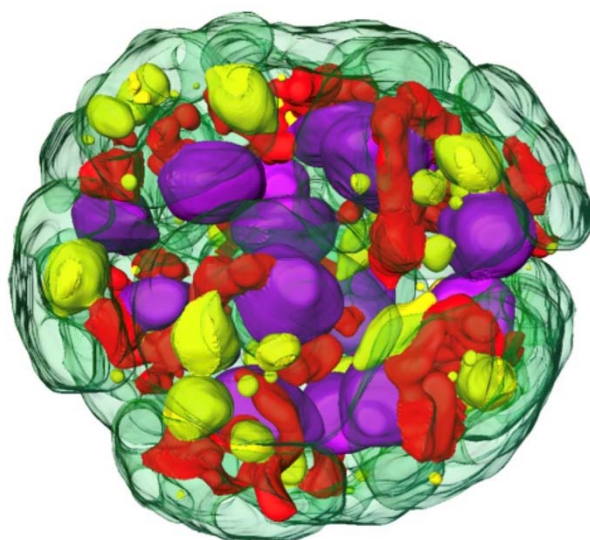
National Center for X-ray Tomography

SOFT X-RAY TOMOGRAPHY

High resolution 3D imaging method. Image contrast generated by cell biomolecular composition. Specimens imaged without being stained, dehydrated or chemically fixed.

CRYOFLUORESCENCE MICROSCOPY

World's first high-numerical aperture microscope for fluorescence imaging at cryogenic temperatures.



- 3D Soft X-ray Tomographic reconstruction of the green alga *Chromochloris zofingiensis*
- Potential as biofuel feedstock and/or high-value source of nutraceutical molecules
- Nucleus (purple), Chloroplast (green), Mitochondria (red), Lipids (yellow), and Starch Granules within the Chloroplast (blue).
- From: Roth *et al.* PNAS (2017)

The National Center for X-ray Tomography (NCXT) develops novel imaging technologies for biological research. NCXT staff and collaborators are spearheading the development of soft x-ray tomography as a new tool for visualizing cells. We designed, built and now operate XM-2, the world's first soft x-ray microscope for life science research. The characteristics of the new microscope, which is located at the Advanced Light Source of Lawrence Berkeley National Laboratory, are well suited to DOE BER research in areas such as biofuel development.

NCXT staff are also developing high-numerical aperture cryo-light microscopy. This new modality allows cryopreserved cells to be imaged with light and then x-rays. The two types of data can be overlaid to form a single, information rich 3D image of a cell. This correlated technique is producing powerful insights into cell structure and function on the mesoscale.

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