

# The Cryo-Electron Microscopy project at BNL an Update.

Erik Johnson – Project Manager

Seán McSweeney – Project Director

**Structural biology** is the way to understand the role of biological molecules with an atomistic and a cellular view.

**Cryo-Electron Microscopy** is a technique complementary to those we have developed at the lightsource.



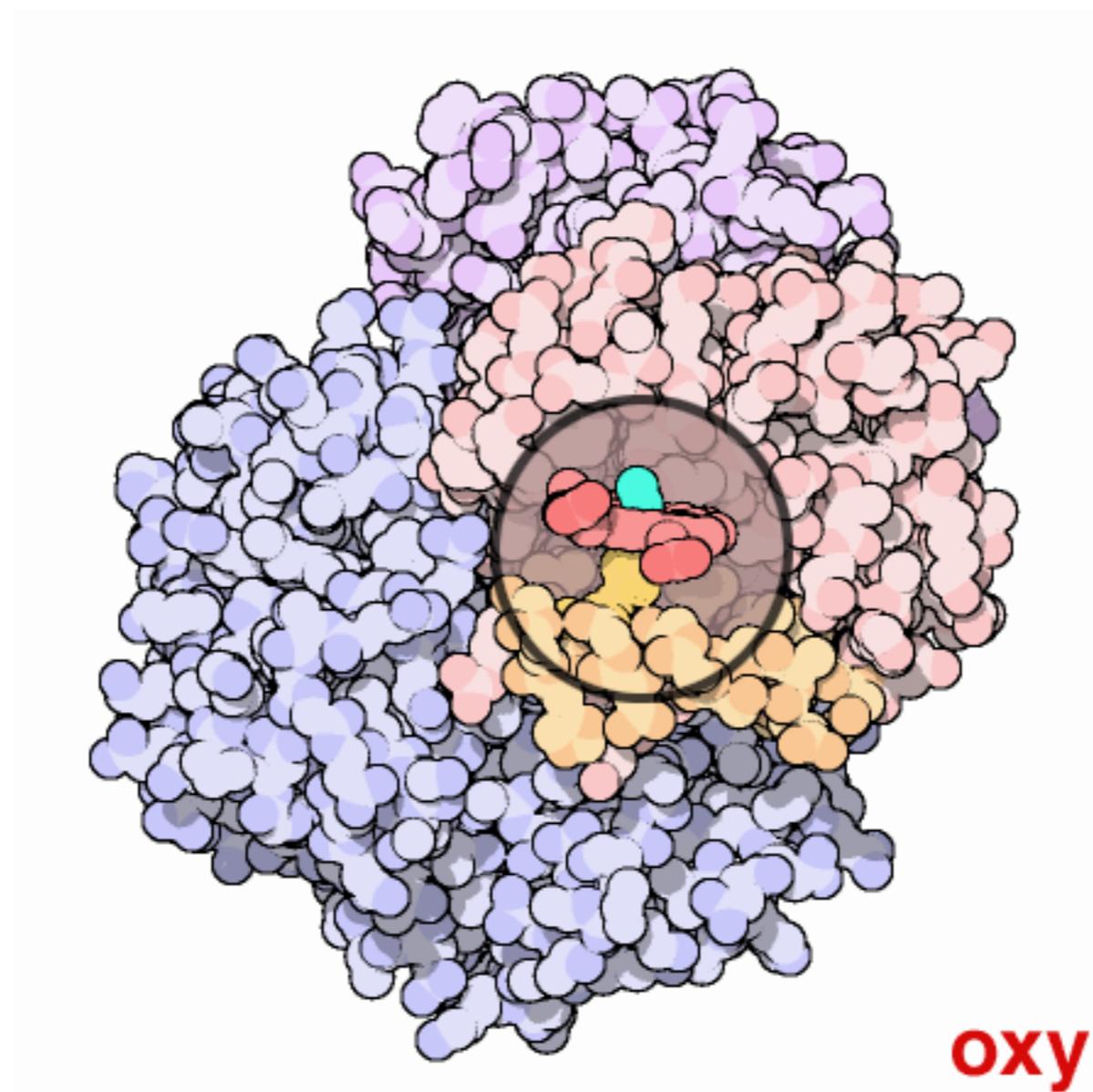
*The Royal Swedish Academy of Sciences has decided to award the*

# 2017 NOBEL PRIZE IN CHEMISTRY



The winners of the 2017 Nobel chemistry prize:  
Jacques Dubochet, Joachim Frank and Richard Henderson.

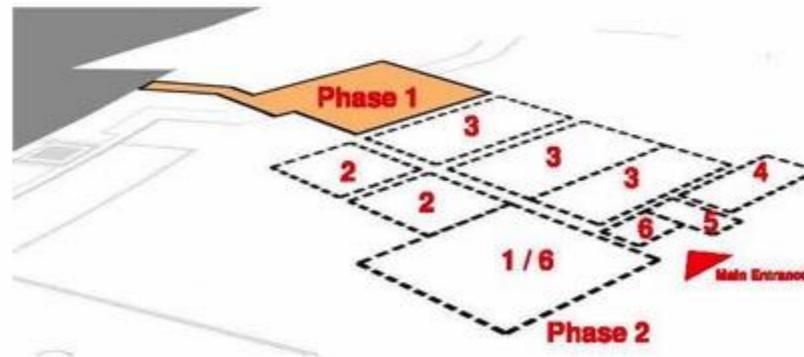
# Structure and function are intimately related.



# Building for the future.



- LEGEND**
- Cryo-EM Facility
  - 1 Auditorium
  - 2 Laboratories
  - 3 Twelve Cryo-EM Instruments
  - 4 Offices
  - 5 Sanitary Block / Stair Tower
  - 6 Lobby

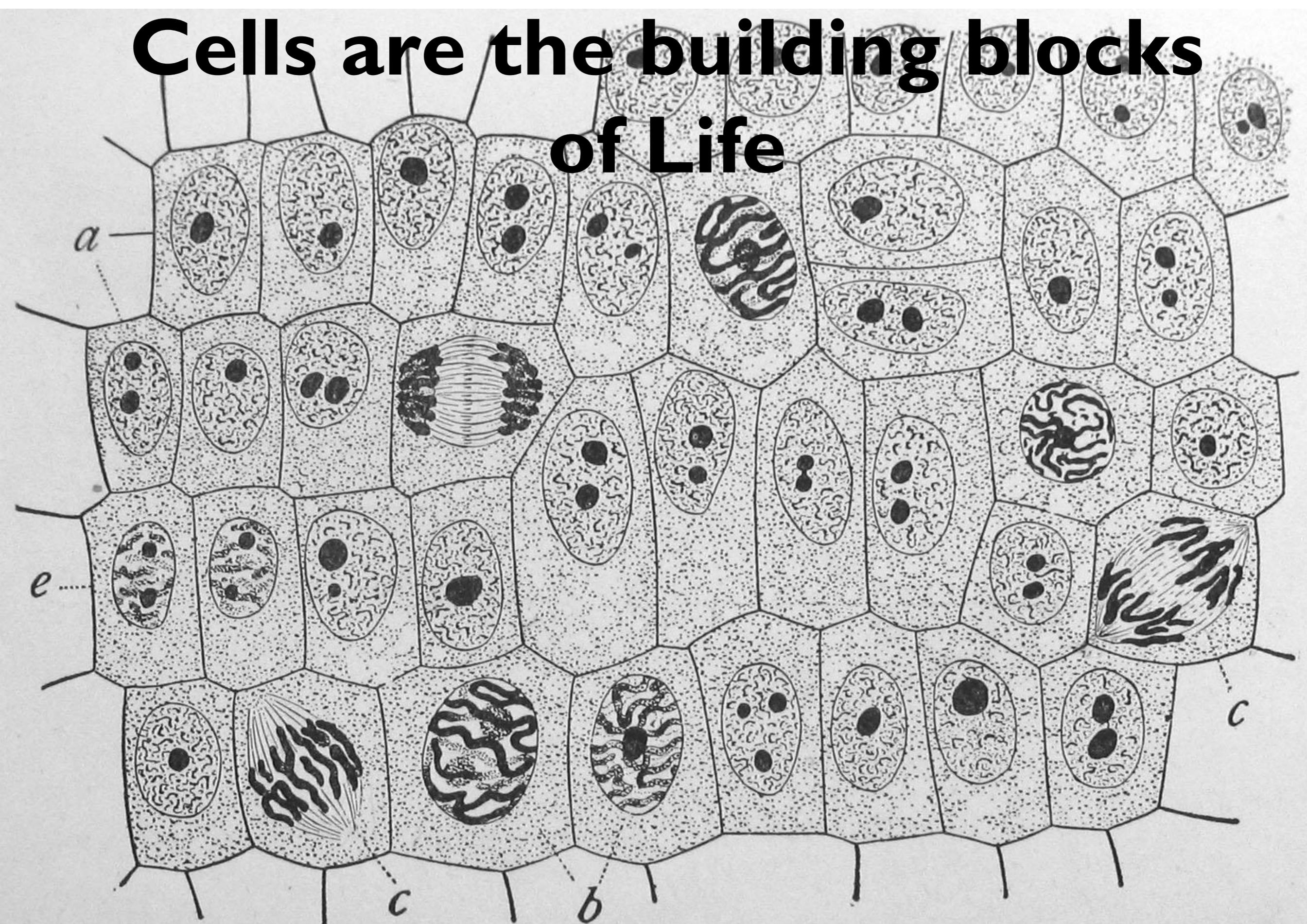


**BROOKHAVEN**  
NATIONAL LABORATORY

UNDER CONTRACT WITH  
UNITED STATES DEPARTMENT OF ENERGY

PROJECT  
CRYO-EM FACILITY

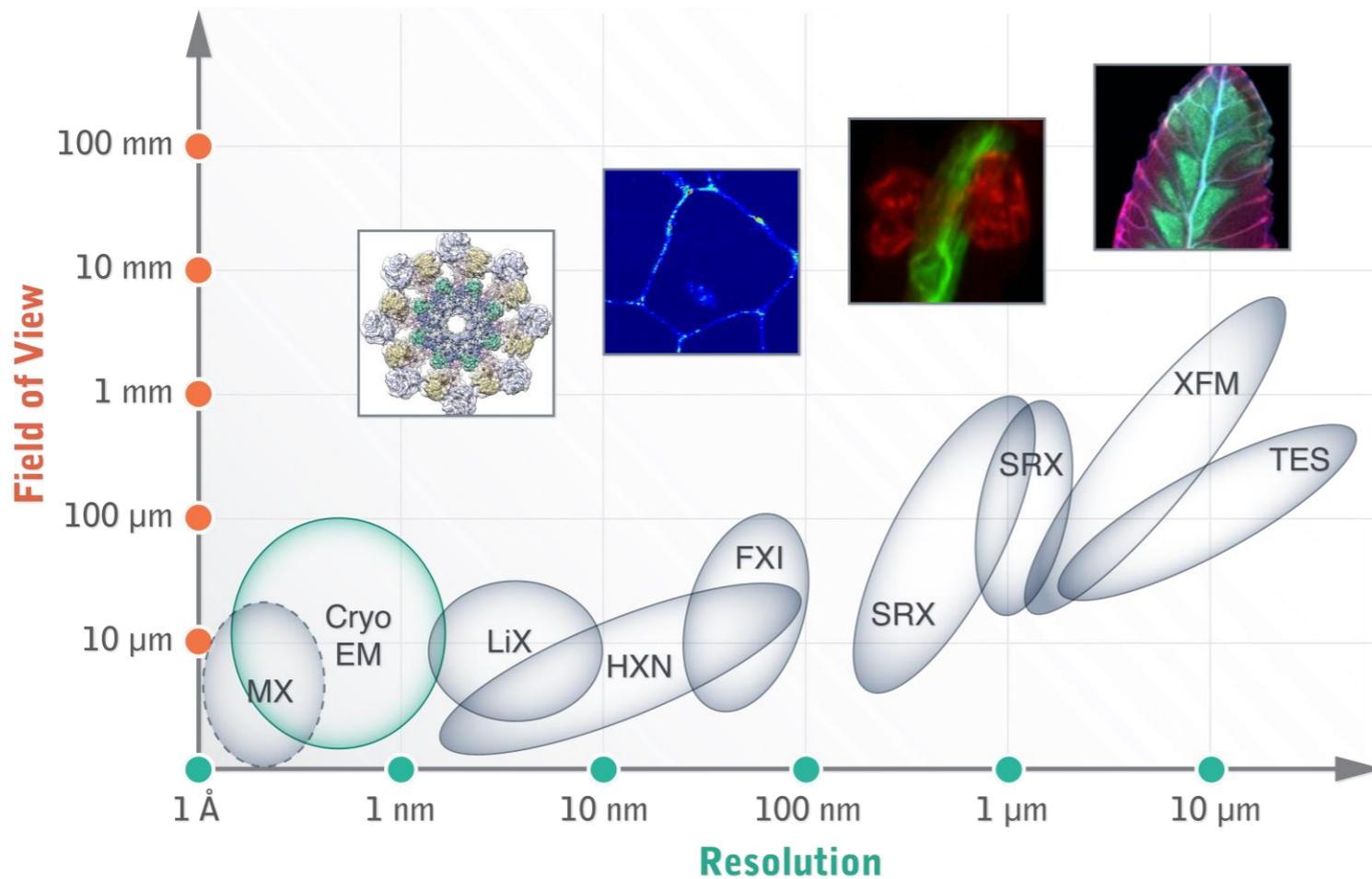
# Cells are the building blocks of Life



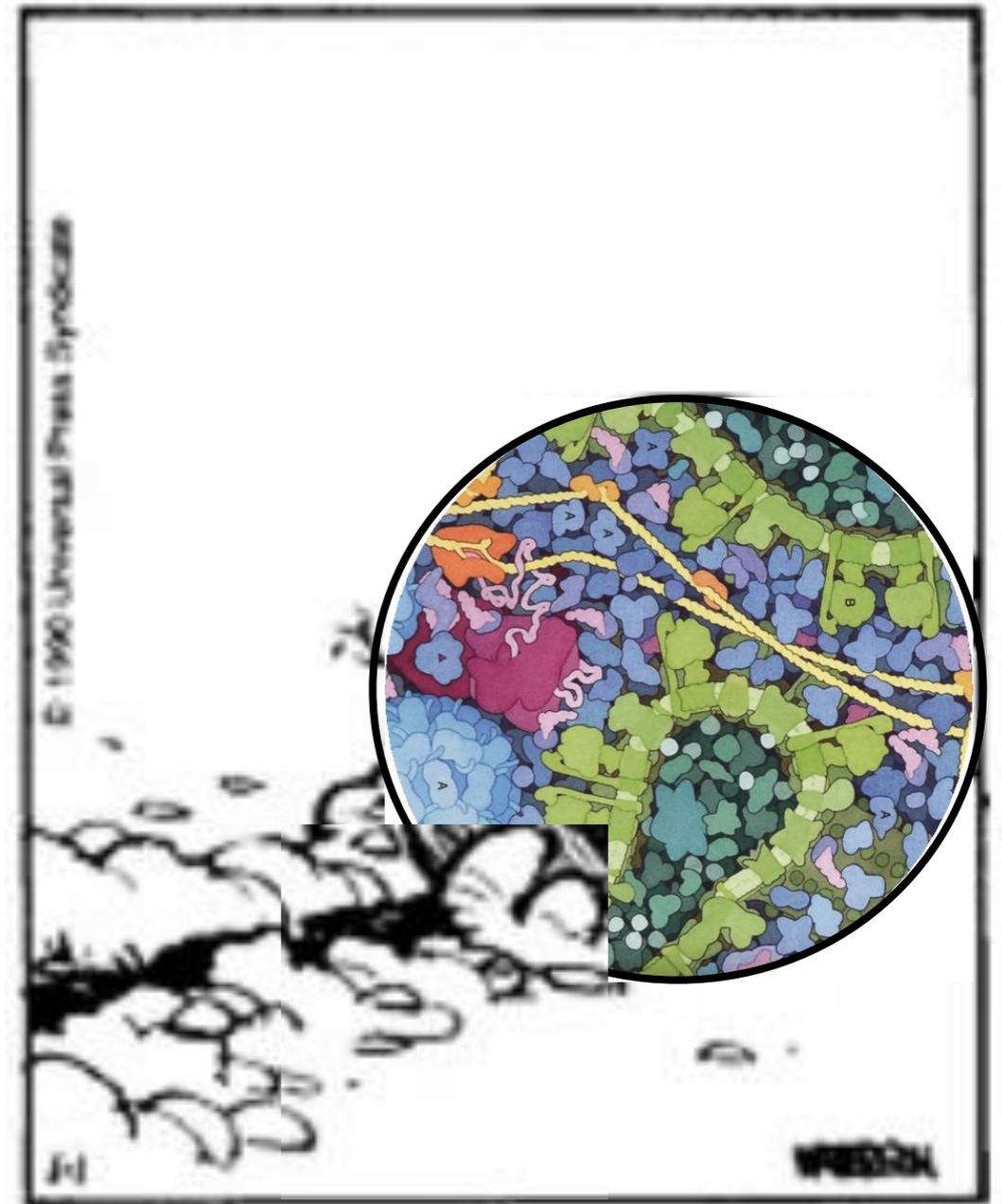
S. McS



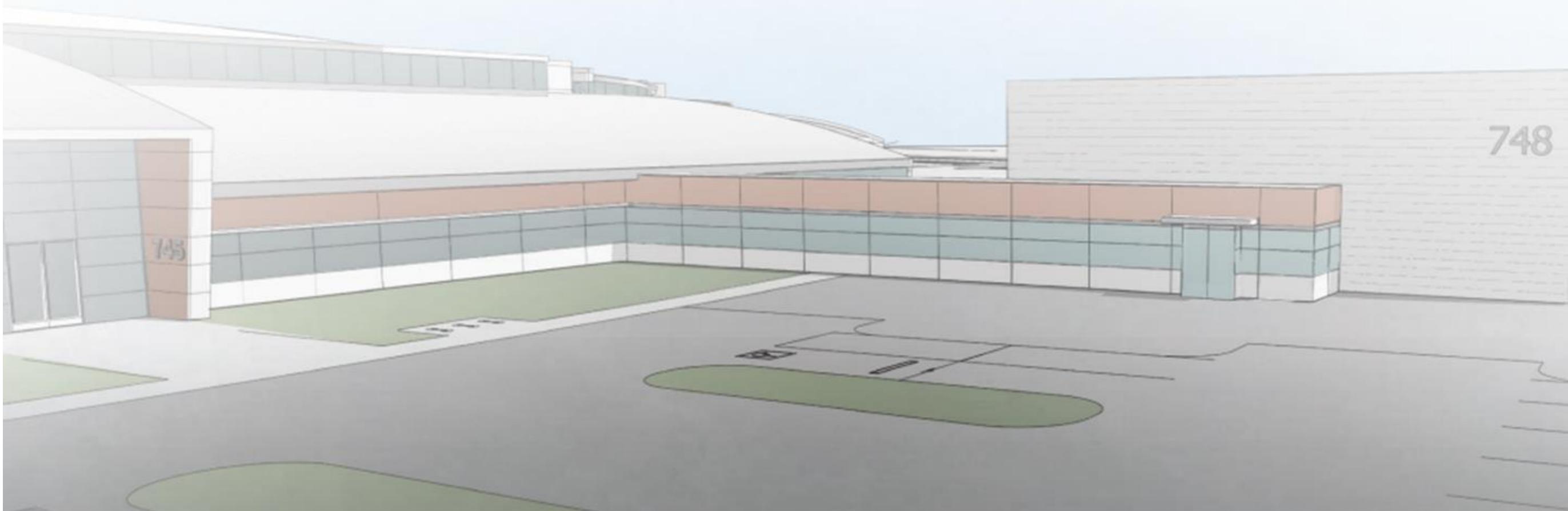
CryoEM is but a part of a bigger picture ....



... just one element of a larger goal of establishing a biological imaging center ...



# Laboratory for BioMolecular Structure



A development at BNL to create a cryoEM center in close proximity to NSLS-II, allowing for close interaction between structural biology and biolmaging researchers following multiple techniques.

# Laboratory for BioMolecular Structure



New York State Senator Ken LaValle joined leaders of ESD and BNL for the Ground Breaking on December 13<sup>th</sup>, 2018.



# Construction collage



February 27<sup>th</sup>, 2019 – Winter weather continues to impede outside construction as snow falls on the construction site.



March 26<sup>th</sup>, 2019 – Harbinger of Spring! Start of form work.



April 17<sup>th</sup>, 2019 – Footings and foundation walls in place and backfill nearing completion.



May 16<sup>th</sup>, 2019 – Microscope slab pours in progress.



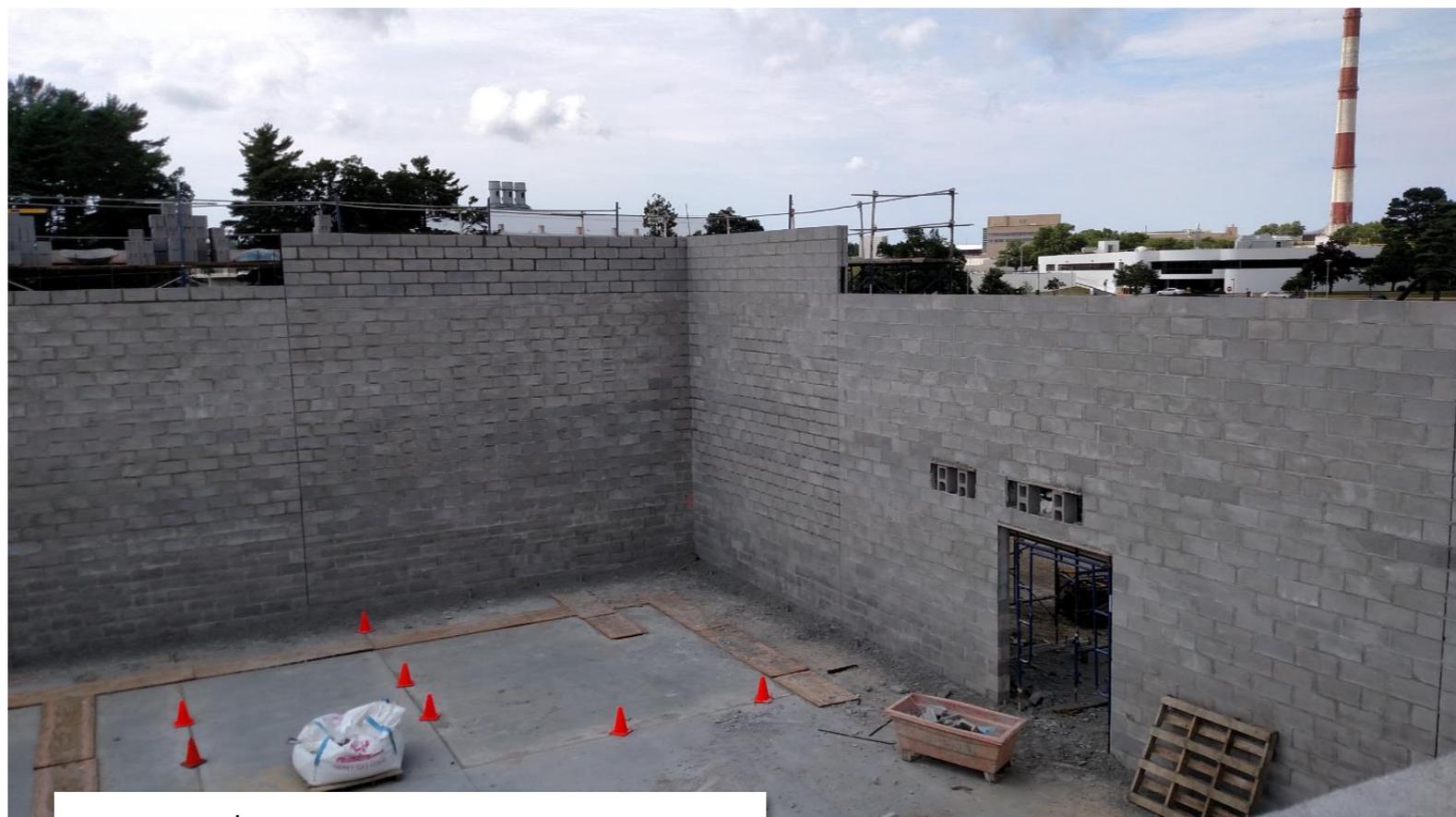
May 31<sup>st</sup>, 2019 – Floor slab pours in progress.



June 14<sup>th</sup>, 2019



June 27<sup>th</sup>, 2019



July 11<sup>th</sup>, 2019 – A peek inside....



Last block on the front wall - July 19, 2019





August 7<sup>th</sup>, 2019 – in lab 1

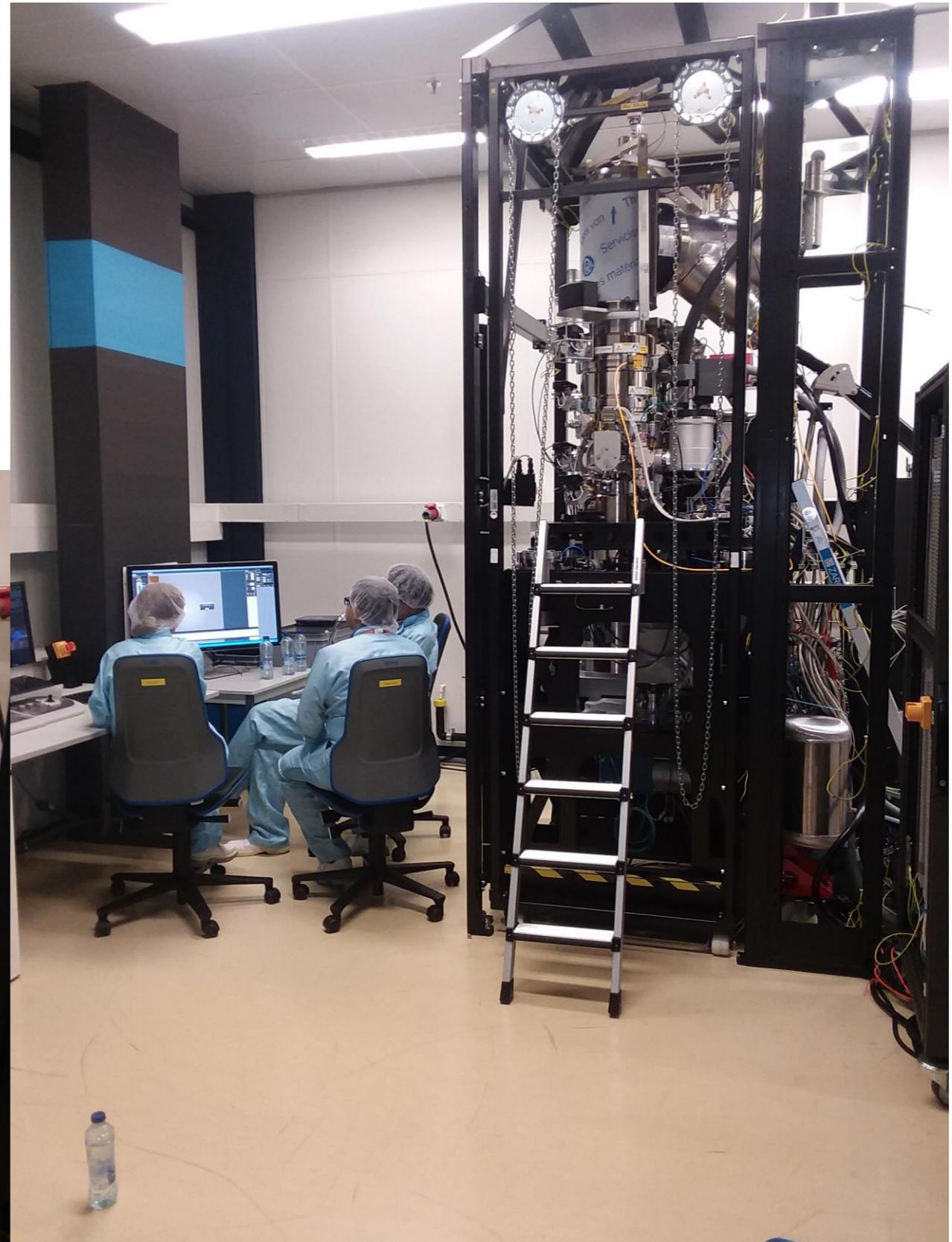


August 7<sup>th</sup>, 2019 – Looking to LOB 5



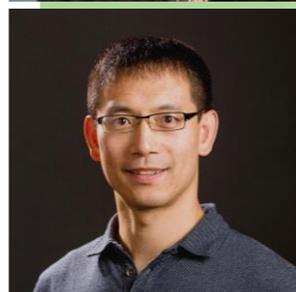
December 13<sup>th</sup>, 2018

Factory acceptance tests of  
our microscope, Eindhoven,  
Netherlands,  
1<sup>st</sup> to 3<sup>rd</sup> October 2019



# Operation Support through DOE.

- Following the opportunity to submit a proposal for development of the CryoEM Facility, we were successful in obtaining initial funding the development of the facility.
- \$5.4M over three years.
- Support covers 5 FTE of effort.
- Recruitment underway.
- Enabled us to establish Joint Appointments with:
- SBU: Dongyan Tan, Saikat Chowdhury.
- Yale : Yong Xiong



## BROOKHAVEN NATIONAL LABORATORY CryoEM Operations

**Applicant/Institution:**  
Brookhaven National Laboratory

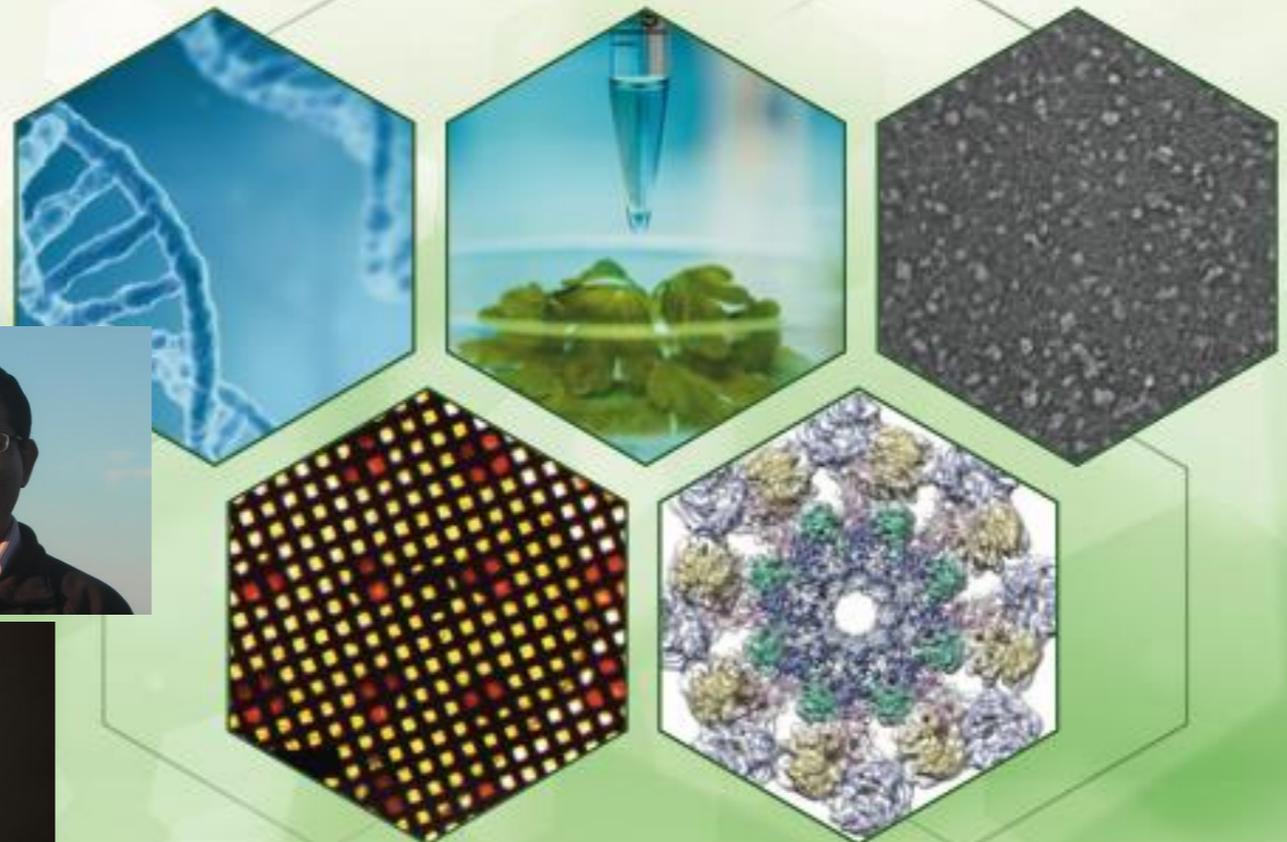
**Street Address/City/State/Zip:**  
Building 745, Brookhaven Avenue,  
Upton, NY 11973

**Postal Address:**  
P.O. Box 5000, Upton, NY 11973

**Lead PI name, telephone number, email:**  
Sean McSweeney, 631-344-4506  
smcsweeney@bnl.gov

**DOE/Office of Science Program Office:**  
Biological and Environmental Research,  
Biological Systems Science Division

**DOE/Office of Science Program Contact:**  
Amy Swain, Ph.D.  
Program Manager, Biological Systems Science Division



# Laboratory for BioMolecular Structure

**BROOKHAVEN NATIONAL LABS CRYO-EM CAPITAL PROJECT**  
Empire State Development Project AC582

A New York State funded initiative to build a core capability at Brookhaven National Laboratory for the determination of biomolecular and cellular structures utilizing cryoelectron microscopy (CryoEM).

CryoEM is planned as a key element of a larger vision called the Laboratory for Bio-Molecular Science (LBMS).



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

**BROOKHAVEN**  
NATIONAL LABORATORY



NEW YORK  
STATE OF  
OPPORTUNITY  
Empire State  
Development