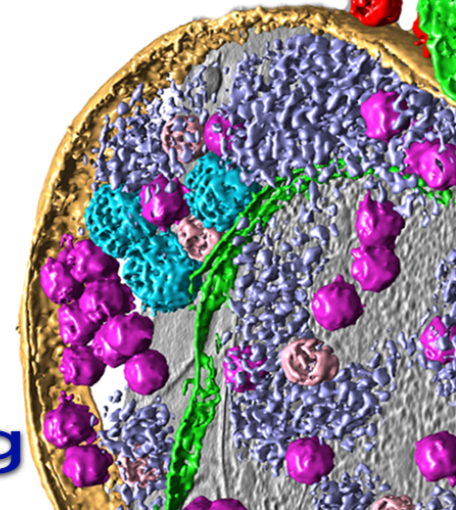


# N C M I

National Center for  
Macromolecular Imaging

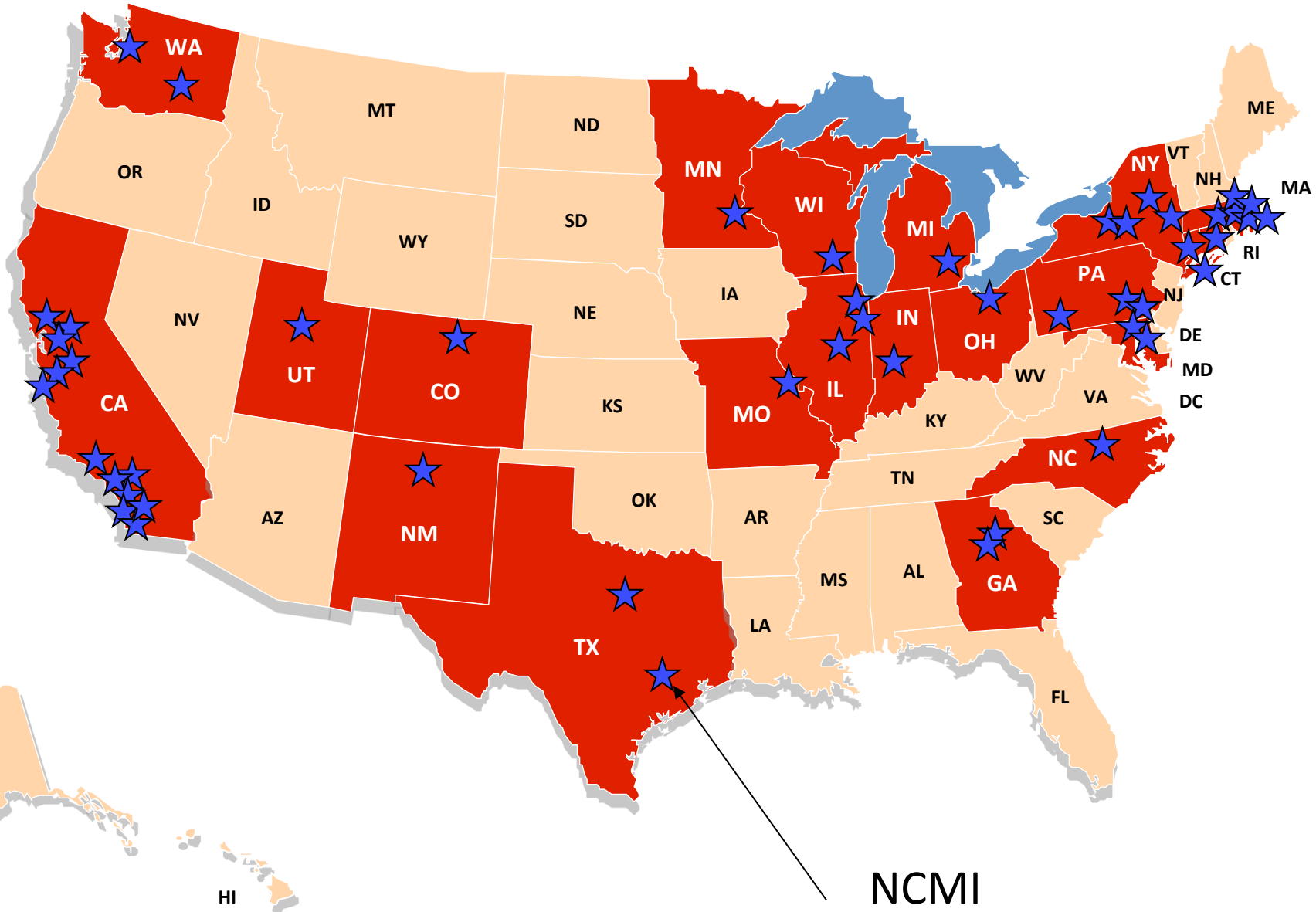


**Wah Chiu, Director**  
**Steven Ludtke, Co-Director**  
**Michael F. Schmid, Co-Director**

Supported By NIH Since 1985

# NIGMS, NIH

## Biomedical Technology Research Resources



# Research Missions at NCMI: CryoEM

- Develop **Cryo-Electron Microscopy** for structure determination of molecular machines without crystals at atomic resolution; and of frozen, hydrated cells/ organelles at molecular resolution
- Collaborate with biological investigators on projects to drive the technology
- Share our experimental and computational methodologies and facilities freely with the global academic community
- Provide training of cryoEM methodologies

# Initial Justifications in Establishing NCM

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# Electron Cryo-Microscopes at NCMi

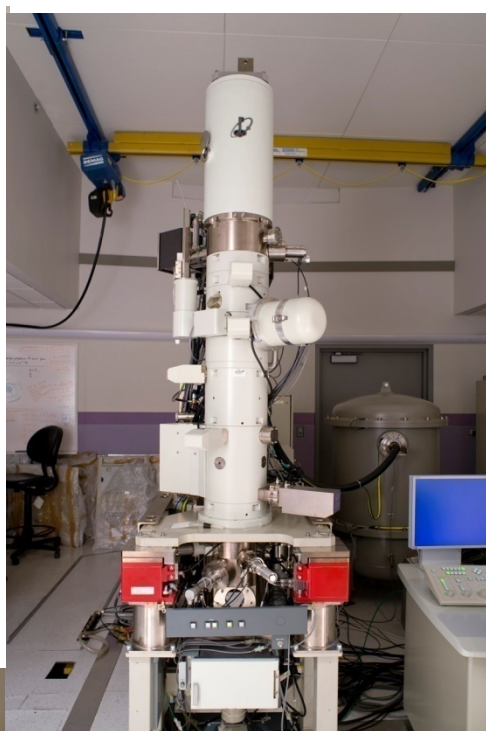
JEM 2100

200 kV  
DE12  
4kCCD  
2007



JEM 2200 FS

200 kV  
Energy Filter  
DE20  
4kCCD  
Phase Plate  
2009 (used scope)



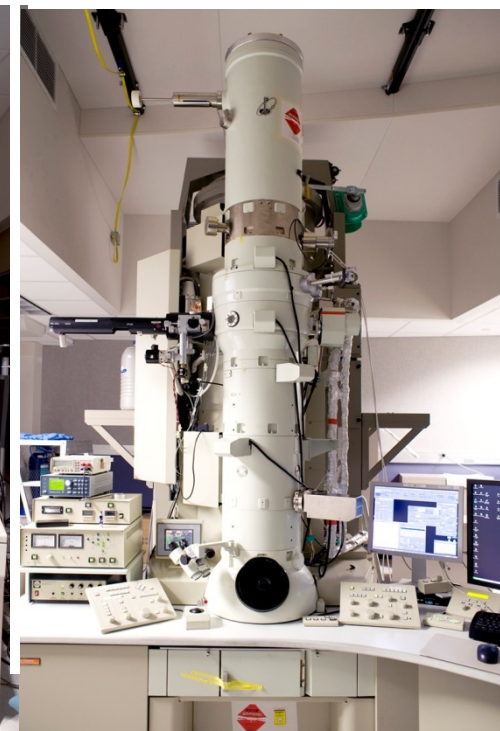
JEM 2010 F

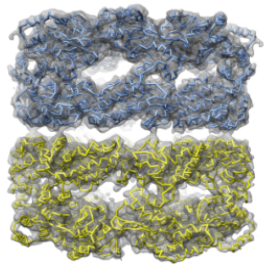
200 kV  
DE12  
4kCCD  
2002



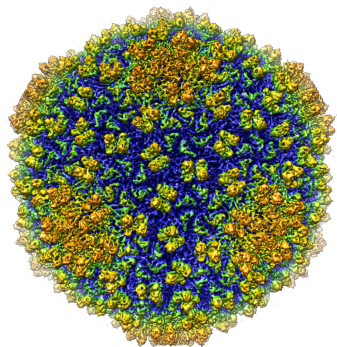
JEM 3200 FSC

300 kV  
Energy filter  
K2 Summit  
2006

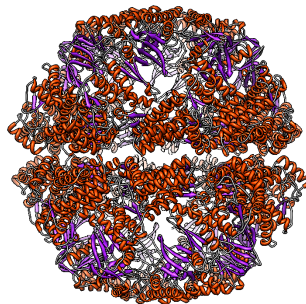




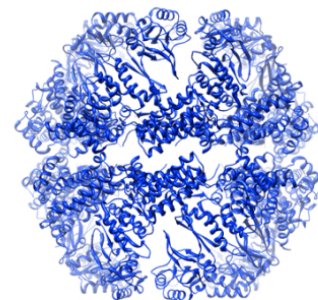
GroEL 2008



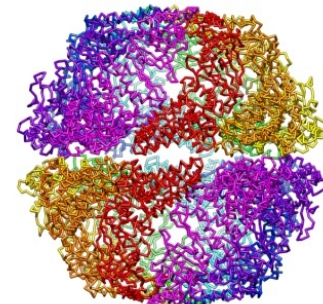
ε15 Phage 2008



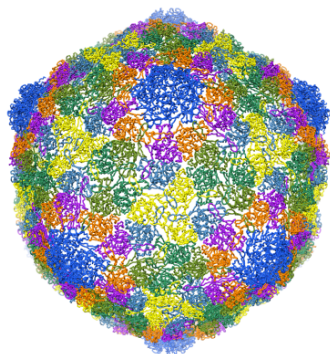
Mm-cpn  
2010



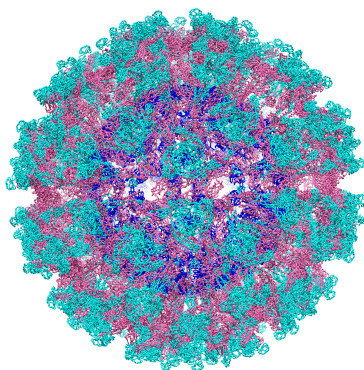
Mutant  
Mm-cpn 2010



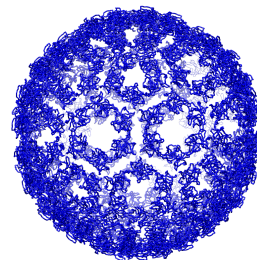
TRiC 2010



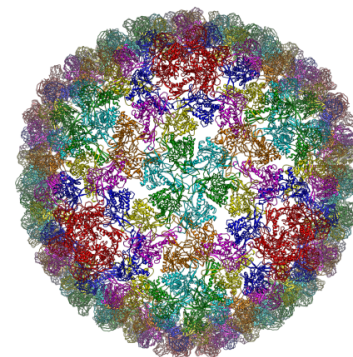
PSSP-7 Phage  
2010



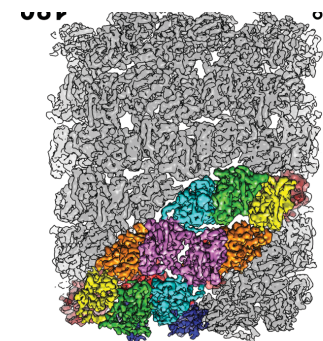
VEEV Shell  
2011



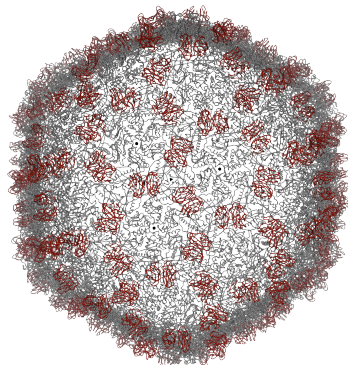
VEEV capsid  
2011



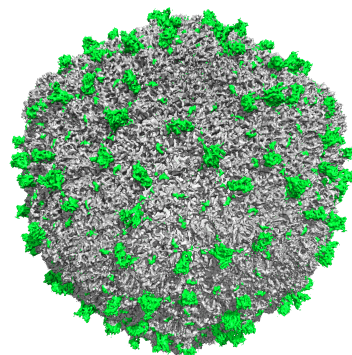
P22 procapsid  
2011



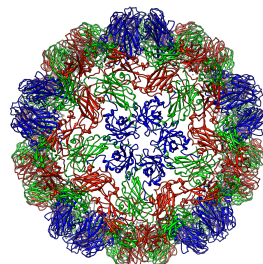
Hymocyanin  
2013



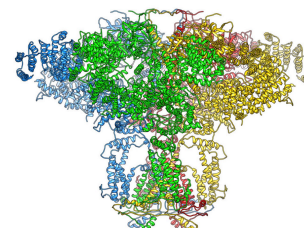
ε15 Phage 2013



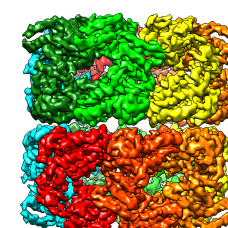
Syn5 2014



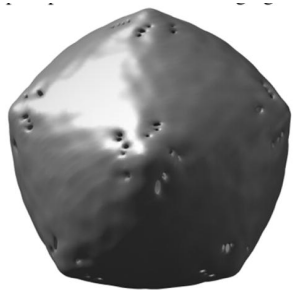
BMV 2014



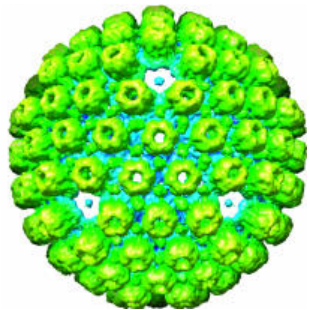
IP<sub>3</sub>R1 2015



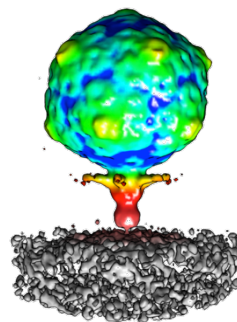
GroEL 2015



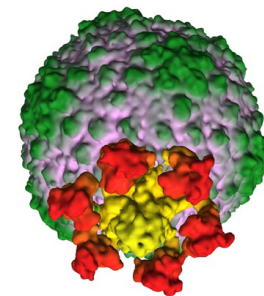
Carboxysome, 2006



HSV-1, 2007



P-SSP7, 2010



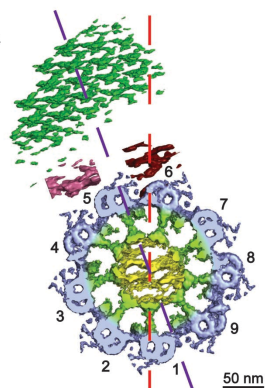
$\epsilon$ 15, 2010



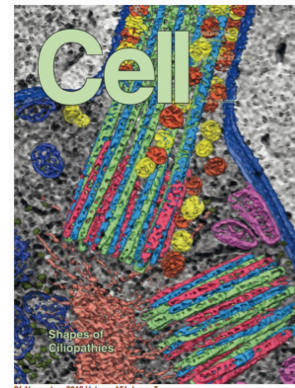
$\epsilon$ 15 infecting  
Salmonella, 2010



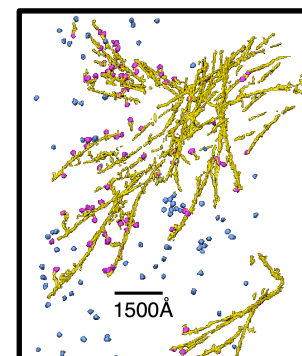
MMLV RNA,  
2010



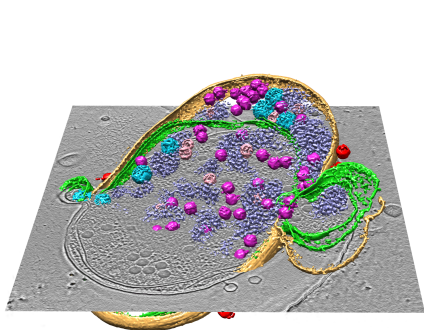
Trypanosoma brucei  
flagellum, 2011



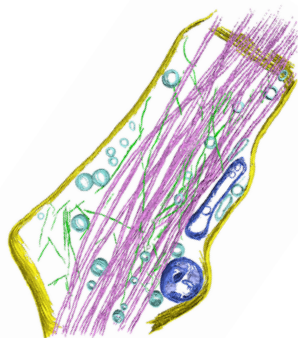
Rod sensory  
cilium, 2012



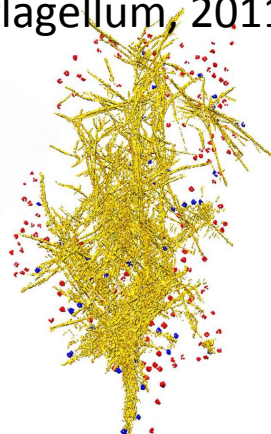
Mutant Htt &  
TRiC, 2013



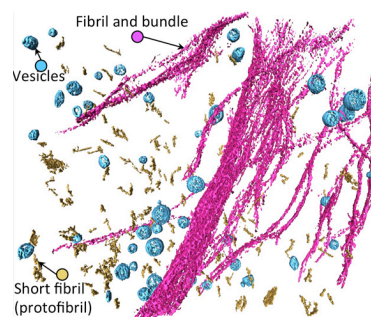
Cyanophage Infecting  
Cyanobacterium, 2013



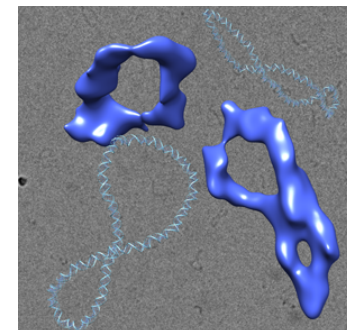
Rat brain  
Axon, 2014



Mutant Htt &  
CCT5, 2015



Mutant Htt  
Aggregates, 2015



Minicircle DNA,  
2015

# NCMI Project Application



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## NCMI Collaborative/Service Project Proposal

This page will allow you to propose a research project to be performed at the NCMI.

The NCMI is equipped with four state of the art intermediate voltage electron cryomicroscopes, sample vitrification robots and a wide range of computational resources all devoted towards our mission of advancing the technology of electron cryomicroscopy and applying this technology to problems of biological significance. We have one phase-plate microscope, and 3 of 4 instruments are equipped with a direct-detection CMOS camera. Our projects span a wide range of topics from macromolecular structural biology, nanobiology, virology, microbiology and cell biology. We have a variety of techniques for examining specimens ranging in size from 10 nm to a micron with resolutions in some cases at subnanometer details. Available techniques include single particle reconstruction, tomography, helical reconstruction and 2-D crystallography. We are involved in work ranging from heavily collaborative projects to strictly service projects. For a collaborative project, our center staff devote significant amounts of effort in carrying out or assisting the projects at one or more phases in the project pipeline from specimen preparation to structural interpretation. For service projects, the users make use of our experimental facility or software with minimum assistance beyond initial training from our staff. Center staff are generally co-authors in the publications in collaborative projects whereas co-authorship is not obligatory for service projects. In either case, NIH support (grant number P41GM103832) must be acknowledged in any publication using the NCMI facility.

If you have confidentiality concerns, or would like to discuss the general feasibility of your project prior to submitting a proposal, you are welcome to email Wah Chiu ([wah@bcm.edu](mailto:wah@bcm.edu)) or one of the center co-directors.

If you have a proposal you think would be appropriate for the NCMI, please submit detailed information on the form below. Once submitted, your proposal will be evaluated by the NCMI director and co-directors, and in some cases outside consultants. We will contact you within two weeks with information on how we can proceed. If the project appears promising we typically begin with an initial set of experiments to assess feasibility.

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JEOL, USA  
FEI

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