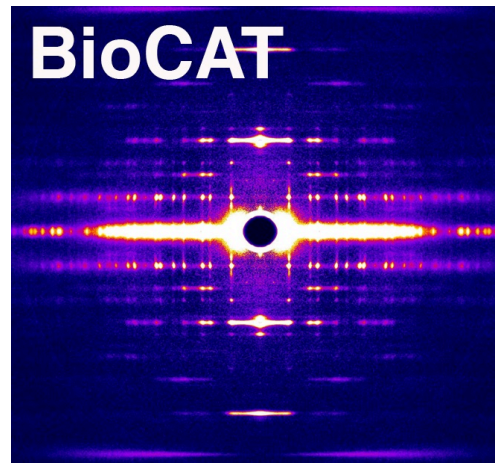


# BioCAT user program during the dark period

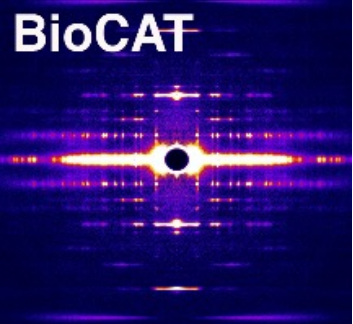


Thomas Irving

BioCAT, CSRRI and Dept. Biology,

Pritzker Institute of Biomedical Science and Engineering

Illinois Institute of Technology, Chicago IL



# BioCAT user program during the dark period

- BioCAT will make a website for users with our down plans, and to direct them to appropriate resources at other synchrotrons for experiments.
- We have made arrangements with SSRL and MacCHESS to run part of our user program on their beamlines during the dark period.
- BioCAT staff will make multiple trips to these facilities to help do specific kinds of experiments.

# BioCAT user program during the dark period

- - BioCAT will make certain non- x-ray capabilities available if needed, such as SEC-MALS experiments for users who need complementary measurements for already collected data, and want to use the same equipment for consistency.
- In order to reduce load on other beamlines, BioCAT scientists will help coordinate and plan experiments, and help users analyze data as appropriate.

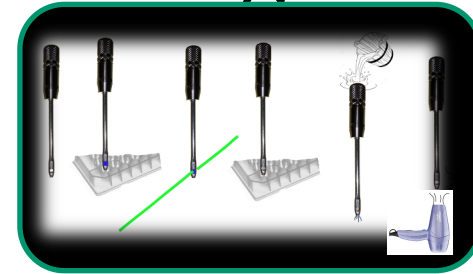
# Muscle Diffraction Experiments at MacCHESS

- Will be doing trial muscle diffraction experiments on BL-ID7A at MacCHESS in May.
- If successful, plan is to have 3 weeks of muscle running (~ 6 user experiments) during the down year
- Time resolved experiments will be possible
  - Experiments with live animals might be possible
  - A possible limitation will be short camera lengths
- ~1.7 m max

# Equilibrium SAXS Experiments at MacCHESS

- Propose 3, 1 week runs for SEC-MALS SAXS where BioCAT staff come and provide expertise to run user experiments
- SEC-SAXS - people can apply for time through the CHESS proposal normally but indicate “BioCAT” on their proposals so they are counted towards CHESS’ contribution for mitigating dark period.
- BioCAT staff will come for additional “mail-in” runs with collected user experiments
- Link to facility description talk given for SAXS SIG
- <https://www.youtube.com/channel/UCfbzcItjmoznxBGD8d4b2Wg>
- HOWTO for applying for beamtime:
- <https://www.youtube.com/watch?v=efaDzp1xB-g>

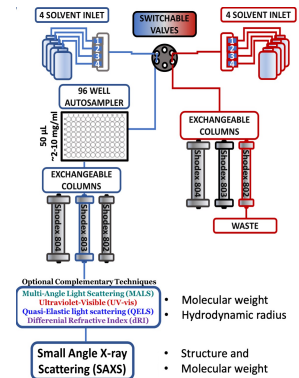
# SIBYLS SAXS beamline For Biology and other Aqueous Samples – [sibyls.als.lbl.gov](http://sibyls.als.lbl.gov)



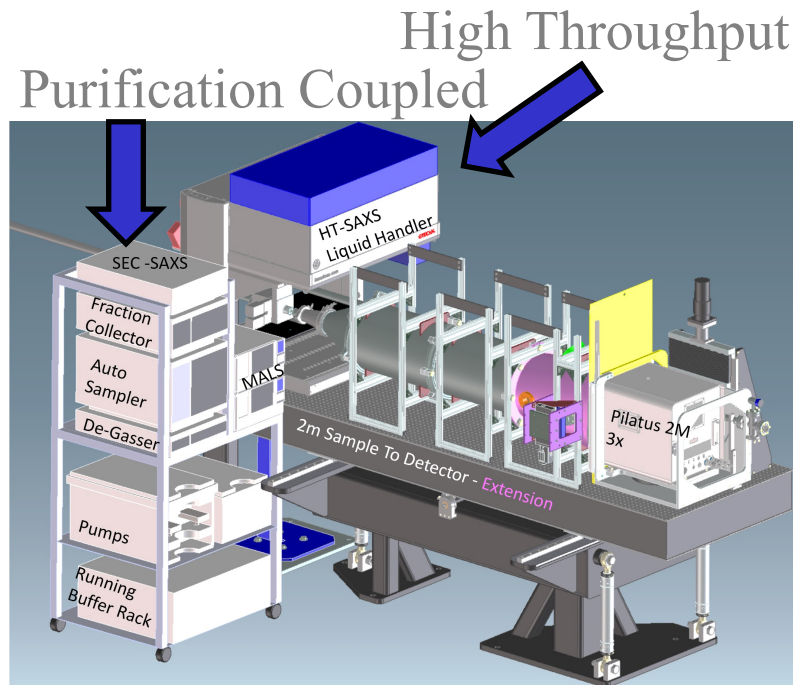
High Throughput –  
96 well plate in 1.5 hours  
8-12 labs per week

Purification Coupled –  
Uninterrupted 6 columns  
6 Running Buffers  
12 samples/user  
8-12 labs per week

Total 16 – 24 projects per week of light



BioSAXS at the  
ALS



# SAXS at SIBYLS

- They anticipate having the capacity to absorb a large number of high throughput SAXS projects and a smaller number of SEC-SAXS experiments by mail-in
- BioCAT staff will provide pre-experiment consultation and post-experiment help with data analysis/interpretation

# Muscle/Fiber Diffraction Experiments at SSRL

- Will be doing trial muscle diffraction experiments on BL4-2 at SSRL in June/July 2022.
- If successful, plan is to have 3 weeks of muscle running (~6 user experiments) during the down year
- SSRL can also accommodate fiber diffraction projects
- Time resolved experiments will be possible
  - Pilatus 1M or Eiger 1M
  - With multilayer mono (2% bandpass) flux in slit collimated beam (0.15 x.0.15 mm).  $>10^{12}$  ph/s
- detector distance: 0.25 m – 3.5 m (in 7 discrete steps)
- No animal facility at SSRL



# Equilibrium SAXS Experiments at SSRL

- Propose 6, 1 week runs for SEC-MALS SAXS where BioCAT staff come to SSRL and provide assistance to run user experiments
- SEC-SAXS - people can apply for time through the SSRL proposal system normally but indicate “BioCAT” on their proposals so they are counted towards SSRL’s contribution for mitigating dark period.
- Additional experiments (e.g. batch solution SAXS) can be done in-person, mail-in or remote using SSRL proposal system; BioCAT staff will be available (remotely) for possible help with data analysis
- remote experiments can include simple pipetting on the tray or other basic robotic sample manipulations - ask BL4-2 staff what's possible
- Link to facility description talk given for SAXS SIG  
<https://www.youtube.com/channel/UCfbzcltjmoznxBGD8d4b2Wg>
- SSRL BL4-2 website for useful HowTo information:
  - <https://www-ssrl.slac.stanford.edu/smb-saxs/content/bl4-2>

# Time-resolved SAXS

- LIX at NSLS II has suitable microbeam optics for continuous flow SAXS experiments.
- We plan to put in specific beamtime proposals to use LIX in collaboration with Lin Yang.
- BioCAT staff will go to LIX with suitable user experiments.
- Expect 2-3 such runs during down year.