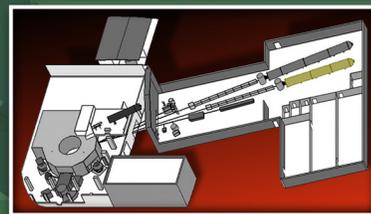


# INSTRUMENT

BEAM LINE

# CG-3

HIGH FLUX ISOTOPE REACTOR



## BIO-SANS – BIOLOGICAL SMALL-ANGLE NEUTRON SCATTERING INSTRUMENT

The Bio-SANS instrument is optimized for analysis of the structure, function, and dynamics of complex biological systems. It is the cornerstone of the Center for Structural Molecular Biology (CSMB) at Oak Ridge National Laboratory. The Bio-



Detector tanks for the SANS instruments at HFIR. The Bio-SANS detector is on the left.

SANS instrument is supported by additional CSMB capabilities that include development of advanced computational tools for neutron analysis and modeling, as well as biophysical characterization and x-ray scattering infrastructure. A dedicated biological sample preparation laboratory is located adjacent to the instrument.

### SPECIFICATIONS

Wavelength	$6 < \lambda < 25 \text{ \AA}$
Wavelength resolution	$\Delta\lambda / \lambda = 9\text{--}45\%$
Q range	$0.0009\text{--}0.8 \text{ \AA}^{-1}$
Sample-to-detector distance	1.1–15.3 m
Detector	2-D linear position-sensitive detector
Detector size	1 x 1 m <sup>2</sup>
Detector resolution/pixels	192 x 256
Max count rate	1 MHz

### APPLICATIONS

- Bio-macromolecules and their assemblies
  - Protein complexes
  - Protein/DNA complexes
  - Lipids
  - Viruses
  - Carbohydrates
- Hierarchical biological structures
  - Gels
  - Fibers and fibrils
  - Vesicles
  - Microemulsions
- Membrane diffraction
- Biomimetic and bio-inspired systems



CG-3 Detector Array

### USER ACCESS

Bio-SANS is operated as a user facility and is sponsored by DOE's Office of Biological and Environmental Research. The instrument is managed under the CSMB User Program.

### CENTER CAPABILITIES

X-ray scattering
Light scattering
Computational tools
Bio-support lab
Protein production + analysis
Bio-deuteration lab

Status: Available to users



<http://www.csmb.ornl.gov>



### FOR MORE INFORMATION, CONTACT

Instrument Scientist: Volker Urban, [urbanvs@ornl.gov](mailto:urbanvs@ornl.gov), 865.576.7221

Instrument Scientist: Sai Venkatesh Pingali, [pingalis@ornl.gov](mailto:pingalis@ornl.gov), 865.241-2424

Instrument Scientist: Shuo Qian, [qians@ornl.gov](mailto:qians@ornl.gov), 865.241.1934

Center Director: Paul Langan, [langanpa@ornl.gov](mailto:langanpa@ornl.gov), 865.576.0666

[neutrons.ornl.gov/cg3](http://neutrons.ornl.gov/cg3)

**OAK RIDGE**  
National Laboratory

March 2015