



National Institute of
General Medical Sciences



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April 20, 2023

The NIH, SSRL and Structural Molecular Biology

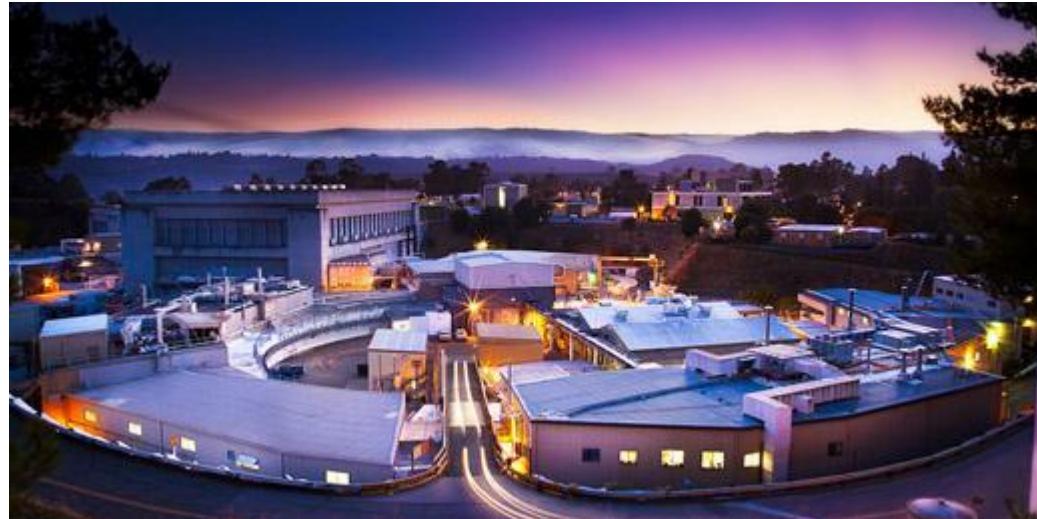
50 Years of Biomedical Research Support

SSRL at 50

From high energy physics parasite to a premier center for beamline experiments

1973

SSRP: 1 Beamline, 5 experimental stations



2023

SSRL: 24 active Beamlines 33 experimental stations

<https://www-ssrl.slac.stanford.edu/content/spear3/spear3-accelerator>

NIH Support of SSRL

I. User and Technology Development Resources

- Division of Research Resources and NCRR
1980-2011 P41: Research Resource
- National Institute of General Medical Sciences (NIGMS)
2012-2020 P41: Research Resource
2020-present P30: Mature Synchrotron Resource

II. Additional Support

- NIGMS
1999-2015: Support through Interagency Transfers to DOE
- NIGMS & NCRR
1999-2001: SPEAR3 Upgrades

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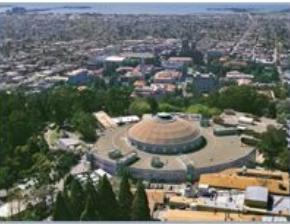
Current SSRL Resources for Structural Molecular Biology

- **SSRL**

- MX: Macromolecular x-ray crystallography
- SAXS: Small angle X-ray scattering
- X-ray absorption (XAS) and emission spectroscopy (XES)

- **SLAC**

- LCLS-x-ray Free Electron Laser
- CryoEM and CryoET



Advanced Light Source (ALS)

Lawrence
Berkeley
National
Laboratory



Stanford Synchrotron Radiation Lightsource (SSRL)

SLAC National Accelerator
Laboratory

SSRL: One of 9 Synchrotron Resources supported, by NIH/NIGMS in Partnership with DOE and others



Advanced Photon Source (APS)

Argonne
National
Laboratory



Cornell High Energy Synchrotron Source (CHESS)

Cornell University



National Synchrotron Light Source (NSLS-II)

Brookhaven National Laboratory

SSRL Successes in Structural Molecular Biology

Productivity

Protein Data Bank Depositions of Protein Structure Coordinates (April 16, 2023):

8028

Nobel Prize Research: Chemistry

Roger Kornberg 2006, Brian Kobilka (with Robert Lefkowitz) 2012, Frances Arnold 2018

Valuable User Resource

2022: 1120 Users, 295 Projects, 204 Publications

The NIH, SSRL and the Protein Structure Initiative: 2000-2015

Marvin Cassman
NIGMS Director
1996-2002



SSRL and the PSI

U54, NIGMS, 2005-2009,
Tools for High Throughput Structural Biology

U54, NIGMS, 2010-2014, TransportPDB,
Center for X-ray Structure determination of Human transporters

PSI-Related Technological Advances “Democratization of Macromolecular X-ray Crystallography”

High throughput structure determination:
automation, remote data acquisition etc.



Charles Edmonds
NIGMS Program Director



Catherine Lewis
Director, CBB Division, NIGMS



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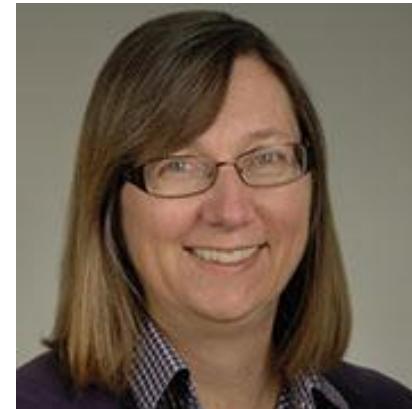
NIH Program Staff and SSRL



Dr. Amy Swain
DOE, BER



Dr. Ward Smith
NIGMS Program
Director



Dr. Mary Ann Wu
NIGMS Program
Director

SSRL: The next 50 years and the NIH



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2073
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