



National Science Foundation
WHERE DISCOVERIES BEGIN

NSB

Research Areas

Funding

Awards

Document Library

News

News

All News

For News Media

Multimedia Gallery >

NSF Director's Newsletter

Search News

Special Reports

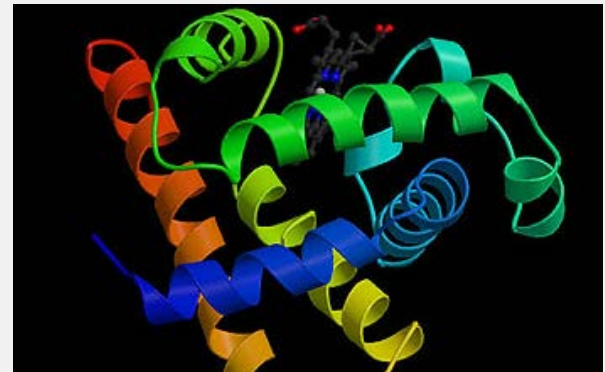
Speeches and Lectures >

Home > News

Fact Sheet

Protein Data Bank - Chronology

Timeline for Structural Biology and the Protein Data Bank



Myoglobin, the first protein structure to be determined at high resolution.

[Credit and Larger Version](#)

January 21, 2004

1913

X-ray diffraction: Max von Laue, William Henry Bragg, and William Lawrence Bragg

- 1957 **Muscle's myoglobin, the first protein structure revealed:** After 22 years of work, the Cavendish Laboratory in Cambridge (UK) uses X-ray diffraction to determine the structure of myoglobin, the first protein to have its structure determined. Kendrew and Max Perutz receive the Nobel Prize for their work on protein structure determination. During the next decade, the structures of proteins would be determined.
- 1967 **First American groups to solve a protein structure:** Two teams announce the structure of ribonuclease: One was from the Roswell Park Memorial Institute (now the Roswell Park Cancer Institute) (See G. Kartha, J. Bello, and D. Harker. "Tertiary structure of ribonuclease." *Nature* 1967). The other was from Yale University. (See H. W. Wyckoff, K. D. Hardman, N. M. Arora, and J. Tsernoglou, L. N. Johnson, and F. M. Richards, "The structure of ribonuclease-S." *Science* 1967, 156, 3749-3753.)
- Summer, 1971 **Idea hatches for repository:** At a Cold Spring Harbor Symposium on "Structure and Function at the Three-Dimensional Level," participants propose the development of a dual repository for macromolecular structure information. Walter Hamilton of the Brookhaven National Laboratory volunteers to set up the U.S. component at Brookhaven National Laboratory.
- Oct. 1971 **Protein Data Bank established:** The establishment of the Protein Data Bank at Brookhaven National Laboratory is announced in *Nature New Biology* (see "Crystallography, Protein Data Bank [Announcement]." *Nature New Biology* 1971, 233, 223). The new repository contains fewer than a dozen structures.
- 1975 **NSF begins support:** Thomas Koetzle, who assumed responsibility for the Protein Data Bank after Hamilton's untimely death, submits an unsolicited proposal to NSF. The first NSF grant for the Protein Data Bank is made on November 1, 1975 (NSF-7518956).
- 1975 **Deposits:** 18 structures are deposited in the Protein Data Bank in 1975, yielding a total of 20 structures since its founding in 1971.
- 1980 **Deposits:** 19 structures are deposited in 1980, bringing the total to 184 depositions in the Protein Data Bank.
- 1989 **Protein Data Bank partnership grows:** The Protein Data Bank becomes a broad-based partnership when the Department of Energy (DOE) and components of the National Institutes of Health join in providing direct support for Protein Data Bank activities.
- 1990 **Deposits:** 236 structures are deposited in Protein Data Bank in 1990, with a total of 420 structures since its founding.
- 1994 **Interagency support grows:** Memorandum of Understanding signed by NSF, DOE, and the National Institute of General Medical Sciences (NIGMS) forms a formal partnership for support of the Protein Data Bank.
- 1995 **Renewed support for Protein Data Bank:** Open competition results in award to Brookhaven National Laboratory for continued support of the Protein Data Bank (NSF-9518956).

investigator) and John Westbrook of Rutgers University, Peter Arzberger and Philip Drenth of the San Diego Supercomputer Center at the University of California at San Diego (SDSC) and John Koenig of the National Institute of Standards and Technology (NIST).

2000 **Deposits:** 2,937 structures are deposited in Protein Data Bank in 2000, with a total of 10,000 structures since its founding.

2000 **MOM's poster proteins:** The Molecule of the Month, authored by David Goodsell of the National Institute of Health, begins its profiles of key and interesting biomolecular structures with monthly profiles. Past honorees include DNA, RNA, ribosomes, and anthrax toxin.

Aug. 2003 **Agencies double:** A new Memorandum of Understanding creates a broad coalition of federal agencies in support of the Protein Data Bank: NSF, DOE, NLM, NIGMS, National Cancer Institute, National Center for Research Resources (NCRR), National Institute of Biomedical Research, National Institute of Bioengineering (NIBIB), and the National Institute of Neurological Disorders and Stroke.

Dec. 2003 **Global collaboration:** The Protein Data Bank achieves formal, international status. The announcement of international management of the Protein Data Bank archives is announced in Nature. Signatories are the RCSB, the European Bioinformatics Institute (EBI) and the Institute of Protein Research at Osaka University. The partners are to serve as custodians of the world's protein structure data "with the goal of maintaining a single archive of macromolecular structural data that is freely and fully available to the global community."

2003 **Deposits:** While the first protein structure took 22 years to solve, structures now are deposited in the Protein Data Bank at an average rate of more than 10 per day: more than 4,600 new deposits were made in 2003, bringing the total of accessible structures to nearly 24,000.

2004 **New era launched:** With funding from eight federal agencies, the new five-year, \$100 million period begins with the RCSB.

-NSF-

Media Contacts

Sean Kearns, NSF, (703) 292-7963, skearns@nsf.gov

The National Science Foundation (NSF) is an independent federal agency that supports fundamental research and education across all fields of science and engineering. In fiscal year (FY) 2016, its budget is \$7.5 billion. NSF receives funding through grants to nearly 2,000 colleges, universities and other institutions. Each year, NSF receives about 60,000 proposals for funding and makes about 12,000 new funding awards. NSF also awards about \$620 million in service contracts yearly.

Useful NSF Web Sites:

NSF Home Page: <https://www.nsf.gov>

NSF News: <https://www.nsf.gov/news/>

For the News Media: <https://www.nsf.gov/news/newsroom.jsp>

Science and Engineering Statistics: <https://www.nsf.gov/statistics/>

Awards Searches: <https://www.nsf.gov/awardsearch/>



News

- All News
- Multimedia
- Gallery

Funding & Awards

- A-Z Index of Funding Opportunities
- Find Funding
- Award Search
- Proposal & Award Policies Procedures Guide (PAPPG)
- Recently Announced Funding Opportunities
- Upcoming Funding Opportunity Due Dates

Document Library & About NSF

- Document Library
- About NSF
- Careers
- Staff Directory

About Services

- Application Submission
- ACM\$ (Award Cash Management Service)
- Notifications & Requests
- Project Reports
- Proposal Status
- Public Access
- User Management

Feedback



[See all NSF social media](#)

[Text Only Version](#) | [View Mobile Site](#)

[Website Policies](#) | [Budget and Performance](#) | [Inspector General](#) | [Privacy](#) | [FOIA](#) | [No FEAR Act](#) | [USA.gov](#) | [Accessibility](#) | [Plain Language](#) | [Contact](#)
National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA Tel: (703) 292-5111 , FIRS: (800) 877-8339 | TDD: (800) 281-8749