

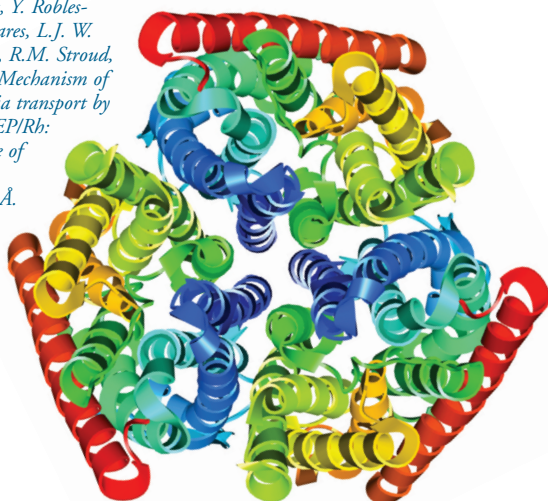
5 EASY STEPS FOR FAST AND ACCURATE DATA DEPOSITION

- 1 Check the sequence
- 2 Check the ligands
- 3 Prepare data for deposition using tools
- 4 Validate the structure
- 5 Deposit the structure with ADIT/ADIT-NMR

RELATED WEBSITES

UniProt	www.uniprot.org
BLAST	www.ncbi.nlm.nih.gov/BLAST
Ligand Expo	ligand-expo.rcsb.org
pdb_extract	pdb-extract.rcsb.org
SF-Tool	pdb-extract.rcsb.org/auto-check/index-ext.html
Validation Suite	deposit.rcsb.org/validate
ADIT	deposit.rcsb.org/adit (RCSB PDB) pdbdep.protein.osaka-u.ac.jp/adit (PDBj)
ADIT-NMR	deposit.bmrb.wisc.edu/bmrb-adit (BMRB) nmradit.protein.osaka-u.ac.jp/bmrb-adit (PDBj)
Software Downloads	sw-tools.rcsb.org pdb_extract , Validation Suite , ADIT , more

1u77: S. Khademi, J. O'Connell III, J. Remis, Y. Robles-Colmenares, L.J. W. Miercke, R.M. Stroud, (2004) Mechanism of ammonia transport by Amt/MEP/Rh: structure of AmtB at 1.35 Å. Science 305: 1587-1594.



DEPOSITING MULTIPLE STRUCTURES

pdb_extract offers an author information form that contains the information that is the same in related entries. This form can be filled out once to prepare multiple related entries solved by X-ray and NMR. For other methods, one representative structure should be deposited. After it has been annotated and processed, this finalized entry can be used as a template for the related depositions.

AFTER DEPOSITION

After the structure is deposited using ADIT, the assigned PDB ID appears in the web browser and is sent to the contact authors. Typically, structures are annotated, returned to the author for review, and finalized within 2 weeks of deposition.

RELEASE INFORMATION

COORDINATE RELEASE:

Entries can be released immediately after processing (REL), held until publication (HPUB), or held up to 1 year after deposition (HOLD). If the citation for a structure is not published within a 1-year period, depositors are given the option to either release or withdraw the deposition. Citation information should be sent to deposit@deposit.rcsb.org

SEQUENCE RELEASE:

Sequences may be released before the structures. These data are available from the unreleased entries search feature at www.pdb.org

CITATION UPDATES:

Citations are sent by depositors, users, selected journals, and by automatic PubMed searches. Depositors are notified when a citation is found for structures on HPUB.



The RCSB PDB is a member of the Worldwide PDB (www.wwpdb.org).

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www.pdb.org • deposit@deposit.rcsb.org

5 Easy Steps for Structure Deposition

The RCSB PDB offers tools that make checking and preparing structures for deposition fast and efficient.

Software tools are available in source and binary form from sw-tools.rcsb.org. More deposition information is available from deposit.rcsb.org.

Questions?
deposit@deposit.rcsb.org



2b12:
T. Murata,
I. Yamato, Y. Kakinuma,
A.G.W. Leslie, J.E.
Walker (2005)
Structure of the
rotor of the Vacuolar-Type
Na-ATPase from
Enterococcus
hirae. Science
308, 654-659.

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University of California, San Diego

5 Easy Steps for Structure Deposition

The RCSB PDB offers a variety of tools, including ADIT/ADIT-NMR, the Validation Server, SF-Tool, pdb_extract, and Ligand Expo, that help researchers validate and deposit data. Questions? Email deposit@deposit.rcsb.org.

1 CHECK THE SEQUENCE

BLAST proteins: www.uniprot.org
BLAST nucleic acids: www.ncbi.nlm.nih.gov/BLAST

The sequence should contain all residues used in the experiment, including expression tags, as well as residues missing due to disorder. Check the sequence of each unique polymer present in the structure (using BLAST¹) to determine the appropriate sequence database references for the proteins or nucleic acids present in the file. Any sequence mismatches with the sequence database should correspond to mutation, variant or expression tags in the submitted sequence.

2 CHECK THE LIGANDS

Ligand Expo: ligand-expo.rcsb.org
Chemical Component Dictionary:
www.wwpdb.org/ccd.html

The wwPDB maintains the Chemical Component Dictionary, which describes all residue and small molecule components found in PDB entries. Ligand Expo can be used to see if any of the chemical components in your structure (ligands, drugs, inhibitors, ions, modified residues, etc.) already exist in this resource.

If the ligand is present, the 3-character code used in your coordinate file should match the dictionary.

If the ligand is not present, you can submit the new component with your structure. During deposition, (a) upload a 2D image file of the component showing the bond order, and (b) include the complete chemical name and any common names in the ADIT editor.

3 PREPARE DATA FOR DEPOSITION USING PDB_EXTRACT AND SF-TOOL

pdb_extract workstation:
sw-tools.rcsb.org/apps/PDB_EXTRACT
pdb_extract web: pdb-extract.rcsb.org
SF-Tool: pdb-extract.rcsb.org/auto-check/index-ext.html

pdb_extract creates a single file containing information about data collection, phasing, density modification, and the final structure refinement using the output and log files produced by NMR and X-ray structure determination applications. It also converts structure factor files into mmCIF format. These two files are then ready for validation and deposition using ADIT/ADIT-NMR.

SF-Tool converts between file formats (mmCIF, MTZ, CNS/CNX, XPLOR, SHELX, TNT, HKL2000, SCALEPACK, D*Trek, SAINT, OTHER) and checks structure factors with the program SFCHECK.³

4 VALIDATE THE STRUCTURE

Validation Server: deposit.rcsb.org/validate



The Validation Server checks the sequence and file format consistency and compares the geometrical and chemical interactions to various standards. It reports errors so they can be corrected before deposition, including incorrectly positioned waters, geometrical errors, sequence/coordinate mismatches, and missing or extra atoms or residues. Reports from PROCHECK², NUCHECK, SFCHECK³, and MolProbity⁴ are made available.

5 DEPOSIT THE STRUCTURE USING ADIT/ADIT-NMR

Workstation: sw-tools.rcsb.org/apps/ADIT
ADIT: deposit.rcsb.org/adit (RCSB PDB)
pdbdep.protein.osaka-u.ac.jp/adit (PDBj)
ADIT-NMR: deposit.bmrb.wisc.edu/bmrb-adit (BMRB)
nmradit.protein.osaka-u.ac.jp/bmrb-adit (PDBj)



ADIT and ADIT-NMR checks, validates, and edits PDB structure data entries. To deposit a structure, upload the relevant coordinate and experimental data files and include mandatory information using the ADIT editor. A session ID number is provided for depositors who wish to continue a deposition session at a later time. A PDB ID is provided once the deposition is complete.

STRUCTURE DEPOSITION CHECKLIST

When depositing, please have these items on hand (mandatory items in red):

- ☐ Contact authors name (including PI), e-mail address, postal address, phone and fax numbers
- ☐ Title for the deposited structure and any relevant keywords
- ☐ Macromolecule names
- ☐ Sequence & chain ID for each macromolecule, including expression tags and residues missing due to disorder
- ☐ Source information: scientific names for source organisms, expression systems, or details about synthetically produced molecules
- ☐ Citation information: author names, title, and journal details, if available
- ☐ Ligand names and chemical diagrams

More detailed checklists specific to X-ray, NMR, and electron microscopy (EM) depositions are available at:

X-ray: deposit.rcsb.org/depoinfo/instruct_xray1.html
NMR: deposit.rcsb.org/depoinfo/instruct_nmr1.html
EM: deposit.rcsb.org/depoinfo/instruct_em1.html

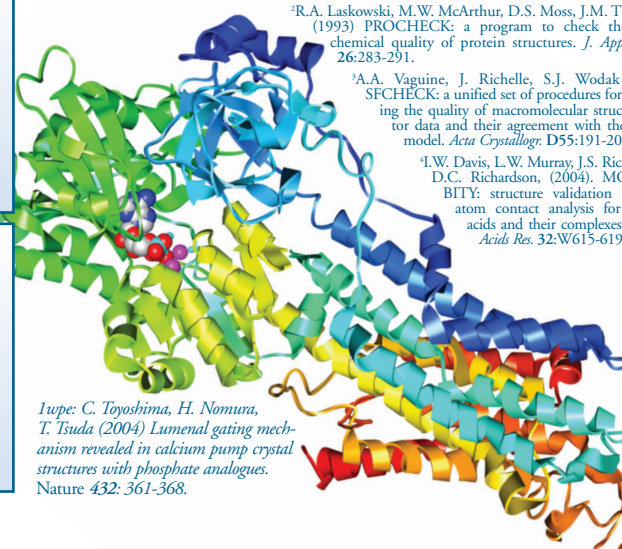
REFERENCES

¹S.F. Altschul, W. Gish, W. Miller, E.W. Myers, & D.J. Lipman (1990) Basic local alignment search tool. *J. Mol. Biol.* 215:403-410.

²R.A. Laskowski, M.W. McArthur, D.S. Moss, J.M. Thornton (1993) PROCHECK: a program to check the stereochemical quality of protein structures. *J. Appl. Cryst.* 26:283-291.

³A.A. Vaguine, J. Richelle, S.J. Wodak (1999) SFCHECK: a unified set of procedures for evaluating the quality of macromolecular structure-factor data and their agreement with the atomic model. *Acta Crystallogr.* D55:191-205.

⁴L.W. Davis, L.W. Murray, J.S. Richardson, D.C. Richardson, (2004). MOLPROBITY: structure validation and all-atom contact analysis for nucleic acids and their complexes. *Nucleic Acids Res.* 32:W615-619.



1upe: C. Toyoshima, H. Nomura, T. Tsuda (2004) Lumenal gating mechanism revealed in calcium pump crystal structures with phosphate analogues. *Nature* 432: 361-368.