# Integrative Structure Validation Report

## November 04, 2026 - 05:25 PM PST

*The following software was used in the production of this report:*

*IHMValidation Version 3.2*
*Python-IHM Version 2.9*
*MolProbity Version 4.5.2*

| | |
|---|---|
| PDB ID | 9AB5 \| pdb_00009ab5 |
| Structure Title | SH1-SH2 Cross-linked Myosin Subfragment-1 (S1) Reconstructed from Replica-derived Geometric Constraints |
| Structure Authors | Kimori, Y.; Baba, N.; Katayama, E. |
| Deposited on | 2026-10-25 |

*This is a PDB-IHM Structure Validation Report.*

*We welcome your comments at helpdesk@pdb-ihm.org*

*A user guide is available at https://pdb-ihm.org/validation_help.html with specific help available everywhere you see the* ? symbol.

*List of references used to build this report is available here.*

# 1. Overview

## 1.1. Summary

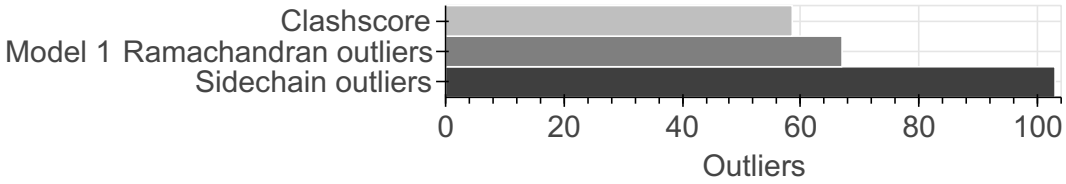
*This entry consists of 1 model(s). A total of 3 dataset(s) were used to build this entry.*

| Name | Type | Count |
|---|---|---|
| 2DEM class average | Experimental data | 1 |
| Other | Experimental data | 1 |
| Experimental model | Starting model | 1 |

## 1.2. Overall quality

*This validation report contains model quality assessments for all structures, data quality and fit to model assessments for SAS and crosslinking-MS datasets. Data quality and fit to model assessments for other datasets and model uncertainty are under development. Number of plots is limited to 256.*

### Model Quality: MolProbity Analysis




# 2. Model Details

## 2.1. Ensemble information

*This entry consists of 0 distinct ensemble(s).*

## 2.2. Representation

*This entry has 1 representation(s).*

| ID | Model(s) | Entity ID | Molecule name | Chain(s) [auth] | Total residues | Rigid segments | Flexible segments | Model coverage/ Starting model coverage (%) | Scale |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | MYOSIN REGULATORY LIGHT CHAIN | A [B] | 156 | - | 1-156 | 100.00 / 100.00 | Atomic |
| | | 2 | MYOSIN ESSENTIAL LIGHT CHAIN | B [C] | 156 | - | 1-156 | 100.00 / 100.00 | Atomic |
| | | 3 | MYOSIN HEAVY CHAIN S-S CROSS-LINKED S1 | C [A] | 835 | - | 1-835 | 100.00 / 100.00 | Atomic |

## 2.3. Datasets used for modeling

*There are 3 unique datasets used to build the models in this entry.*

| ID | Dataset type | Database name | Data access code |
|---|---|---|---|
| 1 | 2DEM class average | Not available | 10.1042/BJ20120412 |
| 2 | Experimental model | PDB | pdb_0000112o |
| 3 | Other | Not available | Not available |

## 2.4. Methodology and software

*This entry is a result of 1 distinct protocol(s).*

| Step number | Protocol ID | Method name | Method type | Method description | Number of computed models | Multi state modeling | Multi scale modeling |
|---|---|---|---|---|---|---|---|
| 1 | 1 | Conformational identification | Similarity retrieval from known crystal-structure templates | Morphologically-processed, class-averaged freeze-replica images of the catalytic domain were compared against simulated template images generated from known myosin crystal structures (1L2O, 1DFL, 1B7T, 1DFK). The pPDM/C-K-cross-linked form (1L2O) gave the best match and was selected as the catalytic-domain configuration. | Not available | False | False |
| 2 | 1 | Atomic model building | Rigid-body repositioning of the catalytic domain and lever arm according to the measured view angles | The catalytic domain and lever arm of 1L2O were separated near the lever-arm root and independently repositioned according to the view angles determined for each module from the averaged replica images, producing a tentative atomic model of the disulfide-cross-linked myosin that satisfies all projected views. | Not available | False | False |
| 3 | 1 | Three-dimensional envelope reconstruction and fitting | Topography-based single-particle reconstruction and model fitting | The global 3-D surface envelope was reconstructed from the replica images by topography-based single-particle analysis, and the atomic model was fitted into the reconstructed shell, with the module view angles fixing the model orientation. | Not available | False | False |

*There are 2 software packages reported in this entry.*

| ID | Software name | Software version | Software classification | Software location |
|---|---|---|---|---|
| 1 | RasMol | Not available | model building | http://www.openrasmol.org/ |
| 2 | UCSF ChimeraX | 1.12 | model building | https://www.rbvi.ucsf.edu/chimerax/ |

# 3. Data quality

## 3.4. 2DEM class average

Validation for this section is under development.

# 4. Model quality

For models with atomic structures, MolProbity analysis is performed. For models with coarse-grained or multi-scale structures, excluded volume analysis is performed.

## 4.1b. MolProbity Analysis

*Excluded volume satisfaction for the models in the entry are listed below. The Analysed column shows the number of particle-partice or particle-atom pairs for which excluded volume was analysed.*

### Standard geometry: bond outliers

*There are 1 bond length outliers in this entry (0.01% of 8395 assessed bonds). A summary is provided below.*

| Chain | Res | Type | Atoms | \|Z\| | Observed (Å) | Ideal (Å) | Model ID (Worst) | Models (Total) |
|---|---|---|---|---|---|---|---|---|
| C | 158 | ASN | CA-CB | 5.55 | 1.42 | 1.53 | 1 | 1 |

### Standard geometry: angle outliers

*There are 50 bond angle outliers in this entry (0.44% of 11339 assessed bonds). A summary is provided below.*

| Chain | Res | Type | Atoms | \|Z\| | Observed (Å) | Ideal (Å) | Model ID (Worst) | Models (Total) |
|---|---|---|---|---|---|---|---|---|
| A | 151 | SER | N-CA-C | 8.25 | 134.11 | 111.00 | 1 | 1 |
| C | 158 | ASN | CA-CB-CG | 7.63 | 104.97 | 112.60 | 1 | 1 |
| C | 407 | THR | N-CA-C | 7.56 | 89.83 | 111.00 | 1 | 1 |
| C | 510 | ILE | C-N-CA | 7.45 | 108.29 | 121.70 | 1 | 1 |
| C | 510 | ILE | C-CA-CB | 7.32 | 96.96 | 111.60 | 1 | 1 |
| C | 407 | THR | C-N-CA | 7.14 | 108.84 | 121.70 | 1 | 1 |
| C | 725 | PRO | N-CA-C | 6.85 | 129.21 | 112.10 | 1 | 1 |
| C | 111 | LEU | N-CA-C | 6.69 | 92.26 | 111.00 | 1 | 1 |
| C | 539 | PHE | C-CA-CB | 6.55 | 97.66 | 110.10 | 1 | 1 |
| A | 97 | ASP | N-CA-C | 6.43 | 92.98 | 111.00 | 1 | 1 |
| C | 503 | GLU | CA-C-N | 6.35 | 103.51 | 116.20 | 1 | 1 |
| C | 503 | GLU | O-C-N | 6.34 | 133.14 | 123.00 | 1 | 1 |
| A | 150 | GLY | N-CA-C | 6.31 | 131.61 | 113.30 | 1 | 1 |
| C | 503 | GLU | C-N-CA | 6.31 | 133.06 | 121.70 | 1 | 1 |
| A | 118 | ASP | N-CA-C | 6.09 | 93.96 | 111.00 | 1 | 1 |
| C | 14 | ALA | N-CA-C | 6.06 | 127.97 | 111.00 | 1 | 1 |
| C | 511 | ASP | CA-C-N | 6.00 | 104.21 | 116.20 | 1 | 1 |
| C | 7 | ASP | N-CA-C | 5.91 | 127.54 | 111.00 | 1 | 1 |
| C | 664 | HIS | N-CA-C | 5.82 | 94.71 | 111.00 | 1 | 1 |
| C | 506 | ALA | N-CA-C | 5.75 | 94.90 | 111.00 | 1 | 1 |
| C | 644 | THR | N-CA-C | 5.74 | 94.92 | 111.00 | 1 | 1 |
| A | 150 | GLY | C-N-CA | 5.35 | 131.34 | 121.70 | 1 | 1 |
| C | 544 | ASP | N-CA-C | 5.26 | 125.74 | 111.00 | 1 | 1 |
| C | 507 | TRP | N-CA-CB | 5.17 | 101.71 | 110.50 | 1 | 1 |
| C | 512 | PHE | N-CA-C | 5.15 | 125.41 | 111.00 | 1 | 1 |

| Chain | Res | Type | Atoms | \|Z\| | Observed (Å) | Ideal (Å) | Model ID (Worst) | Models (Total) |
|---|---|---|---|---|---|---|---|---|
| C | 707 | PHE | CA-CB-CG | 5.09 | 118.89 | 113.80 | 1 | 1 |
| C | 11 | GLN | N-CA-C | 5.01 | 125.04 | 111.00 | 1 | 1 |
| C | 17 | ARG | N-CA-C | 4.98 | 124.94 | 111.00 | 1 | 1 |
| C | 511 | ASP | C-N-CA | 4.96 | 130.63 | 121.70 | 1 | 1 |
| C | 376 | GLY | N-CA-C | 4.94 | 98.99 | 113.30 | 1 | 1 |
| C | 6 | SER | C-N-CA | 4.89 | 112.90 | 121.70 | 1 | 1 |
| C | 276 | GLN | N-CA-C | 4.81 | 97.53 | 111.00 | 1 | 1 |
| C | 158 | ASN | C-CA-CB | 4.80 | 119.23 | 110.10 | 1 | 1 |
| C | 453 | ASN | C-CA-CB | 4.75 | 119.13 | 110.10 | 1 | 1 |
| C | 402 | LYS | C-CA-CB | 4.75 | 101.08 | 110.10 | 1 | 1 |
| B | 21 | TRP | N-CA-C | 4.67 | 124.06 | 111.00 | 1 | 1 |
| C | 750 | PRO | N-CA-C | 4.55 | 123.48 | 112.10 | 1 | 1 |
| C | 502 | LYS | C-N-CA | 4.49 | 129.78 | 121.70 | 1 | 1 |
| C | 509 | PHE | N-CA-C | 4.42 | 98.61 | 111.00 | 1 | 1 |
| C | 506 | ALA | C-N-CA | 4.37 | 113.84 | 121.70 | 1 | 1 |
| C | 646 | SER | N-CA-C | 4.32 | 123.09 | 111.00 | 1 | 1 |
| C | 647 | ALA | N-CA-C | 4.31 | 98.93 | 111.00 | 1 | 1 |
| C | 410 | VAL | N-CA-C | 4.25 | 122.91 | 111.00 | 1 | 1 |
| C | 511 | ASP | CA-C-O | 4.25 | 128.02 | 120.80 | 1 | 1 |
| C | 6 | SER | N-CA-C | 4.19 | 99.26 | 111.00 | 1 | 1 |
| C | 196 | VAL | O-C-N | 4.16 | 129.65 | 123.00 | 1 | 1 |
| A | 16 | GLN | N-CA-C | 4.15 | 99.37 | 111.00 | 1 | 1 |
| C | 736 | LYS | N-CA-C | 4.13 | 122.57 | 111.00 | 1 | 1 |
| C | 12 | TYR | N-CA-C | 4.12 | 99.45 | 111.00 | 1 | 1 |
| C | 757 | THR | N-CA-C | 4.03 | 122.28 | 111.00 | 1 | 1 |

## Too-close contacts

*The following all-atom clashscore is based on a MolProbity analysis. All-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The table below contains clashscores for all atomic models in this entry.*

| Model ID | Clash score | Number of clashes |
|---|---|---|
| 1 | 58.59 | 942 |

*There are 942 clashes. The table below contains the detailed list of all clashes based on a MolProbity analysis. Bad clashes are >= 0.4 Angstrom. The output is limited to 100 rows.*

| Atom 1 | Atom 2 | Clash(Å) | Model ID (Worst) | Models (Total) |
|---|---|---|---|---|
| C:191:MET:SD | C:195:LYS:HE2 | 1.50 | 1 | 1 |

| Atom 1 | Atom 2 | Clash(Å) | Model ID (Worst) | Models (Total) |
|---|---|---|---|---|
| C:191:MET:SD | C:195:LYS:CE | 1.23 | 1 | 1 |
| C:137:ILE:CD1 | C:195:LYS:HD2 | 1.19 | 1 | 1 |
| C:402:LYS:CD | C:409:MET:HE2 | 1.18 | 1 | 1 |
| C:833:VAL:O | C:835:PRO:HD3 | 1.15 | 1 | 1 |
| C:11:GLN:CG | C:12:TYR:H | 1.15 | 1 | 1 |
| C:402:LYS:HG2 | C:403:VAL:N | 1.14 | 1 | 1 |
| C:46:ALA:HA | C:61:VAL:HG23 | 1.13 | 1 | 1 |
| C:15:VAL:HG22 | C:86:GLU:OE2 | 1.10 | 1 | 1 |
| C:112:ILE:HD13 | C:125:PRO:HG3 | 1.09 | 1 | 1 |
| C:137:ILE:CD1 | C:195:LYS:CD | 1.09 | 1 | 1 |
| C:402:LYS:CG | C:403:VAL:N | 1.08 | 1 | 1 |
| C:11:GLN:HG2 | C:12:TYR:H | 1.07 | 1 | 1 |
| C:508:GLU:HA | C:508:GLU:OE1 | 1.06 | 1 | 1 |
| C:137:ILE:HD13 | C:195:LYS:HD2 | 1.05 | 1 | 1 |
| B:73:GLU:HA | B:76:MET:HE2 | 1.03 | 1 | 1 |
| C:507:TRP:CE3 | C:507:TRP:O | 1.03 | 1 | 1 |
| C:402:LYS:HD2 | C:409:MET:CE | 1.03 | 1 | 1 |
| B:17:LEU:HD21 | C:801:LEU:HD12 | 1.02 | 1 | 1 |
| C:529:ILE:HG22 | C:551:LEU:HD22 | 1.01 | 1 | 1 |
| C:11:GLN:HG3 | C:12:TYR:N | 1.01 | 1 | 1 |
| C:576:ALA:CB | C:588:PRO:HB2 | 1.01 | 1 | 1 |
| A:68:ASN:H | A:68:ASN:ND2 | 1.00 | 1 | 1 |
| C:402:LYS:HD2 | C:409:MET:HE2 | 1.00 | 1 | 1 |
| B:6:ASP:HA | B:9:ASP:HB2 | 0.99 | 1 | 1 |
| C:11:GLN:CG | C:12:TYR:N | 0.98 | 1 | 1 |
| A:68:ASN:N | A:68:ASN:HD22 | 0.98 | 1 | 1 |
| C:500:TYR:O | C:505:ILE:O | 0.97 | 1 | 1 |
| C:115:TYR:HE2 | C:145:LYS:HE2 | 0.97 | 1 | 1 |
| A:52:ASP:CG | A:53:ASP:H | 0.96 | 1 | 1 |
| C:95:ASN:O | C:99:VAL:HG23 | 0.96 | 1 | 1 |
| C:373:GLU:HG3 | C:399:LEU:HD22 | 0.95 | 1 | 1 |
| C:185:ASN:H | C:185:ASN:HD22 | 0.95 | 1 | 1 |
| C:466:ILE:HD12 | C:587:VAL:HG22 | 0.95 | 1 | 1 |
| C:623:LYS:HG3 | C:624:ALA:H | 0.94 | 1 | 1 |
| A:145:THR:HA | A:148:ILE:HG22 | 0.94 | 1 | 1 |

| Atom 1 | Atom 2 | Clash(Å) | Model ID (Worst) | Models (Total) |
|---|---|---|---|---|
| C:523:ILE:O | C:530:LEU:HG | 0.94 | 1 | 1 |
| C:800:LYS:O | C:804:GLN:HG3 | 0.94 | 1 | 1 |
| C:46:ALA:CA | C:61:VAL:HG23 | 0.93 | 1 | 1 |
| C:225:VAL:HG23 | C:226:LEU:H | 0.93 | 1 | 1 |
| C:115:TYR:CE1 | C:150:PRO:HA | 0.92 | 1 | 1 |
| C:409:MET:C | C:409:MET:SD | 0.91 | 1 | 1 |
| C:309:TYR:CD2 | C:356:LEU:HB3 | 0.91 | 1 | 1 |
| A:32:ASP:C | A:34:PHE:H | 0.90 | 1 | 1 |
| A:14:GLN:HA | A:14:GLN:HE21 | 0.89 | 1 | 1 |
| B:29:ASP:OD2 | B:58:MET:HG3 | 0.89 | 1 | 1 |
| C:115:TYR:HE1 | C:150:PRO:HA | 0.89 | 1 | 1 |
| C:297:ASN:OD1 | C:304:PRO:HG3 | 0.87 | 1 | 1 |
| C:681:LEU:HD12 | C:682:VAL:H | 0.86 | 1 | 1 |
| C:415:ASN:H | C:418:GLN:HB2 | 0.86 | 1 | 1 |
| C:578:PHE:HE1 | C:580:LEU:HG | 0.86 | 1 | 1 |
| A:73:LEU:H | A:73:LEU:HD12 | 0.85 | 1 | 1 |
| B:42:ILE:HG22 | B:44:PRO:HD3 | 0.85 | 1 | 1 |
| C:137:ILE:HD13 | C:195:LYS:CD | 0.84 | 1 | 1 |
| C:115:TYR:CE2 | C:145:LYS:HE2 | 0.84 | 1 | 1 |
| C:15:VAL:HG23 | C:149:PRO:HB3 | 0.84 | 1 | 1 |
| C:471:SER:OG | C:472:PHE:N | 0.84 | 1 | 1 |
| C:402:LYS:HG3 | C:409:MET:SD | 0.84 | 1 | 1 |
| C:373:GLU:HG3 | C:399:LEU:CD2 | 0.83 | 1 | 1 |
| C:112:ILE:HD11 | C:129:LEU:HD11 | 0.83 | 1 | 1 |
| C:185:ASN:O | C:189:VAL:HG23 | 0.83 | 1 | 1 |
| C:193:LEU:HD21 | C:456:ILE:HD12 | 0.83 | 1 | 1 |
| C:580:LEU:O | C:586:ASN:HA | 0.83 | 1 | 1 |
| C:185:ASN:H | C:185:ASN:ND2 | 0.83 | 1 | 1 |
| A:143:LYS:HA | A:143:LYS:HE2 | 0.82 | 1 | 1 |
| A:135:GLU:O | A:137:GLY:N | 0.82 | 1 | 1 |
| C:285:PHE:HB3 | C:312:ILE:HG21 | 0.82 | 1 | 1 |
| C:407:THR:O | C:408:GLU:C | 0.82 | 1 | 1 |
| C:595:LEU:O | C:599:LYS:HE2 | 0.82 | 1 | 1 |
| A:52:ASP:HB3 | A:55:GLU:HG3 | 0.81 | 1 | 1 |
| C:157:ASP:OD1 | C:192:TYR:OH | 0.81 | 1 | 1 |

| Atom 1 | Atom 2 | Clash(Å) | Model ID (Worst) | Models (Total) |
|---|---|---|---|---|
| C:508:GLU:CA | C:508:GLU:OE1 | 0.80 | 1 | 1 |
| C:137:ILE:CD1 | C:195:LYS:HD3 | 0.80 | 1 | 1 |
| C:578:PHE:CE1 | C:580:LEU:HG | 0.80 | 1 | 1 |
| C:395:LEU:O | C:395:LEU:HD13 | 0.80 | 1 | 1 |
| C:163:MET:HE1 | C:251:PHE:HB2 | 0.80 | 1 | 1 |
| C:112:ILE:HG23 | C:123:VAL:O | 0.80 | 1 | 1 |
| C:112:ILE:HD12 | C:129:LEU:HD12 | 0.80 | 1 | 1 |
| C:86:GLU:HG2 | C:106:ARG:HH12 | 0.79 | 1 | 1 |
| A:32:ASP:O | A:34:PHE:N | 0.79 | 1 | 1 |
| C:529:ILE:HG22 | C:551:LEU:CD2 | 0.79 | 1 | 1 |
| C:402:LYS:CD | C:409:MET:CE | 0.79 | 1 | 1 |
| C:137:ILE:HD11 | C:195:LYS:HD2 | 0.79 | 1 | 1 |
| C:602:ILE:HD11 | C:607:VAL:HG22 | 0.78 | 1 | 1 |
| B:42:ILE:HG22 | B:43:ASN:H | 0.78 | 1 | 1 |
| C:313:ASN:C | C:313:ASN:HD22 | 0.78 | 1 | 1 |
| C:521:ASP:HB3 | C:525:LYS:HD3 | 0.78 | 1 | 1 |
| C:8:PRO:HG2 | C:139:LYS:HE2 | 0.78 | 1 | 1 |
| C:417:ASN:C | C:419:VAL:H | 0.78 | 1 | 1 |
| C:8:PRO:CG | C:139:LYS:HE2 | 0.77 | 1 | 1 |
| C:548:GLN:CB | C:591:ILE:HD13 | 0.77 | 1 | 1 |
| C:361:MET:HE2 | C:380:ALA:HB1 | 0.77 | 1 | 1 |
| C:724:ALA:HB3 | C:742:ILE:HG23 | 0.77 | 1 | 1 |
| C:225:VAL:HG23 | C:226:LEU:N | 0.77 | 1 | 1 |
| C:229:TYR:CD2 | C:284:ILE:HD13 | 0.77 | 1 | 1 |
| C:547:PHE:CE1 | C:551:LEU:HD21 | 0.77 | 1 | 1 |
| A:120:PHE:HB3 | A:125:MET:HG2 | 0.77 | 1 | 1 |
| B:32:LYS:O | B:36:VAL:HG23 | 0.77 | 1 | 1 |
| C:833:VAL:O | C:835:PRO:CD | 0.77 | 1 | 1 |
| C:373:GLU:CG | C:399:LEU:HD22 | 0.76 | 1 | 1 |

## Torsion angles: Protein backbone

*In the following table, Ramachandran outliers are listed. The Analysed column shows the number of residues for which the backbone conformation was analysed.*

| Model ID | Analysed | Favored | Allowed | Outliers |
|---|---|---|---|---|
| 1 | 1048 | 783 | 198 | 67 |

*There are 67 unique backbone outliers. Detailed list of outliers are tabulated below.*

| Chain | Res | Type | Models (Total) |
|---|---|---|---|
| A | 33 | GLY | 1 |
| A | 41 | LYS | 1 |
| A | 45 | GLU | 1 |
| A | 64 | PRO | 1 |
| A | 71 | MET | 1 |
| A | 117 | GLY | 1 |
| A | 122 | LYS | 1 |
| A | 136 | GLY | 1 |
| B | 35 | ASP | 1 |
| B | 53 | GLY | 1 |
| B | 75 | LEU | 1 |
| B | 102 | SER | 1 |
| B | 120 | GLU | 1 |
| C | 8 | PRO | 1 |
| C | 11 | GLN | 1 |
| C | 15 | VAL | 1 |
| C | 30 | GLY | 1 |
| C | 62 | ALA | 1 |
| C | 101 | TYR | 1 |
| C | 102 | ASN | 1 |
| C | 125 | PRO | 1 |
| C | 142 | GLY | 1 |
| C | 145 | LYS | 1 |
| C | 151 | HIS | 1 |
| C | 152 | LEU | 1 |
| C | 158 | ASN | 1 |
| C | 167 | ARG | 1 |
| C | 181 | GLY | 1 |
| C | 182 | LYS | 1 |
| C | 183 | THR | 1 |
| C | 193 | LEU | 1 |
| C | 198 | CYS | 1 |
| C | 219 | ILE | 1 |
| C | 222 | ALA | 1 |
| C | 223 | ASN | 1 |

| Chain | Res | Type | Models (Total) |
|---|---|---|---|
| C | 253 | PRO | 1 |
| C | 283 | HIS | 1 |
| C | 284 | ILE | 1 |
| C | 295 | GLU | 1 |
| C | 304 | PRO | 1 |
| C | 307 | GLY | 1 |
| C | 343 | GLU | 1 |
| C | 345 | LYS | 1 |
| C | 361 | MET | 1 |
| C | 380 | ALA | 1 |
| C | 394 | LEU | 1 |
| C | 395 | LEU | 1 |
| C | 410 | VAL | 1 |
| C | 416 | MET | 1 |
| C | 418 | GLN | 1 |
| C | 462 | ALA | 1 |
| C | 464 | PHE | 1 |
| C | 504 | GLY | 1 |
| C | 508 | GLU | 1 |
| C | 526 | PRO | 1 |
| C | 529 | ILE | 1 |
| C | 544 | ASP | 1 |
| C | 571 | PRO | 1 |
| C | 604 | GLU | 1 |
| C | 607 | VAL | 1 |
| C | 623 | LYS | 1 |
| C | 684 | ALA | 1 |
| C | 735 | GLY | 1 |
| C | 742 | ILE | 1 |
| C | 816 | ARG | 1 |
| C | 818 | TRP | 1 |
| C | 834 | LYS | 1 |

## Torsion angles : Protein sidechains

*In the following table, sidechain rotameric outliers are listed. The Analysed column shows the number of residues for which the sidechain conformation was analysed.*

| Model ID | Analysed | Favored | Allowed | Outliers |
|---|---|---|---|---|
| 1 | 846 | 632 | 111 | 103 |

*There are 103 unique sidechain outliers. Detailed list of outliers are tabulated below. The output is limited to 100 rows.*

| Chain | Res | Type | Models (Total) |
|---|---|---|---|
| A | 14 | GLN | 1 |
| A | 15 | LYS | 1 |
| A | 39 | ASP | 1 |
| A | 49 | ARG | 1 |
| A | 64 | PRO | 1 |
| A | 68 | ASN | 1 |
| A | 78 | ASP | 1 |
| A | 88 | THR | 1 |
| A | 90 | ARG | 1 |
| A | 98 | GLU | 1 |
| A | 101 | THR | 1 |
| A | 120 | PHE | 1 |
| A | 128 | THR | 1 |
| B | 5 | GLN | 1 |
| B | 6 | ASP | 1 |
| B | 9 | ASP | 1 |
| B | 22 | ASP | 1 |
| B | 35 | ASP | 1 |
| B | 52 | VAL | 1 |
| B | 55 | THR | 1 |
| B | 58 | MET | 1 |
| B | 68 | PHE | 1 |
| B | 73 | GLU | 1 |
| B | 82 | THR | 1 |
| B | 91 | LYS | 1 |
| B | 120 | GLU | 1 |
| B | 121 | ASP | 1 |
| B | 124 | GLU | 1 |
| B | 140 | LYS | 1 |
| B | 141 | TYR | 1 |
| C | 11 | GLN | 1 |

| Chain | Res | Type | Models (Total) |
|---|---|---|---|
| C | 59 | LYS | 1 |
| C | 83 | GLU | 1 |
| C | 108 | THR | 1 |
| C | 124 | ASN | 1 |
| C | 126 | TYR | 1 |
| C | 129 | LEU | 1 |
| C | 144 | ARG | 1 |
| C | 145 | LYS | 1 |
| C | 157 | ASP | 1 |
| C | 161 | GLN | 1 |
| C | 166 | ASP | 1 |
| C | 173 | LEU | 1 |
| C | 182 | LYS | 1 |
| C | 185 | ASN | 1 |
| C | 200 | VAL | 1 |
| C | 211 | LYS | 1 |
| C | 215 | LEU | 1 |
| C | 220 | ILE | 1 |
| C | 236 | ARG | 1 |
| C | 263 | GLU | 1 |
| C | 280 | ARG | 1 |
| C | 288 | ILE | 1 |
| C | 313 | ASN | 1 |
| C | 316 | CYS | 1 |
| C | 319 | VAL | 1 |
| C | 326 | GLU | 1 |
| C | 332 | ASP | 1 |
| C | 333 | GLU | 1 |
| C | 341 | THR | 1 |
| C | 343 | GLU | 1 |
| C | 371 | GLN | 1 |
| C | 373 | GLU | 1 |
| C | 389 | ILE | 1 |
| C | 395 | LEU | 1 |
| C | 409 | MET | 1 |

| Chain | Res | Type | Models (Total) |
|---|---|---|---|
| C | 415 | ASN | 1 |
| C | 420 | VAL | 1 |
| C | 438 | LEU | 1 |
| C | 446 | LEU | 1 |
| C | 449 | LYS | 1 |
| C | 471 | SER | 1 |
| C | 495 | LEU | 1 |
| C | 502 | LYS | 1 |
| C | 507 | TRP | 1 |
| C | 508 | GLU | 1 |
| C | 515 | ASP | 1 |
| C | 529 | ILE | 1 |
| C | 530 | LEU | 1 |
| C | 553 | GLN | 1 |
| C | 554 | ASN | 1 |
| C | 561 | MET | 1 |
| C | 563 | THR | 1 |
| C | 578 | PHE | 1 |
| C | 591 | ILE | 1 |
| C | 592 | THR | 1 |
| C | 595 | LEU | 1 |
| C | 598 | ASN | 1 |
| C | 599 | LYS | 1 |
| C | 609 | LEU | 1 |
| C | 642 | PHE | 1 |
| C | 644 | THR | 1 |
| C | 645 | ILE | 1 |
| C | 664 | HIS | 1 |
| C | 694 | ASN | 1 |
| C | 723 | LEU | 1 |
| C | 726 | ASN | 1 |
| C | 772 | GLU | 1 |
| C | 778 | LEU | 1 |
| C | 788 | HIS | 1 |

# 5. Fit to Data Used for Modeling Assessment

## 5.4. 2DEM class average

Validation for this section is under development.

# 6. Fit to Data Used for Validation Assessment

Validation for this section is under development.

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