Integrative Structure Validation Report

November 19, 2025 - 04:33 PM PST

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

IHMValidation Version 3.0
Python-IHM Version 2.7
MolProbity Version 4.5.2
EMDB validation analysis Version 0.0.1.dev127
ChimeraX Version 1.9
Chimera Version 1.19
MapQ Version 1.8.1

PDB ID	9A9X | pdb_00009a9x
Structure Title	Mock fibril structure of CNS-11g
Structure Authors	Lu, J.; Sawaya, M.R.; Ge, P.; Boyer, D.R.; Eisenberg, D.S.
Deposited on	2025-06-09

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

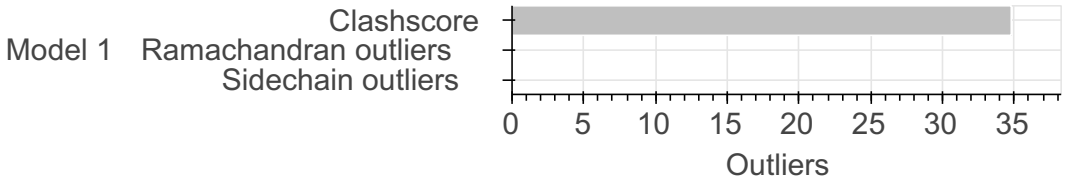
This entry consists of 1 model(s). A total of 1 dataset(s) were used to build this entry.

Name	Type	Count
3DEM volume	Experimental data	1

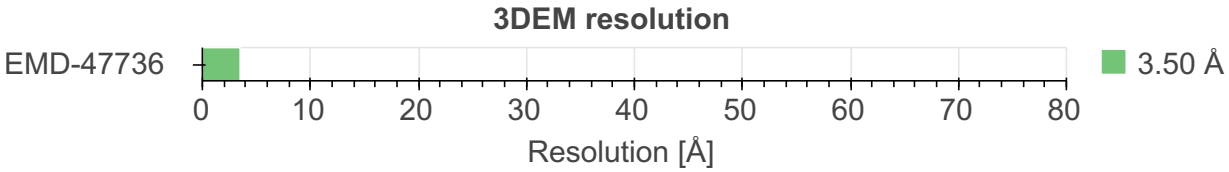
1.2. Overall quality

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.

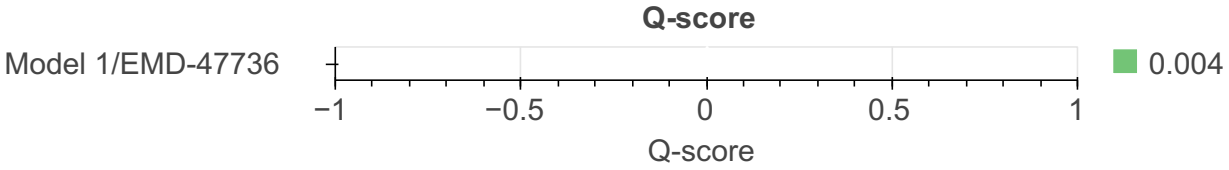
Model Quality: MolProbity Analysis



Data Quality



Fit to Data Used for Modeling



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	CNS-11g	A [B]	Non-polymeric	-	-	Not available / Not available	Atomic

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				B					
				C [B]					
				D [B]					
				E [B]					
				F [B]					
				G [B]					
				H [B]					
				I [B]					
				J [B]					
				K [B]					
				L [B]					
				M [B]					
				N [B]					
				O [B]					
				P [B]					
				Q [B]					
				R [B]					
				S [B]					
				T [B]					
				U [B]					
				V [B]					
				W [B]					
				X [C]					
				Y [C]					
				Z [C]					
				AA [C]					
				AB [A]					
				AC [D]					
				AD [E]					
				BA [C]					
				BB [A]					
				BC [D]					
				BD [E]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				CA [C]					
				CB [A]					
				CC [D]					
				CD [E]					
				DA [C]					
				DB [A]					
				DC [D]					
				DD [E]					
				EA [C]					
				EB [A]					
				EC [D]					
				ED [E]					
				FA [C]					
				FB [A]					
				FC [D]					
				FD [E]					
				GA [C]					
				GB [A]					
				GC [D]					
				GD [E]					
				HA [C]					
				HB [A]					
				HC [D]					
				HD [E]					
				IA [C]					
				IB [A]					
				IC [D]					
				ID [E]					
				JA [C]					
				JB [A]					
				JC [D]					
				JD [E]					
				KA [C]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				KB [A]					
				KC [D]					
				KD [E]					
				LA [C]					
				LB [A]					
				LC [D]					
				MA [C]					
				MB [A]					
				MC [D]					
				NA [C]					
				NB [A]					
				NC [D]					
				OA [C]					
				OB [A]					
				OC [E]					
				PA [C]					
				PB [A]					
				PC [E]					
				QA [C]					
				QB [A]					
				QC [E]					
				RA [C]					
				RB [D]					
				RC [E]					
				SA [C]					
				SB [D]					
				SC [E]					
				TA [C]					
				TB [D]					
				TC [E]					
				UA [A]					
				UB [D]					
				UC [E]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				VA [A]					
				VB [D]					
				VC [E]					
				WA [A]					
				WB [D]					
				WC [E]					
				XA [A]					
				XB [D]					
				XC [E]					
				YA [A]					
				YB [D]					
				YC [E]					
				ZA [A]					
				ZB [D]					
				ZC [E]					

2.3. Datasets used for modeling

There is 1 unique dataset used to build the models in this entry.

ID	Dataset type	Database name	Data access code
1	3DEM volume	EMDB	EMD-47736

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	modeling	Not available	Not available	Not available	False	False

There is 1 software package reported in this entry.

ID	Software name	Software version	Software classification	Software location
1	PHENIX	Not available	refinement	https://phenix-online.org/

3. Data quality

3.3. 3DEM

This section describes quality of the 3DEM datasets

EMD-47736

3.3.1. Experimental information

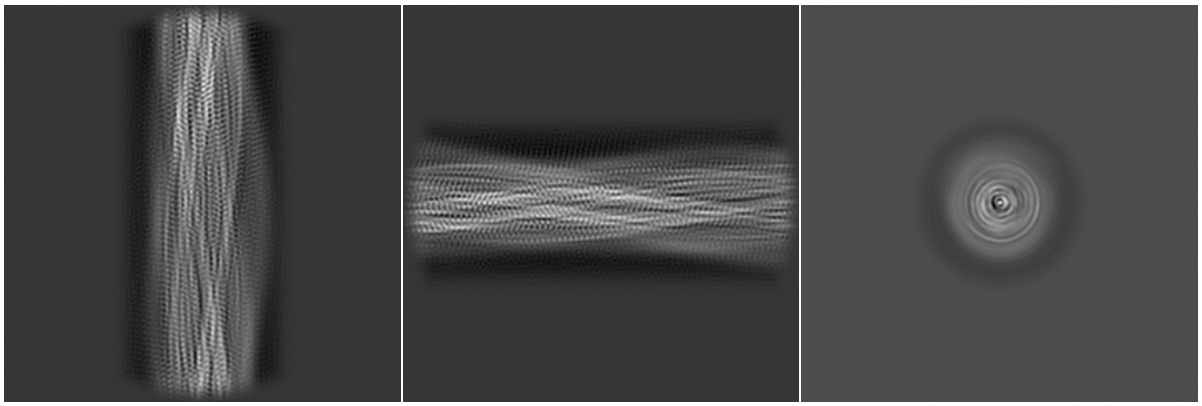
EM reconstruction method:	HELICAL
Resolution:	3.50 Å
Recommended level:	5.003
Estimated volume:	203.14 nm³
Specimen preparation:	Preparation ID 1 Vitrification
Map-only validation report:	wwPDB validation report

3.3.2. Map visualisation

This section contains visualisations of the EMDB entry EMD-47736. These allow visual inspection of the internal detail of the map and identification of artifacts. Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

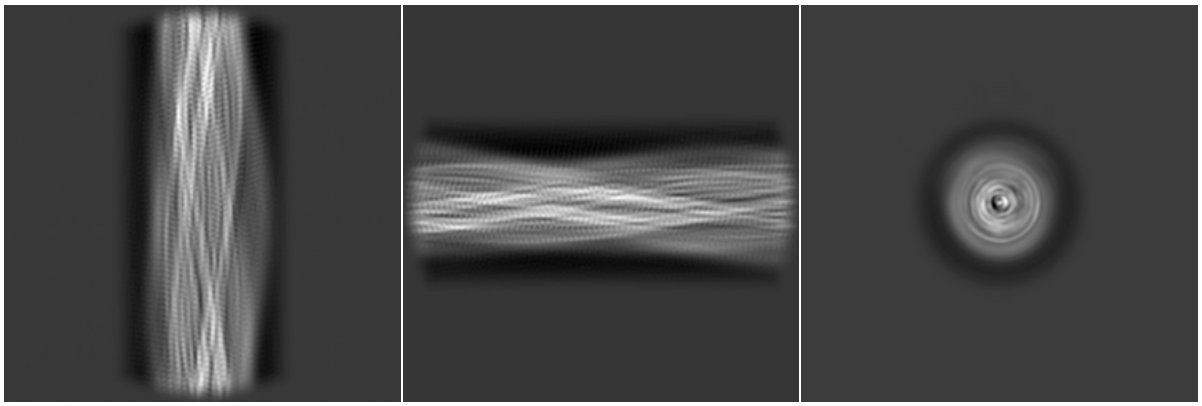
3.3.2.1. Orthogonal projections

Primary map



X **Y** **Z**

Raw map

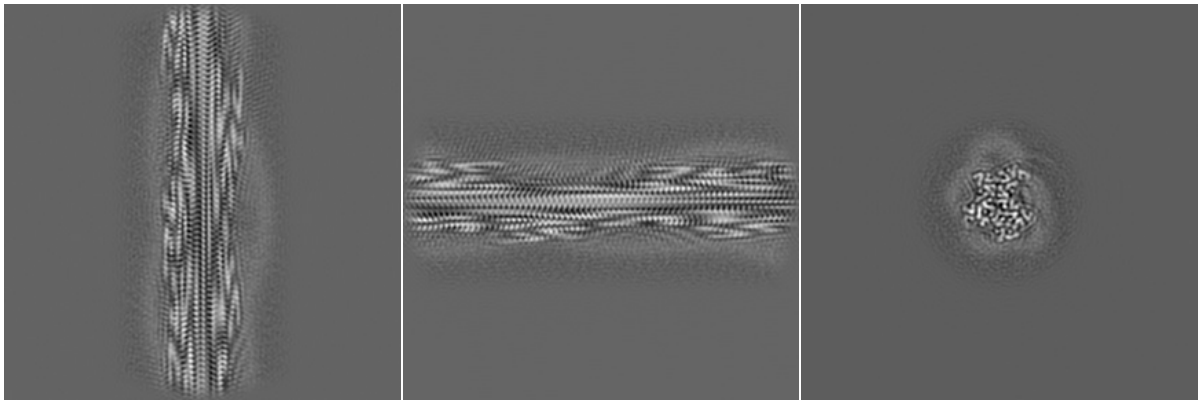


X **Y** **Z**

The images above show the map projected in three orthogonal directions.

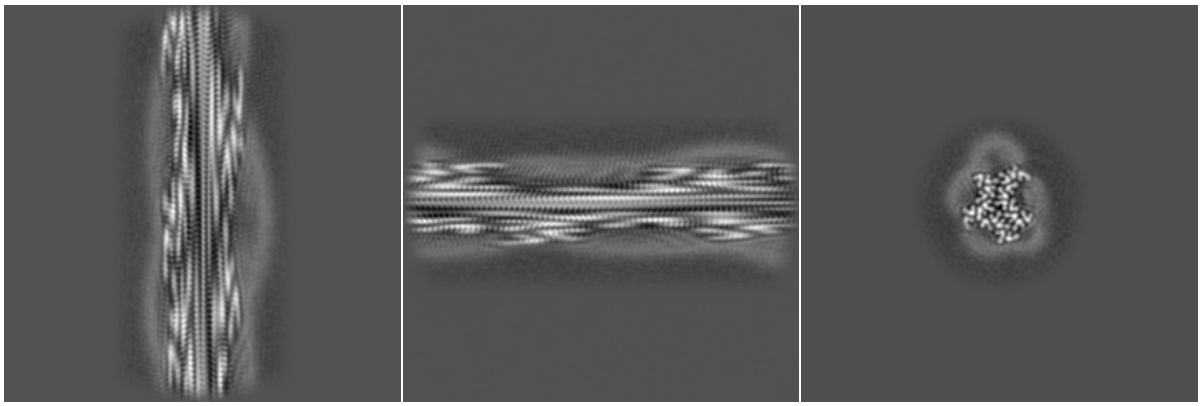
3.3.2.2. Central slices

Primary map



X Index: 144 **Y Index: 144** **Z Index: 144**

Raw map

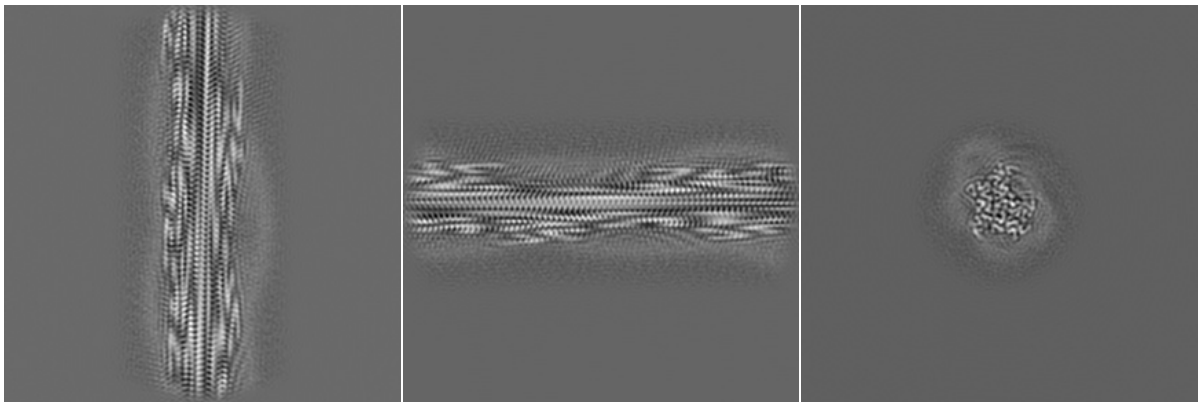


X Index: 144 **Y Index: 144** **Z Index: 144**

The images above show central slices of the map in three orthogonal directions.

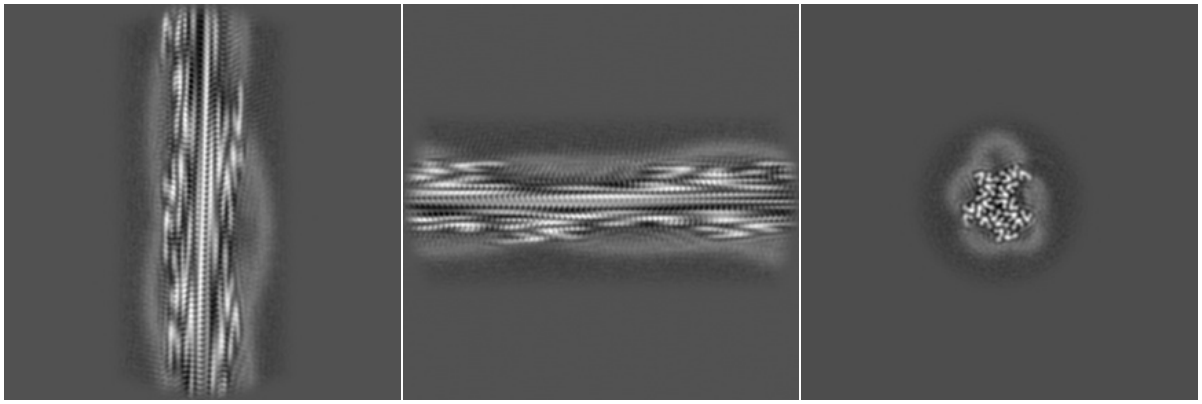
3.3.2.3. Largest variance slices

Primary map



X Index: 146 **Y Index: 144** **Z Index: 187**

Raw map

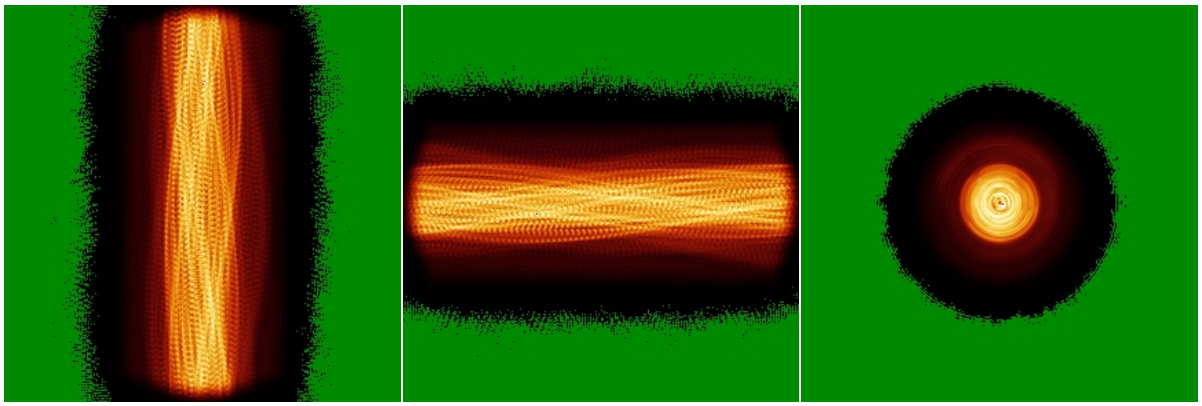


X Index: 147 **Y Index: 144** **Z Index: 140**

The images above show the largest variance slices of the map in three orthogonal directions.

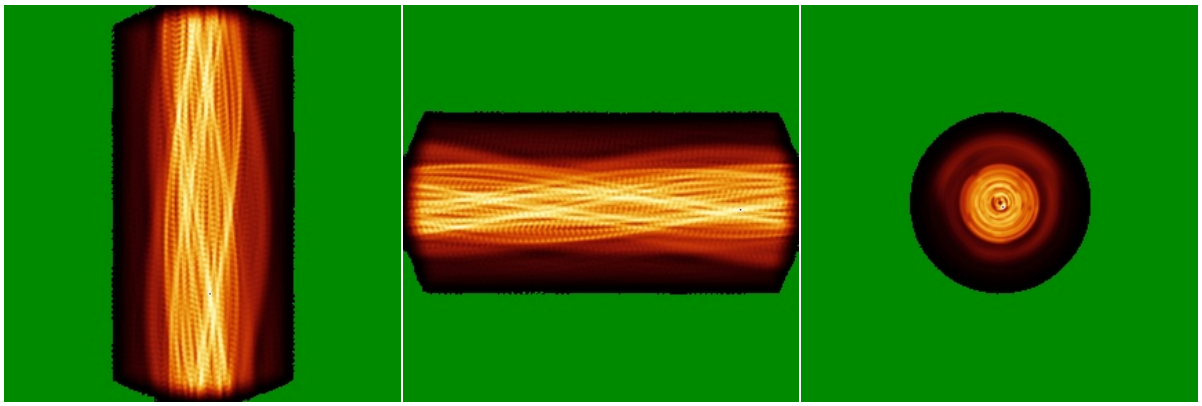
3.3.2.4 Orthogonal standard-deviation projections (false-color) ?

Primary map



X **Y** **Z**

Raw map

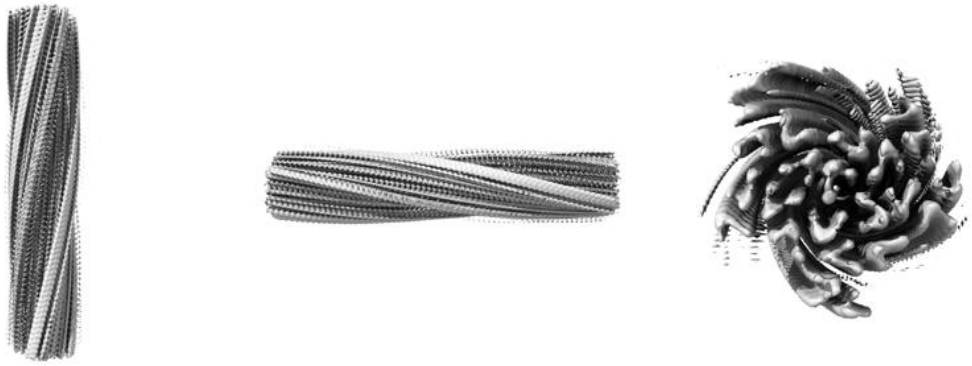


X **Y** **Z**

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

3.3.2.5. Orthogonal surface views

Primary map



X **Y** **Z**

The images above show the 3D surface view of the map at the recommended contour level 5.003 . These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

Raw map

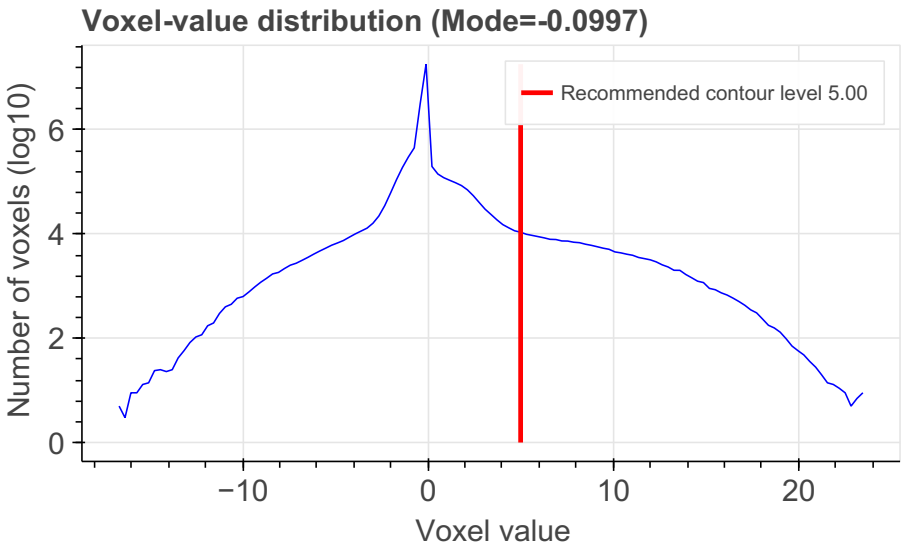
X **Y** **Z**

These images show the 3D surface of the raw map. The raw map's contour level 5.760 was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

3.3.3. Map analysis

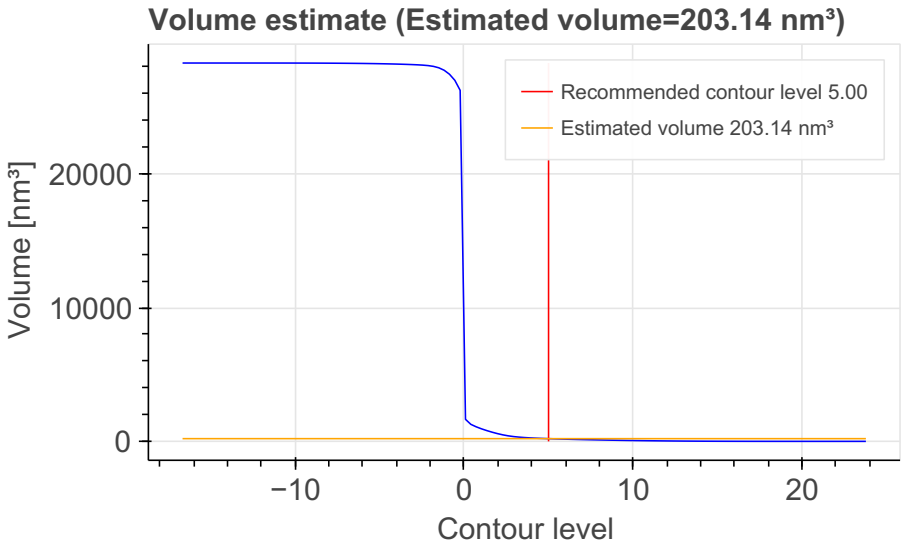
This section contains the results of statistical analysis of the map.

3.3.3.1. Map-value distribution



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

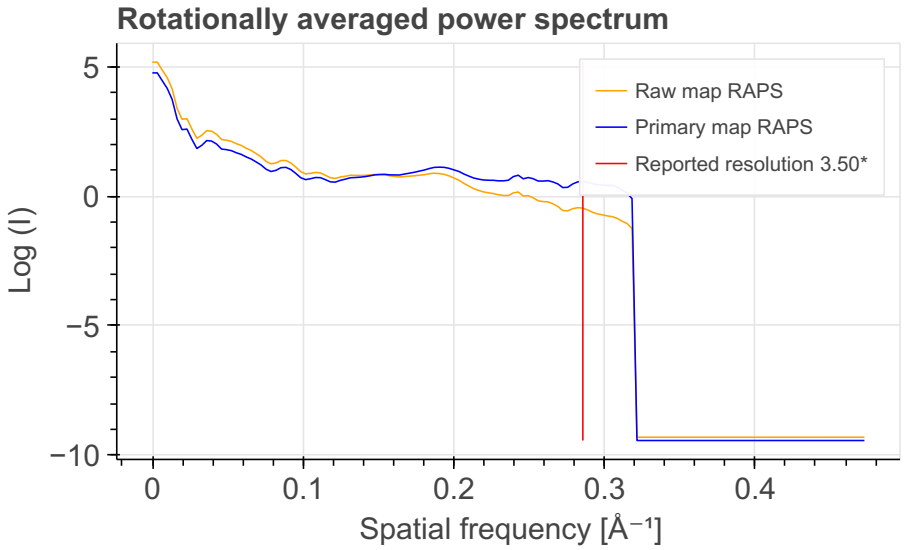
3.3.3.2. Volume estimate ?



The volume at the recommended contour level is 203.14 nm³.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

3.3.3.3. Rotationally averaged power spectrum ?

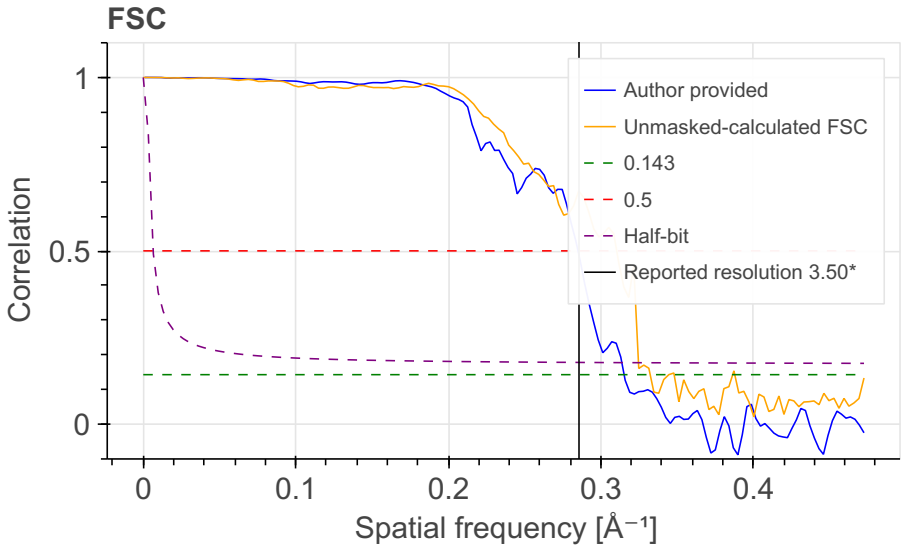


*Reported resolution corresponds to spatial frequency of 0.286 Å^{-1}

3.3.4. Fourier-Shell correlation

3.3.4.1. FSC

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.



*Reported resolution corresponds to spatial frequency of 0.286 Å^{-1}

3.3.4.2. Resolution estimates

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	**0.5**	**Half-bit**
Reported by author	3.50	-	-
Author-provided FSC curve	3.17	3.51	3.19
Unmasked-calculated*	3.01	3.22	3.08

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.01 differs from the reported value 3.50 by more than 10%.

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

Bond length outliers can not be evaluated for this model

Standard geometry: angle outliers

Bond angle outliers can not be evaluated for this model

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	34.78	120

There are 120 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)
D:1:A1B:C3	D:1:A1B:N1	0.79	1	1
RC:1:A1B:C3	RC:1:A1B:N1	0.79	1	1
AA:1:A1B:C3	AA:1:A1B:N1	0.78	1	1
UB:1:A1B:C3	UB:1:A1B:N1	0.78	1	1
YB:1:A1B:C3	YB:1:A1B:N1	0.77	1	1
VC:1:A1B:C3	VC:1:A1B:N1	0.77	1	1
XA:1:A1B:C3	XA:1:A1B:N1	0.76	1	1
BB:1:A1B:C3	BB:1:A1B:N1	0.76	1	1
H:1:A1B:C3	H:1:A1B:N1	0.76	1	1
EA:1:A1B:C3	EA:1:A1B:N1	0.75	1	1
M:1:A1B:C17	M:1:A1B:C24	0.69	1	1
GB:1:A1B:C17	GB:1:A1B:C24	0.69	1	1
AD:1:A1B:C17	AD:1:A1B:C24	0.69	1	1
JA:1:A1B:C17	JA:1:A1B:C24	0.69	1	1
DC:1:A1B:C17	DC:1:A1B:C24	0.69	1	1
I:1:A1B:C3	I:1:A1B:N1	0.62	1	1

Atom 1	Atom 2	Clash(Å)	Model ID (Worst)	Models (Total)
WC:1:A1B:C3	WC:1:A1B:N1	0.62	1	1
FA:1:A1B:C3	FA:1:A1B:N1	0.61	1	1
CB:1:A1B:C3	CB:1:A1B:N1	0.61	1	1
ZB:1:A1B:C3	ZB:1:A1B:N1	0.60	1	1
W:1:A1B:C3	W:1:A1B:N1	0.58	1	1
QB:1:A1B:C3	QB:1:A1B:N1	0.58	1	1
TA:1:A1B:C3	TA:1:A1B:N1	0.58	1	1
KD:1:A1B:C3	KD:1:A1B:N1	0.58	1	1
NC:1:A1B:C3	NC:1:A1B:N1	0.58	1	1
FD:1:A1B:C3	FD:1:A1B:N1	0.52	1	1
R:1:A1B:C3	R:1:A1B:N1	0.52	1	1
IC:1:A1B:C3	IC:1:A1B:N1	0.52	1	1
OA:1:A1B:C3	OA:1:A1B:N1	0.52	1	1
G:1:A1B:C24	G:1:A1B:O2	0.51	1	1
LB:1:A1B:C3	LB:1:A1B:N1	0.51	1	1
UC:1:A1B:C24	UC:1:A1B:O2	0.51	1	1
Y:1:A1B:C24	Y:1:A1B:O2	0.51	1	1
DA:1:A1B:C24	DA:1:A1B:O2	0.51	1	1
XB:1:A1B:C24	XB:1:A1B:O2	0.51	1	1
PC:1:A1B:C24	PC:1:A1B:O2	0.51	1	1
B:1:A1B:C24	B:1:A1B:O2	0.51	1	1
AB:1:A1B:C24	AB:1:A1B:O2	0.51	1	1
VA:1:A1B:C24	VA:1:A1B:O2	0.51	1	1
SB:1:A1B:C24	SB:1:A1B:O2	0.50	1	1
ZA:1:A1B:C24	ZA:1:A1B:O2	0.50	1	1
F:1:A1B:C24	F:1:A1B:O2	0.49	1	1
TC:1:A1B:C24	TC:1:A1B:O2	0.49	1	1
BD:1:A1B:C3	BD:1:A1B:N1	0.49	1	1
N:1:A1B:C3	N:1:A1B:N1	0.49	1	1
EC:1:A1B:C3	EC:1:A1B:N1	0.49	1	1
CA:1:A1B:C24	CA:1:A1B:O2	0.49	1	1
WB:1:A1B:C24	WB:1:A1B:O2	0.49	1	1
KA:1:A1B:C3	KA:1:A1B:N1	0.49	1	1
HB:1:A1B:C3	HB:1:A1B:N1	0.48	1	1
YA:1:A1B:C17	YA:1:A1B:C24	0.48	1	1

Atom 1	Atom 2	Clash(Å)	Model ID (Worst)	Models (Total)
BA:1:A1B:C17	BA:1:A1B:C24	0.48	1	1
VB:1:A1B:C17	VB:1:A1B:C24	0.48	1	1
E:1:A1B:C17	E:1:A1B:C24	0.47	1	1
JA:1:A1B:C24	JA:1:A1B:O2	0.47	1	1
GB:1:A1B:C24	GB:1:A1B:O2	0.47	1	1
SC:1:A1B:C17	SC:1:A1B:C24	0.47	1	1
DC:1:A1B:C24	DC:1:A1B:O2	0.47	1	1
M:1:A1B:C24	M:1:A1B:O2	0.47	1	1
AD:1:A1B:C24	AD:1:A1B:O2	0.47	1	1
RB:1:A1B:C24	RB:1:A1B:O2	0.47	1	1
OC:1:A1B:C24	OC:1:A1B:O2	0.46	1	1
O:1:A1B:C17	O:1:A1B:C24	0.46	1	1
LA:1:A1B:C17	LA:1:A1B:C24	0.46	1	1
IB:1:A1B:C17	IB:1:A1B:C24	0.46	1	1
FC:1:A1B:C17	FC:1:A1B:C24	0.46	1	1
CD:1:A1B:C17	CD:1:A1B:C24	0.46	1	1
UA:1:A1B:C24	UA:1:A1B:O2	0.46	1	1
A:1:A1B:C24	A:1:A1B:O2	0.46	1	1
X:1:A1B:C24	X:1:A1B:O2	0.46	1	1
SC:1:A1B:C24	SC:1:A1B:O2	0.45	1	1
VB:1:A1B:C24	VB:1:A1B:O2	0.45	1	1
E:1:A1B:C24	E:1:A1B:O2	0.45	1	1
L:1:A1B:C24	L:1:A1B:O2	0.45	1	1
CC:1:A1B:C24	CC:1:A1B:O2	0.45	1	1
ZC:1:A1B:C24	ZC:1:A1B:O2	0.45	1	1
LB:1:A1B:C17	LB:1:A1B:C24	0.45	1	1
IA:1:A1B:C24	IA:1:A1B:O2	0.45	1	1
FB:1:A1B:C24	FB:1:A1B:O2	0.45	1	1
IC:1:A1B:C17	IC:1:A1B:C24	0.45	1	1
OA:1:A1B:C17	OA:1:A1B:C24	0.45	1	1
YA:1:A1B:C24	YA:1:A1B:O2	0.45	1	1
BA:1:A1B:C24	BA:1:A1B:O2	0.45	1	1
FD:1:A1B:C17	FD:1:A1B:C24	0.44	1	1
O:1:A1B:C24	O:1:A1B:O2	0.44	1	1
LA:1:A1B:C24	LA:1:A1B:O2	0.44	1	1

Atom 1	Atom 2	Clash(Å)	Model ID (Worst)	Models (Total)
R:1:A1B:C17	R:1:A1B:C24	0.44	1	1
CD:1:A1B:C24	CD:1:A1B:O2	0.44	1	1
MB:1:A1B:C24	MB:1:A1B:O2	0.43	1	1
IB:1:A1B:C24	IB:1:A1B:O2	0.43	1	1
JC:1:A1B:C24	JC:1:A1B:O2	0.43	1	1
NC:1:A1B:C17	NC:1:A1B:C24	0.43	1	1
GD:1:A1B:C24	GD:1:A1B:O2	0.43	1	1
TA:1:A1B:C17	TA:1:A1B:C24	0.43	1	1
TA:1:A1B:C24	TA:1:A1B:O2	0.43	1	1
WA:1:A1B:C17	WA:1:A1B:C25	0.43	1	1
KD:1:A1B:C17	KD:1:A1B:C24	0.43	1	1
S:1:A1B:C24	S:1:A1B:O2	0.43	1	1
W:1:A1B:C24	W:1:A1B:O2	0.43	1	1
Z:1:A1B:C17	Z:1:A1B:C25	0.43	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	0	0	0	0

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	0	0	0	0

5. Fit to Data Used for Modeling Assessment

5.3. 3DEM

This section describes fit of models to the 3DEM data. Only results for the representative model, selected as a first model with the largest number of asymmetric units.

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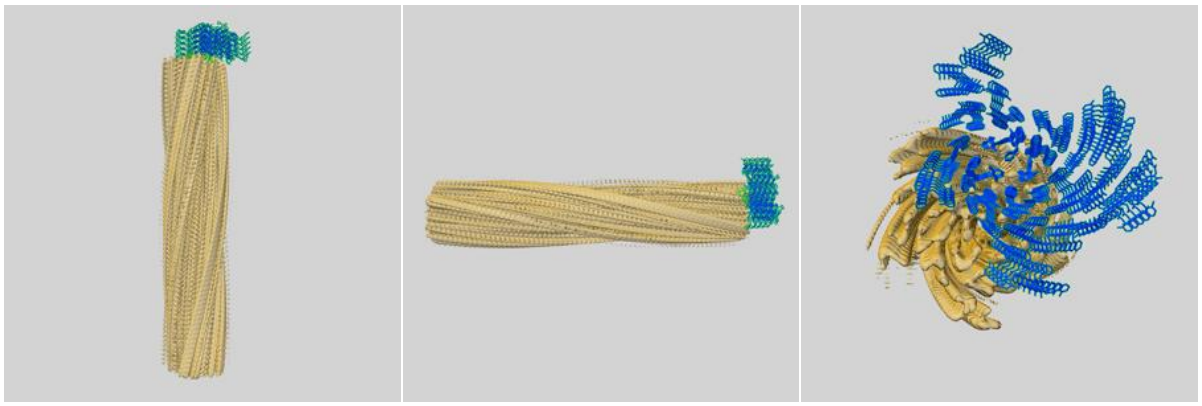
5.3.1. Map-model fit

Only results for the representative Model 1 are shown.

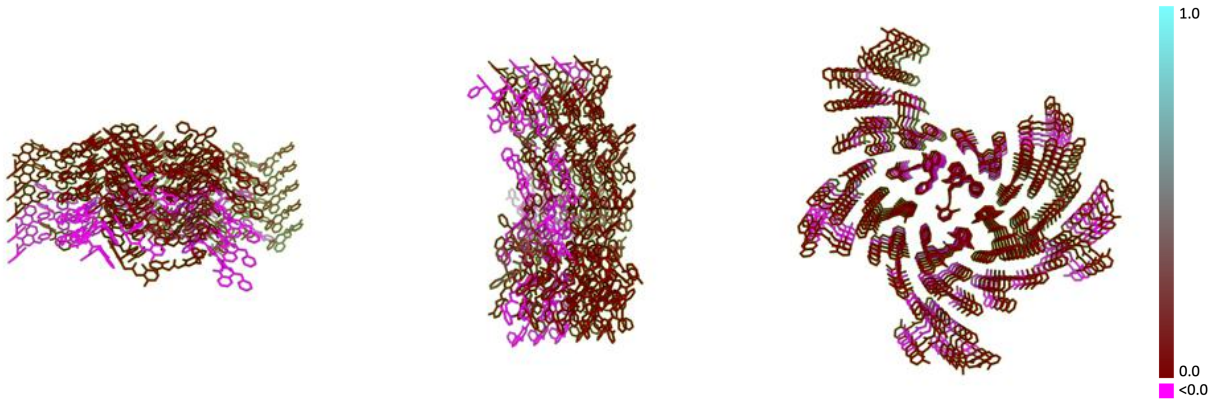
5.3.1.1 Map-model overlay



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 5.003 at 50% transparency in yellow overlaid with a ribbon representation of the model colored in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

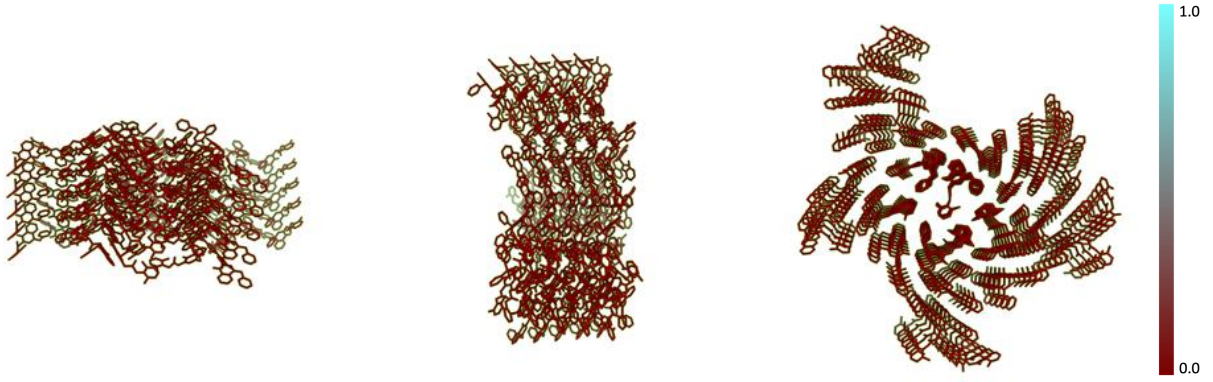
5.3.1.2. Q-score mapped to coordinate model



X Y Z

The images above show the model with each residue colored according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

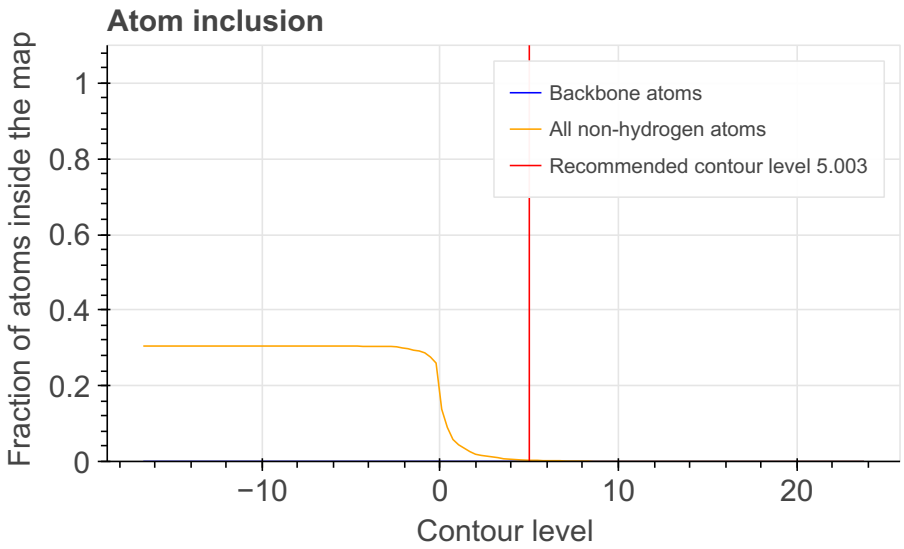
5.3.1.3. Atom inclusion mapped to coordinate model



X Y Z

The images above show the model with each residue colored according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level 5.003 .

5.3.1.4. Atom inclusion



At the recommended contour level, 0% of all backbone atoms, 0% of all non-hydrogen atoms, are inside the map.

5.3.1.5. Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (5.003) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.003	0.004
A	0.000	0.000
B	0.000	0.000
C	0.000	0.000
D	0.000	0.000
E	0.000	0.000
F	0.000	0.000
G	0.000	0.000
H	0.000	0.000
I	0.000	0.000
J	0.000	0.000
K	0.000	0.000
L	0.000	0.000
M	0.000	0.000
N	0.000	0.000
O	0.000	0.000
P	0.000	0.000
Q	0.000	0.000
R	0.000	0.000
S	0.000	0.000
T	0.000	0.000

Chain	Atom inclusion	Q-score
U	0.000	0.000
V	0.000	0.000
W	0.000	0.000
X	0.000	0.000
Y	0.000	0.000
Z	0.000	0.000
AA	0.000	0.000
BA	0.000	-0.002
CA	0.000	0.000
DA	0.000	0.000
EA	0.000	0.000
FA	0.000	0.000
GA	0.000	0.000
HA	0.000	0.000
IA	0.000	0.000
JA	0.000	0.000
KA	0.000	0.000
LA	0.000	0.000
MA	0.000	0.042
NA	0.000	0.000
OA	0.000	0.000
PA	0.000	0.000
QA	0.000	0.000
RA	0.000	0.000
SA	0.000	0.000
TA	0.000	0.000
UA	0.000	0.000
VA	0.000	0.044
WA	0.000	0.000
XA	0.000	0.015
YA	0.000	0.019
ZA	0.000	-0.006
AB	0.000	-0.021
BB	0.000	0.000
CB	0.000	-0.030

Chain	Atom inclusion	Q-score
DB	0.000	-0.051
EB	0.000	0.000
FB	0.000	-0.008
GB	0.000	0.000
HB	0.000	0.000
IB	0.000	0.028
JB	0.000	-0.087
KB	0.000	0.103
LB	0.000	0.000
MB	0.000	-0.005
NB	0.000	0.000
OB	0.000	0.000
PB	0.000	0.018
QB	0.000	0.000
RB	0.000	-0.006
SB	0.000	-0.040
TB	0.000	0.001
UB	0.000	0.103
VB	0.000	-0.010
WB	0.000	0.035
XB	0.000	0.193
YB	0.000	-0.029
ZB	0.000	-0.078
AC	0.000	0.031
BC	0.000	-0.027
CC	0.000	-0.058
DC	0.000	-0.005
EC	0.000	-0.107
FC	0.000	-0.031
GC	0.000	-0.046
HC	0.000	0.022
IC	0.000	0.060
JC	0.000	-0.070
KC	0.000	-0.019
LC	0.000	0.015

Chain	Atom inclusion	Q-score
MC	0.000	0.028
NC	0.000	0.029
OC	0.000	-0.014
PC	0.000	-0.129
QC	0.000	0.013
RC	0.000	0.054
SC	0.000	0.073
TC	0.000	-0.198
UC	0.000	0.142
VC	0.000	0.049
WC	0.000	-0.176
XC	0.000	0.115
YC	0.000	0.007
ZC	0.167	0.039
AD	0.000	0.000
BD	0.100	-0.115
CD	0.033	-0.051
DD	0.000	-0.031
ED	0.000	0.032
FD	0.000	0.192
GD	0.033	-0.020
HD	0.000	0.217
ID	0.000	0.024
JD	0.000	0.242
KD	0.000	-0.031

6. Fit to Data Used for Validation Assessment

Validation for this section is under development.

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