Full wwPDB EM Validation Report

Aug 15, 2026 – 01:25 PM EDT

PDB ID	:	13DE / pdb_000013de
EMDB ID	:	EMD-76990
Title	:	Cryo-EM structure of ATR-ATRIP-ETAA1 AAD (S95D/S111D)
Authors	:	Li, B.; Pavletich, N.P.
Deposited on	:	2026-04-30
Resolution	:	2.90 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references ⓘ) were used in the production of this report:

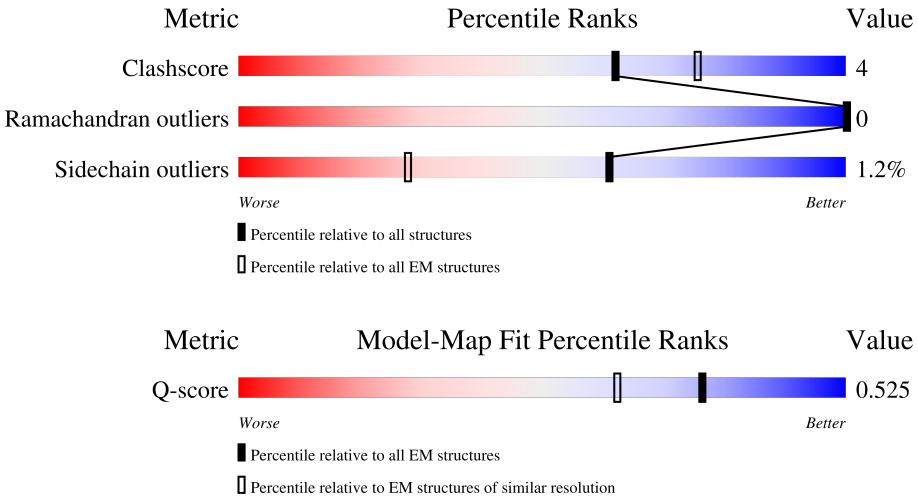
EMDB validation analysis	:	0.0.1.dev133
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.50

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 2.90 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	13054 (2.40 - 3.40)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	2663	84% 10% 5%
1	B	2663	10% 84% 11% 5%
2	C	810	43% 5% 52%
2	D	810	43% 5% 52%

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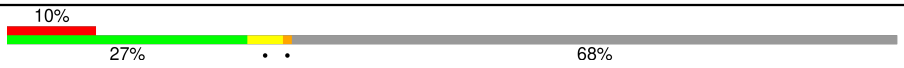
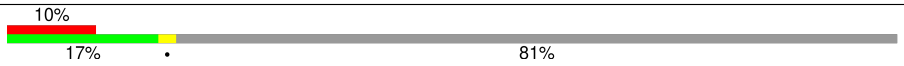
Mol	Chain	Length	Quality of chain
3	E	205	
3	F	205	

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 47273 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Serine/threonine-protein kinase ATR.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	2519	Total 20191	C 12951	N 3423	O 3676	S 141	0	0
1	B	2519	Total 20191	C 12951	N 3423	O 3676	S 141	0	0

There are 38 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-18	MET	-	initiating methionine	UNP Q13535
A	-17	ASP	-	expression tag	UNP Q13535
A	-16	TYR	-	expression tag	UNP Q13535
A	-15	LYS	-	expression tag	UNP Q13535
A	-14	ASP	-	expression tag	UNP Q13535
A	-13	ASP	-	expression tag	UNP Q13535
A	-12	ASP	-	expression tag	UNP Q13535
A	-11	ASP	-	expression tag	UNP Q13535
A	-10	LYS	-	expression tag	UNP Q13535
A	-9	GLU	-	expression tag	UNP Q13535
A	-8	ASN	-	expression tag	UNP Q13535
A	-7	LEU	-	expression tag	UNP Q13535
A	-6	TYR	-	expression tag	UNP Q13535
A	-5	PHE	-	expression tag	UNP Q13535
A	-4	GLN	-	expression tag	UNP Q13535
A	-3	GLY	-	expression tag	UNP Q13535
A	-2	GLY	-	expression tag	UNP Q13535
A	-1	GLY	-	expression tag	UNP Q13535
A	0	ARG	-	expression tag	UNP Q13535
B	-18	MET	-	initiating methionine	UNP Q13535
B	-17	ASP	-	expression tag	UNP Q13535
B	-16	TYR	-	expression tag	UNP Q13535
B	-15	LYS	-	expression tag	UNP Q13535
B	-14	ASP	-	expression tag	UNP Q13535
B	-13	ASP	-	expression tag	UNP Q13535
B	-12	ASP	-	expression tag	UNP Q13535

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-11	ASP	-	expression tag	UNP Q13535
B	-10	LYS	-	expression tag	UNP Q13535
B	-9	GLU	-	expression tag	UNP Q13535
B	-8	ASN	-	expression tag	UNP Q13535
B	-7	LEU	-	expression tag	UNP Q13535
B	-6	TYR	-	expression tag	UNP Q13535
B	-5	PHE	-	expression tag	UNP Q13535
B	-4	GLN	-	expression tag	UNP Q13535
B	-3	GLY	-	expression tag	UNP Q13535
B	-2	GLY	-	expression tag	UNP Q13535
B	-1	GLY	-	expression tag	UNP Q13535
B	0	ARG	-	expression tag	UNP Q13535

- Molecule 2 is a protein called ATR-interacting protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	389	Total	C	N	O	S	0	0
			2976	1891	523	537	25		
2	D	389	Total	C	N	O	S	0	0
			2976	1891	523	537	25		

There are 38 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-18	MET	-	initiating methionine	UNP Q8WXE1
C	-17	ASP	-	expression tag	UNP Q8WXE1
C	-16	TYR	-	expression tag	UNP Q8WXE1
C	-15	LYS	-	expression tag	UNP Q8WXE1
C	-14	ASP	-	expression tag	UNP Q8WXE1
C	-13	ASP	-	expression tag	UNP Q8WXE1
C	-12	ASP	-	expression tag	UNP Q8WXE1
C	-11	ASP	-	expression tag	UNP Q8WXE1
C	-10	LYS	-	expression tag	UNP Q8WXE1
C	-9	GLU	-	expression tag	UNP Q8WXE1
C	-8	ASN	-	expression tag	UNP Q8WXE1
C	-7	LEU	-	expression tag	UNP Q8WXE1
C	-6	TYR	-	expression tag	UNP Q8WXE1
C	-5	PHE	-	expression tag	UNP Q8WXE1
C	-4	GLN	-	expression tag	UNP Q8WXE1
C	-3	GLY	-	expression tag	UNP Q8WXE1
C	-2	GLY	-	expression tag	UNP Q8WXE1
C	-1	GLY	-	expression tag	UNP Q8WXE1

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Chain	Residue	Modelled	Actual	Comment	Reference
C	0	ARG	-	expression tag	UNP Q8WXE1
D	-18	MET	-	initiating methionine	UNP Q8WXE1
D	-17	ASP	-	expression tag	UNP Q8WXE1
D	-16	TYR	-	expression tag	UNP Q8WXE1
D	-15	LYS	-	expression tag	UNP Q8WXE1
D	-14	ASP	-	expression tag	UNP Q8WXE1
D	-13	ASP	-	expression tag	UNP Q8WXE1
D	-12	ASP	-	expression tag	UNP Q8WXE1
D	-11	ASP	-	expression tag	UNP Q8WXE1
D	-10	LYS	-	expression tag	UNP Q8WXE1
D	-9	GLU	-	expression tag	UNP Q8WXE1
D	-8	ASN	-	expression tag	UNP Q8WXE1
D	-7	LEU	-	expression tag	UNP Q8WXE1
D	-6	TYR	-	expression tag	UNP Q8WXE1
D	-5	PHE	-	expression tag	UNP Q8WXE1
D	-4	GLN	-	expression tag	UNP Q8WXE1
D	-3	GLY	-	expression tag	UNP Q8WXE1
D	-2	GLY	-	expression tag	UNP Q8WXE1
D	-1	GLY	-	expression tag	UNP Q8WXE1
D	0	ARG	-	expression tag	UNP Q8WXE1

- Molecule 3 is a protein called Ewing's tumor-associated antigen 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	F	39	Total	C	N	O	S	0	0
			321	197	54	68	2		
3	E	66	Total	C	N	O	S	0	0
			548	340	90	114	4		

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	46	GLY	-	expression tag	UNP Q9NY74
F	47	SER	-	expression tag	UNP Q9NY74
F	48	GLY	-	expression tag	UNP Q9NY74
F	95	ASP	SER	engineered mutation	UNP Q9NY74
F	111	ASP	SER	engineered mutation	UNP Q9NY74
E	46	GLY	-	expression tag	UNP Q9NY74
E	47	SER	-	expression tag	UNP Q9NY74
E	48	GLY	-	expression tag	UNP Q9NY74
E	95	ASP	SER	engineered mutation	UNP Q9NY74
E	111	ASP	SER	engineered mutation	UNP Q9NY74

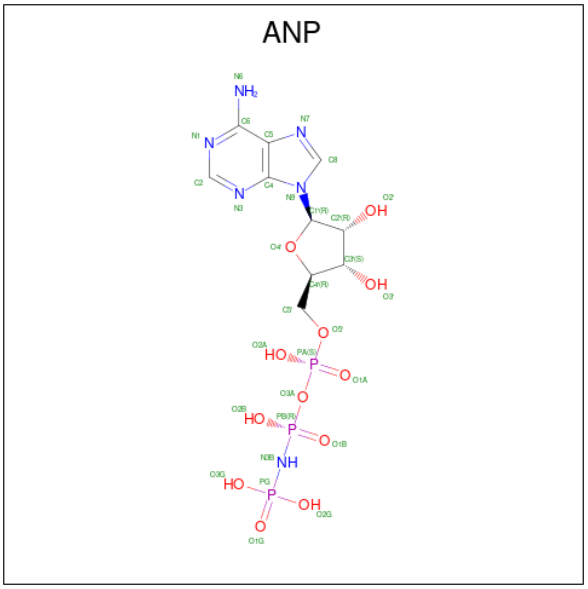
- Molecule 4 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	AltConf
4	A	1	Total Zn 1 1	0
4	C	1	Total Zn 1 1	0
4	B	1	Total Zn 1 1	0
4	D	1	Total Zn 1 1	0

- Molecule 5 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	AltConf
5	A	2	Total Mg 2 2	0
5	B	2	Total Mg 2 2	0

- Molecule 6 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (CCD ID: ANP) (formula: $C_{10}H_{17}N_6O_{12}P_3$).



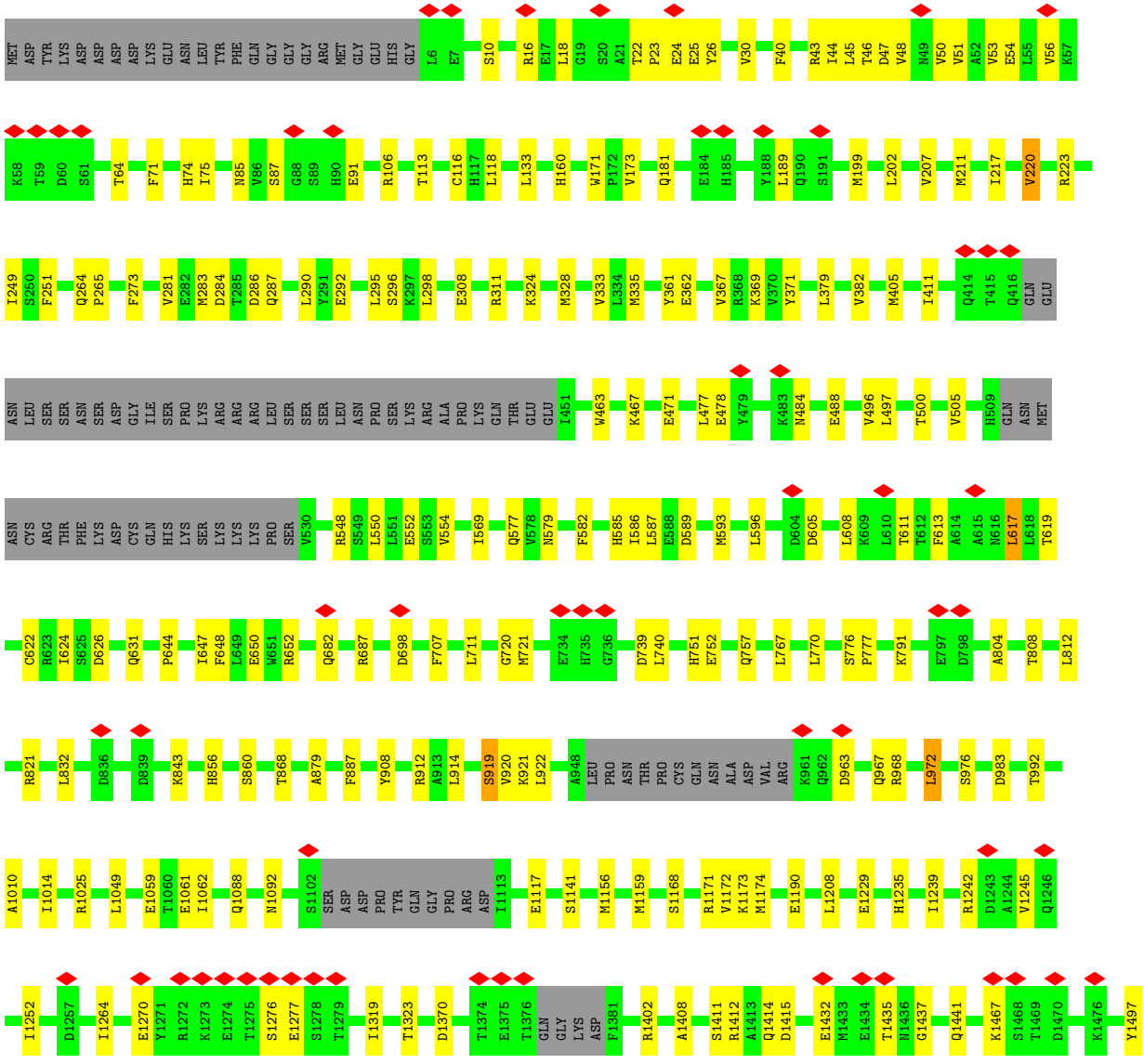
Mol	Chain	Residues	Atoms	AltConf
6	A	1	Total C N O P 31 10 6 12 3	0
6	B	1	Total C N O P 31 10 6 12 3	0

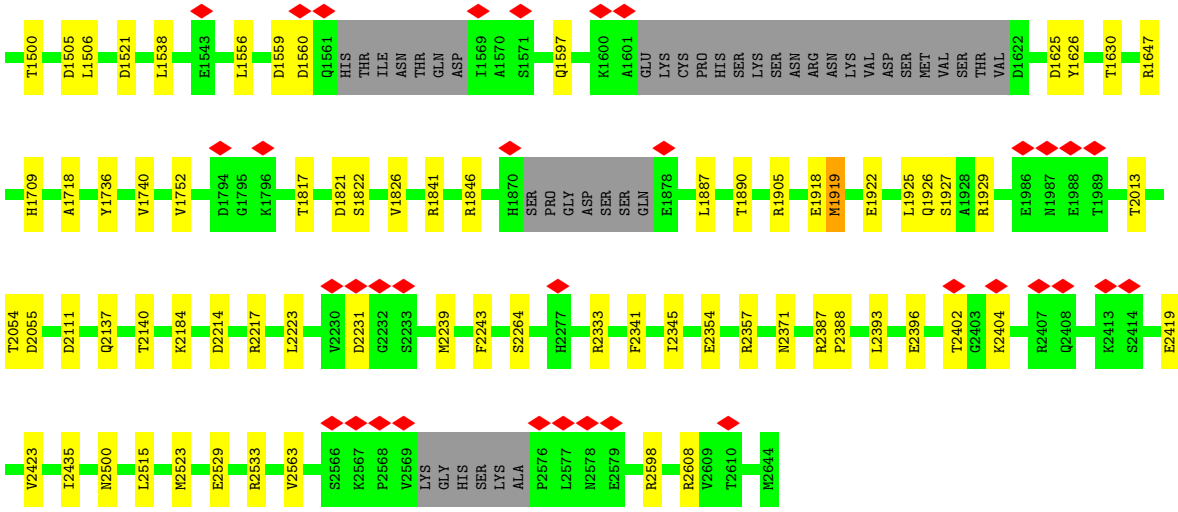
3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Serine/threonine-protein kinase ATR

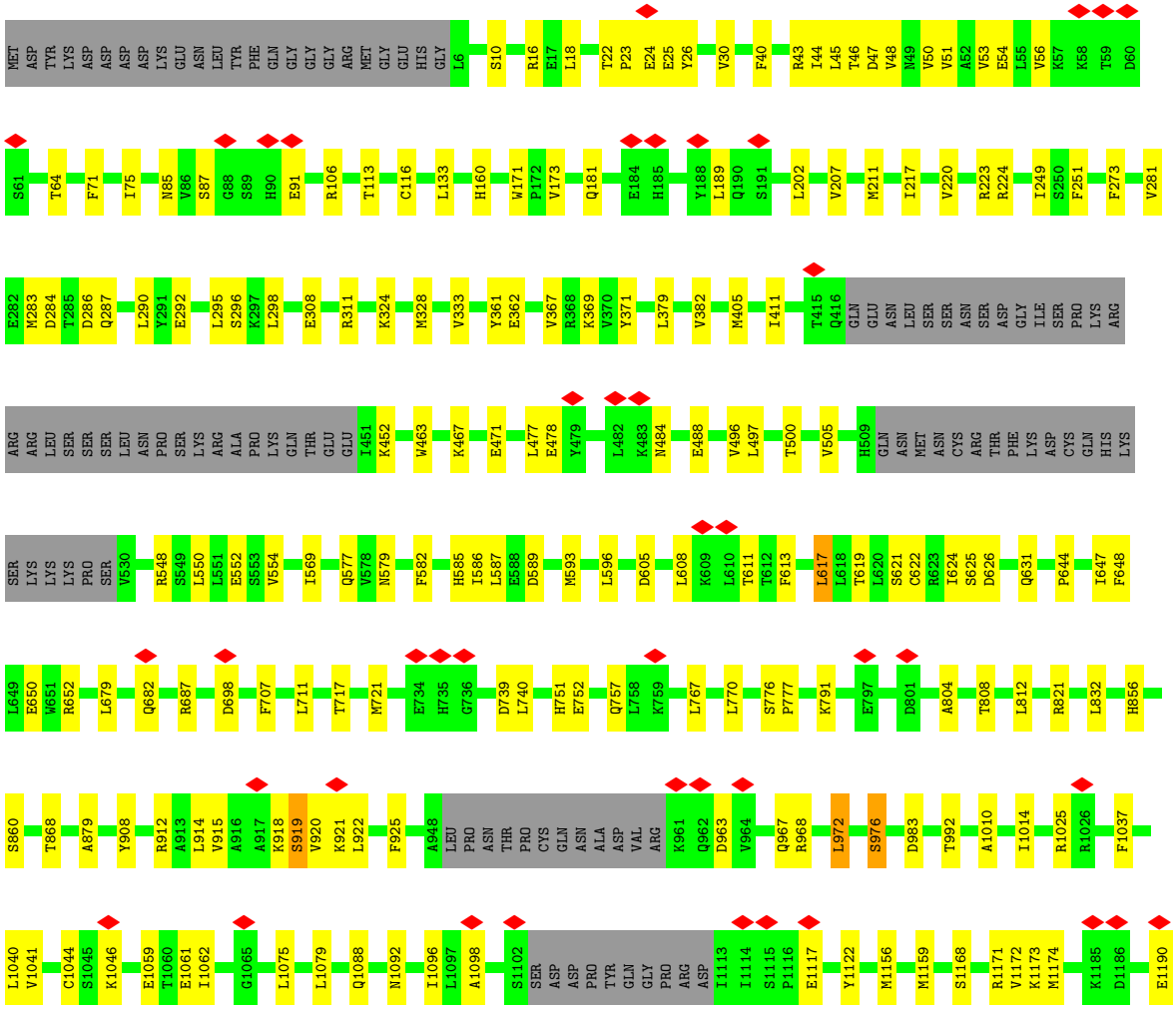
Chain A:

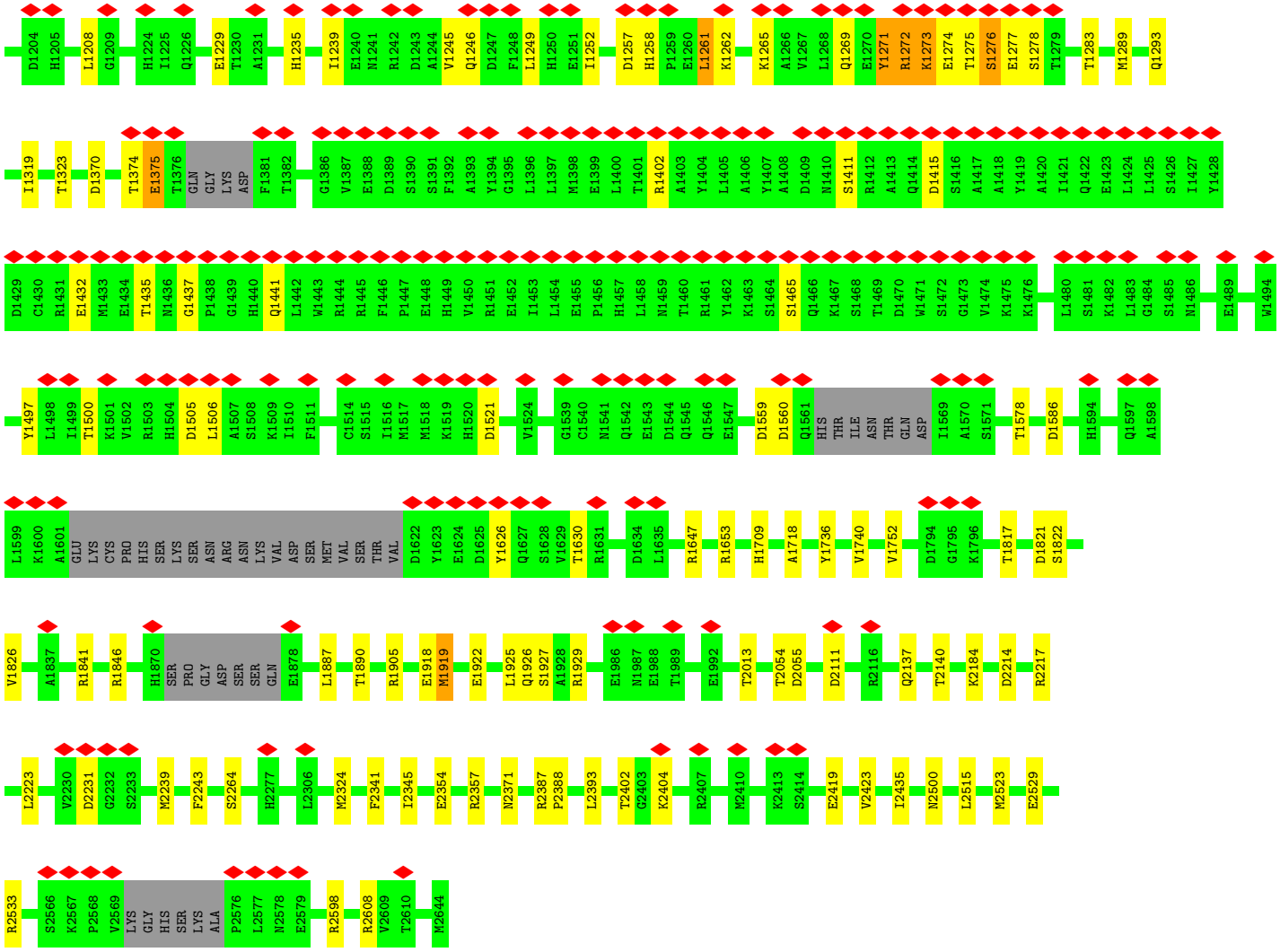




• Molecule 1: Serine/threonine-protein kinase ATR

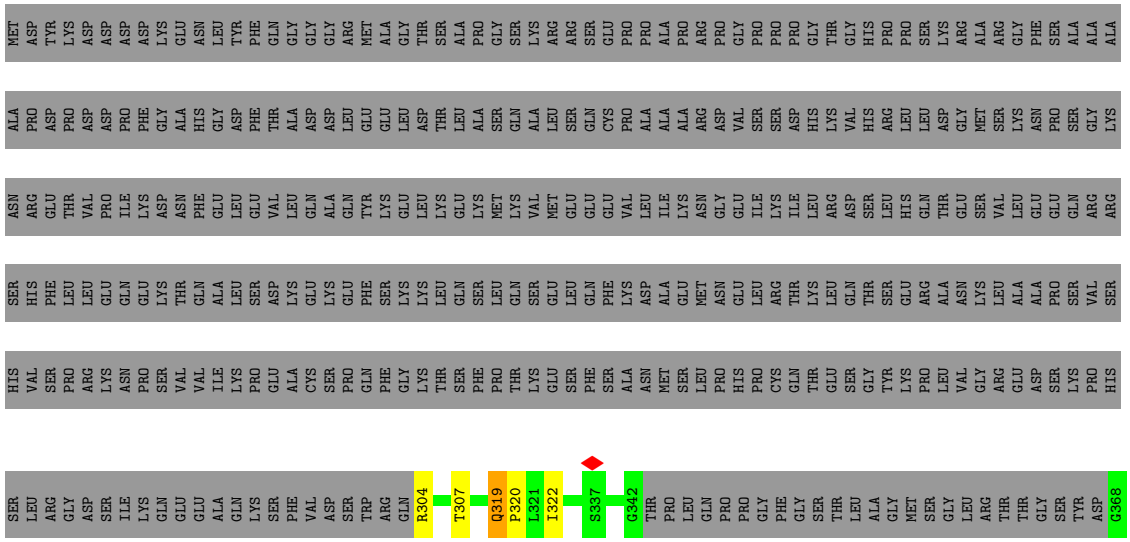
Chain B:

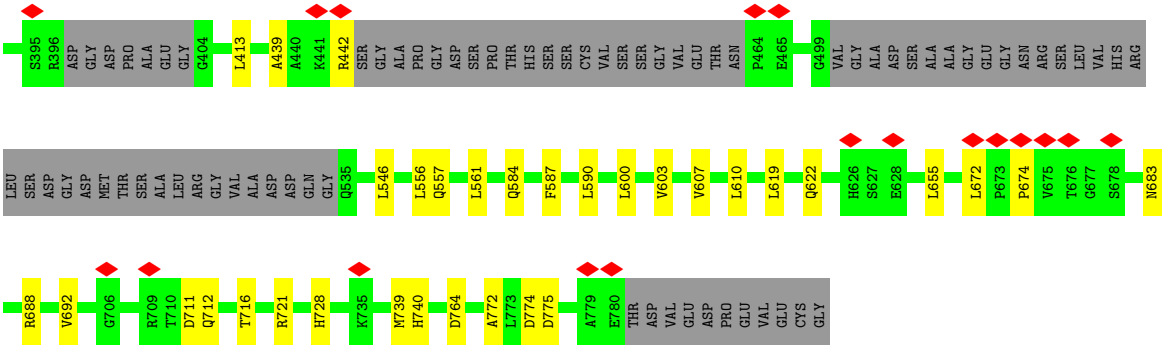




• Molecule 2: ATR-interacting protein

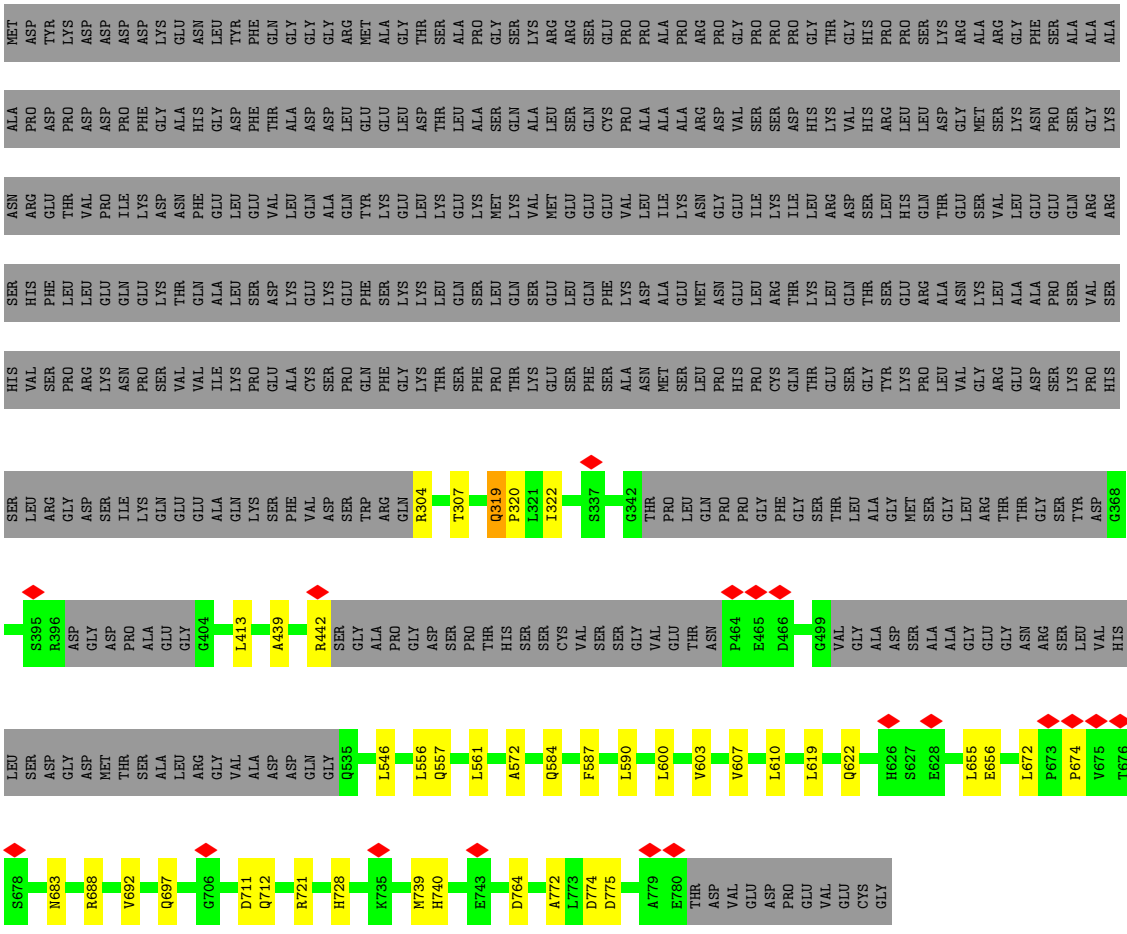
Chain C:





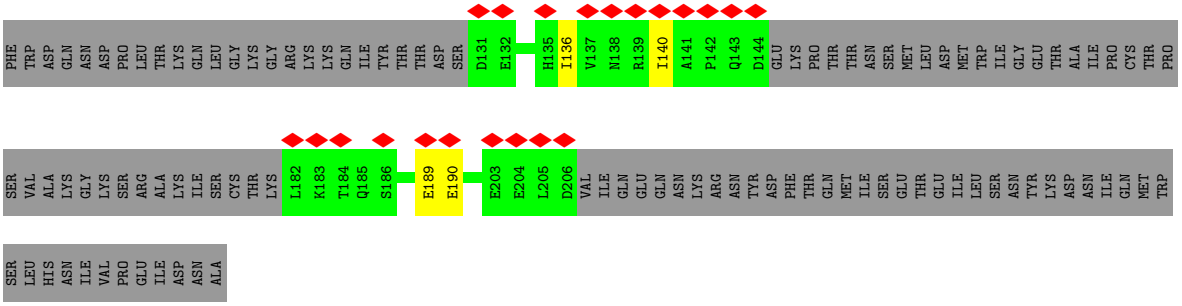
• Molecule 2: ATR-interacting protein

Chain D:



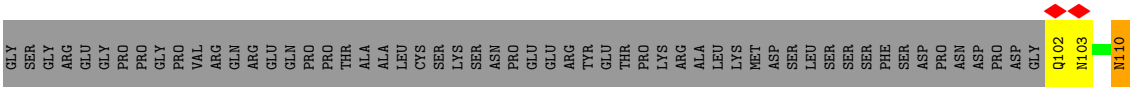
• Molecule 3: Ewing's tumor-associated antigen 1

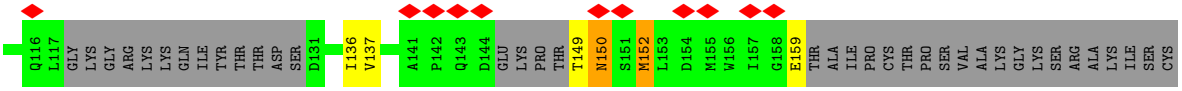
Chain F:

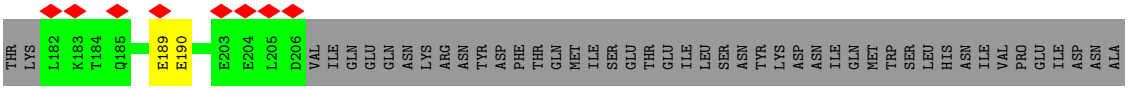


• Molecule 3: Ewing's tumor-associated antigen 1

Chain E:







4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1340199	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	53	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	1700	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	55.273	Depositor
Minimum map value	-32.731	Depositor
Average map value	0.027	Depositor
Map value standard deviation	1.445	Depositor
Recommended contour level	4.3	Depositor
Map size (Å)	319.2, 319.2, 319.2	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.064, 1.064, 1.064	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MG, ANP, ZN

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.14	1/20610 (0.0%)	0.26	0/27858
1	B	0.15	0/20610	0.29	4/27858 (0.0%)
2	C	0.17	0/3028	0.27	0/4112
2	D	0.17	0/3028	0.27	0/4112
3	E	0.12	0/553	0.32	0/740
3	F	0.13	0/322	0.32	0/428
All	All	0.15	1/48151 (0.0%)	0.28	4/65108 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
1	B	0	2
2	C	0	1
2	D	0	1
All	All	0	6

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	919	SER	C-N	5.03	1.40	1.33

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	1273	LYS	N-CA-C	-8.40	102.81	113.23
1	B	919	SER	CA-C-N	-8.11	110.44	121.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	919	SER	C-N-CA	-8.11	110.44	121.80
1	B	1271	TYR	N-CA-C	-5.86	104.97	111.36

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	171	TRP	Peptide
1	A	919	SER	Mainchain
1	B	171	TRP	Peptide
1	B	919	SER	Mainchain
2	C	319	GLN	Peptide
2	D	319	GLN	Peptide

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	20191	0	20473	167	0
1	B	20191	0	20473	193	0
2	C	2976	0	3063	23	0
2	D	2976	0	3063	24	0
3	E	548	0	519	12	0
3	F	321	0	313	6	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
5	A	2	0	0	0	0
5	B	2	0	0	0	0
6	A	31	0	13	0	0
6	B	31	0	13	0	0
All	All	47273	0	47930	412	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (412) close contacts within the same asymmetric unit are listed below, sorted by their clash

magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1249:LEU:HD13	1:B:1271:TYR:CZ	2.03	0.93
1:A:74:HIS:NE2	3:E:190:GLU:OE2	2.07	0.86
1:A:2013:THR:O	1:B:2608:ARG:NH2	2.09	0.86
1:A:1229:GLU:OE2	1:A:1229:GLU:N	2.09	0.85
1:B:1229:GLU:N	1:B:1229:GLU:OE2	2.09	0.84
1:A:2608:ARG:NH2	1:B:2013:THR:O	2.18	0.77
1:B:1117:GLU:N	1:B:1117:GLU:OE1	2.19	0.76
1:A:1117:GLU:N	1:A:1117:GLU:OE1	2.19	0.76
1:B:1249:LEU:CD1	1:B:1271:TYR:CZ	2.69	0.75
1:B:181:GLN:N	1:B:181:GLN:OE1	2.21	0.74
1:B:292:GLU:O	1:B:296:SER:OG	2.04	0.74
1:A:181:GLN:OE1	1:A:181:GLN:N	2.21	0.74
1:B:1249:LEU:HD13	1:B:1271:TYR:CE1	2.23	0.73
1:A:292:GLU:O	1:A:296:SER:OG	2.04	0.73
1:B:1277:GLU:O	1:B:1283:THR:HG21	1.89	0.73
1:A:2354:GLU:OE2	1:A:2357:ARG:NH2	2.22	0.72
1:B:1402:ARG:NH2	1:B:1521:ASP:OD2	2.23	0.71
1:B:2354:GLU:OE2	1:B:2357:ARG:NH2	2.22	0.71
1:A:1141:SER:OG	1:A:1408:ALA:O	2.08	0.71
1:A:2500:ASN:OD1	1:A:2598:ARG:NH2	2.23	0.71
1:A:1412:ARG:NH1	3:E:102:GLN:O	2.24	0.71
1:B:2500:ASN:OD1	1:B:2598:ARG:NH2	2.23	0.71
1:A:1402:ARG:NH2	1:A:1521:ASP:OD2	2.23	0.70
1:A:91:GLU:OE1	1:A:91:GLU:N	2.25	0.70
1:A:1597:GLN:NE2	1:A:2396:GLU:OE2	2.24	0.70
1:B:1096:ILE:HD11	3:F:140:ILE:HG23	1.73	0.70
1:B:91:GLU:N	1:B:91:GLU:OE1	2.25	0.69
1:A:1841:ARG:O	1:A:1846:ARG:NH2	2.26	0.69
1:B:1841:ARG:O	1:B:1846:ARG:NH2	2.26	0.68
1:A:682:GLN:OE1	1:A:682:GLN:N	2.27	0.68
1:B:682:GLN:N	1:B:682:GLN:OE1	2.27	0.67
1:B:467:LYS:NZ	1:B:471:GLU:OE2	2.28	0.67
1:A:467:LYS:NZ	1:A:471:GLU:OE2	2.28	0.67
1:A:1497:TYR:O	1:A:1500:THR:OG1	2.13	0.66
1:B:1319:ILE:O	1:B:1323:THR:OG1	2.13	0.66
3:E:110:ASN:OD1	3:E:110:ASN:N	2.28	0.66
1:A:1319:ILE:O	1:A:1323:THR:OG1	2.13	0.65
1:B:286:ASP:OD1	1:B:287:GLN:N	2.29	0.65
1:A:286:ASP:OD1	1:A:287:GLN:N	2.29	0.65
1:B:647:ILE:O	1:B:652:ARG:NH1	2.30	0.65
1:A:647:ILE:O	1:A:652:ARG:NH1	2.30	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1497:TYR:O	1:B:1500:THR:OG1	2.13	0.64
1:A:856:HIS:O	1:A:860:SER:OG	2.11	0.64
1:B:1088:GLN:O	1:B:1092:ASN:ND2	2.30	0.64
1:A:1088:GLN:O	1:A:1092:ASN:ND2	2.30	0.64
1:A:367:VAL:HG12	1:A:371:TYR:CE2	2.33	0.63
1:A:650:GLU:OE1	1:A:650:GLU:N	2.30	0.63
1:A:1168:SER:O	1:A:1171:ARG:NH1	2.31	0.63
1:B:650:GLU:N	1:B:650:GLU:OE1	2.30	0.63
1:B:1168:SER:O	1:B:1171:ARG:NH1	2.31	0.63
1:B:367:VAL:HG12	1:B:371:TYR:CE2	2.33	0.62
1:B:1905:ARG:NH2	1:B:1927:SER:OG	2.33	0.62
1:A:631:GLN:N	1:A:631:GLN:OE1	2.31	0.61
1:A:1905:ARG:NH2	1:A:1927:SER:OG	2.33	0.61
1:B:631:GLN:OE1	1:B:631:GLN:N	2.31	0.61
1:A:596:LEU:HD23	1:A:624:ILE:HD11	1.81	0.61
1:B:596:LEU:HD23	1:B:624:ILE:HD11	1.81	0.61
1:B:1578:THR:OG1	1:B:1647:ARG:NH2	2.33	0.60
1:B:1046:LYS:NZ	3:F:140:ILE:O	2.30	0.60
1:B:856:HIS:O	1:B:860:SER:OG	2.11	0.60
1:A:18:LEU:HD11	1:A:30:VAL:HG12	1.84	0.60
1:B:918:LYS:HB3	1:B:920:VAL:HG22	1.84	0.60
1:B:2137:GLN:O	1:B:2140:THR:OG1	2.19	0.60
1:A:85:ASN:ND2	1:A:87:SER:OG	2.34	0.59
1:A:2137:GLN:O	1:A:2140:THR:OG1	2.19	0.59
1:B:1505:ASP:OD1	1:B:1506:LEU:N	2.36	0.59
1:B:85:ASN:ND2	1:B:87:SER:OG	2.35	0.58
1:A:1505:ASP:OD1	1:A:1506:LEU:N	2.36	0.58
1:A:968:ARG:O	1:A:972:LEU:HD22	2.03	0.58
1:B:18:LEU:HD11	1:B:30:VAL:HG12	1.84	0.58
1:B:767:LEU:CD2	1:B:808:THR:HG21	2.34	0.58
1:B:1092:ASN:HB3	3:F:140:ILE:HG22	1.85	0.58
1:B:1271:TYR:O	1:B:1274:GLU:HB3	2.04	0.58
1:A:608:LEU:O	1:A:611:THR:OG1	2.22	0.58
1:A:1556:LEU:O	1:A:1647:ARG:NH1	2.33	0.58
1:A:1010:ALA:O	1:A:1014:ILE:HG12	2.04	0.57
1:B:22:THR:N	1:B:25:GLU:OE2	2.38	0.57
1:B:1010:ALA:O	1:B:1014:ILE:HG12	2.04	0.57
1:A:22:THR:N	1:A:25:GLU:OE2	2.38	0.57
1:A:488:GLU:N	1:A:488:GLU:OE1	2.35	0.57
1:B:1249:LEU:CD1	1:B:1271:TYR:CE1	2.86	0.57
1:B:488:GLU:OE1	1:B:488:GLU:N	2.35	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:968:ARG:O	1:B:972:LEU:HD22	2.03	0.57
1:B:1269:GLN:O	1:B:1273:LYS:N	2.38	0.57
1:A:767:LEU:CD2	1:A:808:THR:HG21	2.34	0.57
1:B:1061:GLU:C	1:B:1062:ILE:HD13	2.30	0.56
1:A:804:ALA:O	1:A:808:THR:HG22	2.05	0.56
1:B:915:VAL:HG11	1:B:922:LEU:HG	1.88	0.56
1:B:2239:MET:HE3	1:B:2243:PHE:HB2	1.87	0.56
1:A:1061:GLU:C	1:A:1062:ILE:HD13	2.30	0.56
2:D:721:ARG:NH2	2:D:764:ASP:O	2.39	0.56
1:A:767:LEU:HD21	1:A:808:THR:HG21	1.86	0.56
1:B:767:LEU:HD21	1:B:808:THR:HG21	1.86	0.56
1:A:1141:SER:OG	1:A:1414:GLN:OE1	2.22	0.56
2:C:721:ARG:NH2	2:C:764:ASP:O	2.38	0.56
1:B:608:LEU:O	1:B:611:THR:OG1	2.22	0.56
3:F:189:GLU:OE1	3:F:190:GLU:N	2.38	0.55
1:B:804:ALA:O	1:B:808:THR:HG22	2.05	0.55
1:A:2239:MET:HE3	1:A:2243:PHE:HB2	1.87	0.55
1:B:382:VAL:HG22	1:B:382:VAL:O	2.07	0.55
3:E:189:GLU:OE1	3:E:190:GLU:N	2.38	0.55
1:A:644:PRO:O	1:A:652:ARG:NH1	2.39	0.55
2:D:584:GLN:NE2	2:D:622:GLN:OE1	2.39	0.55
1:A:752:GLU:OE1	1:A:752:GLU:N	2.28	0.55
2:D:600:LEU:CD1	2:D:655:LEU:HD22	2.37	0.55
2:C:600:LEU:CD1	2:C:655:LEU:HD22	2.37	0.54
1:A:382:VAL:O	1:A:382:VAL:HG22	2.07	0.54
1:A:1025:ARG:NH1	1:A:1059:GLU:OE1	2.41	0.54
1:B:1025:ARG:NH1	1:B:1059:GLU:OE1	2.41	0.54
1:B:40:PHE:O	1:B:44:ILE:HG22	2.08	0.53
1:A:1190:GLU:OE2	1:A:1190:GLU:N	2.26	0.53
1:B:605:ASP:OD1	1:B:608:LEU:N	2.41	0.53
1:A:26:TYR:CE1	1:A:30:VAL:HG11	2.44	0.53
1:B:752:GLU:OE1	1:B:752:GLU:N	2.28	0.53
1:B:26:TYR:CE1	1:B:30:VAL:HG11	2.44	0.53
1:A:40:PHE:O	1:A:44:ILE:HG22	2.09	0.53
2:C:584:GLN:NE2	2:C:622:GLN:OE1	2.39	0.53
1:A:707:PHE:HE2	1:A:711:LEU:HD21	1.74	0.53
1:B:113:THR:OG1	1:B:116:CYS:SG	2.67	0.52
1:B:707:PHE:HE2	1:B:711:LEU:HD21	1.74	0.52
1:B:767:LEU:HD21	1:B:808:THR:CG2	2.40	0.52
1:B:585:HIS:O	1:B:589:ASP:OD1	2.27	0.52
1:B:1432:GLU:OE2	1:B:1435:THR:HG22	2.08	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:767:LEU:HD21	1:A:808:THR:CG2	2.39	0.52
1:A:1432:GLU:OE2	1:A:1435:THR:HG22	2.08	0.52
1:B:1289:MET:O	1:B:1293:GLN:NE2	2.38	0.52
2:D:739:MET:HE3	2:D:740:HIS:N	2.25	0.52
2:C:739:MET:HE3	2:C:740:HIS:N	2.25	0.52
1:A:1467:LYS:NZ	3:E:102:GLN:OE1	2.43	0.52
1:B:908:TYR:OH	1:B:912:ARG:NH1	2.43	0.52
1:A:113:THR:OG1	1:A:116:CYS:SG	2.67	0.52
1:B:613:PHE:HB2	1:B:617:LEU:HD23	1.92	0.51
1:A:585:HIS:O	1:A:589:ASP:OD1	2.27	0.51
1:B:770:LEU:CD2	1:B:812:LEU:HD11	2.40	0.51
1:B:1249:LEU:HD13	1:B:1271:TYR:CE2	2.44	0.51
1:A:1919:MET:N	1:A:1919:MET:SD	2.84	0.51
1:A:484:ASN:OD1	1:A:484:ASN:N	2.44	0.51
1:A:908:TYR:OH	1:A:912:ARG:NH1	2.43	0.51
3:E:103:ASN:N	3:E:103:ASN:OD1	2.44	0.51
1:A:613:PHE:HB2	1:A:617:LEU:HD23	1.92	0.51
1:B:644:PRO:O	1:B:652:ARG:NH1	2.39	0.51
1:B:582:PHE:HB3	1:B:586:ILE:HD11	1.93	0.50
1:A:770:LEU:CD2	1:A:812:LEU:HD11	2.40	0.50
1:A:582:PHE:HB3	1:A:586:ILE:HD11	1.93	0.50
1:B:1919:MET:SD	1:B:1919:MET:N	2.84	0.50
1:A:477:LEU:HD21	1:A:550:LEU:HD11	1.94	0.50
1:A:1235:HIS:CE1	1:A:1239:ILE:HD11	2.47	0.50
1:B:477:LEU:HD21	1:B:550:LEU:HD11	1.94	0.50
1:B:1235:HIS:CE1	1:B:1239:ILE:HD11	2.47	0.50
1:B:915:VAL:HG11	1:B:922:LEU:CD2	2.42	0.49
1:A:46:THR:OG1	1:A:106:ARG:NE	2.45	0.49
1:A:1918:GLU:OE1	1:A:1918:GLU:N	2.45	0.49
1:A:2111:ASP:OD1	1:A:2111:ASP:N	2.45	0.49
1:A:2419:GLU:O	1:A:2423:VAL:HG12	2.13	0.49
1:B:46:THR:OG1	1:B:106:ARG:NE	2.45	0.49
1:B:484:ASN:OD1	1:B:484:ASN:N	2.44	0.49
1:B:1272:ARG:CZ	1:B:1272:ARG:HA	2.43	0.49
1:A:1061:GLU:O	1:A:1062:ILE:HD13	2.13	0.49
1:B:1190:GLU:OE2	1:B:1190:GLU:N	2.26	0.48
2:D:304:ARG:O	2:D:307:THR:OG1	2.31	0.48
3:F:189:GLU:OE1	3:F:189:GLU:C	2.56	0.48
3:E:189:GLU:OE1	3:E:189:GLU:C	2.56	0.48
1:A:2214:ASP:OD1	1:A:2217:ARG:NH2	2.47	0.48
1:B:224:ARG:NH2	2:D:572:ALA:O	2.45	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:548:ARG:NH2	1:A:552:GLU:OE1	2.47	0.48
1:B:1626:TYR:O	1:B:1630:THR:HG23	2.13	0.48
1:A:605:ASP:OD1	1:A:608:LEU:N	2.41	0.48
1:B:2214:ASP:OD1	1:B:2217:ARG:NH2	2.47	0.48
1:A:887:PHE:HB2	3:E:152:MET:HE1	1.95	0.48
1:B:548:ARG:NH2	1:B:552:GLU:OE1	2.47	0.48
1:B:1272:ARG:HA	1:B:1272:ARG:NH1	2.29	0.48
1:B:2419:GLU:O	1:B:2423:VAL:HG12	2.13	0.48
1:B:1156:MET:HA	1:B:1159:MET:HE2	1.95	0.48
1:B:577:GLN:HG3	1:B:587:LEU:HD21	1.96	0.47
1:B:1918:GLU:N	1:B:1918:GLU:OE1	2.45	0.47
1:A:1156:MET:HA	1:A:1159:MET:HE2	1.95	0.47
2:C:304:ARG:O	2:C:307:THR:OG1	2.31	0.47
1:B:496:VAL:O	1:B:500:THR:HG23	2.14	0.47
1:B:1061:GLU:O	1:B:1062:ILE:HD13	2.13	0.47
2:D:319:GLN:O	2:D:320:PRO:C	2.57	0.47
1:A:1626:TYR:O	1:A:1630:THR:HG23	2.13	0.47
1:B:1274:GLU:OE1	1:B:1274:GLU:HA	2.15	0.47
1:A:16:ARG:CZ	1:A:16:ARG:HA	2.45	0.47
1:A:71:PHE:O	1:A:75:ILE:HG22	2.15	0.47
1:A:496:VAL:O	1:A:500:THR:HG23	2.14	0.47
1:B:16:ARG:CZ	1:B:16:ARG:HA	2.45	0.47
1:B:71:PHE:O	1:B:75:ILE:HG22	2.15	0.47
1:B:1465:SER:O	1:B:1465:SER:OG	2.27	0.47
1:A:577:GLN:HG3	1:A:587:LEU:HD21	1.96	0.47
1:A:1538:LEU:CD2	1:A:1625:ASP:HB3	2.45	0.47
2:C:319:GLN:O	2:C:320:PRO:C	2.57	0.47
1:B:1277:GLU:O	1:B:1283:THR:CG2	2.60	0.47
1:A:283:MET:HG3	1:A:284:ASP:N	2.29	0.47
1:A:821:ARG:HH11	1:A:868:THR:HG21	1.80	0.47
1:A:2529:GLU:OE2	1:A:2533:ARG:NH2	2.48	0.47
1:B:1586:ASP:OD2	1:B:1653:ARG:NH2	2.41	0.47
1:B:1817:THR:O	1:B:1821:ASP:OD2	2.33	0.47
1:B:2515:LEU:HD11	1:B:2523:MET:HE1	1.98	0.46
2:D:774:ASP:OD1	2:D:775:ASP:N	2.48	0.46
1:A:207:VAL:O	1:A:211:MET:HG2	2.15	0.46
1:B:207:VAL:O	1:B:211:MET:HG2	2.15	0.46
1:B:1046:LYS:HD2	3:F:140:ILE:HD11	1.97	0.46
2:C:774:ASP:OD1	2:C:775:ASP:N	2.48	0.46
1:B:283:MET:HG3	1:B:284:ASP:N	2.29	0.46
1:B:918:LYS:C	1:B:920:VAL:H	2.24	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:757:GLN:NE2	1:A:791:LYS:O	2.48	0.46
1:A:1817:THR:O	1:A:1821:ASP:OD2	2.33	0.46
1:B:757:GLN:NE2	1:B:791:LYS:O	2.48	0.46
1:A:2341:PHE:CE2	1:A:2345:ILE:HD11	2.51	0.46
1:B:1559:ASP:OD1	1:B:1560:ASP:N	2.49	0.46
1:B:2529:GLU:OE2	1:B:2533:ARG:NH2	2.48	0.46
1:B:2341:PHE:CE2	1:B:2345:ILE:HD11	2.51	0.46
1:B:1822:SER:O	1:B:1826:VAL:HG23	2.16	0.46
1:A:1437:GLY:O	1:A:1441:GLN:NE2	2.49	0.45
1:B:1261:LEU:O	1:B:1265:LYS:N	2.37	0.45
1:B:1272:ARG:NH1	1:B:1272:ARG:CA	2.79	0.45
1:A:2515:LEU:HD11	1:A:2523:MET:HE1	1.98	0.45
1:A:379:LEU:O	1:A:382:VAL:HG12	2.16	0.45
1:B:821:ARG:HH11	1:B:868:THR:HG21	1.80	0.45
1:B:1272:ARG:O	1:B:1276:SER:O	2.34	0.45
1:B:379:LEU:O	1:B:382:VAL:HG12	2.16	0.45
1:B:621:SER:O	1:B:625:SER:OG	2.29	0.45
1:B:915:VAL:HG11	1:B:922:LEU:CG	2.47	0.45
1:A:1559:ASP:OD1	1:A:1560:ASP:N	2.49	0.45
2:D:439:ALA:O	2:D:442:ARG:NH1	2.50	0.45
1:A:963:ASP:O	1:A:967:GLN:HG2	2.17	0.45
1:B:648:PHE:N	1:B:648:PHE:CD2	2.85	0.45
1:B:1437:GLY:O	1:B:1441:GLN:NE2	2.49	0.45
1:A:48:VAL:HG11	1:A:113:THR:HG21	1.99	0.44
1:A:1822:SER:O	1:A:1826:VAL:HG23	2.16	0.44
3:E:150:ASN:OD1	3:E:150:ASN:N	2.49	0.44
2:C:439:ALA:O	2:C:442:ARG:NH1	2.50	0.44
2:C:711:ASP:OD1	2:C:712:GLN:N	2.51	0.44
1:B:915:VAL:HG11	1:B:922:LEU:HD23	1.99	0.44
1:B:1252:ILE:HG23	1:B:1252:ILE:O	2.17	0.44
2:D:319:GLN:HG3	2:D:320:PRO:HD3	2.00	0.44
1:A:44:ILE:HG23	1:A:45:LEU:N	2.32	0.44
1:A:687:ARG:H	1:A:687:ARG:HE	1.65	0.44
2:C:319:GLN:HG3	2:C:320:PRO:HD3	2.00	0.44
1:B:48:VAL:HG11	1:B:113:THR:HG21	1.99	0.44
1:A:497:LEU:HD13	1:A:569:ILE:HG23	2.00	0.44
1:B:687:ARG:HE	1:B:687:ARG:H	1.65	0.44
1:B:918:LYS:C	1:B:920:VAL:N	2.76	0.44
1:B:1208:LEU:HD23	1:B:1208:LEU:O	2.18	0.44
1:B:1370:ASP:O	1:B:1370:ASP:OD2	2.36	0.44
1:B:2111:ASP:OD1	1:B:2111:ASP:N	2.45	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:497:LEU:O	1:A:500:THR:OG1	2.32	0.44
1:A:1922:GLU:O	1:A:1926:GLN:HG3	2.17	0.44
1:A:593:MET:HA	1:A:596:LEU:HD13	2.00	0.44
1:A:1208:LEU:HD23	1:A:1208:LEU:O	2.18	0.44
1:B:44:ILE:HG23	1:B:45:LEU:N	2.32	0.44
1:B:963:ASP:O	1:B:967:GLN:HG2	2.17	0.44
1:B:1922:GLU:O	1:B:1926:GLN:HG3	2.17	0.44
2:D:319:GLN:OE1	2:D:319:GLN:HA	2.18	0.44
1:B:593:MET:HA	1:B:596:LEU:HD13	2.00	0.44
2:D:711:ASP:OD1	2:D:712:GLN:N	2.51	0.44
1:A:16:ARG:HA	1:A:16:ARG:NE	2.33	0.43
1:B:18:LEU:CD1	1:B:30:VAL:HG12	2.48	0.43
1:B:133:LEU:HD23	1:B:133:LEU:C	2.43	0.43
1:B:1037:PHE:HB3	1:B:1075:LEU:HD21	1.99	0.43
1:B:2402:THR:HG22	1:B:2404:LYS:H	1.83	0.43
1:A:361:TYR:O	1:A:362:GLU:HG3	2.18	0.43
1:B:1098:ALA:HB2	1:B:1122:TYR:CE2	2.53	0.43
1:A:133:LEU:C	1:A:133:LEU:HD23	2.43	0.43
1:A:707:PHE:CE2	1:A:711:LEU:HD21	2.53	0.43
1:B:463:TRP:CH2	1:B:500:THR:HG22	2.53	0.43
1:B:497:LEU:HD13	1:B:569:ILE:HG23	2.00	0.43
1:B:972:LEU:O	1:B:976:SER:OG	2.32	0.43
1:B:739:ASP:OD1	1:B:740:LEU:N	2.51	0.43
1:A:739:ASP:OD1	1:A:740:LEU:N	2.51	0.43
1:A:1370:ASP:O	1:A:1370:ASP:OD2	2.36	0.43
1:A:1740:VAL:CG1	1:A:1752:VAL:HG13	2.49	0.43
1:B:626:ASP:OD2	1:B:626:ASP:C	2.62	0.43
1:A:2402:THR:HG22	1:A:2404:LYS:H	1.83	0.43
2:C:319:GLN:HA	2:C:319:GLN:OE1	2.18	0.43
1:B:1740:VAL:HG13	1:B:1752:VAL:HG13	2.01	0.43
1:B:2055:ASP:OD1	1:B:2055:ASP:O	2.37	0.43
1:A:18:LEU:CD1	1:A:30:VAL:HG12	2.48	0.43
1:B:361:TYR:O	1:B:362:GLU:HG3	2.18	0.43
1:B:1172:VAL:HG23	1:B:1173:LYS:N	2.33	0.43
1:A:324:LYS:O	1:A:328:MET:HG3	2.19	0.43
1:A:648:PHE:N	1:A:648:PHE:CD2	2.85	0.43
1:A:2054:THR:O	1:A:2054:THR:HG22	2.18	0.43
1:B:308:GLU:OE2	1:B:311:ARG:NH1	2.51	0.43
1:A:832:LEU:HD12	1:A:879:ALA:HB3	2.01	0.43
1:B:1740:VAL:CG1	1:B:1752:VAL:HG13	2.49	0.43
1:B:2054:THR:HG22	1:B:2054:THR:O	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:160:HIS:HB2	1:A:202:LEU:HD21	2.01	0.43
1:A:308:GLU:OE2	1:A:311:ARG:NH1	2.51	0.43
1:A:843:LYS:NZ	3:E:152:MET:HE2	2.34	0.43
1:B:16:ARG:HA	1:B:16:ARG:NE	2.34	0.43
1:A:463:TRP:CH2	1:A:500:THR:HG22	2.53	0.42
1:A:1736:TYR:O	1:A:1740:VAL:HG23	2.18	0.42
1:A:1740:VAL:HG13	1:A:1752:VAL:HG13	2.01	0.42
1:B:832:LEU:HD12	1:B:879:ALA:HB3	2.01	0.42
1:A:47:ASP:OD1	1:A:48:VAL:N	2.52	0.42
2:C:546:LEU:HD12	2:C:561:LEU:HD12	2.01	0.42
1:B:324:LYS:O	1:B:328:MET:HG3	2.19	0.42
1:B:707:PHE:CE2	1:B:711:LEU:HD21	2.52	0.42
1:B:1245:VAL:HG12	1:B:1245:VAL:O	2.18	0.42
1:B:2393:LEU:HB3	1:B:2435:ILE:HD12	2.01	0.42
1:B:1736:TYR:O	1:B:1740:VAL:HG23	2.18	0.42
1:A:626:ASP:OD2	1:A:626:ASP:C	2.62	0.42
1:A:1049:LEU:HD23	3:E:137:VAL:HG23	2.02	0.42
1:A:1172:VAL:HG23	1:A:1173:LYS:N	2.33	0.42
1:B:54:GLU:OE2	1:B:64:THR:N	2.53	0.42
1:B:698:ASP:N	1:B:698:ASP:OD1	2.53	0.42
1:A:54:GLU:OE2	1:A:64:THR:N	2.53	0.42
1:A:2393:LEU:HB3	1:A:2435:ILE:HD12	2.01	0.42
1:A:281:VAL:HG12	1:A:333:VAL:HG23	2.01	0.42
1:A:776:SER:N	1:A:777:PRO:HD2	2.35	0.42
1:A:922:LEU:HD13	1:A:983:ASP:HB2	2.02	0.42
1:A:1245:VAL:O	1:A:1245:VAL:HG12	2.19	0.42
1:A:2055:ASP:OD1	1:A:2055:ASP:O	2.36	0.42
1:B:47:ASP:OD1	1:B:48:VAL:N	2.52	0.42
1:B:1041:VAL:HG11	1:B:1079:LEU:HD21	2.01	0.42
1:A:1925:LEU:O	1:A:1929:ARG:HG3	2.19	0.42
1:A:2223:LEU:HD22	1:A:2371:ASN:ND2	2.35	0.42
2:C:556:LEU:O	2:C:557:GLN:C	2.63	0.42
2:C:590:LEU:HD13	2:C:610:LEU:HD21	2.02	0.42
2:D:600:LEU:HD11	2:D:655:LEU:HD22	2.01	0.42
3:E:149:THR:HA	3:E:152:MET:HE3	2.02	0.42
1:B:281:VAL:HG12	1:B:333:VAL:HG23	2.01	0.42
1:B:283:MET:HG3	1:B:284:ASP:H	1.85	0.42
1:B:550:LEU:O	1:B:554:VAL:HG23	2.20	0.42
1:B:619:THR:HA	1:B:622:CYS:SG	2.60	0.42
1:B:776:SER:N	1:B:777:PRO:HD2	2.35	0.42
1:A:249:ILE:HG23	1:A:298:LEU:HD22	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:619:THR:HA	1:A:622:CYS:SG	2.60	0.42
1:B:1374:THR:O	1:B:1375:GLU:HB3	2.20	0.42
1:B:1411:SER:O	1:B:1415:ASP:OD1	2.38	0.42
2:D:603:VAL:O	2:D:607:VAL:HG23	2.20	0.42
1:A:920:VAL:O	1:A:921:LYS:C	2.63	0.42
1:A:2184:LYS:HD3	1:A:2223:LEU:HD11	2.02	0.42
2:C:739:MET:SD	2:C:739:MET:C	3.03	0.42
1:B:505:VAL:HG22	1:B:579:ASN:HB2	2.02	0.42
1:B:608:LEU:O	1:B:608:LEU:HD23	2.20	0.42
1:B:1269:GLN:HA	1:B:1272:ARG:HB2	2.02	0.42
1:B:2184:LYS:HD3	1:B:2223:LEU:HD11	2.02	0.42
1:B:2387:ARG:HB3	1:B:2388:PRO:HD3	2.01	0.42
2:D:546:LEU:HD12	2:D:561:LEU:HD12	2.01	0.42
1:A:2387:ARG:HB3	1:A:2388:PRO:HD3	2.01	0.41
2:C:712:GLN:O	2:C:716:THR:OG1	2.35	0.41
1:B:217:ILE:HD12	1:B:251:PHE:CE1	2.55	0.41
1:B:920:VAL:O	1:B:921:LYS:C	2.63	0.41
1:B:1257:ASP:OD1	1:B:1265:LYS:NZ	2.48	0.41
1:B:1925:LEU:O	1:B:1929:ARG:HG3	2.19	0.41
1:A:118:LEU:HD22	1:A:118:LEU:H	1.86	0.41
1:A:550:LEU:O	1:A:554:VAL:HG23	2.20	0.41
1:A:721:MET:HE1	1:A:751:HIS:NE2	2.35	0.41
1:A:1411:SER:O	1:A:1415:ASP:OD1	2.38	0.41
1:B:23:PRO:C	1:B:24:GLU:OE2	2.63	0.41
1:B:721:MET:HE1	1:B:751:HIS:NE2	2.35	0.41
2:C:603:VAL:O	2:C:607:VAL:HG23	2.20	0.41
1:B:922:LEU:HD13	1:B:983:ASP:HB2	2.02	0.41
1:A:505:VAL:HG22	1:A:579:ASN:HB2	2.02	0.41
1:A:582:PHE:CB	1:A:586:ILE:HD11	2.50	0.41
2:C:600:LEU:HD11	2:C:655:LEU:HD22	2.01	0.41
1:B:160:HIS:HB2	1:B:202:LEU:HD21	2.01	0.41
1:B:582:PHE:CB	1:B:586:ILE:HD11	2.50	0.41
2:D:556:LEU:O	2:D:557:GLN:C	2.63	0.41
2:D:683:ASN:OD1	2:D:683:ASN:N	2.53	0.41
2:D:739:MET:SD	2:D:739:MET:C	3.03	0.41
1:A:23:PRO:C	1:A:24:GLU:OE2	2.63	0.41
1:A:50:VAL:HG23	1:A:51:VAL:N	2.35	0.41
1:A:199:MET:HE3	1:A:199:MET:HB3	1.99	0.41
1:A:1887:LEU:O	1:A:1890:THR:OG1	2.38	0.41
1:B:50:VAL:HG23	1:B:51:VAL:N	2.35	0.41
2:D:672:LEU:C	2:D:674:PRO:CD	2.94	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:53:VAL:HA	1:A:56:VAL:HG22	2.02	0.41
1:A:707:PHE:CD2	1:A:707:PHE:C	2.99	0.41
1:B:273:PHE:HE1	1:B:295:LEU:HD11	1.86	0.41
1:B:1375:GLU:HG2	1:B:1375:GLU:O	2.21	0.41
1:A:608:LEU:O	1:A:608:LEU:HD23	2.20	0.41
1:A:698:ASP:OD1	1:A:698:ASP:N	2.53	0.41
2:C:672:LEU:C	2:C:674:PRO:CD	2.94	0.41
1:B:249:ILE:HG23	1:B:298:LEU:HD22	2.02	0.41
1:B:707:PHE:CD2	1:B:707:PHE:C	2.99	0.41
1:A:217:ILE:HD12	1:A:251:PHE:CE1	2.55	0.41
1:B:1159:MET:SD	1:B:1174:MET:HE2	2.61	0.41
1:B:2223:LEU:HD22	1:B:2371:ASN:ND2	2.35	0.41
2:D:590:LEU:HD13	2:D:610:LEU:HD21	2.02	0.41
1:A:273:PHE:HE1	1:A:295:LEU:HD11	1.86	0.41
2:C:728:HIS:HB2	2:C:772:ALA:HB1	2.02	0.41
1:B:921:LYS:O	1:B:925:PHE:N	2.41	0.41
2:D:728:HIS:HB2	2:D:772:ALA:HB1	2.02	0.41
1:A:48:VAL:O	1:A:51:VAL:HG12	2.21	0.41
1:A:1709:HIS:NE2	1:A:1718:ALA:HB2	2.36	0.41
1:A:2231:ASP:OD1	1:A:2231:ASP:N	2.54	0.41
1:B:2324:MET:HE3	1:B:2324:MET:HB3	2.02	0.41
1:A:264:GLN:HB2	1:A:265:PRO:HD3	2.03	0.40
1:A:2333:ARG:HG2	1:A:2563:VAL:HG22	2.04	0.40
2:C:587:PHE:HE1	2:C:619:LEU:HD22	1.86	0.40
2:C:683:ASN:N	2:C:683:ASN:OD1	2.53	0.40
1:B:1709:HIS:NE2	1:B:1718:ALA:HB2	2.36	0.40
2:D:688:ARG:O	2:D:692:VAL:HG23	2.21	0.40
1:A:283:MET:HG3	1:A:284:ASP:H	1.85	0.40
1:A:335:MET:SD	1:A:382:VAL:HG23	2.61	0.40
2:C:688:ARG:O	2:C:692:VAL:HG23	2.21	0.40
1:B:1887:LEU:O	1:B:1890:THR:OG1	2.38	0.40
1:A:1159:MET:SD	1:A:1174:MET:HE2	2.61	0.40
1:B:679:LEU:HD23	1:B:717:THR:O	2.22	0.40
1:B:1040:LEU:O	1:B:1044:CYS:HB2	2.21	0.40
1:A:720:GLY:O	1:A:721:MET:HG3	2.22	0.40
1:B:53:VAL:HA	1:B:56:VAL:HG22	2.02	0.40
1:B:452:LYS:CD	1:B:452:LYS:N	2.85	0.40
2:D:587:PHE:HE1	2:D:619:LEU:HD22	1.86	0.40
2:D:656:GLU:OE1	2:D:697:GLN:NE2	2.55	0.40
1:A:220:VAL:O	1:A:220:VAL:CG1	2.69	0.40
1:A:2054:THR:O	1:A:2054:THR:CG2	2.69	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1235:HIS:HE1	1:B:1239:ILE:HD11	1.86	0.40
1:B:2231:ASP:OD1	1:B:2231:ASP:N	2.54	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	2499/2663 (94%)	2427 (97%)	72 (3%)	0	100	100
1	B	2499/2663 (94%)	2432 (97%)	67 (3%)	0	100	100
2	C	379/810 (47%)	356 (94%)	23 (6%)	0	100	100
2	D	379/810 (47%)	356 (94%)	23 (6%)	0	100	100
3	E	58/205 (28%)	56 (97%)	2 (3%)	0	100	100
3	F	35/205 (17%)	34 (97%)	1 (3%)	0	100	100
All	All	5849/7356 (80%)	5661 (97%)	188 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	2248/2379 (94%)	2224 (99%)	24 (1%)	65	88

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	B	2248/2379 (94%)	2221 (99%)	27 (1%)	63 86
2	C	340/694 (49%)	338 (99%)	2 (1%)	78 93
2	D	340/694 (49%)	338 (99%)	2 (1%)	78 93
3	E	63/187 (34%)	58 (92%)	5 (8%)	11 34
3	F	37/187 (20%)	36 (97%)	1 (3%)	39 73
All	All	5276/6520 (81%)	5215 (99%)	61 (1%)	61 86

All (61) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	10	SER
1	A	43	ARG
1	A	173	VAL
1	A	189	LEU
1	A	220	VAL
1	A	223	ARG
1	A	290	LEU
1	A	369	LYS
1	A	405	MET
1	A	411	ILE
1	A	478	GLU
1	A	617	LEU
1	A	914	LEU
1	A	972	LEU
1	A	976	SER
1	A	992	THR
1	A	1242	ARG
1	A	1252	ILE
1	A	1264	ILE
1	A	1270	GLU
1	A	1276	SER
1	A	1277	GLU
1	A	1919	MET
1	A	2264	SER
2	C	322	ILE
2	C	413	LEU
1	B	10	SER
1	B	43	ARG
1	B	173	VAL
1	B	189	LEU

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Mol	Chain	Res	Type
1	B	220	VAL
1	B	223	ARG
1	B	290	LEU
1	B	369	LYS
1	B	405	MET
1	B	411	ILE
1	B	478	GLU
1	B	617	LEU
1	B	914	LEU
1	B	972	LEU
1	B	976	SER
1	B	992	THR
1	B	1246	GLN
1	B	1258	HIS
1	B	1261	LEU
1	B	1262	LYS
1	B	1272	ARG
1	B	1275	THR
1	B	1276	SER
1	B	1278	SER
1	B	1375	GLU
1	B	1919	MET
1	B	2264	SER
2	D	322	ILE
2	D	413	LEU
3	F	136	ILE
3	E	110	ASN
3	E	136	ILE
3	E	150	ASN
3	E	152	MET
3	E	159	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (61) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	27	ASN
1	A	31	GLN
1	A	85	ASN
1	A	287	GLN
1	A	713	GLN
1	A	757	GLN
1	A	827	ASN

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Mol	Chain	Res	Type
1	A	862	ASN
1	A	967	GLN
1	A	1088	GLN
1	A	1092	ASN
1	A	1296	ASN
1	A	1441	GLN
1	A	1590	GLN
1	A	1638	GLN
1	A	1667	GLN
1	A	1705	GLN
1	A	2061	GLN
1	A	2263	GLN
1	A	2280	HIS
1	A	2361	HIS
2	C	387	ASN
2	C	430	HIS
2	C	488	HIS
2	C	588	GLN
2	C	618	GLN
2	C	657	GLN
2	C	697	GLN
1	B	27	ASN
1	B	31	GLN
1	B	85	ASN
1	B	287	GLN
1	B	616	ASN
1	B	713	GLN
1	B	757	GLN
1	B	827	ASN
1	B	862	ASN
1	B	967	GLN
1	B	1088	GLN
1	B	1092	ASN
1	B	1296	ASN
1	B	1441	GLN
1	B	1590	GLN
1	B	1627	GLN
1	B	1638	GLN
1	B	1667	GLN
1	B	1705	GLN
1	B	1783	GLN
1	B	2061	GLN

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Mol	Chain	Res	Type
1	B	2263	GLN
1	B	2280	HIS
1	B	2361	HIS
2	D	387	ASN
2	D	430	HIS
2	D	488	HIS
2	D	588	GLN
2	D	618	GLN
2	D	657	GLN
2	D	697	GLN
3	F	135	HIS
3	E	135	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 10 ligands modelled in this entry, 8 are monoatomic - leaving 2 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
6	ANP	A	2704	5	33,33,33	2.33	6 (18%)	45,52,52	1.20	4 (8%)
6	ANP	B	2704	5	33,33,33	2.32	5 (15%)	45,52,52	1.22	4 (8%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	ANP	A	2704	5	-	2/18/38/38	0/3/3/3
6	ANP	B	2704	5	-	8/18/38/38	0/3/3/3

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	2704	ANP	PB-O3A	9.06	1.70	1.59
6	B	2704	ANP	PB-O3A	8.94	1.70	1.59
6	A	2704	ANP	PG-N3B	6.30	1.79	1.63
6	B	2704	ANP	PG-N3B	6.29	1.79	1.63
6	B	2704	ANP	PG-O1G	4.78	1.53	1.46
6	A	2704	ANP	PG-O1G	4.76	1.53	1.46
6	B	2704	ANP	PB-O1B	2.82	1.50	1.46
6	A	2704	ANP	PB-O1B	2.81	1.50	1.46
6	A	2704	ANP	PB-O2B	-2.10	1.51	1.56
6	B	2704	ANP	PB-O2B	-2.09	1.51	1.56
6	A	2704	ANP	PA-O3A	2.02	1.61	1.59

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	B	2704	ANP	O2B-PB-O1B	5.01	120.61	109.87
6	A	2704	ANP	O2B-PB-O1B	4.96	120.50	109.87
6	B	2704	ANP	O1G-PG-N3B	-4.05	105.81	111.77
6	A	2704	ANP	O1G-PG-N3B	-3.84	106.11	111.77
6	B	2704	ANP	O2G-PG-O3G	2.52	114.36	107.59
6	A	2704	ANP	O2G-PG-O3G	2.48	114.25	107.59
6	B	2704	ANP	O3A-PB-N3B	-2.28	100.26	106.59
6	A	2704	ANP	O3A-PB-N3B	-2.02	100.97	106.59

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	2704	ANP	PA-O3A-PB-O2B
6	B	2704	ANP	PB-N3B-PG-O1G
6	B	2704	ANP	PG-N3B-PB-O1B

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Continued from previous page...

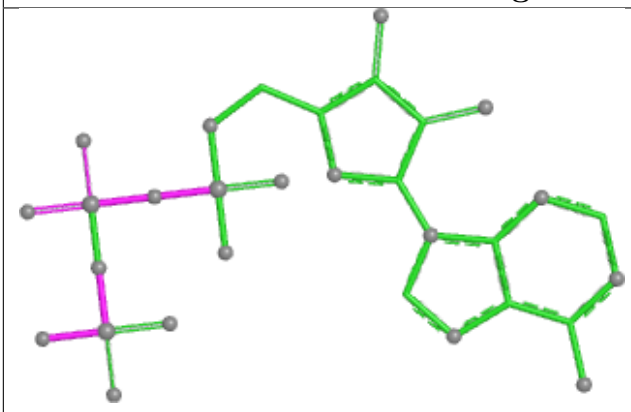
Mol	Chain	Res	Type	Atoms
6	B	2704	ANP	PG-N3B-PB-O3A
6	B	2704	ANP	C5'-O5'-PA-O3A
6	B	2704	ANP	O4'-C4'-C5'-O5'
6	B	2704	ANP	C5'-O5'-PA-O1A
6	A	2704	ANP	C4'-C5'-O5'-PA
6	B	2704	ANP	C4'-C5'-O5'-PA
6	B	2704	ANP	PB-O3A-PA-O5'

There are no ring outliers.

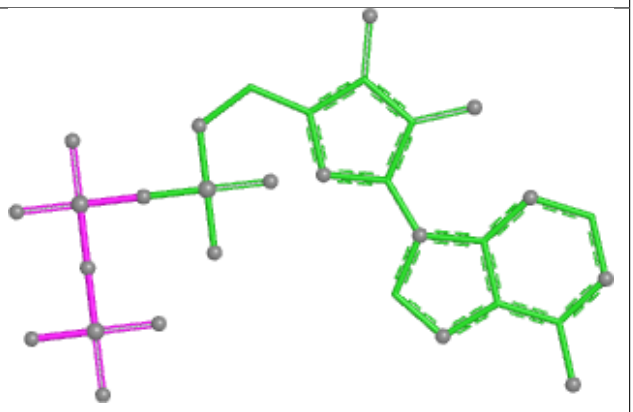
No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

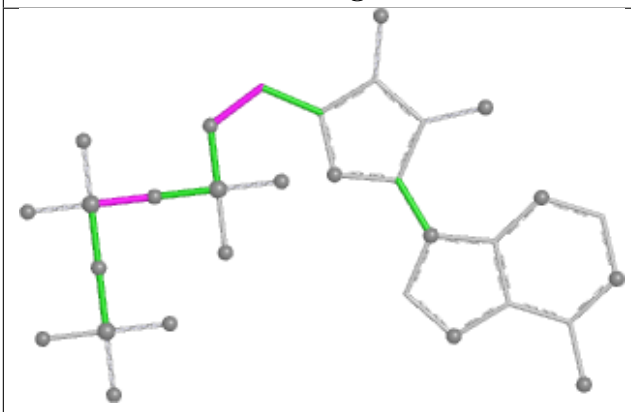
Ligand ANP A 2704



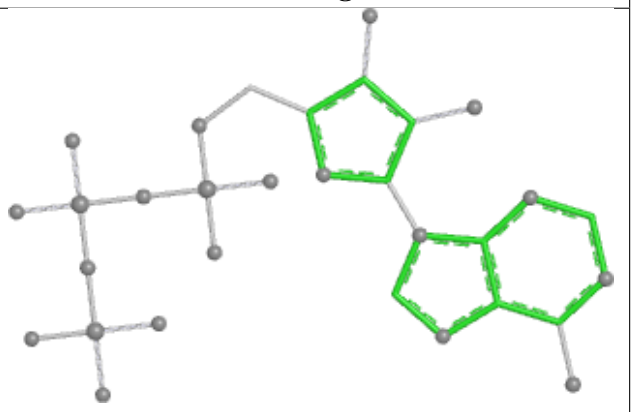
Bond lengths



Bond angles

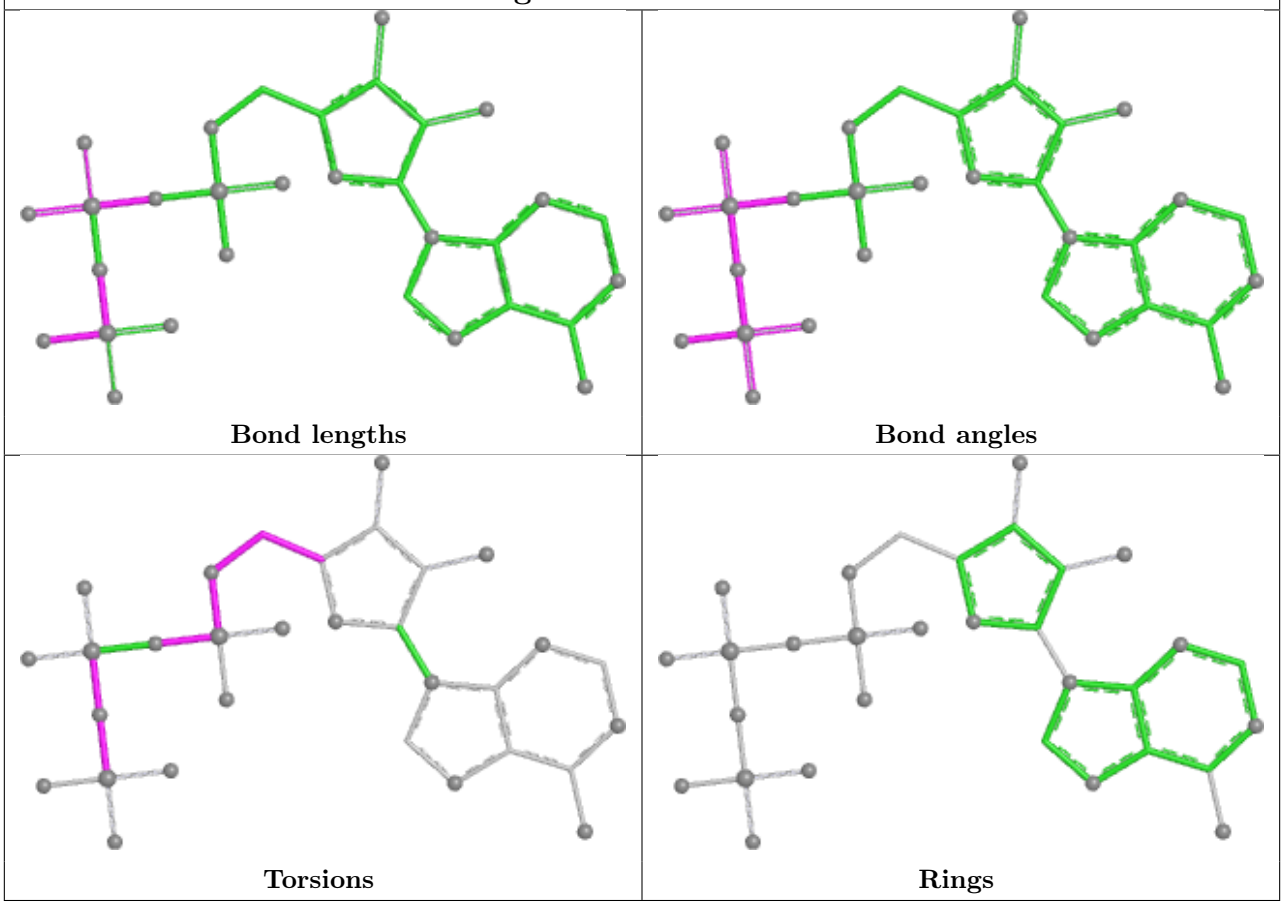


Torsions



Rings

Ligand ANP B 2704



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

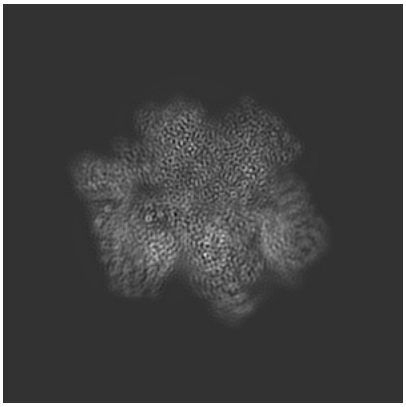
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-76990. These allow visual inspection of the internal detail of the map and identification of artifacts.

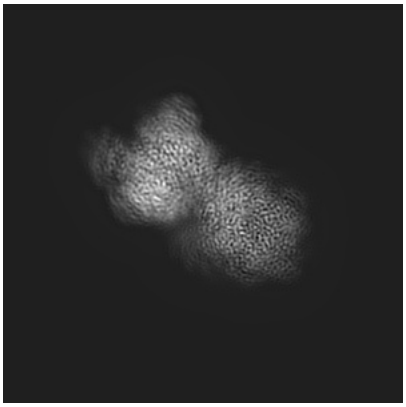
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

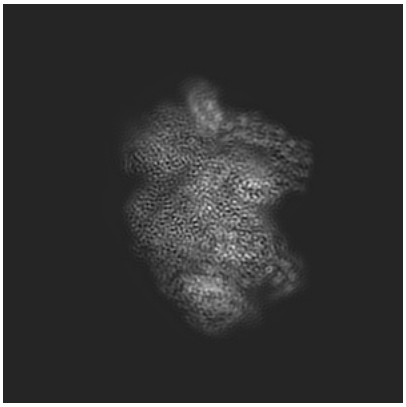
6.1.1 Primary map



X



Y

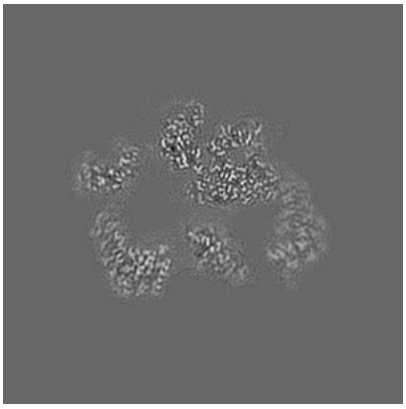


Z

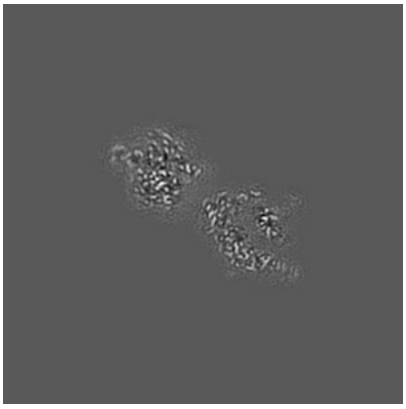
The images above show the map projected in three orthogonal directions.

6.2 Central slices

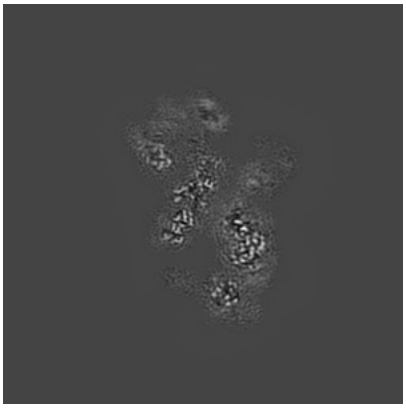
6.2.1 Primary map



X Index: 150



Y Index: 150

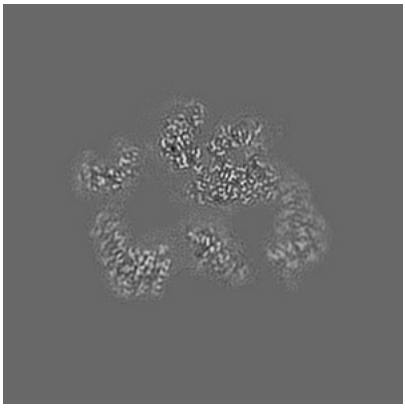


Z Index: 150

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

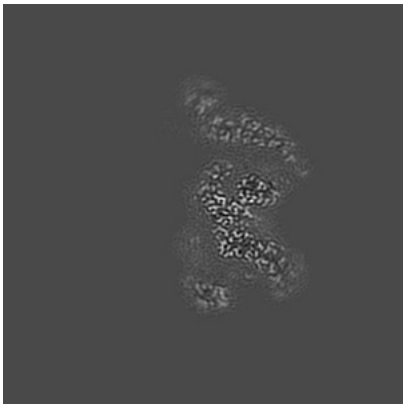
6.3 Largest variance slices (i)

6.3.1 Primary map



X Index: 150

Y Index: 136

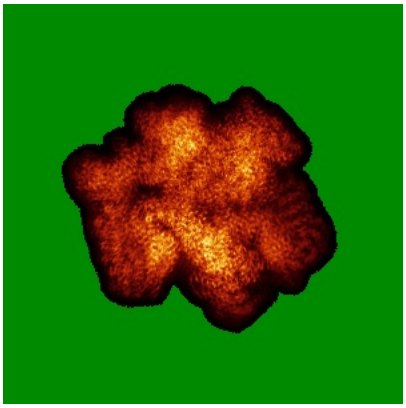


Z Index: 120

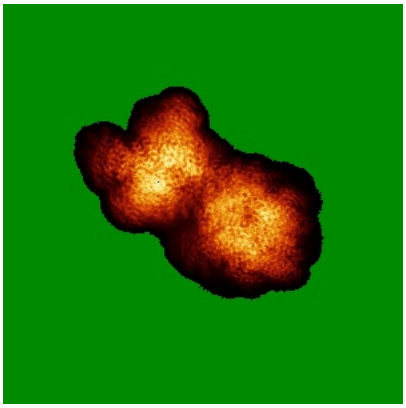
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

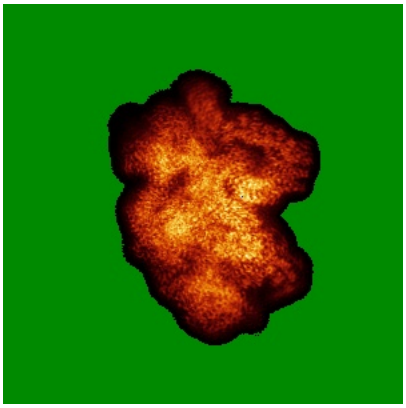
6.4.1 Primary map



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.

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 4.3. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

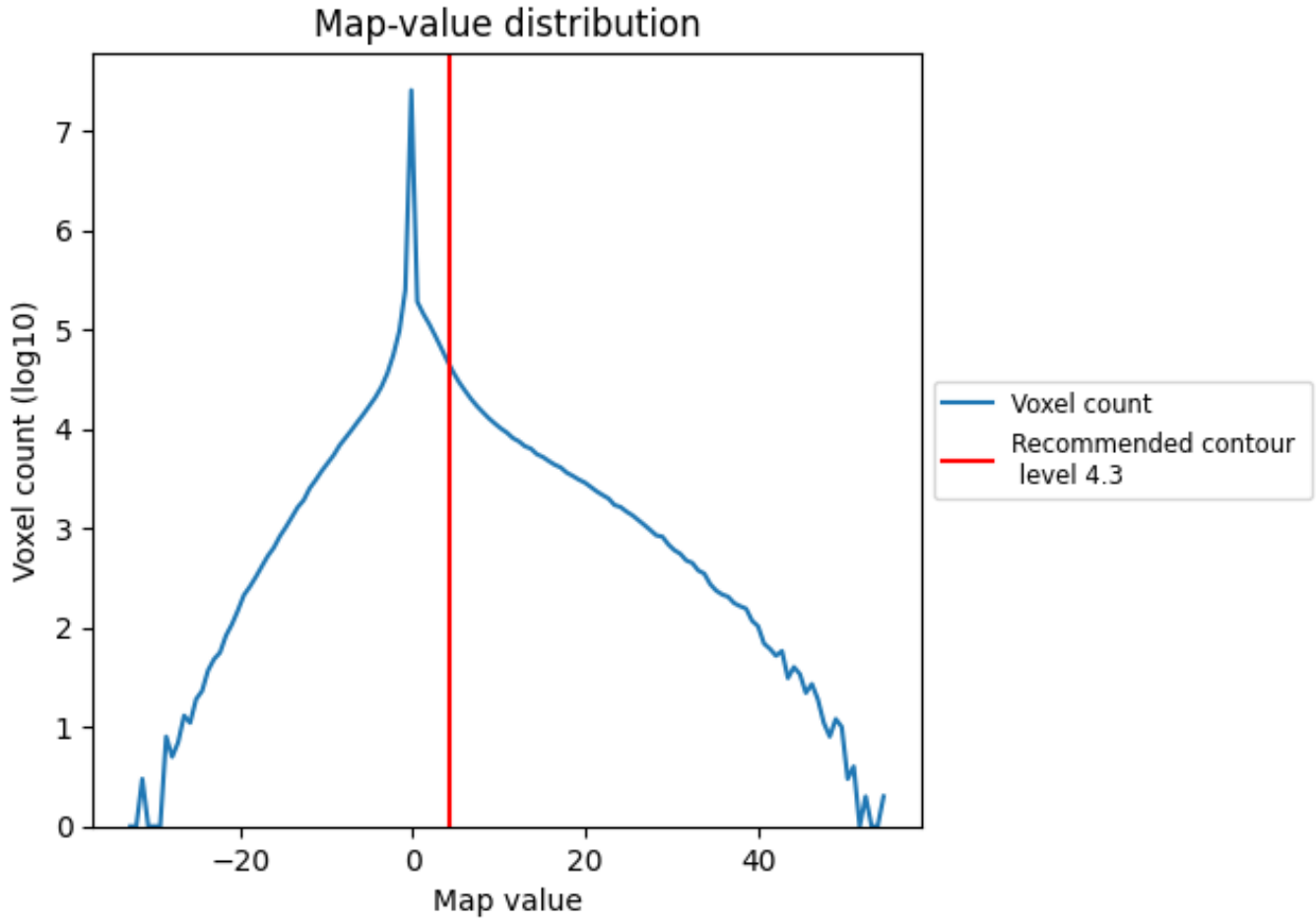
6.6 Mask visualisation (i)

This section was not generated. No masks/segmentation were deposited.

7 Map analysis

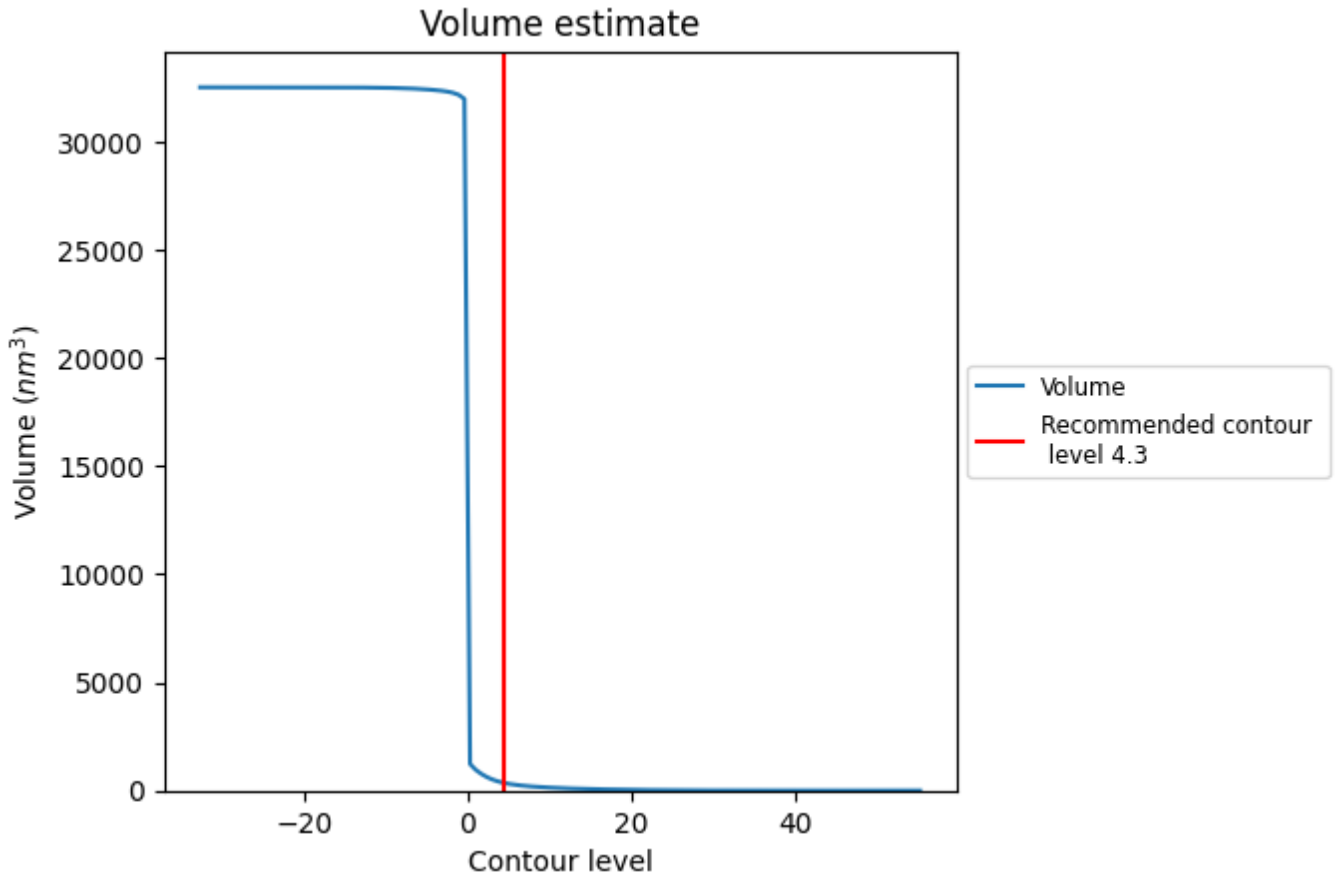
This section contains the results of statistical analysis of the map.

7.1 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.

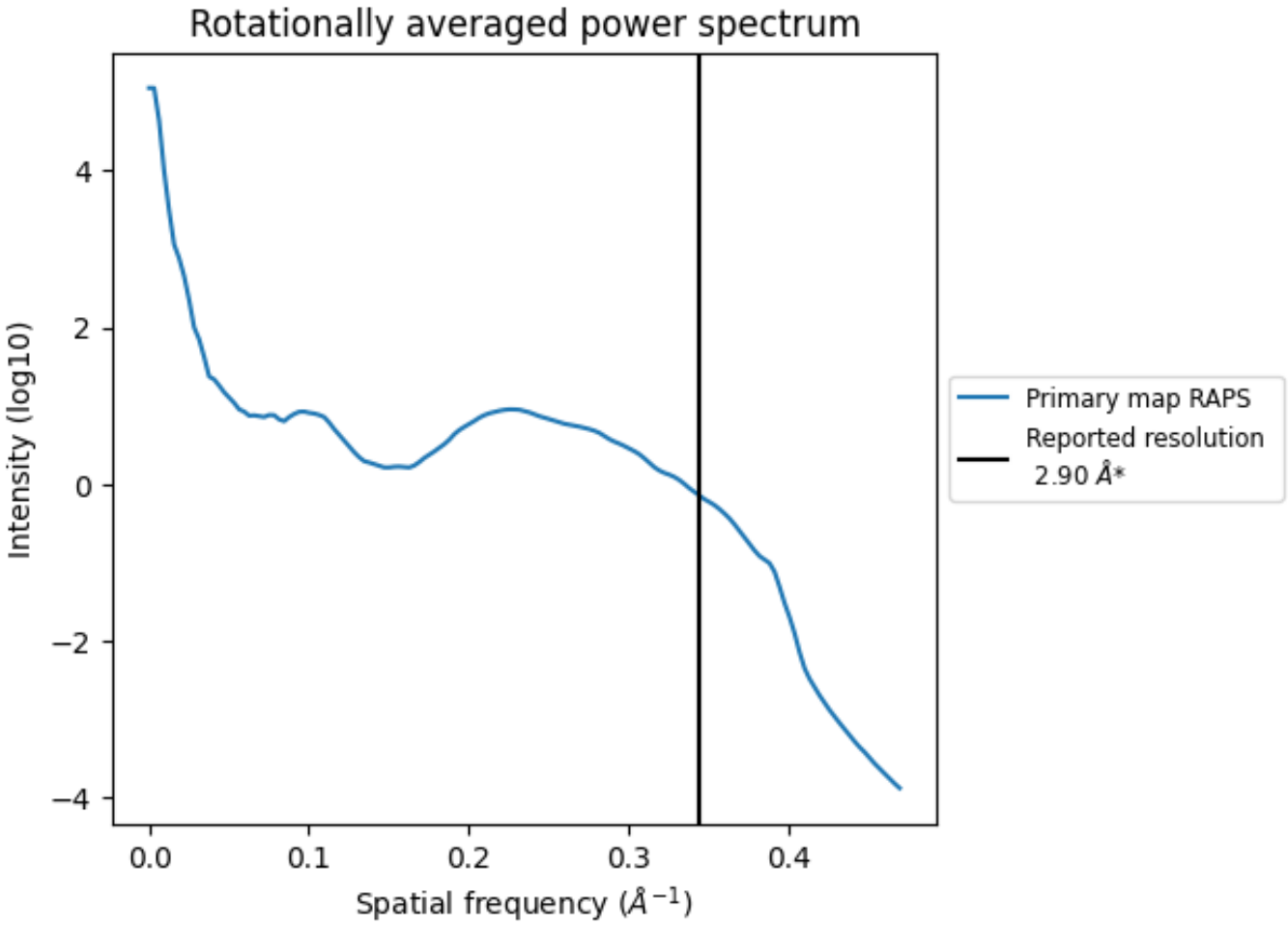
7.2 Volume estimate



The volume at the recommended contour level is 365 nm^3; this corresponds to an approximate mass of 329 kDa.

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.

7.3 Rotationally averaged power spectrum (i)



*Reported resolution corresponds to spatial frequency of 0.345 $Å^{-1}$

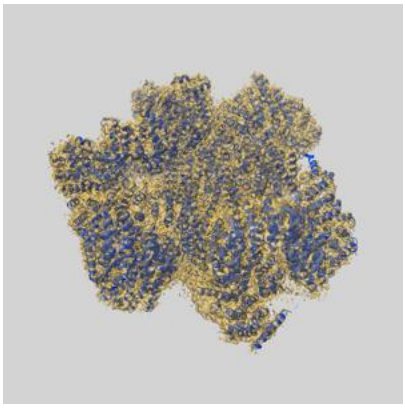
8 Fourier-Shell correlation (i)

This section was not generated. No FSC curve or half-maps provided.

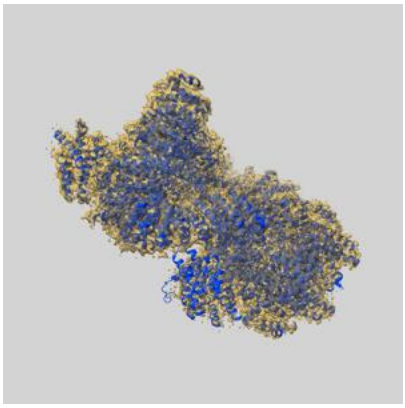
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-76990 and PDB model 13DE. Per-residue inclusion information can be found in section 3 on page 8.

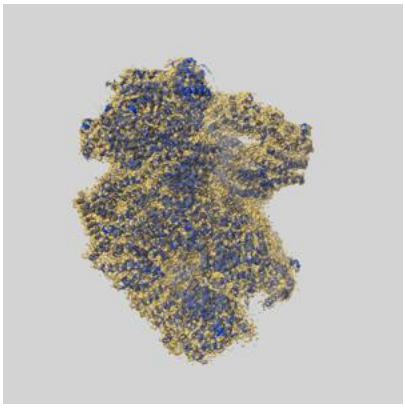
9.1 Map-model overlay



X



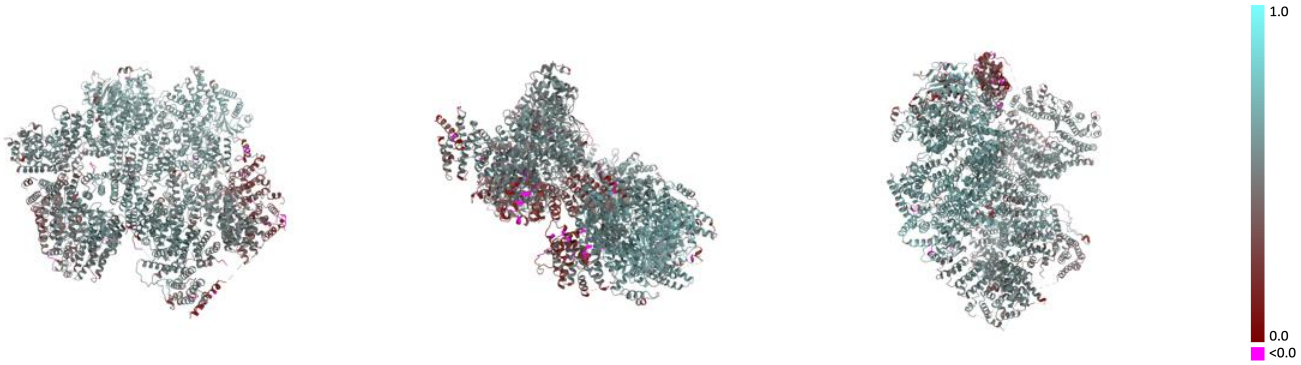
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 4.3 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

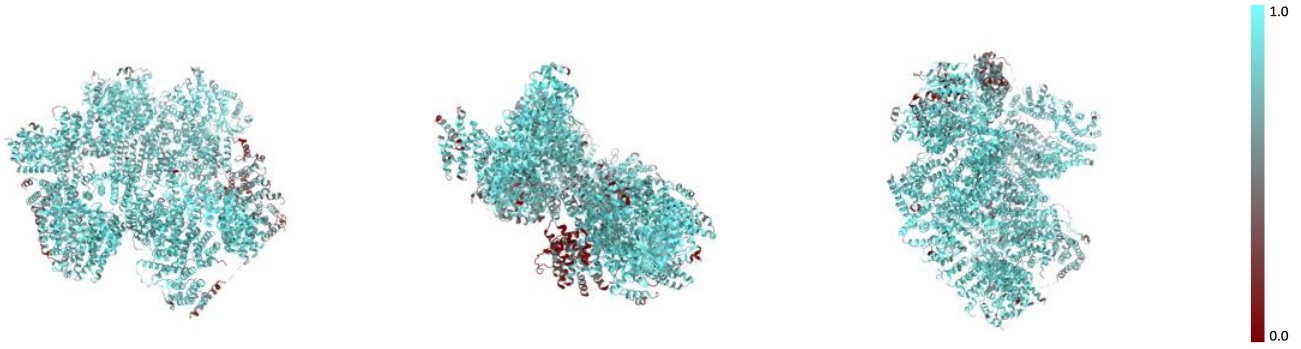
9.2 Q-score mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according 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.

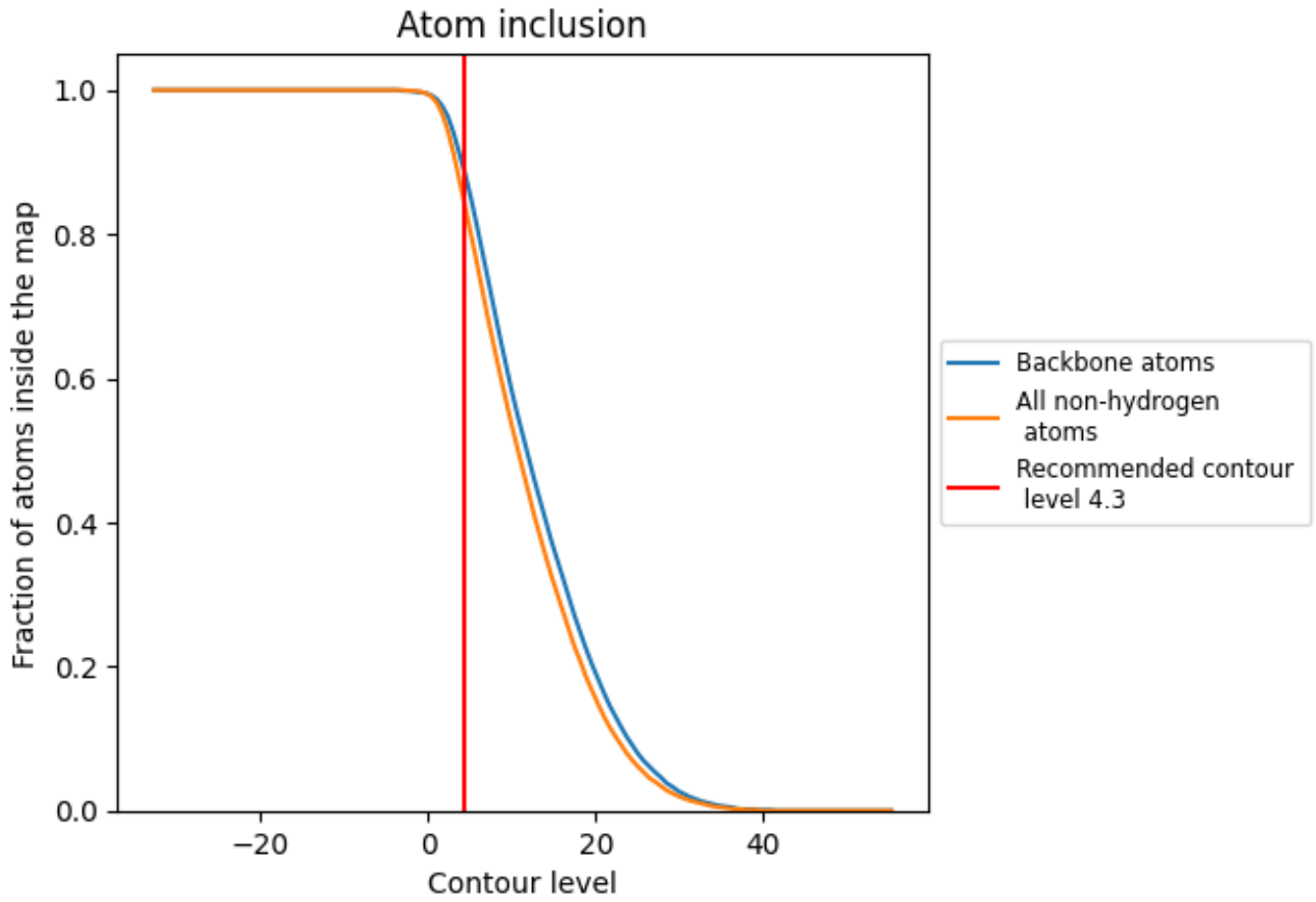
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (4.3).

9.4 Atom inclusion (i)



At the recommended contour level, 89% of all backbone atoms, 84% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (4.3) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8440	0.5250
A	0.8820	0.5560
B	0.8090	0.5060
C	0.8760	0.5190
D	0.8950	0.5230
E	0.5460	0.3940
F	0.3420	0.1450