Full wwPDB EM Validation Report

Apr 14, 2025 – 11:00 am BST

PDB ID	:	9G08 / pdb_00009g08
EMDB ID	:	EMD-50913
Title	:	Structure of human RNF213 bound to the secreted effector IpaH1.4 from Shigella flexneri
Authors	:	Naydenova, K.; Randow, F.
Deposited on	:	2024-07-07
Resolution	:	3.30 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:

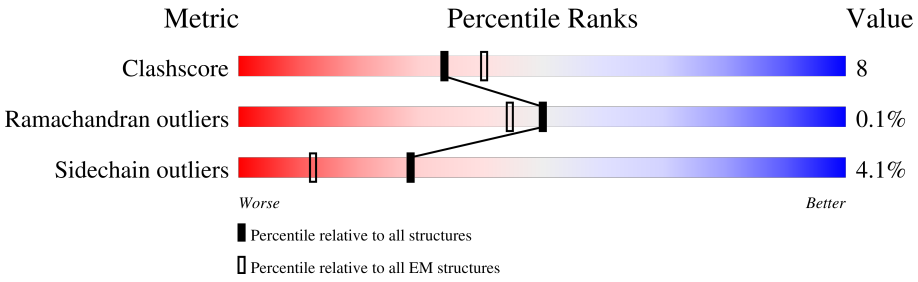
EMDB validation analysis	:	0.0.1.dev117
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.42

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.30 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)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	5247	7% 68% 17% · 14%
2	B	575	8% 27% 14% · 59%

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 77075 atoms, of which 38644 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 E3 ubiquitin-protein ligase RNF213.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	A	4529	73234	23323	36721	6289	6681	220	0	0

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-39	MET	-	initiating methionine	UNP Q63HN8
A	-38	ALA	-	expression tag	UNP Q63HN8
A	-37	SER	-	expression tag	UNP Q63HN8
A	-36	TRP	-	expression tag	UNP Q63HN8
A	-35	SER	-	expression tag	UNP Q63HN8
A	-34	HIS	-	expression tag	UNP Q63HN8
A	-33	PRO	-	expression tag	UNP Q63HN8
A	-32	GLN	-	expression tag	UNP Q63HN8
A	-31	PHE	-	expression tag	UNP Q63HN8
A	-30	GLU	-	expression tag	UNP Q63HN8
A	-29	LYS	-	expression tag	UNP Q63HN8
A	-28	GLY	-	expression tag	UNP Q63HN8
A	-27	SER	-	expression tag	UNP Q63HN8
A	-26	ALA	-	expression tag	UNP Q63HN8
A	-25	GLY	-	expression tag	UNP Q63HN8
A	-24	SER	-	expression tag	UNP Q63HN8
A	-23	ALA	-	expression tag	UNP Q63HN8
A	-22	ALA	-	expression tag	UNP Q63HN8
A	-21	GLY	-	expression tag	UNP Q63HN8
A	-20	SER	-	expression tag	UNP Q63HN8
A	-19	GLY	-	expression tag	UNP Q63HN8
A	-18	ALA	-	expression tag	UNP Q63HN8
A	-17	GLY	-	expression tag	UNP Q63HN8
A	-16	TRP	-	expression tag	UNP Q63HN8
A	-15	SER	-	expression tag	UNP Q63HN8
A	-14	HIS	-	expression tag	UNP Q63HN8
A	-13	PRO	-	expression tag	UNP Q63HN8
A	-12	GLN	-	expression tag	UNP Q63HN8

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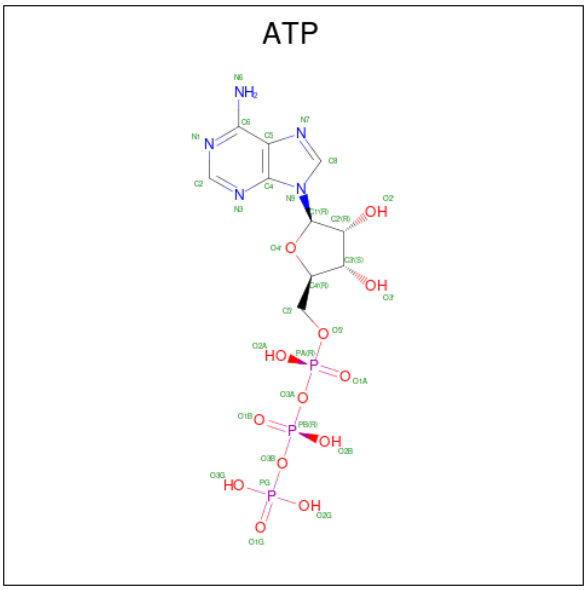
Chain	Residue	Modelled	Actual	Comment	Reference
A	-11	PHE	-	expression tag	UNP Q63HN8
A	-10	GLU	-	expression tag	UNP Q63HN8
A	-9	LYS	-	expression tag	UNP Q63HN8
A	-8	GLU	-	expression tag	UNP Q63HN8
A	-7	ASN	-	expression tag	UNP Q63HN8
A	-6	LEU	-	expression tag	UNP Q63HN8
A	-5	TYR	-	expression tag	UNP Q63HN8
A	-4	PHE	-	expression tag	UNP Q63HN8
A	-3	GLN	-	expression tag	UNP Q63HN8
A	-2	ALA	-	expression tag	UNP Q63HN8
A	-1	MET	-	expression tag	UNP Q63HN8
A	0	SER	-	expression tag	UNP Q63HN8

- Molecule 2 is a protein called E3 ubiquitin-protein ligase IpaH1.4.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
2	B	237	3794	1205	1911	322	349	7	0	0

- Molecule 3 is ADENOSINE-5'-TRIPHOSPHATE (CCD ID: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$).



Mol	Chain	Residues	Atoms						AltConf
			Total	C	H	N	O	P	
3	A	1	43	10	12	5	13	3	0

- Molecule 4 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
4	A	1	Total	Mg	0
			1	1	

- Molecule 5 is ZINC ION (CCD ID: ZN) (formula: Zn).

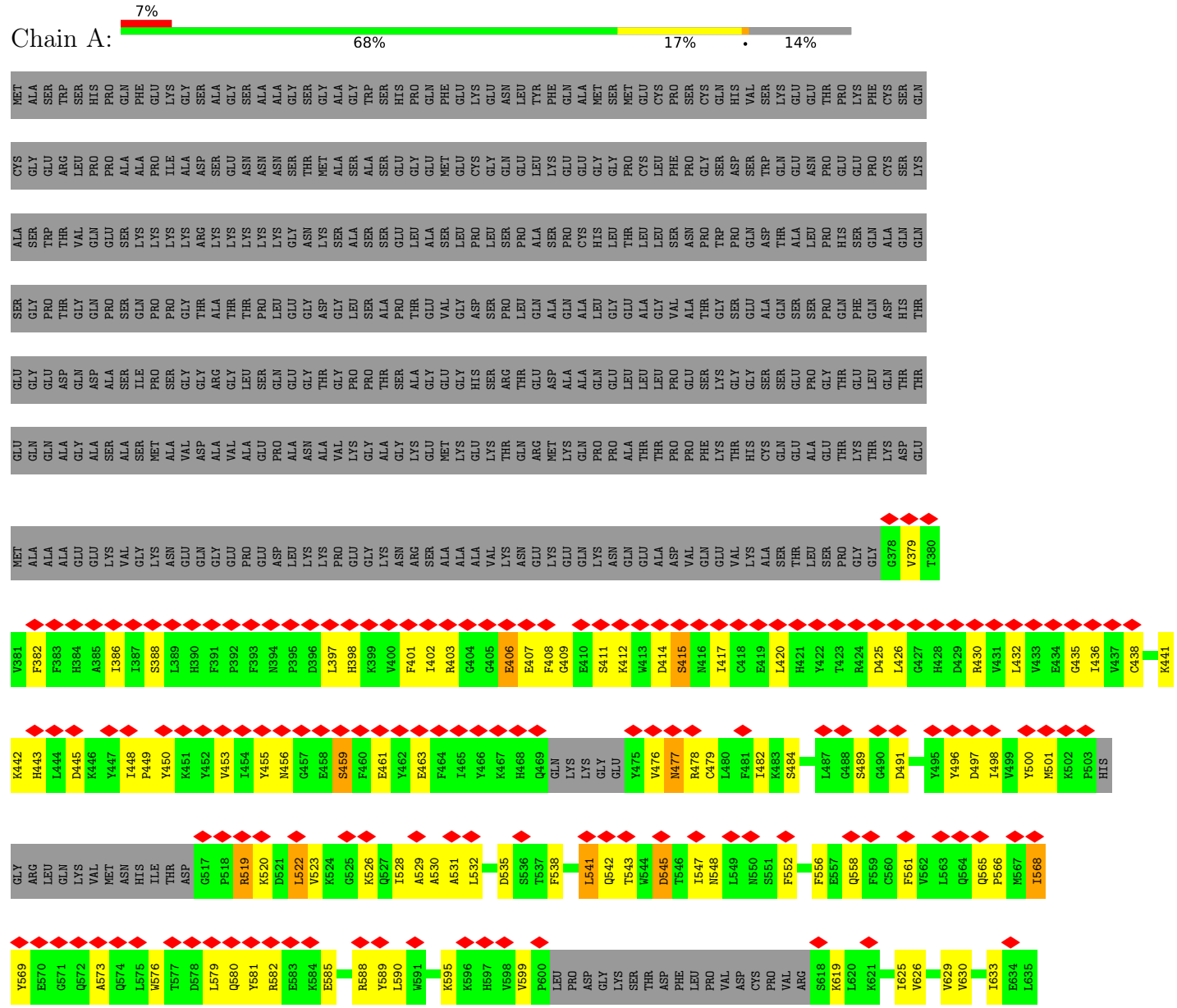
Mol	Chain	Residues	Atoms		AltConf
5	A	3	Total	Zn	0
			3	3	

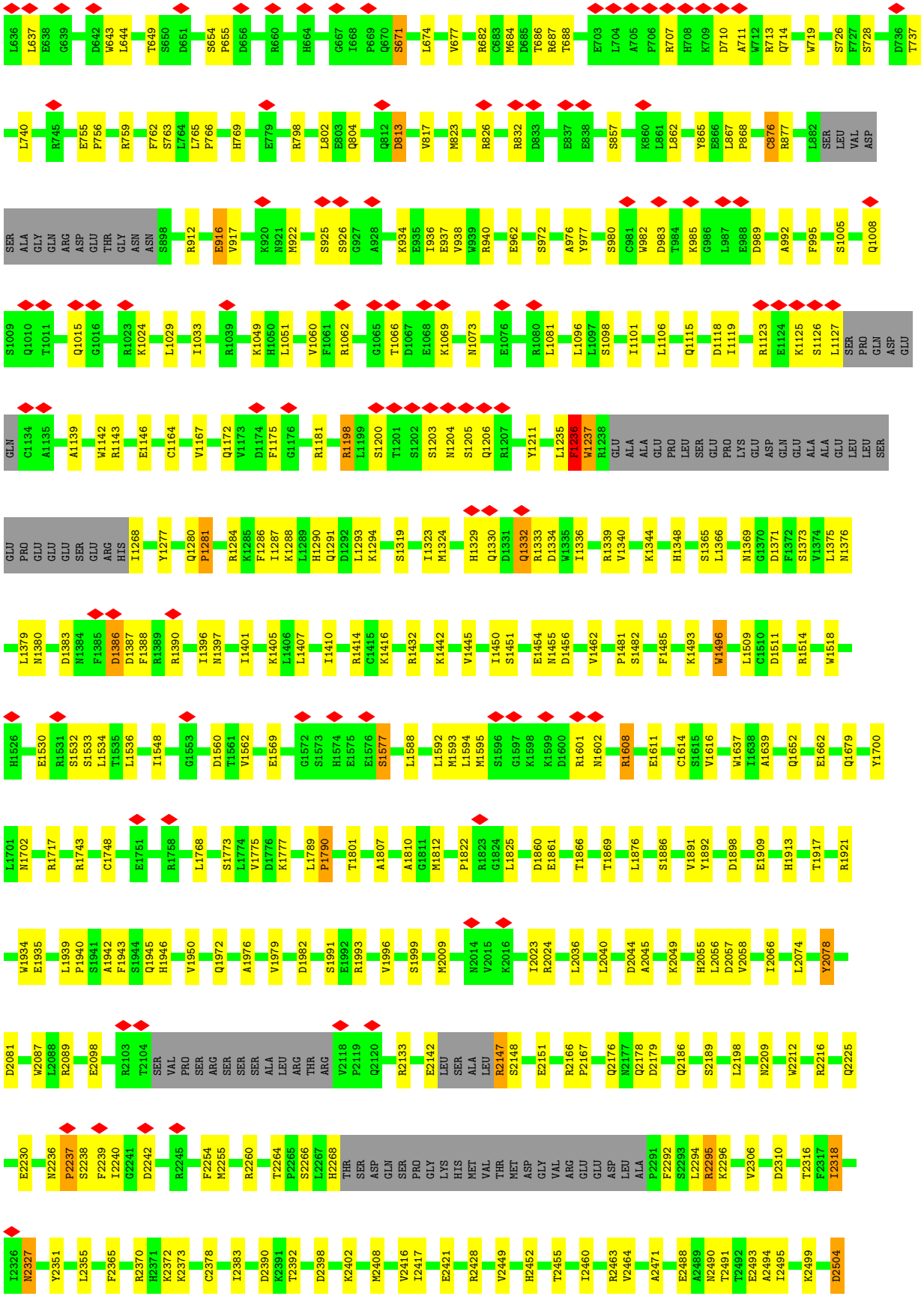
3 Residue-property plots (i)

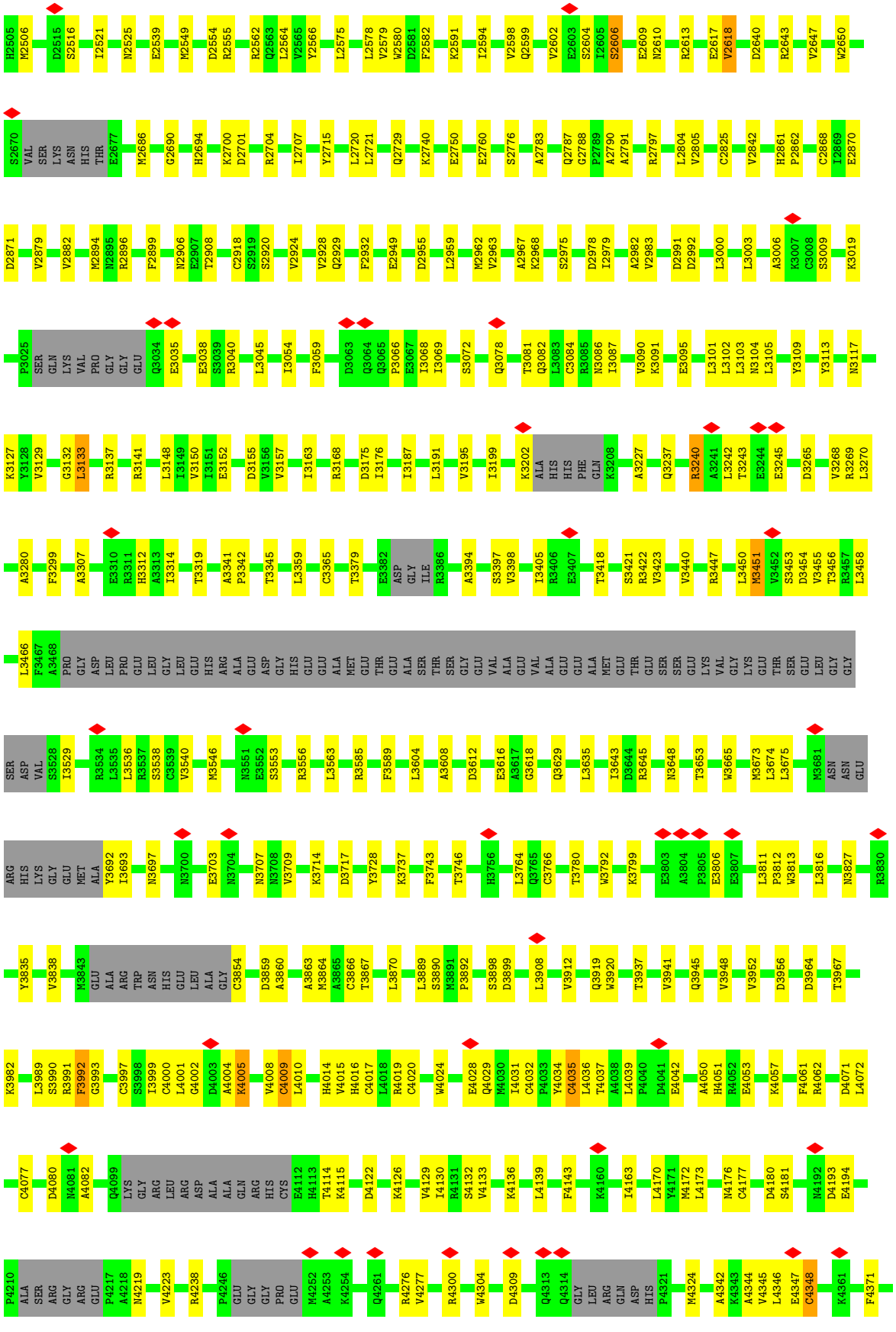
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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.

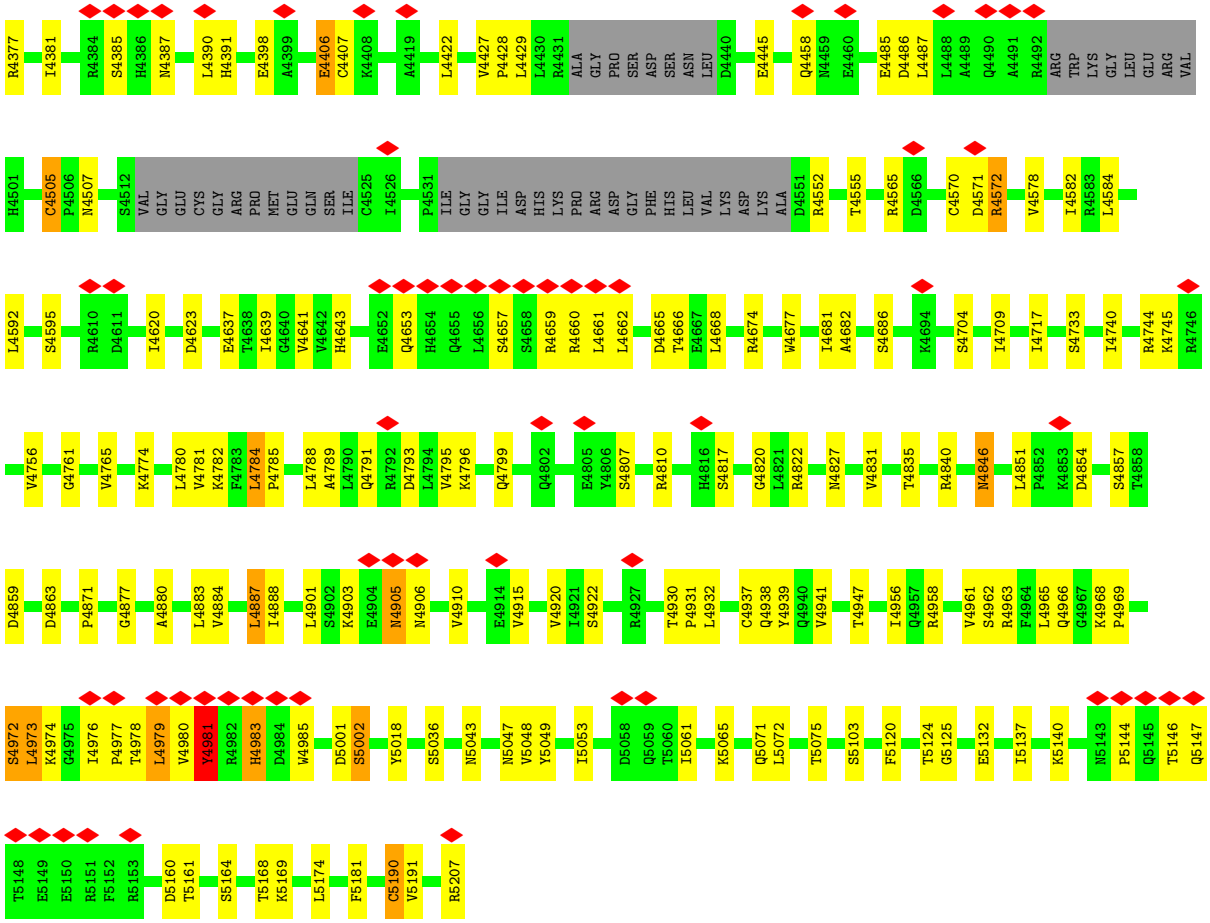
- Molecule 1: E3 ubiquitin-protein ligase RNF213

Chain A:



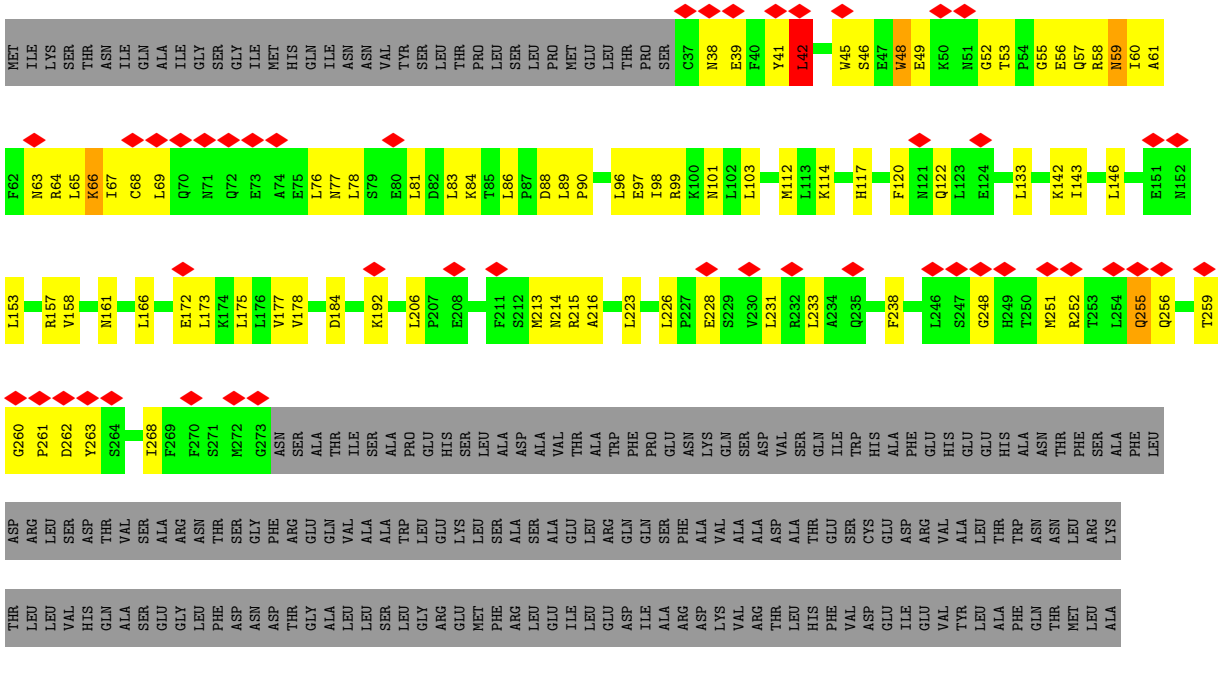

L636 L637 E638 G639 D642 W643 L644 T649 S650 D651 S654 P655 D656 R660 H664 G667 I668 P669 Q670 S671 L674 V677 R682 C683 M684 D685 T686 R687 T688 E703 L704 A705 P706 R707 H708 K709 D710 A711 W712 R713 Q714 W719 S726 F727 S728 D736 T737
L740 R745 E755 P756 R759 F762 S763 L764 L765 P766 H769 E779 R798 L802 E803 Q804 Q812 D813 V817 M823 R826 R832 D833 E837 E838 S857 K860 L861 L862 Y865 E866 L867 P868 C876 R877 L882 SER LEU VAL ASP
SER ALA GLY GLN ARG ASP GLU THR GLY ASN ASN S898 R912 E916 V917 K920 N921 M922 S925 S926 G927 A928 K934 E935 I936 E937 V938 W939 R940 E962 S972 A976 Y977 S980 C981 W982 D983 T984 K985 G986 L987 E988 D989 A992 F995 S1005 Q1008
S1009 Q1010 T1011 Q1015 G1016 R1023 K1024 L1029 I1033 R1039 K1049 H1050 L1051 V1060 F1061 R1062 G1065 T1066 D1067 E1068 K1069 N1073 E1076 R1080 L1081 L1096 L1097 S1098 I1101 L1106 Q1115 D1118 I1119 R1123 E1124 K1125 S1126 L1127 SER PRO GLN ASP GLU
GLN C1134 A1135 A1139 W1142 R1143 E1146 C1164 V1167 Q1172 V1173 D1174 F1175 G1176 R1181 R1198 L1199 S1200 T1201 S1202 S1203 N1204 S1205 Q1206 R1207 Y1211 L1235 F1236 W1237 R1238 GLU ALA ALA GLU PRO LEU SER GLU PRO LYS GLU ASP GLN GLU ALA ALA GLU LEU LEU SER
GLU PRO GLU GLU GLU SER GLU ARG HIS I1268 Y1277 Q1280 P1281 R1284 K1285 F1286 I1287 K1288 L1289 H1290 Q1291 D1292 L1293 K1294 S1319 I1323 M1324 H1329 Q1330 D1331 Q1332 R1333 D1334 W1335 I1336 R1339 V1340 K1344 H1348 S1365 L1366 N1369 G1370 D1371 F1372 S1373 V1374 L1375 N1376
L1379 N1380 D1383 N1384 F1385 D1386 D1387 F1388 R1389 R1390 I1396 N1397 I1401 K1405 L1406 L1407 I1410 R1414 C1415 K1416 R1432 K1442 V1445 I1450 S1451 E1454 N1455 D1456 V1462 P1481 S1482 F1485 K1493 W1496 L1509 C1510 D1511 R1514 W1518
H1526 E1530 R1531 S1532 S1533 L1534 T1535 L1536 I1548 G1553 D1560 T1561 V1562 E1569 G1572 S1573 H1574 E1575 E1576 S1577 L1588 L1592 M1593 L1594 M1595 S1596 G1597 K1598 K1599 D1600 R1601 N1602 R1608 E1611 C1614 S1615 V1616 W1637 I1638 A1639 Q1652 E1662 Q1679 Y1700
L1701 N1702 R1717 R1743 C1748 E1751 R1758 L1768 S1773 L1774 V1775 D1776 K1777 L1789 P1790 T1801 A1807 A1810 G1811 M1812 P1822 R1823 G1824 L1825 D1860 E1861 T1866 T1869 L1876 S1886 V1891 Y1892 D1898 E1909 H1913 T1917 R1921
W1934 E1935 L1939 P1940 S1941 A1942 F1943 S1944 Q1945 H1946 V1950 Q1972 A1976 V1979 D1982 S1991 E1992 R1993 V1996 S1999 M2009 N2014 V2015 K2016 I2023 R2024 L2036 L2040 D2044 A2045 K2049 H2055 L2056 D2057 V2058 I2066 L2074 Y2078
D2081 W2087 L2088 R2089 E2098 R2103 T2104 SER VAL PRO SER ARG SER SER SER ALA LEU ARG THR ARG V2118 P2119 Q2120 R2133 E2142 LEU SER ALA LEU R2147 S2148 E2151 R2166 P2167 Q2176 N2177 Q2178 D2179 Q2186 S2189 L2198 N2209 W2212 R2216 Q2225
E2230 N2236 P2237 S2238 F2239 I2240 G2241 D2242 R2245 F2254 M2255 R2260 T2264 P2265 S2266 L2267 H2268 THR SER ASP GLN SER PRO GLY LYS HIS MET VAL THR MET ASP GLY VAL ARG GLU GLU ASP LEU ALA P2291 F2292 S2293 L2294 R2295 K2296 V2306 D2310 T2316 F2317 I2318
I2326 N2327 Y2351 L2355 F2365 R2370 H2371 K2372 K2373 C2378 I2383 D2390 K2391 T2392 D2398 K2402 M2408 V2416 I2417 E2421 R2428 V2449 H2452 T2455 I2460 R2463 V2464 A2471 E2488 A2489 N2490 T2491 T2492 E2493 A2494 I2495 K2499 D2504





• Molecule 2: E3 ubiquitin-protein ligase IpaH1.4

Chain B:



GLU LYS LEU GLN LEU SER THR ALA VAL LYS GLU MET ARG PHE TYR GLY VAL SER GLY VAL THR ALA ASN ASP LEU ARG THR ALA GLU ALA MET VAL ARG SER ARG GLU GLU ASN GLU PHE THR ASP TRP PHE SER LEU TRP GLY PRO TRP HIS ALA VAL LEU LYS ARG THR GLU ALA ASP

ARG TRP ALA GLN ALA GLU GLU GLN LYS TYR GLU MET LEU GLU ASN GLU TYR SER GLN ARG VAL ALA ASP ARG LEU LYS ALA SER GLY LEU SER GLY ASP ALA ASP ALA GLU ARG GLU ALA GLY ALA GLN VAL MET ARG GLU THR GLU GLN GLN ILE TYR ARG GLN LEU THR ASP GLU VAL

LEU ALA LEU ARG LEU SER GLU ASN GLY SER ASN HIS ILE ALA

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	334921	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 ($e^-/Å^2$)	32	Depositor
Minimum defocus (nm)	700	Depositor
Maximum defocus (nm)	3500	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	8.673	Depositor
Minimum map value	0.000	Depositor
Average map value	0.007	Depositor
Map value standard deviation	0.103	Depositor
Recommended contour level	0.8	Depositor
Map size (Å)	471.552, 471.552, 471.552	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.228, 1.228, 1.228	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, ATP, 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	0.33	0/37285	0.47	0/50439
2	B	0.28	0/1927	0.52	1/2629 (0.0%)
All	All	0.33	0/39212	0.48	1/53068 (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	3
2	B	0	1
All	All	0	4

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	42	LEU	CA-CB-CG	8.03	133.76	115.30

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	2237	PRO	Peptide
1	A	4981	TYR	Peptide
1	A	580	GLN	Peptide
2	B	120	PHE	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	36513	36721	36694	561	0
2	B	1883	1911	1910	62	0
3	A	31	12	12	1	0
4	A	1	0	0	0	0
5	A	3	0	0	0	0
All	All	38431	38644	38616	619	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 8.

All (619) 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:A:1511:ASP:OD1	1:A:1514:ARG:NH1	1.93	1.02
1:A:5061:ILE:O	1:A:5065:LYS:NZ	2.05	0.89
1:A:1198:ARG:NH1	1:A:1200:SER:OG	2.06	0.89
1:A:386:ILE:HD11	1:A:529:ALA:HB2	1.55	0.88
1:A:4817:SER:O	1:A:4822:ARG:NH2	2.05	0.88
1:A:4132:SER:OG	1:A:4177:CYS:SG	2.33	0.87
1:A:2365:PHE:O	1:A:2373:LYS:NZ	2.09	0.86
1:A:4036:LEU:HD22	2:B:175:LEU:HD13	1.56	0.85
1:A:4941:VAL:HG22	1:A:4947:THR:HG22	1.56	0.84
1:A:4901:LEU:O	1:A:4903:LYS:NZ	2.10	0.84
1:A:2074:LEU:O	1:A:2089:ARG:NH2	2.10	0.83
1:A:4176:ASN:OD1	1:A:4744:ARG:NE	2.10	0.83
1:A:916:GLU:OE2	1:A:916:GLU:N	2.13	0.81
1:A:2260:ARG:O	1:A:2264:THR:OG1	1.98	0.81
1:A:1594:LEU:O	1:A:3091:LYS:NZ	2.12	0.81
2:B:97:GLU:OE1	2:B:99:ARG:NH2	2.14	0.81
1:A:3117:ASN:OD1	1:A:3168:ARG:NE	2.14	0.80
1:A:1181:ARG:NH2	1:A:1211:TYR:O	2.16	0.79
1:A:4016:HIS:NE2	1:A:4032:CYS:SG	2.56	0.79
2:B:78:LEU:O	2:B:101:ASN:ND2	2.15	0.79
1:A:3006:ALA:O	1:A:3009:SER:OG	2.01	0.79
1:A:2142:GLU:OE1	1:A:2147:ARG:NH2	2.18	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4015:VAL:O	1:A:4016:HIS:ND1	2.19	0.76
1:A:1118:ASP:OD2	1:A:1119:ILE:N	2.19	0.76
1:A:3103:LEU:O	1:A:3105:LEU:N	2.19	0.75
1:A:4592:LEU:O	1:A:4595:SER:OG	2.05	0.74
1:A:4194:GLU:OE2	1:A:4238:ARG:NH1	2.21	0.74
1:A:2166:ARG:NH2	1:A:2230:GLU:OE1	2.20	0.74
1:A:4406:GLU:N	1:A:4406:GLU:OE2	2.21	0.74
2:B:67:ILE:HD12	2:B:68:CYS:N	2.03	0.74
1:A:4941:VAL:CG2	1:A:4947:THR:HG22	2.18	0.73
1:A:545:ASP:OD1	1:A:547:ILE:HG22	1.88	0.73
2:B:213:MET:SD	2:B:215:ARG:N	2.61	0.73
1:A:3674:LEU:O	1:A:3714:LYS:NZ	2.19	0.72
1:A:3941:VAL:HG12	1:A:4057:LYS:CD	2.18	0.72
1:A:4031:ILE:HG22	1:A:4039:LEU:HB2	1.71	0.72
1:A:5043:ASN:O	1:A:5071:GLN:NE2	2.23	0.71
1:A:3645:ARG:O	1:A:3697:ASN:ND2	2.22	0.71
1:A:4784:LEU:HD21	1:A:4884:VAL:HA	1.72	0.71
1:A:1822:PRO:HD2	1:A:1825:LEU:HD12	1.71	0.71
1:A:2975:SER:N	1:A:2978:ASP:OD2	2.24	0.71
1:A:4810:ARG:NH2	1:A:4863:ASP:OD1	2.23	0.71
1:A:3941:VAL:HG12	1:A:4057:LYS:HD3	1.73	0.70
1:A:456:ASN:OD1	1:A:459:SER:N	2.24	0.70
1:A:2268:HIS:O	1:A:2295:ARG:NH2	2.24	0.70
1:A:3069:ILE:HG22	1:A:3105:LEU:CD1	2.21	0.70
1:A:3345:THR:HG21	1:A:3365:CYS:SG	2.30	0.70
1:A:1375:LEU:HD21	1:A:1485:PHE:CZ	2.27	0.70
1:A:543:THR:OG1	1:A:548:ASN:OD1	2.07	0.70
1:A:2176:GLN:OE1	1:A:2178:GLN:NE2	2.25	0.69
2:B:122:GLN:OE1	2:B:142:LYS:NZ	2.22	0.69
1:A:1768:LEU:O	1:A:1777:LYS:NZ	2.26	0.68
1:A:2618:VAL:CG2	1:A:2707:ILE:HG23	2.24	0.68
1:A:386:ILE:HD12	1:A:498:ILE:HD13	1.74	0.68
1:A:1913:HIS:O	1:A:1917:THR:HG23	1.92	0.68
1:A:4965:LEU:O	1:A:4966:GLN:NE2	2.27	0.67
1:A:1280:GLN:OE1	1:A:1284:ARG:NE	2.28	0.67
1:A:1886:SER:OG	1:A:1921:ARG:NH2	2.28	0.67
1:A:2549:MET:O	1:A:2555:ARG:NH2	2.28	0.67
1:A:2370:ARG:NH1	1:A:2390:ASP:O	2.28	0.67
1:A:585:GLU:OE2	1:A:585:GLU:N	2.27	0.67
2:B:97:GLU:OE2	2:B:117:HIS:ND1	2.27	0.66
1:A:1332:GLN:O	1:A:1334:ASP:N	2.28	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3095:GLU:OE1	1:A:3141:ARG:NH1	2.28	0.66
1:A:4000:CYS:SG	1:A:4005:LYS:NZ	2.68	0.66
2:B:213:MET:HE3	2:B:216:ALA:HB2	1.76	0.66
1:A:3242:LEU:HD12	1:A:3243:THR:N	2.11	0.66
1:A:1029:LEU:HD11	1:A:1060:VAL:HG22	1.79	0.65
1:A:3948:VAL:O	1:A:3952:VAL:HG23	1.97	0.65
1:A:4036:LEU:HD22	2:B:175:LEU:CD1	2.25	0.65
1:A:925:SER:O	1:A:972:SER:OG	2.12	0.65
1:A:4784:LEU:HD22	1:A:4887:LEU:HD23	1.77	0.65
1:A:5001:ASP:OD2	1:A:5002:SER:N	2.30	0.65
2:B:48:TRP:O	2:B:58:ARG:NH2	2.30	0.65
1:A:4744:ARG:NH1	1:A:4939:TYR:OH	2.30	0.65
1:A:3717:ASP:OD2	1:A:4796:LYS:NZ	2.21	0.64
1:A:2392:THR:OG1	1:A:2428:ARG:NH1	2.30	0.64
1:A:719:TRP:O	1:A:759:ARG:NH2	2.30	0.64
1:A:4133:VAL:HG22	1:A:4938:GLN:NE2	2.13	0.64
1:A:530:ALA:HB3	1:A:590:LEU:HD21	1.79	0.64
1:A:1387:ASP:OD1	1:A:1388:PHE:N	2.30	0.63
1:A:1569:GLU:OE2	1:A:1577:SER:N	2.31	0.63
2:B:60:ILE:HA	2:B:63:ASN:OD1	1.99	0.63
1:A:1942:ALA:O	1:A:1945:GLN:NE2	2.32	0.63
1:A:3863:ALA:O	1:A:3867:THR:HG23	1.99	0.63
1:A:2618:VAL:HG23	1:A:2707:ILE:HG23	1.80	0.63
2:B:213:MET:CE	2:B:216:ALA:HB2	2.28	0.63
2:B:158:VAL:O	2:B:161:ASN:ND2	2.32	0.62
1:A:535:ASP:OD1	1:A:535:ASP:N	2.28	0.62
1:A:976:ALA:O	1:A:980:SER:OG	2.17	0.62
1:A:1235:LEU:O	1:A:1237:TRP:N	2.33	0.62
1:A:2133:ARG:NE	1:A:2151:GLU:OE1	2.31	0.62
1:A:2490:ASN:HA	1:A:2495:ILE:HD12	1.81	0.62
1:A:2268:HIS:O	1:A:2268:HIS:ND1	2.33	0.61
1:A:4584:LEU:HD11	1:A:4620:ILE:HG23	1.82	0.61
1:A:1976:ALA:O	1:A:1979:VAL:HG22	2.01	0.60
1:A:4565:ARG:NH1	1:A:4623:ASP:OD1	2.33	0.60
1:A:411:SER:OG	1:A:414:ASP:OD2	2.20	0.60
1:A:426:LEU:HD13	1:A:432:LEU:HB2	1.84	0.60
1:A:3964:ASP:O	1:A:3967:THR:OG1	2.18	0.60
1:A:379:VAL:HG23	1:A:441:LYS:HA	1.83	0.60
1:A:4035:CYS:SG	1:A:4037:THR:OG1	2.54	0.60
1:A:1548:ILE:HG23	1:A:1562:VAL:CG1	2.31	0.60
1:A:2186:GLN:O	1:A:2189:SER:OG	2.17	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:450:TYR:O	1:A:478:ARG:HB2	2.01	0.59
1:A:2539:GLU:OE2	1:A:2562:ARG:NH1	2.35	0.59
1:A:4062:ARG:NE	1:A:4122:ASP:OD2	2.36	0.59
1:A:2044:ASP:OD1	1:A:2045:ALA:N	2.35	0.59
1:A:2055:HIS:NE2	1:A:2098:GLU:OE1	2.36	0.59
1:A:619:LYS:NZ	1:A:649:THR:O	2.35	0.59
1:A:4781:VAL:HG13	1:A:4887:LEU:CD1	2.33	0.59
1:A:4485:GLU:OE2	1:A:4572:ARG:NH1	2.33	0.58
1:A:4979:LEU:HD23	1:A:4980:VAL:H	1.68	0.58
2:B:55:GLY:O	2:B:57:GLN:NE2	2.36	0.58
1:A:4781:VAL:HG13	1:A:4887:LEU:HD13	1.84	0.58
1:A:737:THR:HG1	1:A:769:HIS:CD2	2.22	0.58
1:A:4871:PRO:HD2	1:A:4973:LEU:HD11	1.84	0.58
1:A:2783:ALA:HB2	1:A:2804:LEU:HD11	1.86	0.58
1:A:5120:PHE:O	1:A:5124:THR:OG1	2.12	0.58
1:A:407:GLU:HB2	1:A:449:PRO:HD2	1.86	0.57
1:A:4130:ILE:HD11	1:A:4163:ILE:HD11	1.86	0.57
1:A:498:ILE:HG21	1:A:500:TYR:CZ	2.38	0.57
1:A:740:LEU:HD23	1:A:765:LEU:HD23	1.86	0.57
1:A:2602:VAL:O	1:A:2606:SER:N	2.35	0.57
1:A:1982:ASP:OD1	1:A:1982:ASP:N	2.35	0.57
1:A:3989:LEU:HD13	1:A:4057:LYS:HB2	1.85	0.57
1:A:4505:CYS:SG	1:A:4507:ASN:N	2.76	0.57
2:B:42:LEU:HA	2:B:45:TRP:CE3	2.39	0.57
1:A:386:ILE:HD12	1:A:498:ILE:CD1	2.35	0.57
1:A:398:HIS:HB3	1:A:455:TYR:O	2.05	0.57
1:A:1455:ASN:OD1	1:A:1456:ASP:N	2.38	0.57
1:A:637:LEU:HD11	1:A:644:LEU:HD23	1.85	0.57
1:A:3175:ASP:OD1	1:A:3176:ILE:N	2.38	0.57
2:B:252:ARG:O	2:B:255:GLN:HG3	2.05	0.57
1:A:2928:VAL:HG12	1:A:2932:PHE:CE1	2.39	0.57
2:B:213:MET:SD	2:B:214:ASN:N	2.78	0.57
1:A:1386:ASP:O	1:A:1390:ARG:NE	2.38	0.57
1:A:1860:ASP:OD1	1:A:1861:GLU:N	2.38	0.57
1:A:3265:ASP:OD2	1:A:3269:ARG:NH2	2.37	0.57
1:A:4584:LEU:CD1	1:A:4620:ILE:HG23	2.35	0.56
1:A:633:ILE:HG22	1:A:633:ILE:O	2.05	0.56
1:A:2236:ASN:ND2	1:A:2237:PRO:O	2.39	0.56
1:A:3045:LEU:HD22	1:A:3157:VAL:HG21	1.87	0.56
1:A:630:VAL:HG21	1:A:637:LEU:HD21	1.88	0.56
1:A:977:TYR:O	1:A:1024:LYS:NZ	2.31	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4024:TRP:NE1	1:A:4029:GLN:O	2.39	0.56
1:A:4445:GLU:OE1	1:A:4643:HIS:NE2	2.38	0.56
2:B:206:LEU:HB3	2:B:226:LEU:HD22	1.88	0.56
1:A:3997:CYS:N	1:A:4002:GLY:O	2.35	0.56
1:A:531:ALA:O	1:A:535:ASP:OD1	2.24	0.56
1:A:4276:ARG:NE	1:A:4304:TRP:O	2.37	0.56
2:B:53:THR:OG1	2:B:84:LYS:NZ	2.36	0.56
1:A:3990:SER:O	1:A:3993:GLY:N	2.35	0.56
1:A:940:ARG:HH12	1:A:992:ALA:HB2	1.69	0.56
1:A:1376:ASN:O	1:A:1380:ASN:N	2.35	0.56
1:A:3941:VAL:HG12	1:A:4057:LYS:HD2	1.87	0.56
1:A:4888:ILE:HG12	1:A:4969:PRO:HG2	1.89	0.55
2:B:89:LEU:HB3	2:B:90:PRO:HD2	1.88	0.55
1:A:491:ASP:O	1:A:558:GLN:NE2	2.39	0.55
1:A:3069:ILE:HG22	1:A:3105:LEU:HD12	1.87	0.55
1:A:3087:ILE:HG12	1:A:3133:LEU:HD23	1.88	0.55
1:A:3982:LYS:HA	1:A:4061:PHE:CE1	2.43	0.54
1:A:3202:LYS:HG2	1:A:3270:LEU:HD21	1.89	0.54
1:A:4139:LEU:HB3	1:A:4181:SER:HB2	1.89	0.54
1:A:4387:ASN:HB3	1:A:4390:LEU:HD13	1.88	0.54
2:B:64:ARG:O	2:B:67:ILE:HG13	2.08	0.54
2:B:103:LEU:O	2:B:122:GLN:N	2.36	0.54
1:A:3556:ARG:NH2	1:A:3703:GLU:OE2	2.36	0.54
1:A:3709:VAL:HG23	1:A:3766:CYS:HB3	1.90	0.54
1:A:1051:LEU:O	1:A:1115:GLN:NE2	2.38	0.54
1:A:2787:GLN:O	1:A:2791:ALA:N	2.41	0.54
1:A:1293:LEU:O	1:A:1339:ARG:NE	2.40	0.54
1:A:674:LEU:O	1:A:677:VAL:HG12	2.08	0.53
1:A:2225:GLN:HB3	1:A:2255:MET:SD	2.48	0.53
1:A:1530:GLU:O	1:A:1532:SER:OG	2.27	0.53
2:B:223:LEU:HD22	2:B:226:LEU:HD21	1.90	0.53
1:A:3072:SER:O	1:A:3078:GLN:NE2	2.42	0.53
1:A:3806:GLU:OE2	1:A:3806:GLU:N	2.42	0.53
1:A:936:ILE:HG22	1:A:985:LYS:HE2	1.91	0.52
1:A:1235:LEU:O	1:A:1237:TRP:CD1	2.63	0.52
1:A:3102:LEU:HD12	1:A:3150:VAL:HG22	1.92	0.52
1:A:4980:VAL:O	1:A:4985:TRP:HA	2.08	0.52
1:A:414:ASP:OD2	1:A:415:SER:N	2.42	0.52
1:A:813:ASP:OD2	1:A:813:ASP:N	2.40	0.52
1:A:1407:LEU:HD12	1:A:1410:ILE:HD12	1.91	0.52
1:A:1909:GLU:OE2	1:A:5207:ARG:NH1	2.41	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4019:ARG:NH1	1:A:4020:CYS:SG	2.82	0.52
1:A:4906:ASN:OD1	1:A:4906:ASN:N	2.42	0.52
2:B:83:LEU:N	2:B:101:ASN:OD1	2.34	0.52
1:A:595:LYS:O	1:A:599:VAL:HG13	2.10	0.52
1:A:630:VAL:HG21	1:A:637:LEU:CD2	2.40	0.52
1:A:2575:LEU:O	1:A:2579:VAL:HG23	2.08	0.52
1:A:3450:LEU:HD12	1:A:3451:MET:N	2.25	0.52
1:A:3456:THR:HG22	1:A:3456:THR:O	2.10	0.52
2:B:45:TRP:NE1	2:B:88:ASP:O	2.37	0.52
2:B:96:LEU:HG	2:B:98:ILE:HG23	1.92	0.52
1:A:4854:ASP:OD2	1:A:4854:ASP:N	2.42	0.52
1:A:940:ARG:NH1	1:A:992:ALA:HB2	2.25	0.52
1:A:2598:VAL:O	1:A:2602:VAL:HG23	2.10	0.52
1:A:2918:CYS:HG	1:A:2932:PHE:HZ	1.57	0.52
1:A:408:PHE:HD1	1:A:448:ILE:HG21	1.74	0.52
2:B:260:GLY:O	2:B:262:ASP:N	2.43	0.52
1:A:3422:ARG:NE	1:A:3618:GLY:O	2.36	0.51
1:A:3585:ARG:NH1	1:A:3675:LEU:O	2.39	0.51
1:A:4781:VAL:HG22	1:A:4887:LEU:CD1	2.40	0.51
2:B:61:ALA:HB2	2:B:81:LEU:HD12	1.92	0.51
1:A:3458:LEU:CD2	1:A:3466:LEU:HD21	2.40	0.51
1:A:1548:ILE:HD11	1:A:1616:VAL:HG13	1.93	0.51
1:A:2610:ASN:OD1	1:A:2613:ARG:NH2	2.41	0.51
1:A:2729:GLN:NE2	1:A:2750:GLU:OE1	2.43	0.51
1:A:561:PHE:O	1:A:565:GLN:NE2	2.43	0.51
1:A:1005:SER:O	1:A:1008:GLN:HG3	2.11	0.51
1:A:4795:VAL:O	1:A:4799:GLN:N	2.43	0.51
1:A:4976:ILE:N	1:A:4977:PRO:CD	2.74	0.51
1:A:762:PHE:O	1:A:798:ARG:NH1	2.44	0.51
1:A:3379:THR:HG23	1:A:3418:THR:HG23	1.93	0.51
1:A:379:VAL:HG11	1:A:482:ILE:HD13	1.92	0.51
1:A:940:ARG:NH2	1:A:985:LYS:HB2	2.25	0.51
1:A:3086:ASN:O	1:A:3090:VAL:HG23	2.11	0.51
1:A:1652:GLN:NE2	1:A:1662:GLU:OE1	2.44	0.50
1:A:867:LEU:HB2	1:A:868:PRO:HD3	1.94	0.50
1:A:406:GLU:HA	1:A:409:GLY:O	2.10	0.50
1:A:1291:GLN:O	1:A:1294:LYS:HG2	2.11	0.50
1:A:1401:ILE:O	1:A:1405:LYS:HG3	2.10	0.50
1:A:813:ASP:O	1:A:817:VAL:HG23	2.12	0.50
1:A:4080:ASP:OD1	1:A:4082:ALA:N	2.44	0.50
1:A:568:ILE:O	1:A:573:ALA:HA	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3536:LEU:O	1:A:3540:VAL:HG23	2.12	0.50
1:A:4324:MET:HA	1:A:4709:ILE:HD11	1.92	0.50
1:A:4458:GLN:N	1:A:4653:GLN:OE1	2.40	0.50
1:A:3908:LEU:O	1:A:3912:VAL:HG23	2.12	0.49
1:A:4143:PHE:CZ	1:A:4223:VAL:HG12	2.47	0.49
1:A:4582:ILE:HG23	1:A:4677:TRP:HZ3	1.77	0.49
1:A:684:MET:O	1:A:687:ARG:NH2	2.45	0.49
1:A:2452:HIS:H	1:A:2455:THR:HG1	1.60	0.49
1:A:4050:ALA:O	1:A:4053:GLU:HG3	2.12	0.49
1:A:876:CYS:SG	1:A:877:ARG:N	2.86	0.49
1:A:2254:PHE:CE2	1:A:2306:VAL:HG23	2.47	0.49
1:A:3038:GLU:OE1	1:A:3127:LYS:NZ	2.45	0.49
1:A:3268:VAL:HG11	1:A:3604:LEU:HD23	1.94	0.49
1:A:3589:PHE:HB2	1:A:3635:LEU:HD13	1.94	0.49
1:A:4377:ARG:HD3	1:A:4381:ILE:HD12	1.95	0.49
1:A:2417:ILE:HD13	1:A:2578:LEU:HB2	1.94	0.49
1:A:4665:ASP:OD2	1:A:4666:THR:N	2.45	0.49
1:A:1939:LEU:N	1:A:1940:PRO:HD2	2.28	0.49
1:A:1536:LEU:HD23	1:A:1588:LEU:HD13	1.95	0.49
1:A:443:HIS:CG	1:A:448:ILE:HD11	2.48	0.49
1:A:710:ASP:OD1	1:A:713:ARG:NE	2.43	0.49
1:A:1943:PHE:O	1:A:1946:HIS:N	2.46	0.49
1:A:538:PHE:O	1:A:541:LEU:HG	2.13	0.48
1:A:1679:GLN:HG3	1:A:1775:VAL:HG13	1.95	0.48
1:A:1976:ALA:HB1	1:A:2009:MET:SD	2.53	0.48
1:A:2975:SER:O	1:A:2979:ILE:HD12	2.13	0.48
1:A:3743:PHE:O	1:A:3746:THR:OG1	2.20	0.48
1:A:3864:MET:SD	1:A:3919:GLN:NE2	2.86	0.48
1:A:862:LEU:HD11	1:A:938:VAL:HG21	1.94	0.48
1:A:1414:ARG:HD3	1:A:1496:TRP:CE2	2.49	0.48
1:A:1614:CYS:SG	1:A:3081:THR:HG21	2.53	0.48
1:A:2058:VAL:HG11	1:A:2066:ILE:HD13	1.94	0.48
1:A:1493:LYS:O	1:A:1496:TRP:HB2	2.13	0.48
1:A:4668:LEU:HD22	1:A:4674:ARG:HA	1.94	0.48
1:A:2788:GLY:O	1:A:2797:ARG:HA	2.14	0.48
1:A:3307:ALA:HB1	1:A:3314:ILE:HD13	1.93	0.48
1:A:4827:ASN:O	1:A:4831:VAL:HG23	2.13	0.48
1:A:1123:ARG:HD3	1:A:1123:ARG:C	2.34	0.48
1:A:1482:SER:O	1:A:1482:SER:OG	2.30	0.48
1:A:5164:SER:O	1:A:5168:THR:HG23	2.14	0.48
1:A:1993:ARG:NH1	1:A:2209:ASN:O	2.44	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2266:SER:O	1:A:2296:LYS:HB3	2.13	0.48
1:A:552:PHE:CE2	1:A:625:ILE:HG23	2.49	0.48
1:A:1096:LEU:HD12	1:A:1101:ILE:HD13	1.96	0.48
1:A:1548:ILE:HG23	1:A:1562:VAL:HG12	1.95	0.48
2:B:252:ARG:O	2:B:256:GLN:NE2	2.47	0.48
1:A:542:GLN:N	1:A:542:GLN:OE1	2.45	0.48
1:A:1294:LYS:HB2	1:A:1330:GLN:NE2	2.29	0.48
1:A:2216:ARG:HD2	3:A:5301:ATP:H1'	1.96	0.48
1:A:479:CYS:SG	1:A:569:TYR:HB2	2.54	0.48
1:A:1407:LEU:CD1	1:A:1410:ILE:HD12	2.44	0.48
1:A:5072:LEU:O	1:A:5075:THR:OG1	2.22	0.48
1:A:671:SER:OG	1:A:674:LEU:HB3	2.14	0.47
1:A:4979:LEU:HD22	1:A:4981:TYR:HB3	1.95	0.47
1:A:3643:ILE:O	1:A:3648:ASN:ND2	2.45	0.47
1:A:401:PHE:CE2	1:A:455:TYR:HB2	2.49	0.47
1:A:498:ILE:HG21	1:A:500:TYR:CE1	2.49	0.47
1:A:671:SER:OG	1:A:671:SER:O	2.26	0.47
1:A:3612:ASP:O	1:A:3616:GLU:HG3	2.14	0.47
1:A:4390:LEU:H	1:A:4390:LEU:HD12	1.79	0.47
1:A:4781:VAL:HG22	1:A:4887:LEU:HD13	1.96	0.47
1:A:2023:ILE:HD12	1:A:2056:LEU:CD2	2.45	0.47
1:A:4136:LYS:NZ	1:A:4937:CYS:O	2.42	0.47
1:A:4871:PRO:HA	1:A:4877:GLY:O	2.14	0.47
2:B:166:LEU:HD11	2:B:178:VAL:HG11	1.97	0.47
1:A:711:ALA:O	1:A:714:GLN:N	2.43	0.47
1:A:2416:VAL:HG12	1:A:2521:ILE:HG23	1.97	0.47
1:A:4277:VAL:HG13	1:A:4717:ILE:HG23	1.96	0.47
1:A:532:LEU:HA	1:A:535:ASP:OD1	2.15	0.47
1:A:2147:ARG:HG2	1:A:2147:ARG:HH21	1.80	0.47
1:A:4788:LEU:HD12	1:A:4915:VAL:HG11	1.95	0.47
1:A:1344:LYS:O	1:A:1348:HIS:ND1	2.41	0.47
1:A:2650:TRP:NE1	1:A:2760:GLU:HG2	2.29	0.47
1:A:2924:VAL:HG13	1:A:2967:ALA:HB3	1.96	0.47
1:A:2959:LEU:O	1:A:2963:VAL:HG23	2.14	0.47
1:A:3546:MET:O	1:A:3693:ILE:N	2.37	0.47
1:A:1369:ASN:N	1:A:1481:PRO:O	2.40	0.47
1:A:2488:GLU:O	1:A:2491:THR:OG1	2.19	0.47
1:A:3102:LEU:HG	1:A:3148:LEU:HD11	1.97	0.47
1:A:556:PHE:CZ	1:A:629:VAL:HG13	2.50	0.47
1:A:1029:LEU:CD1	1:A:1060:VAL:HG22	2.45	0.47
1:A:1743:ARG:NH2	1:A:1812:MET:SD	2.88	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1935:GLU:HG2	1:A:1940:PRO:HB2	1.97	0.47
1:A:3707:ASN:N	1:A:3707:ASN:OD1	2.48	0.46
1:A:3054:ILE:HD12	1:A:3054:ILE:H	1.79	0.46
1:A:4486:ASP:OD1	1:A:4552:ARG:NH1	2.47	0.46
1:A:3045:LEU:CD2	1:A:3157:VAL:HG21	2.44	0.46
1:A:4390:LEU:HD12	1:A:4390:LEU:N	2.30	0.46
1:A:4578:VAL:HG11	1:A:4682:ALA:CB	2.45	0.46
2:B:45:TRP:CZ3	2:B:65:LEU:HB3	2.50	0.46
1:A:2398:ASP:O	1:A:2402:LYS:HG3	2.16	0.46
1:A:3068:ILE:CG2	1:A:3103:LEU:HD22	2.46	0.46
2:B:49:GLU:O	2:B:52:GLY:N	2.41	0.46
2:B:213:MET:CG	2:B:233:LEU:HD13	2.46	0.46
1:A:382:PHE:CD2	1:A:436:ILE:CD1	2.98	0.46
1:A:582:ARG:CZ	1:A:582:ARG:HB3	2.45	0.46
1:A:983:ASP:C	1:A:985:LYS:H	2.18	0.46
1:A:2372:LYS:HE2	1:A:2372:LYS:HA	1.96	0.46
1:A:4031:ILE:HD11	2:B:215:ARG:CD	2.45	0.46
1:A:4840:ARG:NH2	1:A:4857:SER:O	2.48	0.46
1:A:382:PHE:CE1	1:A:491:ASP:OD2	2.69	0.46
1:A:802:LEU:HD22	1:A:817:VAL:HG22	1.98	0.46
1:A:823:MET:SD	1:A:826:ARG:NH1	2.89	0.46
1:A:1069:LYS:O	1:A:1073:ASN:ND2	2.41	0.46
1:A:2166:ARG:HB3	1:A:2167:PRO:HD3	1.97	0.46
2:B:76:LEU:HD12	2:B:77:ASN:H	1.79	0.46
2:B:231:LEU:HD23	2:B:268:ILE:CD1	2.46	0.46
1:A:5132:GLU:OE1	1:A:5169:LYS:NZ	2.43	0.46
1:A:5140:LYS:O	1:A:5146:THR:OG1	2.31	0.46
1:A:532:LEU:O	1:A:535:ASP:OD1	2.33	0.46
1:A:4427:VAL:HG12	1:A:4428:PRO:O	2.16	0.46
2:B:166:LEU:CD1	2:B:178:VAL:HG11	2.46	0.46
1:A:425:ASP:OD2	1:A:426:LEU:N	2.49	0.45
2:B:133:LEU:HD23	2:B:153:LEU:HD13	1.98	0.45
1:A:1015:GLN:HA	1:A:1015:GLN:OE1	2.15	0.45
1:A:2402:LYS:HE2	1:A:2582:PHE:CD1	2.51	0.45
1:A:2460:ILE:O	1:A:2464:VAL:HG23	2.16	0.45
1:A:3563:LEU:CD2	1:A:3653:THR:HG21	2.46	0.45
1:A:4637:GLU:O	1:A:4641:VAL:HG23	2.15	0.45
2:B:86:LEU:HD22	2:B:89:LEU:HD11	1.98	0.45
1:A:4961:VAL:HG22	1:A:4965:LEU:HD12	1.98	0.45
2:B:59:ASN:O	2:B:63:ASN:OD1	2.34	0.45
1:A:1287:ILE:HD13	1:A:1329:HIS:NE2	2.31	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1700:TYR:CE2	1:A:1807:ALA:HA	2.52	0.45
1:A:3728:TYR:CD2	1:A:4820:GLY:HA2	2.52	0.45
1:A:1330:GLN:O	1:A:1330:GLN:HG3	2.17	0.45
1:A:1593:MET:HG3	1:A:3084:CYS:HB3	1.99	0.45
1:A:3937:THR:HG21	1:A:3945:GLN:HA	1.99	0.45
1:A:409:GLY:O	1:A:411:SER:N	2.49	0.45
1:A:1608:ARG:O	1:A:1611:GLU:HG2	2.16	0.45
1:A:4136:LYS:NZ	1:A:4180:ASP:OD2	2.46	0.45
1:A:4782:LYS:O	1:A:4785:PRO:HD2	2.16	0.45
1:A:4835:THR:HG22	1:A:4883:LEU:HD11	1.97	0.45
2:B:61:ALA:HB2	2:B:81:LEU:CD1	2.47	0.45
1:A:682:ARG:O	1:A:686:THR:OG1	2.33	0.45
1:A:2871:ASP:N	1:A:2871:ASP:OD1	2.49	0.45
1:A:3937:THR:HA	1:A:3941:VAL:HG22	1.99	0.45
1:A:4173:LEU:HD12	1:A:4939:TYR:HB2	1.98	0.45
1:A:4791:GLN:HG2	1:A:4871:PRO:HG3	1.98	0.45
1:A:5160:ASP:OD2	1:A:5161:THR:N	2.50	0.45
1:A:1702:ASN:O	1:A:1876:LEU:HD22	2.16	0.45
1:A:4133:VAL:HG22	1:A:4938:GLN:HE22	1.81	0.45
1:A:982:TRP:O	1:A:985:LYS:HG3	2.17	0.45
1:A:3890:SER:HA	1:A:3920:TRP:CZ2	2.51	0.45
1:A:4983:HIS:CD2	1:A:4983:HIS:H	2.34	0.45
2:B:63:ASN:O	2:B:66:LYS:HG3	2.17	0.45
1:A:865:TYR:CG	1:A:938:VAL:HG22	2.52	0.45
1:A:2421:GLU:OE1	1:A:2566:TYR:OH	2.32	0.45
1:A:2686:MET:SD	1:A:2721:LEU:HB3	2.56	0.45
1:A:3811:LEU:N	1:A:3812:PRO:CD	2.80	0.45
1:A:4346:LEU:HD12	1:A:4347:GLU:HG2	1.98	0.45
1:A:1069:LYS:HE3	1:A:1069:LYS:HA	1.99	0.44
1:A:1454:GLU:HB3	1:A:1595:MET:SD	2.57	0.44
1:A:3799:LYS:HG2	1:A:3813:TRP:CE2	2.52	0.44
1:A:4930:THR:HB	1:A:4931:PRO:HD3	1.98	0.44
2:B:78:LEU:HD11	2:B:89:LEU:HD13	1.99	0.44
2:B:213:MET:HG3	2:B:233:LEU:HD13	1.99	0.44
1:A:526:LYS:HE2	1:A:579:LEU:HD21	1.99	0.44
1:A:2198:LEU:HD21	1:A:2212:TRP:CH2	2.52	0.44
1:A:4428:PRO:HB2	1:A:4595:SER:HB2	1.99	0.44
1:A:401:PHE:HB2	1:A:453:VAL:HG23	1.99	0.44
1:A:1950:VAL:HG12	1:A:1950:VAL:O	2.17	0.44
1:A:2504:ASP:OD1	1:A:2504:ASP:N	2.50	0.44
1:A:3066:PRO:CG	1:A:3101:LEU:HD13	2.47	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3870:LEU:HD11	1:A:3889:LEU:HD12	1.99	0.44
1:A:3997:CYS:O	1:A:4001:LEU:N	2.44	0.44
1:A:4428:PRO:O	1:A:4429:LEU:HB3	2.18	0.44
1:A:568:ILE:HD13	1:A:568:ILE:H	1.83	0.44
1:A:1991:SER:HB2	1:A:1996:VAL:HG21	1.98	0.44
1:A:3709:VAL:HG23	1:A:3766:CYS:CB	2.47	0.44
1:A:4784:LEU:CB	1:A:4887:LEU:HD22	2.47	0.44
1:A:1898:ASP:HB2	1:A:1934:TRP:HB3	1.99	0.44
1:A:2078:TYR:HA	1:A:2087:TRP:O	2.17	0.44
1:A:4780:LEU:CD2	1:A:4835:THR:HG23	2.48	0.44
1:A:545:ASP:CG	1:A:547:ILE:HG22	2.38	0.44
1:A:1375:LEU:HD21	1:A:1485:PHE:CE1	2.52	0.44
1:A:2715:TYR:HA	1:A:2720:LEU:HD23	1.99	0.44
1:A:5174:LEU:HD22	1:A:5174:LEU:H	1.82	0.44
2:B:157:ARG:HA	2:B:177:VAL:HB	2.00	0.44
1:A:519:ARG:HA	1:A:522:LEU:HD12	1.99	0.44
1:A:1379:LEU:O	1:A:1383:ASP:OD2	2.36	0.44
1:A:2292:PHE:HZ	1:A:2564:LEU:HD22	1.81	0.44
1:A:2968:LYS:NZ	1:A:3035:GLU:OE2	2.51	0.44
2:B:76:LEU:HG	2:B:77:ASN:N	2.33	0.44
2:B:252:ARG:HA	2:B:255:GLN:CG	2.48	0.44
1:A:1386:ASP:O	1:A:1390:ARG:NH1	2.50	0.44
1:A:2471:ALA:HB1	1:A:2516:SER:O	2.17	0.44
1:A:2894:MET:CE	1:A:2899:PHE:HB2	2.48	0.44
1:A:3455:VAL:HG12	1:A:3456:THR:N	2.33	0.44
1:A:4983:HIS:CD2	1:A:4983:HIS:N	2.85	0.44
1:A:476:VAL:HG22	1:A:477:ASN:N	2.33	0.44
1:A:2327:ASN:N	1:A:2327:ASN:OD1	2.51	0.44
1:A:2316:THR:HG22	1:A:2318:ILE:HD11	2.00	0.43
1:A:2962:MET:HE2	1:A:2982:ALA:HA	1.99	0.43
1:A:3054:ILE:HD12	1:A:3054:ILE:N	2.33	0.43
1:A:3394:ALA:O	1:A:3398:VAL:HG23	2.18	0.43
1:A:4795:VAL:HG22	1:A:4974:LYS:CG	2.47	0.43
2:B:259:THR:O	2:B:261:PRO:HD3	2.18	0.43
1:A:4582:ILE:HG12	1:A:4681:ILE:HG21	1.99	0.43
1:A:5140:LYS:O	1:A:5146:THR:CB	2.66	0.43
1:A:5144:PRO:HA	1:A:5147:GLN:HG2	2.00	0.43
1:A:588:ARG:HG3	1:A:589:TYR:N	2.33	0.43
1:A:1789:LEU:N	1:A:1790:PRO:CD	2.81	0.43
1:A:2805:VAL:HB	1:A:2825:CYS:SG	2.59	0.43
1:A:4962:SER:OG	1:A:4963:ARG:HD2	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:5174:LEU:HD22	1:A:5174:LEU:N	2.32	0.43
1:A:862:LEU:CD1	1:A:938:VAL:HG21	2.49	0.43
1:A:1146:GLU:OE2	1:A:1198:ARG:N	2.50	0.43
1:A:2686:MET:O	1:A:2686:MET:HE2	2.18	0.43
1:A:4756:VAL:HG13	1:A:4761:GLY:HA3	1.99	0.43
2:B:143:ILE:HG21	2:B:146:LEU:HD23	1.99	0.43
1:A:2179:ASP:O	1:A:2179:ASP:OD2	2.37	0.43
1:A:4979:LEU:HD23	1:A:4980:VAL:N	2.33	0.43
1:A:1290:HIS:CD2	1:A:1330:GLN:HB3	2.54	0.43
1:A:3405:ILE:O	1:A:3405:ILE:HG22	2.18	0.43
1:A:4029:GLN:HG2	2:B:238:PHE:CD2	2.53	0.43
1:A:4143:PHE:CE1	1:A:4223:VAL:HG12	2.53	0.43
1:A:4172:MET:SD	1:A:4740:ILE:HA	2.59	0.43
1:A:1451:SER:OG	1:A:1518:TRP:NE1	2.46	0.43
1:A:2239:PHE:O	1:A:2239:PHE:CG	2.72	0.43
1:A:2351:TYR:CZ	1:A:2355:LEU:HD11	2.54	0.43
1:A:2861:HIS:HB3	1:A:2862:PRO:HD3	2.00	0.43
1:A:2991:ASP:OD1	1:A:2992:ASP:N	2.52	0.43
1:A:4009:CYS:C	1:A:4010:LEU:HD12	2.38	0.43
1:A:4130:ILE:HD13	1:A:4170:LEU:HD13	2.00	0.43
1:A:4347:GLU:OE1	1:A:4347:GLU:HA	2.19	0.43
1:A:4871:PRO:HG2	1:A:4973:LEU:HG	2.01	0.43
2:B:112:MET:O	2:B:114:LYS:N	2.52	0.43
1:A:1445:VAL:HG13	1:A:1462:VAL:CG1	2.49	0.43
1:A:2240:ILE:C	1:A:2240:ILE:HD12	2.38	0.43
1:A:2783:ALA:HB2	1:A:2804:LEU:CD1	2.47	0.43
1:A:3270:LEU:HD13	1:A:3280:ALA:HB2	2.01	0.43
1:A:4973:LEU:HD13	1:A:4974:LYS:HG3	1.99	0.43
1:A:2147:ARG:HG3	1:A:2148:SER:H	1.84	0.43
1:A:2979:ILE:O	1:A:2983:VAL:HG23	2.19	0.43
1:A:3195:VAL:O	1:A:3199:ILE:HG12	2.19	0.43
1:A:4071:ASP:OD2	1:A:4958:ARG:NH1	2.52	0.43
1:A:4661:LEU:O	1:A:4662:LEU:HD13	2.19	0.43
1:A:407:GLU:HB2	1:A:449:PRO:CD	2.48	0.42
2:B:153:LEU:O	2:B:173:LEU:HD12	2.19	0.42
2:B:248:GLY:HA2	2:B:251:MET:CE	2.48	0.42
1:A:737:THR:HG21	1:A:766:PRO:HG3	2.01	0.42
1:A:937:GLU:CG	1:A:985:LYS:NZ	2.82	0.42
1:A:2024:ARG:NH2	1:A:2057:ASP:OD2	2.50	0.42
1:A:4114:THR:HG21	1:A:4129:VAL:O	2.18	0.42
2:B:42:LEU:HA	2:B:45:TRP:CD2	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:463:GLU:N	1:A:463:GLU:OE1	2.53	0.42
1:A:530:ALA:CB	1:A:590:LEU:HD21	2.49	0.42
1:A:1164:CYS:HA	1:A:1167:VAL:HG22	2.00	0.42
1:A:519:ARG:O	1:A:523:VAL:HG23	2.20	0.42
1:A:1866:THR:N	1:A:1869:THR:OG1	2.46	0.42
1:A:4639:ILE:HG22	1:A:4643:HIS:CD2	2.54	0.42
1:A:654:SER:HB2	1:A:655:PRO:CD	2.50	0.42
1:A:1062:ARG:O	1:A:1066:THR:HG23	2.19	0.42
1:A:2036:LEU:HD23	1:A:2081:ASP:HB3	2.01	0.42
1:A:2650:TRP:CE2	1:A:2760:GLU:HG2	2.55	0.42
1:A:3673:MET:SD	1:A:3674:LEU:N	2.92	0.42
1:A:4016:HIS:CD2	1:A:4032:CYS:SG	3.13	0.42
1:A:4487:LEU:HD21	1:A:4571:ASP:OD2	2.19	0.42
1:A:420:LEU:CD2	1:A:435:GLY:HA3	2.50	0.42
1:A:626:VAL:O	1:A:630:VAL:HG23	2.19	0.42
1:A:1943:PHE:CD1	1:A:1943:PHE:N	2.88	0.42
1:A:3838:VAL:HG21	1:A:3866:CYS:SG	2.60	0.42
1:A:4761:GLY:O	1:A:4765:VAL:N	2.42	0.42
1:A:4761:GLY:HA2	1:A:4765:VAL:HG22	2.00	0.42
2:B:175:LEU:HD11	2:B:177:VAL:HG23	2.01	0.42
1:A:912:ARG:O	1:A:916:GLU:OE2	2.38	0.42
1:A:1608:ARG:HH21	1:A:1608:ARG:HG2	1.85	0.42
1:A:3237:GLN:O	1:A:3240:ARG:NE	2.48	0.42
1:A:3299:PHE:CZ	1:A:3440:VAL:HG21	2.55	0.42
1:A:4009:CYS:HG	1:A:4051:HIS:CE1	2.38	0.42
1:A:4042:GLU:HA	1:A:4042:GLU:OE1	2.20	0.42
1:A:4342:ALA:O	1:A:4345:VAL:HG12	2.20	0.42
1:A:934:LYS:O	1:A:938:VAL:HG23	2.20	0.42
1:A:2493:GLU:C	1:A:2495:ILE:H	2.23	0.42
1:A:2949:GLU:HB2	1:A:3163:ILE:HD13	2.00	0.42
1:A:3187:ILE:O	1:A:3191:LEU:HD23	2.19	0.42
1:A:3859:ASP:OD1	1:A:3860:ALA:N	2.53	0.42
1:A:398:HIS:CB	1:A:455:TYR:O	2.67	0.42
1:A:566:PRO:HG2	1:A:576:TRP:CE3	2.55	0.42
1:A:1277:TYR:O	1:A:1281:PRO:HD2	2.20	0.42
1:A:1396:ILE:O	1:A:1397:ASN:HB3	2.20	0.42
1:A:4871:PRO:HG2	1:A:4973:LEU:CG	2.50	0.42
1:A:4905:ASN:N	1:A:4905:ASN:OD1	2.52	0.42
2:B:38:ASN:HB3	2:B:69:LEU:HD21	2.02	0.42
1:A:1126:SER:C	1:A:1127:LEU:HD22	2.41	0.42
1:A:1861:GLU:O	1:A:1892:TYR:HA	2.18	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2237:PRO:O	1:A:2238:SER:C	2.58	0.42
1:A:4173:LEU:CD1	1:A:4939:TYR:HB2	2.50	0.42
1:A:4781:VAL:HG12	1:A:4920:VAL:HB	2.01	0.42
1:A:4973:LEU:HD22	1:A:4973:LEU:HA	1.89	0.42
1:A:983:ASP:O	1:A:985:LYS:N	2.53	0.41
1:A:3992:PHE:HD1	1:A:3992:PHE:O	2.03	0.41
1:A:1033:ILE:HG22	1:A:1081:LEU:HD12	2.02	0.41
1:A:2449:VAL:HG22	1:A:2463:ARG:HH21	1.85	0.41
1:A:2740:LYS:HB2	1:A:2920:SER:OG	2.20	0.41
1:A:2906:ASN:OD1	1:A:2908:THR:N	2.50	0.41
1:A:3453:SER:HB2	1:A:3529:ILE:HG23	2.01	0.41
1:A:3997:CYS:SG	1:A:3999:ILE:HB	2.60	0.41
1:A:4004:ALA:HA	1:A:4017:CYS:SG	2.60	0.41
1:A:4910:VAL:HB	1:A:4968:LYS:O	2.20	0.41
1:A:4932:LEU:CD2	1:A:4956:ILE:HG23	2.49	0.41
1:A:443:HIS:HB3	1:A:448:ILE:HD11	2.02	0.41
1:A:637:LEU:HD11	1:A:644:LEU:CD2	2.48	0.41
1:A:1106:LEU:HD11	1:A:1143:ARG:HB2	2.03	0.41
1:A:1514:ARG:HD2	1:A:2790:ALA:O	2.20	0.41
1:A:2594:ILE:O	1:A:2598:VAL:HG23	2.20	0.41
1:A:3269:ARG:NH2	1:A:3608:ALA:O	2.52	0.41
1:A:4846:ASN:OD1	1:A:4846:ASN:N	2.54	0.41
2:B:56:GLU:OE1	2:B:58:ARG:NH1	2.46	0.41
2:B:172:GLU:OE1	2:B:192:LYS:NZ	2.45	0.41
1:A:1534:LEU:HD23	1:A:1592:LEU:HD23	2.02	0.41
1:A:3000:LEU:O	1:A:3003:LEU:O	2.38	0.41
1:A:3450:LEU:HD12	1:A:3450:LEU:C	2.40	0.41
2:B:78:LEU:HD22	2:B:83:LEU:HD12	2.03	0.41
1:A:1371:ASP:OD1	1:A:1373:SER:N	2.46	0.41
1:A:1601:ARG:NE	1:A:1601:ARG:HA	2.36	0.41
1:A:2378:CYS:O	1:A:2383:ILE:N	2.46	0.41
1:A:2643:ARG:O	1:A:2647:VAL:HG23	2.21	0.41
1:A:3764:LEU:HD23	1:A:3792:TRP:CZ3	2.55	0.41
1:A:408:PHE:HD2	1:A:417:ILE:HD13	1.86	0.41
1:A:430:ARG:NE	1:A:528:ILE:HD11	2.35	0.41
1:A:916:GLU:OE2	1:A:916:GLU:CA	2.69	0.41
1:A:2690:GLY:HA2	1:A:2694:HIS:HB3	2.02	0.41
1:A:4346:LEU:HD12	1:A:4347:GLU:N	2.35	0.41
1:A:5049:TYR:CD1	1:A:5053:ILE:HD12	2.56	0.41
1:A:426:LEU:CB	1:A:430:ARG:HB2	2.51	0.41
1:A:765:LEU:O	1:A:798:ARG:NH1	2.46	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1366:LEU:HD22	1:A:1432:ARG:NH1	2.35	0.41
1:A:1383:ASP:OD2	1:A:1383:ASP:N	2.52	0.41
1:A:4132:SER:O	1:A:4136:LYS:HG2	2.21	0.41
2:B:41:TYR:HB3	2:B:45:TRP:CZ2	2.55	0.41
1:A:1236:PHE:O	1:A:1237:TRP:HB3	2.20	0.41
1:A:1319:SER:O	1:A:1323:ILE:HG13	2.20	0.41
1:A:3341:ALA:HB1	1:A:3342:PRO:HD2	2.03	0.41
1:A:3692:TYR:HB2	1:A:4978:THR:O	2.21	0.41
1:A:4114:THR:HG22	1:A:4115:LYS:N	2.36	0.41
1:A:4422:LEU:HD23	1:A:4427:VAL:HG21	2.02	0.41
1:A:755:GLU:N	1:A:756:PRO:HD2	2.36	0.41
1:A:862:LEU:HD13	1:A:917:VAL:HG11	2.03	0.41
1:A:1172:GLN:O	1:A:1268:ILE:HG23	2.21	0.41
1:A:1286:PHE:CZ	1:A:1324:MET:HG2	2.55	0.41
1:A:1637:TRP:CZ2	1:A:1639:ALA:HB2	2.56	0.41
1:A:2036:LEU:O	1:A:2040:LEU:HG	2.20	0.41
1:A:2694:HIS:NE2	1:A:2700:LYS:HB3	2.36	0.41
1:A:2955:ASP:OD1	1:A:3040:ARG:NH2	2.47	0.41
1:A:3132:GLY:HA3	1:A:3137:ARG:HH21	1.85	0.41
1:A:3176:ILE:HG21	1:A:3227:ALA:HB1	2.03	0.41
1:A:3359:LEU:HD21	1:A:3397:SER:HB3	2.03	0.41
1:A:4571:ASP:OD1	1:A:4571:ASP:N	2.53	0.41
1:A:4980:VAL:O	1:A:4981:TYR:O	2.39	0.41
1:A:5047:ASN:OD1	1:A:5048:VAL:N	2.53	0.41
1:A:5137:ILE:HG12	1:A:5190:CYS:SG	2.61	0.41
1:A:937:GLU:HG2	1:A:985:LYS:HZ1	1.86	0.41
1:A:977:TYR:CE2	1:A:1024:LYS:HB3	2.55	0.41
1:A:1139:ALA:HA	1:A:1142:TRP:CE3	2.56	0.41
1:A:1388:PHE:CE2	1:A:1396:ILE:HG23	2.56	0.41
1:A:1450:ILE:HG23	1:A:1530:GLU:HA	2.03	0.41
1:A:3109:TYR:O	1:A:3113:TYR:N	2.54	0.41
1:A:3019:LYS:HB2	1:A:3059:PHE:CE1	2.57	0.40
1:A:4385:SER:O	1:A:4391:HIS:NE2	2.48	0.40
1:A:5124:THR:CG2	1:A:5125:GLY:N	2.83	0.40
1:A:1891:VAL:HG12	1:A:1892:TYR:N	2.36	0.40
1:A:2372:LYS:HA	1:A:2372:LYS:CE	2.51	0.40
1:A:2490:ASN:ND2	1:A:2525:ASN:O	2.53	0.40
1:A:2842:VAL:HA	1:A:2882:VAL:O	2.21	0.40
1:A:2861:HIS:HB3	1:A:2862:PRO:CD	2.51	0.40
1:A:3538:SER:OG	1:A:3629:GLN:NE2	2.44	0.40
1:A:4344:ALA:O	1:A:4348:CYS:N	2.53	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4791:GLN:HE21	1:A:4880:ALA:HB1	1.86	0.40
1:A:5190:CYS:SG	1:A:5191:VAL:N	2.93	0.40
2:B:46:SER:O	2:B:49:GLU:HB3	2.21	0.40
2:B:226:LEU:HD23	2:B:226:LEU:HA	1.95	0.40
1:A:2929:GLN:HA	1:A:2932:PHE:CD2	2.56	0.40
1:A:3827:ASN:OD1	1:A:3892:PRO:HB3	2.21	0.40
1:A:4789:ALA:O	1:A:4793:ASP:OD2	2.38	0.40
1:A:726:SER:O	1:A:726:SER:OG	2.36	0.40
1:A:1454:GLU:HG3	1:A:1533:SER:OG	2.21	0.40
1:A:1700:TYR:CZ	1:A:1810:ALA:CB	3.05	0.40
1:A:1748:CYS:SG	1:A:1801:THR:HG23	2.62	0.40
1:A:2591:LYS:NZ	1:A:2617:GLU:OE2	2.42	0.40
1:A:2701:ASP:OD1	1:A:2704:ARG:NH1	2.54	0.40
1:A:2825:CYS:HB3	1:A:2879:VAL:HG11	2.02	0.40
1:A:3563:LEU:HD22	1:A:3653:THR:HG21	2.02	0.40
1:A:3813:TRP:CE3	1:A:3816:LEU:HD12	2.57	0.40
1:A:4980:VAL:O	1:A:4985:TRP:N	2.55	0.40
1:A:1336:ILE:O	1:A:1340:VAL:HG23	2.22	0.40
1:A:2978:ASP:OD1	1:A:2979:ILE:N	2.54	0.40
1:A:3423:VAL:HG21	1:A:5018:TYR:CB	2.51	0.40
1:A:4008:VAL:N	1:A:4016:HIS:O	2.48	0.40
1:A:4784:LEU:HD22	1:A:4887:LEU:CD2	2.48	0.40
1:A:4972:SER:O	1:A:4973:LEU:HD23	2.21	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	4479/5247 (85%)	4245 (95%)	228 (5%)	6 (0%)	48 76
2	B	235/575 (41%)	203 (86%)	32 (14%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	4714/5822 (81%)	4448 (94%)	260 (6%)	6 (0%)	50 76

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1236	PHE
1	A	1333	ARG
1	A	3104	ASN
1	A	4981	TYR
1	A	1602	ASN
1	A	2494	ALA

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	4076/4653 (88%)	3910 (96%)	166 (4%)	26 54
2	B	216/501 (43%)	207 (96%)	9 (4%)	25 53
All	All	4292/5154 (83%)	4117 (96%)	175 (4%)	28 54

All (175) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	388	SER
1	A	397	LEU
1	A	402	ILE
1	A	403	ARG
1	A	406	GLU
1	A	412	LYS
1	A	415	SER
1	A	438	CYS
1	A	442	LYS
1	A	445	ASP
1	A	459	SER
1	A	461	GLU

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Mol	Chain	Res	Type
1	A	477	ASN
1	A	484	SER
1	A	489	SER
1	A	496	TYR
1	A	497	ASP
1	A	501	MET
1	A	519	ARG
1	A	520	LYS
1	A	522	LEU
1	A	541	LEU
1	A	545	ASP
1	A	568	ILE
1	A	581	TYR
1	A	643	TRP
1	A	671	SER
1	A	688	THR
1	A	707	ARG
1	A	728	SER
1	A	763	SER
1	A	804	GLN
1	A	813	ASP
1	A	832	ARG
1	A	857	SER
1	A	876	CYS
1	A	916	GLU
1	A	922	MET
1	A	926	SER
1	A	962	GLU
1	A	989	ASP
1	A	995	PHE
1	A	1049	LYS
1	A	1098	SER
1	A	1125	LYS
1	A	1175	PHE
1	A	1198	ARG
1	A	1203	SER
1	A	1204	ASN
1	A	1205	SER
1	A	1206	GLN
1	A	1236	PHE
1	A	1237	TRP
1	A	1281	PRO

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Mol	Chain	Res	Type
1	A	1288	LYS
1	A	1332	GLN
1	A	1365	SER
1	A	1386	ASP
1	A	1416	LYS
1	A	1442	LYS
1	A	1496	TRP
1	A	1509	LEU
1	A	1560	ASP
1	A	1577	SER
1	A	1608	ARG
1	A	1717	ARG
1	A	1773	SER
1	A	1790	PRO
1	A	1972	GLN
1	A	1999	SER
1	A	2049	LYS
1	A	2078	TYR
1	A	2147	ARG
1	A	2242	ASP
1	A	2294	LEU
1	A	2295	ARG
1	A	2310	ASP
1	A	2318	ILE
1	A	2327	ASN
1	A	2408	MET
1	A	2499	LYS
1	A	2504	ASP
1	A	2506	MET
1	A	2554	ASP
1	A	2580	TRP
1	A	2599	GLN
1	A	2604	SER
1	A	2606	SER
1	A	2609	GLU
1	A	2618	VAL
1	A	2640	ASP
1	A	2776	SER
1	A	2868	CYS
1	A	2870	GLU
1	A	2896	ARG
1	A	3082	GLN

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Mol	Chain	Res	Type
1	A	3129	VAL
1	A	3133	LEU
1	A	3152	GLU
1	A	3155	ASP
1	A	3240	ARG
1	A	3245	GLU
1	A	3312	HIS
1	A	3319	THR
1	A	3421	SER
1	A	3447	ARG
1	A	3451	MET
1	A	3454	ASP
1	A	3553	SER
1	A	3665	TRP
1	A	3737	LYS
1	A	3780	THR
1	A	3835	TYR
1	A	3854	CYS
1	A	3898	SER
1	A	3899	ASP
1	A	3956	ASP
1	A	3991	ARG
1	A	3992	PHE
1	A	4005	LYS
1	A	4009	CYS
1	A	4014	HIS
1	A	4028	GLU
1	A	4034	TYR
1	A	4035	CYS
1	A	4072	LEU
1	A	4077	CYS
1	A	4126	LYS
1	A	4193	ASP
1	A	4219	ASN
1	A	4300	ARG
1	A	4309	ASP
1	A	4348	CYS
1	A	4371	PHE
1	A	4398	GLU
1	A	4406	GLU
1	A	4407	CYS
1	A	4505	CYS

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Mol	Chain	Res	Type
1	A	4555	THR
1	A	4570	CYS
1	A	4572	ARG
1	A	4657	SER
1	A	4659	ARG
1	A	4660	ARG
1	A	4686	SER
1	A	4704	SER
1	A	4733	SER
1	A	4745	LYS
1	A	4774	LYS
1	A	4784	LEU
1	A	4807	SER
1	A	4846	ASN
1	A	4851	LEU
1	A	4859	ASP
1	A	4887	LEU
1	A	4905	ASN
1	A	4922	SER
1	A	4972	SER
1	A	4973	LEU
1	A	4979	LEU
1	A	4983	HIS
1	A	5002	SER
1	A	5036	SER
1	A	5103	SER
1	A	5181	PHE
1	A	5190	CYS
2	B	39	GLU
2	B	42	LEU
2	B	48	TRP
2	B	59	ASN
2	B	66	LYS
2	B	184	ASP
2	B	228	GLU
2	B	255	GLN
2	B	263	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	597	HIS

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Mol	Chain	Res	Type
1	A	921	ASN
1	A	1574	HIS
1	A	1698	HIS
1	A	1804	HIS
1	A	2569	HIS
1	A	3285	GLN
1	A	4081	ASN
1	A	4458	GLN
1	A	4663	ASN
1	A	4983	HIS
2	B	160	ASN
2	B	220	ASN
2	B	256	GLN

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 5 ligands modelled in this entry, 4 are monoatomic - leaving 1 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	$\#\|Z\| > 2$
3	ATP	A	5301	-	26,33,33	0.84	1 (3%)	31,52,52	1.60	6 (19%)

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
3	ATP	A	5301	-	-	6/18/38/38	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	5301	ATP	C5-C4	2.06	1.46	1.40

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	5301	ATP	PB-O3B-PG	-3.71	120.11	132.83
3	A	5301	ATP	PA-O3A-PB	-3.37	121.25	132.83
3	A	5301	ATP	N3-C2-N1	-3.09	123.86	128.68
3	A	5301	ATP	C3'-C2'-C1'	2.86	105.29	100.98
3	A	5301	ATP	C4-C5-N7	-2.36	106.94	109.40
3	A	5301	ATP	C1'-N9-C4	-2.08	122.99	126.64

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	5301	ATP	C5'-O5'-PA-O2A
3	A	5301	ATP	PG-O3B-PB-O2B
3	A	5301	ATP	PG-O3B-PB-O1B
3	A	5301	ATP	C5'-O5'-PA-O3A
3	A	5301	ATP	O4'-C4'-C5'-O5'
3	A	5301	ATP	C5'-O5'-PA-O1A

There are no ring outliers.

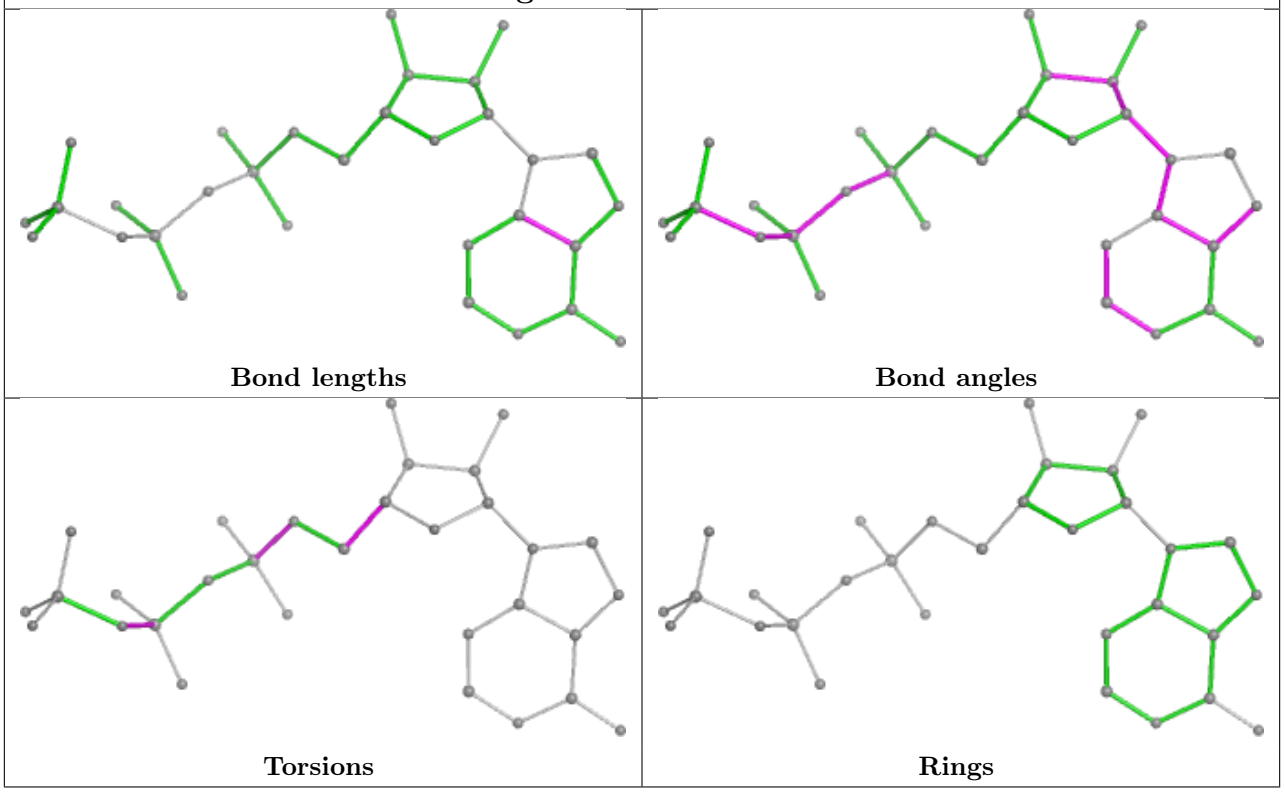
1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	5301	ATP	1	0

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 ATP A 5301



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.

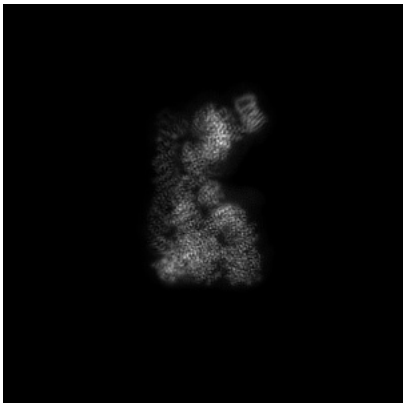
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-50913. These allow visual inspection of the internal detail of the map and identification of artifacts.

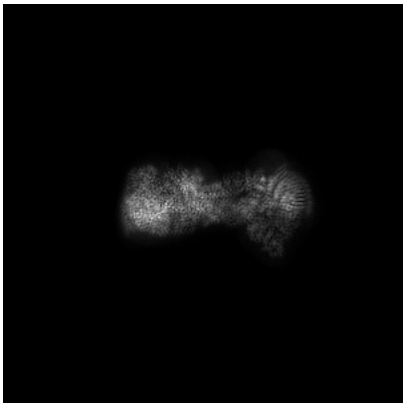
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

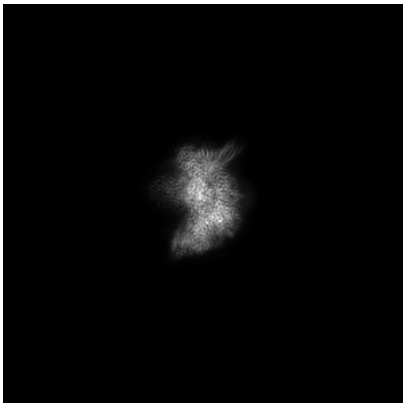
6.1.1 Primary map



X



Y

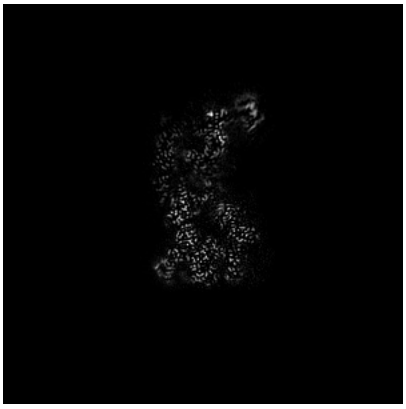


Z

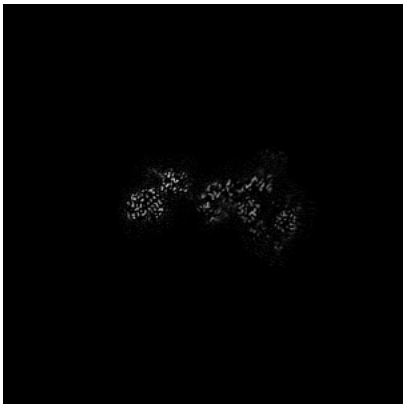
The images above show the map projected in three orthogonal directions.

6.2 Central slices

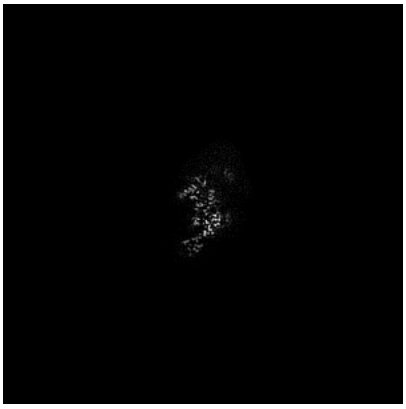
6.2.1 Primary map



X Index: 192



Y Index: 192

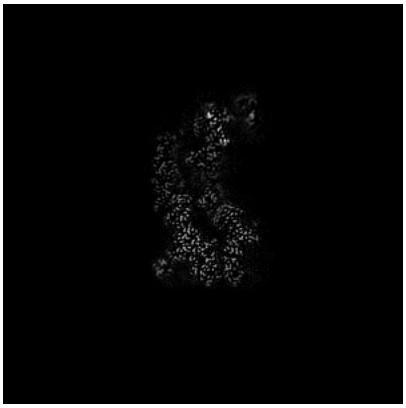


Z Index: 192

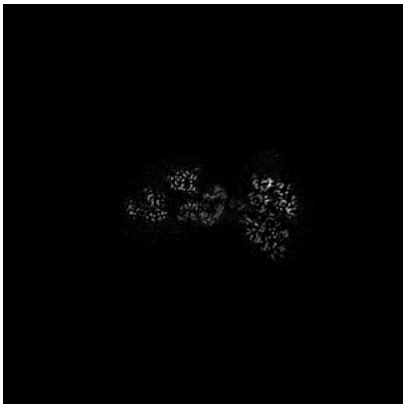
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

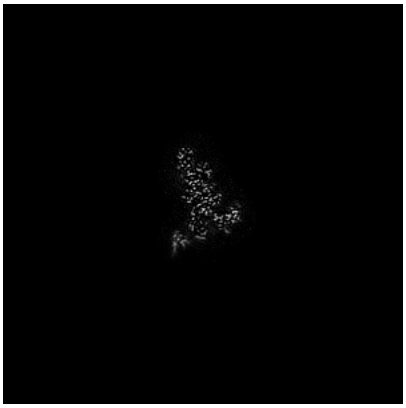
6.3.1 Primary map



X Index: 189



Y Index: 205

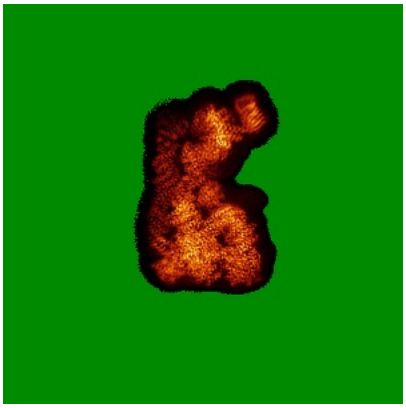


Z Index: 144

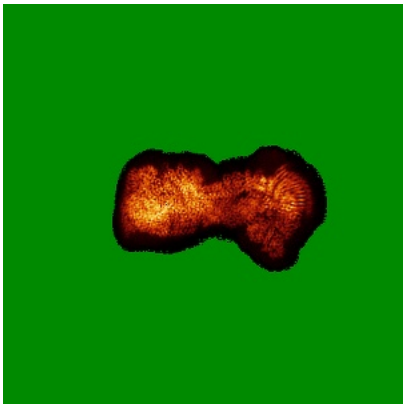
The images above show the largest variance slices of the map in three orthogonal directions.

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

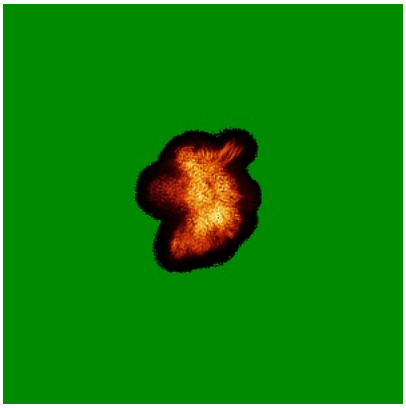
6.4.1 Primary map



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 0.8. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

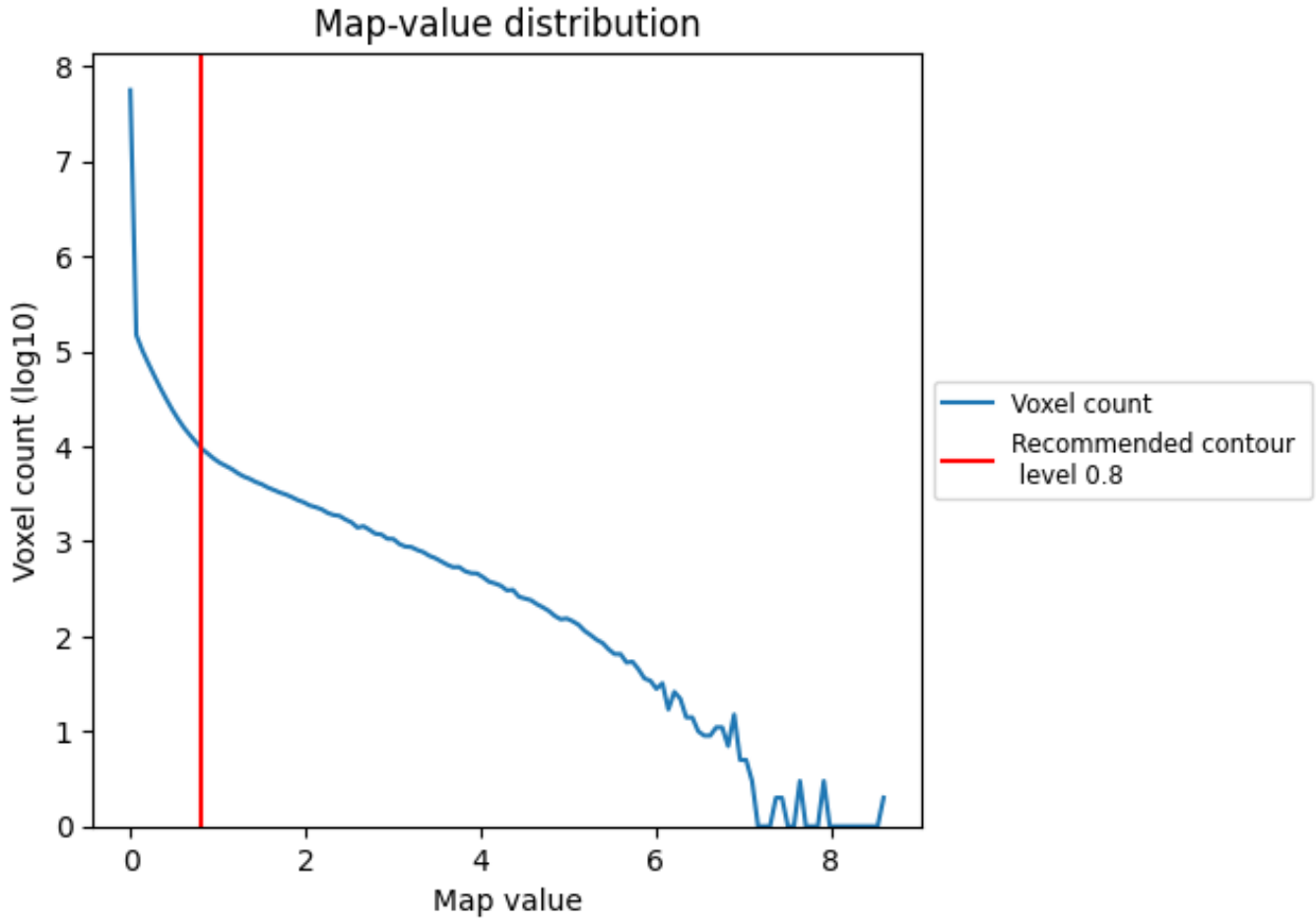
6.6 Mask visualisation (i)

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

7 Map analysis

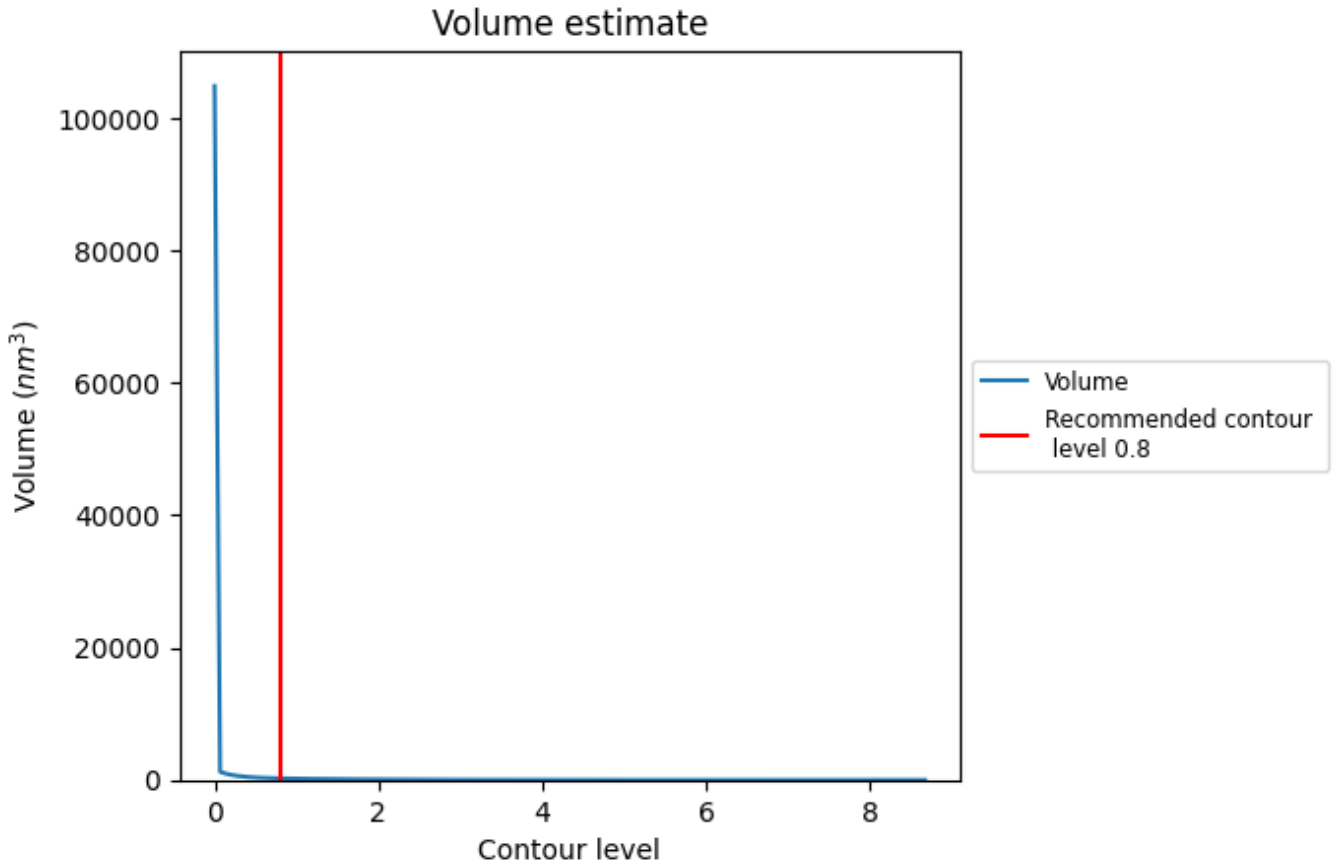
This section contains the results of statistical analysis of the map.

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.

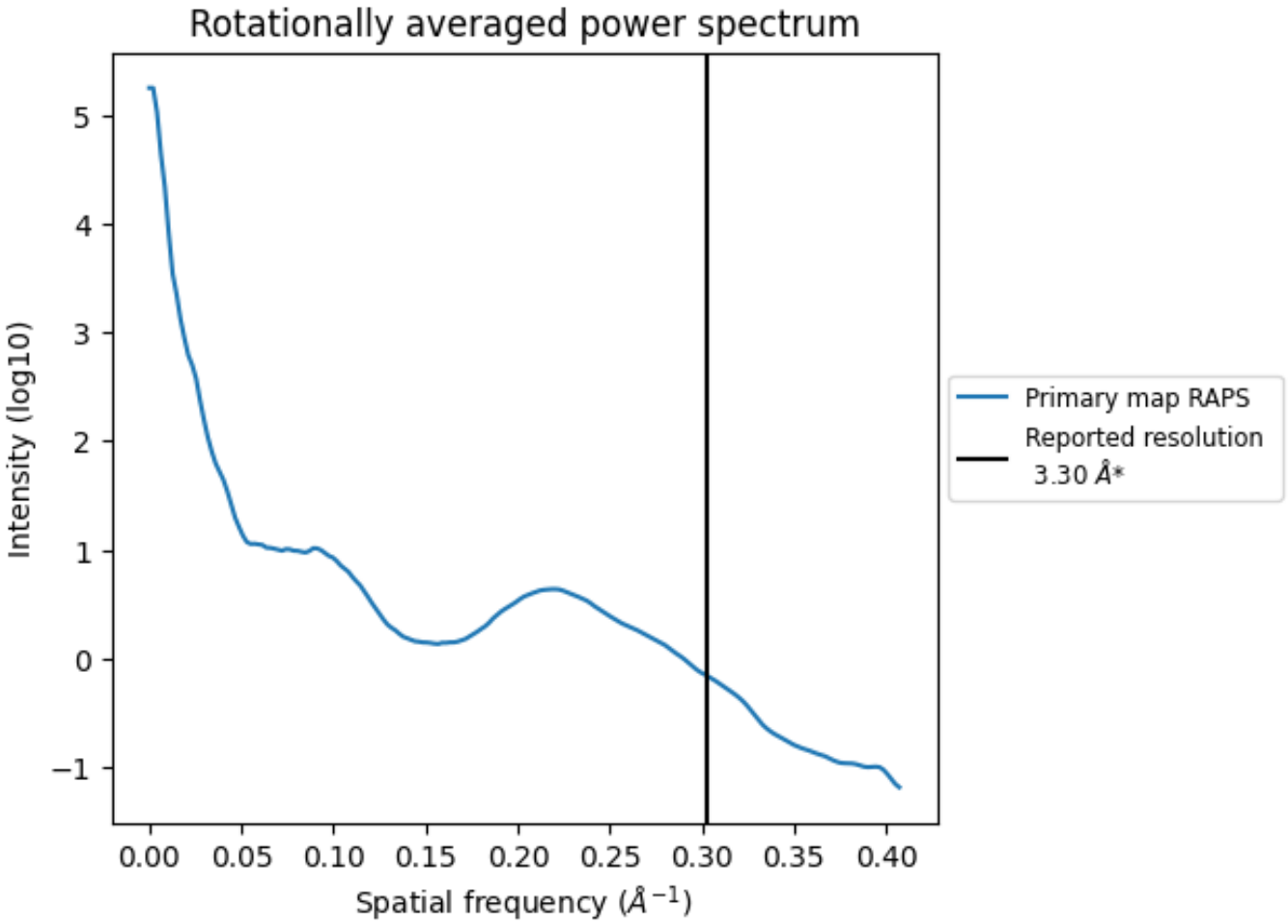
7.2 Volume estimate



The volume at the recommended contour level is 241 nm^3; this corresponds to an approximate mass of 218 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 0.303 Å^{-1}

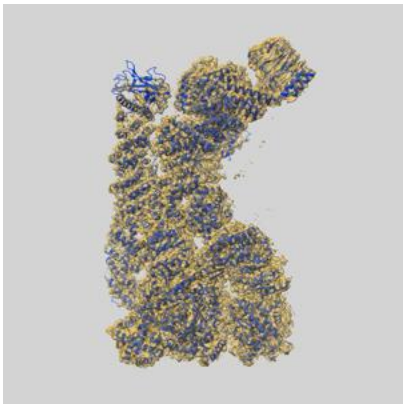
8 Fourier-Shell correlation (i)

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

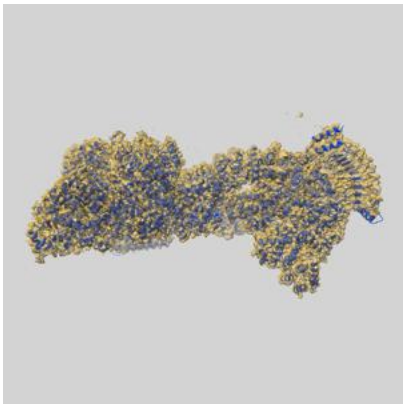
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-50913 and PDB model 9G08. Per-residue inclusion information can be found in section 3 on page 6.

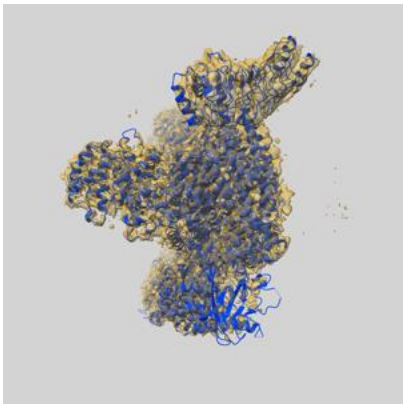
9.1 Map-model overlay



X



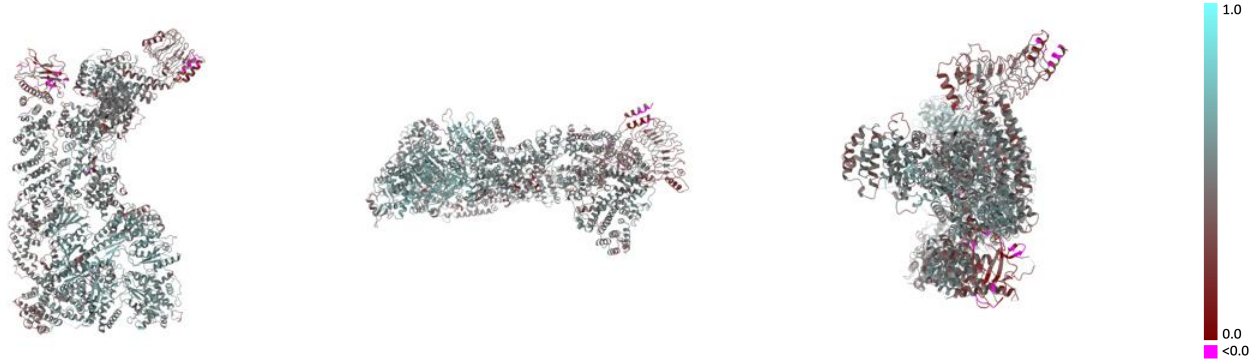
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.8 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.

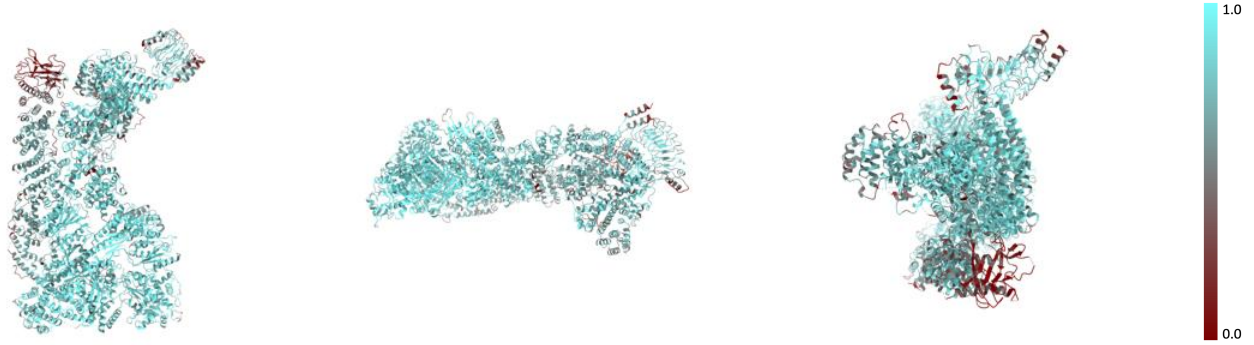
9.2 Q-score mapped to coordinate model (i)



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.

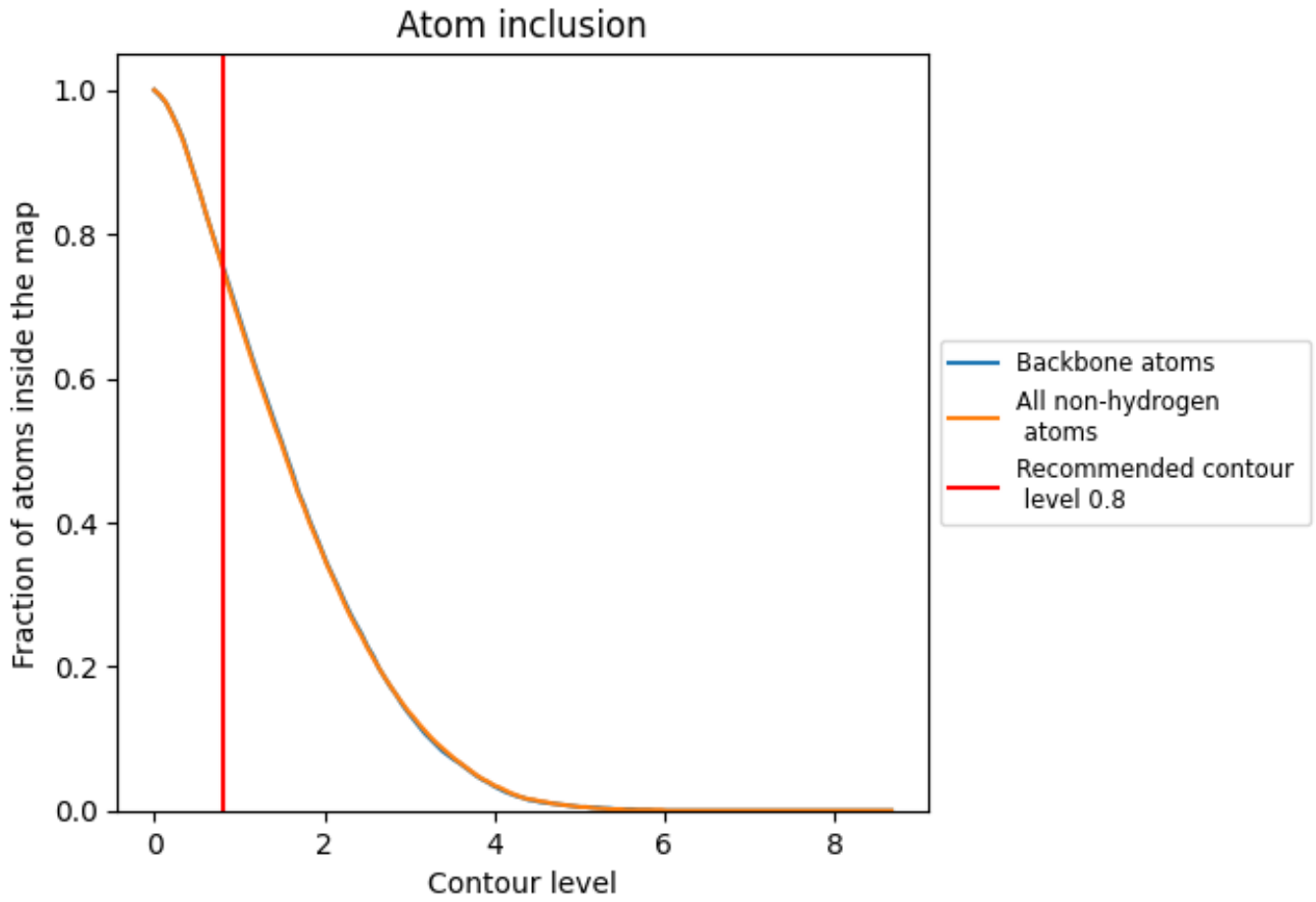
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.8).

9.4 Atom inclusion (i)



At the recommended contour level, 76% of all backbone atoms, 76% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.8) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7550	0.4850
A	0.7710	0.4940
B	0.6110	0.3240