Full wwPDB EM Validation Report

Nov 10, 2025 – 10:29 AM EST

PDB ID	:	9NN2 / pdb_00009nn2
EMDB ID	:	EMD-49563
Title	:	Composite structure of HSV-1 helicase-primase in complex with a forked DNA and amenamevir
Authors	:	He, Q.; Baranovskiy, A.G.; Morstadt, L.M.; Babayeva, N.D.; Lim, C.; Tahirov, T.H.
Deposited on	:	2025-03-04
Resolution	:	3.10 Å(reported)
Based on initial model	:	.

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:

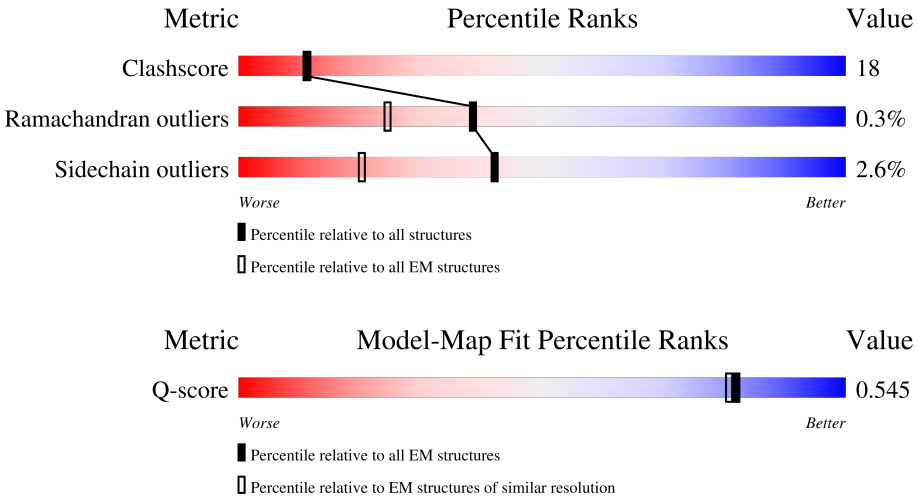
EMDB validation analysis	:	0.0.1.dev129
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive 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)	:	2.46

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 3.10 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	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	14724 (2.60 - 3.60)

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	D	43	7% 9% 84%
2	A	852	6% 58% 34% • 6%
3	B	1058	5% 62% 28% • 9%

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Mol	Chain	Length	Quality of chain
4	C	750	

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 19561 atoms, of which 26 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 DNA chain called DNA (5'-D(P*AP*TP*CP*TP*GP*TP*T)-3').

Mol	Chain	Residues	Atoms					AltConf	Trace
1	D	7	Total	C	N	O	P	0	0
			142	69	21	45	7		

- Molecule 2 is a protein called DNA replication helicase.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	A	797	Total	C	N	O	S	0	0
			6344	4042	1109	1166	27		

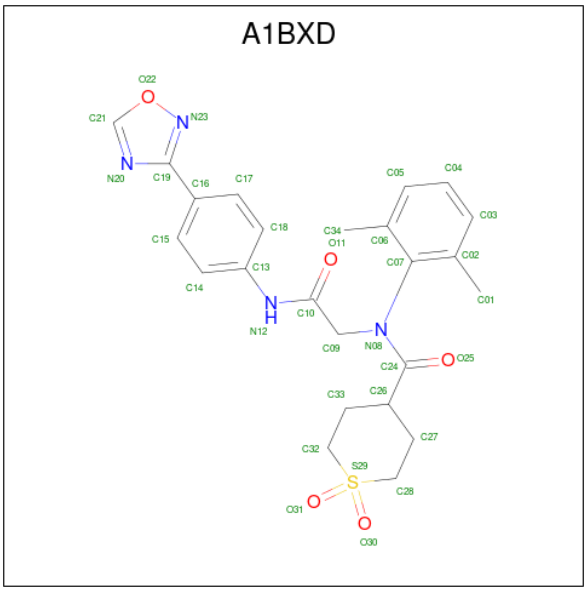
- Molecule 3 is a protein called DNA primase.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	B	963	Total	C	N	O	S	0	0
			7361	4651	1339	1337	34		

- Molecule 4 is a protein called DNA helicase/primase complex-associated protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	C	750	Total	C	N	O	S	0	0
			5648	3625	1000	1003	20		

- Molecule 5 is Amenamevir (CCD ID: A1BXD) (formula: $C_{24}H_{26}N_4O_5S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						AltConf
5	B	1	Total	C	H	N	O	S	0
			60	24	26	4	5	1	

- Molecule 6 is ZINC ION (CCD ID: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
6	B	2	Total	Zn	0
			2	2	

- Molecule 7 is water.

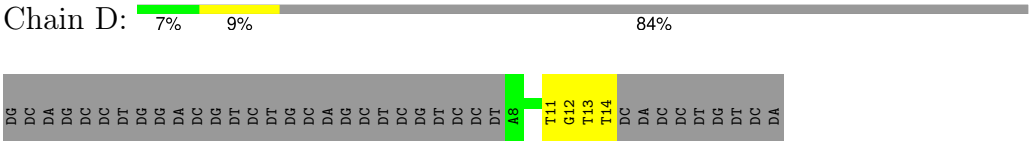
Mol	Chain	Residues	Atoms		AltConf
7	A	1	Total	O	0
			1	1	
7	B	3	Total	O	0
			3	3	

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.

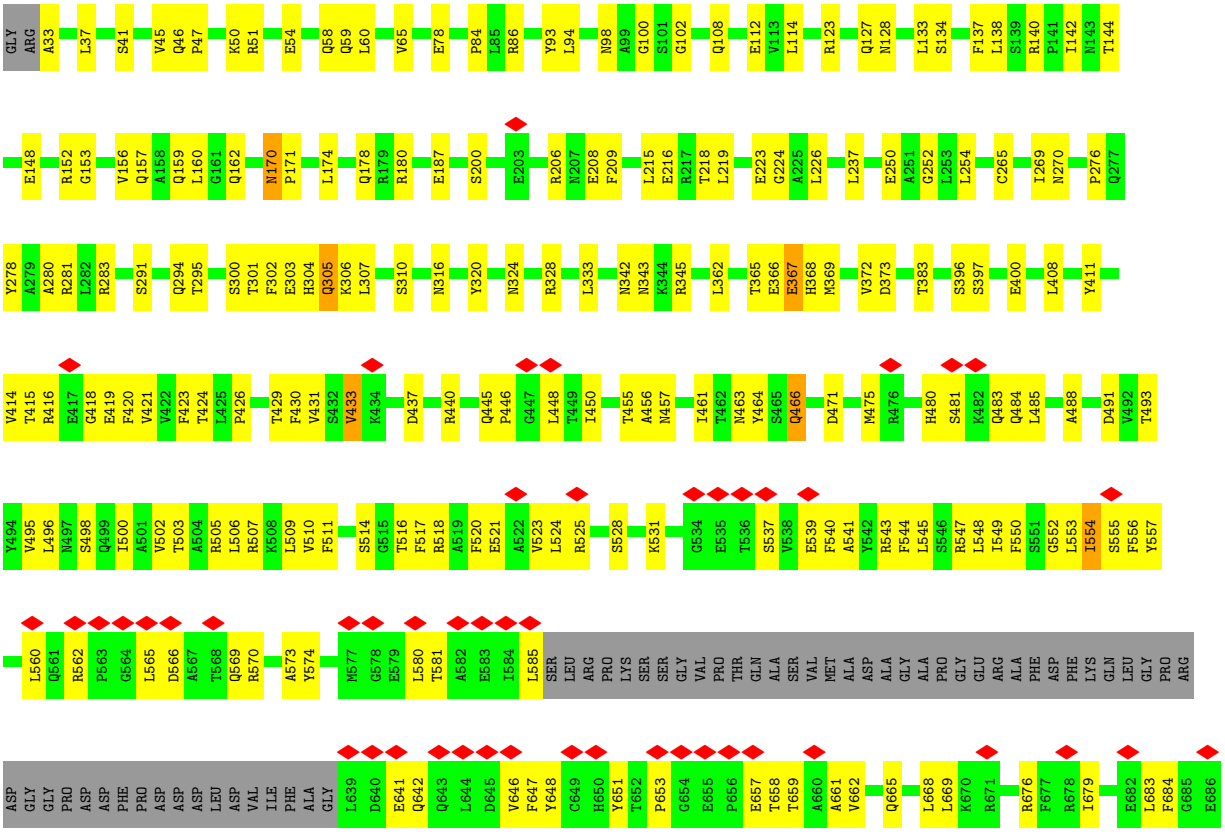
• Molecule 1: DNA (5'-D(P*AP*TP*CP*TP*GP*TP*T)-3')

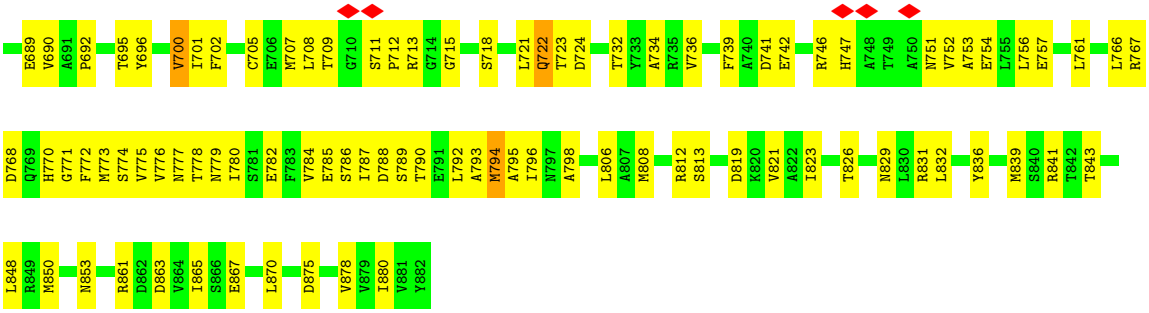
Chain D:



• Molecule 2: DNA replication helicase

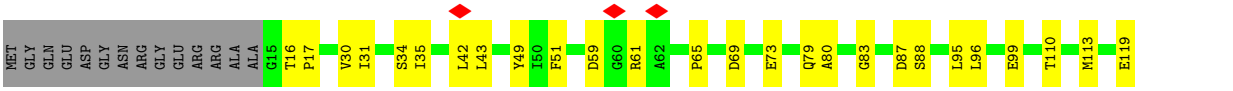
Chain A:

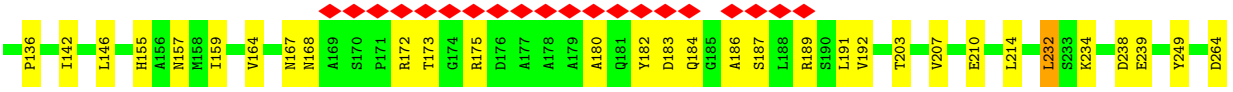


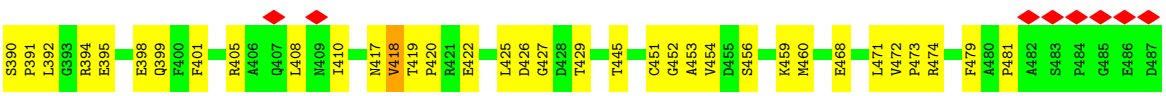


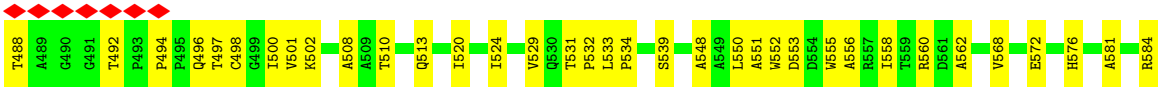
• Molecule 3: DNA primase

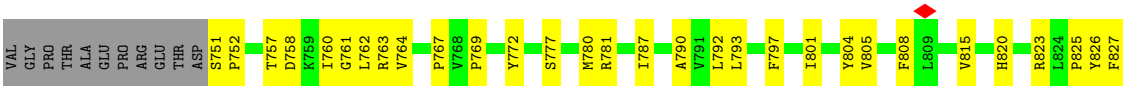
Chain B:

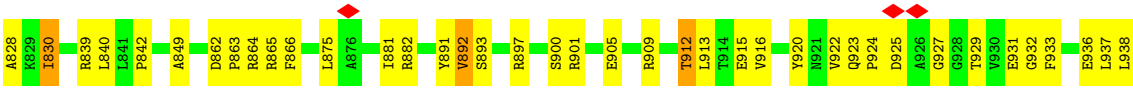


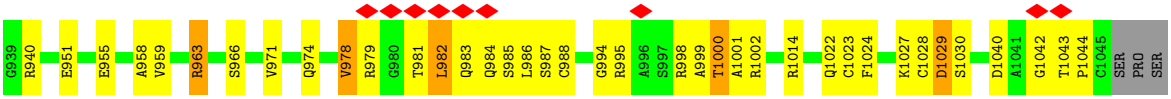












VAL
PRO
CYS
SER
THR
SER
GLN
PRO
SER
SER

• Molecule 4: DNA helicase/primase complex-associated protein

Chain C:

M1 D2 T3 A4 E10 E11 I16 T17 L18 Y19 P24 A27 Y30 F31 H32 V35 Y36 F37 V38 C39 R40 G46 R47 E52 T56 E59 L60 F63 S66 A67 D68 V74 R79 T82 L89 L92 E93 L97 C104 L109

T113 P121 L122 R123 L132 V136 E137 R138 A139 S140 W141 L152 V153 A156 I160 M163 A164 R168 L177 R181 A184 I185 R186 D187 A192 S193 A194 L197 T198 V199 T203 A206 A209 R210 E211 Y212 Q213 T214 P219 I220 K221 K222

E223 L229 V232 C233 E234 L237 R238 H242 R245 V246 R249 Y250 L251 L252 P253 R254 D255 Y256 D257 Y258 F259 A262 G263 E264 K265 F266 S267 L271 F275 R276 A290 P291 V292 F293 A294 F295 P298 E299 G304 V307 P308 P319 V323 P324 A325

T326 A327 E328 R331 D332 L333 A347 V351 V355 V356 L357 P358 C372 L373 L374 P375 E379 A380 V381 I390 I391 Q392 L393 L394 V400 G401 P402 V403 W404 T405 A406 C409 L413 L417 A420 L421 A422 L429 G437 L438 A439 R440 A448 A454

R460 L461 V462 P463 G478 V479 M480 L485 A491 F496 G501 F506 D518 A527 R528 R529 A530 I531 V535 V538 L539 R540 A541 N542 A543 R547 L552 T559 H560 A561 Q566 A567 G568 V569 W570 F571 W572 D576 D579 G582 P585

L586 R587 A594 A595 V598 R599 L602 L606 G607 L608 T609 C612 V613 P614 E615 E616 D617 A618 L619 T620 A621 M625 D630 I633 L634 N638 L641 E644 V648 S651 D657 P660 P661 T662 L670 D671 H674 Y675 W676 R677 R678 V679 V680

R681 P684 E688 S689 L696 P700 L701 V702 D707 L716 I719 V726 K736 Y739 P740 F741 K744 M745 A750

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	725691	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 ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.235	Depositor
Minimum map value	-0.782	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.018	Depositor
Recommended contour level	0.065	Depositor
Map size (Å)	385.2, 385.2, 385.2	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.07, 1.07, 1.07	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: A1BXD, 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	D	0.24	0/157	0.39	0/240
2	A	0.13	0/6483	0.30	0/8802
3	B	0.14	0/7541	0.34	0/10276
4	C	0.14	0/5806	0.32	0/7962
All	All	0.14	0/19987	0.32	0/27280

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	D	142	0	82	8	0
2	A	6344	0	6293	267	0
3	B	7361	0	7292	262	0
4	C	5648	0	5621	170	0
5	B	34	26	0	0	0
6	B	2	0	0	0	0
7	A	1	0	0	0	0
7	B	3	0	0	0	0
All	All	19535	26	19288	689	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 18.

All (689) 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)
2:A:475:MET:HE1	2:A:488:ALA:HB1	1.27	1.10
2:A:200:SER:HB2	2:A:206:ARG:HD3	1.31	1.08
2:A:215:LEU:HD11	3:B:192:VAL:HG21	1.40	1.03
3:B:425:LEU:HD23	3:B:429:THR:HG22	1.42	0.98
2:A:440:ARG:HD2	2:A:446:PRO:HA	1.42	0.98
2:A:511:PHE:HE2	2:A:775:VAL:HG23	1.40	0.86
3:B:16:THR:HG23	3:B:17:PRO:HD2	1.57	0.86
4:C:24:PRO:HG2	4:C:27:ALA:HB3	1.55	0.86
4:C:66:SER:OG	4:C:68:ASP:OD2	1.95	0.85
2:A:485:LEU:HD21	2:A:751:ASN:HD21	1.40	0.84
2:A:642:GLN:HE22	2:A:646:VAL:H	1.25	0.82
3:B:513:GLN:NE2	4:C:641:LEU:O	2.13	0.81
3:B:951:GLU:OE2	3:B:951:GLU:N	2.12	0.81
3:B:625:ILE:HG23	3:B:780:MET:HE1	1.62	0.80
2:A:94:LEU:HD12	2:A:333:LEU:HD11	1.62	0.80
3:B:69:ASP:O	3:B:73:GLU:HG2	1.81	0.80
4:C:37:PHE:HZ	4:C:109:LEU:HD11	1.47	0.80
2:A:475:MET:CE	2:A:488:ALA:HB1	2.11	0.80
3:B:533:LEU:HD22	3:B:551:ALA:HA	1.64	0.79
3:B:371:HIS:ND1	3:B:390:SER:OG	2.16	0.79
4:C:417:LEU:HD12	4:C:480:MET:HE3	1.64	0.78
2:A:303:GLU:OE2	2:A:310:SER:OG	2.02	0.78
3:B:922:VAL:HG21	3:B:933:PHE:HB2	1.66	0.77
3:B:925:ASP:O	3:B:929:THR:OG1	2.02	0.77
2:A:51:ARG:NH1	2:A:54:GLU:OE2	2.18	0.77
3:B:588:ASP:HB2	3:B:752:PRO:HD3	1.67	0.77
3:B:635:GLU:N	3:B:635:GLU:OE2	2.18	0.77
2:A:767:ARG:HD3	2:A:773:MET:CE	2.16	0.76
4:C:613:VAL:HB	4:C:617:ASP:CG	2.11	0.76
3:B:1028:CYS:O	3:B:1029:ASP:HB2	1.84	0.76
3:B:650:ARG:NH2	3:B:671:TYR:O	2.18	0.76
3:B:892:VAL:HG23	3:B:893:SER:H	1.51	0.76
2:A:766:LEU:HD12	2:A:776:VAL:HG21	1.68	0.76
2:A:457:ASN:HB3	2:A:461:ILE:HD11	1.68	0.75
3:B:173:THR:HG21	3:B:184:GLN:HA	1.66	0.75
2:A:307:LEU:HD11	2:A:448:LEU:HD11	1.69	0.75
2:A:557:TYR:HA	2:A:560:LEU:HB2	1.69	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:492:THR:O	3:B:494:PRO:HD3	1.85	0.75
2:A:741:ASP:OD1	2:A:742:GLU:N	2.19	0.75
3:B:334:GLU:O	3:B:338:THR:HG22	1.87	0.75
2:A:433:VAL:CG1	2:A:484:GLN:HG3	2.16	0.74
3:B:183:ASP:HB3	3:B:186:ALA:HB2	1.69	0.74
4:C:606:LEU:O	4:C:609:THR:HG22	1.87	0.74
3:B:978:VAL:HG13	3:B:979:ARG:H	1.53	0.74
4:C:355:VAL:O	4:C:440:ARG:NH1	2.21	0.74
2:A:514:SER:HB2	2:A:773:MET:HE3	1.69	0.73
3:B:173:THR:OG1	3:B:182:TYR:O	2.06	0.73
3:B:656:ALA:HB2	3:B:790:ALA:CB	2.18	0.73
2:A:500:ILE:HD11	2:A:766:LEU:HD22	1.70	0.73
2:A:200:SER:CB	2:A:206:ARG:HD3	2.17	0.73
4:C:602:LEU:HD21	4:C:726:VAL:HG21	1.69	0.73
4:C:16:ILE:HG12	4:C:37:PHE:CD1	2.24	0.73
3:B:901:ARG:O	3:B:905:GLU:HG2	1.88	0.73
3:B:394:ARG:O	3:B:398:GLU:HG3	1.90	0.72
2:A:215:LEU:HD11	3:B:192:VAL:CG2	2.18	0.72
2:A:518:ARG:NH2	2:A:689:GLU:OE1	2.21	0.72
3:B:927:GLY:O	3:B:931:GLU:HG2	1.90	0.72
3:B:932:GLY:O	3:B:936:GLU:HG2	1.89	0.71
2:A:457:ASN:O	2:A:461:ILE:HD12	1.89	0.71
3:B:590:ILE:HD13	3:B:842:PRO:HG2	1.70	0.71
2:A:510:VAL:HG11	2:A:772:PHE:HD2	1.55	0.71
3:B:763:ARG:NH1	3:B:823:ARG:O	2.23	0.71
3:B:912:THR:HG23	3:B:915:GLU:HG3	1.73	0.71
2:A:767:ARG:HD3	2:A:773:MET:HE1	1.73	0.71
3:B:893:SER:O	3:B:897:ARG:HG3	1.91	0.70
2:A:751:ASN:HA	2:A:754:GLU:OE2	1.91	0.70
2:A:133:LEU:HD12	2:A:142:ILE:HD11	1.72	0.70
3:B:498:CYS:O	3:B:502:LYS:HG2	1.92	0.70
3:B:979:ARG:O	3:B:979:ARG:NE	2.24	0.70
2:A:506:LEU:HD21	2:A:779:ASN:OD1	1.90	0.70
2:A:875:ASP:O	3:B:341:ARG:NH2	2.23	0.70
2:A:59:GLN:NE2	2:A:280:ALA:O	2.24	0.69
2:A:863:ASP:O	2:A:867:GLU:HG3	1.92	0.69
4:C:375:PRO:O	4:C:379:GLU:HG2	1.91	0.69
3:B:597:MET:HE2	3:B:610:VAL:HA	1.74	0.69
2:A:711:SER:HB2	2:A:713:ARG:HH11	1.57	0.69
2:A:170:ASN:OD1	2:A:170:ASN:N	2.25	0.69
4:C:585:PRO:O	4:C:586:LEU:HD23	1.92	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:426:ASP:OD2	3:B:427:GLY:N	2.24	0.69
4:C:568:GLY:HA2	4:C:582:GLY:O	1.92	0.69
2:A:520:PHE:O	2:A:523:VAL:HG12	1.93	0.69
2:A:642:GLN:NE2	2:A:646:VAL:HG22	2.08	0.68
3:B:364:SER:OG	3:B:367:ARG:HD2	1.93	0.68
1:D:12:DG:C6	2:A:156:VAL:HG23	2.29	0.68
4:C:400:VAL:CG2	4:C:561:ALA:HB3	2.23	0.68
2:A:500:ILE:HD11	2:A:766:LEU:CD2	2.23	0.68
2:A:711:SER:HB2	2:A:713:ARG:NH1	2.09	0.68
4:C:74:VAL:HG22	4:C:97:LEU:HD11	1.75	0.68
4:C:613:VAL:HG13	4:C:614:PRO:HD2	1.76	0.68
4:C:16:ILE:HG12	4:C:37:PHE:HD1	1.55	0.68
2:A:265:CYS:O	2:A:269:ILE:HD12	1.94	0.68
4:C:602:LEU:CD2	4:C:726:VAL:HG21	2.23	0.68
4:C:613:VAL:CG1	4:C:614:PRO:HD2	2.24	0.68
3:B:1024:PHE:HA	3:B:1030:SER:HB2	1.75	0.68
2:A:550:PHE:O	2:A:648:TYR:OH	2.11	0.67
3:B:172:ARG:H	3:B:172:ARG:HD2	1.58	0.67
3:B:496:GLN:O	3:B:500:ILE:HG22	1.94	0.67
4:C:630:ASP:OD1	4:C:739:TYR:OH	2.04	0.67
2:A:548:LEU:HD22	2:A:695:THR:HG22	1.76	0.67
2:A:554:ILE:HG22	2:A:555:SER:H	1.60	0.67
3:B:284:ASP:OD2	3:B:285:THR:N	2.27	0.67
3:B:974:GLN:HE22	3:B:1002:ARG:HD3	1.59	0.67
2:A:544:PHE:CD1	2:A:715:GLY:HA2	2.30	0.67
3:B:59:ASP:O	3:B:61:ARG:NH2	2.27	0.67
4:C:535:VAL:O	4:C:538:VAL:HG12	1.96	0.66
4:C:92:LEU:HD22	4:C:186:ARG:HD3	1.77	0.66
3:B:155:HIS:O	3:B:159:ILE:HD12	1.94	0.66
3:B:531:THR:OG1	3:B:532:PRO:HA	1.96	0.66
3:B:634:LYS:HG3	3:B:635:GLU:OE2	1.96	0.66
2:A:365:THR:OG1	2:A:367:GLU:OE1	2.13	0.66
4:C:684:PRO:HD2	4:C:688:GLU:HB2	1.78	0.66
3:B:862:ASP:HB3	3:B:865:ARG:HG2	1.78	0.66
4:C:417:LEU:CD1	4:C:480:MET:HE3	2.25	0.66
4:C:633:ILE:HD11	4:C:716:LEU:HD11	1.77	0.66
2:A:433:VAL:HG11	2:A:484:GLN:HG3	1.77	0.66
2:A:291:SER:O	2:A:295:THR:HG22	1.96	0.65
3:B:1043:THR:HB	3:B:1044:PRO:HD3	1.77	0.65
4:C:229:LEU:O	4:C:254:ARG:HG3	1.95	0.65
2:A:304:HIS:NE2	2:A:785:GLU:OE2	2.29	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:C:160:ILE:HG21	4:C:184:ALA:HB1	1.77	0.65
4:C:332:ASP:OD1	4:C:333:LEU:N	2.30	0.65
3:B:797:PHE:O	3:B:801:ILE:HG22	1.97	0.65
2:A:215:LEU:CD1	3:B:192:VAL:HG21	2.22	0.65
2:A:766:LEU:HD12	2:A:776:VAL:CG2	2.27	0.65
3:B:187:SER:O	3:B:191:LEU:HD23	1.97	0.65
2:A:496:LEU:HD22	2:A:705:CYS:SG	2.37	0.65
3:B:395:GLU:O	3:B:399:GLN:HG3	1.97	0.65
4:C:24:PRO:HG2	4:C:27:ALA:CB	2.25	0.65
2:A:480:HIS:CE1	2:A:483:GLN:HB2	2.32	0.64
4:C:238:ARG:CZ	4:C:245:ARG:HD2	2.27	0.64
2:A:58:GLN:OE1	2:A:283:ARG:NH2	2.30	0.64
4:C:156:ALA:HB2	4:C:197:LEU:HD12	1.79	0.64
4:C:263:GLY:N	4:C:323:VAL:O	2.31	0.64
2:A:484:GLN:O	2:A:485:LEU:HD13	1.96	0.64
3:B:1014:ARG:NH2	3:B:1040:ASP:OD2	2.29	0.64
2:A:767:ARG:HB2	2:A:773:MET:CE	2.28	0.64
2:A:510:VAL:HG11	2:A:772:PHE:CD2	2.32	0.64
3:B:550:LEU:HD11	3:B:608:MET:HE1	1.78	0.64
4:C:644:GLU:OE1	4:C:678:ARG:NH2	2.31	0.64
2:A:510:VAL:HG13	2:A:773:MET:O	1.98	0.64
3:B:640:ARG:NH1	3:B:640:ARG:HB2	2.13	0.64
3:B:933:PHE:CE2	3:B:937:LEU:HD11	2.33	0.64
3:B:912:THR:CG2	3:B:915:GLU:HG3	2.28	0.63
2:A:832:LEU:HD23	2:A:861:ARG:HE	1.62	0.63
3:B:277:ILE:HG22	3:B:380:PRO:HD3	1.80	0.63
3:B:978:VAL:HG13	3:B:979:ARG:N	2.14	0.63
3:B:1001:ALA:HA	3:B:1022:GLN:O	1.99	0.63
2:A:524:LEU:HD12	2:A:525:ARG:N	2.13	0.63
2:A:570:ARG:HG2	2:A:574:TYR:CZ	2.33	0.63
3:B:892:VAL:HG23	3:B:893:SER:N	2.14	0.63
3:B:760:ILE:HG22	3:B:762:LEU:HD23	1.81	0.63
4:C:400:VAL:HG22	4:C:561:ALA:HB3	1.79	0.63
3:B:640:ARG:HB2	3:B:640:ARG:HH11	1.63	0.62
3:B:42:LEU:C	3:B:43:LEU:HD22	2.23	0.62
2:A:215:LEU:HD21	3:B:192:VAL:CG2	2.30	0.62
2:A:485:LEU:CD2	2:A:751:ASN:HD21	2.12	0.62
3:B:920:TYR:OH	3:B:1042:GLY:HA2	1.99	0.62
4:C:199:VAL:HG12	4:C:210:ARG:HB2	1.81	0.62
2:A:795:ALA:C	2:A:796:ILE:HD12	2.25	0.62
3:B:479:PHE:CE2	3:B:481:PRO:HB3	2.35	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:974:GLN:NE2	3:B:1002:ARG:HD3	2.15	0.62
2:A:383:THR:HG22	2:A:383:THR:O	2.00	0.61
2:A:431:VAL:HG11	2:A:450:ILE:HD12	1.82	0.61
2:A:324:ASN:O	2:A:328:ARG:HB2	2.00	0.61
4:C:263:GLY:HA3	4:C:324:PRO:HA	1.82	0.61
3:B:453:ALA:O	3:B:460:MET:HE1	2.01	0.61
2:A:553:LEU:C	2:A:554:ILE:HD12	2.26	0.61
2:A:700:VAL:HG22	2:A:709:THR:HB	1.82	0.60
3:B:533:LEU:CD2	3:B:551:ALA:HA	2.31	0.60
3:B:183:ASP:HB3	3:B:186:ALA:CB	2.31	0.60
2:A:700:VAL:HG13	2:A:707:MET:HG2	1.81	0.60
3:B:607:GLN:HG3	3:B:607:GLN:O	2.00	0.60
3:B:801:ILE:O	3:B:805:VAL:HG23	2.02	0.60
4:C:152:LEU:HD23	4:C:153:VAL:N	2.17	0.60
3:B:979:ARG:HH22	3:B:984:GLN:HE22	1.49	0.60
3:B:492:THR:C	3:B:494:PRO:HD3	2.27	0.59
3:B:408:LEU:O	3:B:793:LEU:HD13	2.01	0.59
2:A:108:GLN:O	2:A:112:GLU:HG3	2.02	0.59
2:A:304:HIS:ND1	2:A:787:ILE:HD11	2.16	0.59
2:A:712:PRO:HG2	2:A:736:VAL:HG22	1.85	0.59
4:C:594:ALA:HB1	4:C:719:ILE:HD11	1.83	0.59
2:A:829:ASN:ND2	2:A:831:ARG:HH12	2.00	0.59
3:B:637:VAL:HG12	3:B:638:PRO:O	2.03	0.59
4:C:66:SER:OG	4:C:67:ALA:N	2.35	0.59
2:A:123:ARG:HH11	2:A:505:ARG:HG3	1.68	0.59
2:A:657:GLU:HG3	2:A:658:THR:H	1.67	0.59
2:A:732:THR:HG22	2:A:734:ALA:H	1.68	0.59
3:B:410:ILE:HD13	3:B:790:ALA:HA	1.83	0.59
2:A:657:GLU:HB3	2:A:661:ALA:HB3	1.85	0.59
3:B:175:ARG:HE	3:B:180:ALA:HB1	1.67	0.59
3:B:425:LEU:HD23	3:B:429:THR:CG2	2.26	0.59
2:A:767:ARG:HB2	2:A:773:MET:HE1	1.84	0.59
3:B:828:ALA:HB2	3:B:839:ARG:HG3	1.85	0.59
4:C:181:ARG:O	4:C:185:ILE:HG13	2.03	0.59
4:C:420:ALA:HA	4:C:547:ARG:HH12	1.68	0.59
2:A:581:THR:HG23	2:A:647:PHE:HD1	1.67	0.58
3:B:497:THR:O	3:B:501:VAL:HG23	2.02	0.58
2:A:573:ALA:CB	2:A:683:LEU:HD13	2.34	0.58
4:C:264:GLU:N	4:C:264:GLU:OE2	2.35	0.58
2:A:751:ASN:O	2:A:754:GLU:HG2	2.04	0.58
4:C:177:LEU:HD23	4:C:670:LEU:HD22	1.86	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:642:GLN:HE22	2:A:646:VAL:HG22	1.69	0.58
3:B:79:GLN:HB2	3:B:83:GLY:O	2.03	0.58
3:B:173:THR:HA	3:B:182:TYR:CZ	2.38	0.58
3:B:452:GLY:HA3	3:B:550:LEU:HD23	1.84	0.58
3:B:681:ARG:O	3:B:681:ARG:HD3	2.03	0.58
2:A:153:GLY:O	2:A:156:VAL:HG12	2.04	0.57
2:A:457:ASN:HB3	2:A:461:ILE:CD1	2.34	0.57
3:B:584:ARG:HG2	3:B:639:PHE:HE2	1.68	0.57
4:C:168:ARG:NH1	4:C:187:ASP:OD2	2.37	0.57
2:A:665:GLN:O	2:A:668:LEU:HG	2.04	0.57
4:C:212:TYR:CE2	4:C:219:PRO:HG3	2.39	0.57
4:C:401:GLY:O	4:C:403:VAL:HG22	2.03	0.57
2:A:509:LEU:HD23	2:A:739:PHE:CZ	2.39	0.57
3:B:611:ASN:HB2	3:B:830:ILE:HD13	1.85	0.57
3:B:909:ARG:NH2	3:B:915:GLU:OE1	2.38	0.57
3:B:998:ARG:NE	3:B:998:ARG:HA	2.19	0.57
3:B:395:GLU:OE2	3:B:395:GLU:HA	2.05	0.57
3:B:371:HIS:HB2	3:B:392:LEU:HD13	1.87	0.57
3:B:586:LEU:O	3:B:590:ILE:HG22	2.04	0.57
4:C:221:LYS:HB2	4:C:221:LYS:NZ	2.20	0.57
2:A:483:GLN:HB3	2:A:485:LEU:CD2	2.34	0.57
2:A:668:LEU:HD12	2:A:669:LEU:N	2.20	0.57
3:B:596:VAL:HG12	3:B:597:MET:O	2.05	0.57
3:B:938:LEU:HD21	3:B:959:VAL:HG23	1.86	0.57
4:C:211:GLU:HG3	4:C:220:ILE:HG12	1.86	0.57
2:A:702:PHE:CZ	2:A:707:MET:HG3	2.40	0.57
3:B:49:TYR:CE1	3:B:136:PRO:HB3	2.40	0.57
2:A:433:VAL:HG12	2:A:484:GLN:HG3	1.87	0.56
2:A:509:LEU:CD2	2:A:736:VAL:HG11	2.35	0.56
3:B:629:LEU:HD13	3:B:764:VAL:HG23	1.86	0.56
3:B:1029:ASP:O	3:B:1030:SER:HB3	2.05	0.56
4:C:307:VAL:HG21	4:C:460:ARG:HD3	1.87	0.56
2:A:537:SER:O	2:A:541:ALA:N	2.29	0.56
2:A:702:PHE:CE1	2:A:707:MET:HG3	2.41	0.56
3:B:172:ARG:HD2	3:B:172:ARG:N	2.20	0.56
3:B:760:ILE:HG22	3:B:762:LEU:CD2	2.35	0.56
3:B:864:ARG:HH11	3:B:864:ARG:HG3	1.70	0.56
4:C:27:ALA:HB1	4:C:30:TYR:CE1	2.40	0.56
2:A:553:LEU:HB2	2:A:648:TYR:OH	2.06	0.56
2:A:553:LEU:HB2	2:A:648:TYR:CE2	2.40	0.56
2:A:696:TYR:HE2	2:A:773:MET:HG3	1.69	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:955:GLU:HG2	3:B:983:GLN:HG3	1.87	0.56
4:C:613:VAL:N	4:C:617:ASP:OD2	2.38	0.56
2:A:411:TYR:CE1	2:A:415:THR:HG21	2.40	0.56
2:A:440:ARG:CZ	2:A:440:ARG:HB3	2.35	0.56
3:B:510:THR:O	3:B:531:THR:HG21	2.06	0.56
3:B:963:ARG:HE	3:B:966:SER:HB3	1.70	0.56
3:B:460:MET:CG	3:B:500:ILE:HD11	2.36	0.56
3:B:550:LEU:HD11	3:B:608:MET:CE	2.36	0.56
4:C:744:LYS:HG3	4:C:745:MET:HG2	1.88	0.56
2:A:713:ARG:NH2	2:A:736:VAL:HA	2.20	0.56
2:A:721:LEU:HB2	2:A:724:ASP:OD2	2.06	0.56
3:B:345:ARG:HG3	3:B:345:ARG:HH11	1.70	0.56
3:B:994:GLY:O	3:B:995:ARG:HG2	2.06	0.56
4:C:357:LEU:HG	4:C:358:PRO:HD2	1.87	0.56
4:C:234:GLU:OE2	4:C:249:ARG:NE	2.37	0.56
3:B:285:THR:OG1	3:B:286:VAL:N	2.38	0.55
2:A:41:SER:O	2:A:45:VAL:HG23	2.05	0.55
2:A:502:VAL:CG1	2:A:506:LEU:HD12	2.37	0.55
3:B:16:THR:CG2	3:B:17:PRO:HD2	2.31	0.55
2:A:423:PHE:CE1	2:A:496:LEU:HD13	2.41	0.55
2:A:657:GLU:HB3	2:A:661:ALA:CB	2.36	0.55
3:B:203:THR:O	3:B:207:VAL:HG23	2.06	0.55
2:A:457:ASN:CB	2:A:461:ILE:HD11	2.33	0.55
3:B:585:ARG:HH12	3:B:751:SER:N	2.05	0.55
4:C:152:LEU:HD12	4:C:259:PHE:CD2	2.41	0.55
4:C:271:LEU:HD22	4:C:275:PHE:CE2	2.42	0.55
2:A:528:SER:HA	2:A:531:LYS:HD2	1.88	0.55
4:C:598:VAL:HG23	4:C:719:ILE:HD13	1.89	0.55
2:A:787:ILE:O	2:A:790:THR:HG23	2.07	0.55
4:C:11:GLU:HG2	4:C:40:ARG:O	2.07	0.55
2:A:180:ARG:NH2	2:A:320:TYR:OH	2.39	0.55
3:B:471:LEU:HD22	4:C:702:VAL:HG11	1.88	0.55
3:B:656:ALA:HB2	3:B:790:ALA:HB2	1.87	0.55
2:A:657:GLU:O	2:A:662:VAL:HG23	2.07	0.55
4:C:529:ARG:HH11	4:C:529:ARG:HG2	1.71	0.55
3:B:401:PHE:O	3:B:405:ARG:HD2	2.07	0.55
3:B:633:LEU:HD11	3:B:760:ILE:HG13	1.88	0.55
3:B:671:TYR:OH	3:B:767:PRO:O	2.22	0.55
4:C:211:GLU:HB3	4:C:221:LYS:HB3	1.89	0.55
2:A:819:ASP:OD1	2:A:819:ASP:N	2.40	0.54
3:B:65:PRO:HB3	3:B:69:ASP:HB3	1.89	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:581:THR:HG23	2:A:647:PHE:CD1	2.42	0.54
2:A:304:HIS:CE1	2:A:787:ILE:HD11	2.42	0.54
2:A:431:VAL:HG11	2:A:450:ILE:CD1	2.36	0.54
3:B:422:GLU:OE2	3:B:882:ARG:HB3	2.08	0.54
4:C:160:ILE:HG21	4:C:184:ALA:CB	2.37	0.54
3:B:901:ARG:HG3	3:B:901:ARG:HH11	1.72	0.54
2:A:545:LEU:O	2:A:545:LEU:HD12	2.07	0.54
2:A:562:ARG:HH21	2:A:692:PRO:HD2	1.73	0.54
2:A:368:HIS:O	2:A:372:VAL:HG23	2.08	0.54
3:B:595:PRO:O	3:B:596:VAL:HG23	2.08	0.54
3:B:978:VAL:HG22	3:B:979:ARG:N	2.23	0.54
4:C:356:VAL:O	4:C:437:GLY:HA3	2.07	0.54
4:C:82:THR:HG23	4:C:290:ALA:HB3	1.90	0.53
2:A:739:PHE:HE2	2:A:775:VAL:HG12	1.73	0.53
3:B:998:ARG:HA	3:B:998:ARG:CZ	2.37	0.53
3:B:454:VAL:HG23	3:B:548:ALA:HB2	1.90	0.53
4:C:74:VAL:CG2	4:C:97:LEU:HD11	2.39	0.53
4:C:595:ALA:O	4:C:599:ARG:HG3	2.09	0.53
2:A:157:GLN:HG3	2:A:784:VAL:O	2.08	0.53
2:A:307:LEU:O	2:A:456:ALA:HB1	2.08	0.53
2:A:366:GLU:CD	2:A:366:GLU:H	2.17	0.53
2:A:788:ASP:O	2:A:789:SER:HB2	2.08	0.53
2:A:832:LEU:CD2	2:A:861:ARG:HE	2.21	0.53
3:B:823:ARG:NH1	3:B:827:PHE:O	2.39	0.53
3:B:815:VAL:HA	3:B:820:HIS:ND1	2.23	0.53
3:B:31:ILE:O	3:B:35:ILE:HG12	2.09	0.53
3:B:508:ALA:O	3:B:531:THR:OG1	2.27	0.53
3:B:264:ASP:O	3:B:268:ILE:HG12	2.09	0.53
4:C:262:ALA:HB1	4:C:325:ALA:HB2	1.91	0.53
4:C:422:ALA:HB1	4:C:438:LEU:HD22	1.90	0.53
2:A:252:GLY:HA2	2:A:316:ASN:HD22	1.74	0.52
3:B:801:ILE:O	3:B:801:ILE:HG13	2.08	0.52
2:A:162:GLN:HA	2:A:162:GLN:HE21	1.72	0.52
2:A:65:VAL:HG21	2:A:281:ARG:HG2	1.92	0.52
3:B:556:ALA:O	3:B:560:ARG:HG3	2.08	0.52
3:B:472:VAL:N	3:B:473:PRO:HD2	2.24	0.52
4:C:325:ALA:O	4:C:326:THR:OG1	2.26	0.52
3:B:761:GLY:O	3:B:762:LEU:HD22	2.09	0.52
3:B:981:THR:O	3:B:983:GLN:OE1	2.28	0.52
3:B:1000:THR:HB	3:B:1024:PHE:CD2	2.44	0.52
2:A:712:PRO:HD3	2:A:734:ALA:HB1	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:419:THR:O	3:B:419:THR:OG1	2.25	0.52
4:C:579:ASP:OD1	4:C:599:ARG:NH2	2.43	0.52
2:A:60:LEU:O	2:A:281:ARG:NH1	2.43	0.52
3:B:568:VAL:CG1	3:B:589:ARG:HE	2.23	0.52
1:D:14:DT:O2	2:A:505:ARG:NH1	2.42	0.51
2:A:496:LEU:HD21	2:A:705:CYS:HA	1.91	0.51
3:B:637:VAL:HG22	3:B:804:TYR:CG	2.45	0.51
4:C:63:PHE:HB2	4:C:104:CYS:SG	2.50	0.51
4:C:347:ALA:HB1	4:C:351:VAL:CG2	2.41	0.51
3:B:239:GLU:OE2	3:B:304:SER:OG	2.15	0.51
3:B:644:GLU:OE2	3:B:644:GLU:HA	2.08	0.51
4:C:298:PRO:HG3	4:C:308:PRO:HA	1.93	0.51
2:A:215:LEU:HD21	3:B:192:VAL:HG21	1.91	0.51
3:B:568:VAL:O	3:B:572:GLU:HG2	2.10	0.51
4:C:233:CYS:SG	4:C:252:LEU:HD12	2.50	0.51
4:C:598:VAL:CG2	4:C:719:ILE:HD13	2.40	0.51
2:A:580:LEU:HD22	2:A:679:ILE:HD12	1.93	0.51
3:B:891:TYR:O	3:B:892:VAL:HG22	2.10	0.51
2:A:250:GLU:OE2	2:A:250:GLU:HA	2.10	0.51
2:A:485:LEU:HD21	2:A:751:ASN:ND2	2.18	0.51
4:C:19:TYR:CE2	4:C:291:PRO:HG3	2.46	0.51
3:B:456:SER:O	3:B:460:MET:HB2	2.11	0.51
3:B:488:THR:O	3:B:488:THR:HG23	2.11	0.51
4:C:132:LEU:CD2	4:C:237:LEU:HD22	2.40	0.51
2:A:511:PHE:CE2	2:A:775:VAL:HG23	2.32	0.51
2:A:554:ILE:HD11	2:A:648:TYR:CZ	2.45	0.51
3:B:981:THR:O	3:B:982:LEU:HB2	2.10	0.51
3:B:590:ILE:CD1	3:B:842:PRO:HG2	2.41	0.51
3:B:619:ALA:C	3:B:620:LEU:HD23	2.36	0.51
3:B:792:LEU:HD11	3:B:808:PHE:O	2.11	0.51
2:A:566:ASP:HB3	2:A:569:GLN:HB2	1.92	0.50
3:B:533:LEU:HD22	3:B:551:ALA:CA	2.38	0.50
3:B:553:ASP:OD2	3:B:612:ARG:NH2	2.45	0.50
2:A:170:ASN:CG	2:A:171:PRO:HD3	2.36	0.50
2:A:208:GLU:HG2	2:A:237:LEU:HD21	1.93	0.50
2:A:766:LEU:CD1	2:A:776:VAL:HG21	2.40	0.50
3:B:825:PRO:O	3:B:826:TYR:HB2	2.12	0.50
2:A:174:LEU:O	2:A:178:GLN:HG3	2.11	0.50
3:B:30:VAL:HG21	3:B:95:LEU:HD21	1.94	0.50
3:B:520:ILE:HG21	3:B:533:LEU:HD11	1.92	0.50
3:B:984:GLN:HA	3:B:984:GLN:OE1	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:397:SER:HB3	2:A:400:GLU:HG3	1.94	0.50
2:A:752:VAL:CG1	2:A:756:LEU:HD12	2.42	0.50
3:B:669:ASP:O	3:B:849:ALA:HB3	2.12	0.50
4:C:68:ASP:OD2	4:C:68:ASP:N	2.44	0.50
2:A:187:GLU:H	2:A:187:GLU:CD	2.20	0.50
2:A:421:VAL:HG12	2:A:496:LEU:HB2	1.93	0.50
3:B:913:LEU:HD21	3:B:971:VAL:HG23	1.94	0.50
4:C:587:ARG:NH1	4:C:648:VAL:HG21	2.27	0.50
3:B:922:VAL:HG21	3:B:933:PHE:CB	2.39	0.49
2:A:507:ARG:NH2	2:A:742:GLU:HB3	2.27	0.49
2:A:554:ILE:HG22	2:A:555:SER:N	2.25	0.49
4:C:3:THR:O	4:C:3:THR:HG22	2.12	0.49
2:A:437:ASP:HA	2:A:440:ARG:NH1	2.26	0.49
4:C:164:ALA:O	4:C:168:ARG:HG3	2.12	0.49
2:A:366:GLU:HA	2:A:369:MET:HE2	1.95	0.49
2:A:768:ASP:OD2	2:A:770:HIS:N	2.45	0.49
3:B:265:LEU:O	3:B:269:LYS:HG3	2.12	0.49
2:A:742:GLU:OE2	2:A:746:ARG:HD2	2.13	0.49
2:A:870:LEU:HD13	3:B:348:ASP:OD1	2.11	0.49
3:B:264:ASP:OD1	3:B:264:ASP:N	2.39	0.49
3:B:757:THR:OG1	3:B:758:ASP:N	2.46	0.49
2:A:437:ASP:OD1	2:A:440:ARG:NH2	2.45	0.49
2:A:514:SER:CB	2:A:773:MET:HE3	2.39	0.49
2:A:826:THR:HG23	2:A:826:THR:O	2.11	0.49
2:A:466:GLN:HG2	2:A:812:ARG:NH1	2.28	0.49
3:B:988:CYS:HB2	3:B:1023:CYS:SG	2.53	0.49
4:C:570:TRP:CH2	4:C:572:TRP:HB2	2.47	0.49
3:B:611:ASN:ND2	3:B:828:ALA:O	2.46	0.49
2:A:426:PRO:HG2	2:A:761:LEU:CD2	2.43	0.49
3:B:1000:THR:HB	3:B:1024:PHE:HD2	1.78	0.49
2:A:437:ASP:HA	2:A:440:ARG:CZ	2.42	0.48
2:A:565:LEU:HD13	2:A:684:PHE:CE2	2.48	0.48
2:A:768:ASP:OD2	2:A:768:ASP:C	2.55	0.48
2:A:127:GLN:HE22	2:A:722:GLN:H	1.61	0.48
2:A:216:GLU:OE2	2:A:223:GLU:HA	2.13	0.48
2:A:483:GLN:O	2:A:485:LEU:HD22	2.14	0.48
2:A:777:ASN:OD1	2:A:778:THR:N	2.44	0.48
2:A:839:MET:HE3	2:A:850:MET:HE1	1.94	0.48
3:B:987:SER:HB3	3:B:998:ARG:HD3	1.95	0.48
2:A:510:VAL:CG1	2:A:772:PHE:HD2	2.23	0.48
2:A:566:ASP:CB	2:A:569:GLN:HB2	2.43	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:326:ASP:OD1	3:B:371:HIS:NE2	2.34	0.48
3:B:924:PRO:O	3:B:963:ARG:NH2	2.46	0.48
2:A:218:THR:HG21	3:B:189:ARG:HG2	1.95	0.48
3:B:658:GLN:OE1	3:B:658:GLN:HA	2.14	0.48
4:C:163:MET:SD	4:C:163:MET:N	2.87	0.48
2:A:481:SER:O	2:A:483:GLN:N	2.46	0.48
4:C:194:ALA:HA	4:C:214:THR:HG23	1.94	0.48
2:A:294:GLN:HG2	2:A:836:TYR:CE2	2.49	0.48
2:A:437:ASP:CG	2:A:440:ARG:HH22	2.21	0.48
2:A:573:ALA:HA	2:A:683:LEU:HD11	1.95	0.48
3:B:417:ASN:O	3:B:418:VAL:HG23	2.13	0.48
3:B:891:TYR:O	3:B:892:VAL:CG2	2.62	0.48
4:C:372:CYS:O	4:C:373:LEU:HB2	2.14	0.48
1:D:14:DT:C7	2:A:463:ASN:HD21	2.27	0.48
2:A:418:GLY:O	2:A:419:GLU:HB2	2.14	0.48
3:B:34:SER:HB2	3:B:113:MET:HE2	1.96	0.48
4:C:542:ASN:O	4:C:543:ALA:HB3	2.13	0.48
2:A:437:ASP:HA	2:A:440:ARG:NH2	2.29	0.48
3:B:96:LEU:HD23	3:B:110:THR:HG22	1.96	0.48
3:B:922:VAL:CG2	3:B:933:PHE:HB2	2.40	0.47
4:C:262:ALA:HB3	4:C:264:GLU:OE2	2.14	0.47
2:A:495:VAL:O	2:A:498:SER:OG	2.30	0.47
2:A:779:ASN:O	2:A:798:ALA:HA	2.14	0.47
2:A:792:LEU:HG	2:A:794:MET:HG2	1.96	0.47
3:B:781:ARG:HB3	3:B:781:ARG:NH1	2.30	0.47
3:B:978:VAL:HG22	3:B:979:ARG:H	1.79	0.47
1:D:11:DT:H2"	1:D:12:DG:O5'	2.15	0.47
3:B:277:ILE:CG2	3:B:380:PRO:HD3	2.44	0.47
4:C:232:VAL:HG22	4:C:251:LEU:CD2	2.44	0.47
2:A:345:ARG:HB3	2:A:843:THR:HG22	1.96	0.47
2:A:553:LEU:O	2:A:554:ILE:HD12	2.14	0.47
2:A:813:SER:O	2:A:841:ARG:HD2	2.13	0.47
3:B:175:ARG:HB2	3:B:180:ALA:O	2.14	0.47
4:C:38:VAL:HG23	4:C:252:LEU:CD2	2.44	0.47
2:A:641:GLU:HG2	2:A:642:GLN:N	2.29	0.47
2:A:747:HIS:ND1	2:A:782:GLU:OE2	2.42	0.47
2:A:767:ARG:HD2	2:A:771:GLY:HA2	1.96	0.47
3:B:863:PRO:HA	3:B:866:PHE:CZ	2.50	0.47
4:C:391:ILE:HD11	4:C:393:LEU:HD21	1.97	0.47
2:A:416:ARG:HD2	2:A:419:GLU:HA	1.97	0.47
3:B:288:ALA:O	3:B:289:ALA:HB3	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:568:VAL:HG11	3:B:589:ARG:HE	1.79	0.47
4:C:123:ARG:HH11	4:C:123:ARG:HB2	1.78	0.47
4:C:608:LEU:HD23	4:C:608:LEU:C	2.39	0.47
1:D:14:DT:H72	2:A:463:ASN:HD21	1.80	0.47
2:A:373:ASP:OD1	2:A:853:ASN:ND2	2.48	0.47
3:B:88:SER:HB2	3:B:119:GLU:CG	2.45	0.47
3:B:142:ILE:O	3:B:146:LEU:HB2	2.15	0.47
3:B:534:PRO:HD2	3:B:550:LEU:O	2.15	0.47
3:B:640:ARG:O	3:B:644:GLU:HG2	2.14	0.47
2:A:305:GLN:OE1	2:A:306:LYS:HG3	2.15	0.47
3:B:986:LEU:HD12	3:B:986:LEU:H	1.79	0.47
3:B:365:PRO:HB2	3:B:366:PRO:HD3	1.96	0.47
4:C:391:ILE:CD1	4:C:393:LEU:HD21	2.45	0.47
4:C:501:GLY:HA3	4:C:506:PHE:HA	1.97	0.47
4:C:613:VAL:HB	4:C:617:ASP:OD1	2.15	0.47
2:A:557:TYR:CD1	2:A:560:LEU:HD12	2.50	0.47
3:B:951:GLU:H	3:B:951:GLU:CD	2.07	0.47
4:C:293:PHE:CZ	4:C:295:PHE:HE2	2.33	0.47
4:C:621:ALA:O	4:C:625:MET:HG3	2.15	0.47
3:B:391:PRO:O	3:B:395:GLU:HG2	2.14	0.46
3:B:418:VAL:HG12	3:B:420:PRO:HD3	1.96	0.46
4:C:203:THR:HG23	4:C:206:ALA:H	1.80	0.46
4:C:192:ALA:HB3	4:C:276:ARG:NH1	2.31	0.46
4:C:527:ALA:O	4:C:531:ILE:HG13	2.15	0.46
4:C:633:ILE:HD13	4:C:741:PHE:CE1	2.51	0.46
3:B:539:SER:O	3:B:607:GLN:NE2	2.48	0.46
3:B:983:GLN:HG2	3:B:985:SER:O	2.15	0.46
3:B:562:ALA:CB	3:B:826:TYR:HE1	2.28	0.46
3:B:955:GLU:HG2	3:B:983:GLN:CG	2.45	0.46
3:B:681:ARG:HD3	3:B:681:ARG:C	2.40	0.46
3:B:862:ASP:OD2	3:B:865:ARG:NH1	2.49	0.46
4:C:40:ARG:NH2	4:C:256:TYR:O	2.48	0.46
2:A:156:VAL:O	2:A:156:VAL:HG22	2.16	0.46
3:B:474:ARG:NH1	4:C:700:PRO:HD2	2.31	0.46
4:C:413:LEU:HG	4:C:480:MET:HE1	1.98	0.46
4:C:680:VAL:HG22	4:C:681:ARG:H	1.80	0.46
2:A:144:THR:O	2:A:148:GLU:HG2	2.16	0.46
3:B:922:VAL:HG21	3:B:933:PHE:CG	2.51	0.46
3:B:923:GLN:O	3:B:929:THR:OG1	2.31	0.46
2:A:209:PHE:CD2	2:A:276:PRO:HD3	2.51	0.46
2:A:46:GLN:HB2	2:A:47:PRO:HD3	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:94:LEU:HD12	2:A:333:LEU:HD21	1.97	0.45
2:A:112:GLU:OE1	3:B:249:TYR:OH	2.30	0.45
2:A:152:ARG:HD3	2:A:152:ARG:HA	1.64	0.45
2:A:159:GLN:HB2	2:A:162:GLN:OE1	2.15	0.45
2:A:507:ARG:HA	2:A:718:SER:O	2.15	0.45
2:A:537:SER:HB2	2:A:540:PHE:HB2	1.98	0.45
2:A:574:TYR:CD1	2:A:642:GLN:HG3	2.51	0.45
4:C:598:VAL:HG23	4:C:719:ILE:CD1	2.46	0.45
4:C:619:LEU:HD23	4:C:619:LEU:HA	1.78	0.45
4:C:634:LEU:HD23	4:C:634:LEU:HA	1.84	0.45
2:A:421:VAL:HG11	2:A:705:CYS:SG	2.56	0.45
3:B:595:PRO:C	3:B:596:VAL:HG23	2.41	0.45
4:C:429:LEU:HD23	4:C:429:LEU:HA	1.78	0.45
2:A:102:GLY:H	2:A:342:ASN:HD21	1.64	0.45
2:A:823:ILE:CD1	2:A:848:LEU:HD11	2.46	0.45
3:B:34:SER:CB	3:B:113:MET:HE2	2.46	0.45
3:B:958:ALA:O	3:B:978:VAL:HG12	2.16	0.45
4:C:264:GLU:HG2	4:C:265:LYS:N	2.31	0.45
2:A:483:GLN:C	2:A:485:LEU:HD22	2.40	0.45
2:A:539:GLU:OE2	2:A:659:THR:OG1	2.35	0.45
3:B:555:TRP:HA	3:B:558:ILE:HD12	1.99	0.45
3:B:576:HIS:ND1	3:B:585:ARG:HG3	2.30	0.45
2:A:33:ALA:O	2:A:37:LEU:HD12	2.16	0.45
2:A:491:ASP:OD2	2:A:491:ASP:C	2.60	0.45
2:A:557:TYR:CD1	2:A:557:TYR:N	2.84	0.45
3:B:553:ASP:OD2	3:B:612:ARG:NH1	2.48	0.45
3:B:912:THR:O	3:B:916:VAL:HG23	2.17	0.45
4:C:123:ARG:HD3	4:C:139:ALA:HB2	1.99	0.45
4:C:238:ARG:NH1	4:C:245:ARG:HD2	2.31	0.45
4:C:462:VAL:HB	4:C:463:PRO:HD3	1.98	0.45
2:A:552:GLY:HA2	2:A:695:THR:HG23	1.99	0.45
2:A:570:ARG:HG2	2:A:574:TYR:CE2	2.52	0.45
2:A:712:PRO:CG	2:A:736:VAL:HG22	2.46	0.45
2:A:792:LEU:N	2:A:792:LEU:HD23	2.32	0.45
3:B:238:ASP:OD1	3:B:239:GLU:N	2.49	0.45
3:B:468:GLU:O	3:B:472:VAL:HG23	2.17	0.45
4:C:56:THR:OG1	4:C:59:GLU:HG3	2.17	0.45
4:C:332:ASP:OD1	4:C:332:ASP:C	2.59	0.45
4:C:381:VAL:HG22	4:C:478:GLY:HA3	1.98	0.45
3:B:459:LYS:H	3:B:459:LYS:HG2	1.55	0.45
4:C:121:PRO:O	4:C:122:LEU:HG	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:C:222:LYS:O	4:C:222:LYS:HG3	2.16	0.45
4:C:576:ASP:OD2	4:C:576:ASP:N	2.50	0.45
2:A:137:PHE:O	2:A:138:LEU:HG	2.17	0.45
4:C:16:ILE:HG23	4:C:35:VAL:CG1	2.47	0.45
4:C:566:GLN:HA	4:C:566:GLN:OE1	2.16	0.45
4:C:177:LEU:HB3	4:C:670:LEU:HB3	1.98	0.44
4:C:409:CYS:O	4:C:552:LEU:HD12	2.17	0.44
4:C:491:ALA:HB1	4:C:496:PHE:HD2	1.81	0.44
3:B:288:ALA:C	3:B:290:SER:H	2.25	0.44
4:C:156:ALA:HB2	4:C:197:LEU:CD1	2.46	0.44
4:C:518:ASP:OD2	4:C:518:ASP:N	2.50	0.44
4:C:651:SER:HB2	4:C:676:TRP:CZ3	2.53	0.44
1:D:13:DT:H2'	1:D:14:DT:C2	2.52	0.44
2:A:557:TYR:N	2:A:557:TYR:HD1	2.15	0.44
3:B:348:ASP:O	3:B:352:ILE:HG12	2.17	0.44
4:C:347:ALA:HB1	4:C:351:VAL:HG21	1.99	0.44
4:C:93:GLU:OE2	4:C:186:ARG:NH1	2.49	0.44
4:C:570:TRP:CZ3	4:C:572:TRP:HB2	2.52	0.44
3:B:769:PRO:O	3:B:772:TYR:HB2	2.18	0.44
2:A:780:ILE:HG23	2:A:796:ILE:CG2	2.48	0.44
3:B:232:LEU:CD1	3:B:291:LEU:HD11	2.47	0.44
3:B:315:PHE:HB3	3:B:316:PRO:HD3	2.00	0.44
2:A:408:LEU:HD21	2:A:806:LEU:CD1	2.48	0.44
3:B:909:ARG:HG3	3:B:909:ARG:HH11	1.83	0.44
2:A:372:VAL:HG12	2:A:372:VAL:O	2.18	0.44
2:A:549:ILE:HG21	2:A:669:LEU:HB3	2.00	0.44
2:A:557:TYR:HA	2:A:560:LEU:HD12	1.99	0.44
2:A:808:MET:HE2	2:A:812:ARG:CZ	2.47	0.44
3:B:979:ARG:HH22	3:B:984:GLN:NE2	2.15	0.44
4:C:405:THR:HG22	4:C:406:ALA:N	2.32	0.44
3:B:660:LEU:O	3:B:662:PRO:HD3	2.17	0.43
3:B:864:ARG:HG3	3:B:864:ARG:NH1	2.33	0.43
2:A:78:GLU:OE1	2:A:78:GLU:N	2.42	0.43
2:A:651:TYR:CD2	2:A:653:PRO:HD3	2.53	0.43
3:B:164:VAL:O	3:B:168:ASN:HB2	2.18	0.43
4:C:448:ALA:HA	4:C:454:ALA:HB3	2.01	0.43
2:A:421:VAL:CG1	2:A:496:LEU:HB2	2.48	0.43
2:A:753:ALA:O	2:A:757:GLU:HG3	2.17	0.43
3:B:792:LEU:HD23	3:B:792:LEU:HA	1.89	0.43
3:B:830:ILE:O	3:B:830:ILE:HG22	2.18	0.43
3:B:999:ALA:O	3:B:1000:THR:C	2.60	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:C:615:GLU:OE1	4:C:615:GLU:HA	2.18	0.43
2:A:226:LEU:HD23	3:B:157:ASN:HB3	2.00	0.43
2:A:553:LEU:HB2	2:A:648:TYR:CZ	2.53	0.43
2:A:573:ALA:HB2	2:A:683:LEU:HD13	1.99	0.43
2:A:647:PHE:HB3	2:A:676:ARG:HH21	1.83	0.43
2:A:786:SER:HA	2:A:790:THR:O	2.19	0.43
4:C:403:VAL:O	4:C:559:THR:HA	2.18	0.43
2:A:483:GLN:HB3	2:A:485:LEU:HD23	2.01	0.43
3:B:51:PHE:CE1	3:B:297:ILE:HG23	2.54	0.43
3:B:210:GLU:OE1	3:B:214:LEU:HD12	2.19	0.43
3:B:576:HIS:CE1	3:B:585:ARG:HG3	2.54	0.43
4:C:304:GLY:HA3	4:C:674:HIS:O	2.19	0.43
2:A:668:LEU:CD1	2:A:669:LEU:HG	2.49	0.43
2:A:767:ARG:HB2	2:A:773:MET:HE2	1.99	0.43
3:B:340:ASP:HB2	3:B:354:TYR:OH	2.18	0.43
3:B:581:ALA:O	3:B:585:ARG:HG2	2.19	0.43
4:C:681:ARG:HE	4:C:681:ARG:HB2	1.62	0.43
3:B:49:TYR:CD1	3:B:136:PRO:HB3	2.54	0.43
4:C:209:ALA:HB3	4:C:223:GLU:HB2	2.01	0.43
2:A:784:VAL:HG12	2:A:793:ALA:HB2	2.01	0.42
3:B:88:SER:HB2	3:B:119:GLU:HG2	2.00	0.42
3:B:344:LEU:HD23	3:B:344:LEU:HA	1.78	0.42
3:B:451:CYS:HB3	3:B:552:TRP:CE2	2.54	0.42
4:C:122:LEU:HD22	4:C:136:VAL:CG1	2.48	0.42
4:C:417:LEU:HD23	4:C:417:LEU:HA	1.81	0.42
2:A:100:GLY:HA3	2:A:343:ASN:ND2	2.34	0.42
2:A:878:VAL:HG12	2:A:880:ILE:HD12	2.01	0.42
3:B:595:PRO:O	3:B:596:VAL:CG2	2.67	0.42
3:B:777:SER:O	3:B:781:ARG:HG3	2.19	0.42
4:C:267:SER:OG	4:C:671:ASP:OD2	2.37	0.42
2:A:517:PHE:O	2:A:521:GLU:HG2	2.20	0.42
3:B:781:ARG:CB	3:B:781:ARG:HH11	2.32	0.42
2:A:516:THR:OG1	2:A:690:VAL:HA	2.18	0.42
3:B:825:PRO:HA	3:B:840:LEU:HB2	2.02	0.42
4:C:89:LEU:HB2	4:C:186:ARG:HG3	2.00	0.42
3:B:232:LEU:HD13	3:B:291:LEU:HD11	2.02	0.42
2:A:362:LEU:HD13	3:B:349:ARG:HD2	2.01	0.42
4:C:46:GLY:O	4:C:47:ARG:HD3	2.19	0.42
4:C:56:THR:HG1	4:C:59:GLU:HG3	1.84	0.42
4:C:113:THR:CG2	4:C:136:VAL:HG23	2.49	0.42
4:C:199:VAL:CG1	4:C:210:ARG:HB2	2.50	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:940:ARG:NH2	3:B:1040:ASP:O	2.40	0.42
4:C:264:GLU:CG	4:C:265:LYS:H	2.32	0.42
2:A:94:LEU:CD1	2:A:333:LEU:HD21	2.50	0.42
2:A:219:LEU:HD23	2:A:219:LEU:HA	1.87	0.42
3:B:234:LYS:HA	3:B:234:LYS:HD3	1.87	0.42
3:B:524:ILE:HG21	3:B:529:VAL:HG11	2.01	0.42
4:C:638:ASN:OD1	4:C:638:ASN:N	2.52	0.42
4:C:662:THR:HG22	4:C:662:THR:O	2.20	0.42
3:B:275:TYR:OH	3:B:380:PRO:HB3	2.20	0.42
3:B:345:ARG:HH11	3:B:345:ARG:CG	2.32	0.42
3:B:955:GLU:CG	3:B:983:GLN:HG3	2.49	0.42
4:C:38:VAL:HG23	4:C:252:LEU:HD23	2.02	0.42
2:A:216:GLU:OE2	2:A:224:GLY:N	2.53	0.42
2:A:414:VAL:HG23	2:A:415:THR:N	2.34	0.42
2:A:471:ASP:OD2	2:A:471:ASP:C	2.63	0.42
3:B:601:GLY:O	3:B:602:LEU:HB2	2.20	0.42
4:C:32:HIS:ND1	4:C:52:GLU:OE2	2.50	0.42
4:C:670:LEU:CD2	4:C:696:LEU:HD22	2.50	0.42
2:A:160:LEU:HD23	2:A:187:GLU:OE2	2.20	0.41
2:A:270:ASN:HB3	2:A:278:TYR:HB2	2.02	0.41
2:A:424:THR:HG22	2:A:493:THR:OG1	2.19	0.41
2:A:466:GLN:NE2	2:A:503:THR:HG21	2.35	0.41
3:B:80:ALA:O	3:B:308:ARG:NH1	2.53	0.41
3:B:593:GLN:O	3:B:595:PRO:HD3	2.19	0.41
3:B:663:ALA:HB3	3:B:772:TYR:CE2	2.55	0.41
3:B:963:ARG:NE	3:B:966:SER:HB3	2.33	0.41
3:B:875:LEU:HA	3:B:875:LEU:HD23	1.82	0.41
4:C:531:ILE:O	4:C:535:VAL:HG23	2.20	0.41
4:C:540:ARG:NH1	4:C:540:ARG:HB3	2.35	0.41
4:C:736:LYS:HB3	4:C:736:LYS:HE3	1.57	0.41
3:B:335:LYS:HA	3:B:338:THR:CG2	2.50	0.41
4:C:79:ARG:HG3	4:C:79:ARG:HH11	1.86	0.41
4:C:612:CYS:C	4:C:613:VAL:HG23	2.46	0.41
4:C:689:SER:OG	4:C:707:ASP:OD2	2.32	0.41
1:D:13:DT:H72	1:D:14:DT:O4	2.20	0.41
2:A:226:LEU:HD23	2:A:226:LEU:HA	1.94	0.41
4:C:60:LEU:HA	4:C:104:CYS:SG	2.61	0.41
4:C:587:ARG:O	4:C:648:VAL:HG23	2.21	0.41
2:A:547:ARG:HE	2:A:547:ARG:HB2	1.68	0.41
3:B:654:LEU:HD11	3:B:671:TYR:HB3	2.02	0.41
4:C:132:LEU:HD23	4:C:237:LEU:HD22	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:51:ARG:HG2	2:A:93:TYR:HE2	1.85	0.41
2:A:128:ASN:OD1	2:A:723:THR:HG21	2.21	0.41
2:A:302:PHE:HD1	2:A:303:GLU:N	2.19	0.41
2:A:554:ILE:HG13	2:A:648:TYR:CE2	2.56	0.41
4:C:258:TYR:HB3	4:C:319:PRO:HG2	2.03	0.41
2:A:50:LYS:HB2	2:A:50:LYS:HE3	1.83	0.41
2:A:464:TYR:CD2	2:A:464:TYR:N	2.89	0.41
2:A:700:VAL:HG22	2:A:707:MET:HE3	2.03	0.41
2:A:821:VAL:HG12	2:A:823:ILE:HG13	2.03	0.41
4:C:10:GLU:HB3	4:C:141:TRP:CD1	2.56	0.41
4:C:264:GLU:CG	4:C:265:LYS:N	2.83	0.41
1:D:12:DG:H8	1:D:13:DT:H71	1.85	0.41
2:A:254:LEU:O	2:A:316:ASN:HA	2.21	0.41
2:A:543:ARG:HE	2:A:662:VAL:HG21	1.86	0.41
2:A:553:LEU:HA	2:A:556:PHE:HE1	1.86	0.41
2:A:585:LEU:HD21	2:A:651:TYR:HD1	1.85	0.41
4:C:160:ILE:HD11	4:C:185:ILE:CG1	2.51	0.41
4:C:400:VAL:HG23	4:C:400:VAL:O	2.21	0.41
2:A:539:GLU:O	2:A:543:ARG:HG3	2.21	0.41
3:B:65:PRO:CB	3:B:69:ASP:HB3	2.50	0.41
4:C:390:ILE:HG22	4:C:485:LEU:HD21	2.03	0.41
2:A:84:PRO:HG2	2:A:86:ARG:HD2	2.03	0.40
2:A:200:SER:HB2	2:A:206:ARG:CD	2.24	0.40
2:A:300:SER:HA	2:A:310:SER:O	2.22	0.40
2:A:701:ILE:O	2:A:708:LEU:N	2.50	0.40
2:A:752:VAL:HG12	2:A:756:LEU:HD12	2.02	0.40
3:B:87:ASP:OD1	3:B:88:SER:N	2.54	0.40
3:B:379:ASP:OD2	3:B:384:ALA:HB3	2.21	0.40
3:B:781:ARG:HB3	3:B:781:ARG:HH11	1.85	0.40
4:C:197:LEU:HG	4:C:198:THR:N	2.36	0.40
4:C:660:PRO:HA	4:C:661:PRO:HD3	1.98	0.40
3:B:371:HIS:CE1	3:B:390:SER:HG	2.25	0.40
3:B:881:ILE:O	3:B:881:ILE:HG13	2.21	0.40
4:C:547:ARG:H	4:C:547:ARG:HG2	1.60	0.40
2:A:433:VAL:HG11	2:A:484:GLN:OE1	2.21	0.40
3:B:395:GLU:OE2	3:B:395:GLU:CA	2.68	0.40
4:C:19:TYR:O	4:C:292:VAL:HG13	2.22	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
2	A	793/852 (93%)	756 (95%)	36 (4%)	1 (0%)	48 79
3	B	959/1058 (91%)	894 (93%)	60 (6%)	5 (0%)	25 58
4	C	748/750 (100%)	724 (97%)	23 (3%)	1 (0%)	48 79
All	All	2500/2660 (94%)	2374 (95%)	119 (5%)	7 (0%)	38 68

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A	554	ILE
3	B	1029	ASP
3	B	346	VAL
3	B	978	VAL
3	B	892	VAL
3	B	982	LEU
4	C	612	CYS

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
2	A	680/721 (94%)	659 (97%)	21 (3%)	35 63
3	B	757/832 (91%)	741 (98%)	16 (2%)	48 72
4	C	560/560 (100%)	545 (97%)	15 (3%)	40 67
All	All	1997/2113 (94%)	1945 (97%)	52 (3%)	42 68

All (52) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	A	98	ASN
2	A	114	LEU
2	A	134	SER
2	A	140	ARG
2	A	170	ASN
2	A	301	THR
2	A	305	GLN
2	A	367	GLU
2	A	396	SER
2	A	420	PHE
2	A	429	THR
2	A	430	PHE
2	A	433	VAL
2	A	445	GLN
2	A	455	THR
2	A	466	GLN
2	A	700	VAL
2	A	722	GLN
2	A	774	SER
2	A	794	MET
2	A	865	ILE
3	B	99	GLU
3	B	167	ASN
3	B	232	LEU
3	B	285	THR
3	B	418	VAL
3	B	445	THR
3	B	602	LEU
3	B	654	LEU
3	B	678	SER
3	B	787	ILE
3	B	830	ILE
3	B	900	SER
3	B	912	THR
3	B	963	ARG
3	B	1000	THR
3	B	1027	LYS
4	C	17	THR
4	C	82	THR
4	C	92	LEU
4	C	137	GLU
4	C	198	THR

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Mol	Chain	Res	Type
4	C	221	LYS
4	C	237	LEU
4	C	242	HIS
4	C	246	VAL
4	C	299	GLU
4	C	357	LEU
4	C	394	LEU
4	C	608	LEU
4	C	612	CYS
4	C	657	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
2	A	59	GLN
2	A	64	GLN
2	A	108	GLN
2	A	111	ASN
2	A	127	GLN
2	A	162	GLN
2	A	342	ASN
2	A	387	ASN
2	A	445	GLN
2	A	463	ASN
2	A	533	GLN
2	A	561	GLN
2	A	569	GLN
2	A	643	GLN
2	A	725	ASN
2	A	751	ASN
3	B	58	HIS
3	B	513	GLN
3	B	788	GLN
3	B	906	HIS
3	B	974	GLN
3	B	984	GLN
3	B	1034	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains (i)

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 3 ligands modelled in this entry, 2 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	$\#\|Z\| > 2$
5	A1BXD	B	1101	-	33,37,37	5.43	21 (63%)	45,53,53	2.40	7 (15%)

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
5	A1BXD	B	1101	-	-	6/24/36/36	0/4/4/4

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	1101	A1BXD	O30-S29	11.21	1.65	1.44
5	B	1101	A1BXD	O31-S29	11.20	1.65	1.44
5	B	1101	A1BXD	C07-C06	9.52	1.52	1.40
5	B	1101	A1BXD	C24-N08	9.14	1.46	1.36
5	B	1101	A1BXD	C14-C15	8.52	1.52	1.38
5	B	1101	A1BXD	C19-N20	8.44	1.48	1.35
5	B	1101	A1BXD	C18-C13	8.16	1.53	1.39
5	B	1101	A1BXD	C04-C05	8.12	1.52	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	1101	A1BXD	C17-C16	6.68	1.52	1.39
5	B	1101	A1BXD	C03-C02	6.63	1.53	1.39
5	B	1101	A1BXD	C07-C02	-5.68	1.32	1.40
5	B	1101	A1BXD	C14-C13	-4.55	1.31	1.39
5	B	1101	A1BXD	C10-N12	4.44	1.45	1.35
5	B	1101	A1BXD	C18-C17	-4.32	1.31	1.38
5	B	1101	A1BXD	C04-C03	-4.17	1.31	1.38
5	B	1101	A1BXD	C05-C06	-3.92	1.32	1.39
5	B	1101	A1BXD	C15-C16	-3.91	1.31	1.39
5	B	1101	A1BXD	C32-S29	3.62	1.80	1.76
5	B	1101	A1BXD	C28-S29	3.30	1.79	1.76
5	B	1101	A1BXD	O11-C10	-2.47	1.18	1.23
5	B	1101	A1BXD	O25-C24	-2.14	1.18	1.22

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	B	1101	A1BXD	O31-S29-O30	-9.73	109.79	117.89
5	B	1101	A1BXD	C16-C19-N23	6.03	126.97	119.12
5	B	1101	A1BXD	C32-S29-C28	5.58	109.75	101.11
5	B	1101	A1BXD	C21-N20-C19	5.29	107.45	101.93
5	B	1101	A1BXD	C26-C24-N08	4.10	123.52	118.68
5	B	1101	A1BXD	C13-N12-C10	-2.84	122.49	127.52
5	B	1101	A1BXD	C02-C07-N08	2.19	122.05	119.10

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	1101	A1BXD	C15-C16-C19-N23
5	B	1101	A1BXD	C17-C16-C19-N23
5	B	1101	A1BXD	C17-C16-C19-N20
5	B	1101	A1BXD	C15-C16-C19-N20
5	B	1101	A1BXD	C14-C13-N12-C10
5	B	1101	A1BXD	C18-C13-N12-C10

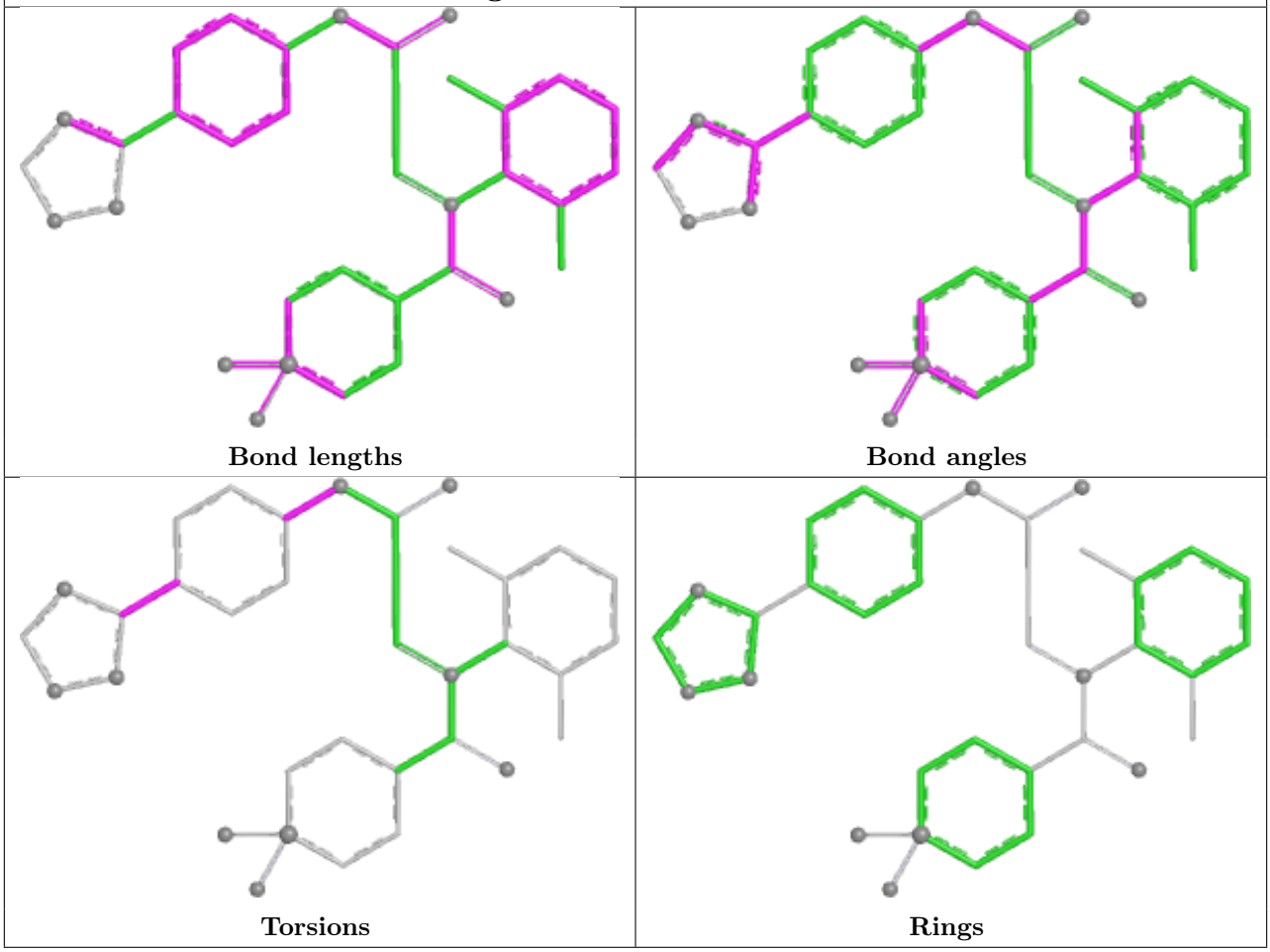
There are no ring outliers.

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 A1BXD B 1101



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.

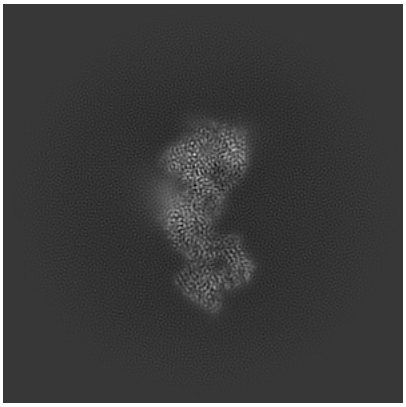
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-49563. These allow visual inspection of the internal detail of the map and identification of artifacts.

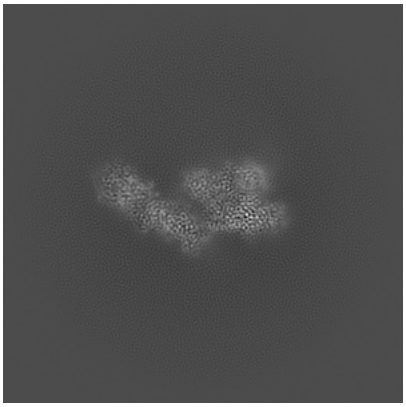
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

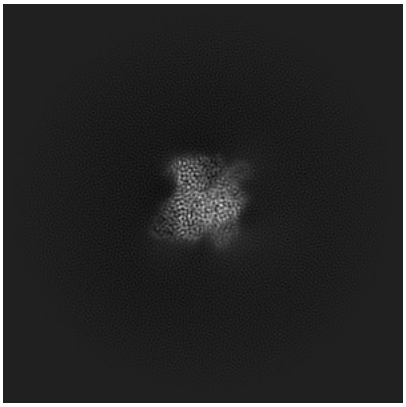
6.1.1 Primary map



X



Y

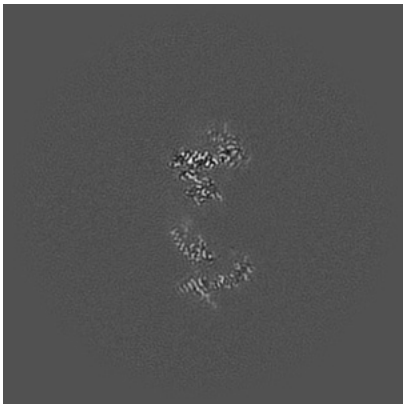


Z

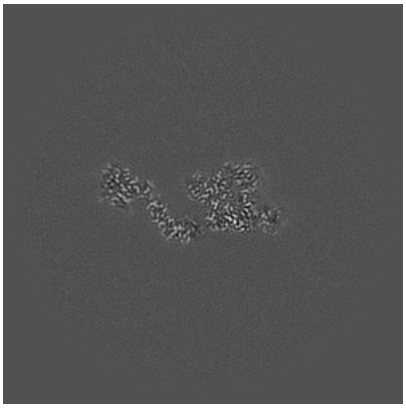
The images above show the map projected in three orthogonal directions.

6.2 Central slices

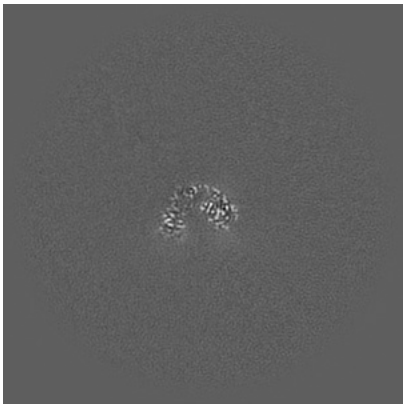
6.2.1 Primary map



X Index: 180



Y Index: 180

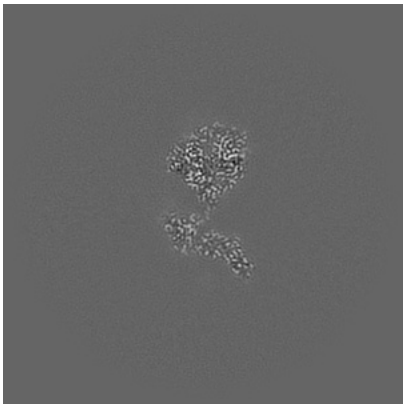


Z Index: 180

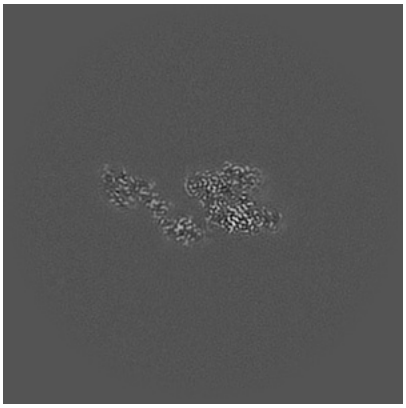
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

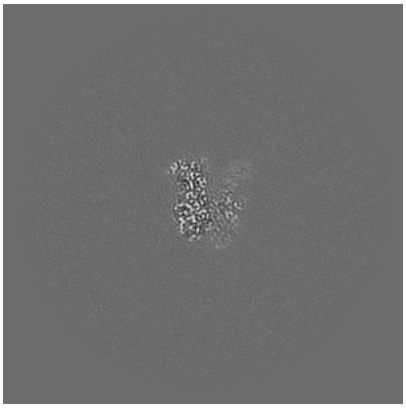
6.3.1 Primary map



X Index: 167



Y Index: 176

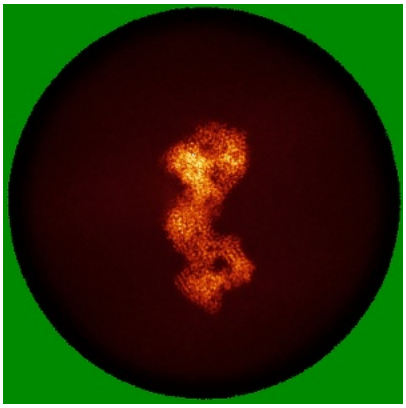


Z Index: 219

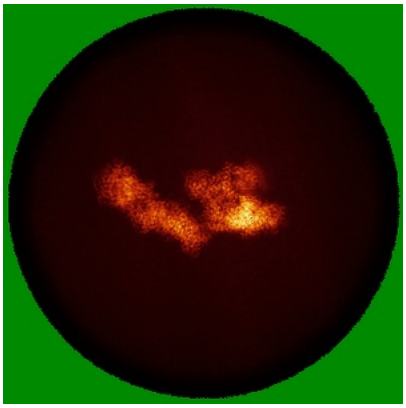
The images above show the largest variance slices of the map in three orthogonal directions.

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

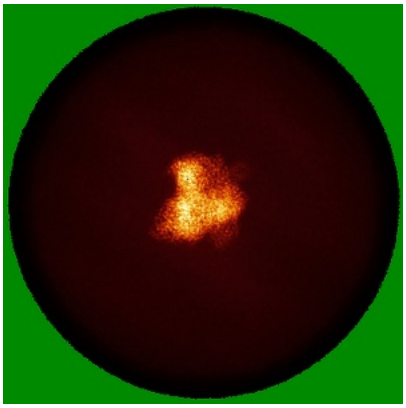
6.4.1 Primary map



X



Y

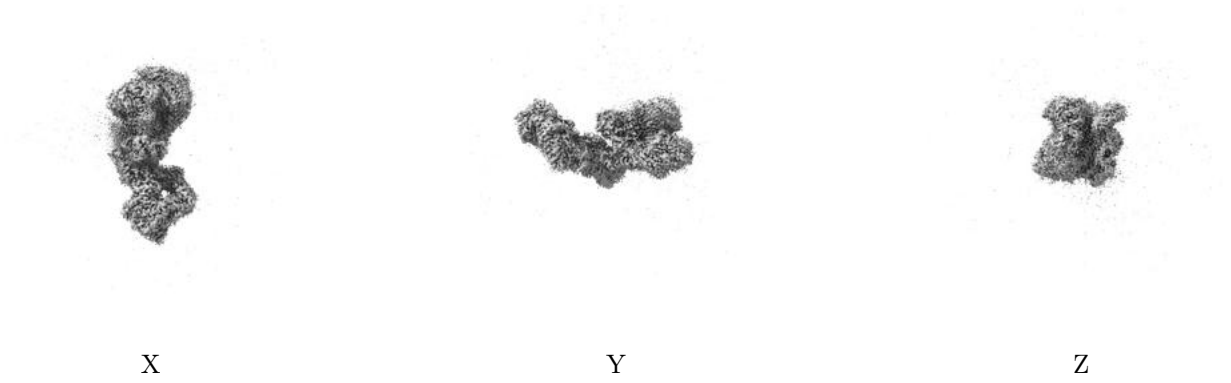


Z

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

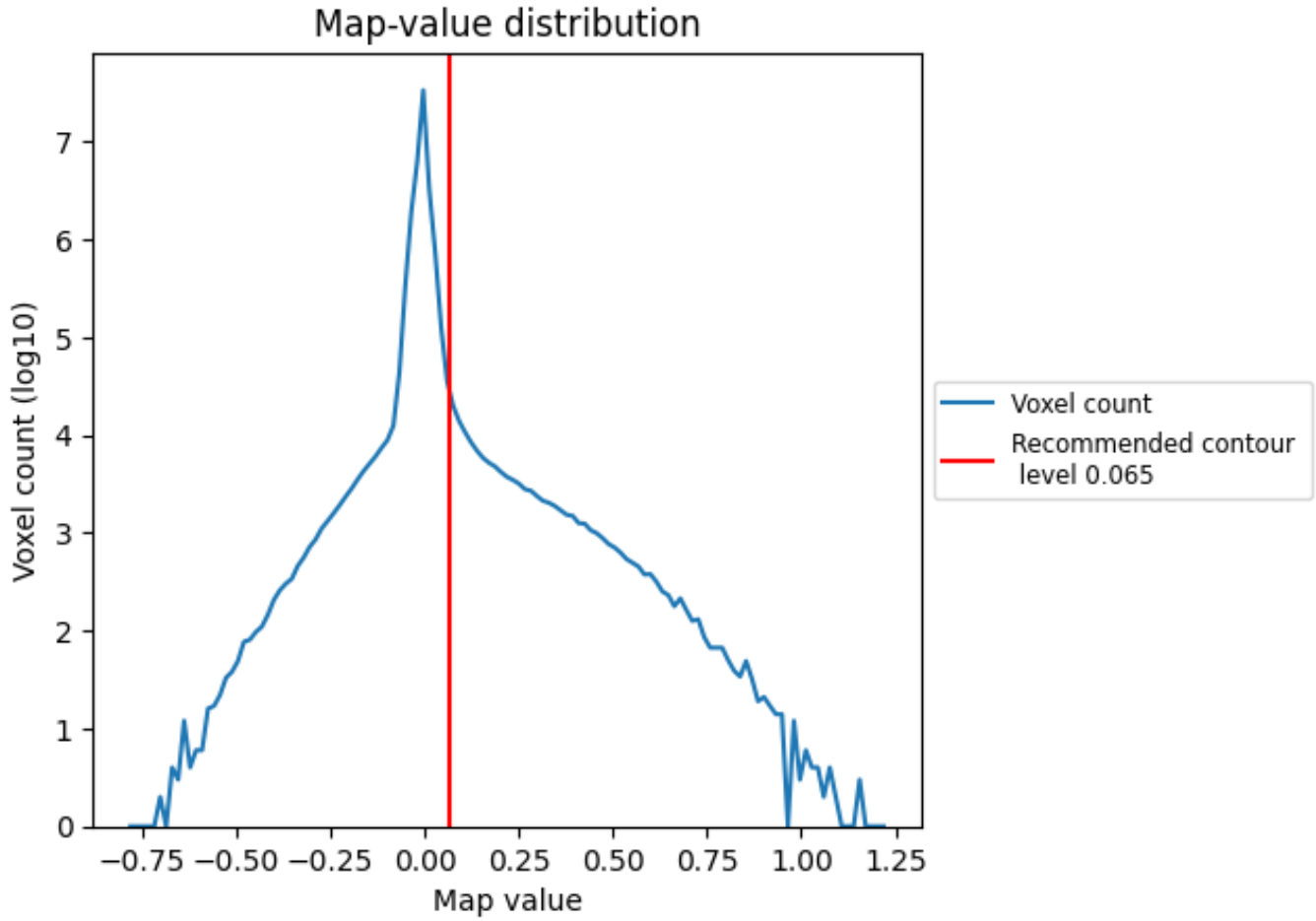
6.6 Mask visualisation (i)

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

7 Map analysis

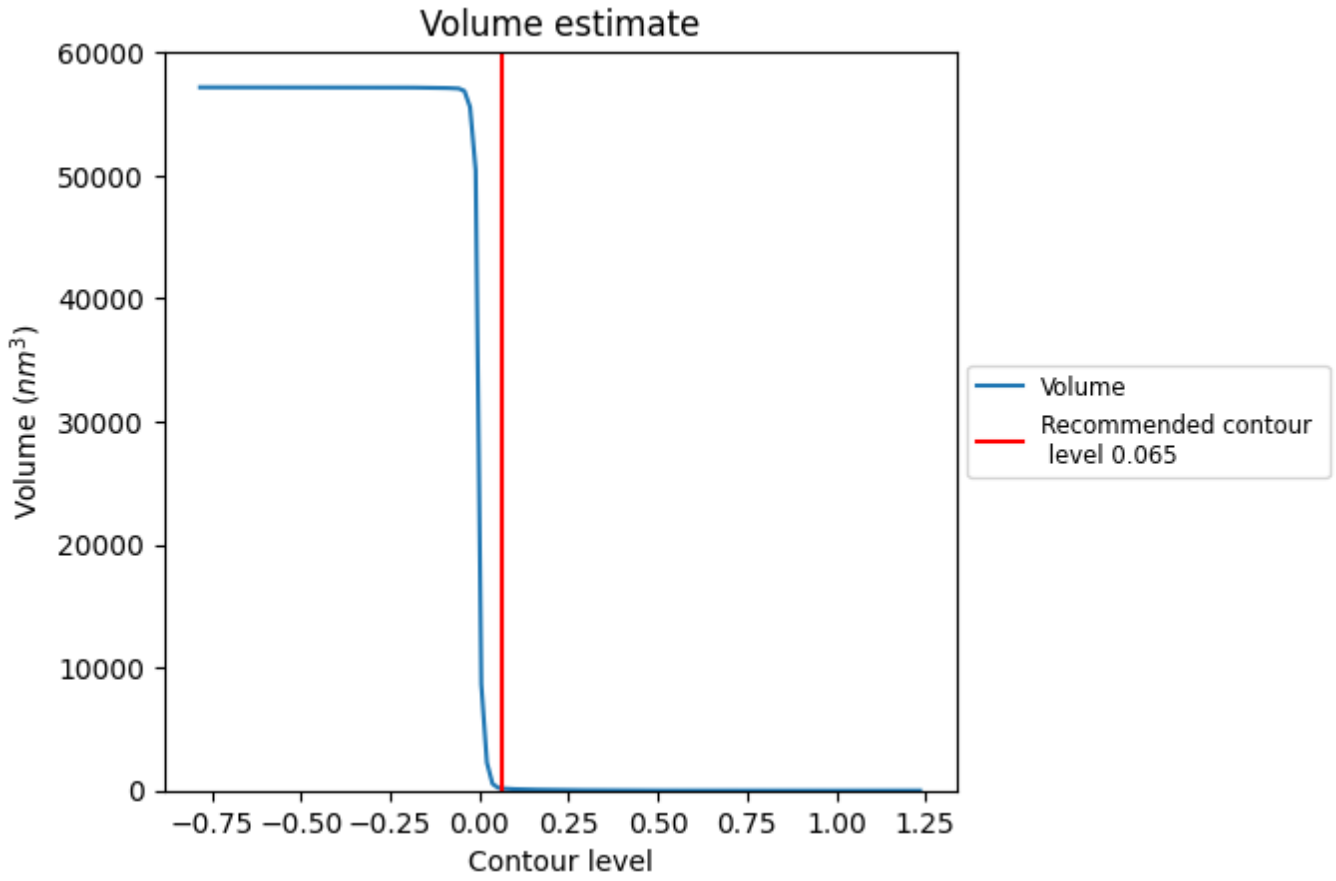
This section contains the results of statistical analysis of the map.

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.

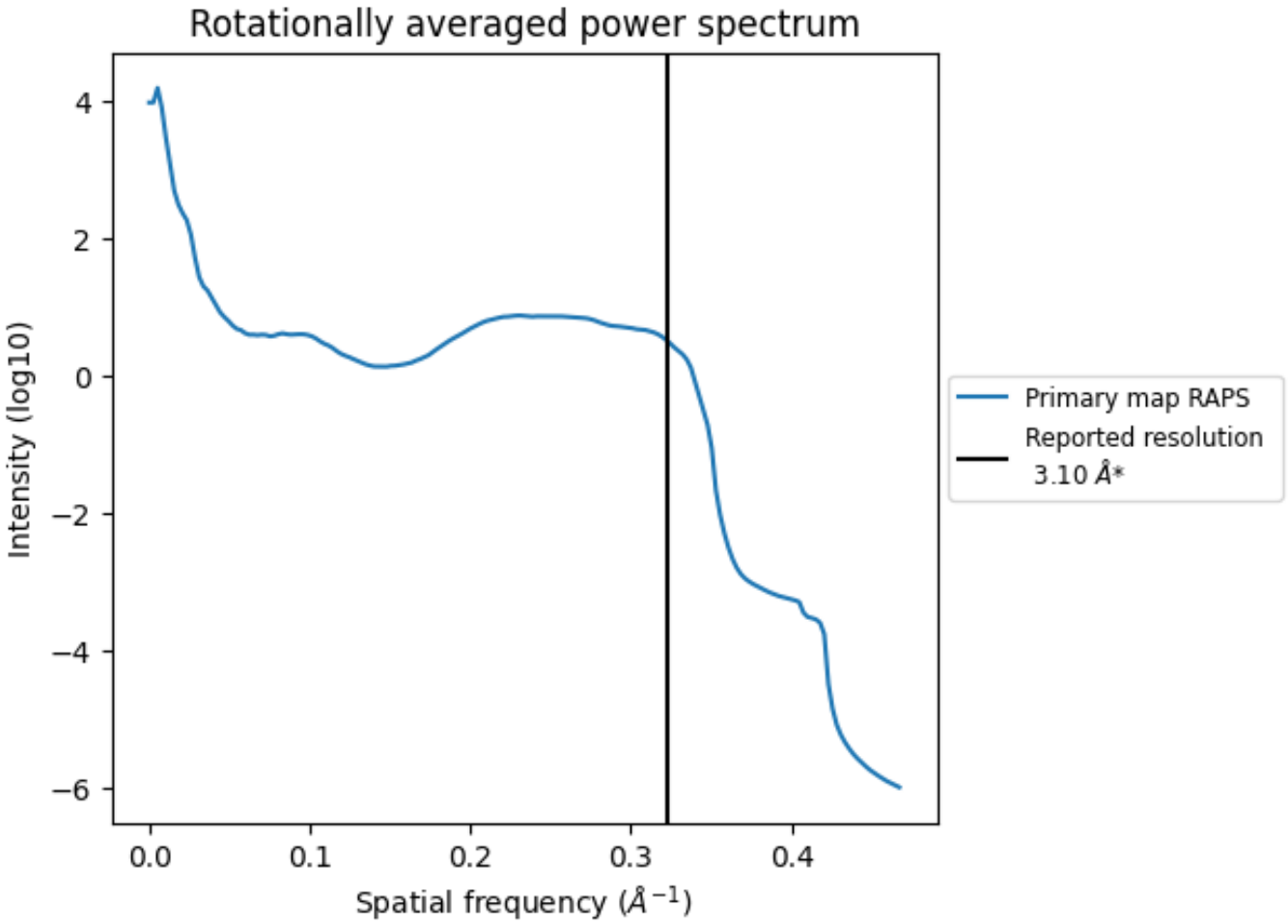
7.2 Volume estimate



The volume at the recommended contour level is 178 nm^3; this corresponds to an approximate mass of 161 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 0.323 Å^{-1}

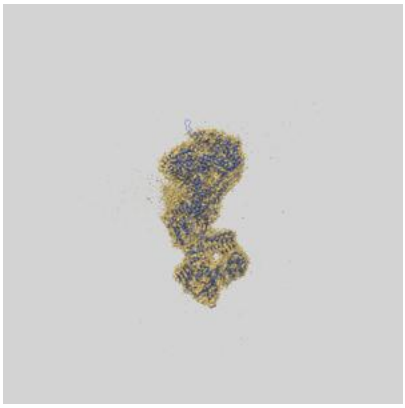
8 Fourier-Shell correlation

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

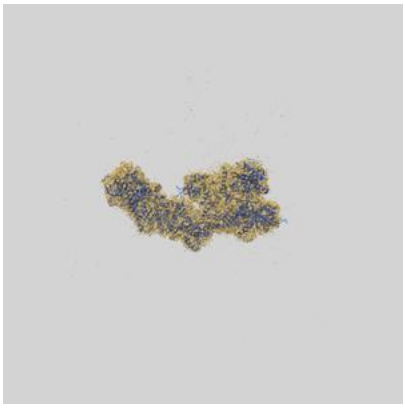
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-49563 and PDB model 9NN2. Per-residue inclusion information can be found in section 3 on page 6.

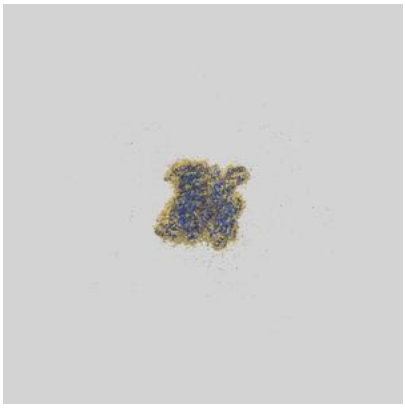
9.1 Map-model overlay



X



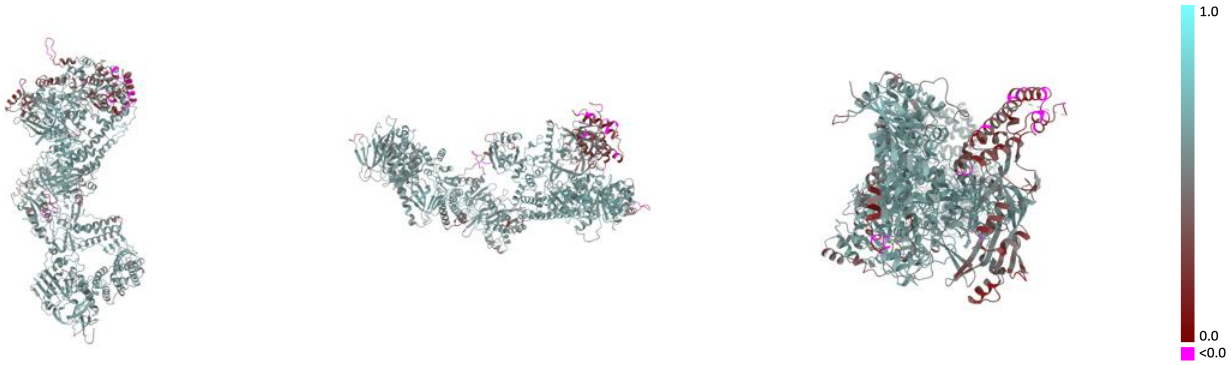
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.065 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.

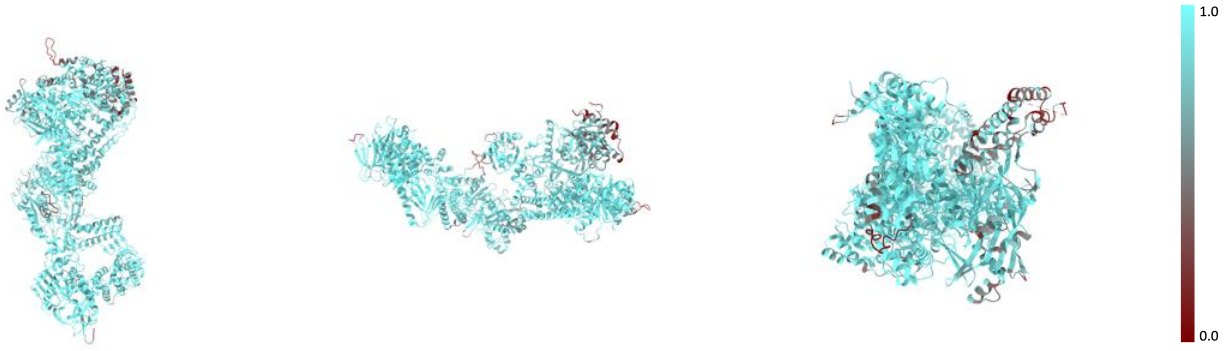
9.2 Q-score mapped to coordinate model (i)



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.

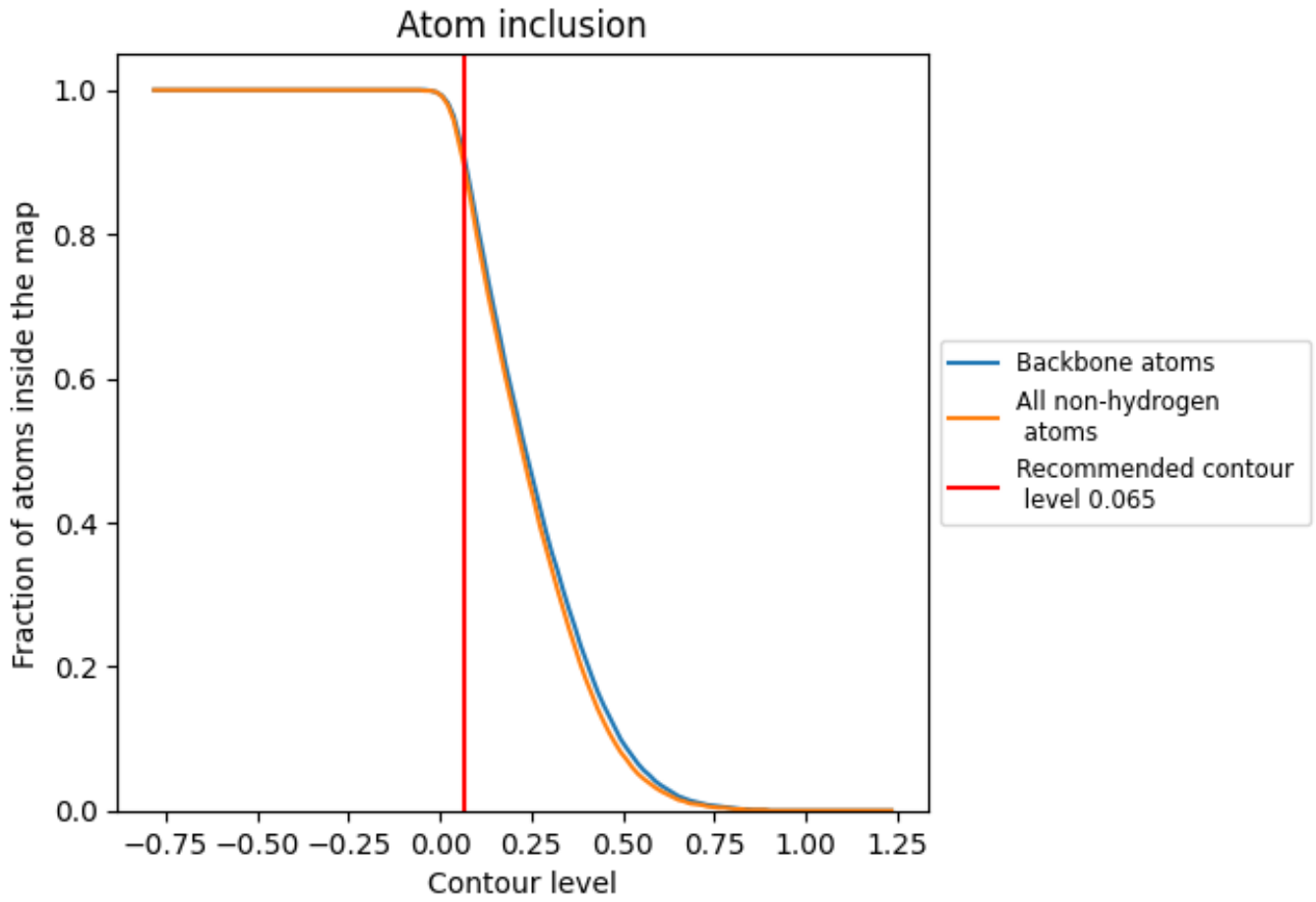
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.065).

9.4 Atom inclusion (i)



At the recommended contour level, 91% of all backbone atoms, 90% 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 (0.065) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8970	0.5450
A	0.8680	0.5110
B	0.8930	0.5530
C	0.9300	0.5720
D	0.9860	0.6070