



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 5, 2024 – 09:15 AM EST

PDB ID : 1XU3
Title : Soluble methane monooxygenase hydroxylase-soaked with bromophenol
Authors : Sazinsky, M.H.; Lippard, S.J.
Deposited on : 2004-10-25
Resolution : 2.30 Å(reported)

This is a Full wwPDB X-ray Structure 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/XrayValidationReportHelp>

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:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

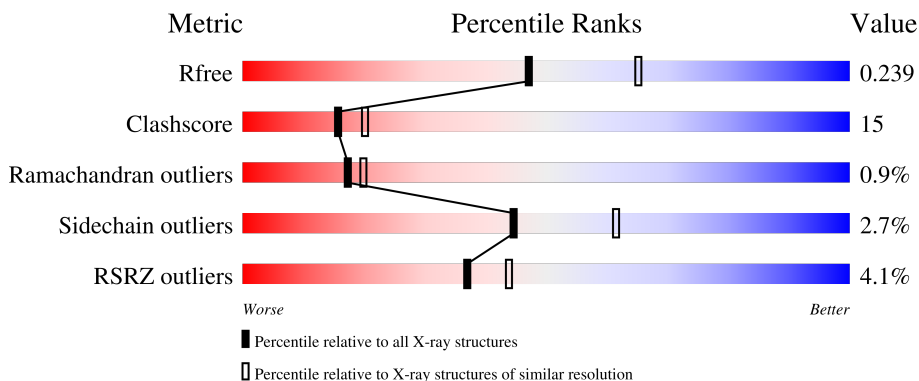
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	527	<div style="display: flex; align-items: center;"> <div style="width: 4%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 69%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 26%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 40px;">4% 69% 26% . .</p>
1	B	527	<div style="display: flex; align-items: center;"> <div style="width: 4%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 64%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 31%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 40px;">4% 64% 31% . .</p>
2	C	389	<div style="display: flex; align-items: center;"> <div style="width: 0%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 80%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 18%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 40px;">% 80% 18% .</p>
2	D	389	<div style="display: flex; align-items: center;"> <div style="width: 7%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 61%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 36%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 40px;">7% 61% 36% .</p>
3	E	170	<div style="display: flex; align-items: center;"> <div style="width: 0%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 81%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 15%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="margin-left: 40px;">% 81% 15% . .</p>

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Mol	Chain	Length	Quality of chain
3	F	170	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	BML	A	1292	-	X	-	-
5	BML	B	1293	-	X	-	-

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 18297 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 Methane monooxygenase component A alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	510	Total	C	N	O	S	0	0	0
			4148	2655	713	762	18			
1	B	510	Total	C	N	O	S	0	0	0
			4137	2646	711	762	18			

- Molecule 2 is a protein called Methane monooxygenase component A beta chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	388	Total	C	N	O	S	0	0	0
			3163	2036	545	574	8			
2	D	388	Total	C	N	O	S	0	0	0
			3151	2028	543	572	8			

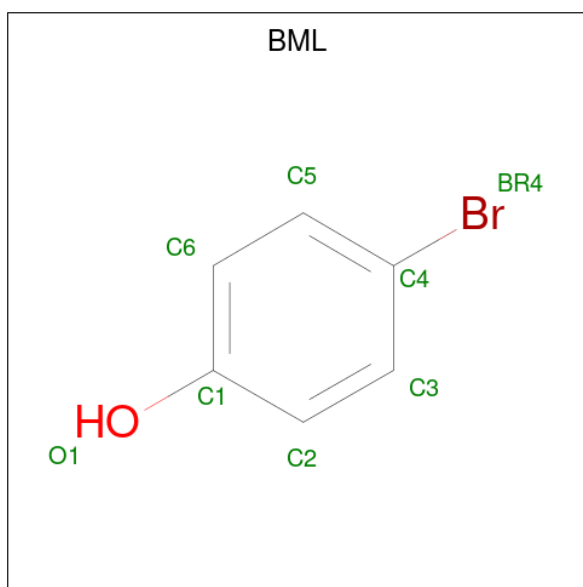
- Molecule 3 is a protein called Methane monooxygenase component A gamma chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	E	166	Total	C	N	O	S	0	0	0
			1364	864	245	250	5			
3	F	166	Total	C	N	O	S	0	0	0
			1358	860	243	250	5			

- Molecule 4 is FE (III) ION (three-letter code: FE) (formula: Fe).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	
4	A	2	Total	Fe	0	0
			2	2		
4	B	2	Total	Fe	0	0
			2	2		

- Molecule 5 is 4-BROMOPHENOL (three-letter code: BML) (formula: C₆H₅BrO).



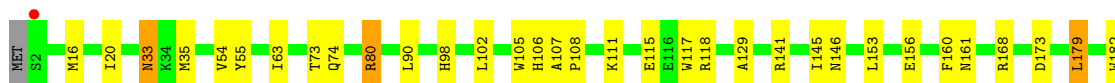
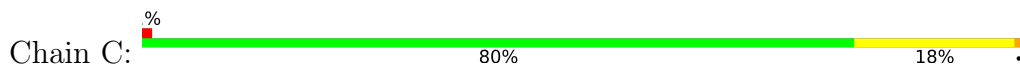
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	Br	C	O		
5	A	1	8	1	6	1	0	0
5	B	1	8	1	6	1	0	0

- Molecule 6 is water.

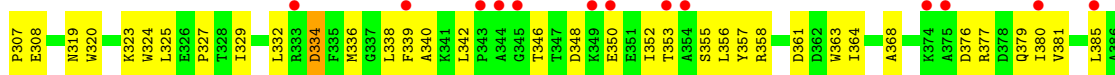
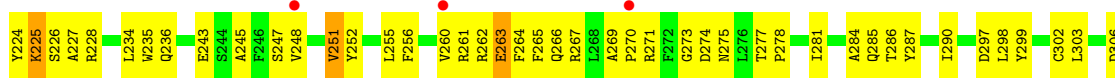
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
6	A	198	198	198	0	0
6	B	208	208	208	0	0
6	C	248	248	248	0	0
6	D	117	117	117	0	0
6	E	138	138	138	0	0
6	F	47	47	47	0	0



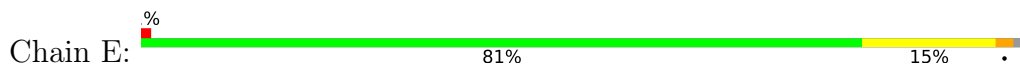
- Molecule 2: Methane monooxygenase component A beta chain



- Molecule 2: Methane monooxygenase component A beta chain

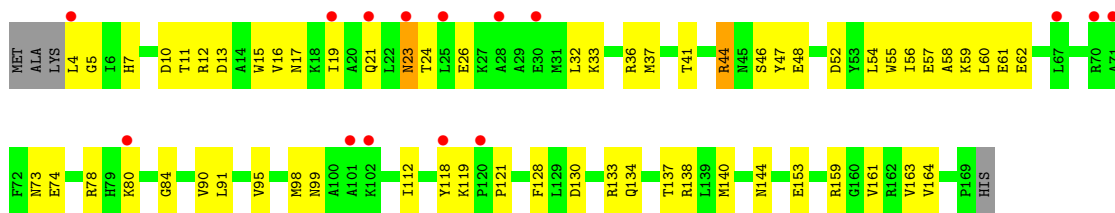


- Molecule 3: Methane monooxygenase component A gamma chain



- Molecule 3: Methane monooxygenase component A gamma chain





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	71.49Å 171.86Å 221.42Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.83 – 2.30 29.83 – 2.30	Depositor EDS
% Data completeness (in resolution range)	94.0 (29.83-2.30) 94.0 (29.83-2.30)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	0.09	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.48 (at 2.29Å)	Xtrriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.201 , 0.245 0.197 , 0.239	Depositor DCC
R_{free} test set	4076 reflections (3.41%)	wwPDB-VP
Wilson B-factor (Å ²)	32.0	Xtrriage
Anisotropy	0.103	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 44.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	18297	wwPDB-VP
Average B, all atoms (Å ²)	40.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.58% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: FE, BML

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	0.39	1/4273 (0.0%)	0.61	2/5808 (0.0%)
1	B	0.36	0/4262	0.57	0/5796
2	C	0.41	0/3259	0.60	0/4430
2	D	0.34	0/3247	0.54	0/4417
3	E	0.39	0/1392	0.63	0/1876
3	F	0.31	0/1387	0.54	0/1873
All	All	0.37	1/17820 (0.0%)	0.58	2/24200 (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	1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	514	ARG	N-CA	6.55	1.59	1.46

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	513	LYS	CA-C-N	8.55	136.01	117.20
1	A	513	LYS	CA-C-O	-6.98	105.44	120.10

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	513	LYS	Mainchain

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	4148	0	3918	116	0
1	B	4137	0	3888	165	0
2	C	3163	0	2986	69	0
2	D	3151	0	2960	134	0
3	E	1364	0	1352	21	0
3	F	1358	0	1335	59	0
4	A	2	0	0	0	0
4	B	2	0	0	0	0
5	A	8	0	4	0	0
5	B	8	0	4	0	0
6	A	198	0	0	4	0
6	B	208	0	0	7	0
6	C	248	0	0	7	0
6	D	117	0	0	0	0
6	E	138	0	0	1	0
6	F	47	0	0	2	0
All	All	18297	0	16447	495	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 15.

All (495) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:166:ALA:HB1	1:B:496:ILE:HD12	1.14	1.08
1:A:352:ALA:HA	1:A:404:PRO:HB2	1.38	1.04
2:C:270:PRO:HB3	2:D:270:PRO:HB3	1.35	1.03
2:D:340:ALA:HA	2:D:389:LYS:HE2	1.44	0.97
1:A:435:THR:HG21	1:A:437:ARG:HE	1.35	0.91
1:A:78:GLN:HE22	1:A:150:GLN:HE21	0.92	0.90
1:A:78:GLN:NE2	1:A:150:GLN:HE21	1.70	0.88

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:286:THR:O	2:C:290:ILE:HD13	1.74	0.86
2:C:146:ASN:HD21	2:C:197:ARG:HH21	1.22	0.85
2:D:319:ASN:OD1	3:F:78:ARG:HD3	1.77	0.85
3:F:13:ASP:O	3:F:16:VAL:HG22	1.78	0.84
1:B:78:GLN:HE22	1:B:150:GLN:HE21	1.24	0.84
1:B:166:ALA:HB1	1:B:496:ILE:CD1	2.05	0.83
1:B:209:GLU:HA	1:B:213:THR:OG1	1.79	0.83
1:A:338:ASP:OD2	1:A:433:ALA:HB2	1.80	0.82
3:F:41:THR:O	3:F:44:ARG:HD2	1.79	0.82
2:C:102:LEU:HD12	2:C:290:ILE:HG23	1.63	0.80
1:A:467:GLN:HG3	6:A:1422:HOH:O	1.81	0.80
2:C:261:ARG:HE	2:C:285:GLN:HE22	1.25	0.80
1:A:435:THR:CG2	1:A:437:ARG:HE	1.95	0.80
1:B:489:ARG:CG	1:B:496:ILE:HD13	2.13	0.79
1:B:118:ILE:HD13	1:B:145:ILE:HD13	1.63	0.78
1:B:134:LYS:HD3	2:D:161:ASN:HD21	1.45	0.78
1:B:489:ARG:HG2	1:B:496:ILE:HD13	1.66	0.78
1:A:78:GLN:HE22	1:A:150:GLN:NE2	1.77	0.77
3:E:15:TRP:O	3:E:19:ILE:HD13	1.84	0.77
2:D:325:LEU:O	2:D:329:ILE:HG12	1.85	0.76
3:E:19:ILE:HG13	3:E:60:LEU:HD13	1.68	0.76
2:C:146:ASN:ND2	2:C:197:ARG:HH21	1.85	0.75
3:F:80:LYS:HE2	3:F:84:GLY:HA2	1.68	0.74
3:E:41:THR:O	3:E:44:ARG:HD2	1.86	0.74
1:B:439:HIS:HB3	3:F:161:VAL:HG21	1.71	0.73
2:C:326:GLU:HB3	2:C:327:PRO:HD3	1.70	0.73
2:D:148:TYR:HE2	2:D:223:VAL:HG21	1.53	0.73
1:B:496:ILE:HD11	6:B:1298:HOH:O	1.89	0.73
1:A:184:MET:HE2	1:A:188:PHE:HB2	1.71	0.73
1:A:155:ASN:HD22	1:A:168:HIS:HD2	1.33	0.73
1:B:227:ASN:HD21	1:B:295:LYS:H	1.36	0.72
2:C:102:LEU:CD1	2:C:290:ILE:HG23	2.18	0.72
1:A:292:TYR:OH	1:A:344:HIS:HD2	1.72	0.72
3:F:57:GLU:O	3:F:61:GLU:HG3	1.91	0.71
3:F:4:LEU:HD11	3:F:10:ASP:OD2	1.90	0.70
1:B:214:ASN:HB3	1:B:215:PRO:HD3	1.74	0.70
1:B:352:ALA:HA	1:B:404:PRO:HB2	1.71	0.70
1:B:166:ALA:CB	1:B:496:ILE:HD12	2.08	0.70
2:D:107:ALA:HB3	2:D:108:PRO:HD3	1.74	0.69
2:C:63:ILE:HD13	6:C:554:HOH:O	1.91	0.69
1:B:23:VAL:HB	2:D:195:LEU:HD11	1.74	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:193:ILE:HD11	2:D:82:SER:HB3	1.73	0.69
2:D:153:LEU:HB3	2:D:193:ILE:HG21	1.75	0.69
1:A:209:GLU:HA	1:A:213:THR:HG23	1.74	0.69
2:D:102:LEU:CD1	2:D:290:ILE:HG23	2.23	0.68
2:D:275:ASN:C	2:D:278:PRO:HD2	2.14	0.68
2:D:269:ALA:HB1	2:D:274:ASP:OD2	1.93	0.68
1:B:198:VAL:O	1:B:202:LEU:HG	1.93	0.68
1:B:406:MET:O	1:B:410:GLU:HG3	1.92	0.68
2:C:360:VAL:O	2:C:364:ILE:HG12	1.94	0.68
1:B:118:ILE:HG21	1:B:145:ILE:HD11	1.76	0.67
1:B:439:HIS:HB3	3:F:161:VAL:CG2	2.24	0.67
3:F:52:ASP:O	3:F:56:ILE:HG12	1.95	0.67
1:A:355:PRO:HG2	1:A:403:ILE:HD13	1.77	0.67
1:B:439:HIS:HD2	3:F:163:VAL:HA	1.60	0.66
1:B:49:LYS:HD3	3:F:140:MET:HB3	1.77	0.66
1:B:78:GLN:NE2	1:B:150:GLN:HE21	1.92	0.66
1:A:184:MET:CE	1:A:188:PHE:HB2	2.26	0.66
1:A:214:ASN:HB3	1:A:215:PRO:HD3	1.78	0.65
1:B:108:ASN:HD21	1:B:175:ARG:HH11	1.44	0.65
1:A:313:TRP:CZ2	1:A:318:ILE:HD11	2.31	0.65
1:B:196:ASP:HB2	3:F:140:MET:SD	2.37	0.65
1:B:489:ARG:HD2	1:B:495:LEU:O	1.96	0.65
1:B:227:ASN:ND2	1:B:295:LYS:H	1.94	0.64
1:B:477:GLU:OE2	1:B:480:GLU:HG2	1.97	0.64
1:B:63:ILE:HD12	1:B:65:LYS:N	2.13	0.64
2:D:153:LEU:HD12	2:D:154:PHE:N	2.13	0.64
2:C:339:PHE:CE2	2:C:352:ILE:HD12	2.34	0.63
1:A:227:ASN:HD21	1:A:295:LYS:H	1.44	0.63
2:D:78:GLY:O	3:F:112:ILE:HD13	1.98	0.63
1:A:175:ARG:HG3	1:A:181:TRP:CD2	2.33	0.63
1:B:193:ILE:HD12	1:B:194:SER:N	2.14	0.63
1:B:268:ASN:HD21	1:B:327:GLU:H	1.45	0.63
1:B:398:PRO:HG3	1:B:507:TRP:CD1	2.34	0.63
1:A:204:LEU:O	1:A:209:GLU:HG3	1.98	0.62
1:B:211:CYS:HB2	1:B:313:TRP:CD1	2.34	0.62
1:A:213:THR:HA	1:A:216:LEU:HB3	1.80	0.62
1:A:352:ALA:HA	1:A:404:PRO:CB	2.24	0.62
1:A:406:MET:O	1:A:410:GLU:HG3	1.99	0.62
2:D:90:LEU:HD13	2:D:303:LEU:HD13	1.80	0.62
2:D:340:ALA:HB2	2:D:389:LYS:HG2	1.82	0.62
2:C:211:THR:O	2:C:214:PRO:HD2	1.98	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:408:PHE:CD2	1:B:415:ILE:HD11	2.35	0.62
1:B:184:MET:HE2	1:B:188:PHE:HB2	1.80	0.62
2:D:262:ARG:HA	2:D:266:GLN:HB3	1.81	0.62
3:F:95:VAL:HG12	3:F:99:ASN:ND2	2.14	0.62
2:C:269:ALA:HB3	2:C:270:PRO:HD3	1.80	0.62
3:F:91:LEU:O	3:F:95:VAL:HG23	1.99	0.62
1:B:216:LEU:HD13	1:B:286:LEU:HD13	1.82	0.61
1:B:382:HIS:O	1:B:386:ILE:HG12	2.00	0.61
1:A:310:TYR:CZ	1:A:336:LYS:HD2	2.35	0.61
1:B:193:ILE:CD1	2:D:82:SER:HB3	2.30	0.61
2:D:261:ARG:HE	2:D:285:GLN:HE22	1.47	0.61
1:A:302:VAL:HG13	1:A:376:TYR:HE2	1.66	0.60
1:B:460:GLU:OE1	1:B:463:ARG:HD3	2.01	0.60
1:B:462:GLU:CB	3:F:112:ILE:HD11	2.31	0.60
2:D:57:GLN:NE2	2:D:59:ASN:HD21	1.99	0.60
2:C:16:MET:O	2:C:20:ILE:HG12	2.00	0.60
1:B:489:ARG:HG3	1:B:496:ILE:HD13	1.84	0.60
1:B:18:ARG:O	2:D:129:ALA:HA	2.02	0.60
1:A:382:HIS:O	1:A:386:ILE:HG12	2.02	0.60
1:A:185:LYS:O	1:A:189:SER:HB2	2.01	0.59
2:C:200:LEU:HA	2:C:203:ILE:CD1	2.32	0.59
2:C:266:GLN:HE22	2:D:132:GLN:CD	2.05	0.59
1:B:281:TYR:CZ	1:B:285:VAL:HG21	2.37	0.59
2:D:153:LEU:HD12	2:D:153:LEU:C	2.23	0.59
2:D:329:ILE:HD12	2:D:380:ILE:HG23	1.83	0.59
2:D:148:TYR:CE2	2:D:223:VAL:HG21	2.37	0.59
2:D:261:ARG:HE	2:D:285:GLN:NE2	2.01	0.59
1:B:462:GLU:HG3	3:F:112:ILE:HD11	1.85	0.58
2:D:376:ASP:OD1	2:D:379:GLN:HB2	2.03	0.58
1:A:190:ASP:HB3	2:C:74:GLN:O	2.04	0.58
1:A:512:ILE:O	1:A:515:LEU:HB2	2.04	0.58
3:F:24:THR:HG21	6:F:182:HOH:O	2.02	0.58
2:D:286:THR:O	2:D:290:ILE:HG12	2.04	0.58
1:A:196:ASP:HB2	3:E:140:MET:SD	2.43	0.58
1:B:23:VAL:HB	2:D:195:LEU:CD1	2.33	0.58
1:B:63:ILE:CD1	1:B:66:GLU:H	2.17	0.58
2:C:333:ARG:HD2	6:C:542:HOH:O	2.04	0.58
1:A:213:THR:O	1:A:217:ILE:HG12	2.03	0.57
2:D:224:TYR:O	2:D:227:ALA:N	2.38	0.57
3:F:58:ALA:O	3:F:62:GLU:HG3	2.04	0.57
2:D:277:THR:HG22	2:D:281:ILE:HD13	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:413:HIS:HD2	1:A:428:SER:OG	1.88	0.57
2:C:364:ILE:HD12	2:C:375:ALA:HB3	1.85	0.57
3:F:95:VAL:HG12	3:F:99:ASN:HD21	1.69	0.57
1:A:96:HIS:HB2	2:C:20:ILE:HD12	1.85	0.57
2:D:189:ILE:HD11	2:D:287:TYR:CD1	2.40	0.57
2:D:357:TYR:CE1	2:D:381:VAL:HG11	2.39	0.57
1:B:49:LYS:CE	3:F:144:ASN:HD22	2.18	0.57
1:B:48:THR:O	3:F:137:THR:HG23	2.05	0.56
2:C:107:ALA:HB3	2:C:108:PRO:HD3	1.87	0.56
2:C:318:ARG:NH2	6:C:574:HOH:O	2.38	0.56
2:D:71:ASP:HB2	3:F:54:LEU:HD11	1.87	0.56
3:E:106:GLU:O	3:E:110:ILE:HG12	2.05	0.56
1:A:81:SER:OG	1:B:84:ASP:HB3	2.06	0.56
1:A:140:GLN:O	1:A:144:GLU:HG2	2.05	0.56
2:D:143:GLU:O	2:D:147:ARG:HB3	2.06	0.56
1:A:175:ARG:HG2	1:A:176:THR:N	2.20	0.56
1:A:498:GLN:HG3	1:A:506:LEU:HD22	1.87	0.56
2:C:261:ARG:HE	2:C:285:GLN:NE2	2.00	0.56
1:A:159:ALA:O	2:C:33:ASN:HB2	2.05	0.56
2:C:105:TRP:O	2:C:108:PRO:HD2	2.05	0.56
1:B:108:ASN:HD21	1:B:175:ARG:HD3	1.71	0.55
1:A:227:ASN:ND2	1:A:295:LYS:H	2.03	0.55
3:F:12:ARG:O	3:F:16:VAL:HG13	2.06	0.55
1:B:43:ARG:HD2	1:B:43:ARG:C	2.26	0.55
1:A:186:ARG:HA	2:C:73:THR:OG1	2.06	0.55
1:B:38:ASP:O	1:B:39:PHE:HB3	2.07	0.55
1:A:305:TRP:CE2	1:A:309:VAL:HG21	2.41	0.55
1:A:76:GLU:OE1	1:B:76:GLU:HG3	2.07	0.55
1:B:401:GLY:HA2	1:B:515:LEU:HD21	1.89	0.55
3:E:44:ARG:HD3	3:E:47:TYR:CZ	2.43	0.54
1:A:123:MET:HB2	2:C:168:ARG:HD3	1.89	0.54
1:B:140:GLN:HG3	1:B:246:HIS:CE1	2.42	0.54
2:D:269:ALA:O	2:D:274:ASP:HB3	2.08	0.54
2:D:336:MET:CE	2:D:356:LEU:HD11	2.38	0.54
3:F:133:ARG:NH1	3:F:134:GLN:HG3	2.22	0.54
2:D:245:ALA:HB3	2:D:299:TYR:OH	2.07	0.54
3:F:36:ARG:CZ	3:F:119:LYS:HB3	2.37	0.54
1:A:381:ASP:O	1:A:385:LYS:HD2	2.08	0.54
1:B:128:ALA:HB1	1:B:133:GLN:HB3	1.89	0.54
1:B:186:ARG:HA	2:D:73:THR:OG1	2.07	0.54
2:C:266:GLN:NE2	2:D:132:GLN:CD	2.60	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:435:THR:HG21	1:A:437:ARG:NE	2.15	0.54
1:B:141:VAL:O	1:B:145:ILE:HG12	2.06	0.54
3:E:15:TRP:HE3	3:E:19:ILE:HD11	1.71	0.54
1:B:105:VAL:O	1:B:109:PHE:HB2	2.08	0.54
1:B:144:GLU:OE2	1:B:144:GLU:HA	2.08	0.54
3:E:109:LYS:HE2	6:E:291:HOH:O	2.08	0.54
1:B:466:CYS:HB2	2:D:73:THR:HA	1.90	0.53
2:C:111:LYS:O	2:C:115:GLU:HG3	2.08	0.53
2:D:167:ALA:O	2:D:176:ARG:NH1	2.40	0.53
2:D:266:GLN:HB2	2:D:281:ILE:HG21	1.90	0.53
1:B:33:GLN:HA	1:B:131:ALA:HB3	1.90	0.53
1:B:461:PRO:HG2	3:F:159:ARG:CZ	2.38	0.53
1:A:65:LYS:HD2	2:C:117:TRP:HB2	1.89	0.53
1:A:171:ALA:O	1:A:175:ARG:HB3	2.09	0.53
1:A:381:ASP:HA	1:A:385:LYS:HE2	1.91	0.53
1:B:207:VAL:HG22	1:B:313:TRP:CZ2	2.43	0.53
2:C:348:ASP:O	2:C:352:ILE:HG12	2.09	0.53
1:A:521:ASN:HB3	1:A:524:LYS:HG2	1.90	0.53
1:A:302:VAL:CG1	1:A:376:TYR:HE2	2.21	0.53
1:B:230:GLU:C	1:B:233:PRO:HD2	2.29	0.53
2:D:189:ILE:HG22	2:D:193:ILE:HD13	1.90	0.53
1:B:302:VAL:HG13	1:B:376:TYR:HE2	1.74	0.53
1:A:144:GLU:HA	1:A:144:GLU:OE2	2.09	0.53
2:C:266:GLN:NE2	2:D:132:GLN:OE1	2.41	0.53
3:E:57:GLU:O	3:E:61:GLU:HG3	2.09	0.53
3:F:130:ASP:OD1	3:F:133:ARG:NH1	2.43	0.53
2:D:364:ILE:HA	2:D:368:ALA:HB3	1.91	0.52
1:A:292:TYR:OH	1:A:344:HIS:CD2	2.60	0.52
3:F:44:ARG:HD3	3:F:47:TYR:CZ	2.44	0.52
1:B:489:ARG:HH11	1:B:496:ILE:HA	1.75	0.52
1:B:63:ILE:HD13	6:B:1305:HOH:O	2.10	0.52
1:B:439:HIS:HE1	1:B:454:GLU:OE1	1.92	0.52
1:A:230:GLU:C	1:A:233:PRO:HD2	2.29	0.52
1:A:452:TRP:O	1:A:456:MET:HG3	2.09	0.52
1:B:146:ARG:HB2	2:D:106:HIS:CE1	2.45	0.52
3:F:61:GLU:O	3:F:121:PRO:HG2	2.09	0.52
1:A:109:PHE:O	1:A:112:VAL:HG12	2.09	0.52
1:A:138:LEU:HD22	2:C:160:PHE:CZ	2.45	0.52
1:B:316:ILE:O	1:B:320:ARG:HG3	2.10	0.52
2:C:63:ILE:CD1	6:C:554:HOH:O	2.56	0.52
2:D:348:ASP:O	2:D:352:ILE:HG12	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:153:GLU:H	3:F:153:GLU:CD	2.12	0.52
3:E:4:LEU:O	3:E:4:LEU:HG	2.10	0.52
3:E:12:ARG:O	3:E:16:VAL:HG23	2.10	0.52
1:B:43:ARG:HD2	1:B:43:ARG:O	2.10	0.52
1:B:212:PHE:O	1:B:215:PRO:HD2	2.10	0.52
2:D:263:GLU:OE2	2:D:263:GLU:HA	2.10	0.52
1:A:417:ILE:HD13	1:A:468:ASN:HB2	1.92	0.52
1:B:202:LEU:HD22	1:B:206:LEU:CD2	2.40	0.51
2:D:98:HIS:HD2	2:D:297:ASP:OD1	1.93	0.51
2:D:105:TRP:O	2:D:108:PRO:HD2	2.09	0.51
3:F:32:LEU:HD13	3:F:60:LEU:HB3	1.92	0.51
2:D:243:GLU:HB2	2:D:320:TRP:CZ2	2.45	0.51
1:B:185:LYS:O	1:B:189:SER:HB2	2.10	0.51
1:B:354:TRP:CG	1:B:355:PRO:HD3	2.46	0.51
2:D:385:LEU:C	2:D:387:GLY:H	2.14	0.51
3:F:19:ILE:HG21	3:F:60:LEU:HD12	1.92	0.51
1:A:398:PRO:HG3	1:A:507:TRP:CD1	2.45	0.51
1:B:118:ILE:CD1	1:B:145:ILE:HD13	2.38	0.51
2:D:54:VAL:O	2:D:55:TYR:HB2	2.10	0.51
2:D:156:GLU:HA	2:D:156:GLU:OE2	2.11	0.51
2:D:348:ASP:OD2	2:D:350:GLU:HB2	2.11	0.51
1:B:495:LEU:HD11	1:B:512:ILE:CG1	2.41	0.51
3:F:33:LYS:O	3:F:37:MET:HG2	2.11	0.51
1:B:190:ASP:HB3	2:D:74:GLN:O	2.11	0.51
1:A:521:ASN:OD1	1:A:523:VAL:HG12	2.12	0.50
6:A:1371:HOH:O	3:E:6:ILE:HD13	2.11	0.50
2:D:277:THR:O	2:D:281:ILE:HD13	2.11	0.50
3:F:74:GLU:O	3:F:78:ARG:HG3	2.11	0.50
3:F:98:MET:HG3	3:F:138:ARG:HG2	1.93	0.50
2:C:146:ASN:HD21	2:C:197:ARG:NH2	2.00	0.50
2:D:377:ARG:O	2:D:381:VAL:HG23	2.11	0.50
2:D:329:ILE:CD1	2:D:380:ILE:HG23	2.42	0.50
1:A:29:HIS:CD2	1:A:61:LYS:HA	2.47	0.50
2:D:102:LEU:HD13	2:D:290:ILE:HG23	1.94	0.50
1:B:192:PHE:O	1:B:200:CYS:HB3	2.12	0.50
1:B:217:ILE:O	1:B:221:THR:HG23	2.12	0.50
1:A:160:LYS:HA	2:C:33:ASN:HB2	1.93	0.50
1:B:140:GLN:HG3	1:B:246:HIS:NE2	2.27	0.50
1:B:490:SER:OG	2:D:32:ASN:HB2	2.12	0.50
1:A:415:ILE:N	1:A:415:ILE:HD12	2.27	0.49
2:D:260:VAL:O	2:D:265:PHE:HD1	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:256:PHE:HA	2:D:332:LEU:HD21	1.93	0.49
2:C:54:VAL:O	2:C:55:TYR:HB2	2.12	0.49
1:A:21:THR:HG21	2:C:203:ILE:HG22	1.94	0.49
1:A:207:VAL:O	1:A:211:CYS:HB3	2.11	0.49
1:B:63:ILE:HA	2:D:191:GLN:HE22	1.76	0.49
2:D:161:ASN:HB3	2:D:235:TRP:CE2	2.47	0.49
1:B:291:GLU:OE1	1:B:343:HIS:HE1	1.94	0.49
2:C:187:ILE:O	2:C:191:GLN:HG3	2.12	0.49
2:C:211:THR:C	2:C:214:PRO:HD2	2.33	0.49
3:F:90:VAL:HG11	3:F:118:TYR:CE2	2.48	0.49
1:B:202:LEU:HD22	1:B:206:LEU:HD22	1.94	0.49
1:B:211:CYS:HB2	1:B:313:TRP:CG	2.47	0.49
2:C:156:GLU:OE2	2:C:156:GLU:HA	2.12	0.49
2:C:201:ALA:HA	2:C:207:PHE:HB3	1.95	0.49
1:B:360:ARG:HG2	1:B:498:GLN:HB2	1.95	0.49
1:B:216:LEU:HA	1:B:308:TRP:CH2	2.47	0.49
2:C:213:VAL:HB	2:C:214:PRO:HD3	1.95	0.49
1:B:113:GLY:HA3	1:B:188:PHE:CD2	2.48	0.49
1:B:462:GLU:HB2	3:F:112:ILE:HD11	1.95	0.49
2:C:90:LEU:HD13	2:C:303:LEU:HD13	1.94	0.49
2:D:135:ALA:O	2:D:273:GLY:HA3	2.13	0.49
2:D:323:LYS:HB2	3:F:78:ARG:NH1	2.27	0.49
2:D:255:LEU:HD21	2:D:363:TRP:CG	2.48	0.48
1:B:49:LYS:HE3	3:F:144:ASN:HD22	1.77	0.48
3:E:32:LEU:HD23	3:E:122:ILE:CD1	2.43	0.48
1:A:268:ASN:HD21	1:A:327:GLU:H	1.60	0.48
1:B:118:ILE:CG2	1:B:145:ILE:HD11	2.42	0.48
1:B:292:TYR:OH	1:B:344:HIS:HD2	1.96	0.48
2:D:277:THR:HB	2:D:278:PRO:HD3	1.95	0.48
1:B:121:THR:HA	1:B:124:LEU:HD12	1.94	0.48
3:F:46:SER:OG	3:F:48:GLU:HG2	2.13	0.48
2:D:247:SER:O	2:D:251:VAL:HB	2.13	0.48
3:F:19:ILE:HD12	6:F:178:HOH:O	2.14	0.48
2:D:340:ALA:CA	2:D:389:LYS:HE2	2.31	0.48
1:A:65:LYS:HB3	2:C:117:TRP:CG	2.49	0.48
1:A:140:GLN:HG3	1:A:246:HIS:CD2	2.49	0.48
1:A:435:THR:CG2	1:A:437:ARG:NE	2.73	0.48
2:D:153:LEU:HB3	2:D:193:ILE:CG2	2.44	0.48
2:D:323:LYS:HB2	3:F:78:ARG:HH11	1.79	0.47
2:D:355:SER:O	2:D:358:ARG:HB2	2.13	0.47
1:A:495:LEU:HD11	1:A:512:ILE:HG13	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:33:GLN:HA	1:A:131:ALA:HB3	1.97	0.47
1:A:76:GLU:HG2	1:B:76:GLU:OE2	2.14	0.47
1:A:260:ASP:OD2	1:A:262:ALA:HB3	2.15	0.47
2:C:141:ARG:HA	2:C:145:ILE:HD12	1.95	0.47
1:A:227:ASN:HD21	1:A:296:PHE:H	1.62	0.47
2:D:102:LEU:HD13	2:D:290:ILE:HD12	1.96	0.47
1:A:91:ALA:HB1	6:A:1294:HOH:O	2.14	0.47
1:B:30:ARG:HG2	1:B:30:ARG:HH11	1.79	0.47
2:D:267:ARG:HG2	2:D:267:ARG:HH11	1.79	0.47
2:D:234:LEU:HD13	2:D:248:VAL:HG22	1.97	0.47
2:D:324:TRP:C	2:D:327:PRO:HD2	2.34	0.47
1:A:108:ASN:HD21	1:A:175:ARG:HE	1.60	0.47
2:C:118:ARG:NH2	2:D:112:ASP:OD1	2.48	0.47
2:C:275:ASN:C	2:C:278:PRO:HD2	2.35	0.47
2:D:189:ILE:O	2:D:193:ILE:HD13	2.15	0.47
1:A:307:ARG:HG2	1:A:312:ASP:OD2	2.14	0.47
1:B:462:GLU:CG	3:F:112:ILE:HD11	2.44	0.47
1:A:243:GLU:O	1:A:247:MET:HG2	2.14	0.47
1:B:134:LYS:HD3	2:D:161:ASN:ND2	2.23	0.47
2:C:161:ASN:HB3	2:C:235:TRP:CE2	2.50	0.47
1:A:53:ALA:HB3	1:A:56:THR:OG1	2.14	0.47
1:B:108:ASN:ND2	1:B:175:ARG:HH11	2.09	0.46
1:B:123:MET:CE	1:B:197:ALA:HA	2.45	0.46
1:B:441:TYR:HB2	3:F:161:VAL:HG23	1.98	0.46
1:B:32:LEU:HD21	1:B:135:ASN:HB2	1.96	0.46
1:A:24:ASN:OD1	1:A:26:GLN:HG2	2.15	0.46
1:A:76:GLU:HG2	1:B:76:GLU:CD	2.36	0.46
1:A:116:ASN:CG	1:A:189:SER:HA	2.36	0.46
1:A:113:GLY:HA3	1:A:188:PHE:CD2	2.50	0.46
1:B:186:ARG:HD3	1:B:186:ARG:C	2.35	0.46
1:A:49:LYS:HD3	3:E:144:ASN:HD22	1.80	0.46
1:A:495:LEU:HD11	1:A:512:ILE:CG1	2.45	0.46
2:D:179:LEU:HD23	2:D:182:TRP:CE3	2.50	0.46
1:B:204:LEU:HG	1:B:205:GLN:HG3	1.98	0.46
2:D:269:ALA:N	2:D:270:PRO:CD	2.78	0.46
1:A:187:VAL:HG12	1:A:277:THR:HG22	1.98	0.46
2:D:339:PHE:CE2	2:D:352:ILE:HD12	2.51	0.46
1:B:32:LEU:O	1:B:35:PHE:HB2	2.16	0.46
1:A:108:ASN:HD21	1:A:175:ARG:HH21	1.64	0.46
2:D:339:PHE:CZ	2:D:352:ILE:HD12	2.51	0.45
3:F:15:TRP:O	3:F:19:ILE:HG23	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:17:ASN:O	3:F:21:GLN:HG2	2.16	0.45
2:D:157:TYR:O	2:D:160:PHE:HB3	2.16	0.45
1:B:344:HIS:HE1	1:B:376:TYR:CD2	2.34	0.45
1:B:401:GLY:HA2	1:B:515:LEU:CD2	2.46	0.45
1:B:155:ASN:OD1	1:B:168:HIS:HD2	1.99	0.45
2:D:189:ILE:HD12	2:D:284:ALA:HB2	1.99	0.45
3:F:36:ARG:NH1	3:F:119:LYS:HB3	2.32	0.45
1:B:143:ASP:CB	1:B:246:HIS:HE2	2.29	0.45
2:D:144:PHE:CE2	2:D:342:LEU:HD23	2.51	0.45
1:A:175:ARG:HG3	1:A:181:TRP:CE2	2.52	0.45
2:D:264:PHE:HD2	2:D:265:PHE:CD1	2.35	0.45
1:A:417:ILE:CD1	1:A:468:ASN:HB2	2.47	0.45
1:B:186:ARG:CZ	1:B:277:THR:HG23	2.47	0.45
1:B:460:GLU:N	1:B:461:PRO:HD3	2.32	0.45
2:D:224:TYR:O	2:D:225:LYS:C	2.55	0.45
2:D:189:ILE:HG22	2:D:193:ILE:CD1	2.47	0.45
3:F:61:GLU:HB3	3:F:121:PRO:HD3	1.99	0.45
1:B:140:GLN:HG3	1:B:246:HIS:CD2	2.52	0.44
1:B:381:ASP:HA	1:B:385:LYS:HE2	1.99	0.44
3:E:36:ARG:CZ	3:E:119:LYS:HB3	2.47	0.44
1:B:188:PHE:HZ	1:B:213:THR:HG22	1.82	0.44
1:A:354:TRP:CE2	1:A:499:PRO:HB3	2.52	0.44
1:A:184:MET:HE2	1:A:184:MET:O	2.17	0.44
2:D:57:GLN:HE21	2:D:59:ASN:ND2	2.16	0.44
2:D:148:TYR:CE2	2:D:338:LEU:HD13	2.53	0.44
1:A:354:TRP:CG	1:A:355:PRO:HD3	2.53	0.44
2:C:33:ASN:N	2:C:33:ASN:HD22	2.15	0.44
2:D:152:PHE:O	2:D:155:ASN:HB3	2.17	0.44
2:D:201:ALA:HA	2:D:207:PHE:HB3	2.00	0.44
1:B:318:ILE:HD12	1:B:326:VAL:CG1	2.47	0.44
2:D:336:MET:HE2	2:D:356:LEU:HD11	2.00	0.44
2:C:306:ASP:O	2:C:310:SER:HB2	2.18	0.44
3:E:76:ASP:OD1	3:E:80:LYS:HE3	2.18	0.44
3:F:23:ASN:C	3:F:23:ASN:HD22	2.21	0.44
3:F:55:TRP:CZ2	3:F:59:LYS:HE2	2.53	0.44
1:B:41:ASN:O	2:D:236:GLN:HB3	2.18	0.43
1:B:63:ILE:HD11	1:B:66:GLU:H	1.83	0.43
1:B:138:LEU:HD22	2:D:160:PHE:CZ	2.53	0.43
2:D:149:TRP:CE2	2:D:193:ILE:HG13	2.53	0.43
1:B:108:ASN:HD21	1:B:175:ARG:CD	2.31	0.43
1:B:128:ALA:O	1:B:134:LYS:HE2	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:413:HIS:HD2	1:B:428:SER:OG	2.01	0.43
1:A:110:LEU:O	1:A:114:GLU:HG2	2.18	0.43
1:B:334:ASP:HB2	6:B:1458:HOH:O	2.18	0.43
1:B:284:PRO:HB3	1:B:342:ALA:HB1	1.99	0.43
2:D:170:ALA:O	2:D:176:ARG:NH2	2.52	0.43
2:D:298:LEU:O	2:D:302:CYS:HB2	2.18	0.43
1:B:162:GLY:HA3	6:B:1417:HOH:O	2.18	0.43
1:A:175:ARG:HD3	6:C:549:HOH:O	2.18	0.43
2:C:98:HIS:HD2	2:C:297:ASP:OD1	2.01	0.43
1:B:63:ILE:HD12	1:B:66:GLU:H	1.82	0.43
1:B:123:MET:HE3	1:B:197:ALA:HA	2.01	0.43
2:D:111:LYS:O	2:D:115:GLU:HG3	2.19	0.43
1:A:283:THR:HB	1:A:284:PRO:CD	2.48	0.43
1:B:202:LEU:CD2	1:B:206:LEU:HD22	2.49	0.43
2:D:57:GLN:HE21	2:D:59:ASN:HD21	1.65	0.43
2:D:226:SER:HB2	2:D:334:ASP:CG	2.39	0.43
2:D:357:TYR:O	2:D:361:ASP:HB2	2.19	0.43
3:F:119:LYS:HA	3:F:128:PHE:CE1	2.54	0.43
1:A:31:TRP:HA	6:A:1490:HOH:O	2.19	0.42
1:A:343:HIS:CD2	1:A:343:HIS:H	2.37	0.42
1:B:167:GLY:O	1:B:171:ALA:HB2	2.19	0.42
1:B:207:VAL:HG22	1:B:313:TRP:HZ2	1.84	0.42
2:C:292:LYS:O	2:C:296:GLN:HG3	2.20	0.42
1:A:84:ASP:HB3	1:B:81:SER:OG	2.19	0.42
1:A:187:VAL:HG11	1:A:281:TYR:HB3	2.01	0.42
1:A:146:ARG:HB2	2:C:106:HIS:CE1	2.54	0.42
1:A:212:PHE:O	1:A:216:LEU:CB	2.68	0.42
1:A:461:PRO:HG2	3:E:159:ARG:CZ	2.50	0.42
1:B:63:ILE:CD1	1:B:65:LYS:HB2	2.48	0.42
2:D:63:ILE:O	2:D:64:ALA:C	2.56	0.42
1:B:125:TRP:CD1	1:B:125:TRP:C	2.93	0.42
2:C:179:LEU:HD12	2:C:182:TRP:CZ3	2.54	0.42
2:D:140:TRP:CZ2	2:D:269:ALA:HA	2.55	0.42
2:D:213:VAL:N	2:D:214:PRO:HD2	2.35	0.42
2:D:324:TRP:O	2:D:327:PRO:HD2	2.19	0.42
1:B:216:LEU:HA	1:B:308:TRP:HH2	1.84	0.42
3:E:36:ARG:NH1	3:E:119:LYS:HB3	2.35	0.42
1:B:323:LYS:HE2	1:B:324:TYR:CE1	2.55	0.42
2:C:261:ARG:NE	2:C:285:GLN:HE22	2.05	0.42
2:D:61:ASP:OD1	3:F:7:HIS:HD2	2.03	0.42
2:D:235:TRP:CD1	2:D:235:TRP:C	2.91	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:435:THR:CG2	1:A:436:LEU:N	2.83	0.42
1:B:194:SER:HA	2:D:76:PHE:CE1	2.54	0.42
1:A:106:VAL:O	1:A:110:LEU:HB2	2.20	0.42
1:A:108:ASN:ND2	1:A:175:ARG:HH21	2.17	0.42
1:A:460:GLU:N	1:A:461:PRO:HD3	2.34	0.42
1:B:187:VAL:O	1:B:188:PHE:HD1	2.02	0.42
2:C:33:ASN:HD22	2:C:33:ASN:H	1.67	0.42
1:A:397:ASP:HA	1:A:398:PRO:HD3	1.78	0.41
1:B:208:GLY:O	1:B:213:THR:HG23	2.20	0.41
3:E:41:THR:O	3:E:44:ARG:CD	2.63	0.41
3:F:80:LYS:HE3	3:F:84:GLY:O	2.20	0.41
1:B:137:TYR:O	1:B:141:VAL:HG23	2.20	0.41
2:C:146:ASN:ND2	2:C:197:ARG:NH2	2.62	0.41
2:D:277:THR:HG22	2:D:281:ILE:CD1	2.49	0.41
3:F:73:ASN:O	3:F:74:GLU:C	2.58	0.41
1:B:28:VAL:HG21	2:D:195:LEU:HD13	2.01	0.41
1:B:283:THR:HB	1:B:284:PRO:HD3	2.01	0.41
2:C:54:VAL:HG12	2:C:55:TYR:CD2	2.54	0.41
2:D:267:ARG:HG2	2:D:267:ARG:NH1	2.34	0.41
1:A:20:PRO:HG3	2:C:129:ALA:HB2	2.01	0.41
1:B:206:LEU:HD23	1:B:271:LEU:HD13	2.02	0.41
2:C:160:PHE:CE2	2:C:187:ILE:HD12	2.55	0.41
2:C:277:THR:HG22	2:C:281:ILE:CD1	2.50	0.41
1:A:185:LYS:HA	1:A:189:SER:HB2	2.02	0.41
1:B:302:VAL:CG1	1:B:376:TYR:HE2	2.33	0.41
1:B:305:TRP:CE2	1:B:309:VAL:HG21	2.56	0.41
1:B:260:ASP:HA	1:B:261:PRO:HD3	1.89	0.41
1:B:331:SER:HA	6:B:1458:HOH:O	2.20	0.41
1:B:397:ASP:HA	1:B:398:PRO:HD3	1.87	0.41
2:C:235:TRP:CD1	2:C:235:TRP:C	2.94	0.41
2:D:385:LEU:HD12	2:D:385:LEU:HA	1.94	0.41
1:B:184:MET:HE1	1:B:188:PHE:CD2	2.55	0.41
1:B:227:ASN:HD21	1:B:296:PHE:H	1.69	0.41
1:B:115:TYR:OH	2:D:173:ASP:HA	2.21	0.41
1:B:179:PRO:HB3	1:B:469:ILE:HD13	2.03	0.41
1:B:186:ARG:HD3	1:B:186:ARG:O	2.21	0.41
2:D:13:ASP:HA	2:D:14:PRO:HD3	1.97	0.41
2:D:140:TRP:NE1	2:D:145:ILE:HD11	2.35	0.41
3:F:23:ASN:HD22	3:F:23:ASN:H	1.69	0.41
3:F:24:THR:HG22	3:F:26:GLU:HB3	2.02	0.41
1:B:50:TYR:CD1	1:B:50:TYR:N	2.89	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:96:HIS:CE1	1:B:98:LYS:HG3	2.56	0.41
1:B:118:ILE:HG21	1:B:145:ILE:CD1	2.48	0.41
2:C:153:LEU:C	2:C:153:LEU:HD12	2.41	0.41
2:C:364:ILE:HA	2:C:368:ALA:HB3	2.03	0.41
2:D:277:THR:N	2:D:278:PRO:CD	2.84	0.41
2:D:306:ASP:C	2:D:308:GLU:H	2.24	0.41
1:A:108:ASN:HD21	1:A:175:ARG:NE	2.19	0.41
1:A:354:TRP:N	1:A:355:PRO:CD	2.84	0.41
1:A:439:HIS:HE1	1:A:454:GLU:OE1	2.03	0.41
1:B:476:ARG:NH1	3:F:5:GLY:HA3	2.36	0.41
2:D:169:GLU:O	2:D:170:ALA:C	2.59	0.41
2:D:228:ARG:HG2	2:D:228:ARG:HH11	1.86	0.41
1:B:66:GLU:HA	1:B:66:GLU:OE2	2.21	0.40
2:D:353:THR:O	2:D:357:TYR:HD1	2.04	0.40
1:A:30:ARG:HD3	1:A:31:TRP:NE1	2.36	0.40
1:A:182:LYS:O	2:C:73:THR:HG21	2.22	0.40
1:A:305:TRP:NE1	1:A:309:VAL:HG21	2.37	0.40
2:D:336:MET:HE1	2:D:356:LEU:HD11	2.03	0.40
1:A:118:ILE:HD11	1:A:145:ILE:HA	2.04	0.40
1:B:139:ALA:HB2	6:B:1396:HOH:O	2.22	0.40
1:B:165:PRO:HG3	6:B:1464:HOH:O	2.21	0.40
1:B:281:TYR:CE1	1:B:285:VAL:HG21	2.56	0.40
2:C:80:ARG:HB2	6:C:558:HOH:O	2.21	0.40
2:C:353:THR:HG21	6:C:605:HOH:O	2.21	0.40
2:D:189:ILE:CD1	2:D:284:ALA:HA	2.51	0.40
2:D:342:LEU:HD22	2:D:346:THR:HG21	2.03	0.40
2:D:357:TYR:CE2	2:D:381:VAL:HG21	2.56	0.40
3:E:62:GLU:O	3:E:66:VAL:HG13	2.22	0.40
1:A:440:GLU:HB3	3:E:162:ARG:HB3	2.03	0.40
1:B:31:TRP:CH2	2:D:210:SER:HA	2.57	0.40
1:B:251:TYR:O	1:B:255:VAL:HG23	2.20	0.40
2:D:77:HIS:CD2	3:F:140:MET:HG2	2.57	0.40
2:D:388:LEU:O	2:D:389:LYS:C	2.60	0.40
1:A:149:HIS:CE1	2:C:105:TRP:HB2	2.57	0.40
1:B:96:HIS:HE1	1:B:98:LYS:HG3	1.86	0.40
1:B:257:ILE:HD12	1:B:257:ILE:C	2.42	0.40
2:D:57:GLN:NE2	2:D:59:ASN:ND2	2.67	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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	508/527 (96%)	485 (96%)	19 (4%)	4 (1%)	19	23
1	B	508/527 (96%)	478 (94%)	25 (5%)	5 (1%)	15	17
2	C	386/389 (99%)	372 (96%)	13 (3%)	1 (0%)	41	50
2	D	386/389 (99%)	351 (91%)	25 (6%)	10 (3%)	5	4
3	E	164/170 (96%)	161 (98%)	3 (2%)	0	100	100
3	F	164/170 (96%)	153 (93%)	11 (7%)	0	100	100
All	All	2116/2172 (97%)	2000 (94%)	96 (4%)	20 (1%)	17	20

All (20) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	311	GLU
1	B	40	LYS
2	D	251	VAL
2	D	64	ALA
2	D	263	GLU
2	D	271	ARG
1	A	94	ARG
1	A	311	GLU
2	D	44	LYS
2	D	225	LYS
2	D	252	TYR
1	A	340	TYR
1	A	514	ARG
1	B	94	ARG
2	D	205	PRO
2	D	210	SER
2	D	307	PRO
1	B	39	PHE
1	B	284	PRO
2	C	251	VAL

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 X-ray entries followed by that with respect to entries of similar resolution.

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	425/442 (96%)	411 (97%)	14 (3%)	38	53
1	B	422/442 (96%)	413 (98%)	9 (2%)	53	70
2	C	315/323 (98%)	306 (97%)	9 (3%)	42	58
2	D	312/323 (97%)	304 (97%)	8 (3%)	46	63
3	E	143/147 (97%)	139 (97%)	4 (3%)	43	60
3	F	142/147 (97%)	138 (97%)	4 (3%)	43	60
All	All	1759/1824 (96%)	1711 (97%)	48 (3%)	44	61

All (48) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	30	ARG
1	A	38	ASP
1	A	43	ARG
1	A	90	ASN
1	A	110	LEU
1	A	125	TRP
1	A	175	ARG
1	A	186	ARG
1	A	213	THR
1	A	279	GLN
1	A	437	ARG
1	A	467	GLN
1	A	514	ARG
1	A	520	LYS
1	B	43	ARG
1	B	90	ASN
1	B	112	VAL
1	B	125	TRP
1	B	186	ARG
1	B	259	ASN
1	B	279	GLN
1	B	311	GLU

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Mol	Chain	Res	Type
1	B	318	ILE
2	C	33	ASN
2	C	35	MET
2	C	80	ARG
2	C	173	ASP
2	C	179	LEU
2	C	195	LEU
2	C	203	ILE
2	C	290	ILE
2	C	378	ASP
2	D	4	LEU
2	D	35	MET
2	D	80	ARG
2	D	153	LEU
2	D	173	ASP
2	D	205	PRO
2	D	220	ASN
2	D	334	ASP
3	E	19	ILE
3	E	44	ARG
3	E	60	LEU
3	E	138	ARG
3	F	11	THR
3	F	23	ASN
3	F	44	ARG
3	F	164	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (64) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	41	ASN
1	A	78	GLN
1	A	90	ASN
1	A	100	ASN
1	A	108	ASN
1	A	168	HIS
1	A	227	ASN
1	A	249	ASN
1	A	259	ASN
1	A	268	ASN
1	A	273	ASN
1	A	278	GLN

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Mol	Chain	Res	Type
1	A	279	GLN
1	A	343	HIS
1	A	344	HIS
1	A	413	HIS
1	A	439	HIS
1	A	442	ASN
1	A	472	GLN
1	A	516	ASN
1	B	33	GLN
1	B	42	ASN
1	B	78	GLN
1	B	90	ASN
1	B	100	ASN
1	B	108	ASN
1	B	155	ASN
1	B	168	HIS
1	B	227	ASN
1	B	249	ASN
1	B	259	ASN
1	B	268	ASN
1	B	273	ASN
1	B	278	GLN
1	B	279	GLN
1	B	343	HIS
1	B	344	HIS
1	B	411	ASN
1	B	413	HIS
1	B	439	HIS
1	B	451	GLN
1	B	516	ASN
1	B	527	ASN
2	C	33	ASN
2	C	98	HIS
2	C	146	ASN
2	C	161	ASN
2	C	266	GLN
2	C	285	GLN
2	C	301	ASN
2	D	57	GLN
2	D	98	HIS
2	D	155	ASN
2	D	161	ASN

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Mol	Chain	Res	Type
2	D	285	GLN
2	D	301	ASN
3	E	45	ASN
3	E	144	ASN
3	E	165	HIS
3	F	7	HIS
3	F	23	ASN
3	F	45	ASN
3	F	99	ASN
3	F	144	ASN

5.3.3 RNA [i](#)

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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 6 ligands modelled in this entry, 4 are monoatomic - leaving 2 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	BML	B	1293	-	8,8,8	3.58	6 (75%)	10,10,10	3.25	5 (50%)
5	BML	A	1292	-	8,8,8	3.58	6 (75%)	10,10,10	3.25	5 (50%)

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	BML	B	1293	-	-	-	0/1/1/1
5	BML	A	1292	-	-	-	0/1/1/1

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	1292	BML	C2-C1	5.55	1.49	1.38
5	B	1293	BML	C2-C1	5.55	1.49	1.38
5	A	1292	BML	C3-C2	4.90	1.47	1.38
5	B	1293	BML	C3-C2	4.72	1.47	1.38
5	B	1293	BML	C6-C5	-4.28	1.31	1.38
5	B	1293	BML	C6-C1	4.24	1.47	1.38
5	A	1292	BML	C6-C1	4.23	1.47	1.38
5	A	1292	BML	C6-C5	-4.16	1.31	1.38
5	B	1293	BML	BR4-C4	-2.40	1.85	1.90
5	A	1292	BML	C3-C4	2.36	1.43	1.38
5	B	1293	BML	C3-C4	2.19	1.42	1.38
5	A	1292	BML	BR4-C4	-2.04	1.86	1.90

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	1292	BML	C6-C5-C4	6.53	127.67	119.19
5	B	1293	BML	C6-C5-C4	6.49	127.62	119.19
5	A	1292	BML	C3-C2-C1	-4.73	114.69	119.88
5	B	1293	BML	C3-C2-C1	-4.66	114.76	119.88
5	B	1293	BML	BR4-C4-C5	4.50	125.84	119.30
5	A	1292	BML	BR4-C4-C5	4.40	125.69	119.30
5	A	1292	BML	C5-C4-C3	-2.91	116.61	121.34
5	B	1293	BML	C5-C4-C3	-2.77	116.83	121.34
5	A	1292	BML	C2-C3-C4	2.67	122.66	119.19
5	B	1293	BML	C2-C3-C4	2.57	122.53	119.19

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	510/527 (96%)	0.05	22 (4%) 35 42	20, 38, 66, 76	0
1	B	510/527 (96%)	-0.10	22 (4%) 35 42	22, 37, 68, 78	0
2	C	388/389 (99%)	-0.49	2 (0%) 91 94	17, 25, 41, 59	0
2	D	388/389 (99%)	0.31	26 (6%) 17 23	25, 48, 72, 86	0
3	E	166/170 (97%)	-0.43	1 (0%) 89 92	19, 29, 46, 66	0
3	F	166/170 (97%)	0.71	15 (9%) 9 12	39, 57, 77, 84	0
All	All	2128/2172 (97%)	-0.02	88 (4%) 37 44	17, 37, 69, 86	0

All (88) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	316	ILE	6.0
2	D	389	LYS	5.2
2	D	344	ALA	4.8
1	A	326	VAL	4.7
2	D	388	LEU	4.6
2	D	205	PRO	4.5
2	C	2	SER	4.4
1	B	39	PHE	4.1
2	D	375	ALA	4.1
1	B	53	ALA	4.0
1	A	317	TRP	3.9
2	D	374	LYS	3.9
1	B	527	ASN	3.9
1	B	318	ILE	3.8
3	F	23	ASN	3.8
1	A	323	LYS	3.7
1	A	434	SER	3.6
1	A	310	TYR	3.6
2	D	206	GLY	3.5

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Mol	Chain	Res	Type	RSRZ
1	B	19	ALA	3.5
1	B	213	THR	3.5
1	B	259	ASN	3.4
2	D	354	ALA	3.3
1	A	315	GLY	3.3
2	D	350	GLU	3.3
1	A	213	THR	3.3
2	D	2	SER	3.3
2	D	136	MET	3.2
1	B	310	TYR	3.2
2	D	148	TYR	3.2
3	F	120	PRO	3.1
2	D	349	LYS	3.1
1	A	212	PHE	3.1
3	F	19	ILE	3.1
1	B	317	TRP	3.0
3	E	4	LEU	3.0
3	F	21	GLN	3.0
3	F	101	ALA	2.8
3	F	70	ARG	2.8
1	B	311	GLU	2.8
1	A	318	ILE	2.8
1	A	53	ALA	2.7
1	B	31	TRP	2.7
3	F	80	LYS	2.7
1	B	319	GLY	2.7
3	F	118	TYR	2.6
3	F	102	LYS	2.6
1	A	324	TYR	2.6
1	B	54	ASN	2.6
2	D	353	THR	2.5
2	D	343	PRO	2.5
2	D	260	VAL	2.5
1	A	262	ALA	2.5
1	B	23	VAL	2.5
1	A	54	ASN	2.5
2	D	345	GLY	2.4
1	A	51	LYS	2.4
3	F	28	ALA	2.4
1	A	322	GLY	2.4
1	B	21	THR	2.4
1	B	20	PRO	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	41	ASN	2.4
1	A	251	TYR	2.4
1	B	320	ARG	2.3
1	A	214	ASN	2.3
2	D	380	ILE	2.3
1	A	319	GLY	2.3
2	D	187	ILE	2.3
1	A	19	ALA	2.2
2	C	389	LYS	2.2
2	D	5	GLY	2.1
3	F	30	GLU	2.1
1	B	316	ILE	2.1
3	F	25	LEU	2.1
2	D	248	VAL	2.1
3	F	71	ALA	2.1
1	B	214	ASN	2.1
2	D	193	ILE	2.1
3	F	4	LEU	2.1
2	D	270	PRO	2.1
2	D	339	PHE	2.1
2	D	385	LEU	2.1
1	A	313	TRP	2.1
2	D	333	ARG	2.0
1	A	38	ASP	2.0
1	B	212	PHE	2.0
3	F	67	LEU	2.0
1	B	59	GLN	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum,

median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
4	FE	A	529	1/1	0.95	0.04	77,77,77,77	0
4	FE	A	528	1/1	0.96	0.04	58,58,58,58	0
4	FE	B	528	1/1	0.97	0.02	62,62,62,62	0
4	FE	B	529	1/1	0.97	0.05	68,68,68,68	0
5	BML	A	1292	8/8	0.97	0.13	50,50,50,50	0
5	BML	B	1293	8/8	0.98	0.10	46,46,46,46	0

6.5 Other polymers [\(i\)](#)

There are no such residues in this entry.