



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 12:39 PM UTC

PDB ID : 3HPY / pdb_00003hpy
Title : Crystal Structure Analysis of the 2,3-dioxygenase LapB from Pseudomonas in the complex with 4-methylcatechol
Authors : Cho, J.-H.; Rhee, S.
Deposited on : 2009-06-05
Resolution : 1.94 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 : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

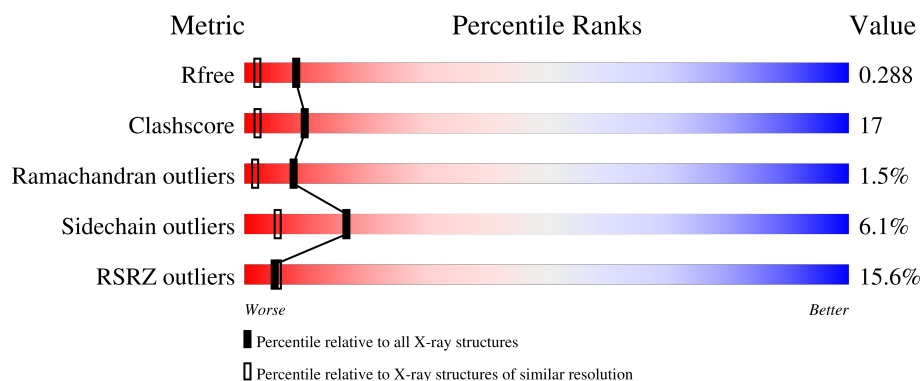
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.94 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}	180053	1452 (1.94-1.94)
Clashscore	190562	1494 (1.94-1.94)
Ramachandran outliers	187476	1479 (1.94-1.94)
Sidechain outliers	187428	1479 (1.94-1.94)
RSRZ outliers	180081	1453 (1.94-1.94)

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	309	11% 60% 29% 7%
1	B	309	11% 61% 27% 5% 7%
1	C	309	21% 58% 34% 7%
1	D	309	16% 57% 33% 5%

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
3	MCT	A	311	-	-	X	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 9706 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.

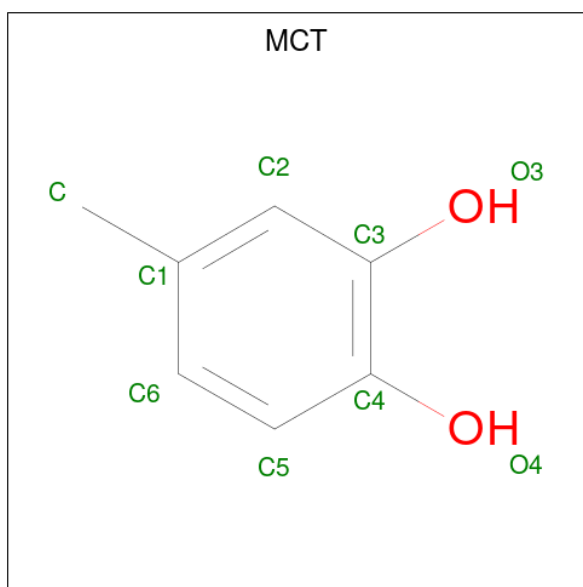
- Molecule 1 is a protein called Catechol 2,3-dioxygenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	288	Total	C	N	O	S	0	0	0
			2300	1464	392	431	13			
1	B	288	Total	C	N	O	S	0	0	0
			2300	1464	392	431	13			
1	C	296	Total	C	N	O	S	0	0	0
			2362	1503	402	444	13			
1	D	296	Total	C	N	O	S	0	0	0
			2362	1503	402	444	13			

- Molecule 2 is FE (III) ION (CCD ID: FE) (formula: Fe).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Fe	0	0
			1	1		
2	B	1	Total	Fe	0	0
			1	1		
2	C	1	Total	Fe	0	0
			1	1		
2	D	1	Total	Fe	0	0
			1	1		

- Molecule 3 is 4-METHYLCATECHOL (CCD ID: MCT) (formula: C₇H₈O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			9	7	2		
3	B	1	Total	C	O	0	0
			9	7	2		
3	C	1	Total	C	O	0	0
			9	7	2		

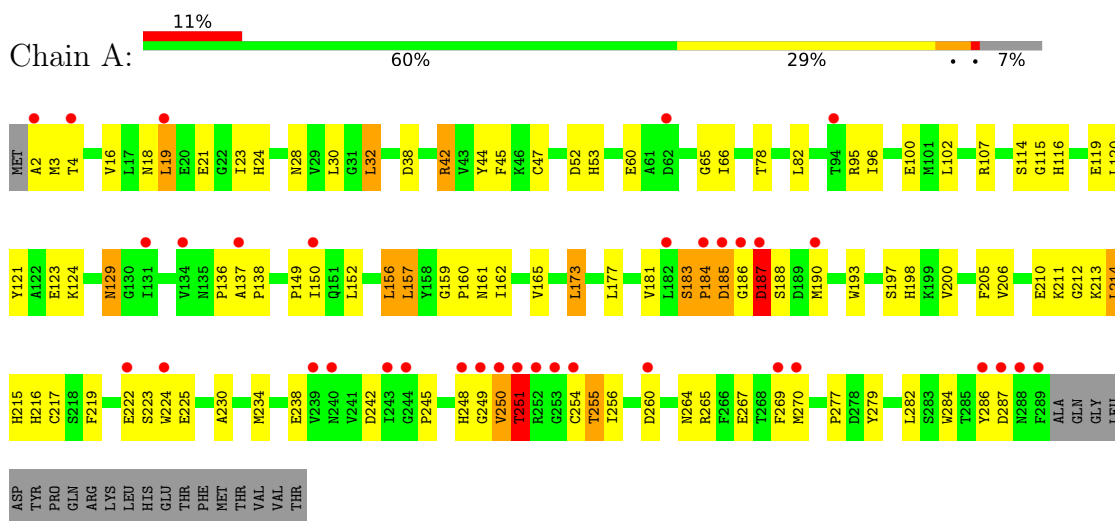
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	95	Total	O	0	0
			95	95		
4	B	102	Total	O	0	0
			102	102		
4	C	80	Total	O	0	0
			80	80		
4	D	74	Total	O	0	0
			74	74		

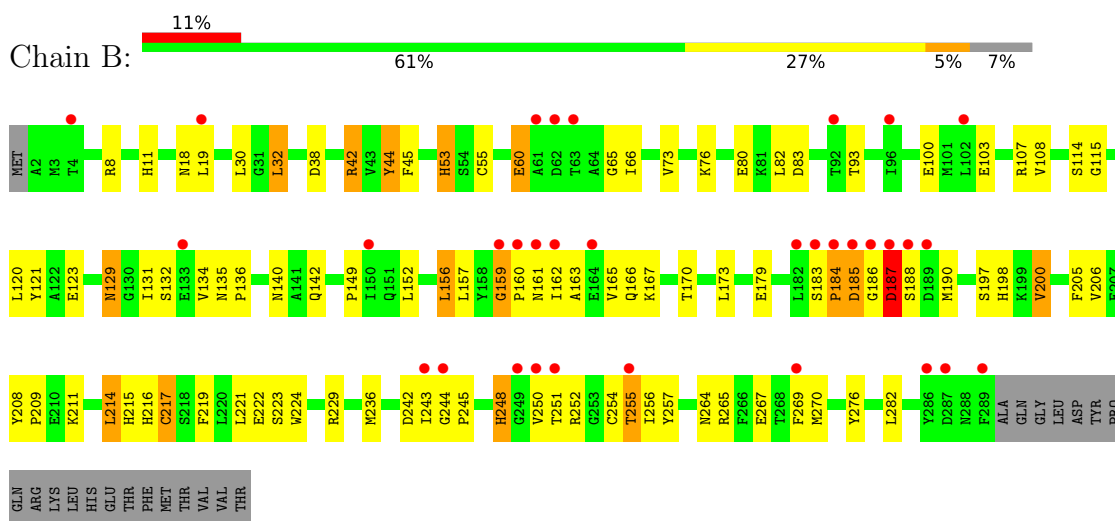
3 Residue-property plots

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 electron 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 dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). 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: Catechol 2,3-dioxygenase

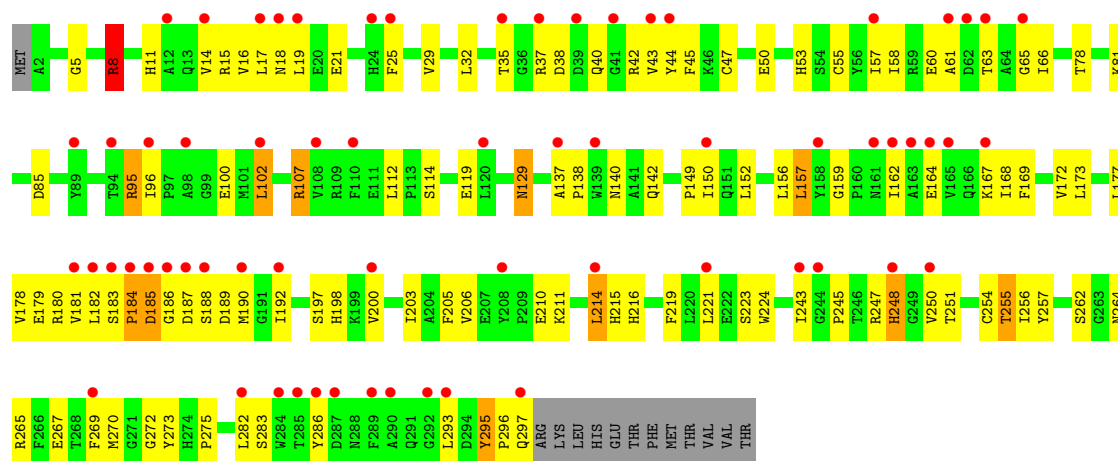


- Molecule 1: Catechol 2,3-dioxygenase

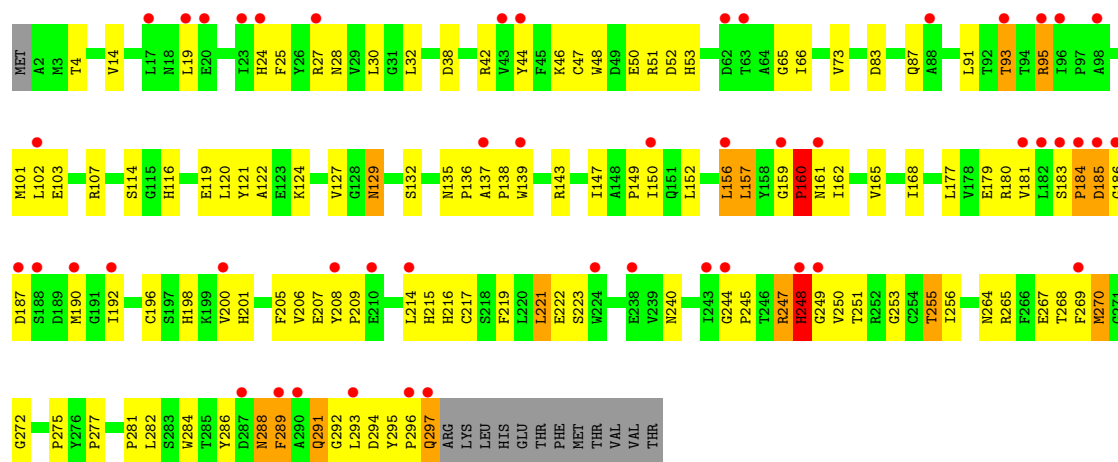


- Molecule 1: Catechol 2,3-dioxygenase





• Molecule 1: Catechol 2,3-dioxygenase



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	96.10Å 97.60Å 133.70Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 1.94 50.00 – 1.94	Depositor EDS
% Data completeness (in resolution range)	78.4 (50.00-1.94) 94.6 (50.00-1.94)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.56 (at 1.94Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.244 , 0.278 0.255 , 0.288	Depositor DCC
R_{free} test set	9350 reflections (9.98%)	wwPDB-VP
Wilson B-factor (Å ²)	27.7	Xtriage
Anisotropy	0.028	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 36.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	0.025 for k,h,-l	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	9706	wwPDB-VP
Average B, all atoms (Å ²)	30.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 32.18 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 9.8029e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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

5.1 Standard geometry

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

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	0.52	0/2363	1.10	12/3210 (0.4%)
1	B	0.50	0/2363	1.06	15/3210 (0.5%)
1	C	0.46	0/2427	1.02	10/3298 (0.3%)
1	D	0.58	2/2427 (0.1%)	1.04	12/3298 (0.4%)
All	All	0.51	2/9580 (0.0%)	1.06	49/13016 (0.4%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	288	ASN	C-N	-6.92	1.24	1.33
1	D	248	HIS	CA-C	-5.06	1.48	1.53

All (49) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	187	ASP	CA-CB-CG	-10.36	102.24	112.60
1	A	188	SER	N-CA-C	-9.04	97.06	108.45
1	A	183	SER	CA-C-N	8.76	130.79	119.84
1	A	183	SER	C-N-CA	8.76	130.79	119.84
1	C	187	ASP	N-CA-C	8.02	121.57	110.35
1	B	188	SER	N-CA-C	-7.72	97.59	109.24
1	B	152	LEU	N-CA-C	-7.60	97.62	109.25
1	C	248	HIS	CA-CB-CG	7.49	121.29	113.80
1	D	289	PHE	N-CA-CB	-6.97	99.88	110.12
1	A	152	LEU	N-CA-C	-6.82	98.09	108.67
1	A	186	GLY	N-CA-C	-6.72	105.39	113.99
1	D	291	GLN	N-CA-C	-6.70	103.79	112.23
1	C	295	TYR	CA-C-N	-6.57	112.41	119.24
1	C	295	TYR	C-N-CA	-6.57	112.41	119.24
1	A	255	THR	N-CA-C	6.51	118.20	107.73

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	255	THR	N-CA-C	6.48	118.00	108.86
1	D	152	LEU	N-CA-C	-6.37	98.79	108.67
1	B	53	HIS	N-CA-C	6.37	119.04	111.33
1	A	217	CYS	N-CA-C	-6.32	100.62	110.42
1	D	269	PHE	N-CA-CB	-6.24	100.41	111.08
1	B	160	PRO	N-CA-C	6.23	121.75	113.40
1	C	152	LEU	N-CA-C	-6.19	99.08	108.67
1	D	249	GLY	N-CA-C	-6.14	98.64	113.18
1	B	159	GLY	CA-C-N	6.13	125.54	118.85
1	B	159	GLY	C-N-CA	6.13	125.54	118.85
1	C	186	GLY	N-CA-C	-6.13	98.65	113.18
1	D	217	CYS	N-CA-C	-6.12	99.73	109.59
1	B	8	ARG	N-CA-C	6.11	113.63	108.13
1	B	217	CYS	N-CA-C	-5.96	100.58	110.17
1	C	188	SER	N-CA-C	-5.90	99.55	108.52
1	A	53	HIS	N-CA-C	5.72	118.25	111.33
1	D	289	PHE	CB-CA-C	5.69	120.23	110.79
1	B	248	HIS	CB-CA-C	-5.68	100.16	109.53
1	C	255	THR	N-CA-C	5.65	116.01	108.38
1	B	187	ASP	N-CA-C	5.63	122.80	110.80
1	A	183	SER	N-CA-C	-5.62	102.53	110.29
1	B	222	GLU	N-CA-C	5.55	117.14	111.14
1	B	276	TYR	CA-C-N	5.50	126.71	119.84
1	B	276	TYR	C-N-CA	5.50	126.71	119.84
1	D	269	PHE	N-CA-C	5.49	118.50	109.72
1	A	47	CYS	N-CA-C	-5.40	102.49	110.48
1	C	178	VAL	N-CA-C	-5.35	106.59	111.67
1	D	25	PHE	N-CA-C	5.32	116.88	111.14
1	D	186	GLY	N-CA-C	-5.25	100.73	113.18
1	A	282	LEU	N-CA-C	-5.25	102.75	110.52
1	C	8	ARG	N-CA-C	5.21	112.71	108.07
1	D	289	PHE	CA-CB-CG	5.19	118.99	113.80
1	D	255	THR	N-CA-C	5.10	115.89	108.14
1	A	100	GLU	N-CA-C	-5.09	105.85	111.71

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	A	2300	0	2193	87	0
1	B	2300	0	2193	76	0
1	C	2362	0	2248	86	0
1	D	2362	0	2248	94	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
3	A	9	0	6	12	0
3	B	9	0	7	0	0
3	C	9	0	6	1	0
4	A	95	0	0	3	0
4	B	102	0	0	1	0
4	C	80	0	0	0	0
4	D	74	0	0	3	0
All	All	9706	0	8901	318	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 17.

All (318) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:250:VAL:HG23	3:A:311:MCT:H6	1.28	1.07
1:D:150:ILE:HD11	1:D:222:GLU:HG2	1.46	0.95
1:A:193:TRP:HZ2	3:A:311:MCT:C	1.82	0.93
1:D:247:ARG:HG3	1:D:248:HIS:N	1.82	0.92
1:C:215:HIS:HD2	1:C:216:HIS:HD1	1.18	0.90
1:A:250:VAL:CG2	3:A:311:MCT:H6	2.02	0.88
1:A:193:TRP:CZ2	3:A:311:MCT:C	2.56	0.88
1:A:223:SER:HA	1:A:270:MET:HE3	1.55	0.88
1:B:223:SER:HA	1:B:270:MET:HE3	1.54	0.87
1:A:193:TRP:CZ2	3:A:311:MCT:H3	2.10	0.87
1:D:247:ARG:HG3	1:D:248:HIS:H	1.35	0.86
1:D:114:SER:HA	1:D:160:PRO:HD2	1.57	0.85
1:B:215:HIS:HD2	1:B:216:HIS:HD1	1.23	0.85
1:D:66:ILE:HB	1:D:214:LEU:HD22	1.59	0.84
1:A:193:TRP:HZ2	3:A:311:MCT:H1	1.39	0.83
1:D:250:VAL:HG12	1:D:251:THR:HG23	1.61	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:250:VAL:HG12	1:C:251:THR:HG23	1.60	0.81
1:A:254:CYS:O	1:A:269:PHE:HB2	1.81	0.80
1:B:162:ILE:HD12	1:B:205:PHE:HB3	1.65	0.79
1:A:150:ILE:HD11	1:A:222:GLU:HG2	1.66	0.78
1:D:223:SER:HA	1:D:270:MET:HE3	1.67	0.77
1:A:162:ILE:HD12	1:A:205:PHE:HB3	1.65	0.76
1:C:254:CYS:O	1:C:269:PHE:HB2	1.85	0.76
1:B:140:ASN:HD21	1:B:142:GLN:HG3	1.51	0.75
1:D:248:HIS:O	1:D:292:GLY:O	2.05	0.74
1:C:215:HIS:CD2	1:C:216:HIS:HD1	2.05	0.74
1:A:107:ARG:HG2	1:A:121:TYR:HB3	1.70	0.74
1:D:181:VAL:HG11	1:D:289:PHE:CE1	2.23	0.73
1:A:215:HIS:HD2	1:A:216:HIS:HD1	1.33	0.73
1:B:114:SER:HB2	1:B:159:GLY:HA3	1.71	0.73
1:D:200:VAL:HG13	1:D:201:HIS:ND1	2.03	0.73
1:A:19:LEU:HD13	1:A:23:ILE:HD11	1.69	0.72
1:C:35:THR:HG21	1:C:53:HIS:O	1.89	0.72
1:B:255:THR:OG1	1:B:267:GLU:HG3	1.89	0.71
1:D:65:GLY:H	1:D:264:ASN:HD21	1.37	0.71
1:C:179:GLU:HG2	1:C:282:LEU:HB2	1.73	0.71
1:A:224:TRP:CZ2	1:B:224:TRP:CZ2	2.80	0.70
1:D:215:HIS:HD2	1:D:216:HIS:HD1	1.38	0.69
1:D:297:GLN:C	1:D:297:GLN:OE1	2.35	0.69
1:C:243:ILE:HG22	1:C:257:TYR:HB2	1.75	0.69
1:D:156:LEU:HD21	1:D:206:VAL:HG23	1.73	0.69
1:B:215:HIS:CD2	1:B:216:HIS:HD1	2.09	0.68
1:A:250:VAL:HG23	3:A:311:MCT:C6	2.17	0.68
1:B:65:GLY:H	1:B:264:ASN:HD21	1.42	0.68
1:C:297:GLN:HE21	1:D:244:GLY:HA3	1.60	0.67
1:D:200:VAL:HG21	1:D:251:THR:HB	1.76	0.67
1:C:245:PRO:HG2	1:D:245:PRO:O	1.95	0.67
1:B:243:ILE:HG22	1:B:257:TYR:HB2	1.76	0.66
1:B:229:ARG:HG3	1:D:143:ARG:NH2	2.11	0.66
1:C:18:ASN:HB3	1:C:21:GLU:HG2	1.77	0.65
1:A:210:GLU:HB3	1:A:213:LYS:HE3	1.77	0.65
1:C:129:ASN:HD22	1:C:129:ASN:H	1.45	0.65
1:C:223:SER:HA	1:C:270:MET:HE3	1.79	0.65
1:B:198:HIS:HE1	1:C:198:HIS:H	1.45	0.65
1:D:30:LEU:HG	1:D:32:LEU:HD13	1.78	0.65
1:D:181:VAL:HG11	1:D:289:PHE:CD1	2.31	0.65
1:B:38:ASP:OD2	1:B:42:ARG:HD3	1.97	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:216:HIS:CE1	3:C:311:MCT:O3	2.51	0.64
1:B:183:SER:HB3	1:B:190:MET:HG2	1.79	0.64
1:C:248:HIS:CE1	1:C:255:THR:HG21	2.35	0.62
1:B:30:LEU:HG	1:B:32:LEU:HD13	1.80	0.61
1:A:18:ASN:HB3	1:A:21:GLU:HG2	1.81	0.61
1:A:114:SER:HA	1:A:160:PRO:HD2	1.82	0.61
1:D:286:TYR:O	1:D:289:PHE:HB2	2.00	0.60
1:D:255:THR:OG1	1:D:267:GLU:HG3	2.00	0.60
1:A:2:ALA:N	1:D:4:THR:O	2.35	0.60
1:B:18:ASN:C	1:B:18:ASN:HD22	2.09	0.60
1:D:160:PRO:HA	1:D:207:GLU:OE2	2.02	0.59
1:A:215:HIS:CD2	1:A:216:HIS:HD1	2.18	0.59
1:B:248:HIS:NE2	1:B:255:THR:HG21	2.18	0.59
1:A:156:LEU:HD21	1:A:206:VAL:HG23	1.84	0.59
1:A:260:ASP:HB2	1:A:264:ASN:O	2.03	0.59
1:B:93:THR:HG23	1:B:108:VAL:HG13	1.85	0.58
1:B:255:THR:OG1	1:B:256:ILE:N	2.36	0.58
1:B:179:GLU:HG2	1:B:282:LEU:HB2	1.86	0.58
1:A:38:ASP:OD1	1:A:42:ARG:HD3	2.04	0.58
1:C:156:LEU:HD21	1:C:206:VAL:HG23	1.85	0.57
1:C:15:ARG:HE	1:C:63:THR:HG23	1.70	0.57
1:D:294:ASP:OD2	1:D:296:PRO:HD2	2.04	0.57
1:B:184:PRO:O	1:B:186:GLY:N	2.37	0.57
1:D:83:ASP:OD2	1:D:93:THR:HG21	2.05	0.57
1:A:245:PRO:HG2	1:B:245:PRO:O	2.05	0.56
1:A:251:THR:HB	3:A:311:MCT:H5	1.86	0.56
1:D:91:LEU:HD11	1:D:168:ILE:HD13	1.87	0.56
1:A:19:LEU:O	1:A:23:ILE:HG13	2.05	0.56
1:B:250:VAL:O	1:B:251:THR:HB	2.05	0.56
1:C:100:GLU:HB3	1:C:107:ARG:NH2	2.20	0.56
1:B:183:SER:O	1:B:185:ASP:N	2.39	0.56
1:D:177:LEU:HD21	1:D:180:ARG:HB3	1.87	0.56
1:A:150:ILE:HD11	1:A:222:GLU:CG	2.35	0.56
1:C:255:THR:OG1	1:C:267:GLU:HG3	2.06	0.55
1:C:66:ILE:HG22	1:C:214:LEU:HB2	1.87	0.55
1:A:224:TRP:CD1	1:B:224:TRP:CD1	2.95	0.55
1:D:38:ASP:OD2	1:D:42:ARG:HD3	2.06	0.55
1:D:200:VAL:HG21	1:D:251:THR:CB	2.36	0.55
1:B:11:HIS:HA	1:B:55:CYS:O	2.07	0.55
1:B:215:HIS:HD2	1:B:216:HIS:ND1	1.99	0.54
1:D:53:HIS:CD2	1:D:103:GLU:HG3	2.42	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:215:HIS:O	1:D:265:ARG:HB3	2.07	0.54
1:A:65:GLY:H	1:A:264:ASN:HD21	1.55	0.54
1:C:247:ARG:HG3	1:C:248:HIS:N	2.23	0.53
1:A:19:LEU:CD1	1:A:23:ILE:HD11	2.36	0.53
1:D:95:ARG:HH11	1:D:95:ARG:HG2	1.73	0.53
1:D:251:THR:O	1:D:272:GLY:HA2	2.07	0.53
1:A:107:ARG:HD2	1:A:119:GLU:OE1	2.08	0.53
1:C:65:GLY:H	1:C:264:ASN:HD21	1.55	0.53
1:B:115:GLY:HA3	1:B:211:LYS:HB2	1.90	0.53
1:C:14:VAL:O	1:C:58:ILE:HA	2.08	0.53
1:C:38:ASP:OD2	1:C:42:ARG:HD3	2.09	0.53
1:A:249:GLY:C	1:A:251:THR:H	2.17	0.53
1:D:250:VAL:HG12	1:D:251:THR:CG2	2.38	0.53
1:B:198:HIS:CE1	1:C:197:SER:HB2	2.44	0.53
1:B:200:VAL:HG21	1:B:251:THR:HG23	1.89	0.53
1:C:162:ILE:HG22	1:C:192:ILE:HD12	1.88	0.53
1:D:116:HIS:CD2	1:D:157:LEU:HG	2.43	0.53
1:C:164:GLU:HA	1:C:167:LYS:HE3	1.90	0.53
1:A:116:HIS:CD2	1:A:157:LEU:HG	2.43	0.52
1:D:184:PRO:O	1:D:185:ASP:C	2.52	0.52
1:A:114:SER:HB2	1:A:159:GLY:HA3	1.90	0.52
1:C:181:VAL:HG11	1:C:190:MET:HE2	1.91	0.52
1:D:215:HIS:CD2	1:D:216:HIS:HD1	2.24	0.52
1:D:160:PRO:O	1:D:161:ASN:HB2	2.09	0.52
1:D:24:HIS:O	1:D:28:ASN:HB2	2.10	0.52
1:A:30:LEU:HG	1:A:32:LEU:HD13	1.91	0.52
1:B:224:TRP:CZ3	1:B:254:CYS:HB3	2.45	0.51
1:C:15:ARG:HB2	1:C:61:ALA:HB3	1.92	0.51
1:D:245:PRO:HB3	1:D:256:ILE:HD11	1.91	0.51
1:C:295:TYR:O	1:C:296:PRO:C	2.50	0.51
1:C:5:GLY:HA2	1:C:78:THR:HG21	1.92	0.51
1:A:96:ILE:HG21	1:A:107:ARG:NH2	2.26	0.51
1:A:52:ASP:HB3	1:A:124:LYS:HG2	1.93	0.51
1:C:47:CYS:HB2	1:C:50:GLU:HG3	1.93	0.51
1:B:184:PRO:C	1:B:186:GLY:H	2.19	0.49
1:D:149:PRO:HB2	1:D:219:PHE:HB3	1.94	0.49
1:A:224:TRP:CE2	1:B:224:TRP:CE2	3.00	0.49
1:B:215:HIS:O	1:B:265:ARG:HB3	2.12	0.49
1:C:245:PRO:O	1:D:245:PRO:HG2	2.12	0.49
1:C:247:ARG:HG3	1:C:248:HIS:O	2.12	0.49
1:D:183:SER:HB3	1:D:190:MET:HG2	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:297:GLN:C	1:D:297:GLN:CD	2.80	0.49
1:B:198:HIS:H	1:C:198:HIS:HE1	1.60	0.49
1:B:229:ARG:HG3	1:D:143:ARG:HH22	1.77	0.49
1:A:96:ILE:HD12	1:A:96:ILE:N	2.28	0.49
1:C:129:ASN:HD22	1:C:129:ASN:N	2.04	0.49
1:C:137:ALA:HB1	1:C:138:PRO:HD2	1.95	0.48
1:C:184:PRO:O	1:C:185:ASP:C	2.56	0.48
1:A:3:MET:HB2	4:A:397:HOH:O	2.12	0.48
1:A:32:LEU:HB3	1:A:45:PHE:HB3	1.95	0.48
1:B:197:SER:HB2	1:C:198:HIS:CE1	2.48	0.48
1:C:297:GLN:HE21	1:D:244:GLY:CA	2.23	0.48
1:B:179:GLU:OE1	1:B:250:VAL:HG13	2.13	0.48
1:B:198:HIS:CE1	1:C:198:HIS:H	2.27	0.48
1:C:129:ASN:H	1:C:129:ASN:ND2	2.10	0.48
1:B:184:PRO:C	1:B:186:GLY:N	2.70	0.48
1:D:162:ILE:HD12	1:D:205:PHE:HB3	1.95	0.48
1:D:129:ASN:H	1:D:129:ASN:HD22	1.62	0.47
1:B:93:THR:CG2	1:B:108:VAL:HG13	2.44	0.47
1:B:242:ASP:HB3	1:B:257:TYR:CB	2.44	0.47
1:C:95:ARG:HB2	1:C:95:ARG:HH11	1.77	0.47
1:A:198:HIS:H	1:D:198:HIS:HE1	1.61	0.47
1:C:140:ASN:HD21	1:C:142:GLN:HG3	1.78	0.47
1:A:185:ASP:C	1:A:187:ASP:N	2.71	0.47
1:A:230:ALA:O	1:A:234:MET:HG3	2.14	0.47
1:A:251:THR:CG2	3:A:311:MCT:H5	2.45	0.47
1:D:255:THR:OG1	1:D:256:ILE:N	2.48	0.47
1:A:78:THR:HG22	1:A:82:LEU:HD23	1.96	0.47
1:A:183:SER:HA	1:A:190:MET:HG2	1.96	0.47
1:A:210:GLU:CB	1:A:213:LYS:HE3	2.43	0.47
1:B:251:THR:O	1:B:252:ARG:HB2	2.15	0.47
1:C:95:ARG:HB2	1:C:95:ARG:NH1	2.29	0.47
1:D:30:LEU:HA	1:D:147:ILE:HD12	1.96	0.47
1:D:107:ARG:HB3	1:D:121:TYR:HB3	1.97	0.47
1:C:245:PRO:HA	1:C:256:ILE:HG12	1.96	0.46
1:D:177:LEU:HD22	1:D:281:PRO:CB	2.45	0.46
1:A:251:THR:CB	3:A:311:MCT:H5	2.45	0.46
1:C:150:ILE:HD12	1:C:150:ILE:N	2.29	0.46
1:A:160:PRO:O	1:A:161:ASN:HB2	2.15	0.46
1:A:82:LEU:HD12	1:A:173:LEU:HD12	1.98	0.46
1:A:136:PRO:HG3	1:D:282:LEU:HD13	1.98	0.46
1:C:243:ILE:HG23	1:C:243:ILE:O	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:250:VAL:C	1:D:251:THR:HG23	2.40	0.46
1:B:107:ARG:HG2	1:B:121:TYR:HB3	1.98	0.46
1:C:44:TYR:CZ	1:C:102:LEU:HB2	2.51	0.46
1:A:279:TYR:HB3	1:D:51:ARG:NH1	2.31	0.46
1:C:162:ILE:HD12	1:C:205:PHE:HB3	1.98	0.46
1:D:73:VAL:CG2	1:D:122:ALA:HB2	2.46	0.46
1:B:156:LEU:HB3	1:B:215:HIS:HB3	1.98	0.45
1:C:40:GLN:HB2	1:C:42:ARG:HD2	1.97	0.45
1:D:121:TYR:CE2	1:D:124:LYS:HD2	2.51	0.45
1:A:250:VAL:CG2	3:A:311:MCT:C6	2.85	0.45
1:B:66:ILE:HG22	1:B:214:LEU:HB2	1.98	0.45
1:C:180:ARG:HD2	1:C:189:ASP:OD1	2.16	0.45
1:B:248:HIS:HE2	1:B:255:THR:HG21	1.82	0.45
1:D:251:THR:C	1:D:253:GLY:H	2.25	0.45
1:B:132:SER:O	1:B:136:PRO:HB3	2.16	0.45
1:D:129:ASN:H	1:D:129:ASN:ND2	2.15	0.45
1:A:115:GLY:HA3	1:A:211:LYS:HB3	1.99	0.45
1:D:245:PRO:HA	1:D:256:ILE:HG12	1.98	0.45
1:A:214:LEU:HD22	1:A:216:HIS:N	2.32	0.45
1:A:184:PRO:HG3	1:A:286:TYR:CD2	2.52	0.45
1:C:183:SER:HB3	1:C:190:MET:HB2	1.99	0.45
1:B:214:LEU:HD22	1:B:215:HIS:N	2.32	0.45
1:D:87:GLN:HA	1:D:91:LEU:O	2.17	0.45
1:B:129:ASN:C	1:B:129:ASN:HD22	2.25	0.44
1:C:107:ARG:HD3	1:C:119:GLU:OE1	2.17	0.44
1:D:288:ASN:ND2	1:D:291:GLN:HB3	2.31	0.44
1:C:182:LEU:HD13	1:C:283:SER:HB3	1.98	0.44
1:B:161:ASN:O	1:B:165:VAL:HG23	2.17	0.44
1:D:48:TRP:HD1	4:D:316:HOH:O	1.99	0.44
1:B:129:ASN:ND2	1:B:131:ILE:H	2.16	0.44
1:D:66:ILE:HG22	1:D:214:LEU:HB2	1.99	0.44
1:D:135:ASN:N	1:D:136:PRO:CD	2.81	0.44
1:A:2:ALA:HA	1:D:196:CYS:O	2.17	0.44
1:B:60:GLU:O	1:B:60:GLU:HG3	2.17	0.44
1:A:44:TYR:CE1	1:A:102:LEU:HD12	2.53	0.44
1:B:19:LEU:HB2	1:B:60:GLU:HB3	1.99	0.44
1:B:149:PRO:HB2	1:B:219:PHE:HB3	2.00	0.44
1:A:197:SER:HB2	1:D:198:HIS:CE1	2.53	0.44
1:A:136:PRO:HD2	1:D:284:TRP:CE2	2.52	0.44
1:C:81:LYS:HD3	1:C:85:ASP:OD2	2.17	0.44
1:D:161:ASN:O	1:D:165:VAL:HG23	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:251:THR:O	1:C:272:GLY:HA2	2.17	0.43
1:D:46:LYS:HE2	1:D:127:VAL:CG1	2.47	0.43
1:D:221:LEU:HD22	1:D:268:THR:HB	1.99	0.43
1:C:189:ASP:HB2	1:C:192:ILE:HD11	2.00	0.43
1:C:273:TYR:CD1	1:C:275:PRO:HD3	2.53	0.43
1:D:200:VAL:HA	1:D:275:PRO:HG3	1.99	0.43
1:C:100:GLU:HB3	1:C:107:ARG:HH21	1.82	0.43
1:D:132:SER:O	1:D:136:PRO:HB3	2.17	0.43
1:A:78:THR:O	1:A:82:LEU:HD23	2.18	0.43
1:A:224:TRP:CZ3	1:A:254:CYS:HB3	2.54	0.43
1:B:44:TYR:N	1:B:44:TYR:CD1	2.87	0.43
1:C:32:LEU:HB3	1:C:45:PHE:HB3	2.00	0.43
1:C:96:ILE:HD12	1:C:96:ILE:N	2.33	0.43
1:C:255:THR:OG1	1:C:256:ILE:N	2.51	0.43
1:A:277:PRO:HG3	4:D:344:HOH:O	2.17	0.43
1:B:83:ASP:OD2	1:B:93:THR:HG21	2.19	0.43
1:D:46:LYS:HD2	1:D:52:ASP:O	2.18	0.43
1:A:161:ASN:O	1:A:165:VAL:HG23	2.18	0.43
1:C:181:VAL:CG1	1:C:190:MET:HE2	2.48	0.43
1:D:47:CYS:HB2	1:D:50:GLU:HG3	1.99	0.43
1:D:181:VAL:HG11	1:D:289:PHE:HE1	1.75	0.43
1:C:159:GLY:HA2	1:C:210:GLU:O	2.18	0.43
1:C:183:SER:HB2	1:C:184:PRO:HD2	2.00	0.43
1:A:129:ASN:HD22	1:A:129:ASN:H	1.66	0.43
1:B:32:LEU:HB3	1:B:45:PHE:HB3	2.00	0.43
1:B:134:VAL:HG22	1:B:135:ASN:ND2	2.33	0.43
1:B:255:THR:HB	1:B:269:PHE:HB3	2.00	0.43
1:C:16:VAL:O	1:C:60:GLU:HA	2.19	0.43
1:C:149:PRO:CB	1:C:219:PHE:HB3	2.49	0.43
1:B:73:VAL:HG22	1:B:121:TYR:O	2.19	0.42
1:A:116:HIS:CD2	1:A:212:GLY:HA2	2.54	0.42
1:A:214:LEU:HD22	1:A:215:HIS:N	2.34	0.42
1:A:255:THR:OG1	1:A:256:ILE:N	2.51	0.42
1:B:156:LEU:HD21	1:B:206:VAL:HG23	2.00	0.42
1:B:149:PRO:CB	1:B:219:PHE:HB3	2.50	0.42
1:D:137:ALA:HB1	1:D:138:PRO:HD2	2.01	0.42
1:D:240:ASN:HA	4:D:338:HOH:O	2.18	0.42
1:A:181:VAL:HG23	1:A:193:TRP:CZ3	2.54	0.42
1:A:251:THR:HG21	3:A:311:MCT:H5	2.01	0.42
1:B:100:GLU:HB3	1:B:107:ARG:NH2	2.34	0.42
1:B:270:MET:SD	1:B:270:MET:C	3.03	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:44:TYR:CD2	1:C:57:ILE:HG12	2.54	0.42
1:C:183:SER:O	1:C:184:PRO:C	2.61	0.42
1:C:17:LEU:HG	1:C:262:SER:HB3	2.01	0.42
1:D:159:GLY:O	1:D:208:TYR:N	2.52	0.42
1:D:179:GLU:OE1	1:D:250:VAL:HG13	2.18	0.42
1:C:8:ARG:HG2	1:C:8:ARG:HH11	1.85	0.42
1:A:16:VAL:O	1:A:60:GLU:HA	2.19	0.42
1:A:250:VAL:HA	1:A:284:TRP:NE1	2.34	0.42
1:A:255:THR:OG1	1:A:267:GLU:HG3	2.20	0.42
1:B:242:ASP:HB3	1:B:257:TYR:HB3	2.00	0.42
1:D:107:ARG:HB2	1:D:119:GLU:HG2	2.01	0.42
1:B:76:LYS:O	1:B:80:GLU:HG2	2.20	0.42
1:D:177:LEU:HD22	1:D:281:PRO:HB3	2.01	0.42
1:A:185:ASP:C	1:A:187:ASP:H	2.28	0.42
1:A:270:MET:HE2	1:A:270:MET:HB2	1.86	0.42
1:B:53:HIS:CD2	1:B:103:GLU:HG3	2.55	0.42
1:C:168:ILE:O	1:C:172:VAL:HB	2.19	0.42
1:C:168:ILE:HG22	1:C:173:LEU:CD2	2.49	0.42
1:C:43:VAL:CG1	1:C:58:ILE:HG13	2.50	0.42
1:C:215:HIS:O	1:C:265:ARG:HB3	2.20	0.42
1:D:14:VAL:HG13	1:D:65:GLY:O	2.20	0.42
1:B:129:ASN:HD22	1:B:129:ASN:H	1.68	0.41
1:B:236:MET:HE1	1:D:139:TRP:CE2	2.54	0.41
1:D:44:TYR:CE1	1:D:102:LEU:HD12	2.55	0.41
1:D:129:ASN:HD22	1:D:129:ASN:N	2.16	0.41
4:A:397:HOH:O	1:D:277:PRO:HG3	2.20	0.41
1:D:156:LEU:HB3	1:D:215:HIS:HB3	2.02	0.41
1:B:163:ALA:O	1:B:167:LYS:HG2	2.19	0.41
1:A:66:ILE:HG22	1:A:214:LEU:HB2	2.03	0.41
1:C:25:PHE:O	1:C:29:VAL:HB	2.20	0.41
1:C:224:TRP:CZ3	1:C:254:CYS:HB3	2.55	0.41
1:A:137:ALA:HB1	1:A:138:PRO:HD2	2.02	0.41
1:A:149:PRO:HB2	1:A:219:PHE:HB3	2.02	0.41
1:A:284:TRP:CE3	1:D:135:ASN:HA	2.55	0.41
1:B:166:GLN:O	1:B:170:THR:HG23	2.21	0.41
1:B:217:CYS:HB2	4:B:335:HOH:O	2.20	0.41
1:C:112:LEU:HD11	1:C:169:PHE:HE1	1.86	0.41
1:C:114:SER:O	1:C:211:LYS:HB2	2.20	0.41
1:B:270:MET:HE2	1:B:270:MET:HB2	1.97	0.41
1:A:224:TRP:NE1	1:B:224:TRP:CE2	2.88	0.41
1:D:295:TYR:HB3	1:D:296:PRO:HD3	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:184:PRO:HG3	1:A:286:TYR:CG	2.55	0.41
1:C:11:HIS:HA	1:C:55:CYS:O	2.21	0.41
1:C:37:ARG:HG2	1:C:43:VAL:HG23	2.03	0.41
1:C:245:PRO:HB3	1:C:256:ILE:HD11	2.02	0.41
1:D:101:MET:HG3	1:D:107:ARG:NH2	2.36	0.41
1:A:225:GLU:HG3	4:A:345:HOH:O	2.21	0.40
1:C:157:LEU:HD21	1:C:203:ILE:HD11	2.03	0.40
1:A:215:HIS:O	1:A:265:ARG:HB3	2.21	0.40
1:A:248:HIS:CD2	1:A:255:THR:HG21	2.56	0.40
1:A:250:VAL:HA	1:A:284:TRP:CE2	2.57	0.40
1:A:24:HIS:O	1:A:28:ASN:HB2	2.21	0.40
1:C:182:LEU:CD1	1:C:283:SER:HB3	2.51	0.40
1:B:208:TYR:HA	1:B:209:PRO:HD3	1.93	0.40
1:D:114:SER:CA	1:D:160:PRO:HD2	2.39	0.40
1:C:184:PRO:HD3	1:C:286:TYR:CD1	2.57	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	286/309 (93%)	271 (95%)	9 (3%)	6 (2%)	5	1
1	B	286/309 (93%)	270 (94%)	12 (4%)	4 (1%)	9	2
1	C	294/309 (95%)	271 (92%)	21 (7%)	2 (1%)	18	9
1	D	294/309 (95%)	273 (93%)	16 (5%)	5 (2%)	7	1
All	All	1160/1236 (94%)	1085 (94%)	58 (5%)	17 (2%)	8	2

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	184	PRO
1	B	185	ASP
1	B	187	ASP
1	B	244	GLY
1	D	187	ASP
1	A	187	ASP
1	A	251	THR
1	D	185	ASP
1	A	242	ASP
1	C	185	ASP
1	D	209	PRO
1	A	185	ASP
1	C	184	PRO
1	A	184	PRO
1	D	160	PRO
1	D	184	PRO
1	A	250	VAL

5.3.2 Protein sidechains ⓘ

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	245/264 (93%)	227 (93%)	18 (7%)	13	3
1	B	245/264 (93%)	230 (94%)	15 (6%)	17	5
1	C	251/264 (95%)	239 (95%)	12 (5%)	23	10
1	D	251/264 (95%)	235 (94%)	16 (6%)	16	5
All	All	992/1056 (94%)	931 (94%)	61 (6%)	17	5

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

Mol	Chain	Res	Type
1	A	4	THR
1	A	19	LEU
1	A	32	LEU
1	A	42	ARG
1	A	95	ARG

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Mol	Chain	Res	Type
1	A	120	LEU
1	A	123	GLU
1	A	129	ASN
1	A	156	LEU
1	A	157	LEU
1	A	173	LEU
1	A	177	LEU
1	A	187	ASP
1	A	200	VAL
1	A	214	LEU
1	A	238	GLU
1	A	251	THR
1	A	287	ASP
1	B	32	LEU
1	B	42	ARG
1	B	44	TYR
1	B	60	GLU
1	B	82	LEU
1	B	120	LEU
1	B	123	GLU
1	B	129	ASN
1	B	156	LEU
1	B	157	LEU
1	B	173	LEU
1	B	187	ASP
1	B	200	VAL
1	B	214	LEU
1	B	221	LEU
1	C	8	ARG
1	C	19	LEU
1	C	95	ARG
1	C	102	LEU
1	C	107	ARG
1	C	129	ASN
1	C	157	LEU
1	C	177	LEU
1	C	200	VAL
1	C	214	LEU
1	C	221	LEU
1	C	293	LEU
1	D	19	LEU
1	D	27	ARG

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Mol	Chain	Res	Type
1	D	93	THR
1	D	95	ARG
1	D	120	LEU
1	D	129	ASN
1	D	156	LEU
1	D	157	LEU
1	D	160	PRO
1	D	192	ILE
1	D	221	LEU
1	D	247	ARG
1	D	248	HIS
1	D	270	MET
1	D	293	LEU
1	D	297	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (37) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	40	GLN
1	A	129	ASN
1	A	142	GLN
1	A	215	HIS
1	A	264	ASN
1	B	18	ASN
1	B	24	HIS
1	B	28	ASN
1	B	129	ASN
1	B	140	ASN
1	B	198	HIS
1	B	215	HIS
1	B	240	ASN
1	B	264	ASN
1	B	288	ASN
1	C	53	HIS
1	C	87	GLN
1	C	129	ASN
1	C	166	GLN
1	C	198	HIS
1	C	215	HIS
1	C	240	ASN
1	C	248	HIS
1	C	264	ASN

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Mol	Chain	Res	Type
1	C	291	GLN
1	C	297	GLN
1	D	18	ASN
1	D	87	GLN
1	D	129	ASN
1	D	166	GLN
1	D	215	HIS
1	D	226	GLN
1	D	237	ASN
1	D	240	ASN
1	D	264	ASN
1	D	288	ASN
1	D	291	GLN

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 7 ligands modelled in this entry, 4 are monoatomic - leaving 3 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
3	MCT	C	311	2	9,9,9	1.46	2 (22%)	12,12,12	1.07	1 (8%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	MCT	B	311	2	9,9,9	1.64	3 (33%)	12,12,12	0.93	0
3	MCT	A	311	2	9,9,9	1.38	1 (11%)	12,12,12	1.10	1 (8%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	MCT	C	311	2	-	-	0/1/1/1
3	MCT	B	311	2	-	-	0/1/1/1
3	MCT	A	311	2	-	-	0/1/1/1

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	311	MCT	C4-C3	2.53	1.44	1.40
3	B	311	MCT	C2-C3	2.21	1.42	1.38
3	B	311	MCT	C5-C4	2.16	1.43	1.39
3	B	311	MCT	C6-C5	2.13	1.42	1.38
3	C	311	MCT	C6-C5	2.12	1.42	1.38
3	C	311	MCT	C2-C3	2.05	1.41	1.38

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	311	MCT	C3-C2-C1	-2.19	119.17	121.03
3	A	311	MCT	C3-C2-C1	-2.03	119.30	121.03

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	311	MCT	1	0
3	A	311	MCT	12	0

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	288/309 (93%)	0.79	35 (12%) 8 9	15, 26, 44, 59	0
1	B	288/309 (93%)	0.83	33 (11%) 9 10	16, 27, 39, 58	0
1	C	296/309 (95%)	1.34	65 (21%) 2 2	21, 33, 48, 63	0
1	D	296/309 (95%)	1.08	49 (16%) 4 4	19, 30, 44, 62	0
All	All	1168/1236 (94%)	1.01	182 (15%) 5 5	15, 29, 45, 63	0

All (182) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	244	GLY	8.3
1	A	289	PHE	7.1
1	D	244	GLY	6.5
1	A	2	ALA	6.4
1	A	250	VAL	5.8
1	D	185	ASP	5.7
1	B	186	GLY	5.4
1	B	244	GLY	5.1
1	B	62	ASP	5.0
1	A	244	GLY	4.9
1	D	186	GLY	4.7
1	A	224	TRP	4.6
1	D	184	PRO	4.6
1	D	187	ASP	4.6
1	C	186	GLY	4.2
1	D	297	GLN	4.1
1	C	293	LEU	4.1
1	C	19	LEU	4.1
1	B	243	ILE	4.0
1	C	290	ALA	4.0
1	D	96	ILE	4.0

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Mol	Chain	Res	Type	RSRZ
1	D	137	ALA	3.9
1	A	251	THR	3.9
1	B	185	ASP	3.9
1	B	289	PHE	3.8
1	B	251	THR	3.8
1	A	185	ASP	3.7
1	C	289	PHE	3.7
1	D	139	TRP	3.7
1	B	184	PRO	3.7
1	A	254	CYS	3.6
1	A	288	ASN	3.6
1	C	286	TYR	3.6
1	D	248	HIS	3.6
1	C	185	ASP	3.5
1	D	188	SER	3.4
1	D	243	ILE	3.4
1	D	192	ILE	3.4
1	C	63	THR	3.4
1	C	43	VAL	3.3
1	C	243	ILE	3.3
1	C	188	SER	3.3
1	C	167	LYS	3.2
1	C	190	MET	3.2
1	D	290	ALA	3.2
1	B	19	LEU	3.2
1	A	253	GLY	3.2
1	B	187	ASP	3.2
1	C	57	ILE	3.1
1	A	248	HIS	3.1
1	C	250	VAL	3.1
1	C	184	PRO	3.1
1	A	249	GLY	3.1
1	D	17	LEU	3.0
1	A	186	GLY	3.0
1	C	137	ALA	3.0
1	B	133	GLU	3.0
1	B	269	PHE	3.0
1	C	285	THR	2.9
1	A	184	PRO	2.9
1	C	41	GLY	2.9
1	C	269	PHE	2.9
1	C	162	ILE	2.9

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Mol	Chain	Res	Type	RSRZ
1	D	182	LEU	2.9
1	D	24	HIS	2.8
1	A	269	PHE	2.8
1	C	139	TRP	2.8
1	A	252	ARG	2.8
1	C	182	LEU	2.8
1	D	19	LEU	2.8
1	C	187	ASP	2.8
1	B	255	THR	2.7
1	D	293	LEU	2.7
1	C	110	PHE	2.7
1	D	289	PHE	2.7
1	A	287	ASP	2.7
1	A	260	ASP	2.7
1	D	23	ILE	2.7
1	C	165	VAL	2.7
1	D	88	ALA	2.6
1	D	98	ALA	2.6
1	A	222	GLU	2.6
1	D	20	GLU	2.6
1	B	161	ASN	2.6
1	B	182	LEU	2.6
1	C	214	LEU	2.6
1	C	192	ILE	2.6
1	D	62	ASP	2.6
1	C	161	ASN	2.6
1	B	188	SER	2.6
1	A	62	ASP	2.6
1	B	150	ILE	2.6
1	D	210	GLU	2.6
1	C	12	ALA	2.6
1	C	35	THR	2.6
1	D	269	PHE	2.5
1	C	102	LEU	2.5
1	D	200	VAL	2.5
1	C	284	TRP	2.5
1	C	248	HIS	2.5
1	C	94	THR	2.5
1	C	108	VAL	2.5
1	D	63	THR	2.5
1	C	44	TYR	2.5
1	C	158	TYR	2.5

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Mol	Chain	Res	Type	RSRZ
1	D	249	GLY	2.5
1	C	61	ALA	2.5
1	A	4	THR	2.5
1	D	181	VAL	2.4
1	D	95	ARG	2.4
1	C	292	GLY	2.4
1	C	164	GLU	2.4
1	C	120	LEU	2.4
1	D	183	SER	2.4
1	C	39	ASP	2.4
1	B	92	THR	2.4
1	C	163	ALA	2.4
1	B	160	PRO	2.4
1	B	159	GLY	2.4
1	D	44	TYR	2.4
1	A	187	ASP	2.4
1	A	243	ILE	2.4
1	C	96	ILE	2.4
1	C	18	ASN	2.4
1	D	161	ASN	2.4
1	D	190	MET	2.4
1	D	238	GLU	2.3
1	A	131	ILE	2.3
1	B	96	ILE	2.3
1	A	270	MET	2.3
1	B	249	GLY	2.3
1	D	224	TRP	2.3
1	A	182	LEU	2.3
1	D	214	LEU	2.3
1	B	4	THR	2.3
1	C	98	ALA	2.3
1	C	17	LEU	2.3
1	C	282	LEU	2.3
1	A	150	ILE	2.3
1	B	162	ILE	2.3
1	C	24	HIS	2.3
1	D	156	LEU	2.3
1	C	62	ASP	2.2
1	A	19	LEU	2.2
1	D	296	PRO	2.2
1	A	286	TYR	2.2
1	D	208	TYR	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	102	LEU	2.2
1	B	286	TYR	2.2
1	A	190	MET	2.2
1	C	37	ARG	2.2
1	B	287	ASP	2.2
1	D	287	ASP	2.2
1	C	221	LEU	2.2
1	C	183	SER	2.1
1	B	61	ALA	2.1
1	A	134	VAL	2.1
1	C	200	VAL	2.1
1	B	164	GLU	2.1
1	A	240	ASN	2.1
1	B	102	LEU	2.1
1	C	25	PHE	2.1
1	C	89	TYR	2.1
1	B	63	THR	2.1
1	B	250	VAL	2.1
1	D	43	VAL	2.1
1	C	287	ASP	2.1
1	D	27	ARG	2.1
1	B	183	SER	2.0
1	C	150	ILE	2.0
1	A	94	THR	2.0
1	D	159	GLY	2.0
1	C	297	GLN	2.0
1	A	239	VAL	2.0
1	C	181	VAL	2.0
1	A	137	ALA	2.0
1	B	189	ASP	2.0
1	D	150	ILE	2.0
1	C	65	GLY	2.0
1	D	93	THR	2.0
1	C	208	TYR	2.0
1	C	14	VAL	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides 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($\text{\AA}^2$)	Q<0.9
2	FE	D	310	1/1	0.55	0.24	59,59,59,59	0
3	MCT	A	311	9/9	0.74	0.19	51,51,53,53	0
3	MCT	B	311	9/9	0.86	0.16	42,44,47,48	0
3	MCT	C	311	9/9	0.88	0.18	49,50,50,51	0
2	FE	C	310	1/1	0.96	0.05	31,31,31,31	0
2	FE	A	310	1/1	0.97	0.05	33,33,33,33	0
2	FE	B	310	1/1	0.99	0.03	29,29,29,29	0

6.5 Other polymers [i](#)

There are no such residues in this entry.