



Full wwPDB X-ray Structure Validation Report ⓘ

May 20, 2025 – 04:02 AM EDT

PDB ID : 3ISN / pdb_00003isn
Title : Crystal structure of HIV-1 RT bound to A 6-vinylpyrimidine inhibitor
Authors : Ennifar, E.; Freisz, S.; Bec, G.; Dumas, P.; Botta, M.; Radi, M.
Deposited on : 2009-08-26
Resolution : 2.50 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 Phenix2.0rc1
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0rc1
EDS : 3.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.006 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.43.1

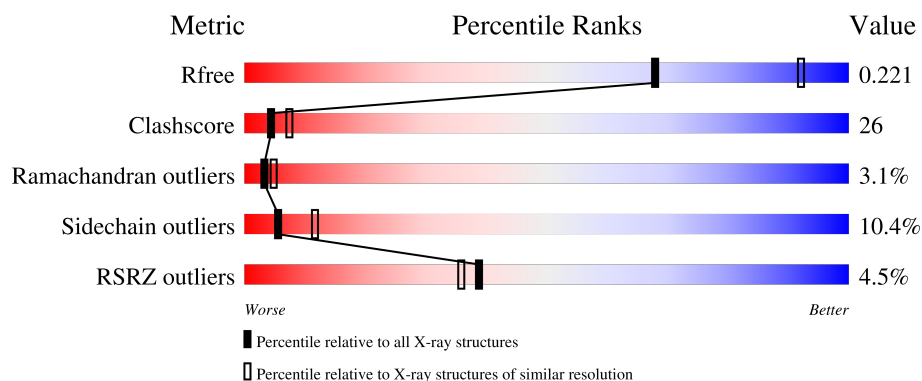
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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}	164625	5504 (2.50-2.50)
Clashscore	180529	6282 (2.50-2.50)
Ramachandran outliers	177936	6191 (2.50-2.50)
Sidechain outliers	177891	6193 (2.50-2.50)
RSRZ outliers	164620	5504 (2.50-2.50)

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	C	560	<div> <div>3%</div> <div>52%</div> <div>38%</div> <div>8%</div> <div>..</div> </div>
2	D	427	<div> <div>6%</div> <div>52%</div> <div>38%</div> <div>7%</div> <div>.</div> </div>

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	EDM	C	561	-	X	-	-

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 8160 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 Reverse transcriptase/ribonuclease H.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	C	556	Total	C	N	O	S	0	0	0
			4521	2927	753	833	8			

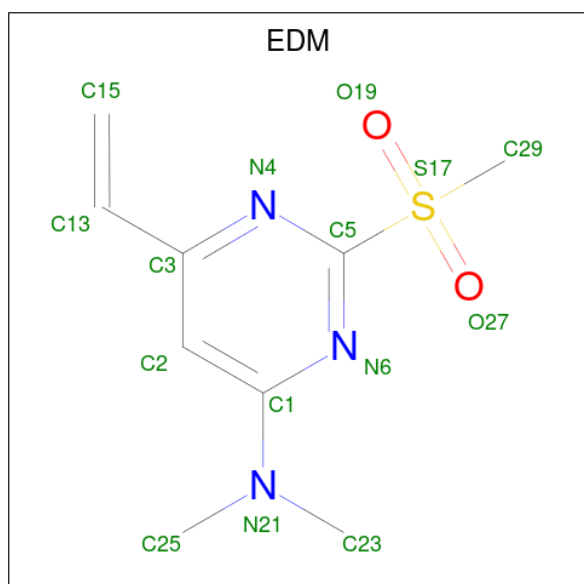
There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	478	GLN	GLU	SEE REMARK 999	UNP P03366

- Molecule 2 is a protein called p51 RT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	415	Total	C	N	O	S	0	0	0
			3420	2225	565	623	7			

- Molecule 3 is 6-ethenyl-N,N-dimethyl-2-(methylsulfonyl)pyrimidin-4-amine (CCD ID: EDM) (formula: C₉H₁₃N₃O₂S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	C	1	Total	C	N	O	S	0	0
			15	9	3	2	1		

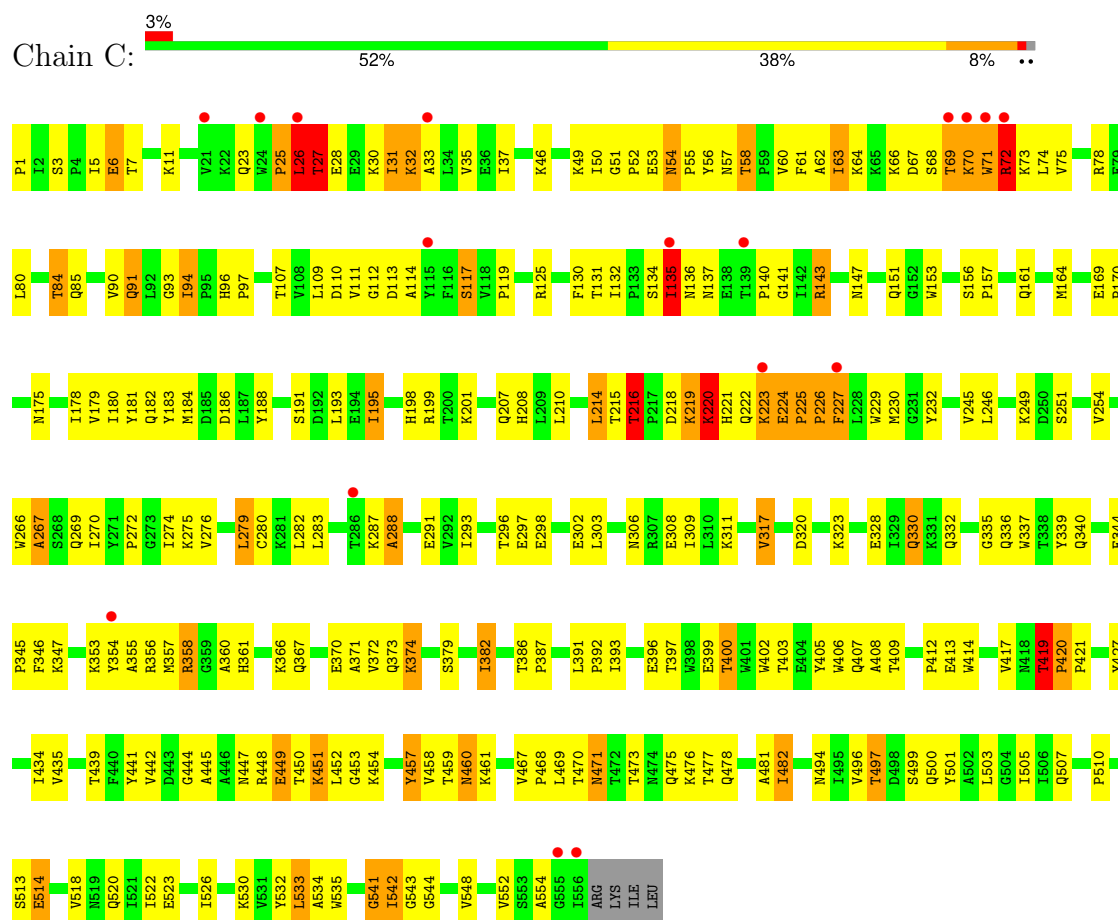
- Molecule 4 is water.

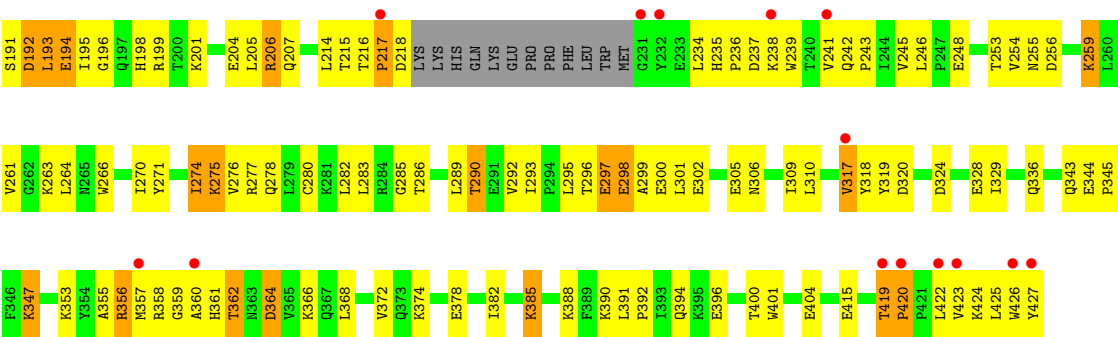
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	C	114	Total	O	0	0
			114	114		
4	D	90	Total	O	0	0
			90	90		

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: Reverse transcriptase/ribonuclease H





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	225.12Å 72.18Å 93.52Å 90.00° 108.97° 90.00°	Depositor
Resolution (Å)	49.10 – 2.50 49.10 – 2.50	Depositor EDS
% Data completeness (in resolution range)	88.8 (49.10-2.50) 88.8 (49.10-2.50)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	0.06	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.67 (at 2.51Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.4_57)	Depositor
R, R_{free}	0.221 , 0.281 0.219 , 0.221	Depositor DCC
R_{free} test set	2197 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	52.1	Xtriage
Anisotropy	0.340	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 45.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	8160	wwPDB-VP
Average B, all atoms (Å ²)	63.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.93% 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

5.1 Standard geometry

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

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	C	0.61	0/4639	0.98	15/6302 (0.2%)
2	D	0.61	0/3518	0.99	9/4781 (0.2%)
All	All	0.61	0/8157	0.98	24/11083 (0.2%)

There are no bond length outliers.

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	419	THR	CA-C-N	10.31	131.00	120.38
2	D	419	THR	C-N-CA	10.31	131.00	120.38
1	C	51	GLY	CA-C-N	8.14	130.02	119.84
1	C	51	GLY	C-N-CA	8.14	130.02	119.84
1	C	216	THR	CA-C-N	7.45	127.49	119.89
1	C	216	THR	C-N-CA	7.45	127.49	119.89
2	D	419	THR	N-CA-C	7.39	119.03	109.64
1	C	54	ASN	CA-C-N	6.23	126.77	120.04
1	C	54	ASN	C-N-CA	6.23	126.77	120.04
1	C	382	ILE	N-CA-C	6.19	116.97	110.72
2	D	320	ASP	CA-C-N	6.05	127.40	119.84
2	D	320	ASP	C-N-CA	6.05	127.40	119.84
2	D	382	ILE	N-CA-C	6.03	116.81	110.72
2	D	419	THR	CB-CA-C	-5.66	100.57	109.52
1	C	225	PRO	N-CA-C	5.54	117.45	110.70
2	D	92	LEU	N-CA-C	-5.52	104.79	112.30
1	C	137	ASN	N-CA-C	5.49	117.45	109.71
1	C	457	TYR	N-CA-C	5.46	115.50	108.34
1	C	132	ILE	CA-C-N	5.45	126.65	119.84
1	C	132	ILE	C-N-CA	5.45	126.65	119.84
1	C	451	LYS	CB-CA-C	-5.33	102.38	110.06
1	C	32	LYS	N-CA-C	-5.21	103.61	110.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	317	VAL	N-CA-CB	-5.11	106.01	112.60
2	D	362	THR	N-CA-C	-5.04	107.29	112.93

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	C	4521	0	4586	254	0
2	D	3420	0	3454	183	0
3	C	15	0	13	1	0
4	C	114	0	0	5	0
4	D	90	0	0	6	0
All	All	8160	0	8053	419	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 26.

All (419) 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:C:143:ARG:HG2	1:C:143:ARG:HH11	1.03	1.11
1:C:419:THR:HB	1:C:420:PRO:HD3	1.14	1.09
1:C:420:PRO:HB2	1:C:421:PRO:HD2	1.40	1.03
1:C:63:ILE:HD12	1:C:74:LEU:HD22	1.41	1.02
1:C:287:LYS:HG3	1:C:288:ALA:H	1.29	0.98
1:C:451:LYS:HB3	1:C:471:ASN:HA	1.47	0.96
2:D:396:GLU:O	2:D:400:THR:HG23	1.65	0.96
2:D:85:GLN:HE21	2:D:86:ASP:H	1.14	0.96
1:C:419:THR:HB	1:C:420:PRO:CD	1.96	0.94
1:C:447:ASN:HD22	1:C:450:THR:H	1.15	0.94
1:C:454:LYS:NZ	1:C:554:ALA:HB3	1.83	0.94
1:C:143:ARG:HG2	1:C:143:ARG:NH1	1.82	0.90
2:D:87:PHE:HB3	2:D:90:VAL:HG23	1.54	0.90

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:336:GLN:HE21	2:D:353:LYS:HD3	1.33	0.90
1:C:195:ILE:HD12	1:C:195:ILE:H	1.36	0.89
2:D:319:TYR:OH	2:D:385:LYS:HD2	1.72	0.89
2:D:193:LEU:O	2:D:194:GLU:HB2	1.75	0.87
1:C:503:LEU:O	1:C:507:GLN:HG2	1.75	0.86
1:C:420:PRO:HB2	1:C:421:PRO:CD	2.06	0.86
1:C:25:PRO:O	1:C:26:LEU:HB2	1.74	0.86
2:D:191:SER:OG	2:D:198:HIS:HD2	1.62	0.83
1:C:84:THR:HG21	1:C:153:TRP:HE1	1.41	0.83
1:C:441:TYR:CE2	1:C:544:GLY:HA3	2.14	0.82
1:C:337:TRP:HE1	1:C:367:GLN:HE21	1.25	0.82
1:C:143:ARG:HH11	1:C:143:ARG:CG	1.92	0.79
1:C:94:ILE:CD1	1:C:269:GLN:HG3	2.13	0.78
2:D:94:ILE:HG23	2:D:95:PRO:HD2	1.65	0.76
1:C:335:GLY:HA2	1:C:367:GLN:HE22	1.48	0.76
2:D:261:VAL:HG13	2:D:276:VAL:HG11	1.67	0.76
1:C:454:LYS:HZ2	1:C:554:ALA:HB3	1.51	0.74
1:C:450:THR:O	1:C:451:LYS:HB2	1.87	0.74
1:C:337:TRP:HE1	1:C:367:GLN:NE2	1.84	0.74
2:D:336:GLN:NE2	2:D:353:LYS:HD3	2.02	0.74
2:D:286:THR:O	2:D:286:THR:HG22	1.87	0.73
1:C:230:MET:HA	3:C:561:EDM:H25A	1.71	0.73
2:D:424:LYS:C	2:D:425:LEU:HD12	2.14	0.73
2:D:264:LEU:HB3	2:D:274:ILE:HD11	1.70	0.72
1:C:175:ASN:ND2	1:C:201:LYS:HZ1	1.87	0.72
2:D:163:SER:O	2:D:167:ILE:HG13	1.88	0.72
1:C:110:ASP:HB2	4:C:667:HOH:O	1.90	0.72
1:C:420:PRO:CB	1:C:421:PRO:HD2	2.18	0.72
1:C:518:VAL:O	1:C:522:ILE:HG12	1.90	0.72
1:C:396:GLU:O	1:C:400:THR:HG22	1.89	0.71
2:D:357:MET:HG3	2:D:358:ARG:H	1.54	0.71
1:C:475:GLN:HB3	1:C:501:TYR:CE2	2.26	0.71
2:D:306:ASN:HD22	2:D:309:ILE:HD12	1.55	0.71
2:D:72:ARG:HG3	2:D:73:LYS:N	2.06	0.70
2:D:274:ILE:HG13	2:D:306:ASN:CG	2.16	0.70
1:C:215:THR:O	1:C:216:THR:HG23	1.91	0.70
2:D:277:ARG:HD3	4:D:500:HOH:O	1.92	0.70
1:C:107:THR:OG1	1:C:198:HIS:HE1	1.75	0.70
1:C:175:ASN:ND2	1:C:201:LYS:NZ	2.41	0.69
1:C:451:LYS:HD2	1:C:471:ASN:HB2	1.74	0.69
1:C:503:LEU:HD22	1:C:535:TRP:HB2	1.75	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:191:SER:OG	1:C:198:HIS:HD2	1.77	0.68
1:C:439:THR:H	1:C:460:ASN:ND2	1.92	0.68
2:D:356:ARG:HB3	2:D:361:HIS:HE1	1.57	0.68
1:C:419:THR:CB	1:C:420:PRO:HD3	2.07	0.67
2:D:175:ASN:HB3	2:D:178:ILE:HD13	1.76	0.67
1:C:441:TYR:CD2	1:C:544:GLY:HA3	2.29	0.67
2:D:425:LEU:HD12	2:D:425:LEU:N	2.10	0.67
1:C:501:TYR:CE1	1:C:505:ILE:HD11	2.29	0.67
1:C:354:TYR:CE2	1:C:374:LYS:HB3	2.30	0.67
1:C:357:MET:HE3	4:C:592:HOH:O	1.93	0.67
1:C:354:TYR:HB3	1:C:356:ARG:NH2	2.09	0.67
1:C:287:LYS:HG3	1:C:288:ALA:N	2.07	0.66
2:D:94:ILE:HG23	2:D:95:PRO:CD	2.26	0.66
1:C:454:LYS:HZ3	1:C:554:ALA:HB3	1.58	0.66
1:C:183:TYR:CE2	1:C:184:MET:HE2	2.31	0.65
2:D:422:LEU:HA	2:D:425:LEU:HD13	1.76	0.65
1:C:56:TYR:O	1:C:143:ARG:NH2	2.29	0.65
1:C:356:ARG:HH11	1:C:370:GLU:HB2	1.62	0.65
1:C:447:ASN:HD22	1:C:450:THR:N	1.91	0.64
2:D:191:SER:OG	2:D:198:HIS:CD2	2.49	0.64
1:C:266:TRP:O	1:C:267:ALA:CB	2.44	0.64
1:C:461:LYS:HE3	4:C:657:HOH:O	1.96	0.63
2:D:275:LYS:CE	2:D:276:VAL:H	2.10	0.63
1:C:109:LEU:HD23	1:C:219:LYS:HE3	1.79	0.63
1:C:31:ILE:O	1:C:35:VAL:HG23	1.97	0.63
1:C:434:ILE:HG13	1:C:494:ASN:HD21	1.63	0.63
2:D:27:THR:O	2:D:31:ILE:HG13	1.98	0.63
2:D:324:ASP:O	2:D:343:GLN:HG2	1.99	0.62
2:D:104:LYS:HG2	2:D:192:ASP:HA	1.81	0.62
1:C:26:LEU:HD22	1:C:27:THR:HG22	1.82	0.62
1:C:135:ILE:HG12	1:C:136:ASN:N	2.14	0.62
1:C:406:TRP:CE3	2:D:419:THR:HB	2.35	0.62
2:D:237:ASP:C	2:D:239:TRP:H	2.07	0.61
2:D:171:PHE:HE2	2:D:204:GLU:HG2	1.64	0.61
1:C:282:LEU:HD21	1:C:296:THR:HG23	1.82	0.61
2:D:422:LEU:HD11	4:D:453:HOH:O	2.00	0.61
1:C:69:THR:O	1:C:70:LYS:C	2.43	0.61
2:D:104:LYS:HG2	2:D:192:ASP:CA	2.31	0.61
1:C:330:GLN:HE22	1:C:340:GLN:HE22	1.49	0.60
1:C:407:GLN:HE22	2:D:394:GLN:HG2	1.67	0.60
1:C:181:TYR:CE1	2:D:138:GLU:HB3	2.37	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:297:GLU:OE2	1:C:298:GLU:HG2	2.01	0.60
1:C:279:LEU:HD22	1:C:302:GLU:OE1	2.02	0.60
2:D:278:GLN:HB3	2:D:299:ALA:HA	1.83	0.60
2:D:266:TRP:CZ3	2:D:425:LEU:HB3	2.36	0.59
2:D:336:GLN:HE21	2:D:353:LYS:CD	2.11	0.59
1:C:442:VAL:HG21	1:C:482:ILE:HG13	1.83	0.59
1:C:195:ILE:H	1:C:195:ILE:CD1	2.12	0.59
1:C:447:ASN:ND2	1:C:450:THR:HG23	2.18	0.59
2:D:274:ILE:HG12	2:D:275:LYS:N	2.14	0.59
2:D:426:TRP:O	2:D:427:TYR:HB2	2.01	0.59
1:C:30:LYS:HD2	1:C:62:ALA:HB3	1.85	0.59
1:C:63:ILE:HG23	1:C:64:LYS:N	2.18	0.59
1:C:417:VAL:HG22	1:C:419:THR:OG1	2.03	0.59
2:D:374:LYS:HE2	4:D:450:HOH:O	2.00	0.59
1:C:266:TRP:O	1:C:267:ALA:HB2	2.01	0.59
1:C:435:VAL:HA	2:D:290:THR:HG21	1.83	0.59
1:C:447:ASN:ND2	1:C:449:GLU:HB2	2.17	0.59
1:C:57:ASN:HD22	1:C:143:ARG:HH12	1.51	0.59
1:C:111:VAL:HG12	1:C:114:ALA:HA	1.85	0.59
1:C:412:PRO:HG3	2:D:401:TRP:CZ2	2.39	0.58
2:D:101:LYS:O	2:D:236:PRO:HB2	2.03	0.58
1:C:219:LYS:O	1:C:220:LYS:C	2.46	0.58
1:C:1:PRO:O	1:C:117:SER:HB2	2.03	0.58
2:D:296:THR:HG22	2:D:297:GLU:H	1.69	0.57
2:D:135:ILE:O	2:D:138:GLU:HG2	2.02	0.57
1:C:131:THR:HG23	1:C:143:ARG:NH1	2.19	0.57
1:C:175:ASN:HB3	1:C:178:ILE:HD12	1.85	0.57
1:C:94:ILE:HG13	1:C:230:MET:HE1	1.85	0.57
1:C:214:LEU:N	1:C:214:LEU:HD22	2.18	0.57
1:C:84:THR:HG21	1:C:153:TRP:NE1	2.17	0.57
2:D:237:ASP:O	2:D:239:TRP:N	2.37	0.57
1:C:180:ILE:O	1:C:181:TYR:HD1	1.88	0.56
2:D:57:ASN:HD22	2:D:143:ARG:HH21	1.53	0.56
1:C:297:GLU:CD	1:C:298:GLU:H	2.14	0.56
1:C:447:ASN:HD21	1:C:449:GLU:HB2	1.71	0.56
1:C:245:VAL:HG23	1:C:245:VAL:O	2.05	0.56
2:D:419:THR:HG22	2:D:420:PRO:O	2.05	0.56
1:C:336:GLN:HE22	1:C:355:ALA:HB2	1.69	0.56
2:D:104:LYS:HG2	2:D:192:ASP:CB	2.36	0.55
1:C:93:GLY:O	2:D:137:ASN:ND2	2.40	0.55
1:C:361:HIS:HD2	1:C:513:SER:OG	1.90	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:275:LYS:HE3	2:D:276:VAL:H	1.71	0.55
1:C:25:PRO:O	1:C:26:LEU:CB	2.51	0.55
2:D:156:SER:HB2	2:D:157:PRO:HD3	1.89	0.55
1:C:444:GLY:HA2	1:C:552:VAL:HG21	1.89	0.55
2:D:355:ALA:O	2:D:356:ARG:HD3	2.06	0.55
1:C:328:GLU:O	1:C:339:TYR:HA	2.07	0.54
1:C:7:THR:HG22	1:C:119:PRO:HB2	1.90	0.54
1:C:180:ILE:O	1:C:181:TYR:CD1	2.61	0.54
1:C:11:LYS:H	1:C:85:GLN:HE21	1.56	0.54
2:D:46:LYS:CD	2:D:116:PHE:HB3	2.38	0.54
2:D:422:LEU:CA	2:D:425:LEU:HD13	2.36	0.54
1:C:164:MET:HG2	1:C:182:GLN:HG3	1.90	0.54
1:C:94:ILE:HD13	1:C:269:GLN:HE21	1.72	0.54
1:C:382:ILE:O	2:D:136:ASN:HB2	2.08	0.54
2:D:105:SER:HB3	2:D:235:HIS:CE1	2.42	0.54
1:C:32:LYS:O	1:C:33:ALA:HB3	2.07	0.54
2:D:116:PHE:CZ	2:D:151:GLN:HG3	2.43	0.54
1:C:57:ASN:ND2	1:C:131:THR:HG23	2.23	0.53
1:C:460:ASN:H	1:C:460:ASN:HD22	1.57	0.53
1:C:94:ILE:HD13	1:C:269:GLN:HG3	1.91	0.53
1:C:434:ILE:HD13	1:C:530:LYS:HB3	1.91	0.53
1:C:49:LYS:HD3	1:C:49:LYS:C	2.33	0.53
1:C:224:GLU:N	1:C:225:PRO:CD	2.72	0.53
2:D:423:VAL:HG21	4:D:474:HOH:O	2.09	0.53
2:D:423:VAL:C	2:D:425:LEU:H	2.16	0.53
2:D:69:THR:HG23	2:D:70:LYS:H	1.73	0.53
2:D:201:LYS:HA	2:D:204:GLU:HB3	1.91	0.52
2:D:305:GLU:O	2:D:309:ILE:HG13	2.09	0.52
2:D:85:GLN:HE21	2:D:86:ASP:N	1.96	0.52
2:D:169:GLU:HB3	2:D:170:PRO:HD3	1.91	0.52
2:D:296:THR:HB	2:D:299:ALA:H	1.74	0.52
2:D:275:LYS:HE2	2:D:277:ARG:H	1.73	0.52
1:C:11:LYS:HB2	1:C:85:GLN:HE21	1.75	0.52
2:D:246:LEU:HD11	2:D:264:LEU:HD21	1.92	0.52
1:C:541:GLY:HA3	2:D:280:CYS:HB3	1.91	0.52
2:D:255:ASN:ND2	2:D:259:LYS:HE2	2.24	0.52
1:C:58:THR:HB	4:C:568:HOH:O	2.08	0.52
1:C:131:THR:CG2	1:C:143:ARG:NH1	2.73	0.52
2:D:134:SER:CB	2:D:139:THR:HB	2.39	0.52
2:D:206:ARG:NH2	2:D:218:ASP:HB2	2.25	0.52
2:D:248:GLU:HG2	2:D:248:GLU:O	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:223:LYS:HB2	1:C:223:LYS:NZ	2.25	0.52
1:C:542:ILE:CD1	2:D:283:LEU:HD12	2.40	0.52
2:D:302:GLU:O	2:D:305:GLU:HB2	2.09	0.52
2:D:295:LEU:HD12	2:D:300:GLU:HG3	1.90	0.51
1:C:169:GLU:HB3	1:C:170:PRO:HD3	1.92	0.51
1:C:471:ASN:CG	1:C:471:ASN:O	2.52	0.51
1:C:226:PRO:O	1:C:227:PHE:CB	2.58	0.51
1:C:71:TRP:O	1:C:72:ARG:HB2	2.11	0.51
2:D:94:ILE:CG2	2:D:95:PRO:N	2.73	0.51
2:D:300:GLU:HG2	2:D:300:GLU:O	2.10	0.51
2:D:46:LYS:HD2	2:D:116:PHE:HB3	1.93	0.51
1:C:358:ARG:HG2	1:C:358:ARG:HH11	1.76	0.51
2:D:400:THR:HG1	2:D:401:TRP:CD1	2.29	0.51
2:D:275:LYS:HE3	2:D:275:LYS:HA	1.91	0.51
2:D:344:GLU:HB3	2:D:347:LYS:HD3	1.93	0.51
1:C:473:THR:OG1	1:C:476:LYS:HG3	2.11	0.51
1:C:134:SER:HB2	1:C:141:GLY:N	2.26	0.50
1:C:245:VAL:O	1:C:245:VAL:CG2	2.58	0.50
2:D:425:LEU:N	2:D:425:LEU:CD1	2.74	0.50
1:C:186:ASP:HB3	1:C:229:TRP:CD1	2.46	0.50
1:C:408:ALA:HA	2:D:364:ASP:OD2	2.11	0.50
2:D:271:TYR:HB3	4:D:497:HOH:O	2.11	0.50
1:C:356:ARG:HH12	1:C:371:ALA:HB2	1.77	0.50
1:C:90:VAL:HG23	1:C:91:GLN:N	2.27	0.50
1:C:134:SER:O	1:C:135:ILE:C	2.55	0.50
1:C:454:LYS:HA	1:C:467:VAL:O	2.12	0.50
2:D:275:LYS:HE2	2:D:276:VAL:H	1.76	0.50
2:D:296:THR:HG22	2:D:297:GLU:N	2.27	0.49
1:C:274:ILE:CD1	1:C:309:ILE:HG21	2.43	0.49
2:D:125:ARG:O	2:D:128:THR:OG1	2.23	0.49
2:D:422:LEU:HD12	2:D:422:LEU:C	2.37	0.49
1:C:451:LYS:NZ	1:C:471:ASN:HB3	2.28	0.49
2:D:151:GLN:HB3	2:D:185:ASP:OD2	2.12	0.49
1:C:288:ALA:HB3	1:C:291:GLU:OE1	2.12	0.49
1:C:60:VAL:HG21	1:C:130:PHE:HD2	1.78	0.49
1:C:66:LYS:HE3	1:C:71:TRP:CH2	2.48	0.49
1:C:471:ASN:O	1:C:471:ASN:ND2	2.45	0.49
2:D:6:GLU:OE2	2:D:6:GLU:HA	2.12	0.49
1:C:419:THR:CB	1:C:420:PRO:CD	2.80	0.49
1:C:520:GLN:HA	1:C:523:GLU:HG2	1.94	0.49
2:D:282:LEU:HD22	2:D:293:ILE:HG21	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:3:SER:OG	1:C:5:ILE:HG22	2.12	0.48
1:C:223:LYS:C	1:C:225:PRO:HD2	2.37	0.48
1:C:533:LEU:HD12	1:C:534:ALA:H	1.77	0.48
2:D:329:ILE:O	2:D:392:PRO:HG3	2.11	0.48
1:C:308:GLU:O	1:C:311:LYS:HB2	2.13	0.48
2:D:282:LEU:HD22	2:D:293:ILE:CG2	2.43	0.48
1:C:219:LYS:HB2	1:C:219:LYS:HZ3	1.77	0.48
1:C:28:GLU:HA	1:C:31:ILE:CG1	2.44	0.48
1:C:494:ASN:HD22	1:C:532:TYR:HB3	1.77	0.48
1:C:542:ILE:HD13	2:D:283:LEU:HD12	1.96	0.48
1:C:543:GLY:HA3	2:D:283:LEU:O	2.14	0.48
2:D:58:THR:HG23	2:D:76:ASP:O	2.14	0.48
2:D:115:TYR:HB3	2:D:149:LEU:HB2	1.96	0.48
2:D:317:VAL:HG12	2:D:347:LYS:HB3	1.96	0.48
1:C:193:LEU:HB2	1:C:198:HIS:HB2	1.96	0.48
1:C:309:ILE:C	1:C:311:LYS:H	2.22	0.48
1:C:478:GLN:O	1:C:482:ILE:HD12	2.13	0.48
1:C:533:LEU:HD12	1:C:534:ALA:N	2.28	0.48
1:C:221:HIS:CG	1:C:222:GLN:H	2.30	0.47
1:C:297:GLU:CG	1:C:298:GLU:N	2.77	0.47
1:C:94:ILE:HD12	1:C:269:GLN:HG3	1.93	0.47
2:D:177:ASP:C	2:D:178:ILE:HD12	2.40	0.47
1:C:275:LYS:H	1:C:306:ASN:HD21	1.62	0.47
1:C:358:ARG:HG2	1:C:358:ARG:NH1	2.29	0.47
1:C:360:ALA:O	1:C:514:GLU:HG3	2.14	0.47
1:C:510:PRO:O	1:C:522:ILE:HD12	2.13	0.47
2:D:206:ARG:HH21	2:D:218:ASP:HB2	1.78	0.47
2:D:237:ASP:C	2:D:239:TRP:N	2.72	0.47
2:D:368:LEU:O	2:D:372:VAL:HG23	2.15	0.47
1:C:475:GLN:HB3	1:C:501:TYR:CD2	2.50	0.47
2:D:28:GLU:HG3	2:D:135:ILE:HD11	1.95	0.47
2:D:129:ALA:HA	2:D:144:TYR:O	2.14	0.47
1:C:112:GLY:C	1:C:114:ALA:H	2.22	0.47
1:C:28:GLU:HA	1:C:31:ILE:HG13	1.98	0.46
2:D:72:ARG:NH1	2:D:110:ASP:OD2	2.48	0.46
2:D:263:LYS:HE3	2:D:425:LEU:HA	1.98	0.46
1:C:26:LEU:O	1:C:27:THR:C	2.58	0.46
2:D:274:ILE:HG13	2:D:306:ASN:OD1	2.16	0.46
1:C:112:GLY:O	1:C:114:ALA:N	2.45	0.46
1:C:180:ILE:C	1:C:181:TYR:CD1	2.93	0.46
1:C:448:ARG:HH22	1:C:475:GLN:HE22	1.61	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:356:ARG:HD2	2:D:356:ARG:HA	1.61	0.46
1:C:61:PHE:HB2	1:C:74:LEU:HB3	1.98	0.46
1:C:112:GLY:C	1:C:114:ALA:N	2.72	0.46
2:D:391:LEU:HA	2:D:392:PRO:HD3	1.73	0.46
1:C:358:ARG:CD	1:C:366:LYS:HD3	2.46	0.46
1:C:417:VAL:O	1:C:417:VAL:HG13	2.16	0.46
2:D:242:GLN:OE1	2:D:353:LYS:HE2	2.16	0.46
2:D:120:LEU:O	2:D:121:ASP:C	2.58	0.46
2:D:193:LEU:O	2:D:194:GLU:CB	2.54	0.46
2:D:242:GLN:NE2	2:D:427:TYR:HD1	2.14	0.46
1:C:332:GLN:HB3	1:C:336:GLN:HB3	1.97	0.46
1:C:434:ILE:HG13	1:C:494:ASN:ND2	2.28	0.46
2:D:89:GLU:C	2:D:91:GLN:H	2.24	0.45
1:C:357:MET:HG3	1:C:358:ARG:N	2.30	0.45
1:C:345:PRO:HB2	1:C:346:PHE:CD2	2.50	0.45
2:D:81:ASN:O	2:D:154:LYS:HE2	2.16	0.45
2:D:216:THR:HA	2:D:217:PRO:HD2	1.79	0.45
1:C:134:SER:HB2	1:C:140:PRO:C	2.42	0.45
1:C:66:LYS:O	1:C:67:ASP:HB2	2.14	0.45
1:C:96:HIS:CG	1:C:97:PRO:HD2	2.51	0.45
1:C:336:GLN:NE2	1:C:355:ALA:HB2	2.32	0.45
1:C:63:ILE:HD12	1:C:74:LEU:CD2	2.29	0.45
1:C:405:TYR:CE2	1:C:407:GLN:HB2	2.52	0.45
1:C:6:GLU:H	1:C:6:GLU:HG2	1.48	0.45
1:C:54:ASN:HA	1:C:55:PRO:HD3	1.62	0.45
2:D:56:TYR:O	2:D:143:ARG:NH2	2.47	0.45
1:C:254:VAL:HG22	1:C:293:ILE:HD11	1.98	0.45
1:C:320:ASP:OD2	1:C:323:LYS:HG3	2.16	0.45
1:C:195:ILE:HD12	1:C:195:ILE:N	2.18	0.45
1:C:219:LYS:HB2	1:C:219:LYS:NZ	2.32	0.45
1:C:451:LYS:HB2	1:C:451:LYS:HE3	1.62	0.45
1:C:360:ALA:HA	1:C:514:GLU:CD	2.41	0.44
1:C:406:TRP:CE3	2:D:419:THR:CB	3.00	0.44
1:C:27:THR:CG2	1:C:30:LYS:HG2	2.47	0.44
1:C:80:LEU:O	1:C:84:THR:HG23	2.16	0.44
1:C:354:TYR:HB3	1:C:356:ARG:HH21	1.78	0.44
1:C:452:LEU:CD2	1:C:470:THR:HG22	2.46	0.44
2:D:103:LYS:O	2:D:236:PRO:HD2	2.18	0.44
1:C:11:LYS:H	1:C:85:GLN:NE2	2.16	0.44
1:C:90:VAL:HG23	1:C:91:GLN:H	1.82	0.44
1:C:445:ALA:O	1:C:477:THR:HG21	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:297:GLU:HG2	1:C:298:GLU:N	2.33	0.44
1:C:181:TYR:CD1	2:D:138:GLU:HB3	2.52	0.44
1:C:420:PRO:CB	1:C:421:PRO:CD	2.80	0.44
1:C:442:VAL:HB	1:C:481:ALA:HB1	1.98	0.44
2:D:125:ARG:HD3	2:D:146:TYR:O	2.17	0.44
1:C:225:PRO:HB2	1:C:226:PRO:HD3	1.99	0.44
2:D:239:TRP:CH2	2:D:378:GLU:HA	2.52	0.44
2:D:17:ASP:CG	2:D:18:GLY:H	2.26	0.43
2:D:94:ILE:CG2	2:D:95:PRO:CD	2.96	0.43
2:D:241:VAL:O	2:D:243:PRO:HD3	2.18	0.43
1:C:27:THR:O	1:C:31:ILE:HG12	2.18	0.43
2:D:54:ASN:HA	2:D:55:PRO:HD3	1.90	0.43
2:D:298:GLU:H	2:D:298:GLU:HG3	1.50	0.43
1:C:64:LYS:CG	1:C:69:THR:HB	2.49	0.43
2:D:419:THR:HA	2:D:420:PRO:HD3	1.43	0.43
1:C:332:GLN:HB3	1:C:336:GLN:CB	2.48	0.43
2:D:207:GLN:HA	2:D:207:GLN:OE1	2.18	0.43
2:D:302:GLU:HA	2:D:305:GLU:HG3	2.00	0.43
2:D:361:HIS:HB3	2:D:366:LYS:HZ2	1.83	0.43
1:C:57:ASN:ND2	1:C:143:ARG:HH12	2.16	0.43
1:C:93:GLY:O	2:D:137:ASN:CG	2.61	0.43
1:C:188:TYR:CD1	1:C:188:TYR:C	2.96	0.43
2:D:84:THR:HG22	2:D:85:GLN:O	2.18	0.43
1:C:358:ARG:HD3	1:C:366:LYS:HD3	2.00	0.43
1:C:453:GLY:O	1:C:469:LEU:N	2.51	0.43
2:D:178:ILE:HD12	2:D:178:ILE:N	2.33	0.43
2:D:30:LYS:HE3	2:D:404:GLU:OE2	2.19	0.43
2:D:69:THR:C	2:D:70:LYS:HG3	2.43	0.43
2:D:422:LEU:HD12	2:D:422:LEU:O	2.18	0.43
1:C:49:LYS:HD3	1:C:50:ILE:N	2.34	0.43
1:C:156:SER:HB2	1:C:157:PRO:HD3	2.01	0.43
1:C:298:GLU:HA	1:C:298:GLU:OE1	2.17	0.43
1:C:161:GLN:HG3	1:C:182:GLN:OE1	2.18	0.43
1:C:272:PRO:HB2	1:C:353:LYS:HG2	2.01	0.43
1:C:287:LYS:CG	1:C:288:ALA:H	2.13	0.43
1:C:427:TYR:OH	1:C:510:PRO:HD2	2.18	0.43
1:C:448:ARG:NH2	1:C:475:GLN:HE22	2.16	0.43
1:C:457:TYR:C	1:C:457:TYR:CD2	2.97	0.43
2:D:85:GLN:HA	2:D:85:GLN:NE2	2.33	0.43
1:C:191:SER:OG	1:C:198:HIS:CD2	2.66	0.42
1:C:379:SER:OG	1:C:387:PRO:HG3	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:54:ASN:C	2:D:54:ASN:OD1	2.62	0.42
2:D:248:GLU:OE1	2:D:248:GLU:N	2.51	0.42
1:C:30:LYS:O	1:C:32:LYS:O	2.38	0.42
2:D:261:VAL:HG13	2:D:276:VAL:CG1	2.45	0.42
2:D:344:GLU:HG3	2:D:345:PRO:HD2	2.00	0.42
2:D:361:HIS:HB3	2:D:366:LYS:NZ	2.34	0.42
1:C:280:CYS:HA	1:C:283:LEU:HD12	2.01	0.42
1:C:232:TYR:CE1	1:C:270:ILE:HD11	2.55	0.42
1:C:402:TRP:O	1:C:402:TRP:CE3	2.73	0.42
2:D:131:THR:HG23	2:D:143:ARG:HG2	2.01	0.42
2:D:242:GLN:NE2	2:D:427:TYR:CD1	2.87	0.42
2:D:246:LEU:CD1	2:D:264:LEU:HD21	2.48	0.42
2:D:328:GLU:HG3	2:D:390:LYS:HD2	2.01	0.42
1:C:31:ILE:HG12	1:C:31:ILE:H	1.66	0.42
2:D:214:LEU:N	2:D:214:LEU:HD12	2.35	0.42
2:D:270:ILE:HG22	2:D:271:TYR:CD1	2.54	0.42
1:C:125:ARG:HD3	1:C:147:ASN:HA	2.00	0.42
1:C:214:LEU:N	1:C:214:LEU:CD2	2.82	0.42
1:C:337:TRP:NE1	1:C:367:GLN:HE21	2.04	0.42
1:C:467:VAL:HA	1:C:468:PRO:HD3	1.76	0.42
2:D:266:TRP:CE3	2:D:425:LEU:HB3	2.54	0.42
1:C:64:LYS:HG3	1:C:69:THR:HB	2.02	0.42
1:C:494:ASN:HB3	2:D:289:LEU:HD12	2.02	0.42
1:C:353:LYS:O	1:C:353:LYS:HG3	2.19	0.42
2:D:259:LYS:HA	2:D:259:LYS:HD3	1.56	0.42
2:D:171:PHE:CZ	2:D:205:LEU:HB2	2.55	0.42
1:C:74:LEU:HD12	1:C:74:LEU:HA	1.87	0.41
1:C:229:TRP:O	1:C:230:MET:HG2	2.20	0.41
2:D:107:THR:OG1	2:D:198:HIS:HE1	2.03	0.41
2:D:85:GLN:NE2	4:D:479:HOH:O	2.50	0.41
2:D:125:ARG:HD3	2:D:147:ASN:HA	2.02	0.41
1:C:113:ASP:HB2	1:C:117:SER:HB3	2.02	0.41
1:C:439:THR:O	1:C:459:THR:HA	2.20	0.41
1:C:543:GLY:C	2:D:285:GLY:O	2.63	0.41
2:D:60:VAL:HG22	2:D:61:PHE:N	2.35	0.41
2:D:422:LEU:HA	2:D:425:LEU:HD22	2.01	0.41
1:C:503:LEU:O	1:C:507:GLN:CG	2.58	0.41
1:C:522:ILE:O	1:C:526:ILE:HG13	2.21	0.41
2:D:104:LYS:HA	2:D:237:ASP:OD2	2.20	0.41
1:C:111:VAL:HG12	1:C:114:ALA:CA	2.51	0.41
1:C:207:GLN:O	1:C:208:HIS:C	2.62	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:94:ILE:HG23	1:C:269:GLN:NE2	2.35	0.41
1:C:412:PRO:HG3	2:D:401:TRP:HZ2	1.85	0.41
2:D:3:SER:C	2:D:5:ILE:H	2.28	0.41
2:D:61:PHE:N	2:D:61:PHE:CD1	2.89	0.41
2:D:73:LYS:NZ	2:D:146:TYR:OH	2.51	0.41
2:D:199:ARG:HE	2:D:199:ARG:HB2	1.45	0.41
1:C:28:GLU:OE1	1:C:135:ILE:HB	2.20	0.41
2:D:28:GLU:HG3	2:D:135:ILE:CD1	2.50	0.41
2:D:88:TRP:O	2:D:91:GLN:CA	2.69	0.41
1:C:73:LYS:HE2	1:C:75:VAL:CG2	2.51	0.41
2:D:8:VAL:O	2:D:121:ASP:HB2	2.21	0.41
1:C:23:GLN:HE22	1:C:60:VAL:H	1.68	0.41
1:C:57:ASN:HD21	1:C:131:THR:HG23	1.86	0.41
1:C:78:ARG:HH22	1:C:287:LYS:C	2.29	0.41
2:D:86:ASP:OD1	2:D:154:LYS:NZ	2.53	0.41
2:D:89:GLU:O	2:D:89:GLU:HG2	2.19	0.41
2:D:94:ILE:HG22	2:D:95:PRO:O	2.21	0.41
2:D:253:THR:HA	2:D:292:VAL:HA	2.03	0.41
2:D:255:ASN:O	2:D:256:ASP:C	2.63	0.41
2:D:424:LYS:HG3	2:D:424:LYS:O	2.21	0.41
1:C:64:LYS:HG2	1:C:69:THR:HG21	2.03	0.40
1:C:221:HIS:CG	1:C:222:GLN:N	2.90	0.40
2:D:356:ARG:CB	2:D:361:HIS:HE1	2.29	0.40
1:C:67:ASP:O	1:C:68:SER:HB3	2.21	0.40
2:D:91:GLN:HG3	2:D:92:LEU:H	1.86	0.40
1:C:306:ASN:ND2	4:C:571:HOH:O	2.54	0.40
1:C:391:LEU:HA	1:C:392:PRO:HD3	1.91	0.40
1:C:497:THR:HB	1:C:499:SER:H	1.86	0.40
2:D:195:ILE:HG23	2:D:196:GLY:N	2.36	0.40
1:C:37:ILE:HG21	1:C:72:ARG:HH21	1.87	0.40
1:C:111:VAL:CG1	1:C:114:ALA:HA	2.51	0.40
1:C:386:THR:HA	1:C:387:PRO:HD3	1.93	0.40
1:C:393:ILE:HG23	1:C:414:TRP:CH2	2.56	0.40
2:D:264:LEU:HB3	2:D:274:ILE:CD1	2.46	0.40
1:C:496:VAL:HG22	1:C:534:ALA:HB3	2.04	0.40
2:D:136:ASN:O	2:D:136:ASN:CG	2.64	0.40
2:D:419:THR:HG21	2:D:423:VAL:CG2	2.51	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	C	554/560 (99%)	479 (86%)	56 (10%)	19 (3%)	3	4
2	D	411/427 (96%)	354 (86%)	46 (11%)	11 (3%)	4	6
All	All	965/987 (98%)	833 (86%)	102 (11%)	30 (3%)	3	5

All (30) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	26	LEU
1	C	70	LYS
1	C	117	SER
1	C	135	ILE
1	C	220	LYS
1	C	358	ARG
1	C	419	THR
1	C	542	ILE
2	D	69	THR
2	D	194	GLU
2	D	238	LYS
1	C	52	PRO
1	C	227	PHE
1	C	267	ALA
1	C	288	ALA
1	C	420	PRO
2	D	65	LYS
2	D	359	GLY
2	D	136	ASN
2	D	360	ALA
1	C	218	ASP
1	C	226	PRO
2	D	95	PRO
2	D	217	PRO
1	C	27	THR

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Mol	Chain	Res	Type
1	C	72	ARG
1	C	541	GLY
2	D	420	PRO
2	D	90	VAL
1	C	25	PRO

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	C	496/500 (99%)	439 (88%)	57 (12%)	4	9
2	D	377/389 (97%)	343 (91%)	34 (9%)	8	16
All	All	873/889 (98%)	782 (90%)	91 (10%)	5	12

All (91) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	6	GLU
1	C	26	LEU
1	C	27	THR
1	C	31	ILE
1	C	46	LYS
1	C	53	GLU
1	C	58	THR
1	C	63	ILE
1	C	69	THR
1	C	71	TRP
1	C	72	ARG
1	C	84	THR
1	C	91	GLN
1	C	94	ILE
1	C	135	ILE
1	C	143	ARG
1	C	151	GLN
1	C	179	VAL

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Mol	Chain	Res	Type
1	C	195	ILE
1	C	199	ARG
1	C	210	LEU
1	C	214	LEU
1	C	216	THR
1	C	219	LYS
1	C	220	LYS
1	C	223	LYS
1	C	224	GLU
1	C	246	LEU
1	C	249	LYS
1	C	251	SER
1	C	276	VAL
1	C	279	LEU
1	C	303	LEU
1	C	317	VAL
1	C	330	GLN
1	C	344	GLU
1	C	347	LYS
1	C	372	VAL
1	C	373	GLN
1	C	374	LYS
1	C	397	THR
1	C	399	GLU
1	C	400	THR
1	C	403	THR
1	C	409	THR
1	C	413	GLU
1	C	419	THR
1	C	449	GLU
1	C	458	VAL
1	C	460	ASN
1	C	471	ASN
1	C	482	ILE
1	C	497	THR
1	C	500	GLN
1	C	514	GLU
1	C	533	LEU
1	C	548	VAL
2	D	2	ILE
2	D	20	LYS
2	D	36	GLU

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Mol	Chain	Res	Type
2	D	66	LYS
2	D	73	LYS
2	D	89	GLU
2	D	91	GLN
2	D	105	SER
2	D	122	GLU
2	D	138	GLU
2	D	192	ASP
2	D	193	LEU
2	D	206	ARG
2	D	215	THR
2	D	234	LEU
2	D	245	VAL
2	D	254	VAL
2	D	259	LYS
2	D	274	ILE
2	D	275	LYS
2	D	290	THR
2	D	297	GLU
2	D	298	GLU
2	D	301	LEU
2	D	310	LEU
2	D	317	VAL
2	D	318	TYR
2	D	347	LYS
2	D	356	ARG
2	D	362	THR
2	D	364	ASP
2	D	385	LYS
2	D	388	LYS
2	D	415	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (39) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	23	GLN
1	C	57	ASN
1	C	85	GLN
1	C	136	ASN
1	C	145	GLN
1	C	147	ASN
1	C	175	ASN

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Mol	Chain	Res	Type
1	C	198	HIS
1	C	255	ASN
1	C	258	GLN
1	C	269	GLN
1	C	306	ASN
1	C	330	GLN
1	C	332	GLN
1	C	336	GLN
1	C	361	HIS
1	C	367	GLN
1	C	407	GLN
1	C	428	GLN
1	C	447	ASN
1	C	460	ASN
1	C	471	ASN
1	C	494	ASN
1	C	500	GLN
1	C	545	ASN
2	D	57	ASN
2	D	85	GLN
2	D	91	GLN
2	D	137	ASN
2	D	145	GLN
2	D	147	ASN
2	D	198	HIS
2	D	255	ASN
2	D	269	GLN
2	D	306	ASN
2	D	315	HIS
2	D	336	GLN
2	D	361	HIS
2	D	394	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

1 ligand is modelled in this entry.

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	EDM	C	561	-	15,15,15	5.21	7 (46%)	18,22,22	4.75	10 (55%)

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	EDM	C	561	-	-	10/12/12/12	0/1/1/1

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	561	EDM	C5-N4	11.86	1.45	1.32
3	C	561	EDM	O19-S17	9.79	1.68	1.44
3	C	561	EDM	O27-S17	9.07	1.66	1.44
3	C	561	EDM	C1-N21	6.50	1.45	1.35
3	C	561	EDM	C5-S17	4.94	1.84	1.80
3	C	561	EDM	C5-N6	3.01	1.35	1.32
3	C	561	EDM	C29-S17	2.18	1.82	1.75

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	561	EDM	N4-C5-N6	-14.20	118.71	130.48
3	C	561	EDM	N6-C1-N21	8.83	121.77	116.91

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	561	EDM	O19-S17-C5	5.00	111.96	107.42
3	C	561	EDM	C29-S17-C5	5.00	108.19	104.39
3	C	561	EDM	O19-S17-O27	-4.24	110.80	117.99
3	C	561	EDM	C2-C1-N21	-3.99	116.85	121.87
3	C	561	EDM	S17-C5-N6	3.80	121.08	115.07
3	C	561	EDM	S17-C5-N4	3.23	120.17	115.07
3	C	561	EDM	C25-N21-C1	-2.63	118.24	120.98
3	C	561	EDM	C2-C3-N4	-2.18	118.42	121.57

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	561	EDM	C2-C1-N21-C23
3	C	561	EDM	N6-C1-N21-C23
3	C	561	EDM	C15-C13-C3-N4
3	C	561	EDM	C15-C13-C3-C2
3	C	561	EDM	N6-C1-N21-C25
3	C	561	EDM	C2-C1-N21-C25
3	C	561	EDM	N6-C5-S17-C29
3	C	561	EDM	N6-C5-S17-O27
3	C	561	EDM	N4-C5-S17-C29
3	C	561	EDM	N4-C5-S17-O27

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	561	EDM	1	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	C	556/560 (99%)	0.05	17 (3%)	51 48	37, 59, 99, 152	0
2	D	415/427 (97%)	0.08	27 (6%)	26 24	29, 59, 101, 125	0
All	All	971/987 (98%)	0.06	44 (4%)	39 36	29, 59, 101, 152	0

All (44) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	92	LEU	5.0
1	C	556	ILE	4.8
1	C	69	THR	4.3
2	D	3	SER	4.2
2	D	93	GLY	3.8
2	D	88	TRP	3.8
2	D	232	TYR	3.7
1	C	24	TRP	3.7
2	D	2	ILE	3.7
2	D	422	LEU	3.5
2	D	90	VAL	3.4
2	D	5	ILE	3.3
2	D	1	PRO	3.2
2	D	231	GLY	3.1
1	C	135	ILE	3.1
2	D	426	TRP	3.1
2	D	423	VAL	2.9
2	D	419	THR	2.8
1	C	70	LYS	2.8
1	C	71	TRP	2.8
2	D	238	LYS	2.7
2	D	360	ALA	2.7
1	C	223	LYS	2.6
1	C	115	TYR	2.6

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Mol	Chain	Res	Type	RSRZ
2	D	357	MET	2.5
1	C	33	ALA	2.4
1	C	26	LEU	2.4
1	C	227	PHE	2.4
1	C	21	VAL	2.4
1	C	354	TYR	2.4
2	D	69	THR	2.4
2	D	85	GLN	2.3
1	C	555	GLY	2.3
2	D	241	VAL	2.3
2	D	4	PRO	2.3
1	C	286	THR	2.2
1	C	72	ARG	2.2
2	D	317	VAL	2.2
2	D	91	GLN	2.1
2	D	420	PRO	2.1
2	D	217	PRO	2.1
1	C	139	THR	2.0
2	D	89	GLU	2.0
2	D	427	TYR	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
3	EDM	C	561	15/15	0.64	0.22	70,84,102,116	0

6.5 Other polymers [i](#)

There are no such residues in this entry.