



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 21, 2018 – 01:34 AM EST

PDB ID : 1F6M
Title : CRYSTAL STRUCTURE OF A COMPLEX BETWEEN THIOREDOXIN
REDUCTASE, THIOREDOXIN, AND THE NADP+ ANALOG, AADP+
Authors : Lennon, B.W.; Williams Jr., C.H.; Ludwig, M.L.
Deposited on : 2000-06-22
Resolution : 2.95 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

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.7.2 (RC1), CSD as538be (2017)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20030736
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20030736

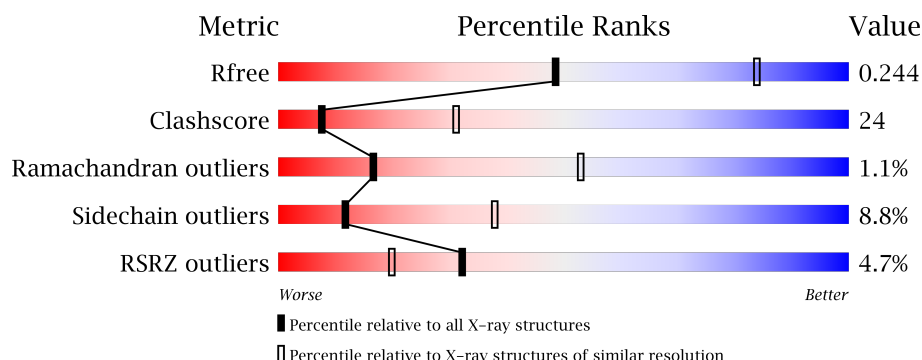
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.95 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}	100719	2395 (3.00-2.92)
Clashscore	112137	2773 (3.00-2.92)
Ramachandran outliers	110173	2680 (3.00-2.92)
Sidechain outliers	110143	2683 (3.00-2.92)
RSRZ outliers	101464	2421 (3.00-2.92)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	320	<div> <div>0.1%</div> <div>62%</div> <div>33%</div> <div>0.1%</div> </div>
1	B	320	<div> <div>68%</div> <div>29%</div> <div>0.1%</div> </div>
1	E	320	<div> <div>2%</div> <div>62%</div> <div>34%</div> <div>0.1%</div> </div>
1	F	320	<div> <div>0.1%</div> <div>64%</div> <div>32%</div> <div>0.1%</div> </div>
2	C	108	<div> <div>9%</div> <div>44%</div> <div>48%</div> <div>7%</div> </div>

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Mol	Chain	Length	Quality of chain
2	D	108	<p>21% 42% 55% 1%</p>
2	G	108	<p>12% 42% 52% 6%</p>
2	H	108	<p>22% 38% 57% 5%</p>

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 13612 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 THIOREDOXIN REDUCTASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	320	Total	C	N	O	S	0	0	0
			2423	1507	429	477	10			
1	B	320	Total	C	N	O	S	0	0	0
			2423	1507	429	477	10			
1	E	320	Total	C	N	O	S	0	0	0
			2423	1507	429	477	10			
1	F	320	Total	C	N	O	S	0	0	0
			2423	1507	429	477	10			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	135	SER	CYS	ENGINEERED	UNP P0A9P4
B	135	SER	CYS	ENGINEERED	UNP P0A9P4
E	135	SER	CYS	ENGINEERED	UNP P0A9P4
F	135	SER	CYS	ENGINEERED	UNP P0A9P4

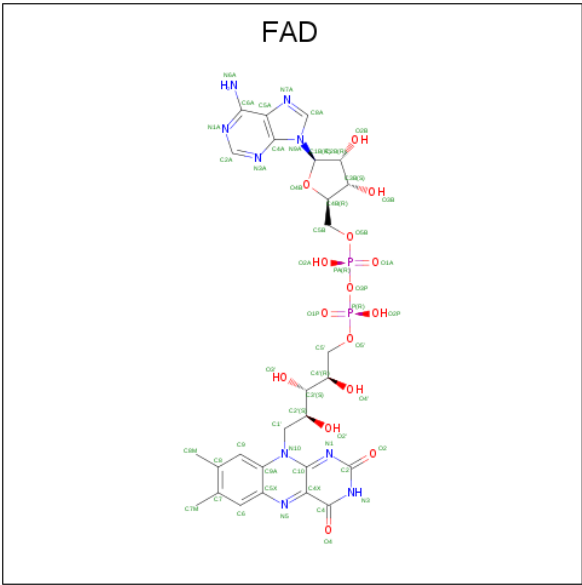
- Molecule 2 is a protein called THIOREDOXIN 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	108	Total	C	N	O	S	0	0	0
			822	528	132	160	2			
2	D	108	Total	C	N	O	S	0	0	0
			822	528	132	160	2			
2	G	108	Total	C	N	O	S	0	0	0
			822	528	132	160	2			
2	H	108	Total	C	N	O	S	0	0	0
			822	528	132	160	2			

There are 4 discrepancies between the modelled and reference sequences:

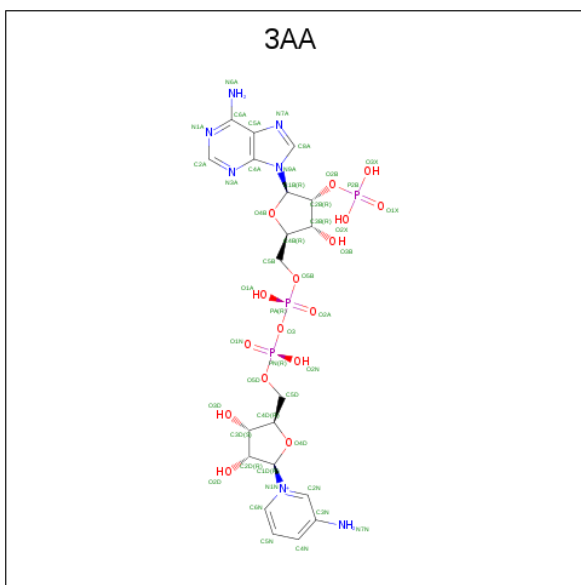
Chain	Residue	Modelled	Actual	Comment	Reference
C	35	SER	CYS	ENGINEERED	UNP P0AA25
D	35	SER	CYS	ENGINEERED	UNP P0AA25
G	35	SER	CYS	ENGINEERED	UNP P0AA25
H	35	SER	CYS	ENGINEERED	UNP P0AA25

- Molecule 3 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: C₂₇H₃₃N₉O₁₅P₂).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
3	B	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
3	E	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
3	F	1	Total	C	N	O	P	0	0
			53	27	9	15	2		

- Molecule 4 is 3-AMINOPYRIDINE-ADENINE DINUCLEOTIDE PHOSPHATE (three-letter code: 3AA) (formula: C₂₀H₂₉N₇O₁₆P₃).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total 46	C 20	N 7	O 16	P 3	0	0
4	B	1	Total 46	C 20	N 7	O 16	P 3	0	0
4	E	1	Total 46	C 20	N 7	O 16	P 3	0	0
4	F	1	Total 46	C 20	N 7	O 16	P 3	0	0

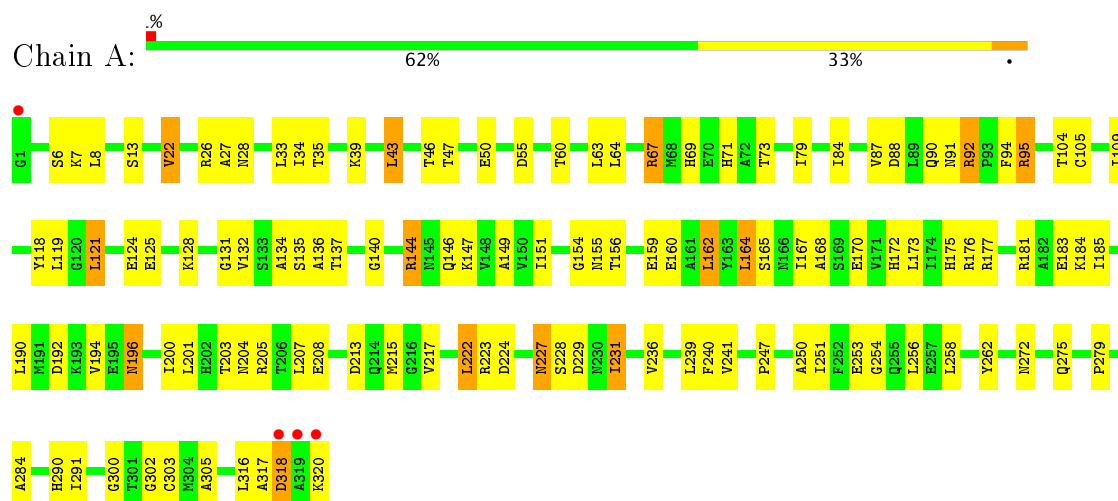
- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	56	Total O 56 56	0	0
5	B	60	Total O 60 60	0	0
5	C	4	Total O 4 4	0	0
5	D	1	Total O 1 1	0	0
5	E	49	Total O 49 49	0	0
5	F	63	Total O 63 63	0	0
5	G	2	Total O 2 2	0	0
5	H	1	Total O 1 1	0	0

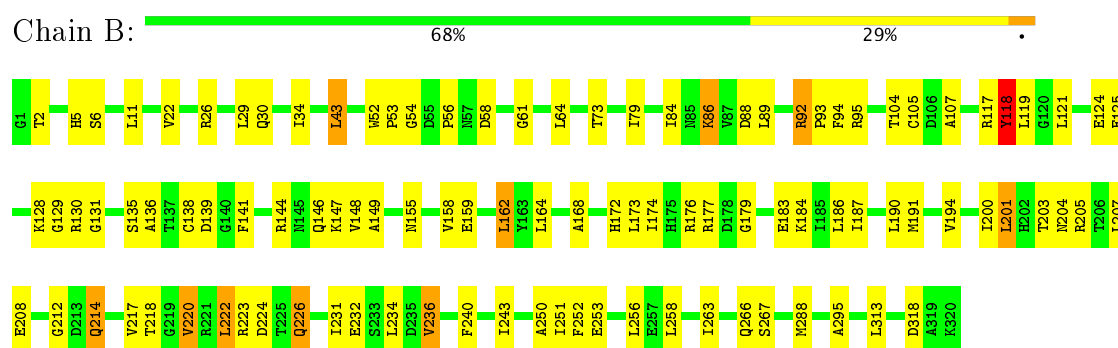
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA 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.

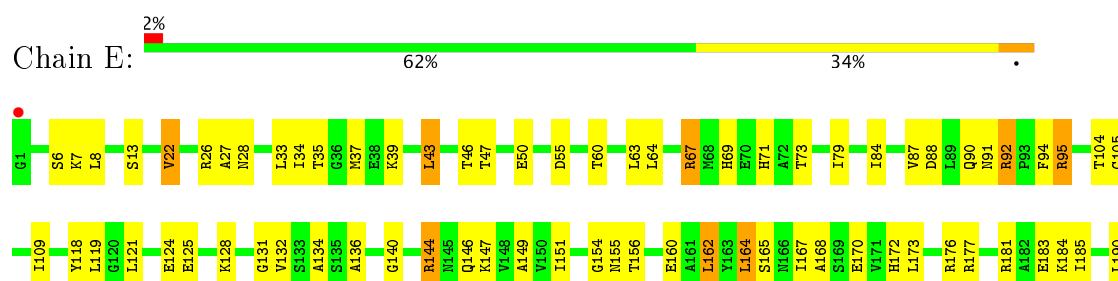
• Molecule 1: THIOREDOXIN REDUCTASE

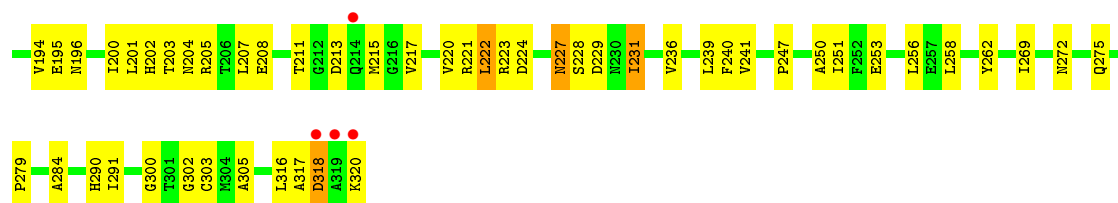


• Molecule 1: THIOREDOXIN REDUCTASE

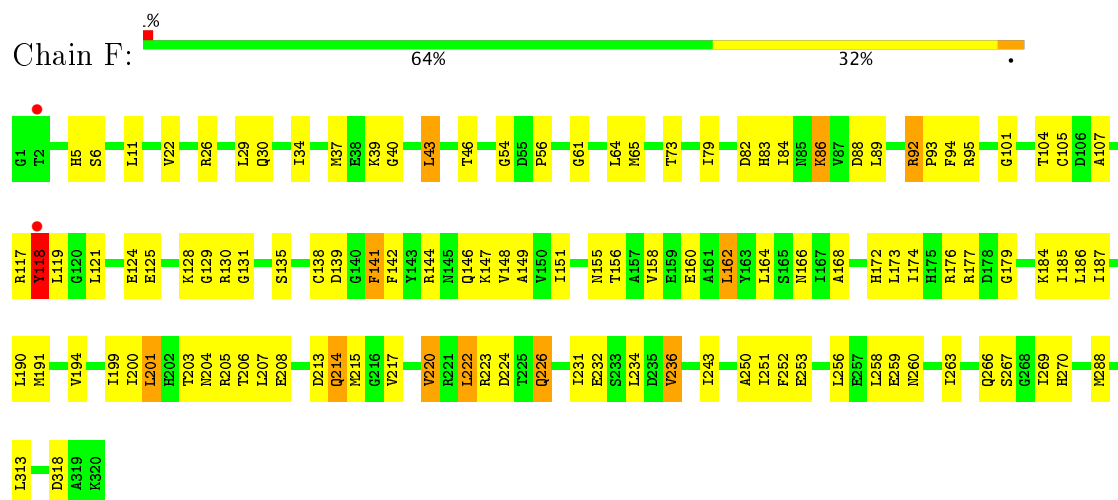


• Molecule 1: THIOREDOXIN REDUCTASE

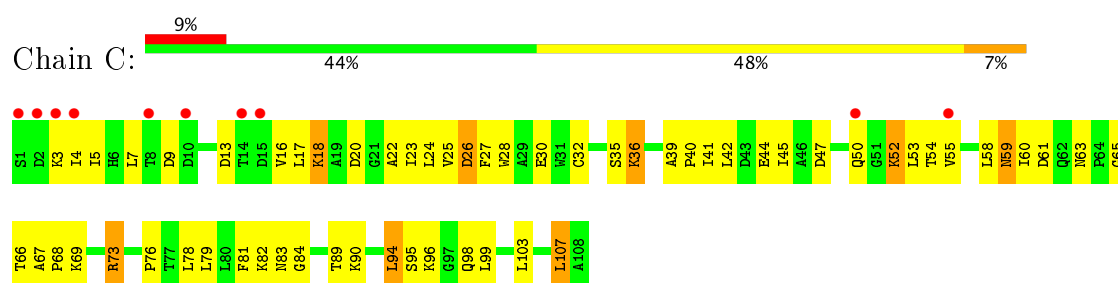




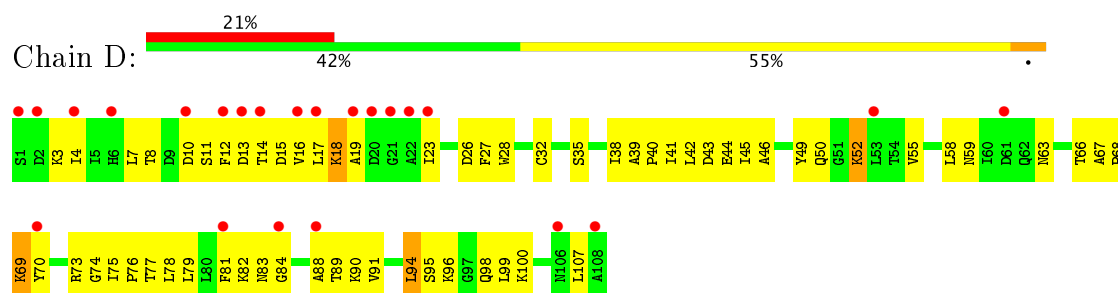
• Molecule 1: THIOREDOXIN REDUCTASE



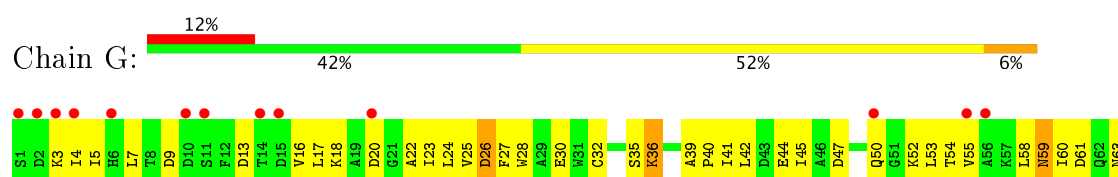
• Molecule 2: THIOREDOXIN 1



• Molecule 2: THIOREDOXIN 1

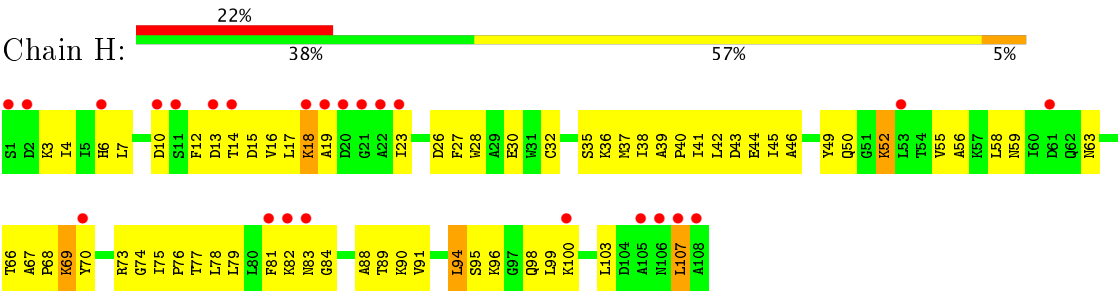


• Molecule 2: THIOREDOXIN 1





● Molecule 2: THIOREDOXIN 1



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	298.93Å 94.83Å 79.61Å 90.00° 104.17° 90.00°	Depositor
Resolution (Å)	31.38 – 2.95 31.38 – 2.95	Depositor EDS
% Data completeness (in resolution range)	99.8 (31.38-2.95) 99.8 (31.38-2.95)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.06 (at 2.95Å)	Xtriage
Refinement program	CNS 0.9	Depositor
R, R_{free}	0.205 , 0.247 0.203 , 0.244	Depositor DCC
R_{free} test set	2747 reflections (6.03%)	DCC
Wilson B-factor (Å ²)	42.6	Xtriage
Anisotropy	0.384	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 55.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.098 for -h-2*k,l	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	13612	wwPDB-VP
Average B, all atoms (Å ²)	46.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.54% 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: 3AA, FAD

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	0.38	0/2462	0.64	0/3332
1	B	0.38	0/2462	0.64	0/3332
1	E	0.39	0/2462	0.64	0/3332
1	F	0.39	0/2462	0.64	0/3332
2	C	0.33	0/837	0.58	0/1134
2	D	0.33	0/837	0.55	0/1134
2	G	0.33	0/837	0.58	0/1134
2	H	0.31	0/837	0.54	0/1134
All	All	0.37	0/13196	0.62	0/17864

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	B	0	1
1	F	0	1
All	All	0	2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	118	TYR	Sidechain
1	F	118	TYR	Sidechain

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	2423	0	2382	111	0
1	B	2423	0	2382	86	0
1	E	2423	0	2382	113	0
1	F	2423	0	2382	94	0
2	C	822	0	832	66	0
2	D	822	0	832	65	0
2	G	822	0	832	64	0
2	H	822	0	832	69	0
3	A	53	0	31	0	0
3	B	53	0	31	0	0
3	E	53	0	31	0	0
3	F	53	0	31	0	0
4	A	46	0	25	4	0
4	B	46	0	25	2	0
4	E	46	0	25	3	0
4	F	46	0	25	3	0
5	A	56	0	0	7	0
5	B	60	0	0	3	0
5	C	4	0	0	0	0
5	D	1	0	0	0	0
5	E	49	0	0	7	0
5	F	63	0	0	6	0
5	G	2	0	0	0	0
5	H	1	0	0	0	0
All	All	13612	0	13080	646	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 24.

All (646) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:42:LEU:HB3	2:G:55:VAL:HG11	1.41	1.01
2:C:42:LEU:HB3	2:C:55:VAL:HG11	1.43	1.00
2:D:14:THR:HA	2:D:18:LYS:HE2	1.39	1.00

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:223:ARG:HH21	1:F:231:ILE:HD11	1.27	0.99
2:H:14:THR:HA	2:H:18:LYS:HE2	1.39	0.99
1:A:196:ASN:HD22	1:A:196:ASN:N	1.60	0.96
2:C:3:LYS:HD2	2:C:50:GLN:HG3	1.53	0.91
1:E:275:GLN:HE22	1:E:279:PRO:HA	1.36	0.91
2:G:3:LYS:HD2	2:G:50:GLN:HG3	1.52	0.90
1:B:223:ARG:HH21	1:B:231:ILE:HD11	1.37	0.89
1:A:275:GLN:HE22	1:A:279:PRO:HA	1.36	0.89
1:E:147:LYS:HG2	1:E:170:GLU:HG2	1.55	0.89
1:A:69:HIS:O	1:A:73:THR:HG23	1.72	0.88
1:A:147:LYS:HG2	1:A:170:GLU:HG2	1.55	0.88
1:A:250:ALA:O	1:A:253:GLU:HG2	1.74	0.87
1:E:69:HIS:O	1:E:73:THR:HG23	1.74	0.87
1:E:250:ALA:O	1:E:253:GLU:HG2	1.77	0.85
1:F:149:ALA:HB2	1:F:236:VAL:HG21	1.61	0.82
1:A:196:ASN:ND2	1:A:196:ASN:N	2.26	0.82
1:B:149:ALA:HB2	1:B:236:VAL:HG21	1.61	0.82
2:D:28:TRP:HB2	2:D:35:SER:HB3	1.62	0.82
1:A:196:ASN:H	1:A:196:ASN:HD22	1.27	0.81
1:F:214:GLN:H	1:F:214:GLN:NE2	1.79	0.80
1:E:132:VAL:HG22	1:E:239:LEU:HD21	1.62	0.80
1:B:214:GLN:NE2	1:B:214:GLN:H	1.80	0.79
1:A:205:ARG:HB3	1:A:222:LEU:HB3	1.65	0.79
2:C:30:GLU:HA	2:C:36:LYS:HZ1	1.49	0.78
1:E:190:LEU:O	1:E:194:VAL:HG23	1.81	0.78
2:H:28:TRP:HB2	2:H:35:SER:HB3	1.65	0.78
1:F:220:VAL:HG12	1:F:234:LEU:HB3	1.66	0.78
1:E:37:MET:HG2	5:E:3503:HOH:O	1.82	0.78
1:A:190:LEU:O	1:A:194:VAL:HG23	1.85	0.76
1:A:119:LEU:HD12	1:A:207:LEU:HD23	1.68	0.76
1:E:95:ARG:HH11	1:E:95:ARG:HG2	1.50	0.76
1:A:95:ARG:HH11	1:A:95:ARG:HG2	1.51	0.76
1:E:43:LEU:O	1:E:46:THR:HG22	1.85	0.75
2:D:13:ASP:HA	2:D:17:LEU:HD13	1.67	0.75
2:H:13:ASP:HA	2:H:17:LEU:HD13	1.69	0.75
1:A:132:VAL:HG22	1:A:239:LEU:HD21	1.67	0.74
1:E:316:LEU:O	1:E:320:LYS:HG3	1.87	0.74
1:E:147:LYS:HG2	1:E:170:GLU:CG	2.18	0.74
1:E:119:LEU:HD12	1:E:207:LEU:HD23	1.68	0.74
1:A:147:LYS:HG2	1:A:170:GLU:CG	2.17	0.74
1:F:73:THR:HG22	1:F:79:ILE:HD13	1.69	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:67:ARG:HG2	1:F:54:GLY:O	1.87	0.73
1:A:316:LEU:O	1:A:320:LYS:HG3	1.87	0.73
1:A:135:SER:OG	1:A:137:THR:HG22	1.88	0.73
1:A:43:LEU:O	1:A:46:THR:HG22	1.89	0.72
2:C:67:ALA:HB3	2:C:68:PRO:HD3	1.71	0.72
1:E:205:ARG:HB3	1:E:222:LEU:HB3	1.72	0.72
1:B:73:THR:HG22	1:B:79:ILE:HD13	1.72	0.71
2:G:67:ALA:HB3	2:G:68:PRO:HD3	1.72	0.71
2:G:26:ASP:HA	2:G:78:LEU:HD23	1.72	0.71
1:E:144:ARG:HH11	1:E:144:ARG:CB	2.04	0.71
1:A:67:ARG:HG2	1:B:54:GLY:O	1.91	0.71
1:F:119:LEU:HD13	1:F:207:LEU:HD23	1.72	0.70
2:H:41:ILE:HG22	2:H:99:LEU:HD23	1.72	0.70
2:D:14:THR:HA	2:D:18:LYS:CE	2.20	0.70
1:E:223:ARG:NH1	1:E:231:ILE:HD11	2.06	0.70
2:C:52:LYS:HD2	2:C:52:LYS:N	2.06	0.70
1:F:95:ARG:HH11	1:F:95:ARG:HG2	1.55	0.70
2:H:14:THR:HA	2:H:18:LYS:CE	2.20	0.70
1:E:13:SER:HB3	1:E:35:THR:HA	1.71	0.70
1:B:92:ARG:HG2	1:B:92:ARG:HH11	1.57	0.70
2:D:41:ILE:HG22	2:D:99:LEU:HD23	1.73	0.70
1:F:92:ARG:HH11	1:F:92:ARG:HG2	1.57	0.70
2:C:26:ASP:HA	2:C:78:LEU:HD23	1.74	0.69
1:B:95:ARG:HH11	1:B:95:ARG:HG2	1.57	0.69
1:A:13:SER:HB3	1:A:35:THR:HA	1.74	0.69
1:A:223:ARG:NH1	1:A:231:ILE:HD11	2.08	0.69
2:H:30:GLU:OE2	2:H:36:LYS:HE2	1.93	0.68
1:A:144:ARG:HH11	1:A:144:ARG:CB	2.06	0.68
1:A:73:THR:HG22	1:A:79:ILE:CD1	2.23	0.68
2:G:44:GLU:HB3	2:G:96:LYS:NZ	2.09	0.68
1:A:73:THR:HG22	1:A:79:ILE:HD12	1.76	0.68
1:E:223:ARG:HH12	1:E:231:ILE:HD11	1.58	0.68
2:G:65:GLY:O	2:G:69:LYS:HG2	1.95	0.67
1:A:223:ARG:HH12	1:A:231:ILE:HD11	1.59	0.67
2:H:41:ILE:O	2:H:45:ILE:HG12	1.95	0.67
2:C:17:LEU:O	2:C:84:GLY:HA3	1.95	0.67
2:D:95:SER:H	2:D:98:GLN:HG3	1.58	0.67
2:H:4:ILE:HG23	2:H:55:VAL:HG12	1.76	0.66
1:E:73:THR:HG22	1:E:79:ILE:HD12	1.77	0.66
2:D:4:ILE:HG23	2:D:55:VAL:HG12	1.76	0.66
1:E:73:THR:HG22	1:E:79:ILE:CD1	2.26	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:176:ARG:O	1:F:204:ASN:HA	1.95	0.66
1:B:223:ARG:HG2	1:B:223:ARG:HH11	1.61	0.66
1:B:258:LEU:HD12	1:B:263:ILE:HA	1.77	0.66
2:H:38:ILE:HG22	2:H:42:LEU:HG	1.77	0.66
2:C:16:VAL:HG22	2:C:23:ILE:HD13	1.78	0.66
2:H:17:LEU:HG	2:H:84:GLY:HA2	1.78	0.66
1:A:208:GLU:HG2	5:A:1511:HOH:O	1.95	0.66
1:B:176:ARG:O	1:B:204:ASN:HA	1.95	0.66
1:B:119:LEU:HD13	1:B:207:LEU:HD23	1.78	0.66
2:C:65:GLY:O	2:C:69:LYS:HG2	1.96	0.66
2:D:41:ILE:O	2:D:45:ILE:HG12	1.96	0.66
1:E:90:GLN:C	1:E:91:ASN:HD22	1.99	0.66
2:C:44:GLU:HB3	2:C:96:LYS:NZ	2.10	0.66
2:G:16:VAL:HG22	2:G:23:ILE:HD13	1.78	0.66
2:H:95:SER:H	2:H:98:GLN:HG3	1.60	0.66
2:H:3:LYS:HE3	2:H:46:ALA:HB1	1.78	0.65
1:B:119:LEU:HB2	1:B:124:GLU:OE2	1.96	0.65
2:D:17:LEU:HG	2:D:84:GLY:HA2	1.78	0.65
1:F:119:LEU:HB2	1:F:124:GLU:OE2	1.97	0.65
2:G:17:LEU:O	2:G:84:GLY:HA3	1.96	0.65
2:D:27:PHE:CE2	2:D:58:LEU:HD23	2.32	0.65
2:G:20:ASP:HA	2:G:83:ASN:OD1	1.97	0.65
2:H:27:PHE:CE2	2:H:58:LEU:HD23	2.32	0.65
2:H:17:LEU:HA	2:H:84:GLY:H	1.62	0.65
1:A:94:PHE:O	1:A:104:THR:HA	1.97	0.65
2:D:38:ILE:HG22	2:D:42:LEU:HG	1.79	0.65
1:E:144:ARG:HB3	1:E:144:ARG:HH11	1.62	0.65
1:F:166:ASN:HB2	5:F:4521:HOH:O	1.96	0.65
2:D:17:LEU:HA	2:D:84:GLY:H	1.62	0.64
1:F:258:LEU:HD12	1:F:263:ILE:HA	1.77	0.64
1:A:90:GLN:C	1:A:91:ASN:HD22	2.01	0.64
1:F:147:LYS:HG3	5:F:4512:HOH:O	1.97	0.64
1:E:183:GLU:OE2	1:F:26:ARG:NH1	2.30	0.63
2:D:16:VAL:HG13	2:D:23:ILE:HG23	1.81	0.62
1:F:135:SER:OG	1:F:138:CYS:HB2	1.99	0.62
2:H:94:LEU:HB2	2:H:98:GLN:CB	2.30	0.62
2:D:3:LYS:HE3	2:D:46:ALA:HB1	1.81	0.62
2:G:52:LYS:O	2:G:107:LEU:HD11	2.00	0.62
1:B:6:SER:O	1:B:105:CYS:HA	2.00	0.62
2:H:39:ALA:HB3	2:H:40:PRO:HD3	1.81	0.62
1:F:223:ARG:HE	1:F:231:ILE:HG12	1.63	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:144:ARG:HH11	1:A:144:ARG:HB3	1.65	0.62
1:E:90:GLN:HE21	1:E:90:GLN:HA	1.66	0.61
2:H:96:LYS:O	2:H:100:LYS:HG3	2.00	0.61
1:E:94:PHE:O	1:E:104:THR:HA	2.00	0.61
2:D:94:LEU:HB2	2:D:98:GLN:CB	2.30	0.61
2:G:35:SER:HA	2:G:76:PRO:HB3	1.82	0.61
1:F:101:GLY:HA3	5:F:4548:HOH:O	2.01	0.61
2:D:39:ALA:HB3	2:D:40:PRO:HD3	1.82	0.61
1:F:94:PHE:O	1:F:104:THR:HA	2.01	0.61
2:G:95:SER:OG	2:G:98:GLN:HG3	2.01	0.61
1:B:135:SER:OG	1:B:138:CYS:HB2	2.00	0.61
1:F:223:ARG:NH2	1:F:231:ILE:HD11	2.07	0.61
1:B:222:LEU:O	1:B:231:ILE:HG23	2.01	0.60
2:C:35:SER:HA	2:C:76:PRO:HB3	1.83	0.60
2:C:20:ASP:HA	2:C:83:ASN:OD1	2.00	0.60
1:E:195:GLU:HG2	1:E:196:ASN:ND2	2.16	0.60
2:G:59:ASN:HD21	2:G:61:ASP:HB2	1.66	0.60
2:H:16:VAL:HG13	2:H:23:ILE:HG23	1.82	0.60
1:A:90:GLN:HE21	1:A:90:GLN:HA	1.66	0.60
1:A:192:ASP:O	1:A:196:ASN:ND2	2.35	0.60
2:D:16:VAL:HG13	2:D:23:ILE:CG2	2.31	0.60
2:C:39:ALA:HB3	2:C:40:PRO:HD3	1.83	0.60
2:C:13:ASP:O	2:C:18:LYS:HG2	2.01	0.60
2:C:30:GLU:HA	2:C:36:LYS:NZ	2.16	0.60
2:G:39:ALA:HB3	2:G:40:PRO:HD3	1.83	0.59
2:G:24:LEU:HB2	2:G:53:LEU:HD11	1.84	0.59
1:B:223:ARG:NH2	1:B:231:ILE:HD11	2.12	0.59
1:B:88:ASP:HB3	1:B:95:ARG:HB2	1.84	0.59
1:F:6:SER:O	1:F:105:CYS:HA	2.01	0.59
2:H:26:ASP:HA	2:H:78:LEU:HD23	1.84	0.59
2:G:30:GLU:HA	2:G:36:LYS:NZ	2.18	0.59
2:H:78:LEU:O	2:H:89:THR:HA	2.02	0.59
2:C:3:LYS:HE3	2:C:54:THR:HA	1.83	0.59
1:E:272:ASN:ND2	1:E:275:GLN:HB2	2.18	0.59
1:A:151:ILE:HG23	1:A:241:VAL:HA	1.85	0.59
1:A:272:ASN:ND2	1:A:275:GLN:HB2	2.17	0.59
2:D:78:LEU:O	2:D:89:THR:HA	2.02	0.59
2:D:26:ASP:HA	2:D:78:LEU:HD23	1.84	0.59
2:H:16:VAL:HG13	2:H:23:ILE:CG2	2.32	0.59
1:E:124:GLU:O	1:E:128:LYS:HG3	2.03	0.59
1:E:90:GLN:HA	1:E:90:GLN:NE2	2.18	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:86:LYS:NZ	1:F:86:LYS:HB3	2.18	0.58
2:D:4:ILE:HD12	2:D:55:VAL:HG11	1.84	0.58
2:G:79:LEU:HA	2:G:89:THR:HG22	1.86	0.58
1:F:129:GLY:HA3	2:H:91:VAL:HG21	1.84	0.58
1:A:90:GLN:NE2	1:A:90:GLN:HA	2.18	0.58
2:G:13:ASP:O	2:G:18:LYS:HG3	2.03	0.58
2:G:3:LYS:HE3	2:G:54:THR:HA	1.85	0.58
2:D:16:VAL:HG22	2:D:23:ILE:HD13	1.85	0.58
2:C:59:ASN:HD21	2:C:61:ASP:HB2	1.68	0.58
1:F:214:GLN:H	1:F:214:GLN:HE21	1.51	0.58
1:E:13:SER:OG	1:E:39:LYS:HA	2.03	0.58
1:A:13:SER:OG	1:A:39:LYS:HA	2.04	0.57
1:B:94:PHE:O	1:B:104:THR:HA	2.04	0.57
2:G:30:GLU:HA	2:G:36:LYS:HZ1	1.69	0.57
2:D:96:LYS:O	2:D:100:LYS:HG3	2.03	0.57
1:E:43:LEU:HB2	5:E:3502:HOH:O	2.04	0.57
2:C:95:SER:OG	2:C:98:GLN:HG3	2.03	0.57
1:E:211:THR:HA	5:E:3519:HOH:O	2.03	0.57
2:C:79:LEU:HA	2:C:89:THR:HG22	1.86	0.57
2:H:4:ILE:HD12	2:H:55:VAL:HG11	1.86	0.57
1:A:227:ASN:HB2	5:A:1552:HOH:O	2.03	0.57
1:A:124:GLU:O	1:A:128:LYS:HG3	2.04	0.57
1:A:291:ILE:HD12	1:A:291:ILE:N	2.20	0.57
2:C:24:LEU:HB2	2:C:53:LEU:HD11	1.87	0.57
1:E:204:ASN:O	1:E:224:ASP:HA	2.05	0.57
1:F:223:ARG:HE	1:F:231:ILE:CG1	2.18	0.57
1:A:131:GLY:HA3	1:A:217:VAL:CG2	2.35	0.56
1:A:91:ASN:N	1:A:91:ASN:HD22	2.03	0.56
1:E:151:ILE:HG23	1:E:241:VAL:HA	1.87	0.56
2:G:22:ALA:HA	2:G:81:PHE:O	2.04	0.56
2:G:59:ASN:HD21	2:G:61:ASP:CB	2.18	0.56
1:F:88:ASP:HB3	1:F:95:ARG:HB2	1.88	0.56
2:C:52:LYS:O	2:C:107:LEU:HD11	2.06	0.56
2:H:59:ASN:O	2:H:63:ASN:HB2	2.05	0.56
1:A:227:ASN:HD22	1:A:227:ASN:C	2.08	0.56
1:E:227:ASN:C	1:E:227:ASN:HD22	2.08	0.56
1:F:222:LEU:O	1:F:231:ILE:HG23	2.05	0.56
1:F:34:ILE:HD13	1:F:84:ILE:HD11	1.86	0.56
1:A:183:GLU:OE2	1:B:26:ARG:NH1	2.35	0.56
2:D:59:ASN:O	2:D:63:ASN:HB2	2.04	0.56
1:A:22:VAL:O	1:A:26:ARG:HG3	2.06	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:41:ILE:HG22	2:G:99:LEU:HD23	1.87	0.56
2:H:77:THR:OG1	2:H:91:VAL:HG22	2.05	0.56
1:A:154:GLY:HA2	1:A:181:ARG:HG3	1.86	0.55
1:A:50:GLU:CD	1:B:26:ARG:NH2	2.59	0.55
1:E:164:LEU:HD21	1:E:240:PHE:CD1	2.42	0.55
2:C:59:ASN:HD21	2:C:61:ASP:CB	2.20	0.55
1:A:121:LEU:O	1:A:124:GLU:HB3	2.06	0.55
2:C:28:TRP:HB2	2:C:35:SER:HB3	1.88	0.55
1:E:176:ARG:HH21	4:E:3501:3AA:P2B	2.29	0.55
1:E:256:LEU:O	1:E:258:LEU:HD13	2.06	0.55
1:F:190:LEU:O	1:F:194:VAL:HG23	2.06	0.55
2:H:16:VAL:HG22	2:H:23:ILE:HD13	1.88	0.55
1:E:91:ASN:N	1:E:91:ASN:HD22	2.03	0.55
1:E:291:ILE:HD12	1:E:291:ILE:N	2.22	0.55
1:F:117:ARG:HH21	4:F:4501:3AA:H8	1.71	0.55
2:G:27:PHE:CE1	2:G:79:LEU:HD13	2.42	0.55
1:A:176:ARG:HH21	4:A:1501:3AA:P2B	2.30	0.55
1:A:256:LEU:O	1:A:258:LEU:HD13	2.05	0.55
1:B:231:ILE:HG22	1:B:232:GLU:N	2.22	0.55
1:F:95:ARG:HG2	1:F:95:ARG:NH1	2.22	0.55
2:G:30:GLU:OE2	2:G:36:LYS:HE2	2.06	0.55
2:C:22:ALA:HA	2:C:81:PHE:O	2.06	0.55
2:G:9:ASP:OD2	2:G:63:ASN:HB3	2.07	0.55
2:C:73:ARG:HG2	2:C:73:ARG:HH21	1.72	0.54
2:G:28:TRP:HB2	2:G:35:SER:HB3	1.90	0.54
1:A:239:LEU:H	1:A:239:LEU:HD23	1.73	0.54
1:B:220:VAL:HG12	1:B:234:LEU:HB3	1.89	0.54
1:B:220:VAL:HG13	1:B:222:LEU:CD1	2.37	0.54
2:C:52:LYS:HD2	2:C:52:LYS:H	1.69	0.54
2:C:9:ASP:OD2	2:C:63:ASN:HB3	2.07	0.54
2:C:58:LEU:HD11	2:C:66:THR:HG21	1.90	0.54
2:G:58:LEU:HD11	2:G:66:THR:HG21	1.89	0.54
2:C:30:GLU:OE2	2:C:36:LYS:HE2	2.07	0.54
2:C:58:LEU:C	2:C:58:LEU:HD23	2.28	0.54
1:E:151:ILE:HD12	1:E:207:LEU:HB2	1.89	0.54
1:E:154:GLY:HA2	1:E:181:ARG:HG3	1.89	0.54
1:E:50:GLU:CD	1:F:26:ARG:NH2	2.60	0.54
2:H:52:LYS:NZ	2:H:52:LYS:HB3	2.23	0.54
1:A:204:ASN:O	1:A:224:ASP:HA	2.07	0.54
1:E:92:ARG:HH11	1:E:92:ARG:HG2	1.72	0.54
1:A:262:TYR:HE1	1:A:290:HIS:HD1	1.53	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:98:GLN:HA	2:G:101:GLU:HG2	1.91	0.53
2:G:58:LEU:HD23	2:G:58:LEU:C	2.29	0.53
1:E:227:ASN:O	1:E:229:ASP:N	2.42	0.53
1:F:207:LEU:HD13	1:F:220:VAL:HG22	1.90	0.53
2:H:94:LEU:HB2	2:H:98:GLN:HB2	1.90	0.53
1:B:223:ARG:HD3	1:B:224:ASP:N	2.24	0.53
1:E:121:LEU:O	1:E:124:GLU:HB3	2.08	0.53
1:E:131:GLY:HA3	1:E:217:VAL:CG2	2.38	0.53
2:G:59:ASN:ND2	2:G:61:ASP:H	2.06	0.53
2:G:73:ARG:HH21	2:G:73:ARG:HG2	1.74	0.53
1:B:34:ILE:HD13	1:B:84:ILE:HD11	1.89	0.53
1:E:170:GLU:OE2	1:E:172:HIS:NE2	2.39	0.53
1:E:22:VAL:O	1:E:26:ARG:HG3	2.09	0.53
1:E:223:ARG:O	1:E:224:ASP:HB3	2.08	0.53
2:G:58:LEU:CD1	2:G:66:THR:HG21	2.39	0.53
1:A:227:ASN:O	1:A:229:ASP:N	2.42	0.52
1:E:239:LEU:HD23	1:E:239:LEU:H	1.74	0.52
1:F:194:VAL:HG11	1:F:201:LEU:HD22	1.91	0.52
2:C:27:PHE:CE1	2:C:79:LEU:HD13	2.44	0.52
1:F:130:ARG:HH11	1:F:130:ARG:HG2	1.74	0.52
1:F:231:ILE:HG22	1:F:232:GLU:N	2.24	0.52
1:A:185:ILE:HG21	1:B:26:ARG:HB3	1.91	0.52
1:A:28:ASN:HD22	1:A:28:ASN:N	2.08	0.52
1:A:156:THR:O	1:A:160:GLU:HG3	2.09	0.52
1:B:207:LEU:CD1	1:B:220:VAL:HG22	2.39	0.52
1:F:29:LEU:HD22	1:F:313:LEU:HD12	1.90	0.52
2:H:13:ASP:O	2:H:18:LYS:HG2	2.10	0.52
2:H:16:VAL:HG11	2:H:81:PHE:CD2	2.45	0.52
2:H:3:LYS:HE2	2:H:46:ALA:O	2.09	0.52
1:B:130:ARG:HG2	1:B:130:ARG:HH11	1.74	0.52
2:C:58:LEU:CD1	2:C:66:THR:HG21	2.40	0.52
2:C:59:ASN:ND2	2:C:61:ASP:H	2.08	0.52
2:G:27:PHE:CE1	2:G:79:LEU:HD22	2.45	0.52
2:D:13:ASP:O	2:D:18:LYS:HG2	2.10	0.52
2:D:16:VAL:HG11	2:D:81:PHE:CD2	2.45	0.52
2:H:43:ASP:C	2:H:45:ILE:H	2.12	0.52
1:B:223:ARG:HD3	1:B:224:ASP:H	1.73	0.51
2:D:41:ILE:CG2	2:D:99:LEU:HD23	2.40	0.51
1:E:28:ASN:N	1:E:28:ASN:HD22	2.08	0.51
2:G:27:PHE:HE1	2:G:79:LEU:HD13	1.74	0.51
2:H:41:ILE:CG2	2:H:99:LEU:HD23	2.39	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:29:LEU:HD22	1:B:313:LEU:HD12	1.91	0.51
2:C:41:ILE:HG22	2:C:99:LEU:HD23	1.91	0.51
1:E:140:GLY:O	1:E:167:ILE:HG21	2.10	0.51
1:B:43:LEU:O	1:B:61:GLY:HA3	2.10	0.51
2:D:45:ILE:O	2:D:49:TYR:HB2	2.10	0.51
1:F:146:GLN:O	1:F:168:ALA:HB1	2.10	0.51
1:F:250:ALA:HA	1:F:253:GLU:HG2	1.92	0.51
2:G:4:ILE:HA	2:G:55:VAL:O	2.11	0.51
2:D:13:ASP:OD2	2:D:17:LEU:HD22	2.10	0.51
1:F:214:GLN:N	1:F:214:GLN:NE2	2.56	0.51
1:A:170:GLU:OE2	1:A:172:HIS:NE2	2.39	0.51
1:E:207:LEU:HD12	1:E:220:VAL:CG1	2.41	0.51
1:F:39:LYS:HB3	2:H:37:MET:SD	2.51	0.51
1:B:144:ARG:HH11	1:B:144:ARG:HG2	1.75	0.51
1:B:250:ALA:HA	1:B:253:GLU:HG2	1.92	0.51
1:B:95:ARG:HG2	1:B:95:ARG:NH1	2.23	0.51
2:D:43:ASP:C	2:D:45:ILE:H	2.13	0.51
1:B:86:LYS:HB3	1:B:86:LYS:NZ	2.25	0.51
2:D:52:LYS:NZ	2:D:52:LYS:HB3	2.26	0.51
2:G:65:GLY:O	2:G:68:PRO:HD2	2.11	0.51
1:A:151:ILE:HD12	1:A:207:LEU:HB2	1.93	0.50
1:B:117:ARG:HH21	4:B:2501:3AA:H8	1.75	0.50
1:B:107:ALA:HB2	1:B:313:LEU:HD21	1.93	0.50
2:D:77:THR:OG1	2:D:91:VAL:HG22	2.11	0.50
2:H:35:SER:HA	2:H:76:PRO:HB3	1.93	0.50
1:A:140:GLY:O	1:A:167:ILE:HG21	2.11	0.50
2:D:94:LEU:HB2	2:D:98:GLN:HB2	1.92	0.50
1:A:92:ARG:HH11	1:A:92:ARG:HG2	1.76	0.50
2:D:15:ASP:O	2:D:19:ALA:HB3	2.12	0.50
1:A:223:ARG:O	1:A:224:ASP:HB3	2.11	0.50
1:A:164:LEU:HD21	1:A:240:PHE:CD1	2.46	0.50
1:B:155:ASN:HB3	4:B:2501:3AA:C4N	2.42	0.50
1:A:87:VAL:HG22	1:A:251:ILE:O	2.12	0.50
1:B:207:LEU:HD13	1:B:220:VAL:HG22	1.94	0.50
2:C:4:ILE:O	2:C:5:ILE:HD13	2.12	0.50
2:C:3:LYS:HE2	2:C:53:LEU:O	2.12	0.50
1:E:262:TYR:HE1	1:E:290:HIS:HD1	1.57	0.50
1:E:185:ILE:HG21	1:F:26:ARG:HB3	1.93	0.50
1:A:254:GLY:HA2	5:A:1524:HOH:O	2.12	0.50
2:C:4:ILE:HA	2:C:55:VAL:O	2.11	0.50
2:G:60:ILE:HA	2:G:63:ASN:O	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:190:LEU:O	1:B:194:VAL:HG23	2.13	0.49
1:F:131:GLY:HA3	1:F:217:VAL:HG23	1.93	0.49
2:H:15:ASP:O	2:H:19:ALA:HB3	2.11	0.49
1:A:184:LYS:NZ	5:A:1555:HOH:O	2.36	0.49
1:B:214:GLN:H	1:B:214:GLN:HE21	1.55	0.49
2:D:35:SER:HA	2:D:76:PRO:HB3	1.95	0.49
2:G:3:LYS:HE2	2:G:53:LEU:O	2.12	0.49
2:H:45:ILE:O	2:H:49:TYR:HB2	2.12	0.49
2:C:27:PHE:HE1	2:C:79:LEU:HD13	1.77	0.49
2:D:69:LYS:HB2	2:D:70:TYR:CD1	2.47	0.49
2:G:23:ILE:HG13	2:G:54:THR:O	2.13	0.49
1:A:275:GLN:NE2	1:A:279:PRO:HA	2.15	0.49
1:A:300:GLY:O	1:A:303:CYS:HB3	2.13	0.49
2:C:18:LYS:HB3	2:C:18:LYS:NZ	2.28	0.49
2:C:27:PHE:CE1	2:C:79:LEU:HD22	2.47	0.49
1:F:155:ASN:HB3	4:F:4501:3AA:C4N	2.43	0.49
1:B:172:HIS:CE1	1:B:200:ILE:HD12	2.48	0.49
1:F:174:ILE:HD13	1:F:222:LEU:HD11	1.94	0.49
2:H:69:LYS:HB2	2:H:70:TYR:CD1	2.48	0.49
1:A:34:ILE:HD13	1:A:84:ILE:HD11	1.95	0.48
1:B:2:THR:HA	5:B:2548:HOH:O	2.12	0.48
2:C:23:ILE:HG13	2:C:54:THR:O	2.13	0.48
2:C:78:LEU:O	2:C:89:THR:HA	2.12	0.48
1:A:144:ARG:HD2	5:A:1533:HOH:O	2.13	0.48
2:D:3:LYS:HE2	2:D:46:ALA:O	2.13	0.48
1:E:220:VAL:CG1	1:E:221:ARG:N	2.75	0.48
2:C:65:GLY:O	2:C:68:PRO:HD2	2.13	0.48
1:F:119:LEU:CD1	1:F:207:LEU:HD23	2.41	0.48
1:E:222:LEU:N	1:E:222:LEU:HD22	2.28	0.48
1:B:129:GLY:HA3	2:D:91:VAL:HG21	1.95	0.48
1:E:222:LEU:H	1:E:222:LEU:HD22	1.77	0.48
1:E:275:GLN:NE2	1:E:279:PRO:HA	2.16	0.48
2:H:13:ASP:OD2	2:H:17:LEU:HD22	2.12	0.48
1:E:247:PRO:HD3	1:E:262:TYR:CZ	2.49	0.48
1:F:43:LEU:O	1:F:61:GLY:HA3	2.13	0.48
2:G:78:LEU:O	2:G:89:THR:HA	2.14	0.48
2:G:27:PHE:HE1	2:G:79:LEU:HD22	1.79	0.48
2:D:77:THR:HG22	2:D:79:LEU:CD1	2.44	0.48
1:E:275:GLN:HE22	1:E:279:PRO:CA	2.18	0.48
1:F:207:LEU:CD1	1:F:220:VAL:HG22	2.43	0.48
2:G:4:ILE:O	2:G:5:ILE:HD13	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:73:THR:HG22	1:A:79:ILE:HD11	1.95	0.48
1:A:88:ASP:HB3	1:A:95:ARG:HB2	1.95	0.48
1:B:194:VAL:HG11	1:B:201:LEU:HD22	1.95	0.48
1:B:214:GLN:NE2	1:B:214:GLN:N	2.57	0.48
1:B:231:ILE:CG2	1:B:232:GLU:N	2.77	0.48
2:C:60:ILE:HA	2:C:63:ASN:O	2.13	0.48
1:E:88:ASP:HB3	1:E:95:ARG:HB2	1.96	0.48
1:F:172:HIS:CE1	1:F:200:ILE:HD12	2.49	0.48
1:E:223:ARG:O	1:E:224:ASP:CB	2.62	0.47
1:E:300:GLY:O	1:E:303:CYS:HB3	2.14	0.47
1:F:125:GLU:HG2	1:F:128:LYS:NZ	2.29	0.47
2:H:18:LYS:HG3	2:H:19:ALA:N	2.29	0.47
1:E:119:LEU:CD1	1:E:207:LEU:HD23	2.42	0.47
1:E:162:LEU:O	1:E:165:SER:HB3	2.13	0.47
1:A:119:LEU:CD1	1:A:207:LEU:HD23	2.42	0.47
1:B:119:LEU:HB3	1:B:121:LEU:HD13	1.97	0.47
2:D:18:LYS:HG3	2:D:19:ALA:N	2.29	0.47
1:F:251:ILE:HD11	1:F:252:PHE:CZ	2.50	0.47
2:G:59:ASN:O	2:G:63:ASN:HB2	2.15	0.47
1:E:87:VAL:HG22	1:E:251:ILE:O	2.15	0.47
1:E:156:THR:O	1:E:160:GLU:HG3	2.14	0.47
1:F:118:TYR:HE2	5:F:4534:HOH:O	1.97	0.47
2:G:26:ASP:HB2	2:G:78:LEU:HD21	1.96	0.47
1:B:146:GLN:O	1:B:168:ALA:HB1	2.15	0.47
1:A:185:ILE:HG22	1:B:26:ARG:O	2.15	0.47
1:E:95:ARG:HG2	1:E:95:ARG:NH1	2.23	0.47
2:H:82:LYS:O	2:H:83:ASN:HB2	2.14	0.47
1:B:223:ARG:NH1	1:B:223:ARG:HG2	2.29	0.47
2:H:77:THR:HG22	2:H:79:LEU:CD1	2.45	0.47
2:H:94:LEU:HB2	2:H:98:GLN:HB3	1.97	0.47
1:A:208:GLU:CG	1:A:223:ARG:HB2	2.45	0.47
1:B:130:ARG:HG2	1:B:130:ARG:NH1	2.30	0.47
2:D:8:THR:OG1	2:D:11:SER:OG	2.30	0.47
1:F:144:ARG:HG2	1:F:144:ARG:HH11	1.80	0.47
1:A:227:ASN:ND2	1:A:227:ASN:C	2.68	0.46
1:A:95:ARG:CG	1:A:95:ARG:HH11	2.24	0.46
2:C:26:ASP:HB2	2:C:78:LEU:HD21	1.97	0.46
1:E:195:GLU:HG2	1:E:196:ASN:HD21	1.80	0.46
1:A:147:LYS:HD2	5:A:1545:HOH:O	2.16	0.46
1:E:34:ILE:HD13	1:E:84:ILE:HD11	1.97	0.46
2:D:50:GLN:C	2:D:52:LYS:H	2.18	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:177:ARG:O	1:A:203:THR:HB	2.15	0.46
1:B:125:GLU:HA	1:B:128:LYS:HZ3	1.80	0.46
1:B:131:GLY:HA3	1:B:217:VAL:HG23	1.96	0.46
1:B:174:ILE:HD13	1:B:222:LEU:HD11	1.96	0.46
2:D:49:TYR:O	2:D:52:LYS:HG2	2.15	0.46
2:D:69:LYS:HB2	2:D:70:TYR:CE1	2.50	0.46
1:E:125:GLU:HA	1:E:128:LYS:HG3	1.96	0.46
1:E:227:ASN:C	1:E:227:ASN:ND2	2.69	0.46
1:F:231:ILE:CG2	1:F:232:GLU:N	2.79	0.46
1:E:71:HIS:HA	1:F:56:PRO:HB3	1.97	0.46
2:D:82:LYS:O	2:D:83:ASN:HB2	2.15	0.46
1:E:220:VAL:HG12	1:E:221:ARG:N	2.30	0.46
1:A:125:GLU:HA	1:A:128:LYS:HG3	1.97	0.46
1:F:119:LEU:HB3	1:F:121:LEU:HD13	1.97	0.46
2:H:95:SER:O	2:H:98:GLN:HB2	2.16	0.46
1:B:208:GLU:OE1	1:B:223:ARG:NH2	2.48	0.46
1:A:71:HIS:HA	1:B:56:PRO:HB3	1.98	0.46
2:D:67:ALA:HB3	2:D:68:PRO:HD3	1.97	0.46
2:C:42:LEU:HD13	2:C:55:VAL:CG1	2.46	0.46
1:E:118:TYR:OH	1:E:134:ALA:HB2	2.16	0.46
2:G:23:ILE:O	2:G:23:ILE:HG23	2.16	0.46
1:A:223:ARG:O	1:A:224:ASP:CB	2.63	0.46
1:A:239:LEU:N	1:A:239:LEU:HD23	2.31	0.46
1:A:95:ARG:HG2	1:A:95:ARG:NH1	2.24	0.45
1:F:208:GLU:HG3	1:F:223:ARG:HB2	1.98	0.45
2:G:44:GLU:HB3	2:G:96:LYS:HZ1	1.78	0.45
2:H:69:LYS:HB2	2:H:70:TYR:CE1	2.51	0.45
2:H:95:SER:OG	2:H:98:GLN:HG2	2.16	0.45
2:C:53:LEU:HB2	2:C:107:LEU:HD21	1.96	0.45
1:F:223:ARG:HD3	1:F:224:ASP:H	1.82	0.45
2:G:17:LEU:C	2:G:84:GLY:HA3	2.37	0.45
1:E:185:ILE:HG22	1:F:26:ARG:O	2.16	0.45
2:H:18:LYS:HG3	2:H:19:ALA:H	1.81	0.45
1:B:187:ILE:O	1:B:191:MET:HG2	2.17	0.45
1:E:184:LYS:NZ	5:E:3542:HOH:O	2.41	0.45
2:C:27:PHE:HE1	2:C:79:LEU:HD22	1.81	0.45
2:D:17:LEU:HD12	2:D:17:LEU:N	2.32	0.45
1:B:119:LEU:CD1	1:B:207:LEU:HD23	2.46	0.45
2:C:41:ILE:O	2:C:45:ILE:HG12	2.17	0.45
1:E:136:ALA:HA	1:E:240:PHE:CE2	2.51	0.45
1:E:207:LEU:CD1	1:E:220:VAL:HG11	2.46	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:107:ALA:HB2	1:F:313:LEU:HD21	1.97	0.45
1:A:247:PRO:HD3	1:A:262:TYR:CZ	2.52	0.45
2:C:32:CYS:HB3	2:C:35:SER:OG	2.17	0.45
2:D:75:ILE:HB	2:D:76:PRO:HA	1.98	0.45
2:H:50:GLN:C	2:H:52:LYS:H	2.19	0.45
1:A:162:LEU:O	1:A:165:SER:HB3	2.16	0.45
1:A:318:ASP:O	1:A:320:LYS:N	2.50	0.45
1:A:91:ASN:N	1:A:91:ASN:ND2	2.65	0.45
1:B:125:GLU:HG2	1:B:128:LYS:NZ	2.32	0.45
2:D:95:SER:OG	2:D:98:GLN:HG2	2.17	0.45
1:E:73:THR:HG22	1:E:79:ILE:HD11	1.99	0.45
2:G:44:GLU:HB3	2:G:96:LYS:HZ2	1.82	0.45
1:A:146:GLN:O	1:A:168:ALA:HB1	2.17	0.45
1:A:275:GLN:HE22	1:A:279:PRO:CA	2.18	0.45
2:D:66:THR:O	2:D:69:LYS:HG2	2.17	0.45
2:D:95:SER:O	2:D:98:GLN:HB2	2.17	0.45
1:F:156:THR:O	1:F:160:GLU:HG3	2.17	0.45
1:F:176:ARG:HH21	4:F:4501:3AA:P2B	2.40	0.45
1:F:92:ARG:HA	1:F:93:PRO:C	2.38	0.45
2:H:17:LEU:N	2:H:17:LEU:HD12	2.32	0.45
1:A:317:ALA:HA	1:A:320:LYS:HD2	1.99	0.44
1:B:139:ASP:OD1	2:D:74:GLY:HA2	2.18	0.44
1:B:92:ARG:CG	1:B:92:ARG:HH11	2.26	0.44
2:C:17:LEU:C	2:C:84:GLY:HA3	2.36	0.44
1:E:177:ARG:HD3	4:E:3501:3AA:O1X	2.17	0.44
1:E:207:LEU:HD12	1:E:220:VAL:HG11	1.97	0.44
2:G:16:VAL:HG13	2:G:23:ILE:CG2	2.46	0.44
2:C:16:VAL:HG13	2:C:23:ILE:CG2	2.47	0.44
2:D:4:ILE:HD12	2:D:55:VAL:CG1	2.47	0.44
1:E:239:LEU:HD23	1:E:239:LEU:N	2.31	0.44
1:A:136:ALA:HA	1:A:240:PHE:CE2	2.53	0.44
1:E:92:ARG:NH1	1:E:92:ARG:HG2	2.33	0.44
2:H:67:ALA:HB3	2:H:68:PRO:HD3	1.98	0.44
1:B:92:ARG:HA	1:B:93:PRO:C	2.37	0.44
1:E:177:ARG:O	1:E:203:THR:HB	2.17	0.44
2:G:13:ASP:CG	2:G:17:LEU:HD23	2.38	0.44
2:H:12:PHE:CE2	2:H:17:LEU:HD11	2.53	0.44
1:A:175:HIS:HA	5:A:1515:HOH:O	2.15	0.44
1:A:27:ALA:O	1:B:184:LYS:HG3	2.18	0.44
1:B:205:ARG:HD3	1:B:205:ARG:HA	1.69	0.44
1:E:146:GLN:O	1:E:168:ALA:HB1	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:27:ALA:O	1:F:184:LYS:HG3	2.16	0.44
2:D:12:PHE:CE2	2:D:17:LEU:HD11	2.52	0.44
1:E:149:ALA:O	1:E:239:LEU:HA	2.18	0.44
1:F:125:GLU:HA	1:F:128:LYS:NZ	2.33	0.44
1:F:139:ASP:OD1	2:H:74:GLY:HA2	2.17	0.44
2:G:59:ASN:ND2	2:G:61:ASP:CB	2.81	0.44
1:A:200:ILE:HD12	1:A:200:ILE:N	2.32	0.44
1:E:253:GLU:HB2	5:E:3530:HOH:O	2.18	0.44
1:F:130:ARG:HG2	1:F:130:ARG:NH1	2.31	0.44
2:G:90:LYS:HE2	2:G:94:LEU:HD23	2.00	0.44
2:H:75:ILE:HB	2:H:76:PRO:HA	1.99	0.44
2:C:103:LEU:O	2:C:107:LEU:HB3	2.18	0.44
1:E:91:ASN:N	1:E:91:ASN:ND2	2.65	0.44
2:G:25:VAL:O	2:G:78:LEU:HA	2.18	0.44
1:B:295:ALA:HB3	5:B:2504:HOH:O	2.18	0.44
2:C:18:LYS:O	2:C:18:LYS:HG3	2.18	0.44
1:E:208:GLU:HG2	5:E:3511:HOH:O	2.18	0.44
1:F:226:GLN:HE21	1:F:226:GLN:HB2	1.63	0.44
2:H:49:TYR:O	2:H:52:LYS:HG2	2.17	0.44
1:B:177:ARG:HB2	1:B:179:GLY:O	2.18	0.43
1:B:220:VAL:HG13	1:B:222:LEU:HD13	1.99	0.43
2:G:17:LEU:C	2:G:18:LYS:HG2	2.39	0.43
2:H:18:LYS:NZ	2:H:18:LYS:HB3	2.33	0.43
1:A:95:ARG:HD3	1:A:104:THR:HG22	1.99	0.43
2:C:23:ILE:HG23	2:C:23:ILE:O	2.17	0.43
1:F:205:ARG:HA	1:F:205:ARG:HD3	1.71	0.43
2:H:66:THR:O	2:H:69:LYS:HG2	2.18	0.43
1:B:251:ILE:HD11	1:B:252:PHE:CZ	2.53	0.43
2:C:13:ASP:CG	2:C:17:LEU:HD23	2.39	0.43
2:C:25:VAL:O	2:C:78:LEU:HA	2.19	0.43
1:F:92:ARG:HH11	1:F:92:ARG:CG	2.27	0.43
2:G:42:LEU:HD13	2:G:55:VAL:CG1	2.48	0.43
2:H:4:ILE:HD12	2:H:55:VAL:CG1	2.48	0.43
1:A:8:LEU:HD11	1:A:109:ILE:HG13	2.00	0.43
1:A:131:GLY:HA3	1:A:217:VAL:HG23	1.99	0.43
1:B:226:GLN:HE21	1:B:226:GLN:HB2	1.63	0.43
1:E:317:ALA:HA	1:E:320:LYS:HD2	1.99	0.43
1:E:47:THR:O	1:E:60:THR:HA	2.17	0.43
1:F:187:ILE:O	1:F:191:MET:HG2	2.19	0.43
1:B:22:VAL:O	1:B:26:ARG:HG3	2.18	0.43
2:D:70:TYR:CD1	2:D:70:TYR:N	2.87	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:59:ASN:O	2:C:63:ASN:HB2	2.19	0.43
1:E:284:ALA:CB	1:E:302:GLY:HA2	2.49	0.43
1:F:234:LEU:HD12	1:F:234:LEU:HA	1.92	0.43
1:A:177:ARG:HD3	4:A:1501:3AA:O1X	2.18	0.43
1:A:284:ALA:HB2	1:A:305:ALA:HB2	2.01	0.43
2:C:90:LYS:HE2	2:C:94:LEU:HD23	2.01	0.43
1:A:118:TYR:OH	1:A:134:ALA:HB2	2.18	0.43
2:D:18:LYS:HG3	2:D:19:ALA:H	1.82	0.43
2:D:94:LEU:HB2	2:D:98:GLN:HB3	1.97	0.43
1:E:131:GLY:HA3	1:E:217:VAL:HG23	2.01	0.43
1:E:208:GLU:CG	1:E:223:ARG:HB2	2.48	0.43
1:F:141:PHE:HE2	1:F:142:PHE:CZ	2.37	0.43
2:G:26:ASP:CB	2:G:42:LEU:HD11	2.49	0.43
2:H:81:PHE:O	2:H:82:LYS:HG3	2.19	0.43
2:C:82:LYS:O	2:C:83:ASN:HB2	2.19	0.43
2:D:50:GLN:O	2:D:52:LYS:N	2.52	0.43
1:F:131:GLY:HA3	1:F:217:VAL:CG2	2.48	0.43
2:G:26:ASP:CA	2:G:78:LEU:HD23	2.46	0.43
1:F:177:ARG:HB2	1:F:179:GLY:O	2.19	0.43
2:G:103:LEU:O	2:G:107:LEU:HB3	2.19	0.43
2:G:13:ASP:O	2:G:17:LEU:HB3	2.19	0.43
1:B:131:GLY:HA3	1:B:217:VAL:CG2	2.49	0.42
2:D:18:LYS:NZ	2:D:18:LYS:HB3	2.34	0.42
2:D:79:LEU:HG	2:D:89:THR:HG22	2.01	0.42
1:E:318:ASP:O	1:E:320:LYS:N	2.50	0.42
1:A:159:GLU:OE1	4:A:1501:3AA:HC4	2.19	0.42
1:A:284:ALA:CB	1:A:302:GLY:HA2	2.49	0.42
2:C:26:ASP:CB	2:C:42:LEU:HD11	2.48	0.42
2:D:13:ASP:HA	2:D:17:LEU:HB2	2.02	0.42
1:E:200:ILE:N	1:E:200:ILE:HD12	2.34	0.42
2:H:17:LEU:HA	2:H:84:GLY:N	2.31	0.42
2:H:70:TYR:N	2:H:70:TYR:CD1	2.87	0.42
2:G:53:LEU:HB2	2:G:107:LEU:HD21	2.02	0.42
2:D:81:PHE:O	2:D:82:LYS:HG3	2.20	0.42
1:E:208:GLU:HG2	1:E:223:ARG:HB2	2.02	0.42
1:E:208:GLU:OE1	1:E:223:ARG:HD2	2.20	0.42
1:E:33:LEU:HD23	1:E:33:LEU:C	2.39	0.42
2:H:58:LEU:HD21	2:H:66:THR:HB	2.01	0.42
1:E:164:LEU:HD21	1:E:240:PHE:CE1	2.54	0.42
1:F:151:ILE:HD11	5:F:4513:HOH:O	2.19	0.42
2:G:41:ILE:O	2:G:45:ILE:HG12	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:149:ALA:O	1:A:239:LEU:HA	2.20	0.42
2:D:88:ALA:O	2:D:89:THR:HG23	2.20	0.42
1:F:269:ILE:HG13	1:F:270:HIS:CE1	2.54	0.42
1:F:82:ASP:OD1	1:F:83:HIS:N	2.53	0.42
2:C:13:ASP:O	2:C:17:LEU:HB3	2.20	0.42
2:C:59:ASN:ND2	2:C:61:ASP:CB	2.82	0.42
1:F:22:VAL:O	1:F:26:ARG:HG3	2.20	0.42
1:F:5:HIS:HA	1:F:104:THR:O	2.20	0.42
1:A:181:ARG:HD2	4:A:1501:3AA:O5B	2.20	0.42
2:C:13:ASP:OD1	2:C:18:LYS:HE2	2.20	0.42
1:E:8:LEU:HD11	1:E:109:ILE:HG13	2.02	0.42
1:E:155:ASN:HB3	4:E:3501:3AA:C4N	2.50	0.42
2:H:13:ASP:HA	2:H:17:LEU:HB2	2.02	0.42
1:A:128:LYS:HA	1:A:132:VAL:HB	2.02	0.41
1:A:208:GLU:OE1	1:A:223:ARG:NH1	2.53	0.41
1:A:26:ARG:NH1	1:B:183:GLU:OE2	2.53	0.41
1:F:158:VAL:HG12	1:F:162:LEU:HD23	2.01	0.41
1:F:86:LYS:HZ2	1:F:86:LYS:HB3	1.85	0.41
2:H:7:LEU:HG	2:H:56:ALA:HB1	2.01	0.41
1:A:208:GLU:HG3	1:A:223:ARG:HB2	2.02	0.41
1:B:266:GLN:O	1:B:267:SER:HB3	2.20	0.41
2:C:44:GLU:HB3	2:C:96:LYS:HZ2	1.81	0.41
2:D:58:LEU:HD21	2:D:66:THR:HB	2.01	0.41
1:B:234:LEU:HD12	1:B:234:LEU:HA	1.93	0.41
1:E:26:ARG:HB3	1:F:185:ILE:HG21	2.01	0.41
1:F:213:ASP:OD1	1:F:215:MET:N	2.50	0.41
1:A:160:GLU:O	1:A:164:LEU:HB2	2.20	0.41
1:A:47:THR:O	1:A:60:THR:HA	2.21	0.41
1:B:117:ARG:HB3	1:B:243:ILE:HG13	2.02	0.41
1:E:95:ARG:HD3	1:E:104:THR:HG22	2.02	0.41
2:H:88:ALA:O	2:H:89:THR:HG23	2.20	0.41
1:A:6:SER:O	1:A:105:CYS:HA	2.20	0.41
1:B:136:ALA:HA	1:B:240:PHE:CE2	2.55	0.41
1:B:212:GLY:HA2	1:B:218:THR:OG1	2.20	0.41
1:F:119:LEU:HB2	1:F:124:GLU:CD	2.41	0.41
1:F:117:ARG:HB3	1:F:243:ILE:HG13	2.02	0.41
1:B:158:VAL:HG12	1:B:162:LEU:HD23	2.03	0.41
1:A:33:LEU:HD23	1:A:33:LEU:C	2.41	0.41
1:B:125:GLU:HA	1:B:128:LYS:NZ	2.35	0.41
2:C:44:GLU:HB3	2:C:96:LYS:HZ1	1.83	0.41
1:E:284:ALA:HB2	1:E:305:ALA:HB2	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:194:VAL:HA	1:F:199:ILE:O	2.21	0.41
1:F:266:GLN:O	1:F:267:SER:HB3	2.20	0.41
1:F:43:LEU:O	1:F:46:THR:HG22	2.21	0.41
1:A:155:ASN:O	1:A:159:GLU:HG3	2.20	0.41
1:F:73:THR:HG22	1:F:79:ILE:CD1	2.47	0.41
2:G:106:ASN:O	2:G:108:ALA:N	2.54	0.41
1:B:5:HIS:HA	1:B:104:THR:O	2.21	0.41
1:E:6:SER:O	1:E:105:CYS:HA	2.20	0.41
2:H:32:CYS:O	2:H:35:SER:HB2	2.21	0.41
1:E:172:HIS:HB3	1:E:202:HIS:CD2	2.56	0.41
1:B:155:ASN:O	1:B:159:GLU:HG3	2.21	0.41
2:D:79:LEU:HG	2:D:89:THR:CG2	2.51	0.41
1:F:37:MET:HG2	5:F:4560:HOH:O	2.20	0.41
2:G:32:CYS:HB3	2:G:35:SER:OG	2.20	0.41
2:H:50:GLN:O	2:H:52:LYS:N	2.54	0.41
1:B:147:LYS:HG3	5:B:2534:HOH:O	2.21	0.40
1:F:37:MET:O	2:H:37:MET:HG2	2.21	0.40
1:B:118:TYR:O	1:B:243:ILE:HD11	2.21	0.40
1:F:40:GLY:O	1:F:65:MET:HG3	2.21	0.40
1:B:52:TRP:HA	1:B:53:PRO:HD2	1.83	0.40
1:E:184:LYS:HG2	5:E:3510:HOH:O	2.21	0.40
1:F:259:GLU:O	1:F:260:ASN:HB2	2.21	0.40
1:B:92:ARG:HG2	1:B:92:ARG:NH1	2.30	0.40
1:E:229:ASP:OD1	1:E:229:ASP:N	2.55	0.40
2:H:38:ILE:CG2	2:H:42:LEU:HG	2.48	0.40
1:A:229:ASP:OD1	1:A:229:ASP:N	2.54	0.40
2:D:32:CYS:O	2:D:35:SER:HB2	2.22	0.40
2:H:103:LEU:O	2:H:107:LEU:HD13	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	318/320 (99%)	292 (92%)	24 (8%)	2 (1%)	28	67
1	B	318/320 (99%)	291 (92%)	26 (8%)	1 (0%)	44	79
1	E	318/320 (99%)	292 (92%)	23 (7%)	3 (1%)	20	58
1	F	318/320 (99%)	293 (92%)	25 (8%)	0	100	100
2	C	106/108 (98%)	84 (79%)	20 (19%)	2 (2%)	9	38
2	D	106/108 (98%)	80 (76%)	22 (21%)	4 (4%)	4	18
2	G	106/108 (98%)	83 (78%)	20 (19%)	3 (3%)	6	26
2	H	106/108 (98%)	79 (74%)	24 (23%)	3 (3%)	6	26
All	All	1696/1712 (99%)	1494 (88%)	184 (11%)	18 (1%)	17	53

All (18) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	228	SER
1	A	231	ILE
1	E	228	SER
1	E	231	ILE
2	G	107	LEU
2	C	7	LEU
2	C	107	LEU
2	D	107	LEU
2	G	7	LEU
2	H	69	LYS
2	H	107	LEU
2	D	69	LYS
2	D	7	LEU
2	D	44	GLU
2	H	44	GLU
1	B	58	ASP
2	G	64	PRO
1	E	269	ILE

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	253/253 (100%)	231 (91%)	22 (9%)	12	38
1	B	253/253 (100%)	229 (90%)	24 (10%)	10	34
1	E	253/253 (100%)	233 (92%)	20 (8%)	14	43
1	F	253/253 (100%)	228 (90%)	25 (10%)	9	32
2	C	87/87 (100%)	79 (91%)	8 (9%)	11	35
2	D	87/87 (100%)	81 (93%)	6 (7%)	18	51
2	G	87/87 (100%)	80 (92%)	7 (8%)	14	42
2	H	87/87 (100%)	80 (92%)	7 (8%)	14	42
All	All	1360/1360 (100%)	1241 (91%)	119 (9%)	12	38

All (119) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	7	LYS
1	A	22	VAL
1	A	43	LEU
1	A	55	ASP
1	A	63	LEU
1	A	64	LEU
1	A	67	ARG
1	A	92	ARG
1	A	95	ARG
1	A	121	LEU
1	A	144	ARG
1	A	162	LEU
1	A	164	LEU
1	A	173	LEU
1	A	196	ASN
1	A	201	LEU
1	A	213	ASP
1	A	215	MET
1	A	222	LEU
1	A	227	ASN
1	A	236	VAL
1	A	318	ASP
1	B	11	LEU
1	B	30	GLN
1	B	43	LEU
1	B	64	LEU
1	B	86	LYS

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Mol	Chain	Res	Type
1	B	89	LEU
1	B	92	ARG
1	B	118	TYR
1	B	141	PHE
1	B	148	VAL
1	B	162	LEU
1	B	164	LEU
1	B	173	LEU
1	B	186	LEU
1	B	201	LEU
1	B	203	THR
1	B	214	GLN
1	B	220	VAL
1	B	222	LEU
1	B	226	GLN
1	B	236	VAL
1	B	256	LEU
1	B	288	MET
1	B	318	ASP
2	C	18	LYS
2	C	26	ASP
2	C	36	LYS
2	C	47	ASP
2	C	52	LYS
2	C	59	ASN
2	C	73	ARG
2	C	94	LEU
2	D	10	ASP
2	D	18	LYS
2	D	52	LYS
2	D	73	ARG
2	D	90	LYS
2	D	94	LEU
1	E	7	LYS
1	E	22	VAL
1	E	43	LEU
1	E	55	ASP
1	E	63	LEU
1	E	64	LEU
1	E	67	ARG
1	E	92	ARG
1	E	95	ARG

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Mol	Chain	Res	Type
1	E	144	ARG
1	E	162	LEU
1	E	164	LEU
1	E	173	LEU
1	E	201	LEU
1	E	213	ASP
1	E	215	MET
1	E	222	LEU
1	E	227	ASN
1	E	236	VAL
1	E	318	ASP
1	F	11	LEU
1	F	30	GLN
1	F	43	LEU
1	F	64	LEU
1	F	86	LYS
1	F	89	LEU
1	F	92	ARG
1	F	118	TYR
1	F	141	PHE
1	F	148	VAL
1	F	162	LEU
1	F	164	LEU
1	F	173	LEU
1	F	186	LEU
1	F	201	LEU
1	F	203	THR
1	F	206	THR
1	F	214	GLN
1	F	220	VAL
1	F	222	LEU
1	F	226	GLN
1	F	236	VAL
1	F	256	LEU
1	F	288	MET
1	F	318	ASP
2	G	26	ASP
2	G	36	LYS
2	G	47	ASP
2	G	59	ASN
2	G	73	ARG
2	G	94	LEU

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Mol	Chain	Res	Type
2	G	101	GLU
2	H	6	HIS
2	H	10	ASP
2	H	18	LYS
2	H	52	LYS
2	H	73	ARG
2	H	90	LYS
2	H	94	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (43) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	90	GLN
1	A	91	ASN
1	A	196	ASN
1	A	204	ASN
1	A	226	GLN
1	A	227	ASN
1	A	260	ASN
1	A	272	ASN
1	A	275	GLN
1	B	28	ASN
1	B	83	HIS
1	B	100	ASN
1	B	214	GLN
1	B	226	GLN
1	B	260	ASN
1	B	266	GLN
1	B	270	HIS
2	C	50	GLN
2	C	59	ASN
2	C	62	GLN
2	D	62	GLN
2	D	98	GLN
1	E	90	GLN
1	E	91	ASN
1	E	196	ASN
1	E	204	ASN
1	E	226	GLN
1	E	227	ASN
1	E	260	ASN
1	E	266	GLN

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Mol	Chain	Res	Type
1	E	272	ASN
1	E	275	GLN
1	F	28	ASN
1	F	100	ASN
1	F	214	GLN
1	F	226	GLN
1	F	260	ASN
1	F	266	GLN
2	G	50	GLN
2	G	59	ASN
2	G	62	GLN
2	H	62	GLN
2	H	98	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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

8 ligands are 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	FAD	A	1500	-	51,58,58	1.77	8 (15%)	54,89,89	3.21	19 (35%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	3AA	A	1501	-	42,50,50	1.47	6 (14%)	48,77,77	1.20	4 (8%)
3	FAD	B	2500	-	51,58,58	1.94	8 (15%)	54,89,89	2.78	14 (25%)
4	3AA	B	2501	-	42,50,50	1.38	7 (16%)	48,77,77	1.11	2 (4%)
3	FAD	E	3500	-	51,58,58	1.82	7 (13%)	54,89,89	3.16	17 (31%)
4	3AA	E	3501	-	42,50,50	1.31	5 (11%)	48,77,77	1.22	4 (8%)
3	FAD	F	4500	-	51,58,58	1.90	10 (19%)	54,89,89	2.86	15 (27%)
4	3AA	F	4501	-	42,50,50	1.37	7 (16%)	48,77,77	1.12	2 (4%)

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	FAD	A	1500	-	-	0/28/50/50	0/6/6/6
4	3AA	A	1501	-	-	0/23/63/63	0/5/5/5
3	FAD	B	2500	-	-	0/28/50/50	0/6/6/6
4	3AA	B	2501	-	-	0/23/63/63	0/5/5/5
3	FAD	E	3500	-	-	0/28/50/50	0/6/6/6
4	3AA	E	3501	-	-	0/23/63/63	0/5/5/5
3	FAD	F	4500	-	-	0/28/50/50	0/6/6/6
4	3AA	F	4501	-	-	0/23/63/63	0/5/5/5

All (58) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	F	4501	3AA	C8A-N7A	-3.20	1.28	1.34
4	A	1501	3AA	C8A-N7A	-3.11	1.28	1.34
4	B	2501	3AA	C8A-N7A	-3.07	1.28	1.34
4	E	3501	3AA	C8A-N7A	-2.97	1.29	1.34
3	F	4500	FAD	C2-N1	-2.73	1.32	1.38
3	E	3500	FAD	C8A-N7A	-2.65	1.29	1.34
3	F	4500	FAD	C8A-N7A	-2.63	1.29	1.34
3	A	1500	FAD	C8A-N7A	-2.57	1.29	1.34
3	B	2500	FAD	C8A-N7A	-2.41	1.30	1.34
3	B	2500	FAD	C2B-C1B	-2.24	1.50	1.53
4	F	4501	3AA	C3N-N7N	-2.14	1.30	1.38
3	A	1500	FAD	C2-N1	-2.04	1.34	1.38
4	F	4501	3AA	C5A-C4A	-2.00	1.36	1.40
3	B	2500	FAD	C8-C7	2.03	1.46	1.41
4	B	2501	3AA	O4D-C1D	2.03	1.44	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1501	3AA	C2N-C3N	2.06	1.44	1.40
3	E	3500	FAD	C2A-N3A	2.08	1.35	1.32
4	E	3501	3AA	P2B-O2B	2.12	1.63	1.59
4	B	2501	3AA	C4N-C3N	2.14	1.44	1.39
4	B	2501	3AA	O3B-C3B	2.15	1.47	1.43
4	A	1501	3AA	P2B-O2B	2.20	1.63	1.59
4	F	4501	3AA	O4B-C1B	2.22	1.44	1.41
3	A	1500	FAD	C10-N1	2.28	1.36	1.33
3	F	4500	FAD	C8-C7	2.31	1.46	1.41
4	F	4501	3AA	P2B-O2B	2.33	1.63	1.59
3	A	1500	FAD	C9-C9A	2.33	1.45	1.40
4	B	2501	3AA	P2B-O2B	2.34	1.63	1.59
4	E	3501	3AA	O4D-C1D	2.36	1.44	1.41
3	F	4500	FAD	C7M-C7	2.47	1.55	1.51
3	B	2500	FAD	C9-C9A	2.47	1.46	1.40
3	F	4500	FAD	C5X-N5	2.48	1.39	1.35
3	A	1500	FAD	C8-C7	2.51	1.47	1.41
3	F	4500	FAD	C10-N1	2.59	1.36	1.33
3	E	3500	FAD	C8-C7	2.68	1.47	1.41
3	F	4500	FAD	C9-C9A	2.73	1.46	1.40
4	B	2501	3AA	C5D-C4D	2.79	1.60	1.51
4	E	3501	3AA	C6N-N1N	3.01	1.43	1.35
4	F	4501	3AA	C5D-C4D	3.03	1.61	1.51
4	E	3501	3AA	O4B-C1B	3.14	1.45	1.41
3	B	2500	FAD	C5X-N5	3.18	1.40	1.35
4	A	1501	3AA	O4B-C1B	3.19	1.45	1.41
3	E	3500	FAD	C10-N1	3.20	1.37	1.33
4	A	1501	3AA	C6N-N1N	3.26	1.43	1.35
4	F	4501	3AA	C6N-N1N	3.44	1.44	1.35
3	E	3500	FAD	C4X-N5	3.58	1.38	1.33
3	A	1500	FAD	C4X-N5	3.58	1.38	1.33
4	B	2501	3AA	C6N-N1N	3.70	1.45	1.35
3	B	2500	FAD	C4-N3	3.76	1.39	1.33
3	F	4500	FAD	C4-N3	4.09	1.40	1.33
4	A	1501	3AA	O4D-C1D	4.10	1.46	1.41
3	A	1500	FAD	C4-N3	4.48	1.41	1.33
3	E	3500	FAD	C4-N3	4.50	1.41	1.33
3	F	4500	FAD	C4X-N5	4.66	1.40	1.33
3	B	2500	FAD	C4X-N5	5.36	1.41	1.33
3	E	3500	FAD	C9A-N10	7.59	1.48	1.38
3	A	1500	FAD	C9A-N10	7.63	1.48	1.38
3	F	4500	FAD	C9A-N10	8.26	1.49	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	2500	FAD	C9A-N10	8.82	1.50	1.38

All (77) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1500	FAD	C4X-C10-N10	-9.70	113.78	120.52
3	E	3500	FAD	C4X-C10-N10	-8.97	114.29	120.52
3	B	2500	FAD	C4X-C10-N10	-7.46	115.34	120.52
3	F	4500	FAD	C4X-C10-N10	-7.45	115.34	120.52
3	A	1500	FAD	C5X-C9A-N10	-6.86	112.56	117.66
3	F	4500	FAD	C4X-C4-N3	-6.62	114.05	123.48
3	E	3500	FAD	C4X-C4-N3	-6.45	114.30	123.48
3	A	1500	FAD	C4X-C4-N3	-6.44	114.32	123.48
3	B	2500	FAD	C4X-C4-N3	-6.30	114.51	123.48
3	E	3500	FAD	C5X-C9A-N10	-6.07	113.15	117.66
3	E	3500	FAD	C6-C5X-N5	-5.16	112.90	118.97
3	A	1500	FAD	C6-C5X-N5	-4.60	113.57	118.97
3	F	4500	FAD	C5X-C9A-N10	-3.89	114.77	117.66
3	B	2500	FAD	C5X-C9A-N10	-3.78	114.85	117.66
3	A	1500	FAD	C4B-O4B-C1B	-3.46	106.09	109.77
3	B	2500	FAD	C4-C4X-N5	-3.44	114.91	118.68
3	E	3500	FAD	C4-C4X-N5	-3.36	114.99	118.68
3	A	1500	FAD	C4-C4X-N5	-3.31	115.05	118.68
3	B	2500	FAD	C6-C5X-N5	-3.26	115.13	118.97
3	F	4500	FAD	C4-C4X-C10	-3.22	117.36	119.96
3	B	2500	FAD	C4-C4X-C10	-3.14	117.42	119.96
3	F	4500	FAD	C4-C4X-N5	-3.13	115.25	118.68
3	F	4500	FAD	C6-C5X-N5	-2.99	115.45	118.97
3	A	1500	FAD	C4-C4X-C10	-2.97	117.56	119.96
3	A	1500	FAD	O3B-C3B-C4B	-2.92	102.56	111.09
3	A	1500	FAD	C1'-N10-C10	-2.81	115.62	118.50
3	A	1500	FAD	C4'-C3'-C2'	-2.66	107.68	113.41
3	E	3500	FAD	C4-C4X-C10	-2.63	117.84	119.96
3	E	3500	FAD	C1'-N10-C10	-2.60	115.84	118.50
3	E	3500	FAD	O3B-C3B-C4B	-2.59	103.51	111.09
4	B	2501	3AA	C3N-C2N-N1N	-2.57	117.93	120.77
3	F	4500	FAD	O2'-C2'-C1'	-2.56	103.87	109.79
4	A	1501	3AA	C3N-C2N-N1N	-2.54	117.97	120.77
4	E	3501	3AA	C3N-C2N-N1N	-2.50	118.02	120.77
3	F	4500	FAD	C1B-N9A-C4A	-2.49	122.34	126.64
4	F	4501	3AA	C3N-C2N-N1N	-2.40	118.12	120.77
3	E	3500	FAD	C4'-C3'-C2'	-2.30	108.46	113.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	2500	FAD	O2'-C2'-C1'	-2.10	104.92	109.79
3	F	4500	FAD	O4'-C4'-C5'	-2.09	105.35	110.00
3	A	1500	FAD	N3A-C2A-N1A	-2.06	127.06	128.86
3	E	3500	FAD	C4B-O4B-C1B	-2.06	107.58	109.77
3	B	2500	FAD	C4X-N5-C5X	-2.05	114.59	116.76
4	A	1501	3AA	O3D-C3D-C2D	2.01	118.27	111.83
4	E	3501	3AA	O3D-C3D-C2D	2.02	118.29	111.83
3	E	3500	FAD	O4'-C4'-C3'	2.02	114.10	109.09
3	E	3500	FAD	O2A-PA-O1A	2.06	122.93	112.28
3	A	1500	FAD	C4A-C5A-N7A	2.08	111.42	109.41
4	E	3501	3AA	C4D-O4D-C1D	2.13	112.04	109.77
4	A	1501	3AA	O5D-C5D-C4D	2.18	116.72	109.00
3	F	4500	FAD	O3'-C3'-C2'	2.21	114.30	108.82
3	A	1500	FAD	O4B-C4B-C3B	2.23	109.59	105.17
3	A	1500	FAD	C7M-C7-C8	2.32	125.59	120.72
3	F	4500	FAD	O4'-C4'-C3'	2.59	115.51	109.09
3	A	1500	FAD	O4'-C4'-C3'	2.61	115.57	109.09
3	E	3500	FAD	C7M-C7-C8	2.73	126.44	120.72
3	B	2500	FAD	O4'-C4'-C3'	2.75	115.91	109.09
3	B	2500	FAD	C1'-N10-C9A	2.75	120.87	118.35
3	B	2500	FAD	C1'-C2'-C3'	2.79	117.80	109.82
3	F	4500	FAD	C1'-C2'-C3'	2.80	117.82	109.82
3	B	2500	FAD	C9A-C5X-N5	2.84	126.46	122.24
3	F	4500	FAD	C9A-C5X-N5	2.96	126.64	122.24
4	A	1501	3AA	C2N-C3N-C4N	3.28	121.32	117.05
3	A	1500	FAD	C9A-C5X-N5	3.29	127.13	122.24
4	B	2501	3AA	C2N-C3N-C4N	3.32	121.38	117.05
4	E	3501	3AA	C2N-C3N-C4N	3.36	121.43	117.05
4	F	4501	3AA	C2N-C3N-C4N	3.40	121.48	117.05
3	E	3500	FAD	C9A-C5X-N5	3.55	127.52	122.24
3	A	1500	FAD	C1'-N10-C9A	3.56	121.61	118.35
3	E	3500	FAD	C1'-N10-C9A	4.31	122.30	118.35
3	E	3500	FAD	C10-C4X-N5	5.64	127.08	120.59
3	A	1500	FAD	C10-C4X-N5	5.81	127.28	120.59
3	F	4500	FAD	C10-C4X-N5	5.91	127.39	120.59
3	B	2500	FAD	C10-C4X-N5	6.15	127.66	120.59
3	B	2500	FAD	C4-N3-C2	12.67	126.24	115.16
3	A	1500	FAD	C4-N3-C2	13.47	126.94	115.16
3	F	4500	FAD	C4-N3-C2	13.54	127.00	115.16
3	E	3500	FAD	C4-N3-C2	13.97	127.38	115.16

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1501	3AA	4	0
4	B	2501	3AA	2	0
4	E	3501	3AA	3	0
4	F	4501	3AA	3	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	320/320 (100%)	-0.42	4 (1%) 77 59	12, 35, 59, 105	0
1	B	320/320 (100%)	-0.46	0 100 100	12, 31, 56, 78	0
1	E	320/320 (100%)	-0.41	5 (1%) 72 53	11, 35, 60, 104	0
1	F	320/320 (100%)	-0.45	2 (0%) 89 77	13, 32, 57, 78	0
2	C	108/108 (100%)	0.69	10 (9%) 9 5	47, 73, 114, 138	7 (6%)
2	D	108/108 (100%)	0.99	23 (21%) 1 1	44, 85, 124, 127	7 (6%)
2	G	108/108 (100%)	0.72	13 (12%) 5 2	47, 73, 113, 138	7 (6%)
2	H	108/108 (100%)	0.89	24 (22%) 1 1	43, 85, 123, 127	7 (6%)
All	All	1712/1712 (100%)	-0.12	81 (4%) 32 20	11, 39, 105, 138	28 (1%)

All (81) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	C	1	SER	12.3
2	G	1	SER	8.5
2	H	6	HIS	7.8
2	G	4	ILE	7.1
2	C	2	ASP	7.0
2	D	1	SER	6.9
2	G	2	ASP	5.9
2	C	4	ILE	5.8
2	C	3	LYS	5.6
2	D	6	HIS	5.4
2	G	3	LYS	5.4
2	H	1	SER	4.9
2	D	14	THR	4.5
2	H	19	ALA	4.4
2	D	108	ALA	4.3
1	A	319	ALA	4.1

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Mol	Chain	Res	Type	RSRZ
2	C	14	THR	4.1
2	D	53	LEU	4.1
2	H	108	ALA	3.9
2	C	10	ASP	3.7
2	H	81	PHE	3.5
2	D	106	ASN	3.5
2	D	23	ILE	3.5
2	D	12	PHE	3.5
2	G	56	ALA	3.4
2	D	17	LEU	3.3
2	D	19	ALA	3.3
2	H	18	LYS	3.3
2	D	84	GLY	3.3
1	A	320	LYS	3.2
2	D	21	GLY	3.2
2	G	14	THR	3.2
2	D	81	PHE	3.1
2	G	10	ASP	3.0
2	H	107	LEU	3.0
2	D	20	ASP	3.0
2	D	61	ASP	3.0
1	E	1	GLY	2.9
2	D	22	ALA	2.9
1	E	320	LYS	2.9
2	G	50	GLN	2.9
1	A	1	GLY	2.9
2	H	14	THR	2.9
2	H	20	ASP	2.9
2	H	106	ASN	2.8
2	D	16	VAL	2.8
2	G	11	SER	2.8
1	A	318	ASP	2.8
2	C	15	ASP	2.7
2	H	21	GLY	2.7
2	H	105	ALA	2.7
2	H	2	ASP	2.7
2	D	13	ASP	2.6
1	E	318	ASP	2.6
2	G	20	ASP	2.6
2	H	70	TYR	2.6
2	D	10	ASP	2.5
2	D	4	ILE	2.5

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Mol	Chain	Res	Type	RSRZ
1	F	118	TYR	2.5
2	H	100	LYS	2.5
1	E	319	ALA	2.4
2	H	10	ASP	2.4
2	G	6	HIS	2.3
2	H	11	SER	2.3
2	H	53	LEU	2.3
2	H	83	ASN	2.3
2	H	13	ASP	2.3
2	D	88	ALA	2.3
2	D	70	TYR	2.3
2	H	23	ILE	2.3
2	C	55	VAL	2.3
2	H	82	LYS	2.2
2	H	61	ASP	2.1
2	G	15	ASP	2.1
2	H	22	ALA	2.1
2	G	55	VAL	2.1
2	C	50	GLN	2.1
1	F	2	THR	2.1
1	E	214	GLN	2.0
2	D	2	ASP	2.0
2	C	8	THR	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(\AA^2)	Q<0.9
4	3AA	B	2501	46/46	0.94	0.18	0.46	23,30,36,36	0
3	FAD	F	4500	53/53	0.97	0.17	0.35	14,24,28,29	0
3	FAD	B	2500	53/53	0.98	0.17	0.23	15,22,27,28	0
4	3AA	E	3501	46/46	0.94	0.16	0.18	30,35,42,42	0
4	3AA	A	1501	46/46	0.94	0.16	0.16	29,32,41,42	0
4	3AA	F	4501	46/46	0.95	0.16	0.15	26,32,39,41	0
3	FAD	E	3500	53/53	0.98	0.14	-0.05	13,21,29,30	0
3	FAD	A	1500	53/53	0.98	0.15	-0.05	15,20,28,31	0

6.5 Other polymers [i](#)

There are no such residues in this entry.