



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 02:27 AM UTC

PDB ID : 3MP4 / pdb_00003mp4
Title : Crystal structure of Human lyase R41M mutant
Authors : Fu, Z.; Runquist, J.A.; Montgomery, C.; Mizioro, H.M.; Kim, J.-J.P.
Deposited on : 2010-04-24
Resolution : 2.20 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

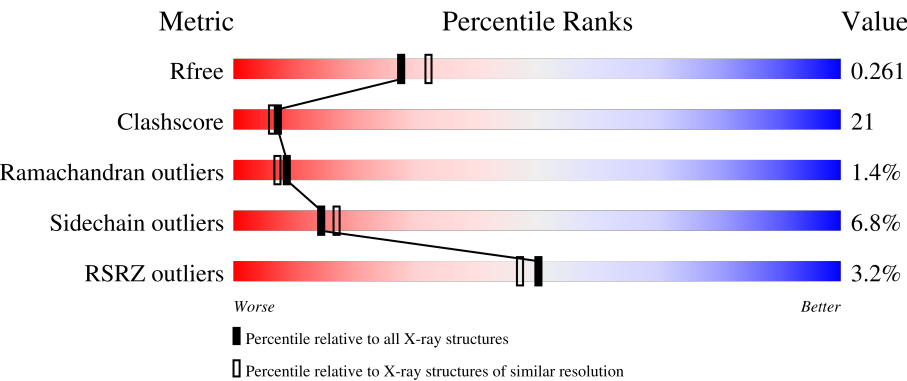
MolProbity	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R _{free}	180053	6164 (2.20-2.20)
Clashscore	190562	6851 (2.20-2.20)
Ramachandran outliers	187476	6768 (2.20-2.20)
Sidechain outliers	187428	6769 (2.20-2.20)
RSRZ outliers	180081	6166 (2.20-2.20)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	298	<div><div>3%</div><div></div><div>71%</div><div>22%</div><div>5% ..</div></div>
1	B	298	<div><div>2%</div><div></div><div>68%</div><div>27%</div><div>..</div></div>
1	C	298	<div><div>7%</div><div></div><div>55%</div><div>40%</div><div>..</div></div>
1	D	298	<div><div>%</div><div></div><div>67%</div><div>27%</div><div>..</div></div>
1	E	298	<div><div>%</div><div></div><div>67%</div><div>27%</div><div>5% ..</div></div>

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Mol	Chain	Length	Quality of chain
1	F	298	<div><div></div><div>6%</div><div>52%</div><div>41%</div><div></div><div></div></div>

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 13431 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 Hydroxymethylglutaryl-CoA lyase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	296	Total	C	N	O	S	0	0	0
			2186	1389	362	417	18			
1	B	296	Total	C	N	O	S	0	0	0
			2186	1389	362	417	18			
1	C	296	Total	C	N	O	S	0	0	0
			2186	1389	362	417	18			
1	D	296	Total	C	N	O	S	0	0	0
			2186	1389	362	417	18			
1	E	296	Total	C	N	O	S	0	0	0
			2186	1389	362	417	18			
1	F	287	Total	C	N	O	S	0	0	0
			2119	1348	350	404	17			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	41	MET	ARG	engineered mutation	UNP P35914
B	41	MET	ARG	engineered mutation	UNP P35914
C	41	MET	ARG	engineered mutation	UNP P35914
D	41	MET	ARG	engineered mutation	UNP P35914
E	41	MET	ARG	engineered mutation	UNP P35914
F	41	MET	ARG	engineered mutation	UNP P35914

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	98	Total	O	0	0
			98	98		
2	B	68	Total	O	0	0
			68	68		
2	C	34	Total	O	0	0
			34	34		

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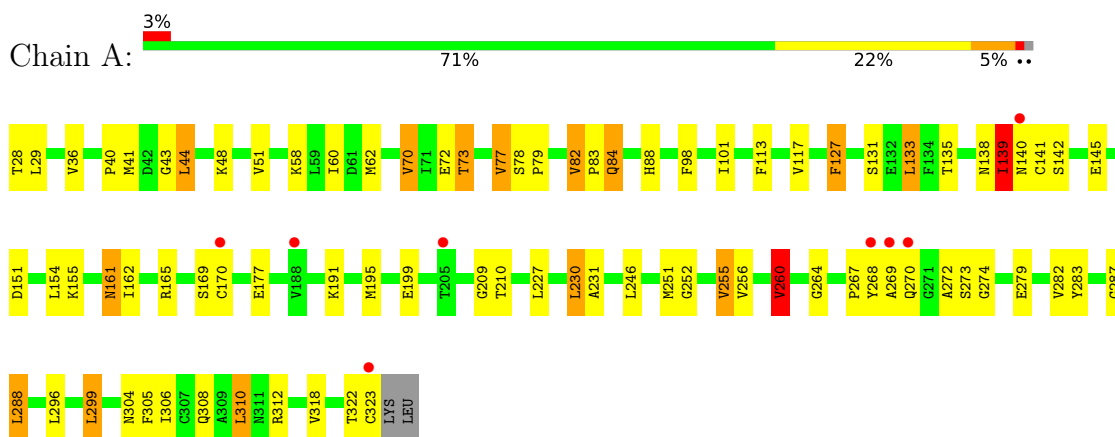
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	D	76	Total 76	O 76	0	0
2	E	78	Total 78	O 78	0	0
2	F	28	Total 28	O 28	0	0

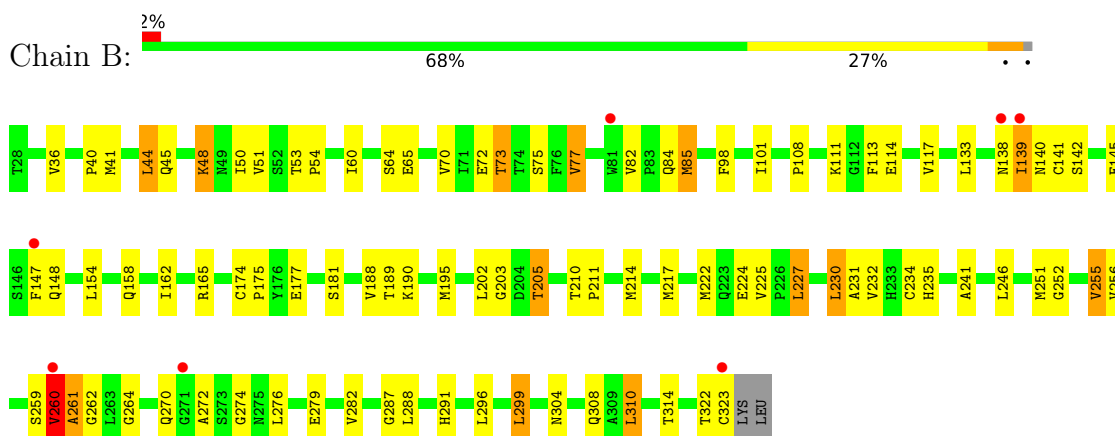
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and 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.

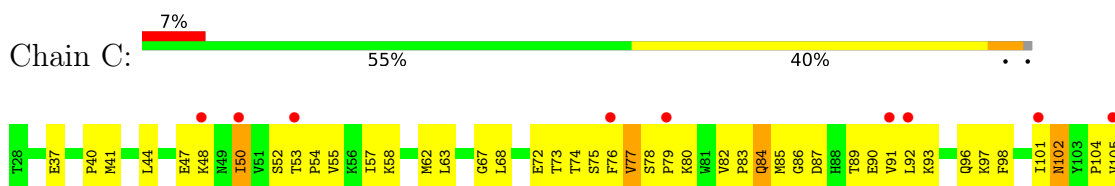
• Molecule 1: Hydroxymethylglutaryl-CoA lyase

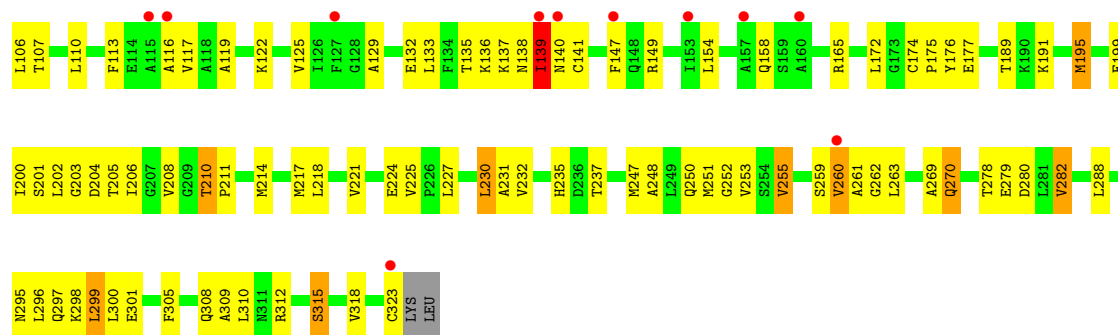


• Molecule 1: Hydroxymethylglutaryl-CoA lyase

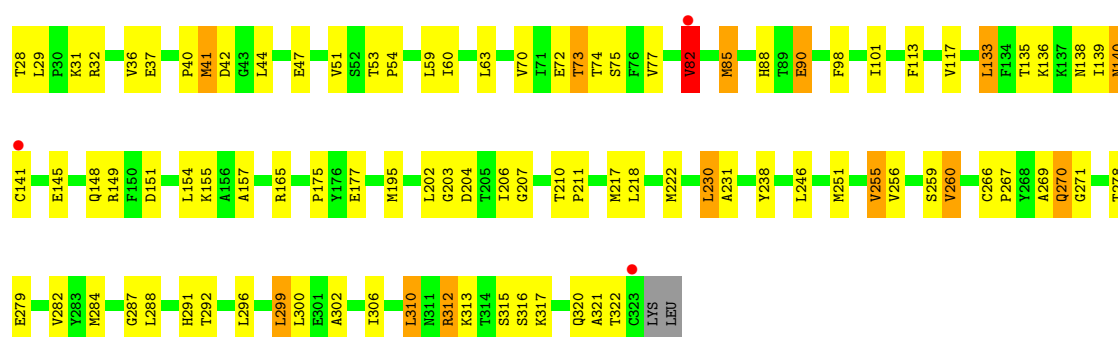


• Molecule 1: Hydroxymethylglutaryl-CoA lyase

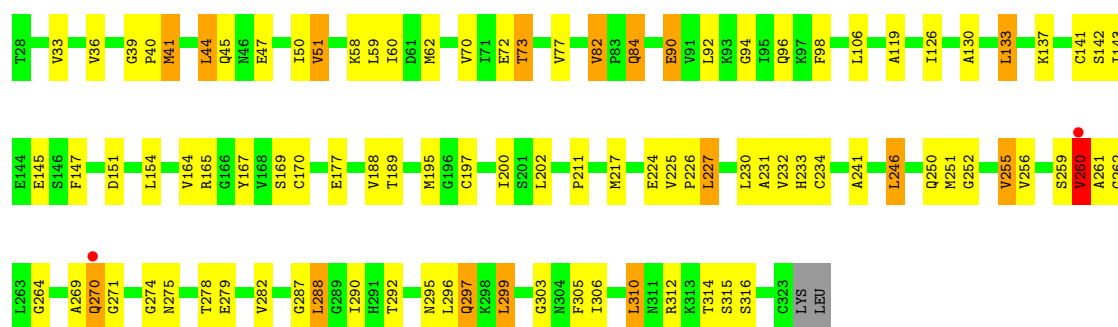




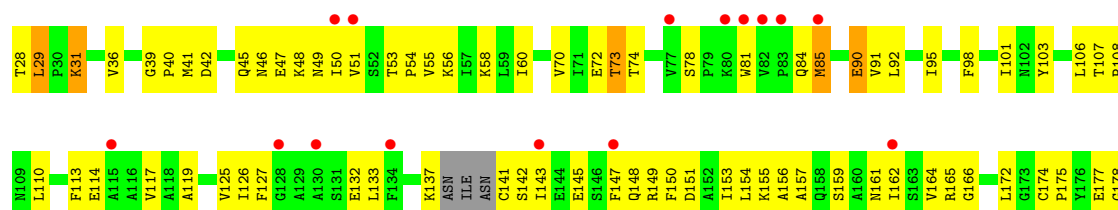
● Molecule 1: Hydroxymethylglutaryl-CoA lyase

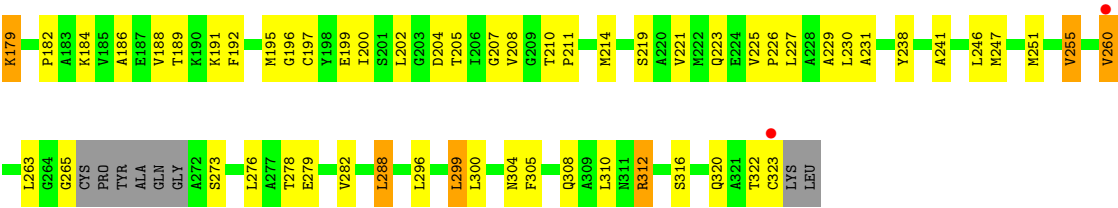


● Molecule 1: Hydroxymethylglutaryl-CoA lyase



● Molecule 1: Hydroxymethylglutaryl-CoA lyase





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	196.49Å 116.62Å 86.98Å 90.00° 112.80° 90.00°	Depositor
Resolution (Å)	29.16 – 2.20 29.16 – 2.20	Depositor EDS
% Data completeness (in resolution range)	91.2 (29.16-2.20) 91.2 (29.16-2.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.05	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.50 (at 2.20Å)	Xtriage
Refinement program	CNS 1.2	Depositor
R, R_{free}	0.219 , 0.261 0.219 , 0.261	Depositor DCC
R_{free} test set	8395 reflections (10.03%)	wwPDB-VP
Wilson B-factor (Å ²)	36.6	Xtriage
Anisotropy	0.338	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 40.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	13431	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 4.16% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.49	0/2221	0.95	5/3007 (0.2%)
1	B	0.44	0/2221	0.93	6/3007 (0.2%)
1	C	0.38	0/2221	0.92	3/3007 (0.1%)
1	D	0.44	0/2221	0.94	7/3007 (0.2%)
1	E	0.42	0/2221	0.94	7/3007 (0.2%)
1	F	0.37	0/2150	0.89	5/2906 (0.2%)
All	All	0.42	0/13255	0.93	33/17941 (0.2%)

There are no bond length outliers.

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	73	THR	N-CA-C	9.49	121.39	111.14
1	E	73	THR	N-CA-C	8.27	121.49	111.40
1	B	73	THR	N-CA-C	7.74	120.84	111.40
1	E	94	GLY	N-CA-C	7.14	122.94	113.37
1	D	73	THR	N-CA-C	7.00	122.12	112.04
1	A	73	THR	N-CA-C	6.80	121.84	112.04
1	B	148	GLN	N-CA-C	-6.53	104.09	111.14
1	A	209	GLY	N-CA-C	6.30	120.27	112.14
1	E	227	LEU	N-CA-C	6.22	118.57	111.11
1	F	202	LEU	CA-C-N	-5.94	118.08	122.18
1	F	202	LEU	C-N-CA	-5.94	118.08	122.18
1	B	181	SER	N-CA-C	5.89	117.07	109.65
1	C	203	GLY	N-CA-C	5.68	119.41	110.71
1	B	227	LEU	N-CA-C	5.61	117.84	111.11
1	F	227	LEU	N-CA-C	5.56	118.05	111.33
1	E	292	THR	N-CA-C	-5.53	107.79	114.75
1	F	73	THR	N-CA-C	5.53	116.99	110.97
1	D	203	GLY	N-CA-C	5.49	120.48	110.71
1	E	130	ALA	N-CA-C	-5.46	106.20	112.92
1	E	224	GLU	N-CA-C	5.45	120.06	113.41
1	C	315	SER	N-CA-C	-5.36	106.41	113.17

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	292	THR	N-CA-C	-5.30	106.75	113.43
1	F	29	LEU	N-CA-C	5.26	116.05	109.57
1	D	302	ALA	N-CA-C	-5.24	105.49	111.14
1	B	203	GLY	N-CA-C	5.22	120.01	110.71
1	A	127	PHE	N-CA-C	5.17	117.50	108.76
1	A	88	HIS	N-CA-C	5.17	117.59	111.33
1	B	64	SER	N-CA-C	-5.13	105.69	111.28
1	E	241	ALA	N-CA-C	5.12	117.25	111.11
1	A	230	LEU	N-CA-C	5.11	118.14	109.76
1	D	82	VAL	CA-C-N	5.05	124.54	119.19
1	D	82	VAL	C-N-CA	5.05	124.54	119.19
1	D	315	SER	N-CA-C	-5.02	106.85	113.17

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2186	0	2240	82	0
1	B	2186	0	2240	69	0
1	C	2186	0	2240	131	0
1	D	2186	0	2240	85	0
1	E	2186	0	2240	79	0
1	F	2119	0	2178	110	0
2	A	98	0	0	1	0
2	B	68	0	0	4	0
2	C	34	0	0	2	0
2	D	76	0	0	3	0
2	E	78	0	0	2	0
2	F	28	0	0	1	0
All	All	13431	0	13378	543	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 21.

All (543) 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:77:VAL:HG13	1:C:82:VAL:HG11	1.29	1.10
1:A:28:THR:HG22	1:A:29:LEU:H	1.20	1.03
1:F:191:LYS:HG3	1:F:195:MET:HE2	1.39	1.03
1:F:50:ILE:HG22	1:F:84:GLN:HG3	1.42	1.02
1:B:214:MET:HE1	1:B:232:VAL:HG21	1.44	1.00
1:B:48:LYS:H	1:B:48:LYS:HD2	1.30	0.94
1:E:36:VAL:HA	1:E:70:VAL:HG13	1.51	0.92
1:F:31:LYS:H	1:F:31:LYS:HZ2	1.19	0.88
1:D:36:VAL:HA	1:D:70:VAL:HG13	1.53	0.88
1:A:260:VAL:O	1:A:279:GLU:OE1	1.90	0.88
1:C:40:PRO:HA	1:C:44:LEU:HD23	1.57	0.86
1:C:211:PRO:HG2	1:D:288:LEU:HD21	1.58	0.85
1:D:154:LEU:HD12	1:D:195:MET:HE2	1.59	0.84
1:E:84:GLN:H	1:E:84:GLN:HE21	1.22	0.84
1:B:279:GLU:HG3	1:B:299:LEU:HD13	1.61	0.82
1:C:251:MET:HE2	1:C:251:MET:HA	1.62	0.81
1:B:264:GLY:O	1:B:274:GLY:HA3	1.81	0.81
1:C:47:GLU:HG2	1:C:310:LEU:HD21	1.63	0.81
1:D:139:ILE:CG2	1:D:149:ARG:HH22	1.94	0.80
1:E:84:GLN:H	1:E:84:GLN:NE2	1.78	0.80
1:F:31:LYS:H	1:F:31:LYS:NZ	1.78	0.80
1:D:139:ILE:HG21	1:D:149:ARG:HH22	1.46	0.80
1:C:77:VAL:CG1	1:C:82:VAL:HG11	2.09	0.79
1:B:36:VAL:HG22	1:B:70:VAL:HG11	1.65	0.79
1:E:50:ILE:HG22	1:E:84:GLN:HG3	1.64	0.79
1:B:77:VAL:HB	1:B:108:PRO:HG3	1.63	0.78
1:D:36:VAL:HG22	1:D:70:VAL:HG11	1.66	0.78
1:A:58:LYS:HG2	1:A:62:MET:HE2	1.66	0.78
1:A:279:GLU:HG3	1:A:299:LEU:HD13	1.66	0.78
1:E:36:VAL:HG22	1:E:70:VAL:HG11	1.66	0.78
1:C:113:PHE:O	1:C:117:VAL:HG23	1.84	0.77
1:C:78:SER:HB2	1:C:80:LYS:HG2	1.64	0.77
1:E:58:LYS:HG2	1:E:62:MET:HE2	1.66	0.77
1:A:138:ASN:O	1:A:139:ILE:HG23	1.84	0.76
1:B:36:VAL:HA	1:B:70:VAL:HG13	1.67	0.76
1:C:102:ASN:N	1:C:102:ASN:HD22	1.81	0.76
1:A:141:CYS:HB2	1:A:145:GLU:HB2	1.66	0.76
1:D:231:ALA:HB2	1:D:255:VAL:HG22	1.68	0.76
1:B:282:VAL:HG21	1:B:296:LEU:HD13	1.67	0.75
1:A:62:MET:HE1	1:A:305:PHE:CG	2.22	0.75
1:A:58:LYS:HG2	1:A:62:MET:CE	2.17	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:154:LEU:HD13	1:E:195:MET:HB3	1.69	0.74
1:D:231:ALA:CB	1:D:255:VAL:HG22	2.16	0.74
1:F:31:LYS:HZ3	1:F:31:LYS:HB2	1.51	0.74
1:F:78:SER:HB3	1:F:81:TRP:CD1	2.24	0.73
1:F:36:VAL:HA	1:F:70:VAL:HG13	1.71	0.72
1:C:40:PRO:HG2	1:C:72:GLU:O	1.90	0.72
1:D:154:LEU:HD13	1:D:195:MET:HB3	1.72	0.71
1:E:288:LEU:HD11	1:F:211:PRO:HD2	1.71	0.70
1:F:133:LEU:HB2	1:F:177:GLU:HG3	1.73	0.70
1:A:322:THR:O	1:A:323:CYS:HB2	1.89	0.70
1:B:282:VAL:CG2	1:B:296:LEU:HD13	2.22	0.70
1:F:106:LEU:HD12	1:F:125:VAL:O	1.92	0.69
1:A:191:LYS:HE2	1:A:195:MET:CE	2.22	0.69
1:F:141:CYS:N	1:F:149:ARG:HH12	1.91	0.69
1:C:138:ASN:O	1:C:139:ILE:HG23	1.92	0.69
1:F:322:THR:O	1:F:323:CYS:HB2	1.92	0.69
1:B:75:SER:HB3	1:B:85:MET:HG2	1.73	0.69
1:A:28:THR:HG22	1:A:29:LEU:N	2.01	0.69
1:A:60:ILE:HD13	1:A:73:THR:HG23	1.74	0.69
1:E:282:VAL:HG21	1:E:296:LEU:HD13	1.74	0.69
1:F:60:ILE:HD13	1:F:73:THR:HG23	1.75	0.69
1:F:42:ASP:HA	1:F:45:GLN:HE21	1.58	0.69
1:C:279:GLU:HG3	1:C:299:LEU:HD13	1.75	0.68
1:B:251:MET:HE2	1:B:251:MET:HA	1.75	0.68
1:D:136:LYS:C	1:D:138:ASN:H	2.01	0.68
1:D:151:ASP:O	1:D:155:LYS:HD3	1.93	0.68
1:C:87:ASP:O	1:C:91:VAL:HG23	1.92	0.68
1:E:40:PRO:HA	1:E:44:LEU:HD22	1.74	0.68
1:E:282:VAL:CG2	1:E:296:LEU:HD13	2.23	0.68
1:E:92:LEU:HD23	1:E:119:ALA:HB3	1.75	0.68
1:E:264:GLY:O	1:E:274:GLY:HA3	1.94	0.68
1:B:214:MET:CE	1:B:232:VAL:HG21	2.21	0.68
1:B:117:VAL:HG22	1:B:162:ILE:CD1	2.24	0.67
1:F:40:PRO:HG2	1:F:72:GLU:O	1.95	0.67
1:B:98:PHE:HB2	1:B:101:ILE:HD12	1.76	0.67
1:A:161:ASN:HD21	1:C:149:ARG:NH1	1.93	0.67
1:B:142:SER:HB3	1:B:145:GLU:HG3	1.77	0.66
1:D:41:MET:HE3	1:D:75:SER:N	2.10	0.66
1:C:138:ASN:C	1:C:139:ILE:HD13	2.20	0.66
1:E:233:HIS:HE1	1:E:275:ASN:OD1	1.79	0.66
1:D:284:MET:O	1:D:288:LEU:HD23	1.94	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:40:PRO:HG2	1:D:72:GLU:O	1.95	0.66
1:D:47:GLU:HG2	1:D:310:LEU:HD21	1.77	0.66
1:E:62:MET:HE1	1:E:305:PHE:CG	2.30	0.66
1:B:133:LEU:HD23	1:B:177:GLU:HG2	1.76	0.65
1:E:84:GLN:HE21	1:E:84:GLN:N	1.94	0.65
1:A:282:VAL:CG2	1:A:296:LEU:HD13	2.25	0.65
1:B:40:PRO:HG2	1:B:72:GLU:O	1.96	0.65
1:A:191:LYS:HE2	1:A:195:MET:HE1	1.78	0.65
1:B:189:THR:HG22	1:B:225:VAL:HG21	1.78	0.65
1:E:260:VAL:O	1:E:279:GLU:OE1	2.15	0.65
1:B:60:ILE:HD13	1:B:73:THR:HG23	1.78	0.65
1:E:142:SER:OG	1:E:145:GLU:HG3	1.97	0.65
1:A:84:GLN:H	1:A:84:GLN:NE2	1.93	0.64
1:D:282:VAL:HG21	1:D:296:LEU:HD13	1.79	0.64
1:E:36:VAL:HA	1:E:70:VAL:CG1	2.27	0.64
1:F:172:LEU:HD11	1:F:214:MET:HE2	1.80	0.64
1:A:40:PRO:HA	1:A:44:LEU:HD22	1.79	0.64
1:D:251:MET:HA	1:D:251:MET:HE2	1.80	0.64
1:E:40:PRO:HG2	1:E:72:GLU:O	1.98	0.64
1:B:231:ALA:CB	1:B:255:VAL:HG22	2.28	0.63
1:F:137:LYS:HD2	1:F:137:LYS:N	2.13	0.63
1:C:135:THR:HA	1:C:139:ILE:HD11	1.79	0.63
1:C:82:VAL:O	1:C:82:VAL:HG13	1.98	0.63
1:F:230:LEU:O	1:F:255:VAL:HG13	1.97	0.63
1:F:304:ASN:O	1:F:308:GLN:HG3	1.97	0.63
1:F:189:THR:HG22	1:F:225:VAL:HG21	1.79	0.63
1:A:282:VAL:HG21	1:A:296:LEU:HD13	1.80	0.63
1:B:154:LEU:HD13	1:B:195:MET:HB3	1.80	0.63
1:B:214:MET:HE1	1:B:232:VAL:CG2	2.26	0.63
1:F:151:ASP:OD1	1:F:155:LYS:HD3	1.99	0.63
1:C:96:GLN:O	1:C:97:LYS:HD3	1.99	0.63
1:D:154:LEU:CD1	1:D:195:MET:HB3	2.28	0.63
1:F:47:GLU:HG2	1:F:310:LEU:HD21	1.81	0.63
1:A:77:VAL:HG11	1:A:82:VAL:HG11	1.81	0.62
1:F:186:ALA:HA	1:F:221:VAL:HG22	1.82	0.62
1:C:62:MET:HE1	1:C:305:PHE:CG	2.35	0.62
1:A:83:PRO:HG2	1:A:84:GLN:HE21	1.64	0.61
1:F:154:LEU:HD13	1:F:195:MET:HB3	1.83	0.61
1:A:210:THR:HG21	1:B:287:GLY:HA3	1.82	0.61
1:C:154:LEU:O	1:C:158:GLN:HB2	2.01	0.61
1:B:291:HIS:HB2	2:B:763:HOH:O	2.00	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:172:LEU:HD12	1:F:204:ASP:HB2	1.82	0.61
1:B:50:ILE:HG22	1:B:84:GLN:HG3	1.82	0.60
1:E:279:GLU:OE1	1:E:279:GLU:N	2.34	0.60
1:C:58:LYS:HZ2	1:C:62:MET:HE2	1.65	0.60
1:F:36:VAL:HG22	1:F:70:VAL:HG11	1.83	0.60
1:C:53:THR:HG22	1:C:57:ILE:HD11	1.83	0.60
1:E:33:VAL:HG23	1:E:290:ILE:HG21	1.81	0.60
1:C:278:THR:O	1:C:282:VAL:HG13	2.02	0.60
1:C:279:GLU:HG2	1:C:300:LEU:HD23	1.83	0.60
1:F:282:VAL:CG2	1:F:296:LEU:HD13	2.31	0.60
1:B:259:SER:O	1:B:260:VAL:O	2.19	0.60
1:C:78:SER:HB2	1:C:80:LYS:CG	2.32	0.59
1:F:208:VAL:HG12	1:F:238:TYR:CE2	2.37	0.59
1:B:211:PRO:HD3	2:B:618:HOH:O	2.02	0.59
1:D:51:VAL:HG13	1:D:310:LEU:HD13	1.84	0.59
1:B:48:LYS:H	1:B:48:LYS:CD	2.04	0.59
1:B:40:PRO:HA	1:B:44:LEU:HD22	1.85	0.58
1:C:122:LYS:NZ	1:C:122:LYS:HB3	2.18	0.58
1:F:51:VAL:CG1	1:F:310:LEU:HD13	2.33	0.58
1:C:98:PHE:CB	1:C:101:ILE:HD12	2.33	0.58
1:C:154:LEU:HD13	1:C:195:MET:O	2.03	0.58
1:A:58:LYS:CG	1:A:62:MET:HE2	2.33	0.58
1:A:251:MET:HA	1:A:251:MET:HE2	1.85	0.58
1:D:139:ILE:HG21	1:D:149:ARG:NH2	2.16	0.58
1:F:200:ILE:HD12	1:F:200:ILE:N	2.18	0.58
1:C:98:PHE:HB2	1:C:101:ILE:HD12	1.85	0.58
1:D:202:LEU:HD13	1:D:217:MET:SD	2.44	0.57
1:B:190:LYS:HD3	1:B:224:GLU:HB3	1.86	0.57
1:C:259:SER:OG	1:C:263:LEU:HB2	2.04	0.57
1:C:211:PRO:HD3	2:C:620:HOH:O	2.05	0.57
1:C:41:MET:SD	1:C:41:MET:C	2.87	0.57
1:D:282:VAL:CG2	1:D:296:LEU:HD13	2.34	0.57
1:E:92:LEU:HD23	1:E:119:ALA:CB	2.34	0.57
1:E:51:VAL:HG13	1:E:310:LEU:HD12	1.87	0.57
1:C:129:ALA:HB3	1:C:135:THR:HG23	1.86	0.56
1:A:135:THR:HG22	1:A:141:CYS:O	2.04	0.56
1:C:191:LYS:HE2	1:C:195:MET:HE1	1.87	0.56
1:C:282:VAL:CG2	1:C:296:LEU:HD13	2.36	0.56
1:E:62:MET:HE1	1:E:305:PHE:CD2	2.40	0.56
1:E:231:ALA:CB	1:E:255:VAL:HG22	2.35	0.56
1:E:59:LEU:HD22	1:E:306:ILE:HD13	1.86	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:28:THR:CG2	1:A:29:LEU:H	2.02	0.56
1:C:135:THR:O	1:C:139:ILE:HG12	2.05	0.56
1:A:306:ILE:HG13	1:A:310:LEU:CD2	2.36	0.56
1:C:37:GLU:OE2	1:C:260:VAL:HG23	2.04	0.56
1:D:41:MET:HE3	1:D:74:THR:HA	1.87	0.56
1:E:77:VAL:HG11	1:E:82:VAL:HG11	1.87	0.56
1:E:270:GLN:CD	1:E:270:GLN:H	2.13	0.56
1:F:126:ILE:HD11	1:F:197:CYS:SG	2.46	0.56
1:D:211:PRO:HD3	2:D:671:HOH:O	2.06	0.56
1:A:231:ALA:CB	1:A:255:VAL:HG22	2.36	0.55
1:C:72:GLU:HA	1:C:104:PRO:HG2	1.88	0.55
1:C:53:THR:HG23	1:C:91:VAL:HG22	1.88	0.55
1:E:287:GLY:HA3	1:F:210:THR:HG21	1.89	0.55
1:A:40:PRO:HG2	1:A:72:GLU:O	2.07	0.55
1:A:84:GLN:H	1:A:84:GLN:CD	2.15	0.55
1:C:53:THR:O	1:C:57:ILE:HG13	2.06	0.55
1:C:308:GLN:C	1:C:310:LEU:H	2.15	0.55
1:C:89:THR:HG22	1:C:93:LYS:HE2	1.89	0.55
1:C:231:ALA:CB	1:C:255:VAL:HG22	2.36	0.55
1:C:232:VAL:HG23	1:C:253:VAL:HG11	1.89	0.55
1:A:154:LEU:HD13	1:A:195:MET:HG2	1.87	0.55
1:C:82:VAL:HG22	1:C:85:MET:HB2	1.88	0.55
1:F:53:THR:N	1:F:54:PRO:HD2	2.22	0.55
1:C:78:SER:O	1:C:82:VAL:HG12	2.07	0.55
1:C:92:LEU:HD23	1:C:119:ALA:HB3	1.89	0.55
1:D:136:LYS:C	1:D:138:ASN:N	2.65	0.55
1:F:58:LYS:HD3	1:F:305:PHE:CZ	2.42	0.55
1:F:147:PHE:CE1	1:F:191:LYS:HG2	2.42	0.54
1:D:154:LEU:CD1	1:D:195:MET:HE2	2.35	0.54
1:E:278:THR:HG22	1:E:299:LEU:HD11	1.89	0.54
1:A:279:GLU:HA	1:A:282:VAL:HG22	1.89	0.54
1:D:41:MET:HE3	1:D:74:THR:C	2.32	0.54
1:F:145:GLU:C	1:F:149:ARG:HH11	2.15	0.54
1:F:229:ALA:C	1:F:230:LEU:HD12	2.33	0.54
1:C:191:LYS:HE2	1:C:195:MET:CE	2.38	0.54
1:A:62:MET:HE1	1:A:305:PHE:CD2	2.43	0.54
1:F:247:MET:CE	1:F:251:MET:HE3	2.38	0.54
1:B:82:VAL:O	1:B:82:VAL:HG13	2.08	0.54
1:B:241:ALA:HB1	1:B:276:LEU:HB2	1.90	0.54
1:D:37:GLU:HG2	1:D:63:LEU:HD13	1.89	0.54
1:C:101:ILE:C	1:C:102:ASN:HD22	2.16	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:260:VAL:O	1:F:279:GLU:OE1	2.26	0.53
1:F:247:MET:O	1:F:247:MET:HE3	2.07	0.53
1:C:211:PRO:CG	1:D:288:LEU:HD21	2.35	0.53
1:C:262:GLY:HA3	1:C:315:SER:HB2	1.90	0.53
1:C:76:PHE:CD2	1:C:116:ALA:HB2	2.43	0.53
1:F:113:PHE:HE2	1:F:157:ALA:HB2	1.73	0.53
1:B:322:THR:O	1:B:323:CYS:HB2	2.08	0.53
1:C:102:ASN:N	1:C:102:ASN:ND2	2.51	0.53
1:F:174:CYS:SG	1:F:175:PRO:HD2	2.48	0.53
1:C:53:THR:N	1:C:54:PRO:HD2	2.23	0.52
1:C:83:PRO:HG2	1:C:84:GLN:NE2	2.24	0.52
1:C:74:THR:H	1:C:105:VAL:HG12	1.74	0.52
1:C:139:ILE:C	1:C:141:CYS:H	2.17	0.52
1:D:41:MET:HE2	1:D:41:MET:HA	1.91	0.52
1:B:231:ALA:HB1	1:B:255:VAL:HG22	1.92	0.52
1:D:90:GLU:H	1:D:90:GLU:CD	2.18	0.52
1:F:184:LYS:HE3	1:F:188:VAL:HG23	1.92	0.52
1:A:141:CYS:HA	1:A:145:GLU:OE2	2.08	0.52
1:F:133:LEU:HD13	1:F:137:LYS:NZ	2.24	0.52
1:F:145:GLU:O	1:F:148:GLN:HB2	2.10	0.52
1:F:51:VAL:HG13	1:F:310:LEU:HD13	1.91	0.52
1:A:58:LYS:HE3	1:A:305:PHE:CE1	2.45	0.52
1:C:154:LEU:CD1	1:C:195:MET:HG2	2.39	0.52
1:E:47:GLU:HG2	1:E:310:LEU:HD21	1.90	0.52
1:F:39:GLY:N	1:F:40:PRO:HD2	2.25	0.52
1:B:113:PHE:CZ	1:B:162:ILE:HD12	2.45	0.52
1:B:133:LEU:HD23	1:B:177:GLU:CG	2.40	0.52
1:D:279:GLU:HG2	1:D:300:LEU:HD23	1.92	0.52
1:C:84:GLN:CD	1:C:84:GLN:H	2.17	0.52
1:C:191:LYS:O	1:C:195:MET:HB2	2.10	0.52
1:E:189:THR:HG22	1:E:225:VAL:HG21	1.92	0.52
1:E:279:GLU:O	1:E:282:VAL:HG22	2.10	0.52
1:A:58:LYS:NZ	1:A:62:MET:HE2	2.24	0.51
1:E:126:ILE:HD11	1:E:197:CYS:SG	2.50	0.51
1:E:227:LEU:HD21	1:E:252:GLY:HA3	1.91	0.51
1:E:96:GLN:HB2	1:E:98:PHE:HE1	1.76	0.51
1:F:166:GLY:O	1:F:200:ILE:HA	2.11	0.51
1:D:139:ILE:O	1:D:140:ASN:HB2	2.11	0.51
1:F:199:GLU:C	1:F:200:ILE:HD12	2.35	0.51
1:A:138:ASN:C	1:A:139:ILE:HG12	2.35	0.51
1:C:37:GLU:HB2	1:C:68:LEU:CD1	2.41	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:280:ASP:OD1	1:C:318:VAL:HG23	2.11	0.51
1:C:78:SER:C	1:C:80:LYS:H	2.19	0.51
1:B:48:LYS:HD2	1:B:48:LYS:N	2.13	0.51
1:C:133:LEU:HD13	1:C:177:GLU:OE1	2.11	0.51
1:D:269:ALA:O	1:D:270:GLN:C	2.53	0.51
1:A:191:LYS:O	1:A:195:MET:HB2	2.10	0.51
1:F:46:ASN:HB3	1:F:265:GLY:H	1.75	0.51
1:E:141:CYS:HB2	1:E:145:GLU:OE1	2.11	0.50
1:F:322:THR:O	1:F:323:CYS:CB	2.58	0.50
1:C:63:LEU:HD21	1:C:260:VAL:HG22	1.93	0.50
1:F:178:GLY:O	1:F:179:LYS:C	2.54	0.50
1:C:132:GLU:HB3	1:C:136:LYS:NZ	2.27	0.50
1:E:58:LYS:HG2	1:E:62:MET:CE	2.39	0.50
1:C:210:THR:HG21	1:D:287:GLY:HA3	1.92	0.50
1:F:42:ASP:HA	1:F:45:GLN:NE2	2.24	0.50
1:A:227:LEU:HD21	1:A:252:GLY:HA3	1.92	0.50
1:C:204:ASP:HA	2:C:629:HOH:O	2.12	0.50
1:D:135:THR:HG22	1:D:141:CYS:O	2.11	0.50
1:F:164:VAL:O	1:F:197:CYS:HA	2.11	0.50
1:B:53:THR:N	1:B:54:PRO:HD2	2.27	0.50
1:B:231:ALA:HB2	1:B:255:VAL:HG22	1.94	0.50
1:C:52:SER:OG	1:C:55:VAL:HG23	2.11	0.50
1:E:231:ALA:HB2	1:E:255:VAL:HG22	1.93	0.50
1:F:98:PHE:HB2	1:F:101:ILE:HD12	1.93	0.50
1:B:154:LEU:O	1:B:158:GLN:HG3	2.11	0.50
1:C:295:ASN:OD1	1:C:298:LYS:HG3	2.12	0.49
1:A:154:LEU:CD1	1:A:195:MET:HG2	2.42	0.49
1:E:133:LEU:HB2	1:E:177:GLU:HG3	1.93	0.49
1:A:77:VAL:HG11	1:A:82:VAL:CG1	2.41	0.49
1:A:304:ASN:O	1:A:308:GLN:HG3	2.12	0.49
1:A:113:PHE:O	1:A:117:VAL:HG23	2.13	0.49
1:B:260:VAL:O	1:B:262:GLY:N	2.37	0.49
1:C:230:LEU:O	1:C:255:VAL:HG13	2.13	0.49
1:D:88:HIS:HE1	2:D:724:HOH:O	1.96	0.49
1:A:264:GLY:O	1:A:274:GLY:HA3	2.12	0.49
1:A:267:PRO:C	1:A:269:ALA:H	2.20	0.49
1:D:60:ILE:HD13	1:D:73:THR:HG23	1.95	0.49
1:E:47:GLU:HG2	1:E:310:LEU:CD2	2.42	0.49
1:F:241:ALA:HB1	1:F:276:LEU:HB2	1.95	0.49
1:B:205:THR:O	1:B:235:HIS:ND1	2.34	0.49
1:B:222:MET:HE3	1:B:227:LEU:HD13	1.93	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:133:LEU:HD23	1:D:177:GLU:HG2	1.95	0.49
1:E:96:GLN:HB2	1:E:98:PHE:CE1	2.48	0.49
1:F:51:VAL:HG23	1:F:56:LYS:HG3	1.94	0.49
1:C:137:LYS:HD2	1:C:176:TYR:CZ	2.48	0.48
1:E:58:LYS:NZ	1:E:62:MET:HE2	2.27	0.48
1:F:137:LYS:HD2	1:F:137:LYS:H	1.75	0.48
1:F:251:MET:HA	1:F:251:MET:HE2	1.95	0.48
1:D:51:VAL:CG1	1:D:310:LEU:HD13	2.43	0.48
1:F:165:ARG:HD2	1:F:199:GLU:OE2	2.12	0.48
1:C:139:ILE:HD13	1:C:139:ILE:N	2.27	0.48
1:C:279:GLU:HG2	1:C:300:LEU:CD2	2.43	0.48
1:A:282:VAL:HG23	1:A:296:LEU:HD13	1.95	0.48
1:F:58:LYS:HD3	1:F:305:PHE:CE1	2.48	0.48
1:C:67:GLY:O	1:C:68:LEU:C	2.55	0.48
1:C:147:PHE:CE1	1:C:191:LYS:HG2	2.47	0.48
1:D:32:ARG:HB3	1:D:291:HIS:HB3	1.95	0.48
1:C:217:MET:O	1:C:221:VAL:HG23	2.13	0.48
1:D:279:GLU:O	1:D:282:VAL:HG22	2.13	0.48
1:E:143:ILE:O	1:E:147:PHE:HD1	1.97	0.48
1:F:247:MET:HE1	1:F:251:MET:HE3	1.96	0.48
1:A:142:SER:OG	1:A:145:GLU:HG3	2.13	0.48
1:A:161:ASN:HD21	1:C:149:ARG:CZ	2.26	0.48
1:F:92:LEU:HD23	1:F:119:ALA:CB	2.43	0.48
1:C:282:VAL:HG21	1:C:296:LEU:HD13	1.96	0.48
1:D:155:LYS:HD2	1:D:155:LYS:N	2.29	0.48
1:E:39:GLY:N	1:E:40:PRO:HD2	2.29	0.48
1:F:91:VAL:O	1:F:95:ILE:HG23	2.13	0.48
1:A:142:SER:H	1:A:145:GLU:CD	2.22	0.47
1:C:199:GLU:C	1:C:200:ILE:HD12	2.39	0.47
1:E:270:GLN:CD	1:E:270:GLN:N	2.71	0.47
1:B:260:VAL:C	1:B:262:GLY:H	2.20	0.47
1:C:106:LEU:O	1:C:107:THR:HG23	2.13	0.47
1:F:127:PHE:N	1:F:127:PHE:CD1	2.80	0.47
1:A:273:SER:HB2	2:A:555:HOH:O	2.14	0.47
1:C:62:MET:HE1	1:C:305:PHE:CD2	2.49	0.47
1:C:189:THR:HG22	1:C:225:VAL:HG21	1.96	0.47
1:E:303:GLY:O	1:E:306:ILE:HG22	2.13	0.47
1:F:28:THR:HG23	1:F:29:LEU:N	2.28	0.47
1:A:169:SER:O	1:A:170:CYS:SG	2.71	0.47
1:C:269:ALA:O	1:C:270:GLN:C	2.57	0.47
1:D:41:MET:HE3	1:D:74:THR:CA	2.45	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:48:LYS:H	1:A:48:LYS:HD2	1.78	0.47
1:D:36:VAL:HA	1:D:70:VAL:CG1	2.36	0.47
1:E:51:VAL:HG13	1:E:310:LEU:CD1	2.44	0.47
1:C:75:SER:HA	1:C:106:LEU:HB2	1.95	0.47
1:D:218:LEU:O	1:D:222:MET:HG3	2.15	0.47
1:F:154:LEU:CD1	1:F:195:MET:HB3	2.43	0.47
1:C:132:GLU:HB3	1:C:136:LYS:HZ3	1.80	0.47
1:C:202:LEU:HD13	1:C:217:MET:SD	2.55	0.47
1:C:297:GLN:O	1:C:301:GLU:HG3	2.15	0.47
1:D:260:VAL:O	1:D:279:GLU:OE1	2.33	0.47
1:F:156:ALA:O	1:F:159:SER:HB2	2.14	0.47
1:A:77:VAL:CG1	1:A:82:VAL:CG1	2.93	0.47
1:D:60:ILE:CD1	1:D:73:THR:HG23	2.44	0.47
1:C:84:GLN:NE2	1:C:84:GLN:H	2.13	0.47
1:D:316:SER:O	1:D:320:GLN:HG3	2.14	0.47
1:A:117:VAL:HG22	1:A:162:ILE:CD1	2.45	0.47
1:B:272:ALA:HB1	2:B:871:HOH:O	2.14	0.47
1:C:41:MET:HG3	1:C:106:LEU:HD13	1.97	0.47
1:C:78:SER:C	1:C:80:LYS:N	2.71	0.47
1:D:175:PRO:HB3	1:D:206:ILE:HG21	1.96	0.47
1:F:133:LEU:HD13	1:F:137:LYS:HZ3	1.79	0.47
1:F:231:ALA:CB	1:F:255:VAL:HG22	2.45	0.46
1:C:79:PRO:HG3	1:C:86:GLY:HA2	1.97	0.46
1:C:227:LEU:HD21	1:C:252:GLY:HA3	1.96	0.46
1:E:90:GLU:HG3	2:E:714:HOH:O	2.16	0.46
1:E:39:GLY:HA2	1:E:259:SER:OG	2.15	0.46
1:E:200:ILE:N	1:E:200:ILE:HD12	2.31	0.46
1:F:73:THR:OG1	1:F:103:TYR:HB3	2.16	0.46
1:F:191:LYS:O	1:F:195:MET:HG3	2.16	0.46
1:D:77:VAL:HG11	1:D:82:VAL:HG11	1.97	0.46
1:E:41:MET:O	1:E:41:MET:HE2	2.15	0.46
1:F:50:ILE:CG2	1:F:84:GLN:HG3	2.30	0.46
1:F:90:GLU:OE1	1:F:90:GLU:N	2.47	0.46
1:A:270:GLN:OE1	1:B:323:CYS:HA	2.16	0.46
1:A:270:GLN:C	1:A:272:ALA:H	2.24	0.46
1:E:167:TYR:CE1	1:E:233:HIS:HD2	2.34	0.46
1:E:295:ASN:OD1	1:E:297:GLN:HG2	2.14	0.46
1:A:165:ARG:HD2	1:A:199:GLU:OE2	2.16	0.46
1:C:237:THR:HG22	1:D:321:ALA:HB2	1.96	0.46
1:F:182:PRO:HD2	2:F:776:HOH:O	2.16	0.46
1:D:207:GLY:O	1:D:238:TYR:HD2	1.99	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:41:MET:O	1:E:45:GLN:HB2	2.16	0.46
1:F:74:THR:OG1	1:F:85:MET:HE2	2.15	0.46
1:F:148:GLN:C	1:F:150:PHE:H	2.23	0.46
1:D:51:VAL:HG13	1:D:310:LEU:CD1	2.45	0.46
1:C:90:GLU:HA	1:C:93:LYS:HE2	1.98	0.46
1:D:47:GLU:HG2	1:D:310:LEU:CD2	2.43	0.46
1:D:270:GLN:HB2	1:D:271:GLY:H	1.52	0.46
1:E:142:SER:HG	1:E:145:GLU:HG3	1.81	0.46
1:F:92:LEU:HD23	1:F:119:ALA:HB3	1.98	0.46
1:F:110:LEU:O	1:F:113:PHE:HB3	2.16	0.46
1:F:192:PHE:HD2	1:F:195:MET:HE3	1.79	0.46
1:B:84:GLN:O	1:B:85:MET:HE3	2.15	0.45
1:B:304:ASN:O	1:B:308:GLN:HG3	2.16	0.45
1:C:92:LEU:HD23	1:C:119:ALA:CB	2.46	0.45
1:F:85:MET:HE3	1:F:85:MET:HA	1.98	0.45
1:A:82:VAL:HG22	1:A:82:VAL:O	2.16	0.45
1:F:279:GLU:O	1:F:282:VAL:HG22	2.15	0.45
1:A:231:ALA:HB2	1:A:255:VAL:HG22	1.97	0.45
1:B:147:PHE:HZ	1:B:188:VAL:HG13	1.81	0.45
1:C:172:LEU:HD12	1:C:204:ASP:HB2	1.98	0.45
1:D:260:VAL:HG13	1:D:299:LEU:CD2	2.45	0.45
1:E:261:ALA:HB1	1:E:314:THR:OG1	2.17	0.45
1:C:247:MET:HE2	1:C:251:MET:HG2	1.98	0.45
1:F:219:SER:O	1:F:223:GLN:HG2	2.17	0.45
1:F:282:VAL:HG21	1:F:296:LEU:HD13	1.97	0.45
1:B:84:GLN:C	1:B:85:MET:HE3	2.42	0.45
1:B:139:ILE:C	1:B:141:CYS:H	2.23	0.45
1:C:122:LYS:HB3	1:C:122:LYS:HZ2	1.81	0.45
1:D:210:THR:HB	1:D:211:PRO:HD2	1.97	0.45
1:D:266:CYS:HA	1:D:267:PRO:HD3	1.84	0.45
1:F:117:VAL:HG22	1:F:162:ILE:CD1	2.47	0.45
1:B:227:LEU:HD21	1:B:252:GLY:HA3	1.99	0.45
1:C:218:LEU:CD1	1:C:248:ALA:HA	2.47	0.45
1:B:202:LEU:HD13	1:B:217:MET:SD	2.57	0.45
1:B:261:ALA:HB1	1:B:314:THR:OG1	2.16	0.45
1:C:37:GLU:HG2	1:C:63:LEU:HD13	1.99	0.45
1:C:53:THR:HG22	1:C:57:ILE:CD1	2.47	0.45
1:B:98:PHE:CB	1:B:101:ILE:HD12	2.46	0.45
1:C:136:LYS:HA	1:C:140:ASN:HA	1.98	0.45
1:C:200:ILE:HD12	1:C:200:ILE:N	2.32	0.45
1:E:41:MET:HE1	1:E:45:GLN:OE1	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:278:THR:O	1:E:282:VAL:HG13	2.17	0.45
1:F:113:PHE:O	1:F:117:VAL:HG23	2.17	0.44
1:F:151:ASP:HA	1:F:154:LEU:HD12	1.98	0.44
1:F:204:ASP:CG	1:F:207:GLY:HA2	2.42	0.44
1:A:62:MET:CE	1:A:305:PHE:CD2	3.00	0.44
1:D:317:LYS:HD3	1:D:320:GLN:OE1	2.17	0.44
1:B:165:ARG:HD3	2:B:877:HOH:O	2.17	0.44
1:C:133:LEU:HA	1:C:136:LYS:HB2	2.00	0.44
1:D:312:ARG:HD3	1:D:313:LYS:O	2.17	0.44
1:A:139:ILE:HD12	1:A:141:CYS:SG	2.58	0.44
1:C:110:LEU:O	1:C:113:PHE:HB3	2.17	0.44
1:C:154:LEU:HD13	1:C:195:MET:HG2	1.99	0.44
1:F:230:LEU:HD12	1:F:230:LEU:N	2.32	0.44
1:F:278:THR:HG22	1:F:299:LEU:HD11	1.99	0.44
1:A:51:VAL:HG13	1:A:310:LEU:HD13	1.99	0.44
1:E:90:GLU:OE1	1:E:90:GLU:N	2.51	0.44
1:E:269:ALA:O	1:E:270:GLN:C	2.60	0.44
1:C:41:MET:HE2	1:C:106:LEU:CD1	2.48	0.44
1:C:82:VAL:CG2	1:C:85:MET:HB2	2.48	0.44
1:C:133:LEU:N	1:C:133:LEU:HD12	2.33	0.44
1:D:28:THR:OG1	1:D:29:LEU:N	2.47	0.44
1:E:154:LEU:HD23	1:E:164:VAL:HG21	1.98	0.43
1:F:226:PRO:O	1:F:230:LEU:HD13	2.18	0.43
1:B:85:MET:HE3	1:B:85:MET:HA	1.99	0.43
1:D:41:MET:HG3	1:D:72:GLU:HG2	2.00	0.43
1:E:154:LEU:CD1	1:E:195:MET:HB3	2.41	0.43
1:E:246:LEU:HD22	1:E:250:GLN:HG3	2.00	0.43
1:F:41:MET:HE2	1:F:106:LEU:HD22	2.00	0.43
1:F:159:SER:C	1:F:161:ASN:H	2.25	0.43
1:A:41:MET:HE3	1:A:41:MET:C	2.43	0.43
1:A:58:LYS:CE	1:A:62:MET:HE2	2.49	0.43
1:A:98:PHE:HB2	1:A:101:ILE:HD12	1.99	0.43
1:C:41:MET:CB	1:C:72:GLU:HG2	2.48	0.43
1:A:77:VAL:HG13	1:A:82:VAL:HG13	2.00	0.43
1:C:206:ILE:HG13	1:C:208:VAL:HG13	1.99	0.43
1:D:145:GLU:HA	1:D:148:GLN:OE1	2.17	0.43
1:C:125:VAL:HG22	1:C:165:ARG:HB3	2.01	0.43
1:D:41:MET:HE1	1:D:85:MET:CG	2.48	0.43
1:F:184:LYS:HE3	1:F:188:VAL:CG2	2.48	0.43
1:F:279:GLU:HG2	1:F:300:LEU:HD23	2.00	0.43
1:C:107:THR:CG2	1:C:113:PHE:HA	2.48	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:113:PHE:HZ	1:D:157:ALA:HA	1.84	0.43
1:F:263:LEU:HD23	1:F:312:ARG:CZ	2.49	0.43
1:A:139:ILE:C	1:A:141:CYS:H	2.26	0.43
1:D:98:PHE:HB2	1:D:101:ILE:HD12	2.00	0.43
1:D:140:ASN:HD22	1:D:140:ASN:HA	1.57	0.43
1:F:51:VAL:HB	1:F:55:VAL:HG11	2.01	0.43
1:C:37:GLU:HB2	1:C:68:LEU:HD11	2.01	0.43
1:D:36:VAL:HG22	1:D:70:VAL:CG1	2.44	0.43
1:D:133:LEU:HB2	1:D:177:GLU:HG3	2.01	0.43
1:F:142:SER:HB3	1:F:145:GLU:CG	2.48	0.43
1:D:231:ALA:HB1	1:D:255:VAL:HG22	1.97	0.42
1:E:211:PRO:HG2	1:F:288:LEU:CD1	2.49	0.42
1:F:157:ALA:HB1	1:F:162:ILE:O	2.19	0.42
1:E:58:LYS:HZ3	1:E:62:MET:HE2	1.85	0.42
1:E:60:ILE:HD13	1:E:73:THR:HG23	2.01	0.42
1:F:142:SER:HB3	1:F:145:GLU:CD	2.45	0.42
1:A:306:ILE:HG13	1:A:310:LEU:HD23	2.02	0.42
1:B:45:GLN:HG3	1:B:82:VAL:HG21	2.01	0.42
1:B:174:CYS:SG	1:B:175:PRO:HD2	2.60	0.42
1:B:232:VAL:HG22	1:B:234:CYS:SG	2.59	0.42
1:C:40:PRO:HA	1:C:44:LEU:CD2	2.40	0.42
1:C:201:SER:HA	1:C:231:ALA:HB3	2.01	0.42
1:A:43:GLY:HA2	1:A:264:GLY:HA3	2.02	0.42
1:C:90:GLU:HA	1:C:93:LYS:CE	2.50	0.42
1:C:205:THR:O	1:C:235:HIS:ND1	2.49	0.42
1:D:259:SER:O	1:D:260:VAL:C	2.62	0.42
1:D:278:THR:HG22	1:D:299:LEU:HD11	2.00	0.42
1:A:288:LEU:HD11	1:B:211:PRO:HB2	2.02	0.42
1:B:41:MET:C	1:B:41:MET:SD	3.03	0.42
1:B:139:ILE:O	1:B:141:CYS:N	2.51	0.42
1:C:214:MET:HE1	1:C:232:VAL:CG1	2.49	0.42
1:C:247:MET:HE3	1:C:250:GLN:HB2	2.01	0.42
1:D:138:ASN:C	1:D:138:ASN:ND2	2.75	0.42
1:D:279:GLU:HG2	1:D:300:LEU:CD2	2.49	0.42
1:F:47:GLU:HG2	1:F:310:LEU:CD2	2.47	0.42
1:F:132:GLU:CD	1:F:143:ILE:HD12	2.45	0.42
1:C:214:MET:HE1	1:C:232:VAL:HG11	2.01	0.41
1:D:90:GLU:CD	1:D:90:GLU:N	2.78	0.41
1:E:188:VAL:HG23	1:E:189:THR:N	2.35	0.41
1:E:226:PRO:O	1:E:230:LEU:CD2	2.68	0.41
1:F:46:ASN:CB	1:F:265:GLY:H	2.33	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:111:LYS:O	1:B:114:GLU:HB3	2.18	0.41
1:C:50:ILE:HD12	1:C:84:GLN:HA	2.02	0.41
1:E:202:LEU:HD13	1:E:217:MET:SD	2.61	0.41
1:A:127:PHE:CD1	1:A:127:PHE:N	2.88	0.41
1:A:139:ILE:O	1:A:141:CYS:N	2.53	0.41
1:C:37:GLU:OE2	1:C:260:VAL:N	2.48	0.41
1:D:59:LEU:HD13	1:D:306:ILE:HB	2.02	0.41
1:D:279:GLU:HG3	1:D:299:LEU:HD13	2.02	0.41
1:E:41:MET:HG3	1:E:106:LEU:HD13	2.03	0.41
1:E:106:LEU:N	1:E:106:LEU:HD12	2.35	0.41
1:A:78:SER:HA	1:A:79:PRO:HD3	1.94	0.41
1:A:135:THR:HG23	1:A:139:ILE:HD11	2.02	0.41
1:E:59:LEU:HD22	1:E:306:ILE:CD1	2.50	0.41
1:A:83:PRO:HG2	1:A:84:GLN:NE2	2.32	0.41
1:A:131:SER:HB3	1:A:170:CYS:SG	2.60	0.41
1:A:133:LEU:HB2	1:A:177:GLU:HG3	2.02	0.41
1:D:230:LEU:O	1:D:255:VAL:HG13	2.20	0.41
1:C:139:ILE:HB	1:C:149:ARG:HH22	1.85	0.41
1:D:204:ASP:HA	2:D:615:HOH:O	2.20	0.41
1:E:279:GLU:HB2	1:E:316:SER:OG	2.20	0.41
1:F:107:THR:HA	1:F:108:PRO:HD2	1.95	0.41
1:F:151:ASP:O	1:F:155:LYS:HB2	2.20	0.41
1:A:36:VAL:HG13	1:A:70:VAL:CG2	2.51	0.41
1:D:41:MET:HB3	1:D:42:ASP:H	1.72	0.41
1:A:287:GLY:HA3	1:B:210:THR:HG21	2.02	0.41
1:B:260:VAL:C	1:B:262:GLY:N	2.79	0.41
1:C:261:ALA:O	1:C:315:SER:HB2	2.20	0.41
1:C:308:GLN:C	1:C:310:LEU:N	2.79	0.41
1:D:53:THR:N	1:D:54:PRO:HD2	2.35	0.41
1:D:139:ILE:O	1:D:139:ILE:HG22	2.21	0.41
1:F:113:PHE:CD2	1:F:153:ILE:HG23	2.55	0.41
1:B:310:LEU:HD12	1:B:310:LEU:HA	1.96	0.41
1:C:58:LYS:NZ	1:C:62:MET:HE2	2.35	0.40
1:C:93:LYS:HB2	1:C:93:LYS:HE3	1.90	0.40
1:C:139:ILE:HB	1:C:149:ARG:NH2	2.36	0.40
1:E:234:CYS:HB3	2:E:546:HOH:O	2.20	0.40
1:A:139:ILE:C	1:A:141:CYS:N	2.79	0.40
1:A:161:ASN:HD22	1:A:161:ASN:HA	1.54	0.40
1:E:169:SER:O	1:E:170:CYS:HB2	2.21	0.40
1:F:133:LEU:HD23	1:F:177:GLU:HG2	2.03	0.40
1:A:151:ASP:O	1:A:155:LYS:HD3	2.22	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:174:CYS:SG	1:C:175:PRO:HD2	2.62	0.40
1:D:113:PHE:O	1:D:117:VAL:HG23	2.21	0.40
1:E:133:LEU:O	1:E:137:LYS:HB2	2.21	0.40
1:F:316:SER:O	1:F:320:GLN:HG3	2.21	0.40
1:B:117:VAL:HG22	1:B:162:ILE:HD11	2.02	0.40
1:B:230:LEU:O	1:B:255:VAL:HG13	2.21	0.40
1:D:41:MET:HE2	1:D:85:MET:HE2	2.02	0.40
1:E:262:GLY:HA3	1:E:315:SER:HB2	2.03	0.40
1:A:283:TYR:HB2	1:A:318:VAL:HG21	2.04	0.40
1:F:288:LEU:HD12	1:F:288:LEU:HA	1.83	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	294/298 (99%)	281 (96%)	10 (3%)	3 (1%)	12	11
1	B	294/298 (99%)	281 (96%)	8 (3%)	5 (2%)	7	5
1	C	294/298 (99%)	271 (92%)	18 (6%)	5 (2%)	7	5
1	D	294/298 (99%)	280 (95%)	11 (4%)	3 (1%)	12	11
1	E	294/298 (99%)	282 (96%)	9 (3%)	3 (1%)	12	11
1	F	281/298 (94%)	258 (92%)	18 (6%)	5 (2%)	6	4
All	All	1751/1788 (98%)	1653 (94%)	74 (4%)	24 (1%)	9	7

All (24) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	139	ILE
1	A	260	VAL

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Mol	Chain	Res	Type
1	B	260	VAL
1	C	270	GLN
1	D	260	VAL
1	D	270	GLN
1	E	260	VAL
1	F	260	VAL
1	B	261	ALA
1	B	270	GLN
1	C	139	ILE
1	C	260	VAL
1	E	271	GLY
1	F	48	LYS
1	F	273	SER
1	A	140	ASN
1	B	140	ASN
1	C	309	ALA
1	E	270	GLN
1	F	179	LYS
1	C	48	LYS
1	D	322	THR
1	B	139	ILE
1	F	196	GLY

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	238/240 (99%)	220 (92%)	18 (8%)	12	14
1	B	238/240 (99%)	222 (93%)	16 (7%)	15	17
1	C	238/240 (99%)	223 (94%)	15 (6%)	16	19
1	D	238/240 (99%)	222 (93%)	16 (7%)	15	17
1	E	238/240 (99%)	218 (92%)	20 (8%)	10	11
1	F	231/240 (96%)	220 (95%)	11 (5%)	23	30
All	All	1421/1440 (99%)	1325 (93%)	96 (7%)	14	17

All (96) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	44	LEU
1	A	70	VAL
1	A	77	VAL
1	A	82	VAL
1	A	84	GLN
1	A	133	LEU
1	A	139	ILE
1	A	161	ASN
1	A	230	LEU
1	A	246	LEU
1	A	255	VAL
1	A	256	VAL
1	A	260	VAL
1	A	268	TYR
1	A	288	LEU
1	A	299	LEU
1	A	310	LEU
1	A	312	ARG
1	B	44	LEU
1	B	48	LYS
1	B	51	VAL
1	B	65	GLU
1	B	77	VAL
1	B	85	MET
1	B	138	ASN
1	B	205	THR
1	B	230	LEU
1	B	246	LEU
1	B	255	VAL
1	B	256	VAL
1	B	260	VAL
1	B	288	LEU
1	B	299	LEU
1	B	310	LEU
1	C	50	ILE
1	C	77	VAL
1	C	84	GLN
1	C	102	ASN
1	C	139	ILE
1	C	195	MET
1	C	210	THR
1	C	224	GLU

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Mol	Chain	Res	Type
1	C	230	LEU
1	C	255	VAL
1	C	282	VAL
1	C	288	LEU
1	C	299	LEU
1	C	312	ARG
1	C	323	CYS
1	D	31	LYS
1	D	41	MET
1	D	44	LEU
1	D	82	VAL
1	D	85	MET
1	D	90	GLU
1	D	133	LEU
1	D	140	ASN
1	D	165	ARG
1	D	230	LEU
1	D	246	LEU
1	D	255	VAL
1	D	256	VAL
1	D	299	LEU
1	D	310	LEU
1	D	312	ARG
1	E	41	MET
1	E	44	LEU
1	E	51	VAL
1	E	82	VAL
1	E	84	GLN
1	E	90	GLU
1	E	133	LEU
1	E	151	ASP
1	E	165	ARG
1	E	232	VAL
1	E	246	LEU
1	E	251	MET
1	E	255	VAL
1	E	256	VAL
1	E	260	VAL
1	E	288	LEU
1	E	297	GLN
1	E	299	LEU
1	E	310	LEU

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Mol	Chain	Res	Type
1	E	312	ARG
1	F	31	LYS
1	F	49	ASN
1	F	85	MET
1	F	90	GLU
1	F	114	GLU
1	F	205	THR
1	F	246	LEU
1	F	255	VAL
1	F	288	LEU
1	F	299	LEU
1	F	312	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (59) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	84	GLN
1	A	88	HIS
1	A	96	GLN
1	A	140	ASN
1	A	161	ASN
1	A	223	GLN
1	A	235	HIS
1	A	244	ASN
1	A	250	GLN
1	A	297	GLN
1	A	311	ASN
1	A	320	GLN
1	B	45	GLN
1	B	46	ASN
1	B	102	ASN
1	B	138	ASN
1	B	161	ASN
1	B	223	GLN
1	B	244	ASN
1	B	250	GLN
1	B	297	GLN
1	B	311	ASN
1	C	45	GLN
1	C	84	GLN
1	C	102	ASN
1	C	223	GLN

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Mol	Chain	Res	Type
1	C	244	ASN
1	C	250	GLN
1	C	291	HIS
1	C	297	GLN
1	C	311	ASN
1	D	138	ASN
1	D	140	ASN
1	D	161	ASN
1	D	223	GLN
1	D	244	ASN
1	D	250	GLN
1	D	270	GLN
1	D	297	GLN
1	D	311	ASN
1	E	84	GLN
1	E	102	ASN
1	E	140	ASN
1	E	148	GLN
1	E	223	GLN
1	E	233	HIS
1	E	250	GLN
1	E	297	GLN
1	E	304	ASN
1	E	311	ASN
1	F	45	GLN
1	F	46	ASN
1	F	161	ASN
1	F	223	GLN
1	F	235	HIS
1	F	250	GLN
1	F	297	GLN
1	F	311	ASN
1	F	320	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](#)

There are no ligands in this entry.

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	296/298 (99%)	-0.14	8 (2%) 56 53	20, 32, 54, 69	0
1	B	296/298 (99%)	0.12	7 (2%) 59 56	25, 40, 70, 84	0
1	C	296/298 (99%)	0.71	20 (6%) 23 20	31, 57, 76, 80	0
1	D	296/298 (99%)	0.09	3 (1%) 79 77	25, 38, 68, 79	0
1	E	296/298 (99%)	0.11	2 (0%) 84 82	26, 40, 62, 78	0
1	F	287/298 (96%)	0.74	17 (5%) 28 25	36, 58, 82, 88	0
All	All	1767/1788 (98%)	0.27	57 (3%) 50 47	20, 42, 74, 88	0

All (57) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	170	CYS	4.6
1	C	92	LEU	3.9
1	E	270	GLN	3.7
1	F	82	VAL	3.5
1	A	268	TYR	3.3
1	C	260	VAL	3.3
1	B	138	ASN	3.2
1	F	130	ALA	3.2
1	C	76	PHE	3.0
1	B	147	PHE	3.0
1	C	127	PHE	3.0
1	F	134	PHE	3.0
1	A	269	ALA	3.0
1	F	128	GLY	2.8
1	F	81	TRP	2.8
1	C	140	ASN	2.8
1	B	139	ILE	2.7
1	C	147	PHE	2.7
1	C	50	ILE	2.7

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Mol	Chain	Res	Type	RSRZ
1	D	323	CYS	2.7
1	D	82	VAL	2.7
1	F	323	CYS	2.7
1	B	260	VAL	2.6
1	B	81	TRP	2.6
1	F	85	MET	2.5
1	E	260	VAL	2.5
1	F	260	VAL	2.5
1	C	323	CYS	2.4
1	A	323	CYS	2.4
1	C	115	ALA	2.4
1	F	143	ILE	2.4
1	A	140	ASN	2.3
1	F	80	LYS	2.3
1	F	115	ALA	2.3
1	C	139	ILE	2.3
1	C	105	VAL	2.3
1	F	77	VAL	2.3
1	D	141	CYS	2.2
1	B	271	GLY	2.2
1	C	157	ALA	2.2
1	C	101	ILE	2.2
1	C	48	LYS	2.2
1	C	79	PRO	2.2
1	F	51	VAL	2.2
1	F	83	PRO	2.2
1	C	53	THR	2.1
1	C	116	ALA	2.1
1	C	91	VAL	2.1
1	F	50	ILE	2.1
1	B	323	CYS	2.1
1	C	160	ALA	2.1
1	C	153	ILE	2.1
1	A	188	VAL	2.1
1	F	147	PHE	2.1
1	A	205	THR	2.0
1	A	270	GLN	2.0
1	F	162	ILE	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.