



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 10, 2026 – 04:47 pm BST

PDB ID : 9S7Z / pdb_00009s7z
Title : Structure of truncated human 60 kDa lysophospholipase at 2.73 Å resolution
Authors : Rabe von Pappenheim, F.; Eulig, N.; Mahler, M.; Tittmann, K.
Deposited on : 2025-08-05
Resolution : 2.73 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	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.50

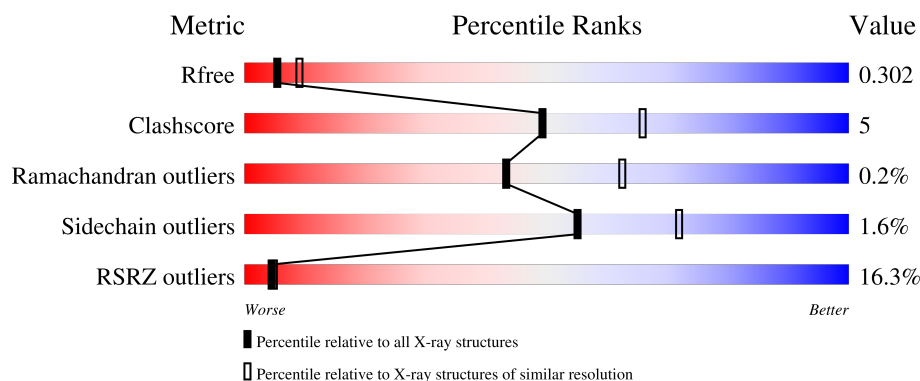
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.73 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	1819 (2.76-2.72)
Clashscore	190562	1866 (2.76-2.72)
Ramachandran outliers	187476	1830 (2.76-2.72)
Sidechain outliers	187428	1831 (2.76-2.72)
RSRZ outliers	180081	1819 (2.76-2.72)

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	368	
1	B	368	
1	C	368	
1	D	368	
1	E	368	

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Mol	Chain	Length	Quality of chain
1	F	368	23% 79% 13% 7%

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 31152 atoms, of which 15748 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.

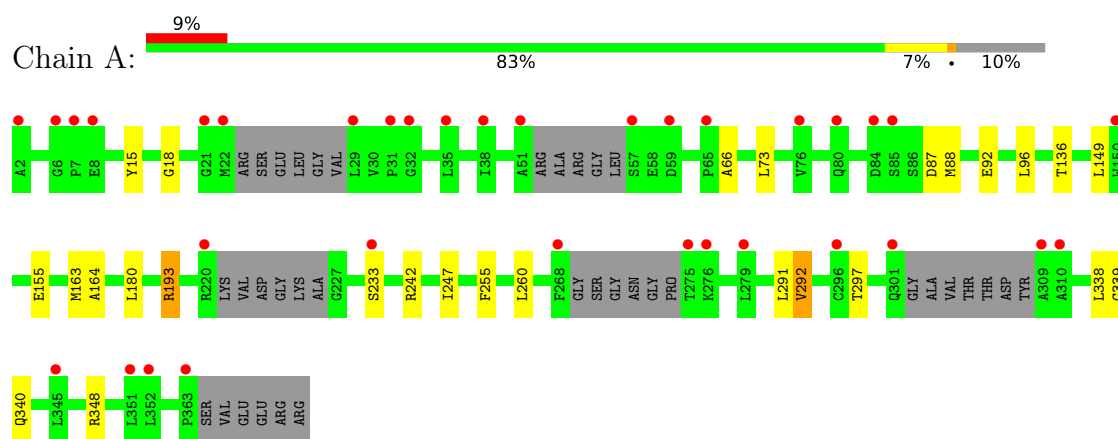
- Molecule 1 is a protein called 60 kDa lysophospholipase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	332	Total	C	H	N	O	S	0	0	0
			5128	1620	2590	440	459	19			
1	E	322	Total	C	H	N	O	S	0	0	0
			5002	1574	2527	437	445	19			
1	F	342	Total	C	H	N	O	S	0	0	0
			5302	1669	2686	460	468	19			
1	D	341	Total	C	H	N	O	S	0	0	0
			5271	1659	2662	457	474	19			
1	C	343	Total	C	H	N	O	S	0	0	0
			5316	1673	2690	461	473	19			
1	B	333	Total	C	H	N	O	S	0	0	0
			5133	1616	2593	447	459	18			

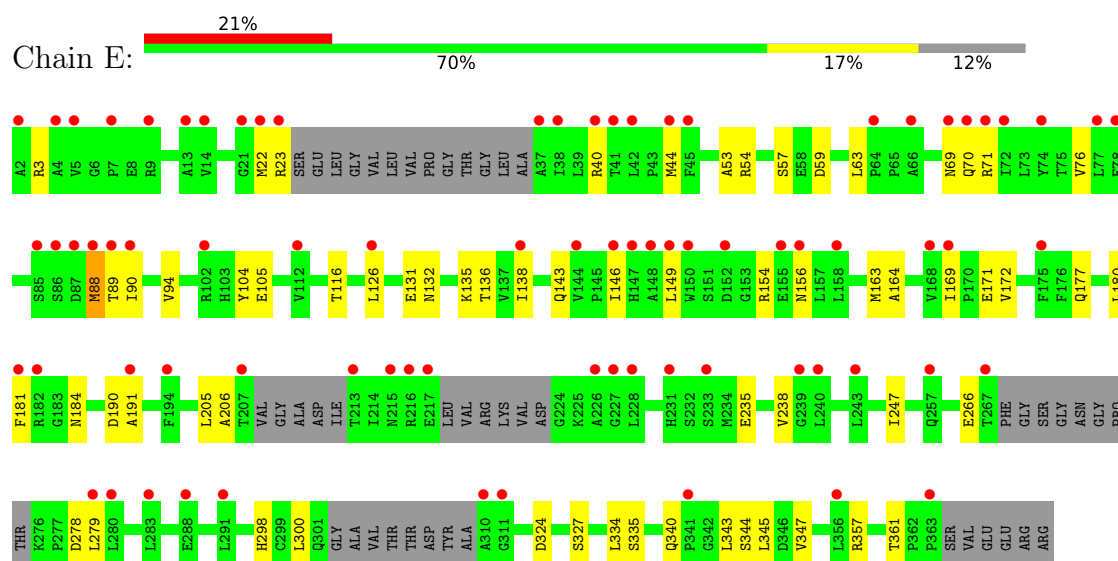
3 Residue-property plots [i](#)

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.

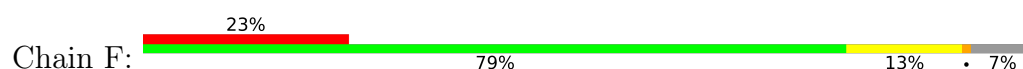
- Molecule 1: 60 kDa lysophospholipase

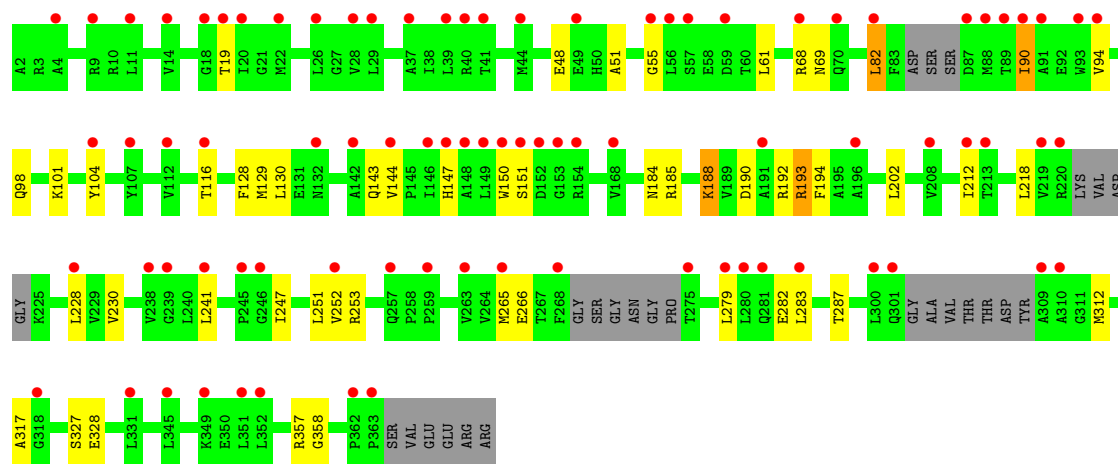


- Molecule 1: 60 kDa lysophospholipase

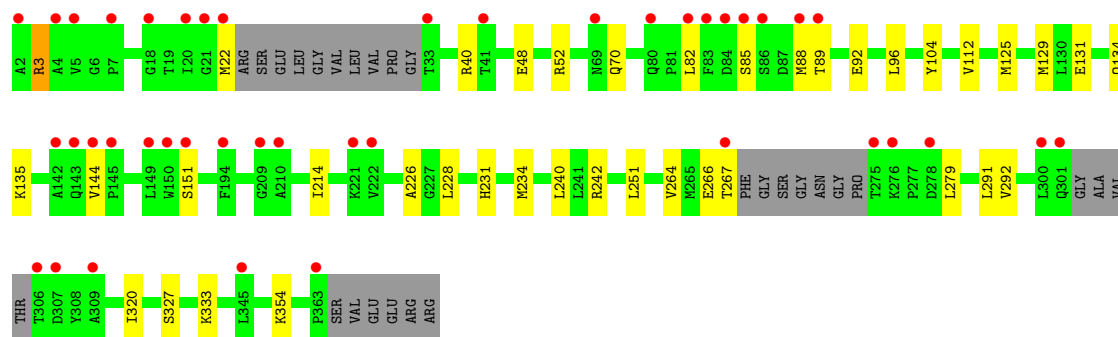
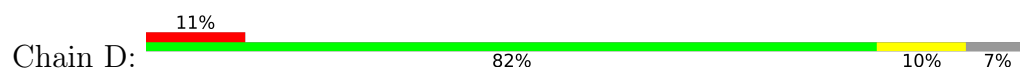


- Molecule 1: 60 kDa lysophospholipase

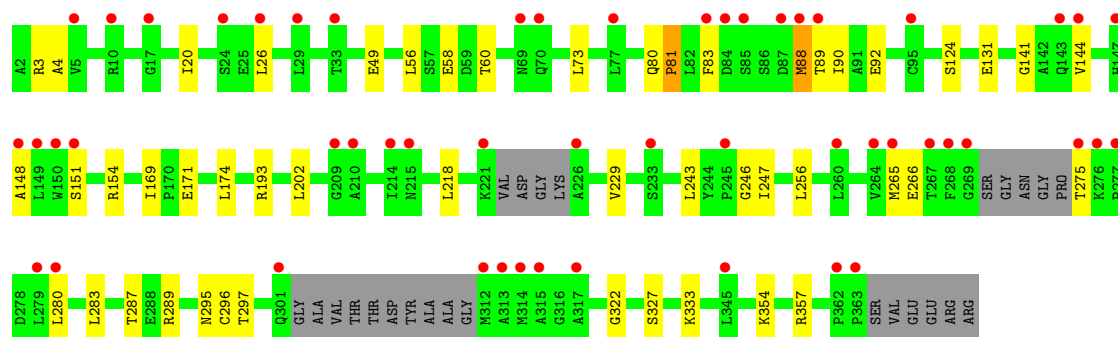
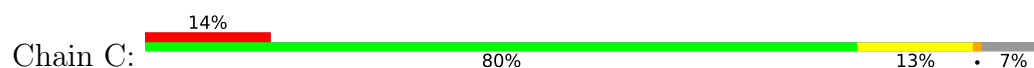




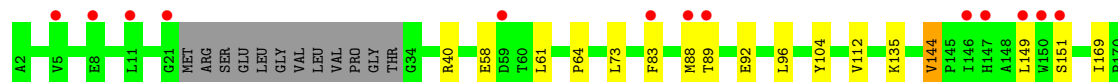
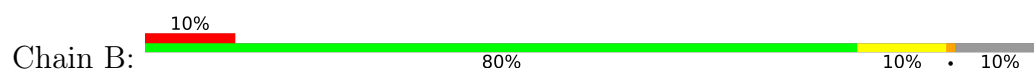
• Molecule 1: 60 kDa lysophospholipase

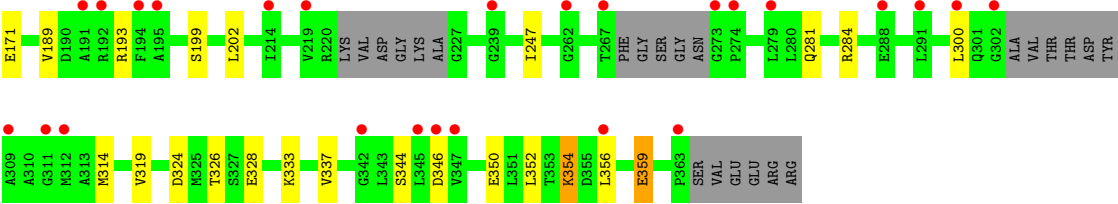


• Molecule 1: 60 kDa lysophospholipase



• Molecule 1: 60 kDa lysophospholipase





4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	131.15Å 240.21Å 184.99Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	100.74 – 2.73 100.74 – 2.73	Depositor EDS
% Data completeness (in resolution range)	99.6 (100.74-2.73) 99.7 (100.74-2.73)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.69 (at 2.73Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.262 , 0.305 0.260 , 0.302	Depositor DCC
R_{free} test set	3924 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å ²)	68.5	Xtriage
Anisotropy	0.326	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.39 , 55.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	0.028 for 1/2*h-1/2*k,-3/2*h-1/2*k,-l 0.036 for 1/2*h+1/2*k,3/2*h-1/2*k,-l	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	31152	wwPDB-VP
Average B, all atoms (Å ²)	90.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 35.88 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 5.4506e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

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

5 Model quality [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	0.08	0/2582	0.22	0/3500
1	B	0.09	0/2584	0.23	0/3502
1	C	0.09	0/2672	0.24	0/3621
1	D	0.09	0/2654	0.25	0/3597
1	E	0.10	0/2517	0.24	0/3405
1	F	0.10	0/2661	0.24	0/3605
All	All	0.09	0/15670	0.24	0/21230

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2538	2590	2593	20	0
1	B	2540	2593	2597	26	0
1	C	2626	2690	2695	32	0
1	D	2609	2662	2668	24	0
1	E	2475	2527	2530	39	0
1	F	2616	2686	2690	32	0
All	All	15404	15748	15773	167	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 5.

All (167) 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:E:88:MET:HE2	1:E:89:THR:H	1.28	0.98
1:C:296:CYS:O	1:C:297:THR:OG1	1.96	0.82
1:E:180:LEU:O	1:E:205:LEU:N	2.18	0.77
1:B:89:THR:OG1	1:B:92:GLU:OE1	2.03	0.77
1:F:128:PHE:O	1:F:357:ARG:NH2	2.22	0.72
1:E:88:MET:HE2	1:E:89:THR:N	2.05	0.70
1:C:283:LEU:O	1:C:287:THR:OG1	2.11	0.68
1:F:252:VAL:HG21	1:F:279:LEU:HD11	1.75	0.67
1:E:104:TYR:O	1:E:135:LYS:NZ	2.27	0.67
1:A:255:PHE:CE2	1:D:251:LEU:HD21	2.30	0.66
1:B:281:GLN:OE1	1:B:284:ARG:NH1	2.27	0.66
1:D:131:GLU:OE1	1:D:231:HIS:NE2	2.24	0.65
1:F:48:GLU:OE1	1:F:48:GLU:N	2.32	0.63
1:A:92:GLU:OE1	1:A:92:GLU:N	2.32	0.63
1:A:233:SER:OG	1:A:339:GLY:O	2.14	0.62
1:D:92:GLU:N	1:D:92:GLU:OE1	2.32	0.61
1:E:298:HIS:ND1	1:F:190:ASP:OD2	2.27	0.61
1:C:295:ASN:O	1:C:322:GLY:N	2.32	0.61
1:A:149:LEU:HD11	1:B:64:PRO:HG2	1.83	0.61
1:B:144:VAL:HG21	1:B:151:SER:HA	1.82	0.60
1:D:333:LYS:NZ	1:D:354:LYS:O	2.31	0.60
1:F:116:THR:HG21	1:F:143:GLN:OE1	2.02	0.59
1:B:344:SER:OG	1:B:346:ASP:OD1	2.16	0.59
1:F:94:VAL:HA	1:F:129:MET:HE2	1.85	0.59
1:C:266:GLU:OE2	1:C:327:SER:OG	2.12	0.58
1:D:125:MET:HB3	1:D:129:MET:HE3	1.86	0.58
1:C:333:LYS:NZ	1:C:354:LYS:O	2.36	0.58
1:F:184:ASN:ND2	1:F:357:ARG:O	2.36	0.57
1:D:48:GLU:OE2	1:D:52:ARG:NH1	2.38	0.56
1:D:96:LEU:HD21	1:D:112:VAL:HG11	1.87	0.56
1:C:92:GLU:N	1:C:92:GLU:OE1	2.38	0.56
1:F:266:GLU:OE2	1:F:327:SER:OG	2.23	0.56
1:C:131:GLU:HB3	1:C:229:VAL:HG13	1.89	0.55
1:D:320:ILE:HD12	1:D:320:ILE:N	2.22	0.54
1:D:291:LEU:HD23	1:D:292:VAL:N	2.23	0.54
1:E:235:GLU:O	1:E:335:SER:OG	2.19	0.54
1:C:56:LEU:HB3	1:C:60:THR:HG23	1.90	0.53
1:A:66:ALA:HB2	1:B:149:LEU:HD22	1.89	0.53
1:A:292:VAL:HG11	1:A:338:LEU:HD21	1.90	0.53
1:C:148:ALA:O	1:C:154:ARG:NH1	2.40	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:243:LEU:HD11	1:C:265:MET:HE2	1.91	0.52
1:B:92:GLU:OE1	1:B:92:GLU:N	2.42	0.52
1:A:193:ARG:HD3	1:A:193:ARG:H	1.75	0.52
1:F:202:LEU:HD11	1:F:218:LEU:HD22	1.90	0.52
1:C:49:GLU:N	1:C:49:GLU:OE1	2.42	0.52
1:D:3:ARG:NH2	1:D:70:GLN:OE1	2.43	0.51
1:C:58:GLU:N	1:C:58:GLU:OE1	2.41	0.51
1:C:247:ILE:O	1:C:247:ILE:HG23	2.10	0.51
1:F:116:THR:HG21	1:F:143:GLN:CD	2.36	0.51
1:B:247:ILE:HG23	1:B:247:ILE:O	2.11	0.51
1:A:163:MET:HE2	1:A:180:LEU:HD22	1.93	0.51
1:F:144:VAL:HG21	1:F:151:SER:HA	1.94	0.50
1:F:312:MET:N	1:F:312:MET:SD	2.85	0.50
1:D:22:MET:HE1	1:D:82:LEU:HD23	1.94	0.49
1:E:57:SER:OG	1:E:59:ASP:OD1	2.21	0.49
1:E:116:THR:HG21	1:E:143:GLN:HG2	1.94	0.49
1:B:40:ARG:NH2	1:B:58:GLU:O	2.45	0.49
1:E:345:LEU:HD23	1:E:345:LEU:O	2.13	0.49
1:B:144:VAL:CG2	1:B:151:SER:HA	2.43	0.49
1:F:82:LEU:HD23	1:F:82:LEU:C	2.38	0.48
1:B:169:ILE:O	1:B:171:GLU:N	2.46	0.48
1:A:242:ARG:HD2	1:D:242:ARG:HE	1.77	0.48
1:B:96:LEU:HD21	1:B:112:VAL:HG11	1.95	0.48
1:D:104:TYR:O	1:D:135:LYS:NZ	2.37	0.48
1:E:163:MET:HE2	1:E:180:LEU:HD22	1.96	0.48
1:F:253:ARG:NH1	1:F:282:GLU:OE1	2.44	0.48
1:C:80:GLN:HB3	1:C:81:PRO:HD3	1.96	0.48
1:B:333:LYS:NZ	1:B:354:LYS:O	2.39	0.47
1:E:88:MET:HA	1:E:88:MET:CE	2.44	0.47
1:F:98:GLN:HG3	1:F:230:VAL:HG11	1.96	0.47
1:D:104:TYR:CD1	1:D:228:LEU:HD22	2.49	0.47
1:F:287:THR:HG21	1:F:317:ALA:O	2.15	0.47
1:A:260:LEU:O	1:A:291:LEU:HD11	2.14	0.47
1:E:63:LEU:O	1:E:71:ARG:NH1	2.42	0.47
1:D:134:GLN:NE2	1:D:226:ALA:HB3	2.29	0.47
1:E:334:LEU:HD23	1:E:334:LEU:C	2.40	0.46
1:F:251:LEU:HD23	1:F:251:LEU:C	2.40	0.46
1:F:104:TYR:CD1	1:F:228:LEU:HD22	2.50	0.46
1:C:246:GLY:N	1:B:88:MET:HB3	2.30	0.46
1:E:126:LEU:HB2	1:E:172:VAL:HG11	1.96	0.46
1:F:212:ILE:HD12	1:F:212:ILE:N	2.31	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:247:ILE:HG23	1:F:247:ILE:O	2.16	0.46
1:E:136:THR:HG21	1:E:164:ALA:HA	1.98	0.46
1:D:144:VAL:HG21	1:D:151:SER:HA	1.97	0.46
1:B:73:LEU:HD12	1:B:73:LEU:N	2.30	0.46
1:A:136:THR:HG21	1:A:164:ALA:HA	1.98	0.46
1:A:247:ILE:HG23	1:A:247:ILE:O	2.16	0.46
1:E:324:ASP:OD2	1:E:361:THR:OG1	2.22	0.46
1:C:20:ILE:HD12	1:C:141:GLY:HA2	1.98	0.46
1:A:193:ARG:H	1:A:193:ARG:HH11	1.61	0.46
1:F:241:LEU:O	1:F:265:MET:HA	2.15	0.46
1:C:3:ARG:NH1	1:C:4:ALA:O	2.49	0.46
1:B:61:LEU:HD12	1:B:61:LEU:N	2.29	0.46
1:A:15:TYR:OH	1:A:18:GLY:O	2.31	0.45
1:E:156:ASN:OD1	1:E:177:GLN:N	2.49	0.45
1:F:68:ARG:O	1:F:69:ASN:CB	2.63	0.45
1:C:256:LEU:O	1:C:289:ARG:NH2	2.47	0.45
1:E:3:ARG:NH2	1:E:70:GLN:OE1	2.46	0.45
1:E:22:MET:O	1:E:23:ARG:C	2.59	0.45
1:A:73:LEU:HD12	1:A:73:LEU:N	2.31	0.45
1:B:83:PHE:CD1	1:B:83:PHE:N	2.83	0.45
1:D:251:LEU:C	1:D:251:LEU:HD23	2.42	0.44
1:F:61:LEU:HD22	1:F:61:LEU:N	2.33	0.44
1:F:185:ARG:NH2	1:F:358:GLY:O	2.43	0.44
1:B:326:THR:OG1	1:B:328:GLU:OE1	2.31	0.44
1:F:90:ILE:HG22	1:F:90:ILE:O	2.18	0.44
1:C:89:THR:HG22	1:C:90:ILE:H	1.82	0.44
1:F:188:LYS:CB	1:F:188:LYS:NZ	2.81	0.44
1:D:40:ARG:NH2	1:D:48:GLU:OE2	2.50	0.44
1:D:279:LEU:HD23	1:D:279:LEU:C	2.43	0.44
1:A:155:GLU:OE1	1:A:155:GLU:N	2.42	0.43
1:E:344:SER:HB3	1:E:347:VAL:HG22	1.99	0.43
1:C:174:LEU:C	1:C:174:LEU:HD23	2.43	0.43
1:E:247:ILE:O	1:E:247:ILE:HG23	2.17	0.43
1:E:300:LEU:C	1:E:300:LEU:HD23	2.43	0.43
1:B:189:VAL:HG11	1:B:193:ARG:HG3	2.00	0.43
1:E:90:ILE:N	1:E:90:ILE:HD12	2.33	0.43
1:E:149:LEU:C	1:E:149:LEU:HD12	2.43	0.43
1:E:169:ILE:O	1:E:171:GLU:N	2.47	0.43
1:D:266:GLU:OE2	1:D:327:SER:OG	2.34	0.43
1:E:180:LEU:CB	1:E:206:ALA:HB3	2.48	0.43
1:E:76:VAL:O	1:E:76:VAL:HG13	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:146:ILE:CG1	1:E:154:ARG:HG2	2.49	0.43
1:C:73:LEU:N	1:C:73:LEU:HD12	2.33	0.43
1:B:300:LEU:HA	1:B:324:ASP:HB3	2.01	0.43
1:A:340:GLN:O	1:A:348:ARG:NH2	2.45	0.42
1:B:199:SER:OG	1:B:202:LEU:O	2.35	0.42
1:B:356:LEU:N	1:B:359:GLU:OE2	2.48	0.42
1:D:291:LEU:HD23	1:D:292:VAL:H	1.85	0.42
1:C:202:LEU:HD11	1:C:218:LEU:HD22	2.01	0.42
1:F:101:LYS:HA	1:F:228:LEU:HD23	2.01	0.42
1:F:130:LEU:C	1:F:130:LEU:HD23	2.44	0.42
1:C:280:LEU:C	1:C:280:LEU:HD13	2.44	0.42
1:E:90:ILE:O	1:E:94:VAL:HG23	2.19	0.42
1:E:131:GLU:OE1	1:E:357:ARG:NH2	2.53	0.42
1:C:265:MET:HE1	1:C:283:LEU:HD11	2.01	0.42
1:A:92:GLU:O	1:A:96:LEU:N	2.50	0.42
1:E:138:ILE:HD12	1:E:164:ALA:HB2	2.00	0.42
1:F:192:ARG:HE	1:F:193:ARG:HH21	1.68	0.42
1:B:104:TYR:O	1:B:135:LYS:NZ	2.45	0.42
1:A:297:THR:O	1:A:297:THR:HG22	2.20	0.42
1:F:51:ALA:O	1:F:55:GLY:N	2.44	0.42
1:F:328:GLU:OE1	1:F:328:GLU:N	2.49	0.42
1:C:83:PHE:N	1:C:83:PHE:CD1	2.88	0.42
1:C:88:MET:HE1	1:C:92:GLU:HB2	2.02	0.42
1:E:238:VAL:HG12	1:E:334:LEU:HD22	2.02	0.41
1:E:266:GLU:OE2	1:E:327:SER:OG	2.29	0.41
1:C:275:THR:O	1:C:275:THR:HG22	2.20	0.41
1:B:337:VAL:HG21	1:B:352:LEU:HD21	2.02	0.41
1:E:278:ASP:OD1	1:E:279:LEU:N	2.50	0.41
1:E:340:GLN:HB3	1:E:343:LEU:HD13	2.02	0.41
1:D:240:LEU:HD22	1:D:264:VAL:O	2.20	0.41
1:E:90:ILE:HD12	1:E:90:ILE:H	1.85	0.41
1:E:190:ASP:OD1	1:E:191:ALA:N	2.53	0.41
1:C:243:LEU:HD21	1:C:265:MET:HE2	2.02	0.41
1:C:296:CYS:O	1:C:297:THR:CB	2.67	0.41
1:F:193:ARG:HG2	1:F:194:PHE:N	2.36	0.41
1:A:87:ASP:OD1	1:A:88:MET:N	2.52	0.41
1:C:131:GLU:OE1	1:C:357:ARG:NH2	2.49	0.41
1:C:144:VAL:HG21	1:C:151:SER:HA	2.02	0.41
1:C:169:ILE:O	1:C:171:GLU:N	2.54	0.41
1:E:53:ALA:O	1:E:54:ARG:HB3	2.20	0.41
1:B:314:MET:HG3	1:B:319:VAL:HB	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:350:GLU:O	1:B:354:LYS:NZ	2.54	0.40
1:E:131:GLU:O	1:E:132:ASN:C	2.65	0.40
1:D:129:MET:HE2	1:D:234:MET:HG3	2.04	0.40
1:D:88:MET:SD	1:D:89:THR:N	2.89	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	320/368 (87%)	312 (98%)	8 (2%)	0	100	100
1	B	323/368 (88%)	306 (95%)	17 (5%)	0	100	100
1	C	335/368 (91%)	319 (95%)	15 (4%)	1 (0%)	36	54
1	D	333/368 (90%)	321 (96%)	11 (3%)	1 (0%)	36	54
1	E	310/368 (84%)	286 (92%)	24 (8%)	0	100	100
1	F	332/368 (90%)	315 (95%)	16 (5%)	1 (0%)	36	54
All	All	1953/2208 (88%)	1859 (95%)	91 (5%)	3 (0%)	43	62

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	90	ILE
1	D	85	SER
1	C	81	PRO

5.3.2 Protein sidechains [i](#)

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

resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	272/298 (91%)	270 (99%)	2 (1%)	76	85
1	B	270/298 (91%)	267 (99%)	3 (1%)	65	79
1	C	281/298 (94%)	277 (99%)	4 (1%)	59	74
1	D	278/298 (93%)	275 (99%)	3 (1%)	65	79
1	E	264/298 (89%)	257 (97%)	7 (3%)	39	61
1	F	278/298 (93%)	271 (98%)	7 (2%)	42	63
All	All	1643/1788 (92%)	1617 (98%)	26 (2%)	55	72

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	193	ARG
1	A	292	VAL
1	E	40	ARG
1	E	44	MET
1	E	69	ASN
1	E	88	MET
1	E	105	GLU
1	E	181	PHE
1	E	184	ASN
1	F	19	THR
1	F	82	LEU
1	F	147	HIS
1	F	150	TRP
1	F	188	LYS
1	F	193	ARG
1	F	283	LEU
1	D	3	ARG
1	D	214	ILE
1	D	267	THR
1	C	26	LEU
1	C	88	MET
1	C	124	SER
1	C	193	ARG
1	B	144	VAL
1	B	354	LYS
1	B	359	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	F	340	GLN
1	D	103	HIS
1	C	147	HIS
1	C	166	GLN
1	B	215	ASN
1	B	231	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

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	332/368 (90%)	0.79	34 (10%)	12 12	52, 74, 125, 152	0
1	B	333/368 (90%)	0.91	38 (11%)	10 9	56, 83, 125, 153	0
1	C	343/368 (93%)	1.09	52 (15%)	5 5	53, 86, 135, 161	0
1	D	341/368 (92%)	0.75	42 (12%)	8 8	48, 69, 117, 170	0
1	E	322/368 (87%)	1.50	78 (24%)	2 2	77, 105, 147, 182	0
1	F	342/368 (92%)	1.37	84 (24%)	2 1	63, 99, 139, 162	0
All	All	2013/2208 (91%)	1.07	328 (16%)	4 5	48, 87, 135, 182	0

All (328) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	51	ALA	6.8
1	C	269	GLY	6.7
1	A	268	PHE	6.2
1	F	56	LEU	6.1
1	C	147	HIS	6.1
1	C	150	TRP	5.9
1	D	275	THR	5.9
1	E	207	THR	5.6
1	E	150	TRP	5.4
1	E	88	MET	5.4
1	C	149	LEU	5.1
1	B	302	GLY	5.0
1	B	88	MET	5.0
1	F	146	ILE	5.0
1	B	21	GLY	5.0
1	E	77	LEU	4.9
1	B	300	LEU	4.9
1	F	309	ALA	4.9
1	E	41	THR	4.9

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Mol	Chain	Res	Type	RSRZ
1	F	268	PHE	4.9
1	F	89	THR	4.8
1	B	89	THR	4.7
1	F	150	TRP	4.6
1	F	90	ILE	4.6
1	E	310	ALA	4.6
1	F	37	ALA	4.4
1	E	267	THR	4.3
1	B	150	TRP	4.3
1	E	228	LEU	4.2
1	E	149	LEU	4.2
1	B	151	SER	4.2
1	F	26	LEU	4.2
1	D	83	PHE	4.2
1	D	2	ALA	4.1
1	B	194	PHE	4.1
1	D	80	GLN	4.1
1	D	150	TRP	4.1
1	C	268	PHE	4.1
1	D	84	ASP	4.1
1	B	309	ALA	4.0
1	F	212	ILE	4.0
1	B	5	VAL	4.0
1	C	363	PRO	4.0
1	E	22	MET	4.0
1	E	44	MET	4.0
1	E	168	VAL	4.0
1	E	148	ALA	3.9
1	A	345	LEU	3.9
1	E	279	LEU	3.9
1	E	2	ALA	3.9
1	E	356	LEU	3.9
1	D	82	LEU	3.9
1	C	89	THR	3.8
1	D	307	ASP	3.8
1	A	59	ASP	3.7
1	F	275	THR	3.7
1	D	85	SER	3.7
1	D	194	PHE	3.7
1	B	345	LEU	3.6
1	D	306	THR	3.6
1	C	275	THR	3.6

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Mol	Chain	Res	Type	RSRZ
1	E	87	ASP	3.6
1	F	252	VAL	3.6
1	E	85	SER	3.6
1	D	222	VAL	3.5
1	F	153	GLY	3.5
1	E	86	SER	3.5
1	E	243	LEU	3.5
1	D	149	LEU	3.5
1	D	151	SER	3.5
1	E	21	GLY	3.5
1	D	5	VAL	3.5
1	C	245	PRO	3.4
1	C	77	LEU	3.4
1	D	88	MET	3.4
1	D	276	LYS	3.4
1	C	362	PRO	3.4
1	C	210	ALA	3.4
1	C	88	MET	3.4
1	F	88	MET	3.3
1	A	80	GLN	3.3
1	E	311	GLY	3.3
1	B	363	PRO	3.3
1	C	209	GLY	3.3
1	D	69	ASN	3.3
1	B	273	GLY	3.3
1	D	86	SER	3.2
1	D	89	THR	3.2
1	F	82	LEU	3.2
1	E	169	ILE	3.2
1	D	278	ASP	3.1
1	A	301	GLN	3.1
1	C	29	LEU	3.1
1	C	277	PRO	3.1
1	F	91	ALA	3.1
1	F	93	TRP	3.1
1	F	154	ARG	3.1
1	D	21	GLY	3.0
1	E	78	GLU	3.0
1	F	147	HIS	3.0
1	E	89	THR	3.0
1	F	20	ILE	3.0
1	C	267	THR	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	342	GLY	3.0
1	E	291	LEU	3.0
1	F	70	GLN	3.0
1	D	143	GLN	3.0
1	C	69	ASN	3.0
1	A	22	MET	3.0
1	E	9	ARG	3.0
1	E	213	THR	3.0
1	F	19	THR	3.0
1	B	267	THR	3.0
1	C	226	ALA	3.0
1	C	313	ALA	3.0
1	A	85	SER	2.9
1	C	151	SER	2.9
1	E	5	VAL	2.9
1	F	14	VAL	2.9
1	F	28	VAL	2.9
1	E	283	LEU	2.9
1	B	274	PRO	2.9
1	A	31	PRO	2.9
1	C	84	ASP	2.8
1	F	149	LEU	2.8
1	D	267	THR	2.8
1	C	144	VAL	2.8
1	A	21	GLY	2.8
1	B	191	ALA	2.8
1	E	23	ARG	2.8
1	C	301	GLN	2.8
1	B	311	GLY	2.8
1	D	142	ALA	2.8
1	C	24	SER	2.8
1	F	241	LEU	2.8
1	F	352	LEU	2.8
1	C	5	VAL	2.8
1	C	312	MET	2.8
1	D	301	GLN	2.7
1	E	72	ILE	2.7
1	E	138	ILE	2.7
1	F	279	LEU	2.7
1	B	356	LEU	2.7
1	B	312	MET	2.7
1	F	41	THR	2.7

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Mol	Chain	Res	Type	RSRZ
1	F	151	SER	2.7
1	A	7	PRO	2.7
1	C	70	GLN	2.7
1	F	331	LEU	2.7
1	F	345	LEU	2.7
1	D	22	MET	2.7
1	E	37	ALA	2.7
1	E	144	VAL	2.7
1	C	214	ILE	2.6
1	A	29	LEU	2.6
1	C	345	LEU	2.6
1	C	221	LYS	2.6
1	F	362	PRO	2.6
1	C	265	MET	2.6
1	F	29	LEU	2.6
1	C	95	CYS	2.6
1	E	156	ASN	2.6
1	C	148	ALA	2.6
1	C	264	VAL	2.6
1	A	351	LEU	2.6
1	E	155	GLU	2.6
1	F	246	GLY	2.6
1	F	132	ASN	2.6
1	F	191	ALA	2.6
1	F	263	VAL	2.6
1	D	210	ALA	2.6
1	A	84	ASP	2.6
1	E	38	ILE	2.6
1	B	288	GLU	2.6
1	E	4	ALA	2.6
1	E	64	PRO	2.6
1	F	208	VAL	2.6
1	E	175	PHE	2.6
1	F	281	GLN	2.6
1	A	65	PRO	2.5
1	F	196	ALA	2.5
1	F	257	GLN	2.5
1	F	310	ALA	2.5
1	B	195	ALA	2.5
1	B	147	HIS	2.5
1	C	83	PHE	2.5
1	C	33	THR	2.5

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Mol	Chain	Res	Type	RSRZ
1	C	85	SER	2.5
1	B	149	LEU	2.5
1	F	245	PRO	2.5
1	D	363	PRO	2.5
1	E	147	HIS	2.5
1	D	41	THR	2.4
1	E	40	ARG	2.4
1	F	220	ARG	2.4
1	E	240	LEU	2.4
1	A	57	SER	2.4
1	E	7	PRO	2.4
1	E	194	PHE	2.4
1	E	182	ARG	2.4
1	B	192	ARG	2.4
1	E	90	ILE	2.4
1	F	87	ASP	2.4
1	F	94	VAL	2.4
1	F	142	ALA	2.4
1	B	262	GLY	2.4
1	A	2	ALA	2.4
1	C	280	LEU	2.4
1	F	213	THR	2.4
1	C	215	ASN	2.4
1	B	59	ASP	2.4
1	E	227	GLY	2.4
1	F	168	VAL	2.4
1	E	181	PHE	2.4
1	E	280	LEU	2.3
1	D	345	LEU	2.3
1	D	145	PRO	2.3
1	F	4	ALA	2.3
1	D	309	ALA	2.3
1	B	291	LEU	2.3
1	E	146	ILE	2.3
1	F	107	TYR	2.3
1	A	275	THR	2.3
1	E	233	SER	2.3
1	F	57	SER	2.3
1	C	233	SER	2.3
1	F	363	PRO	2.3
1	D	18	GLY	2.3
1	F	351	LEU	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	83	PHE	2.3
1	E	363	PRO	2.3
1	F	152	ASP	2.3
1	A	150	TRP	2.3
1	E	70	GLN	2.3
1	F	219	VAL	2.3
1	F	104	TYR	2.3
1	E	215	ASN	2.3
1	F	239	GLY	2.3
1	F	318	GLY	2.3
1	E	45	PHE	2.3
1	E	226	ALA	2.2
1	B	146	ILE	2.2
1	E	102	ARG	2.2
1	F	9	ARG	2.2
1	E	152	ASP	2.2
1	E	239	GLY	2.2
1	F	18	GLY	2.2
1	F	144	VAL	2.2
1	F	283	LEU	2.2
1	C	26	LEU	2.2
1	A	276	LYS	2.2
1	A	309	ALA	2.2
1	F	265	MET	2.2
1	B	8	GLU	2.2
1	E	341	PRO	2.2
1	E	257	GLN	2.2
1	A	6	GLY	2.2
1	A	32	GLY	2.2
1	F	59	ASP	2.2
1	E	126	LEU	2.2
1	C	276	LYS	2.2
1	F	44	MET	2.2
1	A	310	ALA	2.2
1	C	315	ALA	2.2
1	E	217	GLU	2.2
1	E	71	ARG	2.2
1	E	69	ASN	2.2
1	F	259	PRO	2.2
1	D	7	PRO	2.2
1	F	39	LEU	2.2
1	F	280	LEU	2.2

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Mol	Chain	Res	Type	RSRZ
1	F	300	LEU	2.2
1	D	209	GLY	2.2
1	B	346	ASP	2.2
1	A	76	VAL	2.2
1	A	220	ARG	2.2
1	F	68	ARG	2.2
1	C	143	GLN	2.2
1	E	158	LEU	2.2
1	F	228	LEU	2.2
1	C	260	LEU	2.2
1	B	239	GLY	2.2
1	E	14	VAL	2.2
1	D	144	VAL	2.2
1	A	296	CYS	2.1
1	C	279	LEU	2.1
1	A	38	ILE	2.1
1	B	214	ILE	2.1
1	E	13	ALA	2.1
1	E	66	ALA	2.1
1	E	216	ARG	2.1
1	F	349	LYS	2.1
1	F	112	VAL	2.1
1	F	238	VAL	2.1
1	C	317	ALA	2.1
1	A	8	GLU	2.1
1	D	33	THR	2.1
1	D	221	LYS	2.1
1	F	55	GLY	2.1
1	E	112	VAL	2.1
1	B	219	VAL	2.1
1	F	40	ARG	2.1
1	F	22	MET	2.1
1	A	35	LEU	2.1
1	A	279	LEU	2.1
1	E	42	LEU	2.1
1	B	11	LEU	2.1
1	B	347	VAL	2.1
1	C	87	ASP	2.0
1	E	191	ALA	2.0
1	D	4	ALA	2.0
1	F	301	GLN	2.0
1	D	20	ILE	2.0

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Mol	Chain	Res	Type	RSRZ
1	C	17	GLY	2.0
1	C	10	ARG	2.0
1	E	288	GLU	2.0
1	F	49	GLU	2.0
1	F	148	ALA	2.0
1	A	233	SER	2.0
1	C	314	MET	2.0
1	A	363	PRO	2.0
1	F	116	THR	2.0
1	A	352	LEU	2.0
1	F	11	LEU	2.0
1	D	300	LEU	2.0
1	B	279	LEU	2.0
1	E	231	HIS	2.0
1	E	74	TYR	2.0

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

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

6.3 Carbohydrates [i](#)

There are no 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.