



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 14, 2017 – 04:24 am GMT

PDB ID : 5CCI  
Title : Structure of the Mg<sup>2+</sup>-bound synaptotagmin-1 SNARE complex (short unit cell form)  
Authors : Zhou, Q.; Zhao, M.; Lyubimov, A.Y.; Uervirojnangkoorn, M.; Weis, W.I.; Brunger, A.T.  
Deposited on : 2015-07-02  
Resolution : 4.10 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](mailto: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.

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

MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.9-1692
EDS	:	trunk28620
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)	:	recalc28949

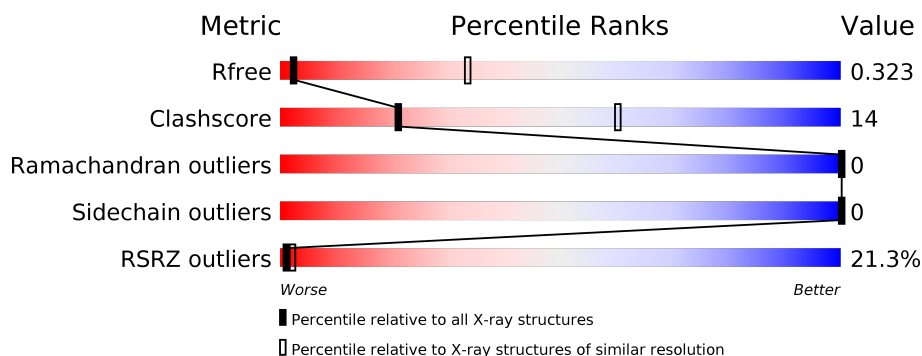
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 4.10 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	1153 (4.60-3.60)
Clashscore	112137	1002 (4.54-3.66)
Ramachandran outliers	110173	1000 (4.58-3.62)
Sidechain outliers	110143	1191 (4.60-3.60)
RSRZ outliers	101464	1165 (4.60-3.60)

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  $\geq 3$ , 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	63	<div> <div>5%</div> <div> <div></div> <div>76%</div> <div>22%</div> <div>•</div> </div> </div>
2	B	67	<div> <div>10%</div> <div> <div></div> <div>78%</div> <div>22%</div> </div> </div>
3	C	77	<div> <div>19%</div> <div> <div></div> <div>81%</div> <div>14%</div> <div>5%</div> </div> </div>
4	D	65	<div> <div>3%</div> <div> <div></div> <div>80%</div> <div>18%</div> <div>•</div> </div> </div>
5	E	281	<div> <div>19%</div> <div> <div></div> <div>79%</div> <div>21%</div> </div> </div>
5	F	281	<div> <div>33%</div> <div> <div></div> <div>74%</div> <div>21%</div> <div>5%</div> </div> </div>

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 6406 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 Vesicle-associated membrane protein 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	62	Total	C	N	O	S	0	0	0
			503	306	95	101	1			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	27	GLY	-	expression tag	UNP P63045

- Molecule 2 is a protein called Syntaxin-1A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	67	Total	C	N	O	S	0	0	0
			541	334	92	110	5			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	190	MET	-	initiating methionine	UNP P32851

- Molecule 3 is a protein called Synaptosomal-associated protein 25.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	73	Total	C	N	O	S	0	0	0
			588	350	106	127	5			

- Molecule 4 is a protein called Synaptosomal-associated protein 25.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	64	Total	C	N	O	S	0	0	0
			499	294	98	102	5			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	140	MET	-	initiating methionine	UNP P60881

- Molecule 5 is a protein called Synaptotagmin-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	E	280	Total	C	N	O	S	0	0	0
			2190	1405	367	410	8			
5	F	268	Total	C	N	O	S	0	0	0
			2081	1337	350	387	7			

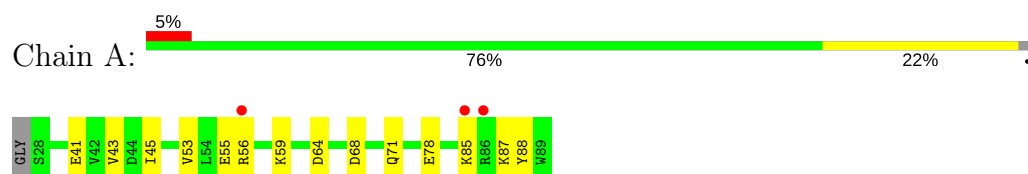
- Molecule 6 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	F	2	Total	Mg	0	0
			2	2		
6	E	2	Total	Mg	0	0
			2	2		

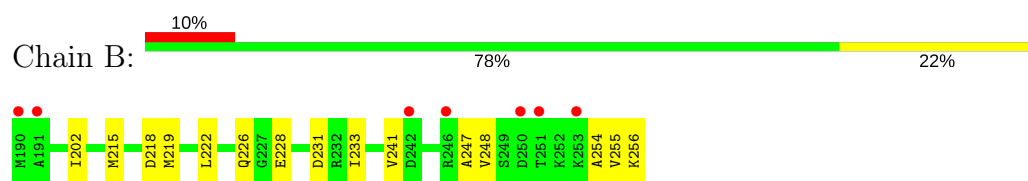
### 3 Residue-property plots [i](#)

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.

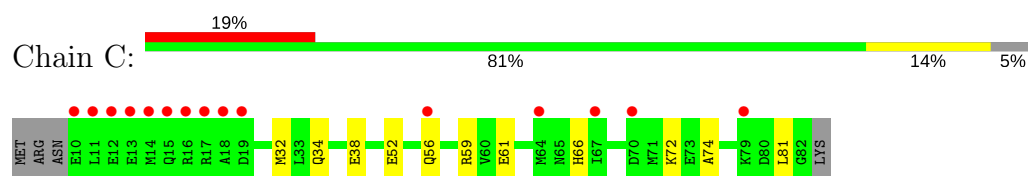
- Molecule 1: Vesicle-associated membrane protein 2



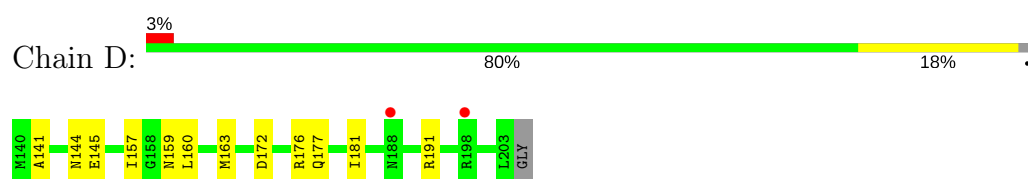
- Molecule 2: Syntaxin-1A



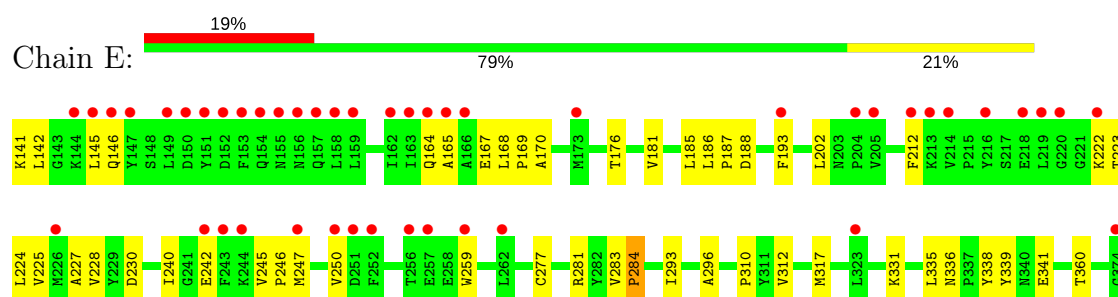
- Molecule 3: Synaptosomal-associated protein 25

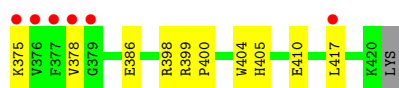


- Molecule 4: Synaptosomal-associated protein 25



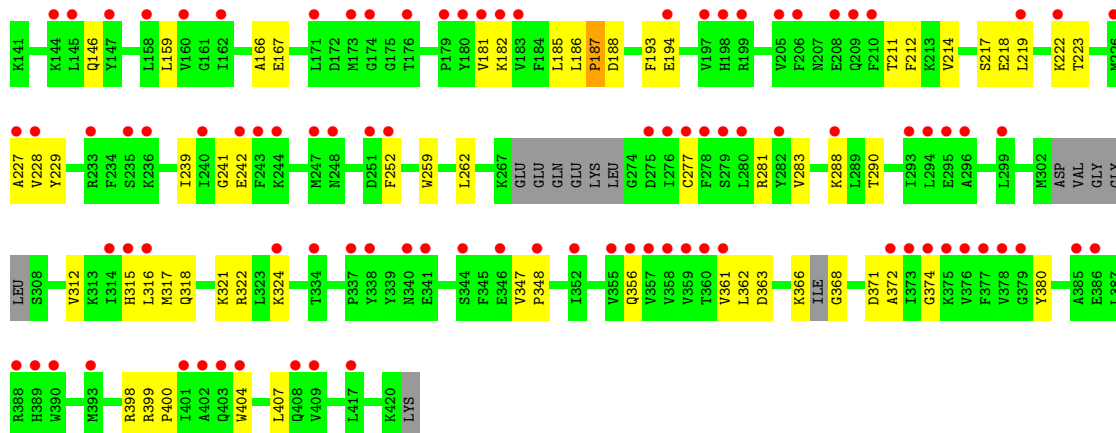
- Molecule 5: Synaptotagmin-1





● Molecule 5: Synaptotagmin-1

Chain F: 33% 74% 21% 5%



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	69.06Å 171.76Å 146.56Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.24 – 4.10 74.10 – 4.10	Depositor EDS
% Data completeness (in resolution range)	95.7 (48.24-4.10) 94.9 (74.10-4.10)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.12	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.07 (at 4.15Å)	Xtriage
Refinement program	PHENIX	Depositor
R, $R_{free}$	0.276 , 0.323 0.278 , 0.323	Depositor DCC
$R_{free}$ test set	675 reflections (4.99%)	DCC
Wilson B-factor (Å <sup>2</sup> )	135.5	Xtriage
Anisotropy	0.803	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.40 , 231.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.41$ , $\langle L^2 \rangle = 0.24$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.86	EDS
Total number of atoms	6406	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	193.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.00% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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](#)

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

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	0.25	0/506	0.35	0/677
2	B	0.25	0/546	0.34	0/730
3	C	0.24	0/588	0.33	0/782
4	D	0.24	0/499	0.40	0/664
5	E	0.30	1/2239 (0.0%)	0.43	0/3029
5	F	0.26	1/2127 (0.0%)	0.41	0/2875
All	All	0.27	2/6505 (0.0%)	0.40	0/8757

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	E	284	PRO	N-CD	-7.69	1.37	1.47
5	F	187	PRO	N-CD	5.11	1.55	1.47

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	503	0	502	12	0
2	B	541	0	529	12	0
3	C	588	0	573	10	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	D	499	0	486	11	0
5	E	2190	0	2133	90	0
5	F	2081	0	2015	55	0
6	E	2	0	0	0	0
6	F	2	0	0	0	0
All	All	6406	0	6238	173	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 14.

All (173) 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)
5:F:187:PRO:CG	5:F:222:LYS:HG3	1.46	1.45
5:E:142:LEU:CD2	5:E:169:PRO:HG3	1.47	1.42
5:F:187:PRO:HG3	5:F:222:LYS:CG	1.53	1.39
5:E:222:LYS:O	5:E:247:MET:HG2	1.37	1.21
5:E:142:LEU:CD2	5:E:169:PRO:CG	2.22	1.18
5:E:142:LEU:HD23	5:E:169:PRO:CG	1.82	1.07
5:E:222:LYS:O	5:E:247:MET:CG	2.01	1.07
5:E:142:LEU:HA	5:E:169:PRO:HD3	1.37	1.06
5:E:142:LEU:CA	5:E:169:PRO:HD3	1.87	1.04
5:E:142:LEU:HD22	5:E:169:PRO:CG	1.86	1.03
5:E:142:LEU:CD1	5:E:240:ILE:O	2.08	1.00
5:F:187:PRO:CD	5:F:222:LYS:HG3	1.94	0.98
4:D:141:ALA:HA	4:D:144:ASN:ND2	1.79	0.97
5:F:193:PHE:CE1	5:F:212:PHE:CE1	2.55	0.94
5:E:185:LEU:HD21	5:E:212:PHE:CG	2.01	0.94
5:E:142:LEU:O	5:E:169:PRO:HD3	1.68	0.93
5:E:142:LEU:O	5:E:168:LEU:HA	1.69	0.92
5:E:142:LEU:HD22	5:E:169:PRO:HG2	1.54	0.87
5:F:187:PRO:HG3	5:F:222:LYS:CD	2.04	0.86
5:E:142:LEU:HD23	5:E:169:PRO:HG3	0.86	0.85
5:E:142:LEU:C	5:E:169:PRO:HD3	1.97	0.84
4:D:144:ASN:OD1	4:D:145:GLU:N	2.11	0.84
5:E:187:PRO:CG	5:E:222:LYS:HA	2.09	0.83
5:E:142:LEU:HD11	5:E:240:ILE:O	1.79	0.82
5:E:186:LEU:N	5:E:223:THR:O	2.12	0.82
4:D:141:ALA:HA	4:D:144:ASN:HD21	1.44	0.82
5:F:186:LEU:HB3	5:F:223:THR:HB	1.62	0.81
5:E:187:PRO:HG2	5:E:222:LYS:HG2	1.63	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:142:LEU:O	5:E:167:GLU:O	1.98	0.81
5:E:142:LEU:HA	5:E:169:PRO:CD	2.11	0.80
5:E:185:LEU:HD21	5:E:212:PHE:CD1	2.17	0.78
5:E:193:PHE:HE2	5:E:212:PHE:CE1	2.01	0.78
5:F:187:PRO:HG3	5:F:222:LYS:HG3	0.78	0.77
5:E:142:LEU:HD13	5:E:240:ILE:O	1.86	0.76
5:E:187:PRO:HG2	5:E:222:LYS:HA	1.67	0.75
5:F:356:GLN:HE22	5:F:380:TYR:HB3	1.51	0.74
5:E:141:LYS:HD3	5:E:141:LYS:N	2.03	0.72
5:E:142:LEU:O	5:E:169:PRO:CD	2.36	0.72
5:E:193:PHE:CE2	5:E:212:PHE:CE1	2.78	0.72
5:E:142:LEU:CA	5:E:169:PRO:CD	2.66	0.72
5:F:193:PHE:HE1	5:F:212:PHE:CE1	2.06	0.71
5:E:187:PRO:HG2	5:E:222:LYS:CB	2.20	0.71
5:F:317:MET:HB2	5:F:356:GLN:HB2	1.71	0.71
5:E:223:THR:HG23	5:E:245:VAL:O	1.91	0.70
5:F:187:PRO:CG	5:F:222:LYS:CG	2.33	0.70
5:E:142:LEU:HD13	5:E:240:ILE:HG22	1.72	0.69
5:E:296:ALA:O	5:E:336:ASN:ND2	2.26	0.68
5:E:186:LEU:CB	5:E:223:THR:HB	2.24	0.68
5:E:187:PRO:HG2	5:E:222:LYS:CG	2.23	0.68
5:E:187:PRO:HG3	5:E:222:LYS:HA	1.76	0.68
5:F:187:PRO:HD3	5:F:223:THR:H	1.58	0.68
5:F:186:LEU:CB	5:F:223:THR:HB	2.26	0.65
5:F:288:LYS:NZ	5:F:290:THR:OG1	2.30	0.65
5:E:187:PRO:HG2	5:E:222:LYS:CA	2.26	0.65
5:F:281:ARG:HB3	5:F:290:THR:HB	1.78	0.65
5:F:193:PHE:HE1	5:F:212:PHE:HE1	1.44	0.64
5:E:187:PRO:HD3	5:E:223:THR:H	1.63	0.64
5:F:187:PRO:CD	5:F:222:LYS:CG	2.71	0.64
5:E:146:GLN:HB2	5:E:259:TRP:CE2	2.35	0.62
5:F:193:PHE:CE1	5:F:212:PHE:HE1	2.15	0.62
5:E:187:PRO:HD3	5:E:223:THR:N	2.15	0.62
2:B:248:VAL:HG22	3:C:74:ALA:HB2	1.81	0.61
5:F:316:LEU:HB3	5:F:324:LYS:HB2	1.82	0.61
5:E:360:THR:HG23	5:E:375:LYS:HB3	1.83	0.60
5:F:193:PHE:CD1	5:F:212:PHE:CZ	2.90	0.60
5:E:142:LEU:O	5:E:168:LEU:CA	2.48	0.59
5:E:188:ASP:OD1	5:E:188:ASP:O	2.21	0.59
5:E:185:LEU:CD2	5:E:212:PHE:CD1	2.86	0.59
5:F:185:LEU:HB2	5:F:188:ASP:OD1	2.03	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:277:CYS:HB2	5:E:404:TRP:CD2	2.38	0.58
5:E:223:THR:HG22	5:E:224:LEU:N	2.19	0.58
5:F:315:HIS:HB3	5:F:322:ARG:HD2	1.85	0.58
3:C:34:GLN:NE2	3:C:38:GLU:OE2	2.38	0.57
1:A:55:GLU:HG2	1:A:59:LYS:HE2	1.87	0.57
5:E:223:THR:HG23	5:E:245:VAL:C	2.25	0.56
5:F:312:VAL:HG22	5:F:361:VAL:HG22	1.87	0.56
5:F:283:VAL:HG13	5:F:398:ARG:HG2	1.87	0.55
5:F:363:ASP:HB3	5:F:371:ASP:HB2	1.90	0.54
1:A:78:GLU:HA	2:B:247:ALA:HB2	1.90	0.54
5:E:187:PRO:HD3	5:E:223:THR:O	2.08	0.54
5:E:335:LEU:HD23	5:E:335:LEU:H	1.73	0.53
5:F:219:LEU:HA	5:F:222:LYS:HE3	1.89	0.53
5:F:374:GLY:HA3	5:F:407:LEU:HD13	1.89	0.53
1:A:56:ARG:NH1	2:B:226:GLN:OE1	2.42	0.53
1:A:88:TYR:CD2	3:C:81:LEU:HD21	2.44	0.52
5:F:187:PRO:HD3	5:F:222:LYS:HG3	1.90	0.51
1:A:85:LYS:HA	2:B:254:ALA:HB2	1.93	0.51
2:B:218:ASP:O	2:B:222:LEU:HG	2.12	0.50
5:E:378:VAL:HG12	5:E:386:GLU:HB3	1.93	0.49
4:D:157:ILE:HD13	4:D:160:LEU:HD12	1.94	0.49
5:F:318:GLN:O	5:F:321:LYS:HG2	2.12	0.49
5:E:331:LYS:NZ	5:E:338:TYR:O	2.45	0.49
5:E:142:LEU:HA	5:E:169:PRO:CG	2.42	0.49
5:F:146:GLN:HB2	5:F:259:TRP:CE2	2.48	0.49
5:E:283:VAL:HG12	5:E:398:ARG:HA	1.94	0.48
5:F:356:GLN:NE2	5:F:380:TYR:HB3	2.24	0.48
2:B:255:VAL:HG13	2:B:256:LYS:HG3	1.96	0.48
5:E:187:PRO:CD	5:E:223:THR:H	2.27	0.48
5:F:193:PHE:CD1	5:F:212:PHE:CE1	3.00	0.48
5:E:223:THR:CG2	5:E:224:LEU:N	2.76	0.48
5:E:187:PRO:CG	5:E:222:LYS:CA	2.85	0.47
5:F:166:ALA:O	5:F:167:GLU:HG2	2.13	0.47
4:D:177:GLN:O	4:D:181:ILE:HG12	2.14	0.47
5:F:218:GLU:N	5:F:218:GLU:OE1	2.45	0.47
5:E:181:VAL:HG22	5:E:228:VAL:HG22	1.96	0.47
5:F:185:LEU:HD11	5:F:212:PHE:HB3	1.96	0.47
1:A:64:ASP:HA	2:B:233:ILE:HG12	1.96	0.47
5:F:186:LEU:HD13	5:F:223:THR:HG21	1.98	0.46
1:A:43:VAL:HA	2:B:215:MET:HE1	1.96	0.46
5:E:230:ASP:HB2	5:E:240:ILE:HD11	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:181:VAL:HG22	5:F:228:VAL:HG22	1.98	0.46
5:E:222:LYS:O	5:E:247:MET:HG3	2.05	0.46
5:E:227:ALA:HA	5:E:242:GLU:HA	1.98	0.46
5:E:283:VAL:CG1	5:E:398:ARG:HA	2.46	0.46
5:E:165:ALA:HB1	5:E:168:LEU:HD21	1.98	0.46
5:E:142:LEU:HD13	5:E:240:ILE:CG2	2.44	0.45
5:E:141:LYS:CD	5:E:141:LYS:N	2.73	0.45
5:E:310:PRO:HD2	5:E:331:LYS:O	2.16	0.45
5:E:386:GLU:HA	5:E:405:HIS:HE1	1.82	0.45
5:E:186:LEU:CB	5:E:223:THR:CB	2.94	0.45
5:E:186:LEU:CB	5:E:223:THR:C	2.86	0.44
5:E:186:LEU:CB	5:E:225:VAL:HG23	2.47	0.44
5:F:182:LYS:HG3	5:F:194:GLU:HG2	1.98	0.44
5:F:217:SER:OG	5:F:218:GLU:OE1	2.31	0.44
5:F:214:VAL:HG21	5:F:222:LYS:HE2	1.98	0.44
3:C:56:GLN:HG2	3:C:59:ARG:NH2	2.33	0.44
5:E:185:LEU:HG	5:E:212:PHE:CE1	2.52	0.44
5:F:187:PRO:CG	5:F:222:LYS:CD	2.87	0.44
5:F:366:LYS:O	5:F:368:GLY:HA3	2.18	0.44
4:D:163:MET:HG2	5:E:338:TYR:CZ	2.53	0.43
4:D:163:MET:HG2	5:E:338:TYR:CE1	2.53	0.43
1:A:41:GLU:O	1:A:45:ILE:HG12	2.17	0.43
5:F:229:TYR:CE1	5:F:239:ILE:HG22	2.54	0.43
1:A:53:VAL:HG21	2:B:219:MET:SD	2.57	0.43
5:F:277:CYS:HB3	5:F:404:TRP:CE3	2.54	0.43
4:D:172:ASP:O	4:D:176:ARG:HG2	2.19	0.43
5:E:339:TYR:HB3	5:E:341:GLU:HG3	2.00	0.43
2:B:241:VAL:HG13	3:C:66:HIS:HD2	1.84	0.42
5:E:142:LEU:CB	5:E:169:PRO:CD	2.97	0.42
1:A:68:ASP:O	1:A:71:GLN:HG3	2.19	0.42
5:F:185:LEU:HD11	5:F:212:PHE:CB	2.49	0.42
5:F:241:GLY:HA3	5:F:262:LEU:HD13	2.00	0.42
5:E:185:LEU:CG	5:E:212:PHE:CD1	3.03	0.42
5:E:246:PRO:O	5:E:250:VAL:HG23	2.19	0.42
5:F:187:PRO:HG3	5:F:222:LYS:HD3	1.96	0.42
5:E:283:VAL:HA	5:E:284:PRO:HD3	1.68	0.42
5:F:159:LEU:HD12	5:F:211:THR:HG22	2.02	0.42
5:F:227:ALA:HB2	5:F:242:GLU:HG3	2.01	0.42
2:B:202:ILE:HG23	3:C:32:MET:HE1	2.02	0.42
5:E:281:ARG:HB2	5:E:400:PRO:HB3	2.01	0.42
5:E:317:MET:SD	5:E:417:LEU:HD13	2.60	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:159:ASN:ND2	5:E:336:ASN:OD1	2.52	0.41
5:F:277:CYS:HB3	5:F:404:TRP:CD2	2.55	0.41
3:C:61:GLU:HB2	4:D:181:ILE:HD11	2.03	0.41
5:E:146:GLN:HB2	5:E:259:TRP:CD2	2.54	0.41
5:E:176:THR:HG22	5:E:202:LEU:HG	2.02	0.41
5:E:145:LEU:HD12	5:E:164:GLN:O	2.20	0.41
5:F:219:LEU:HD21	5:F:252:PHE:HE2	1.85	0.41
1:A:87:LYS:HE3	1:A:88:TYR:CE1	2.55	0.41
5:E:142:LEU:HA	5:E:169:PRO:HG3	2.02	0.41
5:F:399:ARG:HA	5:F:400:PRO:HD3	1.91	0.41
3:C:52:GLU:CD	5:E:399:ARG:HE	2.24	0.41
1:A:88:TYR:CE2	3:C:81:LEU:HD21	2.56	0.41
2:B:228:GLU:O	2:B:231:ASP:HB2	2.20	0.41
5:F:347:VAL:HA	5:F:348:PRO:HD2	1.90	0.41
5:E:170:ALA:HB2	5:E:202:LEU:HD11	2.04	0.40
5:E:293:ILE:HG21	5:E:312:VAL:HG21	2.02	0.40
3:C:72:LYS:HG3	4:D:191:ARG:HH22	1.86	0.40
5:E:142:LEU:HB3	5:E:169:PRO:CD	2.51	0.40
5:E:185:LEU:HG	5:E:212:PHE:CD1	2.56	0.40
5:F:219:LEU:HD21	5:F:252:PHE:CE2	2.57	0.40
5:F:362:LEU:HD22	5:F:372:ALA:HA	2.03	0.40
5:E:375:LYS:HD3	5:E:410:GLU:HA	2.02	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	60/63 (95%)	60 (100%)	0	0	100	100
2	B	65/67 (97%)	64 (98%)	1 (2%)	0	100	100
3	C	71/77 (92%)	71 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	D	62/65 (95%)	60 (97%)	2 (3%)	0	100	100
5	E	278/281 (99%)	270 (97%)	8 (3%)	0	100	100
5	F	260/281 (92%)	253 (97%)	7 (3%)	0	100	100
All	All	796/834 (95%)	778 (98%)	18 (2%)	0	100	100

There are no Ramachandran outliers to report.

### 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	54/54 (100%)	54 (100%)	0	100	100
2	B	60/61 (98%)	60 (100%)	0	100	100
3	C	65/69 (94%)	65 (100%)	0	100	100
4	D	53/56 (95%)	53 (100%)	0	100	100
5	E	233/251 (93%)	233 (100%)	0	100	100
5	F	221/251 (88%)	221 (100%)	0	100	100
All	All	686/742 (92%)	686 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
5	F	356	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](#)

Of 4 ligands modelled in this entry, 4 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	62/63 (98%)	0.52	3 (4%) 31 24	145, 159, 185, 203	0
2	B	67/67 (100%)	0.82	7 (10%) 7 7	147, 159, 187, 189	0
3	C	73/77 (94%)	1.34	15 (20%) 1 2	149, 165, 208, 220	0
4	D	64/65 (98%)	0.38	2 (3%) 49 39	145, 164, 207, 211	0
5	E	280/281 (99%)	0.94	52 (18%) 1 3	144, 185, 215, 265	0
5	F	268/281 (95%)	1.63	94 (35%) 0 1	166, 228, 287, 302	0
All	All	814/834 (97%)	1.12	173 (21%) 1 2	144, 186, 272, 302	0

All (173) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
5	F	375	LYS	8.6
5	F	403	GLN	8.2
3	C	12	GLU	7.6
5	F	377	PHE	7.3
5	E	153	PHE	7.3
2	B	190	MET	7.3
5	F	252	PHE	7.1
5	F	373	ILE	7.1
5	E	150	ASP	6.7
3	C	13	GLU	6.5
3	C	16	ARG	6.4
5	F	295	GLU	6.3
3	C	15	GLN	6.2
5	E	151	TYR	6.1
3	C	10	GLU	6.0
5	E	216	TYR	6.0
5	F	402	ALA	5.9
5	F	374	GLY	5.7
5	F	376	VAL	5.5

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Mol	Chain	Res	Type	RSRZ
5	F	194	GLU	5.3
5	F	173	MET	5.3
5	F	182	LYS	5.2
5	F	378	VAL	5.1
5	E	219	LEU	5.1
5	E	164	GLN	5.0
5	F	296	ALA	4.9
5	E	212	PHE	4.9
5	F	278	PHE	4.9
5	F	359	VAL	4.8
5	F	358	VAL	4.7
5	F	337	PRO	4.7
5	E	146	GLN	4.7
5	E	154	GLN	4.7
5	E	144	LYS	4.6
5	F	226	MET	4.6
5	E	377	PHE	4.6
5	F	404	TRP	4.4
5	F	357	VAL	4.4
5	F	388	ARG	4.4
5	E	226	MET	4.3
3	C	11	LEU	4.3
3	C	17	ARG	4.2
3	C	14	MET	4.2
5	E	213	LYS	4.2
5	F	276	ILE	4.2
5	F	210	PHE	4.1
5	F	346	GLU	4.1
5	F	361	VAL	4.0
5	E	222	LYS	4.0
5	F	206	PHE	4.0
5	E	218	GLU	3.9
5	E	147	TYR	3.9
3	C	19	ASP	3.9
5	E	257	GLU	3.9
5	E	152	ASP	3.9
5	F	324	LYS	3.9
5	F	279	SER	3.8
5	E	252	PHE	3.7
5	F	372	ALA	3.7
5	E	259	TRP	3.7
5	F	385	ALA	3.7

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Mol	Chain	Res	Type	RSRZ
5	F	227	ALA	3.7
5	E	157	GLN	3.7
5	F	316	LEU	3.6
5	F	389	HIS	3.6
5	F	179	PRO	3.6
5	F	338	TYR	3.6
5	E	173	MET	3.5
5	E	378	VAL	3.5
5	F	244	LYS	3.5
5	E	375	LYS	3.4
5	E	156	ASN	3.4
3	C	18	ALA	3.4
5	E	163	ILE	3.4
5	F	288	LYS	3.3
5	F	401	ILE	3.3
5	E	205	VAL	3.3
5	E	158	LEU	3.2
5	F	299	LEU	3.2
5	F	219	LEU	3.2
5	E	214	VAL	3.2
5	E	165	ALA	3.2
5	F	390	TRP	3.1
5	F	356	GLN	3.1
2	B	246	ARG	3.1
5	F	209	GLN	3.1
5	E	162	ILE	3.1
5	F	408	GLN	3.1
5	F	222	LYS	3.1
5	F	275	ASP	3.0
5	F	145	LEU	3.0
5	F	417	LEU	3.0
5	F	181	VAL	3.0
5	E	145	LEU	3.0
5	F	147	TYR	2.9
5	E	193	PHE	2.9
5	F	277	CYS	2.9
5	F	280	LEU	2.9
5	E	243	PHE	2.9
5	F	174	GLY	2.9
5	E	166	ALA	2.9
5	F	379	GLY	2.8
5	F	198	HIS	2.8

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Mol	Chain	Res	Type	RSRZ
5	F	242	GLU	2.8
5	E	417	LEU	2.8
5	F	282	TYR	2.8
5	F	355	VAL	2.7
5	E	256	THR	2.7
5	F	180	TYR	2.7
3	C	79	LYS	2.7
5	F	248	ASN	2.7
5	F	199	ARG	2.7
5	F	160	VAL	2.6
5	E	149	LEU	2.6
5	F	208	GLU	2.6
5	F	314	ILE	2.6
5	E	220	GLY	2.6
5	E	244	LYS	2.6
4	D	198	ARG	2.6
5	F	176	THR	2.6
5	F	162	ILE	2.6
1	A	86	ARG	2.6
5	F	243	PHE	2.6
3	C	70	ASP	2.6
5	F	334	THR	2.6
5	F	352	ILE	2.5
5	F	158	LEU	2.5
5	F	233	ARG	2.5
5	E	159	LEU	2.5
4	D	188	ASN	2.4
5	F	360	THR	2.4
5	E	204	PRO	2.4
5	F	171	LEU	2.4
1	A	56	ARG	2.4
5	F	205	VAL	2.4
5	F	235	SER	2.4
1	A	85	LYS	2.4
5	F	240	ILE	2.4
5	F	144	LYS	2.4
5	F	197	VAL	2.4
5	E	376	VAL	2.3
5	E	379	GLY	2.3
5	F	293	ILE	2.3
5	F	386	GLU	2.3
5	E	374	GLY	2.3

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Mol	Chain	Res	Type	RSRZ
5	F	315	HIS	2.3
5	F	348	PRO	2.3
5	F	344	SER	2.2
5	F	340	ASN	2.2
5	F	393	MET	2.2
5	F	294	LEU	2.2
5	E	242	GLU	2.2
2	B	251	THR	2.2
3	C	67	ILE	2.2
5	F	236	LYS	2.2
5	F	251	ASP	2.2
2	B	191	ALA	2.1
5	F	183	VAL	2.1
2	B	253	LYS	2.1
2	B	242	ASP	2.1
5	E	323	LEU	2.1
5	F	409	VAL	2.1
3	C	56	GLN	2.1
5	E	155	ASN	2.1
5	F	228	VAL	2.1
5	E	247	MET	2.1
5	E	251	ASP	2.1
5	F	341	GLU	2.1
3	C	64	MET	2.0
2	B	250	ASP	2.0
5	E	262	LEU	2.0
5	E	250	VAL	2.0
5	F	247	MET	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, 95<sup>th</sup> 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(Å <sup>2</sup> )	Q<0.9
6	MG	F	502	1/1	0.29	0.12	-1.75	283,283,283,283	0
6	MG	E	502	1/1	0.95	0.14	-1.76	160,160,160,160	0
6	MG	F	501	1/1	0.89	0.17	-1.91	167,167,167,167	0
6	MG	E	501	1/1	0.92	0.22	-	197,197,197,197	0

## 6.5 Other polymers

There are no such residues in this entry.