Full wwPDB X-ray Structure Validation Report (i)

Oct 11, 2023 – 09:47 AM EDT

PDB ID	:	7N6E
Title	:	TCR peptide HLA-A2 complex
Authors	:	Chaurasia, P.; Rossjohn, J.; Petersen, J.
Deposited on	:	2021-06-08
Resolution	:	3.20 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 (i) 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 (i)) were used in the production of this report:

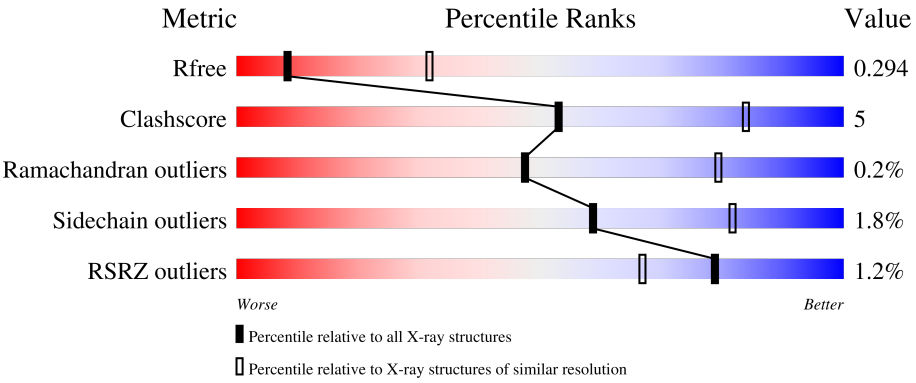
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

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 3.20 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}	130704	1133 (3.20-3.20)
Clashscore	141614	1253 (3.20-3.20)
Ramachandran outliers	138981	1234 (3.20-3.20)
Sidechain outliers	138945	1233 (3.20-3.20)
RSRZ outliers	127900	1095 (3.20-3.20)

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 <=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	278	2% 85% 13% ·
1	D	278	3% 87% 11% ··
2	B	100	2% 83% 16% ·
2	E	100	85% 14% ·
3	C	9	78% 22%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
3	F	9	
4	G	202	
4	I	202	
5	H	242	
5	J	242	

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 12991 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 MHC class I antigen.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	271	Total	C	N	O	S	0	0	0
			2165	1357	395	404	9			
1	D	274	Total	C	N	O	S	0	0	0
			2192	1376	397	410	9			

- Molecule 2 is a protein called Beta-2-microglobulin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	99	Total	C	N	O	S	0	0	0
			809	515	136	155	3			
2	E	99	Total	C	N	O	S	0	0	0
			806	515	137	151	3			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	0	MET	-	initiating methionine	UNP P61769
E	0	MET	-	initiating methionine	UNP P61769

- Molecule 3 is a protein called Spike protein S1.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	C	9	Total	C	N	O	0	0	0
			82	56	13	13			
3	F	9	Total	C	N	O	0	0	0
			82	56	13	13			

- Molecule 4 is a protein called TRAV12-1 TCR-alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	G	198	Total	C	N	O	S	0	0	0
			1510	938	255	307	10			

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	I	199	Total	C	N	O	S	0	0	0
			1552	964	265	313	10			

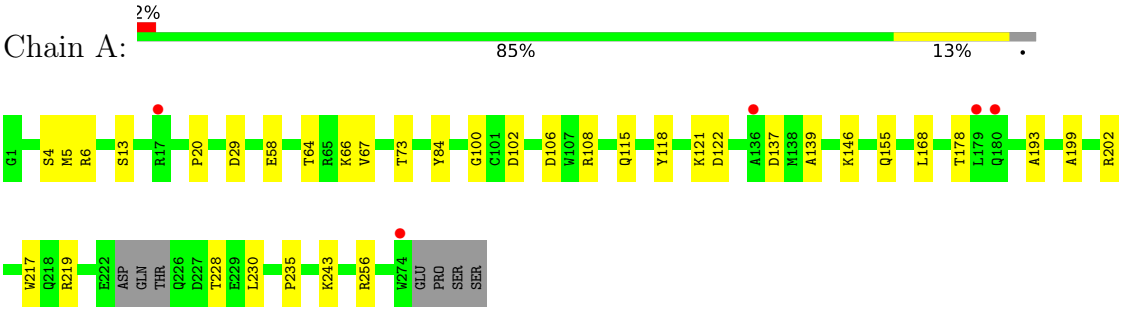
- Molecule 5 is a protein called TRBV19 TCR beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	H	239	Total	C	N	O	S	0	0	0
			1905	1206	329	364	6			
5	J	239	Total	C	N	O	S	0	0	0
			1888	1197	327	358	6			

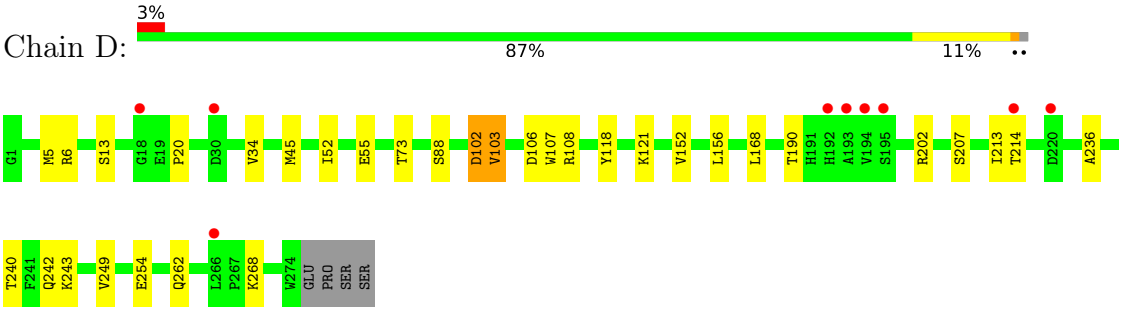
3 Residue-property plots (i)

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.

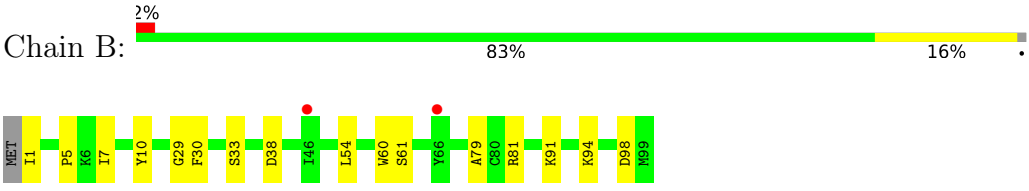
• Molecule 1: MHC class I antigen



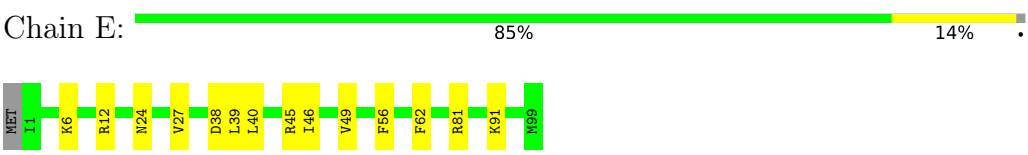
• Molecule 1: MHC class I antigen



• Molecule 2: Beta-2-microglobulin

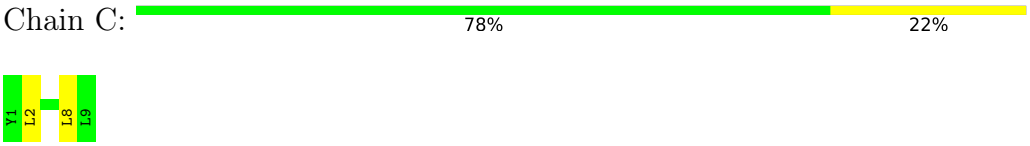


• Molecule 2: Beta-2-microglobulin



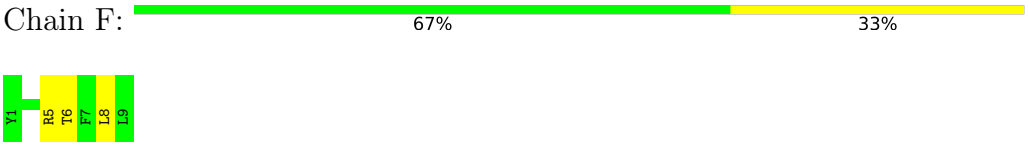
• Molecule 3: Spike protein S1

Chain C:



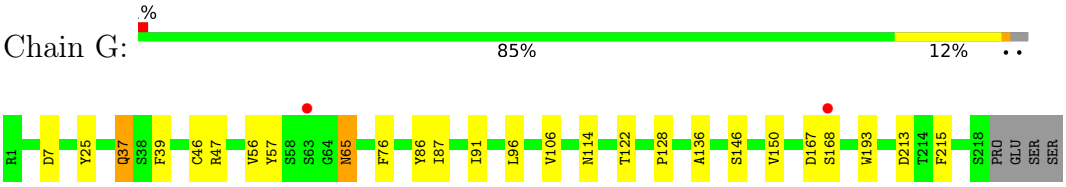
• Molecule 3: Spike protein S1

Chain F:



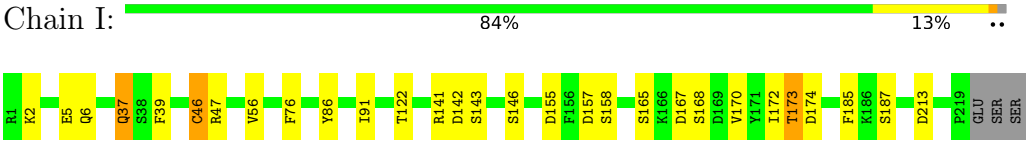
• Molecule 4: TRAV12-1 TCR-alpha

Chain G:



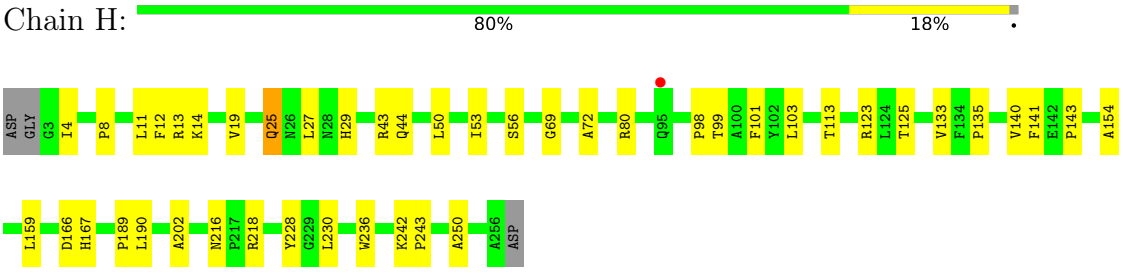
• Molecule 4: TRAV12-1 TCR-alpha

Chain I:



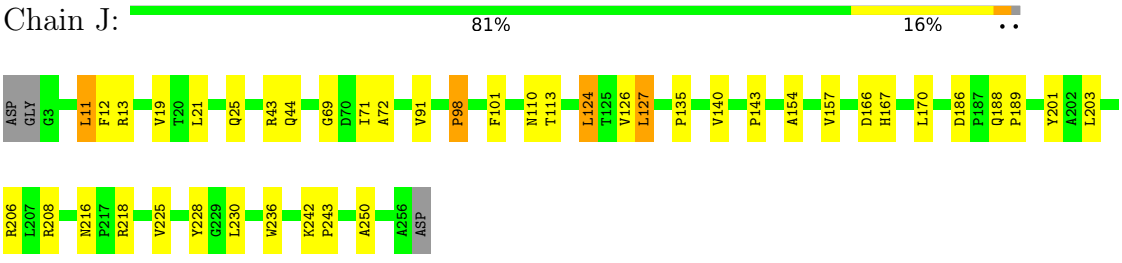
• Molecule 5: TRBV19 TCR beta

Chain H:



• Molecule 5: TRBV19 TCR beta

Chain J:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	63.83Å 95.13Å 168.75Å 90.00° 100.18° 90.00°	Depositor
Resolution (Å)	47.85 – 3.20 47.85 – 3.20	Depositor EDS
% Data completeness (in resolution range)	94.9 (47.85-3.20) 91.5 (47.85-3.20)	Depositor EDS
R_{merge}	0.18	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.42 (at 3.19Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.239 , 0.294 0.238 , 0.294	Depositor DCC
R_{free} test set	1994 reflections (6.36%)	wwPDB-VP
Wilson B-factor (Å^2)	53.9	Xtriage
Anisotropy	0.396	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.27 , -3.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.45$, $< L^2 > = 0.28$	Xtriage
Estimated twinning fraction	0.105 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.86	EDS
Total number of atoms	12991	wwPDB-VP
Average B, all atoms (Å^2)	56.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.55% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

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	0.24	0/2227	0.50	0/3026
1	D	0.24	0/2256	0.50	0/3068
2	B	0.24	0/832	0.47	0/1130
2	E	0.24	0/829	0.47	0/1125
3	C	0.25	0/84	0.54	0/112
3	F	0.24	0/84	0.52	0/112
4	G	0.25	0/1542	0.48	0/2098
4	I	0.25	0/1585	0.49	0/2149
5	H	0.24	0/1956	0.50	0/2662
5	J	0.24	0/1939	0.48	0/2641
All	All	0.24	0/13334	0.49	0/18123

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

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	2165	0	2005	23	0
1	D	2192	0	2028	20	0
2	B	809	0	751	12	0
2	E	806	0	756	11	0
3	C	82	0	88	2	0
3	F	82	0	88	3	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	G	1510	0	1375	14	0
4	I	1552	0	1461	17	0
5	H	1905	0	1805	25	0
5	J	1888	0	1777	27	0
All	All	12991	0	12134	135	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 (135) 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:J:13:ARG:HG3	5:J:19:VAL:HB	1.68	0.76
5:H:4:ILE:HG13	5:H:25:GLN:HB3	1.68	0.75
4:I:167:ASP:HB3	4:I:170:VAL:HG12	1.71	0.71
1:D:190:THR:HG22	1:D:202:ARG:HB3	1.71	0.71
1:A:5:MET:HB2	1:A:168:LEU:HD13	1.72	0.71
2:E:39:LEU:HD13	2:E:49:VAL:HG11	1.73	0.71
5:H:43:ARG:HB2	5:H:53:ILE:HD11	1.73	0.69
2:B:7:ILE:HD12	2:B:91:LYS:HD2	1.74	0.69
1:A:219:ARG:HD2	1:A:256:ARG:HE	1.58	0.69
1:D:5:MET:HB2	1:D:168:LEU:HD13	1.74	0.68
5:J:135:PRO:HD3	5:J:243:PRO:HB3	1.77	0.66
2:E:40:LEU:HD21	2:E:81:ARG:HE	1.60	0.65
5:H:135:PRO:HD3	5:H:243:PRO:HB3	1.80	0.62
5:J:98:PRO:HA	5:J:126:VAL:HG22	1.81	0.62
1:A:73:THR:HG23	3:C:8:LEU:HD23	1.82	0.61
5:H:13:ARG:HG3	5:H:19:VAL:HB	1.82	0.61
2:B:29:GLY:HA2	2:B:61:SER:HB2	1.83	0.61
1:A:202:ARG:NH1	2:B:98:ASP:O	2.33	0.61
1:A:230:LEU:HD11	1:A:243:LYS:HE3	1.82	0.60
1:A:6:ARG:HD3	1:A:100:GLY:HA3	1.82	0.60
1:D:236:ALA:HB1	2:E:12:ARG:HG3	1.83	0.60
4:G:96:LEU:HD11	4:G:128:PRO:HB3	1.84	0.60
1:D:73:THR:HG23	3:F:8:LEU:HD23	1.83	0.60
2:B:33:SER:HB2	2:B:54:LEU:HD21	1.85	0.58
5:J:140:VAL:HG23	5:J:250:ALA:HB3	1.84	0.58
2:B:79:ALA:HB2	2:B:94:LYS:HD3	1.84	0.57
5:H:8:PRO:HG2	5:H:11:LEU:HB2	1.86	0.57
1:D:118:TYR:O	1:D:121:LYS:HG2	2.05	0.57
1:A:4:SER:O	1:A:29:ASP:N	2.32	0.57

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:I:155:ASP:OD1	5:J:208:ARG:NH1	2.27	0.57
5:H:44:GLN:HB3	5:H:101:PHE:HB3	1.86	0.56
5:H:140:VAL:HG23	5:H:250:ALA:HB3	1.87	0.56
5:H:216:ASN:HD21	5:H:218:ARG:HE	1.54	0.56
1:D:103:VAL:HG13	1:D:107:TRP:HA	1.87	0.56
5:J:69:GLY:H	5:J:72:ALA:HB2	1.71	0.55
2:E:38:ASP:O	2:E:81:ARG:N	2.34	0.55
1:D:213:ILE:HD11	1:D:243:LYS:HB3	1.89	0.54
1:A:155:GLN:O	4:I:37:GLN:NE2	2.41	0.53
1:A:217:TRP:HB2	1:A:228:THR:HG21	1.91	0.53
4:G:56:VAL:HG11	4:G:87:ILE:HG23	1.90	0.53
1:D:6:ARG:NH1	1:D:102:ASP:OD1	2.41	0.53
1:D:242:GLN:NE2	2:E:12:ARG:O	2.42	0.53
4:G:47:ARG:HE	5:H:123:ARG:NH1	2.06	0.52
1:D:207:SER:HA	1:D:240:THR:HB	1.90	0.52
5:J:11:LEU:HB3	5:J:124:LEU:HD12	1.91	0.51
5:J:167:HIS:HB3	5:J:228:TYR:HB2	1.92	0.51
2:E:56:PHE:HA	2:E:62:PHE:HA	1.92	0.51
4:I:46:CYS:SG	5:J:188:GLN:NE2	2.83	0.50
5:H:50:LEU:HD11	5:H:103:LEU:HD12	1.93	0.50
4:G:65:ASN:N	4:G:65:ASN:OD1	2.44	0.50
5:J:12:PHE:HD2	5:J:127:LEU:HD21	1.77	0.50
1:A:84:TYR:HB3	1:A:139:ALA:HB1	1.94	0.49
4:I:76:PHE:HD1	4:I:91:ILE:HG12	1.77	0.49
4:G:57:TYR:HD2	4:G:65:ASN:HD21	1.59	0.49
5:H:216:ASN:HD21	5:H:218:ARG:HH21	1.59	0.49
5:J:44:GLN:HB3	5:J:101:PHE:HB3	1.94	0.49
5:J:157:VAL:HG22	5:J:206:ARG:HG2	1.93	0.49
5:H:99:THR:HG22	5:H:125:THR:HA	1.95	0.49
1:D:52:ILE:HD12	1:D:55:GLU:HG3	1.95	0.49
5:H:56:SER:OG	5:H:80:ARG:NH1	2.43	0.49
5:J:19:VAL:HG13	5:J:91:VAL:HB	1.95	0.49
5:J:12:PHE:CZ	5:J:230:LEU:HD23	2.49	0.48
3:F:6:THR:H	4:G:114:ASN:HD21	1.62	0.48
3:F:5:ARG:HG3	4:G:37:GLN:HG3	1.95	0.48
1:A:66:LYS:HE3	3:C:2:LEU:HB2	1.95	0.48
1:D:106:ASP:OD2	1:D:108:ARG:HB2	2.14	0.48
2:E:45:ARG:HG2	2:E:46:ILE:N	2.28	0.48
4:I:167:ASP:OD1	4:I:168:SER:N	2.47	0.48
5:H:12:PHE:CZ	5:H:230:LEU:HD23	2.49	0.47
1:D:13:SER:HA	1:D:20:PRO:HB3	1.95	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:H:166:ASP:HB2	5:H:189:PRO:HG3	1.96	0.47
1:A:106:ASP:OD2	1:A:108:ARG:HB2	2.15	0.47
5:H:143:PRO:HG2	5:H:154:ALA:HB1	1.96	0.47
5:H:190:LEU:O	5:H:202:ALA:N	2.48	0.46
5:J:13:ARG:O	5:J:126:VAL:HA	2.15	0.46
1:A:219:ARG:HG3	1:A:256:ARG:HB3	1.97	0.46
1:A:13:SER:HA	1:A:20:PRO:HB3	1.98	0.46
5:J:12:PHE:HB2	5:J:127:LEU:HD21	1.97	0.46
5:J:143:PRO:HG3	5:J:154:ALA:HB1	1.98	0.45
4:G:25:TYR:HB3	4:G:106:VAL:HG11	1.99	0.45
4:G:7:ASP:O	4:G:122:THR:HG22	2.16	0.45
4:I:165:SER:HB3	4:I:172:ILE:HG13	1.97	0.45
2:B:1:ILE:HD12	2:B:1:ILE:HA	1.85	0.45
5:H:167:HIS:HB3	5:H:228:TYR:HB2	1.99	0.45
5:J:43:ARG:HD3	5:J:71:ILE:HD12	1.98	0.45
5:J:189:PRO:HB2	5:J:201:TYR:HB3	1.99	0.45
1:A:193:ALA:HA	1:A:199:ALA:HA	1.99	0.44
2:E:38:ASP:N	2:E:81:ARG:O	2.40	0.44
5:H:12:PHE:HZ	5:H:230:LEU:HD23	1.82	0.44
5:J:216:ASN:HD21	5:J:218:ARG:HH11	1.65	0.44
1:A:118:TYR:O	1:A:121:LYS:HG2	2.16	0.44
2:B:38:ASP:OD1	1:D:88:SER:HB3	2.18	0.44
1:A:137:ASP:OD1	1:A:137:ASP:N	2.51	0.44
1:D:214:THR:HB	1:D:262:GLN:HB2	2.00	0.44
4:I:2:LYS:HB2	4:I:5:GLU:HG2	1.99	0.43
4:I:39:PHE:HB2	4:I:56:VAL:HB	2.00	0.43
1:A:235:PRO:O	2:B:10:TYR:OH	2.26	0.43
5:J:170:LEU:HG	5:J:225:VAL:HG22	2.01	0.42
5:H:141:PHE:HE1	5:H:159:LEU:HB2	1.83	0.42
4:I:167:ASP:HB3	4:I:170:VAL:CG1	2.46	0.42
5:H:236:TRP:CG	5:H:242:LYS:HB3	2.54	0.42
5:H:69:GLY:H	5:H:72:ALA:HB2	1.83	0.42
4:I:157:ASP:OD1	4:I:158:SER:N	2.52	0.42
5:J:186:ASP:HB2	5:J:203:LEU:HD12	2.01	0.42
1:A:64:THR:HA	1:A:67:VAL:HG12	2.01	0.42
1:D:152:VAL:HG12	1:D:156:LEU:HD12	2.02	0.42
5:H:13:ARG:HD3	5:H:13:ARG:HA	1.89	0.42
1:A:146:LYS:HE2	5:J:110:ASN:ND2	2.35	0.42
1:D:268:LYS:HE2	1:D:268:LYS:HB3	1.91	0.42
5:H:133:VAL:O	5:H:243:PRO:HG3	2.20	0.42
2:B:38:ASP:O	2:B:81:ARG:N	2.42	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:I:142:ASP:OD1	4:I:143:SER:N	2.53	0.42
1:A:58:GLU:H	1:A:58:GLU:HG2	1.66	0.41
2:E:81:ARG:HA	2:E:91:LYS:O	2.20	0.41
4:G:136:ALA:HB2	4:G:215:PHE:HB3	2.02	0.41
5:H:27:LEU:HB2	5:H:29:HIS:CE1	2.55	0.41
1:D:34:VAL:HB	1:D:45:MET:SD	2.60	0.41
4:G:76:PHE:HD1	4:G:91:ILE:HG12	1.85	0.41
5:J:236:TRP:CG	5:J:242:LYS:HB3	2.55	0.41
1:D:249:VAL:HG21	1:D:254:GLU:HG3	2.02	0.41
4:I:47:ARG:HE	5:J:188:GLN:HG3	1.84	0.41
1:D:236:ALA:O	2:E:24:ASN:ND2	2.50	0.41
5:J:166:ASP:HB2	5:J:189:PRO:HG3	2.03	0.41
2:B:5:PRO:HB3	2:B:30:PHE:HB3	2.03	0.41
4:I:173:THR:HG22	4:I:174:ASP:H	1.86	0.41
4:G:150:VAL:HG22	4:G:193:TRP:HB3	2.03	0.41
1:A:115:GLN:HG3	2:B:60:TRP:CH2	2.55	0.41
1:A:122:ASP:OD1	2:B:60:TRP:NE1	2.53	0.41
2:E:6:LYS:O	2:E:27:VAL:HA	2.21	0.41
5:J:12:PHE:CD2	5:J:127:LEU:HD21	2.55	0.41
4:G:39:PHE:HB2	4:G:56:VAL:HB	2.02	0.40
4:G:167:ASP:OD1	4:G:168:SER:N	2.54	0.40
4:I:76:PHE:CD1	4:I:91:ILE:HG12	2.56	0.40
4:I:141:ARG:NH1	4:I:146:SER:O	2.54	0.40
4:I:185:PHE:CE2	4:I:187:SER:HB3	2.56	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	267/278 (96%)	254 (95%)	13 (5%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	272/278 (98%)	259 (95%)	13 (5%)	0	100	100
2	B	97/100 (97%)	93 (96%)	4 (4%)	0	100	100
2	E	97/100 (97%)	94 (97%)	3 (3%)	0	100	100
3	C	7/9 (78%)	7 (100%)	0	0	100	100
3	F	7/9 (78%)	7 (100%)	0	0	100	100
4	G	196/202 (97%)	182 (93%)	13 (7%)	1 (0%)	29	67
4	I	197/202 (98%)	187 (95%)	10 (5%)	0	100	100
5	H	237/242 (98%)	222 (94%)	14 (6%)	1 (0%)	34	69
5	J	237/242 (98%)	220 (93%)	16 (7%)	1 (0%)	34	69
All	All	1614/1662 (97%)	1525 (94%)	86 (5%)	3 (0%)	47	79

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	G	146	SER
5	J	98	PRO
5	H	98	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	217/234 (93%)	215 (99%)	2 (1%)	78	91
1	D	219/234 (94%)	217 (99%)	2 (1%)	78	91
2	B	89/95 (94%)	89 (100%)	0	100	100
2	E	88/95 (93%)	88 (100%)	0	100	100
3	C	9/9 (100%)	9 (100%)	0	100	100
3	F	9/9 (100%)	9 (100%)	0	100	100
4	G	165/183 (90%)	160 (97%)	5 (3%)	41	73
4	I	176/183 (96%)	169 (96%)	7 (4%)	31	66

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
5	H	205/210 (98%)	202 (98%)	3 (2%)	65 85
5	J	200/210 (95%)	194 (97%)	6 (3%)	41 73
All	All	1377/1462 (94%)	1352 (98%)	25 (2%)	59 82

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	102	ASP
1	A	178	THR
1	D	102	ASP
1	D	103	VAL
4	G	37	GLN
4	G	46	CYS
4	G	65	ASN
4	G	86	TYR
4	G	213	ASP
4	I	6	GLN
4	I	37	GLN
4	I	46	CYS
4	I	86	TYR
4	I	122	THR
4	I	173	THR
4	I	213	ASP
5	H	14	LYS
5	H	25	GLN
5	H	113	THR
5	J	11	LEU
5	J	21	LEU
5	J	25	GLN
5	J	113	THR
5	J	124	LEU
5	J	127	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
4	G	114	ASN
4	I	37	GLN
4	I	81	ASN
5	H	110	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
5	H	188	GLN
5	J	107	GLN
5	J	110	ASN
5	J	188	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

There are no monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

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^{th} 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	271/278 (97%)	-0.07	5 (1%) 68 55	34, 63, 99, 120	0
1	D	274/278 (98%)	-0.02	9 (3%) 46 30	28, 64, 103, 125	0
2	B	99/100 (99%)	0.01	2 (2%) 65 51	32, 67, 99, 108	0
2	E	99/100 (99%)	-0.15	0 100 100	37, 67, 108, 126	0
3	C	9/9 (100%)	-0.30	0 100 100	27, 34, 44, 54	0
3	F	9/9 (100%)	-0.46	0 100 100	24, 36, 40, 53	0
4	G	198/202 (98%)	-0.22	2 (1%) 82 72	22, 41, 84, 106	0
4	I	199/202 (98%)	-0.27	0 100 100	25, 42, 76, 94	0
5	H	239/242 (98%)	-0.29	1 (0%) 92 89	25, 46, 81, 104	0
5	J	239/242 (98%)	-0.24	0 100 100	27, 52, 79, 111	0
All	All	1636/1662 (98%)	-0.17	19 (1%) 79 67	22, 53, 95, 126	0

All (19) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	180	GLN	2.9
1	D	195	SER	2.9
1	D	30	ASP	2.9
4	G	63	SER	2.6
5	H	95	GLN	2.5
1	D	214	THR	2.5
1	D	192	HIS	2.5
1	A	274	TRP	2.4
1	D	194	VAL	2.4
1	D	18	GLY	2.3
1	A	17	ARG	2.3
2	B	46	ILE	2.2
1	D	220	ASP	2.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
4	G	168	SER	2.1
1	D	266	LEU	2.1
1	A	136	ALA	2.1
1	D	193	ALA	2.1
1	A	179	LEU	2.0
2	B	66	TYR	2.0

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

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.