



Full wwPDB X-ray Structure Validation Report ⓘ

May 28, 2020 – 09:38 pm BST

PDB ID : 2AK4
Title : Crystal Structure of SB27 TCR in complex with HLA-B*3508-13mer peptide
Authors : Tynan, F.E.; Burrows, S.R.; Buckle, A.M.; Clements, C.S.; Borg, N.A.; Miles, J.J.; Beddoe, T.; Whisstock, J.C.; Wilce, M.C.; Silins, S.L.; Burrows, J.M.; Kjer-Nielsen, L.; Konstenko, L.; Purcell, A.W.; McCluskey, J.; Rossjohn, J.
Deposited on : 2005-08-03
Resolution : 2.50 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.11
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) : 2.11

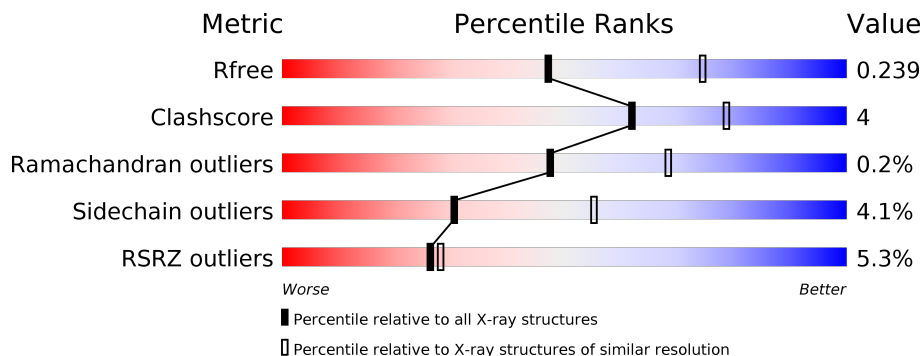
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria 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	276	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 91%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 8%; height: 10px; background-color: yellow; margin-right: 2px;"></div> </div> <p style="font-size: small; margin-top: 5px;">2% 91% 8%</p>
1	F	276	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 92%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 8%; height: 10px; background-color: yellow; margin-right: 2px;"></div> </div> <p style="font-size: small; margin-top: 5px;">2% 92% 8%</p>
1	K	276	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 92%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 8%; height: 10px; background-color: yellow; margin-right: 2px;"></div> </div> <p style="font-size: small; margin-top: 5px;">5% 92% 8%</p>
1	Q	276	<div style="display: flex; align-items: center;"> <div style="width: 18%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 89%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 11%; height: 10px; background-color: yellow; margin-right: 2px;"></div> </div> <p style="font-size: small; margin-top: 5px;">18% 89% 11%</p>
2	B	99	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 93%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 5%; height: 10px; background-color: yellow; margin-right: 2px;"></div> </div> <p style="font-size: small; margin-top: 5px;">2% 93% 5% •</p>
2	G	99	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 2px;"></div> <div style="width: 93%; height: 10px; background-color: green; margin-right: 2px;"></div> <div style="width: 5%; height: 10px; background-color: yellow; margin-right: 2px;"></div> </div> <p style="font-size: small; margin-top: 5px;">2% 93% 5% •</p>

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
2	L	99	<p>2% 92% 6% .</p>
2	R	99	<p>2% 91% 7% .</p>
3	C	13	<p>77% 23%</p>
3	H	13	<p>77% 23%</p>
3	M	13	<p>8% 77% 23%</p>
3	S	13	<p>77% 23%</p>
4	D	211	<p>6% 82% 13% . .</p>
4	I	211	<p>9% 84% 10% . .</p>
4	N	211	<p>6% 80% 15% . .</p>
4	T	211	<p>8% 82% 14% . .</p>
5	E	245	<p>2% 81% 16% . .</p>
5	J	245	<p>4% 82% 14% . .</p>
5	P	245	<p>3% 82% 15% . .</p>
5	U	245	<p>4% 80% 15% . .</p>

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 26609 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 HLA-B35 variant.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	276	Total 2243	C 1397	N 412	O 427	S 7	0	0	0
1	F	276	Total 2242	C 1398	N 411	O 426	S 7	0	0	0
1	K	276	Total 2220	C 1387	N 405	O 421	S 7	0	0	0
1	Q	276	Total 2239	C 1397	N 404	O 431	S 7	0	0	0

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	99	Total 799	C 509	N 134	O 153	S 3	0	0	0
2	G	99	Total 818	C 521	N 136	O 158	S 3	0	0	0
2	L	99	Total 807	C 514	N 136	O 154	S 3	0	0	0
2	R	99	Total 788	C 504	N 133	O 148	S 3	0	0	0

- Molecule 3 is a protein called EBV peptide LPEPLPQGQLTAY.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	C	13	Total 101	C 66	N 15	O 20	0	0	0
3	H	13	Total 101	C 66	N 15	O 20	0	0	0
3	M	13	Total 96	C 63	N 14	O 19	0	0	0
3	S	13	Total 97	C 64	N 14	O 19	0	0	0

- Molecule 4 is a protein called SB27 T cell receptor alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	204	Total	C	N	O	S	0	0	0
			1575	998	252	319	6			
4	I	204	Total	C	N	O	S	0	0	0
			1579	1004	252	316	7			
4	N	204	Total	C	N	O	S	0	0	0
			1603	1018	257	321	7			
4	T	204	Total	C	N	O	S	0	0	0
			1560	992	248	314	6			

- Molecule 5 is a protein called SB27 T cell receptor beta chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	E	241	Total	C	N	O	S	0	0	0
			1887	1188	327	363	9			
5	J	241	Total	C	N	O	S	0	0	0
			1882	1187	326	360	9			
5	P	241	Total	C	N	O	S	0	0	0
			1883	1186	328	360	9			
5	U	238	Total	C	N	O	S	0	0	0
			1828	1151	320	348	9			

- Molecule 6 is IODIDE ION (three-letter code: IOD) (formula: I).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	G	1	Total	I	0	0
			1	1		
6	J	1	Total	I	0	0
			1	1		
6	Q	2	Total	I	0	0
			2	2		
6	D	1	Total	I	0	0
			1	1		
6	K	3	Total	I	0	0
			3	3		
6	E	1	Total	I	0	0
			1	1		
6	H	1	Total	I	0	0
			1	1		
6	B	1	Total	I	0	0
			1	1		
6	C	1	Total	I	0	0
			1	1		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	3	Total I 3 3	0	0
6	R	1	Total I 1 1	0	0
6	L	1	Total I 1 1	0	0
6	S	1	Total I 1 1	0	0
6	F	4	Total I 4 4	0	0

- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	26	Total O 26 26	0	0
7	B	9	Total O 9 9	0	0
7	D	12	Total O 12 12	0	0
7	E	13	Total O 13 13	0	0
7	F	22	Total O 22 22	0	0
7	G	8	Total O 8 8	0	0
7	I	8	Total O 8 8	0	0
7	J	18	Total O 18 18	0	0
7	K	18	Total O 18 18	0	0
7	L	8	Total O 8 8	0	0
7	M	1	Total O 1 1	0	0
7	N	20	Total O 20 20	0	0
7	P	25	Total O 25 25	0	0
7	Q	19	Total O 19 19	0	0

Continued on next page...

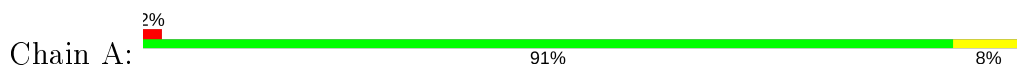
Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	R	3	Total O 3 3	0	0
7	S	1	Total O 1 1	0	0
7	T	8	Total O 8 8	0	0
7	U	20	Total O 20 20	0	0

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.

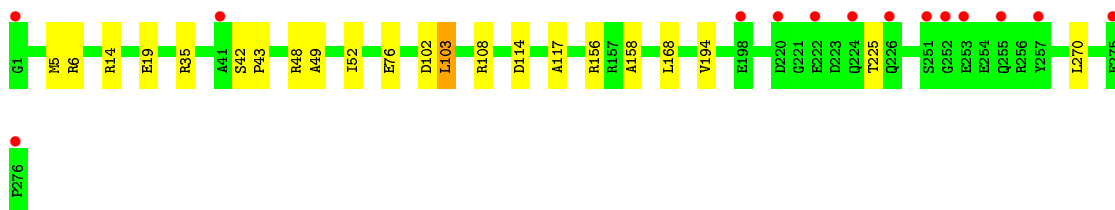
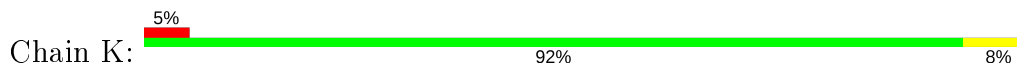
- Molecule 1: HLA-B35 variant



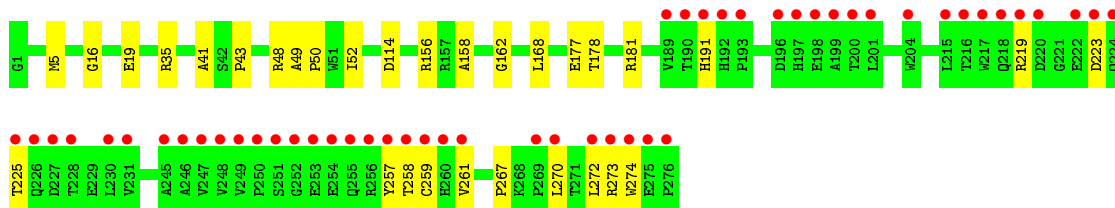
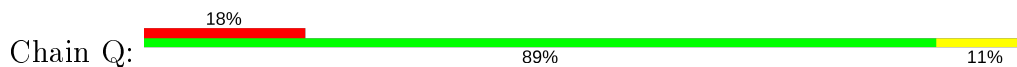
- Molecule 1: HLA-B35 variant



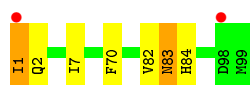
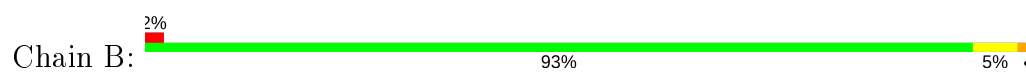
- Molecule 1: HLA-B35 variant



- Molecule 1: HLA-B35 variant



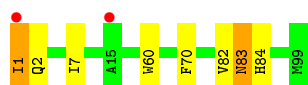
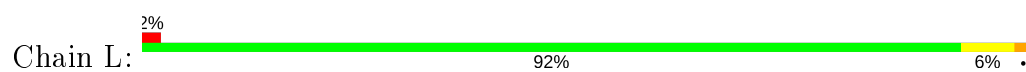
- Molecule 2: Beta-2-microglobulin



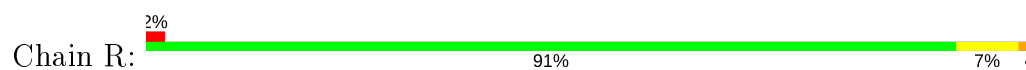
- Molecule 2: Beta-2-microglobulin



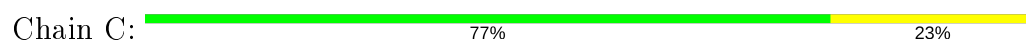
- Molecule 2: Beta-2-microglobulin



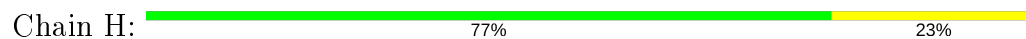
- Molecule 2: Beta-2-microglobulin



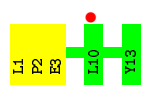
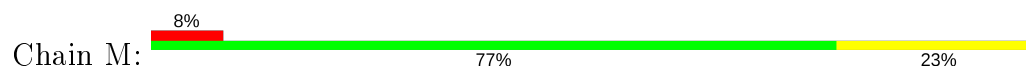
- Molecule 3: EBV peptide LPEPLPQGQLTAY



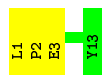
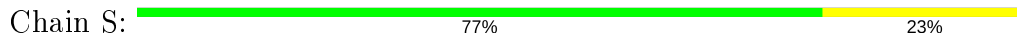
- Molecule 3: EBV peptide LPEPLPQGQLTAY



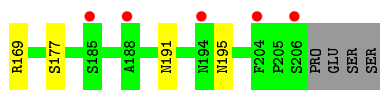
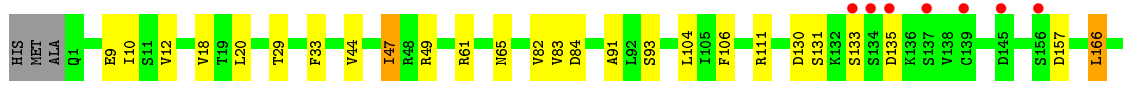
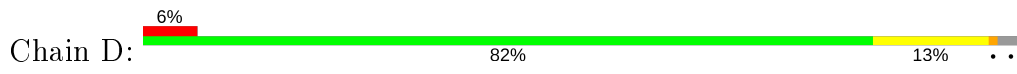
- Molecule 3: EBV peptide LPEPLPQGQLTAY



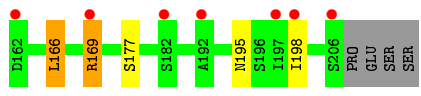
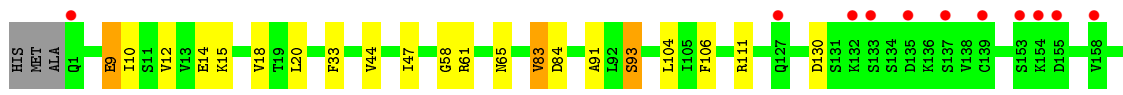
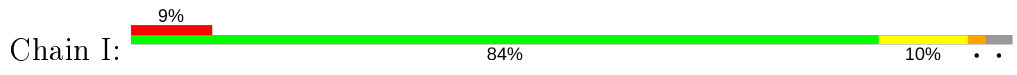
- Molecule 3: EBV peptide LPEPLPQGQLTAY



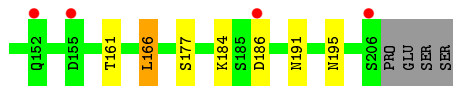
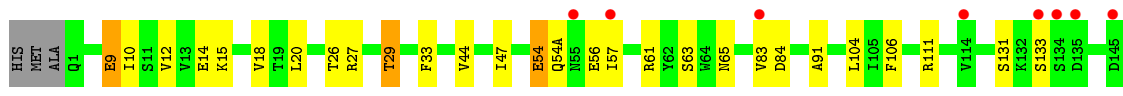
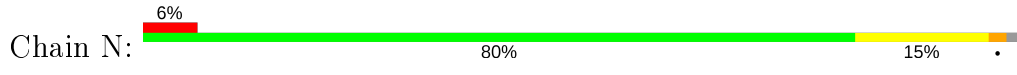
• Molecule 4: SB27 T cell receptor alpha chain



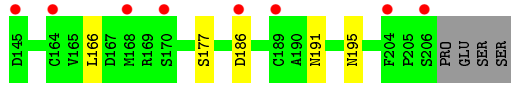
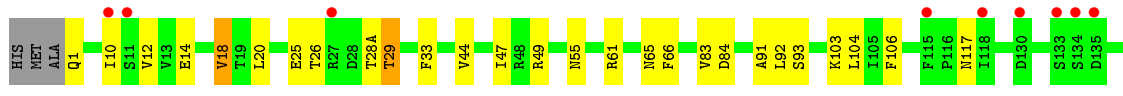
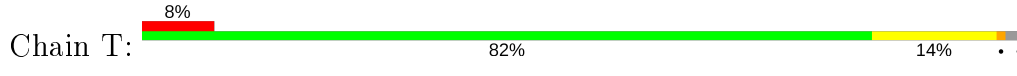
• Molecule 4: SB27 T cell receptor alpha chain



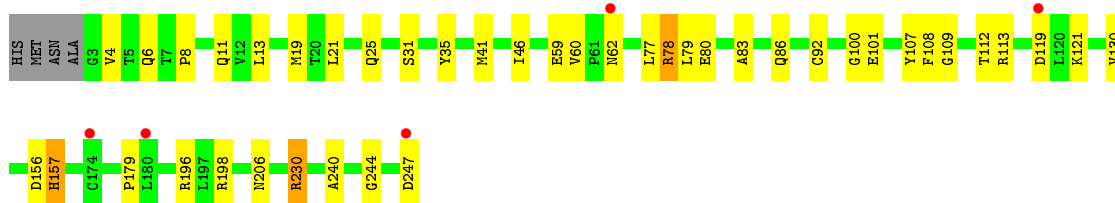
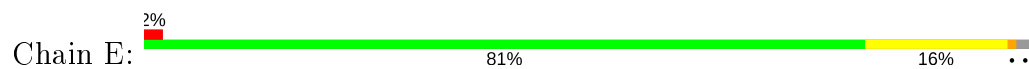
• Molecule 4: SB27 T cell receptor alpha chain



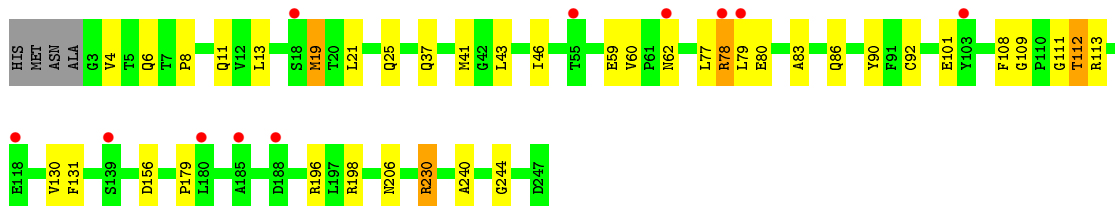
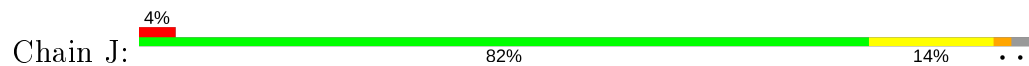
• Molecule 4: SB27 T cell receptor alpha chain



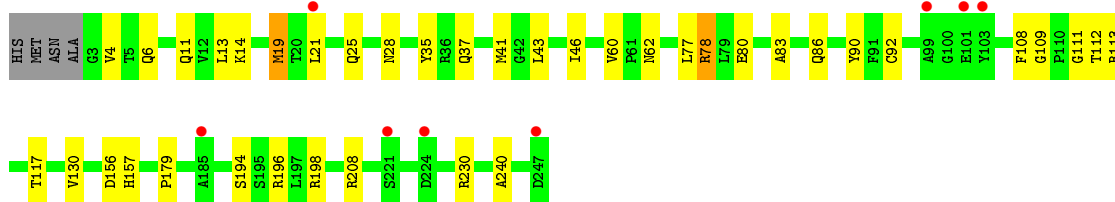
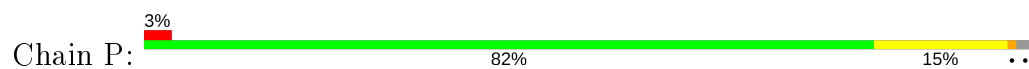
• Molecule 5: SB27 T cell receptor beta chain



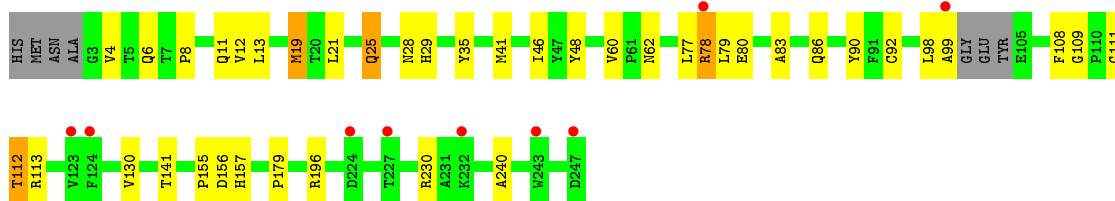
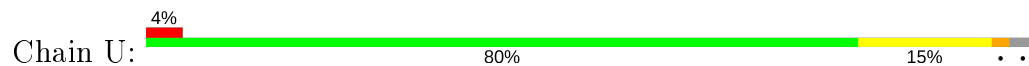
- Molecule 5: SB27 T cell receptor beta chain



- Molecule 5: SB27 T cell receptor beta chain



- Molecule 5: SB27 T cell receptor beta chain



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	79.15Å 213.28Å 122.30Å 90.00° 89.94° 90.00°	Depositor
Resolution (Å)	50.00 – 2.50 38.08 – 2.50	Depositor EDS
% Data completeness (in resolution range)	95.5 (50.00-2.50) 95.3 (38.08-2.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.51 (at 2.51Å)	Xtrriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.246 , 0.278 0.225 , 0.239	Depositor DCC
R_{free} test set	4033 reflections (3.02%)	wwPDB-VP
Wilson B-factor (Å ²)	35.4	Xtrriage
Anisotropy	0.644	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , -17.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.43$, $\langle L^2 \rangle = 0.26$	Xtrriage
Estimated twinning fraction	0.318 for h,-k,-l	Xtrriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	26609	wwPDB-VP
Average B, all atoms (Å ²)	10.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.27% 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

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

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.38	0/2306	0.54	0/3137
1	F	0.37	0/2305	0.53	0/3135
1	K	0.38	0/2283	0.55	1/3106 (0.0%)
1	Q	0.36	0/2302	0.52	0/3132
2	B	0.38	0/822	0.50	0/1116
2	G	0.37	0/841	0.50	0/1141
2	L	0.38	0/830	0.51	0/1127
2	R	0.37	0/811	0.49	0/1104
3	C	0.36	0/104	0.44	0/142
3	H	0.33	0/104	0.47	0/142
3	M	0.40	0/99	0.46	0/135
3	S	0.35	0/100	0.44	0/137
4	D	0.39	0/1613	0.53	0/2196
4	I	0.38	0/1617	0.52	0/2202
4	N	0.39	0/1641	0.54	0/2232
4	T	0.39	0/1598	0.54	0/2180
5	E	0.38	0/1939	0.63	2/2641 (0.1%)
5	J	0.37	0/1934	0.52	1/2634 (0.0%)
5	P	0.39	0/1935	0.65	3/2634 (0.1%)
5	U	0.36	0/1878	0.52	1/2562 (0.0%)
All	All	0.38	0/27062	0.54	8/36835 (0.0%)

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	247	ASP	CA-C-O	16.16	154.04	120.10
5	P	78	ARG	NE-CZ-NH2	-14.42	113.09	120.30
5	P	78	ARG	NE-CZ-NH1	13.59	127.10	120.30
1	K	103	LEU	CA-CB-CG	7.36	132.23	115.30

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	P	78	ARG	CD-NE-CZ	5.92	131.89	123.60
5	E	78	ARG	NE-CZ-NH1	-5.80	117.40	120.30
5	J	78	ARG	NE-CZ-NH1	-5.62	117.49	120.30
5	U	78	ARG	NE-CZ-NH1	-5.58	117.51	120.30

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	2243	0	2093	21	0
1	F	2242	0	2093	13	0
1	K	2220	0	2061	13	0
1	Q	2239	0	2077	21	0
2	B	799	0	732	4	0
2	G	818	0	760	4	0
2	L	807	0	747	5	0
2	R	788	0	713	6	0
3	C	101	0	102	2	0
3	H	101	0	102	2	0
3	M	96	0	95	2	0
3	S	97	0	96	2	0
4	D	1575	0	1435	15	0
4	I	1579	0	1449	23	0
4	N	1603	0	1492	19	0
4	T	1560	0	1410	18	0
5	E	1887	0	1766	26	0
5	J	1882	0	1764	28	0
5	P	1883	0	1768	21	0
5	U	1828	0	1688	24	0
6	A	3	0	0	1	0
6	B	1	0	0	0	0
6	C	1	0	0	0	0
6	D	1	0	0	0	0
6	E	1	0	0	1	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	F	4	0	0	1	0
6	G	1	0	0	0	0
6	H	1	0	0	0	0
6	J	1	0	0	1	0
6	K	3	0	0	0	0
6	L	1	0	0	0	0
6	Q	2	0	0	1	0
6	R	1	0	0	1	0
6	S	1	0	0	0	0
7	A	26	0	0	0	0
7	B	9	0	0	0	0
7	D	12	0	0	1	0
7	E	13	0	0	3	0
7	F	22	0	0	0	0
7	G	8	0	0	0	0
7	I	8	0	0	1	0
7	J	18	0	0	4	0
7	K	18	0	0	1	0
7	L	8	0	0	0	0
7	M	1	0	0	0	0
7	N	20	0	0	0	0
7	P	25	0	0	0	0
7	Q	19	0	0	2	0
7	R	3	0	0	0	0
7	S	1	0	0	0	0
7	T	8	0	0	0	0
7	U	20	0	0	1	0
All	All	26609	0	24443	223	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 4.

All (223) 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:P:78:ARG:HD3	5:P:80:GLU:OE2	1.80	0.81
1:A:253:GLU:HG2	4:I:83:VAL:HG21	1.64	0.79
1:A:197:HIS:HB2	4:I:169:ARG:HG3	1.67	0.77
1:Q:162:GLY:HA2	4:T:28(A):THR:HG23	1.74	0.70
5:P:6:GLN:HE21	5:P:109:GLY:HA3	1.57	0.69
2:G:83:ASN:HD22	2:G:84:HIS:H	1.41	0.69

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:61:ARG:NH2	4:D:84:ASP:OD2	2.27	0.68
2:L:83:ASN:HD22	2:L:84:HIS:H	1.41	0.68
5:J:6:GLN:HE21	5:J:109:GLY:HA3	1.57	0.68
1:A:255:GLN:HG3	4:I:61:ARG:NH1	2.08	0.68
1:A:253:GLU:HG2	4:I:83:VAL:CG2	2.24	0.68
1:K:156:ARG:HD3	3:M:3:GLU:OE2	1.94	0.68
5:U:83:ALA:H	5:U:86:GLN:HE21	1.41	0.68
5:U:6:GLN:HE21	5:U:109:GLY:HA3	1.58	0.67
1:Q:156:ARG:HD3	3:S:3:GLU:OE2	1.94	0.67
2:B:83:ASN:HD22	2:B:84:HIS:H	1.43	0.67
2:R:83:ASN:HD22	2:R:84:HIS:H	1.42	0.67
5:E:83:ALA:H	5:E:86:GLN:HE21	1.44	0.65
1:Q:158:ALA:O	4:T:29:THR:HG21	1.96	0.64
5:J:83:ALA:H	5:J:86:GLN:HE21	1.45	0.64
5:P:83:ALA:H	5:P:86:GLN:HE21	1.42	0.64
1:A:49:ALA:O	1:A:52:ILE:HG22	1.98	0.64
4:N:61:ARG:NH2	4:N:84:ASP:OD2	2.29	0.64
5:U:46:ILE:HD13	5:U:60:VAL:HG23	1.79	0.64
4:D:166:LEU:HD11	5:E:198:ARG:HB3	1.79	0.63
1:Q:16:GLY:O	7:Q:1019:HOH:O	2.15	0.63
1:K:49:ALA:O	1:K:52:ILE:HG22	1.99	0.62
5:E:6:GLN:HE21	5:E:109:GLY:HA3	1.63	0.62
1:Q:49:ALA:O	1:Q:52:ILE:HG22	2.00	0.62
4:I:61:ARG:NH2	4:I:84:ASP:OD2	2.33	0.62
4:N:57:ILE:HG12	4:N:63:SER:HB2	1.82	0.61
4:I:166:LEU:HD11	5:J:198:ARG:HB3	1.82	0.61
1:F:49:ALA:O	1:F:52:ILE:HG22	2.01	0.60
5:U:141:THR:HA	7:U:260:HOH:O	2.00	0.60
1:Q:258:THR:HG22	1:Q:273:ARG:HG2	1.84	0.60
4:I:93:SER:HB2	4:I:104:LEU:HA	1.83	0.60
4:T:61:ARG:NH2	4:T:84:ASP:OD2	2.34	0.59
5:J:46:ILE:HD13	5:J:60:VAL:HG23	1.85	0.59
1:F:114:ASP:OD2	1:F:156:ARG:HD2	2.04	0.58
5:P:46:ILE:HD13	5:P:60:VAL:HG23	1.84	0.58
4:D:106:PHE:HZ	5:E:108:PHE:HZ	1.52	0.58
1:K:114:ASP:OD2	1:K:156:ARG:HD2	2.04	0.57
5:U:12:VAL:HG22	5:U:155:PRO:HG3	1.85	0.57
5:E:46:ILE:HD13	5:E:60:VAL:HG23	1.87	0.57
5:J:59:GLU:CG	7:J:1023:HOH:O	2.52	0.56
1:Q:114:ASP:OD2	1:Q:156:ARG:HD2	2.06	0.56
4:D:12:VAL:HG11	4:D:18:VAL:HG23	1.88	0.56

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:I:9:GLU:HG3	4:I:111:ARG:HB3	1.88	0.56
1:A:114:ASP:OD2	1:A:156:ARG:HD2	2.06	0.55
1:A:275:GLU:HG2	4:I:58:GLY:HA2	1.87	0.55
2:L:83:ASN:HD22	2:L:84:HIS:N	2.04	0.55
2:G:83:ASN:HD22	2:G:84:HIS:N	2.05	0.54
1:F:17:ARG:NH2	1:Q:178:THR:O	2.37	0.54
4:N:177:SER:OG	5:P:196:ARG:HD3	2.08	0.54
1:A:156:ARG:HD3	3:C:3:GLU:OE2	2.08	0.53
5:P:21:LEU:HD12	5:P:77:LEU:HD23	1.90	0.53
4:D:82:VAL:HG13	7:D:1027:HOH:O	2.06	0.53
5:J:21:LEU:HD12	5:J:77:LEU:HD23	1.90	0.53
1:K:5:MET:HB2	1:K:168:LEU:HD13	1.90	0.53
5:U:98:LEU:O	5:U:99:ALA:CB	2.56	0.53
4:I:12:VAL:HG11	4:I:18:VAL:HG23	1.90	0.53
4:D:10:ILE:HD12	4:D:20:LEU:HD23	1.91	0.53
4:T:49:ARG:HH22	4:T:55:ASN:HD22	1.57	0.53
2:B:83:ASN:HD22	2:B:84:HIS:N	2.07	0.53
5:E:21:LEU:HD12	5:E:77:LEU:HD23	1.91	0.53
2:R:83:ASN:HD22	2:R:84:HIS:N	2.06	0.53
1:F:156:ARG:HD3	3:H:3:GLU:OE2	2.09	0.52
1:A:5:MET:HB2	1:A:168:LEU:HD13	1.91	0.52
5:E:230:ARG:HD3	6:E:1021:IOD:I	2.80	0.52
1:K:6:ARG:NH2	1:K:102:ASP:OD1	2.40	0.52
5:U:78:ARG:HD2	5:U:80:GLU:OE2	2.10	0.52
5:J:59:GLU:HG3	7:J:1023:HOH:O	2.10	0.52
1:F:5:MET:HB2	1:F:168:LEU:HD13	1.92	0.52
1:A:251:SER:HB2	4:I:169:ARG:HH12	1.75	0.52
4:I:130:ASP:HA	5:J:131:PHE:CD2	2.45	0.52
5:U:21:LEU:HD12	5:U:77:LEU:HD23	1.91	0.52
4:I:106:PHE:HZ	5:J:108:PHE:HZ	1.57	0.51
1:Q:5:MET:HB2	1:Q:168:LEU:HD13	1.93	0.51
5:E:130:VAL:HG23	5:E:240:ALA:HB3	1.93	0.51
1:Q:259:CYS:N	1:Q:272:LEU:O	2.33	0.51
1:K:76:GLU:HA	7:K:1016:HOH:O	2.11	0.51
5:J:6:GLN:NE2	5:J:92:CYS:H	2.09	0.51
5:E:157:HIS:HD2	7:E:1029:HOH:O	1.94	0.50
1:Q:43:PRO:HG3	6:Q:1011:IOD:I	2.81	0.50
4:N:10:ILE:HD12	4:N:20:LEU:HD23	1.93	0.50
5:J:78:ARG:HD2	5:J:80:GLU:OE2	2.12	0.50
4:D:33:PHE:HB2	4:D:91:ALA:HB3	1.93	0.50
5:E:78:ARG:HD2	5:E:80:GLU:OE2	2.12	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:117:ALA:HB2	2:L:60:TRP:CE2	2.47	0.50
4:I:10:ILE:HD12	4:I:20:LEU:HD23	1.94	0.50
1:A:43:PRO:HG3	6:A:1010:IOD:I	2.82	0.49
4:N:166:LEU:HD11	5:P:198:ARG:HB3	1.93	0.49
5:E:6:GLN:NE2	5:E:92:CYS:H	2.10	0.49
1:Q:261:VAL:HB	1:Q:270:LEU:HB2	1.93	0.49
1:A:197:HIS:CB	4:I:169:ARG:HG3	2.41	0.49
1:A:255:GLN:CG	4:I:61:ARG:NH1	2.75	0.49
4:N:12:VAL:HG11	4:N:18:VAL:HG23	1.94	0.49
4:N:131:SER:HB2	5:P:130:VAL:O	2.13	0.48
4:T:55:ASN:HD21	4:T:66:PHE:H	1.61	0.48
1:A:255:GLN:CG	4:I:61:ARG:HH11	2.26	0.48
5:E:156:ASP:HB2	5:E:179:PRO:HG2	1.96	0.48
4:N:106:PHE:HZ	5:P:108:PHE:HZ	1.61	0.48
4:T:10:ILE:HD12	4:T:20:LEU:HD23	1.94	0.48
5:E:157:HIS:CD2	7:E:1029:HOH:O	2.67	0.48
2:L:7:ILE:HD12	2:L:82:VAL:HG21	1.96	0.47
4:N:33:PHE:HB2	4:N:91:ALA:HB3	1.95	0.47
5:P:14:LYS:HA	5:P:117:THR:O	2.13	0.47
1:Q:162:GLY:HA2	4:T:28(A):THR:CG2	2.44	0.47
1:F:43:PRO:HG3	6:F:1012:IOD:I	2.85	0.47
5:U:156:ASP:HB2	5:U:179:PRO:HG2	1.96	0.47
1:A:255:GLN:NE2	4:I:61:ARG:H	2.13	0.47
1:Q:258:THR:HG22	1:Q:273:ARG:CG	2.44	0.47
4:T:55:ASN:ND2	4:T:66:PHE:H	2.13	0.47
4:D:47:ILE:HD11	4:D:49:ARG:HH21	1.80	0.47
4:T:12:VAL:HG11	4:T:18:VAL:HG23	1.94	0.47
2:G:7:ILE:HD12	2:G:82:VAL:HG21	1.97	0.47
1:A:114:ASP:OD2	1:A:156:ARG:NH1	2.39	0.47
1:A:35:ARG:HG2	1:A:48:ARG:HD3	1.97	0.47
2:B:7:ILE:HD12	2:B:82:VAL:HG21	1.97	0.47
1:K:158:ALA:O	4:N:29:THR:HG21	2.14	0.47
4:D:47:ILE:CD1	4:D:49:ARG:HH21	2.28	0.46
4:N:9:GLU:HG3	4:N:111:ARG:HB3	1.98	0.46
5:P:130:VAL:HG23	5:P:240:ALA:HB3	1.96	0.46
1:K:108:ARG:HH11	1:K:108:ARG:HA	1.80	0.46
4:D:177:SER:OG	5:E:196:ARG:HD3	2.16	0.46
5:U:78:ARG:HG3	5:U:79:LEU:N	2.30	0.46
4:I:33:PHE:HB2	4:I:91:ALA:HB3	1.97	0.46
5:J:130:VAL:HG23	5:J:240:ALA:HB3	1.98	0.46
4:N:54:GLU:CB	4:N:54(A):GLN:HA	2.46	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:T:106:PHE:HZ	5:U:108:PHE:HZ	1.63	0.46
4:D:9:GLU:HG3	4:D:111:ARG:HB3	1.96	0.45
1:K:35:ARG:HG2	1:K:48:ARG:HD3	1.98	0.45
5:P:156:ASP:HB2	5:P:179:PRO:HG2	1.97	0.45
5:J:230:ARG:HD3	6:J:1022:IOD:I	2.86	0.45
5:U:130:VAL:HG23	5:U:240:ALA:HB3	1.98	0.45
5:U:11:GLN:HG2	5:U:19:MET:SD	2.56	0.45
4:D:104:LEU:HB3	5:E:35:TYR:OH	2.16	0.45
1:F:35:ARG:HG2	1:F:48:ARG:HD3	1.99	0.45
4:D:93:SER:HB2	4:D:104:LEU:HA	1.98	0.45
4:I:106:PHE:HZ	5:J:108:PHE:CZ	2.34	0.45
4:T:93:SER:HB2	4:T:104:LEU:HA	1.98	0.45
5:U:6:GLN:NE2	5:U:92:CYS:H	2.14	0.45
5:J:19:MET:HE2	5:J:19:MET:HB3	1.88	0.45
5:J:78:ARG:HG3	5:J:79:LEU:N	2.32	0.45
1:Q:191:HIS:HB2	1:Q:274:TRP:NE1	2.32	0.45
1:Q:35:ARG:HG2	1:Q:48:ARG:HD3	1.99	0.45
5:E:78:ARG:HG3	5:E:79:LEU:N	2.32	0.45
4:I:14:GLU:O	4:I:15:LYS:HB2	2.17	0.44
2:R:7:ILE:HD12	2:R:82:VAL:HG21	2.00	0.44
5:E:19:MET:HB3	5:E:19:MET:HE2	1.88	0.44
4:N:161:THR:HG21	5:P:194:SER:OG	2.18	0.44
1:Q:191:HIS:HB2	1:Q:274:TRP:CD1	2.52	0.44
5:J:13:LEU:HD11	5:J:19:MET:HB2	1.98	0.44
5:P:6:GLN:NE2	5:P:92:CYS:H	2.16	0.44
4:T:177:SER:OG	5:U:196:ARG:HD3	2.18	0.44
5:U:25:GLN:OE1	5:U:28:ASN:N	2.50	0.44
5:U:98:LEU:O	5:U:99:ALA:HB2	2.18	0.44
1:K:158:ALA:HA	4:N:29:THR:HG21	1.98	0.44
5:U:13:LEU:HD11	5:U:19:MET:HB2	1.99	0.43
1:Q:219:ARG:HD3	1:Q:257:TYR:CZ	2.52	0.43
5:U:13:LEU:HD11	5:U:19:MET:CB	2.48	0.43
1:A:110:LEU:HD11	1:F:86:ASN:ND2	2.33	0.43
4:N:14:GLU:O	4:N:15:LYS:HB2	2.19	0.43
2:B:1:ILE:HG22	2:B:2:GLN:H	1.82	0.43
5:J:90:TYR:O	5:J:111:GLY:HA2	2.19	0.43
4:T:33:PHE:HB2	4:T:91:ALA:HB3	1.99	0.43
3:H:1:LEU:HD12	3:H:2:PRO:HD2	2.00	0.43
5:J:156:ASP:HB2	5:J:179:PRO:HG2	2.01	0.43
5:E:13:LEU:HD11	5:E:19:MET:HB2	1.99	0.43
1:F:219:ARG:HD3	1:F:257:TYR:CZ	2.54	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:J:59:GLU:HG2	7:J:1023:HOH:O	2.18	0.43
2:L:1:ILE:HG22	2:L:2:GLN:H	1.83	0.43
5:U:19:MET:HE2	5:U:19:MET:HB3	1.86	0.43
5:J:13:LEU:HD11	5:J:19:MET:CB	2.48	0.43
4:N:184:LYS:HE2	4:N:186:ASP:HB2	2.00	0.43
1:A:177:GLU:H	1:A:177:GLU:HG2	1.59	0.43
2:R:1:ILE:HG22	2:R:2:GLN:H	1.83	0.43
2:G:1:ILE:HG22	2:G:2:GLN:H	1.83	0.42
5:J:230:ARG:HG2	7:J:1027:HOH:O	2.18	0.42
1:K:158:ALA:CA	4:N:29:THR:HG21	2.49	0.42
5:U:90:TYR:O	5:U:111:GLY:HA2	2.20	0.42
4:T:103:LYS:HE2	5:U:48:TYR:CE2	2.54	0.42
4:D:106:PHE:HZ	5:E:108:PHE:CZ	2.34	0.42
1:A:269:PRO:HG2	1:F:151:ARG:NH1	2.34	0.42
3:M:1:LEU:HD12	3:M:2:PRO:HD2	2.02	0.42
5:E:13:LEU:HD11	5:E:19:MET:CB	2.49	0.42
5:J:8:PRO:HG3	5:J:11:GLN:HE21	1.84	0.42
5:P:11:GLN:HG2	5:P:19:MET:SD	2.60	0.42
5:E:119:ASP:OD1	5:E:121:LYS:HG2	2.19	0.42
4:T:26:THR:HB	4:T:92:LEU:HD21	2.02	0.42
5:E:11:GLN:HG2	5:E:19:MET:SD	2.60	0.42
5:E:206:ASN:O	5:E:244:GLY:HA3	2.20	0.42
1:F:114:ASP:OD2	1:F:156:ARG:NH1	2.43	0.42
5:J:206:ASN:O	5:J:244:GLY:HA3	2.20	0.42
5:P:90:TYR:O	5:P:111:GLY:HA2	2.20	0.42
4:T:104:LEU:HB3	5:U:35:TYR:OH	2.20	0.41
5:J:8:PRO:O	5:J:112:THR:HB	2.20	0.41
3:S:1:LEU:HD12	3:S:2:PRO:HD2	2.02	0.41
3:C:1:LEU:HD12	3:C:2:PRO:HD2	2.01	0.41
4:D:131:SER:C	4:D:133:SER:H	2.22	0.41
1:A:109:LEU:HD22	1:A:161:GLU:HG2	2.03	0.41
4:I:177:SER:OG	5:J:196:ARG:HD3	2.21	0.41
1:K:42:SER:HA	1:K:43:PRO:HD2	1.88	0.41
2:R:43:GLY:N	6:R:1018:IOD:I	3.20	0.41
1:F:16:GLY:HA2	1:Q:50:PRO:HG2	2.03	0.41
5:E:59:GLU:HG3	7:E:1024:HOH:O	2.21	0.41
5:J:37:GLN:HB2	5:J:43:LEU:CD2	2.51	0.41
5:P:19:MET:HB3	5:P:19:MET:HE2	1.88	0.41
5:P:37:GLN:HB2	5:P:43:LEU:CD2	2.50	0.41
5:P:6:GLN:HE21	5:P:109:GLY:CA	2.32	0.41
5:E:8:PRO:HG3	5:E:11:GLN:HE21	1.86	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:N:104:LEU:O	5:P:35:TYR:OH	2.32	0.40
5:P:13:LEU:HD11	5:P:19:MET:CB	2.51	0.40
5:E:100:GLY:HA2	5:E:107:TYR:CE1	2.57	0.40
1:F:42:SER:HA	1:F:43:PRO:HD2	1.94	0.40
4:I:198:ILE:HG12	7:I:217:HOH:O	2.20	0.40
4:T:1:GLN:HA	4:T:25:GLU:O	2.21	0.40
5:J:11:GLN:HG2	5:J:19:MET:SD	2.61	0.40
4:N:57:ILE:HG12	4:N:63:SER:CB	2.49	0.40
1:Q:181:ARG:HD3	7:Q:1027:HOH:O	2.22	0.40
1:Q:35:ARG:HD3	2:R:53:ASP:OD1	2.20	0.40
5:U:8:PRO:O	5:U:112:THR:HB	2.22	0.40
4:T:14:GLU:OE1	4:T:117:ASN:N	2.50	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	274/276 (99%)	270 (98%)	4 (2%)	0	100	100
1	F	274/276 (99%)	269 (98%)	5 (2%)	0	100	100
1	K	274/276 (99%)	268 (98%)	6 (2%)	0	100	100
1	Q	274/276 (99%)	267 (97%)	5 (2%)	2 (1%)	22	39
2	B	97/99 (98%)	97 (100%)	0	0	100	100
2	G	97/99 (98%)	97 (100%)	0	0	100	100
2	L	97/99 (98%)	97 (100%)	0	0	100	100
2	R	97/99 (98%)	97 (100%)	0	0	100	100
3	C	11/13 (85%)	11 (100%)	0	0	100	100
3	H	11/13 (85%)	11 (100%)	0	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	M	11/13 (85%)	11 (100%)	0	0	100	100
3	S	11/13 (85%)	11 (100%)	0	0	100	100
4	D	202/211 (96%)	191 (95%)	10 (5%)	1 (0%)	29	48
4	I	202/211 (96%)	194 (96%)	8 (4%)	0	100	100
4	N	202/211 (96%)	189 (94%)	10 (5%)	3 (2%)	10	18
4	T	202/211 (96%)	194 (96%)	8 (4%)	0	100	100
5	E	239/245 (98%)	234 (98%)	5 (2%)	0	100	100
5	J	239/245 (98%)	235 (98%)	4 (2%)	0	100	100
5	P	239/245 (98%)	235 (98%)	4 (2%)	0	100	100
5	U	234/245 (96%)	228 (97%)	6 (3%)	0	100	100
All	All	3287/3376 (97%)	3206 (98%)	75 (2%)	6 (0%)	47	68

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	N	54	GLU
4	N	56	GLU
4	N	133	SER
1	Q	267	PRO
4	D	130	ASP
1	Q	41	ALA

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	230/234 (98%)	224 (97%)	6 (3%)	46	72
1	F	229/234 (98%)	223 (97%)	6 (3%)	46	72
1	K	224/234 (96%)	218 (97%)	6 (3%)	44	71
1	Q	228/234 (97%)	224 (98%)	4 (2%)	59	81
2	B	86/94 (92%)	83 (96%)	3 (4%)	36	62

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	G	90/94 (96%)	87 (97%)	3 (3%)	38	64
2	L	88/94 (94%)	85 (97%)	3 (3%)	37	63
2	R	82/94 (87%)	79 (96%)	3 (4%)	34	60
3	C	11/11 (100%)	11 (100%)	0	100	100
3	H	11/11 (100%)	11 (100%)	0	100	100
3	M	10/11 (91%)	10 (100%)	0	100	100
3	S	10/11 (91%)	10 (100%)	0	100	100
4	D	174/195 (89%)	163 (94%)	11 (6%)	18	34
4	I	174/195 (89%)	165 (95%)	9 (5%)	23	44
4	N	180/195 (92%)	169 (94%)	11 (6%)	18	36
4	T	169/195 (87%)	159 (94%)	10 (6%)	19	37
5	E	200/211 (95%)	190 (95%)	10 (5%)	24	46
5	J	199/211 (94%)	190 (96%)	9 (4%)	27	51
5	P	200/211 (95%)	189 (94%)	11 (6%)	21	41
5	U	190/211 (90%)	180 (95%)	10 (5%)	22	43
All	All	2785/2980 (94%)	2670 (96%)	115 (4%)	30	55

All (115) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	14	ARG
1	A	177	GLU
1	A	223	ASP
1	A	225	THR
1	A	270	LEU
1	A	272	LEU
2	B	1	ILE
2	B	70	PHE
2	B	83	ASN
4	D	29	THR
4	D	44	VAL
4	D	47	ILE
4	D	65	ASN
4	D	83	VAL
4	D	135	ASP
4	D	157	ASP
4	D	166	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	D	169	ARG
4	D	191	ASN
4	D	195	ASN
5	E	4	VAL
5	E	25	GLN
5	E	31	SER
5	E	41	MET
5	E	62	ASN
5	E	101	GLU
5	E	112	THR
5	E	113	ARG
5	E	157	HIS
5	E	230	ARG
1	F	14	ARG
1	F	108	ARG
1	F	177	GLU
1	F	223	ASP
1	F	225	THR
1	F	270	LEU
2	G	1	ILE
2	G	70	PHE
2	G	83	ASN
4	I	9	GLU
4	I	44	VAL
4	I	47	ILE
4	I	65	ASN
4	I	83	VAL
4	I	93	SER
4	I	166	LEU
4	I	169	ARG
4	I	195	ASN
5	J	4	VAL
5	J	19	MET
5	J	25	GLN
5	J	41	MET
5	J	62	ASN
5	J	101	GLU
5	J	112	THR
5	J	113	ARG
5	J	230	ARG
1	K	14	ARG
1	K	19	GLU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	K	103	LEU
1	K	194	VAL
1	K	225	THR
1	K	270	LEU
2	L	1	ILE
2	L	70	PHE
2	L	83	ASN
4	N	9	GLU
4	N	26	THR
4	N	27	ARG
4	N	29	THR
4	N	44	VAL
4	N	47	ILE
4	N	65	ASN
4	N	83	VAL
4	N	166	LEU
4	N	191	ASN
4	N	195	ASN
5	P	4	VAL
5	P	19	MET
5	P	25	GLN
5	P	28	ASN
5	P	41	MET
5	P	62	ASN
5	P	112	THR
5	P	113	ARG
5	P	157	HIS
5	P	208	ARG
5	P	230	ARG
1	Q	19	GLU
1	Q	177	GLU
1	Q	223	ASP
1	Q	225	THR
2	R	1	ILE
2	R	70	PHE
2	R	83	ASN
4	T	18	VAL
4	T	29	THR
4	T	44	VAL
4	T	47	ILE
4	T	65	ASN
4	T	83	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	T	166	LEU
4	T	186	ASP
4	T	191	ASN
4	T	195	ASN
5	U	4	VAL
5	U	19	MET
5	U	25	GLN
5	U	29	HIS
5	U	41	MET
5	U	62	ASN
5	U	112	THR
5	U	113	ARG
5	U	157	HIS
5	U	230	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (56) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	72	GLN
1	A	80	ASN
1	A	255	GLN
1	A	260	HIS
2	B	83	ASN
4	D	65	ASN
4	D	113	GLN
4	D	183	ASN
4	D	191	ASN
5	E	6	GLN
5	E	11	GLN
5	E	29	HIS
5	E	86	GLN
5	E	106	GLN
5	E	157	HIS
1	F	65	GLN
1	F	80	ASN
1	F	86	ASN
1	F	226	GLN
1	F	255	GLN
1	F	260	HIS
2	G	83	ASN
3	H	9	GLN
4	I	65	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	I	183	ASN
5	J	6	GLN
5	J	11	GLN
5	J	28	ASN
5	J	29	HIS
5	J	62	ASN
5	J	86	GLN
1	K	80	ASN
1	K	260	HIS
2	L	83	ASN
4	N	65	ASN
4	N	183	ASN
4	N	191	ASN
5	P	6	GLN
5	P	11	GLN
5	P	28	ASN
5	P	86	GLN
5	P	157	HIS
1	Q	80	ASN
1	Q	197	HIS
1	Q	226	GLN
1	Q	260	HIS
2	R	83	ASN
4	T	55	ASN
4	T	65	ASN
4	T	113	GLN
4	T	183	ASN
5	U	6	GLN
5	U	11	GLN
5	U	29	HIS
5	U	86	GLN
5	U	157	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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 22 ligands modelled in this entry, 22 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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	276/276 (100%)	0.40	6 (2%) 62 65	2, 6, 22, 32	0
1	F	276/276 (100%)	0.43	5 (1%) 68 71	2, 6, 23, 33	0
1	K	276/276 (100%)	0.61	14 (5%) 28 29	2, 6, 23, 30	0
1	Q	276/276 (100%)	1.09	51 (18%) 1 1	2, 6, 22, 28	0
2	B	99/99 (100%)	0.23	2 (2%) 65 68	2, 8, 21, 23	0
2	G	99/99 (100%)	0.33	2 (2%) 65 68	2, 8, 21, 23	0
2	L	99/99 (100%)	0.32	2 (2%) 65 68	2, 7, 20, 23	0
2	R	99/99 (100%)	0.31	2 (2%) 65 68	2, 7, 20, 23	0
3	C	13/13 (100%)	0.39	0 100 100	2, 3, 8, 8	0
3	H	13/13 (100%)	0.15	0 100 100	2, 3, 8, 9	0
3	M	13/13 (100%)	0.53	1 (7%) 13 13	2, 3, 5, 8	0
3	S	13/13 (100%)	0.18	0 100 100	2, 3, 5, 8	0
4	D	204/211 (96%)	0.53	12 (5%) 22 23	2, 13, 28, 32	0
4	I	204/211 (96%)	0.69	18 (8%) 10 10	2, 13, 29, 32	0
4	N	204/211 (96%)	0.67	12 (5%) 22 23	2, 13, 29, 32	0
4	T	204/211 (96%)	0.71	17 (8%) 11 11	2, 12, 28, 32	0
5	E	241/245 (98%)	0.42	5 (2%) 63 66	2, 10, 23, 31	0
5	J	241/245 (98%)	0.47	11 (4%) 32 34	3, 10, 23, 30	0
5	P	241/245 (98%)	0.51	8 (3%) 46 50	2, 10, 24, 33	0
5	U	238/245 (97%)	0.54	9 (3%) 40 43	2, 10, 23, 31	0
All	All	3329/3376 (98%)	0.55	177 (5%) 26 28	2, 9, 25, 33	0

All (177) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	Q	252	GLY	14.0
1	Q	255	GLN	9.7
1	Q	227	ASP	8.7
1	Q	199	ALA	8.1
1	Q	249	VAL	7.9
5	P	103	TYR	7.8
1	Q	276	PRO	6.7
4	D	133	SER	6.7
2	R	1	ILE	6.6
1	Q	219	ARG	6.3
1	Q	220	ASP	6.1
1	Q	224	GLN	6.1
1	Q	251	SER	5.9
1	Q	198	GLU	5.3
1	Q	201	LEU	5.3
1	Q	200	THR	5.0
4	D	206	SER	5.0
1	Q	254	GLU	4.9
2	L	1	ILE	4.9
5	P	247	ASP	4.8
1	Q	228	THR	4.8
5	P	99	ALA	4.7
4	I	133	SER	4.7
4	I	154	LYS	4.6
1	Q	191	HIS	4.6
1	Q	217	TRP	4.6
1	Q	257	TYR	4.5
4	N	135	ASP	4.4
4	I	206	SER	4.4
2	G	1	ILE	4.4
5	E	247	ASP	4.2
4	T	135	ASP	4.1
1	K	1	GLY	4.1
1	K	257	TYR	4.1
1	A	194	VAL	4.1
1	Q	273	ARG	4.1
1	Q	248	VAL	4.1
1	Q	258	THR	3.9
4	N	133	SER	3.8
1	Q	247	VAL	3.7
2	B	1	ILE	3.7
1	K	41	ALA	3.6
1	Q	259	CYS	3.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
4	T	206	SER	3.6
5	U	247	ASP	3.6
5	U	227	THR	3.6
1	Q	225	THR	3.5
1	A	276	PRO	3.5
1	K	224	GLN	3.5
4	N	206	SER	3.5
1	Q	246	ALA	3.4
4	T	133	SER	3.4
4	T	170	SER	3.4
1	Q	193	PRO	3.4
5	U	243	TRP	3.4
1	Q	215	LEU	3.3
4	N	57	ILE	3.3
1	Q	256	ARG	3.3
1	F	194	VAL	3.3
1	Q	226	GLN	3.3
4	I	197	ILE	3.3
4	D	185	SER	3.2
1	Q	269	PRO	3.2
1	Q	190	THR	3.2
1	Q	222	GLU	3.2
4	D	134	SER	3.1
4	T	168	MET	3.1
5	P	224	ASP	3.1
1	Q	230	LEU	3.1
5	U	99	ALA	3.1
1	Q	272	LEU	3.0
4	T	164	CYS	3.0
1	Q	196	ASP	3.0
1	K	276	PRO	3.0
5	J	180	LEU	2.9
5	J	185	ALA	2.9
1	Q	192	HIS	2.9
4	N	186	ASP	2.9
4	N	114	VAL	2.9
4	T	186	ASP	2.9
1	Q	204	TRP	2.8
1	F	86	ASN	2.8
4	N	55	ASN	2.8
1	Q	189	VAL	2.8
1	Q	253	GLU	2.8

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
5	J	118	GLU	2.8
4	T	145	ASP	2.8
1	Q	250	PRO	2.8
4	T	130	ASP	2.8
4	D	135	ASP	2.8
1	K	252	GLY	2.7
4	T	189	CYS	2.7
1	Q	218	GLN	2.7
5	E	119	ASP	2.7
1	A	86	ASN	2.7
4	I	155	ASP	2.7
4	I	132	LYS	2.6
1	Q	260	HIS	2.6
4	I	192	ALA	2.6
5	J	62	ASN	2.6
5	P	101	GLU	2.6
1	K	251	SER	2.6
1	K	198	GLU	2.6
5	E	62	ASN	2.6
1	Q	223	ASP	2.6
4	I	169	ARG	2.6
4	T	10	ILE	2.6
4	T	115	PHE	2.6
1	Q	216	THR	2.5
5	J	78	ARG	2.5
1	K	220	ASP	2.5
1	Q	275	GLU	2.5
5	E	174	CYS	2.5
4	T	11	SER	2.5
1	Q	245	ALA	2.4
5	J	79	LEU	2.4
5	P	21	LEU	2.4
1	Q	274	TRP	2.4
4	I	135	ASP	2.4
4	I	162	ASP	2.4
5	J	55	THR	2.4
1	Q	261	VAL	2.4
1	A	196	ASP	2.4
5	J	188	ASP	2.4
1	K	226	GLN	2.4
4	T	204	PHE	2.4
4	N	83	VAL	2.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
4	D	204	PHE	2.4
1	K	255	GLN	2.4
4	T	134	SER	2.4
4	I	139	CYS	2.4
1	K	275	GLU	2.3
4	D	194	ASN	2.3
1	F	197	HIS	2.3
1	Q	270	LEU	2.3
5	E	180	LEU	2.3
5	U	232	LYS	2.3
1	K	222	GLU	2.3
1	F	75	ARG	2.3
4	I	158	VAL	2.3
4	N	155	ASP	2.3
5	P	185	ALA	2.3
1	A	223	ASP	2.2
5	P	221	SER	2.2
5	J	18	SER	2.2
4	T	118	ILE	2.2
2	L	15	ALA	2.2
4	D	137	SER	2.2
4	I	137	SER	2.2
1	A	225	THR	2.2
3	M	10	LEU	2.2
1	F	222	GLU	2.2
1	Q	197	HIS	2.2
2	R	98	ASP	2.2
4	I	198	ILE	2.2
2	G	77	GLU	2.2
1	Q	231	VAL	2.1
5	U	78	ARG	2.1
5	U	124	PHE	2.1
5	U	224	ASP	2.1
4	D	188	ALA	2.1
4	I	127	GLN	2.1
2	B	98	ASP	2.1
4	D	156	SER	2.1
4	N	134	SER	2.1
5	J	139	SER	2.1
1	K	253	GLU	2.1
5	J	103	TYR	2.1
4	D	139	CYS	2.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
4	I	1	GLN	2.1
4	N	152	GLN	2.1
5	U	123	VAL	2.0
4	I	153	SER	2.0
4	I	182	SER	2.0
4	T	27	ARG	2.0
4	D	145	ASP	2.0
4	N	145	ASP	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. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
6	IOD	R	1018	1/1	0.90	0.14	65,65,65,65	0
6	IOD	L	1017	1/1	0.94	0.11	65,65,65,65	0
6	IOD	J	1022	1/1	0.95	0.12	62,62,62,62	0
6	IOD	C	1013	1/1	0.96	0.04	9,9,9,9	0
6	IOD	B	1016	1/1	0.97	0.17	52,52,52,52	0
6	IOD	S	1015	1/1	0.97	0.03	29,29,29,29	0
6	IOD	G	1020	1/1	0.97	0.12	46,46,46,46	0
6	IOD	D	1019	1/1	0.98	0.14	52,52,52,52	0
6	IOD	Q	1007	1/1	0.98	0.06	3,3,3,3	0
6	IOD	A	1010	1/1	0.98	0.04	12,12,12,12	0
6	IOD	E	1021	1/1	0.98	0.12	58,58,58,58	0
6	IOD	K	1009	1/1	0.99	0.04	13,13,13,13	0
6	IOD	K	1001	1/1	0.99	0.18	3,3,3,3	0
6	IOD	F	1012	1/1	0.99	0.04	32,32,32,32	0
6	IOD	F	1004	1/1	0.99	0.14	5,5,5,5	0

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
6	IOD	H	1014	1/1	0.99	0.03	12,12,12,12	0
6	IOD	F	1008	1/1	0.99	0.04	4,4,4,4	0
6	IOD	Q	1011	1/1	0.99	0.03	20,20,20,20	0
6	IOD	K	1005	1/1	1.00	0.09	3,3,3,3	0
6	IOD	F	1003	1/1	1.00	0.15	2,2,2,2	0
6	IOD	A	1002	1/1	1.00	0.18	3,3,3,3	0
6	IOD	A	1006	1/1	1.00	0.05	3,3,3,3	0

6.5 Other polymers [i](#)

There are no such residues in this entry.