WORLDWIDE wwPDB PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 7, 2024 – 02:25 PM EST

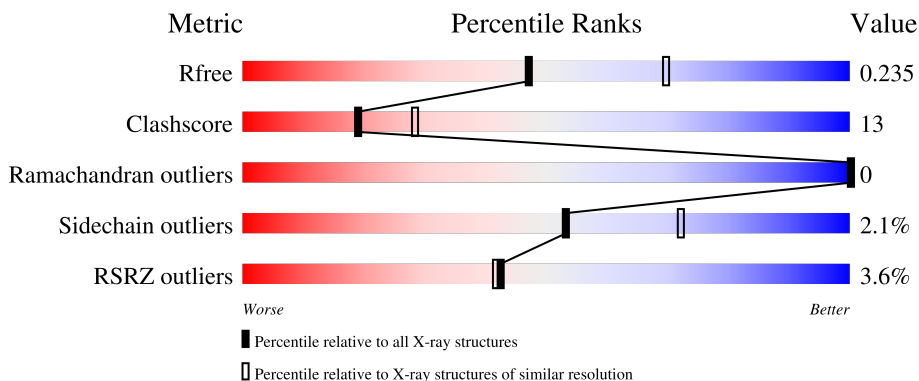|		
PDB ID	:	8TUB
Title	:	HLA B7:02 with HPNGYKSLSTL
Authors	:	Littler, D.R.; Rossjohn, J.; Chaurasia, P.; Petersen, J.
Deposited on	:	2023-08-16
Resolution	:	2.40 Å(reported)

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.40 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	Percentile Ranks	Value
Rfree		0.235
Clashscore		13
Ramachandran outliers		0
Sidechain outliers		2.1%
RSRZ outliers		3.6%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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	99	81% 17% •
1	B	99	.% 87% 12% •
1	E	99	74% 24% •
1	I	99	10% 73% 26% •
2	C	275	2% 78% 21% •

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
2	F	275	77% 21%
2	G	275	79% 20%
2	J	275	12% 73% 25%
3	D	11	91% 9%
3	H	11	73% 18% 9%
3	K	11	82% 18%
3	Q	11	73% 27%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	PEG	F	301	-	-	X	-

2   Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 13263 atoms, of which 46 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 Beta-2-microglobulin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	99	Total	C	N	O	S	0	0	0
			829	528	140	158	3			
1	B	99	Total	C	N	O	S	0	0	0
			813	518	138	154	3			
1	E	99	Total	C	N	O	S	0	0	0
			829	528	140	158	3			
1	I	99	Total	C	N	O	S	0	0	0
			823	525	137	158	3			

- Molecule 2 is a protein called HLA class I histocompatibility antigen, B-7 alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	F	275	Total	C	N	O	S	0	1	0
			2248	1396	411	434	7			
2	C	275	Total	C	N	O	S	0	0	0
			2247	1395	412	434	6			
2	G	275	Total	C	N	O	S	0	0	0
			2249	1396	410	437	6			
2	J	275	Total	C	N	O	S	0	0	0
			2247	1395	413	433	6			

- Molecule 3 is a protein called HIS-PRO-ASN-GLY-TYR-LYS-SER-LEU-SER-THR-LEU.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	Q	11	Total	C	N	O	0	0	0
			85	54	15	16			
3	D	11	Total	C	N	O	0	0	0
			85	54	15	16			
3	H	11	Total	C	N	O	0	0	0
			86	54	15	17			
3	K	11	Total	C	N	O	0	0	0
			86	54	15	17			

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total 10	C 2	H 6	O 2	0	0
4	F	1	Total 10	C 2	H 6	O 2	0	0
4	Q	1	Total 10	C 2	H 6	O 2	0	0
4	E	1	Total 10	C 2	H 6	O 2	0	0
4	E	1	Total 10	C 2	H 6	O 2	0	0
4	H	1	Total 10	C 2	H 6	O 2	0	0

- Molecule 5 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
5	F	1	17	4	10	3	0	0

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	48	Total 48	O 48	0	0
6	F	114	Total 114	O 114	0	0
6	Q	2	Total 2	O 2	0	0
6	B	30	Total 30	O 30	0	0
6	C	92	Total 92	O 92	0	0
6	D	4	Total 4	O 4	0	0
6	E	32	Total 32	O 32	0	0
6	G	138	Total 138	O 138	0	0
6	H	7	Total 7	O 7	0	0
6	I	22	Total 22	O 22	0	0
6	J	64	Total 64	O 64	0	0

Continued from previous page...

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	K	6	Total 6	O 6	0	0

3 Residue-property plots ⓘ

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: Beta-2-microglobulin

Chain A:

- Molecule 1: Beta-2-microglobulin

Chain B:

- Molecule 1: Beta-2-microglobulin

Chain E:

- Molecule 1: Beta-2-microglobulin

Chain I:

- Molecule 2: HLA class I histocompatibility antigen, B-7 alpha chain

Chain F:

I142 R151 R156 R157 R181 A182 D183 K186 V189 I194 E198 R202 C203 W204 E212 T216 R219 D220 Q224 G237 D238 R239 V249 E253 E254 Q255 R256 Y257 T258 C259 H260 V261 Q262 P269 L272 R273 W274 E275

• Molecule 2: HLA class I histocompatibility antigen, B-7 alpha chain

Chain C:

2%
78%   21%

G1 S4 M5 R6 Y9 R14 E19 F33 V34 R44 E45 E46 P50 E53 Q54 D61 R62 Q70 A71 R75 E76 M98 D106 G107 R108 D114 Q115 Y116 A117 Y123 E128 R131 D137 A140 Q141 R145 K146 E163

D177 E180 D183 T187 I194 R202 C203 W204 L215 Q218 R219 D223 Q224 T225 E232 D238 R239 T240 V248 V249 P250 E253 E254 Q255 R256 Y257 T258 C259 H260 V261 P267 L272 R273 W274 E275

• Molecule 2: HLA class I histocompatibility antigen, B-7 alpha chain

Chain G:

%
79%   20%

G1 M5 R6 Y9 R14 R17 P20 V34 R44 R62 I66 Q70 A71 Q72 R75 E76 R82 Y85 E89 A90 G91 D102 V103 G104 P105 D106 G107 R108 R111 G112 H113 A117 Y118 D119 D137 T143 K146 W147 E154

L168 R169 E173 L179 K186 H192 P193 I194 H197 T200 L201 R202 T225 E232 T233 G237 K243 W244 S251 Q255 T258 Q262 K268 P269 L270 T271 L272 R273 W274 E275
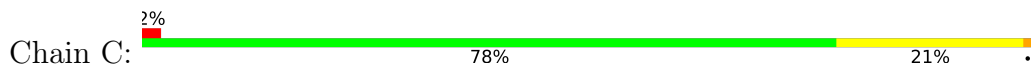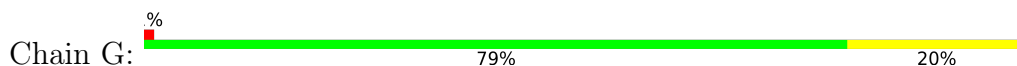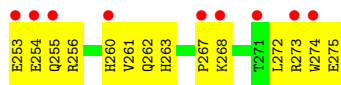
• Molecule 2: HLA class I histocompatibility antigen, B-7 alpha chain

Chain J:

12%
73%   25%

G1 S2 H3 S4 M5 R6 Y9 R14 R17 P20 P43 R44 E53 Q70 R75 R79 N80 L81 R82 G83 Y84 Y85 N86 Q87 T94 M98 D106 G107 R108 L109 Y118 D119 G120 K121 L130 D137 A140 Q141 R145 K146 W147 A150

R151 E152 A153 E154 V165 E166 W167 L168 R169 D177 E180 R181 P184 T187 H191 H192 P193 I194 S195 D196 H197 E198 A199 T200 L201 R202 C203 W204 A205 L206 Y209 P210 L215 T216 W217 E222 D223 Q224 T225 Q226 V231 W244 V247 V248 V249 P250 S251 G252

E253 E254 Q255 R256 H260 V261 Q262 H263 P267 K268 T271 L272 R273 W274 E275

• Molecule 3: HIS-PRO-ASN-GLY-TYR-LYS-SER-LEU-SER-THR-LEU

Chain Q:

73%   27%

H1 G4 Y5 K6 L11

• Molecule 3: HIS-PRO-ASN-GLY-TYR-LYS-SER-LEU-SER-THR-LEU

Chain D: 91%   9%

• Molecule 3: HIS-PRO-ASN-GLY-TYR-LYS-SER-LEU-SER-THR-LEU

Chain H:

• Molecule 3: HIS-PRO-ASN-GLY-TYR-LYS-SER-LEU-SER-THR-LEU

Chain K:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	49.21Å 90.67Å 104.56Å 97.54° 93.83° 90.23°	Depositor
Resolution (Å)	43.00 – 2.40	Depositor
	47.62 – 2.40	EDS
% Data completeness (in resolution range)	94.5 (43.00-2.40)	Depositor
	94.5 (47.62-2.40)	EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.58 (at 2.39Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.197 , 0.238	Depositor
	0.197 , 0.235	DCC
R_{free} test set	3318 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	27.3	Xtriage
Anisotropy	0.434	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 35.5	EDS
L-test for twinning [2]	$< |L| > = 0.51, < L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	13263	wwPDB-VP
Average B, all atoms (Å^2)	39.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.58% 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 (i)

5.1 Standard geometry (i)

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

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	0.54	0/852	0.66	0/1152
1	B	0.52	1/836 (0.1%)	0.71	0/1134
1	E	0.43	0/852	0.64	0/1152
1	I	0.51	1/846 (0.1%)	0.66	0/1145
2	C	0.65	1/2309 (0.0%)	0.77	1/3137 (0.0%)
2	F	0.59	2/2309 (0.1%)	0.76	1/3136 (0.0%)
2	G	0.58	1/2311 (0.0%)	0.74	0/3140
2	J	0.61	2/2309 (0.1%)	0.72	1/3137 (0.0%)
3	D	0.54	0/87	0.62	0/117
3	H	0.43	0/88	0.70	0/117
3	K	0.51	0/88	0.64	0/117
3	Q	0.35	0/87	0.57	0/117
All	All	0.58	8/12974 (0.1%)	0.73	3/17601 (0.0%)

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	J	184	PRO	N-CD	-15.85	1.25	1.47
2	C	267	PRO	N-CD	-12.65	1.30	1.47
2	F	57	PRO	N-CD	-10.34	1.33	1.47
1	I	14	PRO	N-CD	-9.74	1.34	1.47
1	B	90	PRO	N-CD	6.86	1.57	1.47

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	62	ARG	NE-CZ-NH1	5.91	123.25	120.30
2	J	14	ARG	NE-CZ-NH2	-5.37	117.62	120.30
2	F	17	ARG	N-CA-C	-5.28	96.75	111.00

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	829	0	794	16	0
1	B	813	0	764	11	0
1	E	829	0	793	27	0
1	I	823	0	783	25	0
2	C	2247	0	2085	61	4
2	F	2248	0	2086	55	0
2	G	2249	0	2087	68	0
2	J	2247	0	2089	61	4
3	D	85	0	86	1	0
3	H	86	0	86	6	0
3	K	86	0	86	3	0
3	Q	85	0	86	3	0
4	A	4	6	6	0	0
4	E	8	12	12	0	0
4	F	4	6	6	1	0
4	H	4	6	6	0	0
4	Q	4	6	6	1	0
5	F	7	10	10	4	0
6	A	48	0	0	7	0
6	B	30	0	0	6	0
6	C	92	0	0	15	0
6	D	4	0	0	0	0
6	E	32	0	0	10	0
6	F	114	0	0	11	0
6	G	138	0	0	32	0
6	H	7	0	0	1	0
6	I	22	0	0	7	0
6	J	64	0	0	14	0
6	K	6	0	0	0	0
6	Q	2	0	0	0	0
All	All	13217	46	11871	320	4

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 13.

The worst 5 of 320 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)
2:C:219:ARG:NH1	2:C:257:TYR:CE1	1.72	1.58
2:C:219:ARG:NH1	2:C:257:TYR:CZ	1.68	1.57
2:C:275:GLU:HB2	6:C:304:HOH:O	1.22	1.37
2:J:82:ARG:NH1	2:J:87:GLN:O	1.59	1.34
2:C:219:ARG:NH1	2:C:257:TYR:OH	1.58	1.32

All (4) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:177:ASP:CA	2:J:255:GLN:NE2[1_656]	1.54	0.66
2:C:183:ASP:OD1	2:J:273:ARG:NH1[1_656]	2.01	0.19
2:C:177:ASP:OD1	2:J:255:GLN:NE2[1_656]	2.13	0.07
2:C:183:ASP:OD1	2:J:273:ARG:NH2[1_656]	2.17	0.03

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	97/99 (98%)	96 (99%)	1 (1%)	0	100	100
1	B	97/99 (98%)	96 (99%)	1 (1%)	0	100	100
1	E	97/99 (98%)	95 (98%)	2 (2%)	0	100	100
1	I	97/99 (98%)	96 (99%)	1 (1%)	0	100	100
2	C	273/275 (99%)	264 (97%)	9 (3%)	0	100	100
2	F	274/275 (100%)	267 (97%)	7 (3%)	0	100	100
2	G	273/275 (99%)	265 (97%)	8 (3%)	0	100	100
2	J	273/275 (99%)	266 (97%)	7 (3%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	D	9/11 (82%)	9 (100%)	0	0	100	100
3	H	9/11 (82%)	9 (100%)	0	0	100	100
3	K	9/11 (82%)	9 (100%)	0	0	100	100
3	Q	9/11 (82%)	9 (100%)	0	0	100	100
All	All	1517/1540 (98%)	1481 (98%)	36 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	94/94 (100%)	91 (97%)	3 (3%)	39	59
1	B	90/94 (96%)	88 (98%)	2 (2%)	52	71
1	E	94/94 (100%)	91 (97%)	3 (3%)	39	59
1	I	93/94 (99%)	90 (97%)	3 (3%)	39	59
2	C	231/233 (99%)	228 (99%)	3 (1%)	69	84
2	F	230/233 (99%)	225 (98%)	5 (2%)	52	71
2	G	232/233 (100%)	229 (99%)	3 (1%)	69	84
2	J	231/233 (99%)	226 (98%)	5 (2%)	52	71
3	D	10/10 (100%)	10 (100%)	0	100	100
3	H	10/10 (100%)	9 (90%)	1 (10%)	7	11
3	K	10/10 (100%)	10 (100%)	0	100	100
3	Q	10/10 (100%)	10 (100%)	0	100	100
All	All	1335/1348 (99%)	1307 (98%)	28 (2%)	53	72

5 of 28 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	70	PHE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	J	223	ASP
2	G	137	ASP
2	J	98	MET
2	G	111	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 16 such sidechains are listed below:

Mol	Chain	Res	Type
2	J	262	GLN
2	J	192	HIS
2	C	255	GLN
1	I	51	HIS
2	C	115	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 ⓘ

7 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
4	EDO	Q	101	-	3,3,3	0.35	0	2,2,2	0.21	0
4	EDO	E	102	-	3,3,3	0.46	0	2,2,2	0.88	0
5	PEG	F	301	-	6,6,6	0.49	0	5,5,5	0.66	0
4	EDO	F	302	-	3,3,3	0.49	0	2,2,2	0.37	0
4	EDO	E	101	-	3,3,3	0.25	0	2,2,2	0.41	0
4	EDO	H	101	-	3,3,3	0.43	0	2,2,2	0.30	0
4	EDO	A	101	-	3,3,3	0.49	0	2,2,2	0.97	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	EDO	Q	101	-	-	0/1/1/1	-
4	EDO	E	102	-	-	0/1/1/1	-
5	PEG	F	301	-	-	2/4/4/4	-
4	EDO	F	302	-	-	0/1/1/1	-
4	EDO	E	101	-	-	1/1/1/1	-
4	EDO	H	101	-	-	1/1/1/1	-
4	EDO	A	101	-	-	1/1/1/1	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	E	101	EDO	O1-C1-C2-O2
5	F	301	PEG	C1-C2-O2-C3
5	F	301	PEG	C4-C3-O2-C2
4	A	101	EDO	O1-C1-C2-O2
4	H	101	EDO	O1-C1-C2-O2

There are no ring outliers.

3 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	Q	101	EDO	1	0
5	F	301	PEG	4	0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	F	302	EDO	1	0

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, 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	99/99 (100%)	-0.03	0	100	100	21, 39, 61, 69	0
1	B	99/99 (100%)	-0.15	1 (1%)	82	80	24, 43, 69, 90	0
1	E	99/99 (100%)	-0.05	0	100	100	20, 36, 64, 71	0
1	I	99/99 (100%)	0.46	10 (10%)	7	6	33, 54, 88, 116	0
2	C	275/275 (100%)	0.05	6 (2%)	62	60	20, 36, 69, 94	0
2	F	275/275 (100%)	-0.08	2 (0%)	87	86	19, 28, 67, 101	0
2	G	275/275 (100%)	-0.11	3 (1%)	80	79	17, 26, 49, 92	0
2	J	275/275 (100%)	0.52	34 (12%)	4	3	22, 44, 102, 126	0
3	D	11/11 (100%)	-0.18	0	100	100	22, 24, 27, 28	0
3	H	11/11 (100%)	-0.10	0	100	100	20, 22, 24, 25	0
3	K	11/11 (100%)	-0.17	0	100	100	28, 30, 35, 36	0
3	Q	11/11 (100%)	-0.15	0	100	100	21, 25, 26, 27	0
All	All	1540/1540 (100%)	0.08	56 (3%)	42	42	17, 35, 75, 126	0

The worst 5 of 56 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	J	251	SER	5.3
2	J	250	PRO	5.2
2	J	197	HIS	5.0
2	J	255	GLN	5.0
2	J	248	VAL	4.6

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

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

WORLDWIDE
wwPDB
PROTEIN DATA BANK

6.3   Carbohydrates (i)

There are no monosaccharides 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(Å^2)	Q<0.9
4	EDO	E	102	4/4	0.77	0.26	33,39,43,45	0
5	PEG	F	301	7/7	0.80	0.27	26,32,38,38	0
4	EDO	F	302	4/4	0.90	0.13	31,37,41,41	0
4	EDO	Q	101	4/4	0.93	0.21	23,33,40,44	0
4	EDO	E	101	4/4	0.93	0.17	31,38,43,49	0
4	EDO	H	101	4/4	0.95	0.14	24,29,33,38	0
4	EDO	A	101	4/4	0.97	0.16	32,39,42,50	0

6.5   Other polymers (i)

There are no such residues in this entry.