WORLDWIDE wwPDB PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report (i)

Sep 23, 2023 – 07:41 PM EDT

PDB ID	:	5TVP
Title	:	SUMO2 bound to Mouse Tdp2 catalytic domain with a 5'-phosphorylated DNA ternary complex
Authors	:	Schellenberg, M.J.; Williams, R.S.
Deposited on	:	2016-11-09
Resolution	:	2.40 Å(reported)

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

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
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 ⓘ

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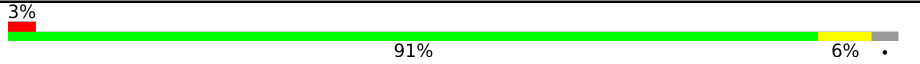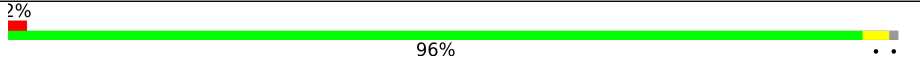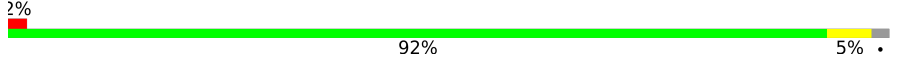*X-RAY DIFFRACTION*

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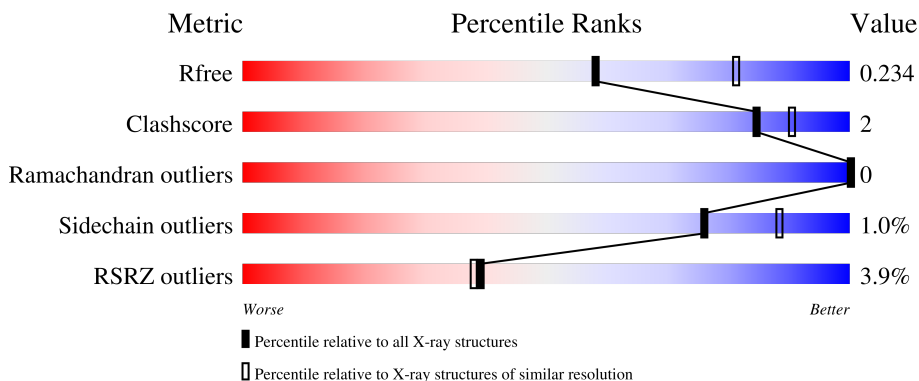
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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	256	3% / 91% / 6% ·
1	B	256	2% / 96% · ·
1	E	256	2% / 92% / 5% ·
1	G	256	% / 88% / 10% ·
1	I	256	4% / 89% / 8% · ·

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Mol	Chain	Length	Quality of chain
1	K	256	2% / 91% / 7% / ·
1	M	256	3% / 91% / 6% / ·
1	O	256	3% / 89% / 7% / ·
2	C	9	100%
2	D	9	100%
2	F	9	100%
2	H	9	100%
2	J	9	100%
2	L	9	100%
2	N	9	100%
2	P	9	100%
3	Q	81	44% / 84% / 10% / 6%

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 18735 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 Tyrosyl-DNA phosphodiesterase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	I	249	Total	C	N	O	S	0	0	0
			1975	1258	342	361	14			
1	O	249	Total	C	N	O	S	0	0	0
			1975	1258	342	361	14			
1	E	250	Total	C	N	O	S	0	0	0
			1984	1264	343	363	14			
1	G	249	Total	C	N	O	S	0	0	0
			1975	1258	342	361	14			
1	B	254	Total	C	N	O	S	0	0	0
			2013	1281	347	371	14			
1	A	249	Total	C	N	O	S	0	0	0
			1975	1258	342	361	14			
1	K	249	Total	C	N	O	S	0	0	0
			1975	1258	342	361	14			
1	M	250	Total	C	N	O	S	0	0	0
			1984	1264	343	363	14			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
I	115	SER	-	expression tag	UNP Q9JJX7
I	116	LYS	-	expression tag	UNP Q9JJX7
I	117	GLY	-	expression tag	UNP Q9JJX7
O	115	SER	-	expression tag	UNP Q9JJX7
O	116	LYS	-	expression tag	UNP Q9JJX7
O	117	GLY	-	expression tag	UNP Q9JJX7
E	115	SER	-	expression tag	UNP Q9JJX7
E	116	LYS	-	expression tag	UNP Q9JJX7
E	117	GLY	-	expression tag	UNP Q9JJX7
G	115	SER	-	expression tag	UNP Q9JJX7
G	116	LYS	-	expression tag	UNP Q9JJX7
G	117	GLY	-	expression tag	UNP Q9JJX7
B	115	SER	-	expression tag	UNP Q9JJX7

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Chain	Residue	Modelled	Actual	Comment	Reference
B	116	LYS	-	expression tag	UNP Q9JJX7
B	117	GLY	-	expression tag	UNP Q9JJX7
A	115	SER	-	expression tag	UNP Q9JJX7
A	116	LYS	-	expression tag	UNP Q9JJX7
A	117	GLY	-	expression tag	UNP Q9JJX7
K	115	SER	-	expression tag	UNP Q9JJX7
K	116	LYS	-	expression tag	UNP Q9JJX7
K	117	GLY	-	expression tag	UNP Q9JJX7
M	115	SER	-	expression tag	UNP Q9JJX7
M	116	LYS	-	expression tag	UNP Q9JJX7
M	117	GLY	-	expression tag	UNP Q9JJX7

- Molecule 2 is a DNA chain called DNA (5'-D(P*CP*CP*GP*AP*AP*TP*TP*CP*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	J	9	Total 184	C 87	N 33	O 55	P 9	0	0	0
2	P	9	Total 184	C 87	N 33	O 55	P 9	0	0	0
2	F	9	Total 184	C 87	N 33	O 55	P 9	0	0	0
2	H	9	Total 184	C 87	N 33	O 55	P 9	0	0	0
2	C	9	Total 184	C 87	N 33	O 55	P 9	0	0	0
2	D	9	Total 184	C 87	N 33	O 55	P 9	0	0	0
2	L	9	Total 184	C 87	N 33	O 55	P 9	0	0	0
2	N	9	Total 184	C 87	N 33	O 55	P 9	0	0	0

- Molecule 3 is a protein called Small ubiquitin-related modifier 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	Q	76	Total 617	C 381	N 111	O 121	S 4	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Q	8	SER	-	expression tag	UNP P61957

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Chain	Residue	Modelled	Actual	Comment	Reference
Q	9	ASN	-	expression tag	UNP P61957

- Molecule 4 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	I	1	Total 5	O 4	P 1	0	0
4	O	1	Total 5	O 4	P 1	0	0
4	E	1	Total 5	O 4	P 1	0	0
4	E	1	Total 5	O 4	P 1	0	0
4	G	1	Total 5	O 4	P 1	0	0
4	B	1	Total 5	O 4	P 1	0	0
4	A	1	Total 5	O 4	P 1	0	0
4	K	1	Total 5	O 4	P 1	0	0
4	M	1	Total 5	O 4	P 1	0	0

- Molecule 5 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).

EDO

C1

O2
OH

C2

HO
O1

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	I	1	Total 4	C 2	O 2	0	0
5	I	1	Total 4	C 2	O 2	0	0
5	O	1	Total 4	C 2	O 2	0	0
5	O	1	Total 4	C 2	O 2	0	0
5	O	1	Total 4	C 2	O 2	0	0
5	G	1	Total 4	C 2	O 2	0	0
5	G	1	Total 4	C 2	O 2	0	0
5	G	1	Total 4	C 2	O 2	0	0
5	G	1	Total 4	C 2	O 2	0	0
5	B	1	Total 4	C 2	O 2	0	0
5	A	1	Total 4	C 2	O 2	0	0
5	K	1	Total 4	C 2	O 2	0	0
5	K	1	Total 4	C 2	O 2	0	0

- Molecule 6 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	E	1	Total 1	Cl 1	0	0
6	B	1	Total 1	Cl 1	0	0
6	M	1	Total 1	Cl 1	0	0

- Molecule 7 is water.

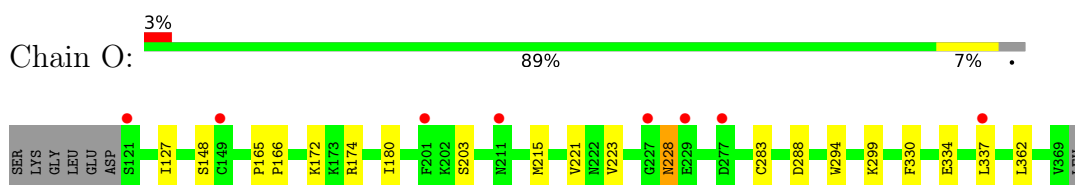| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	I	86	Total 86	O 86	0	0
7	J	7	Total 7	O 7	0	0
7	O	48	Total 48	O 48	0	0
7	P	1	Total 1	O 1	0	0
7	Q	10	Total 10	O 10	0	0
7	E	101	Total 101	O 101	0	0
7	F	10	Total 10	O 10	0	0
7	G	82	Total 82	O 82	0	0
7	H	1	Total 1	O 1	0	0
7	B	88	Total 88	O 88	0	0
7	C	8	Total 8	O 8	0	0
7	A	92	Total 92	O 92	0	0
7	D	3	Total 3	O 3	0	0
7	K	72	Total 72	O 72	0	0
7	L	6	Total 6	O 6	0	0
7	M	71	Total 71	O 71	0	0
7	N	4	Total 4	O 4	0	0

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.
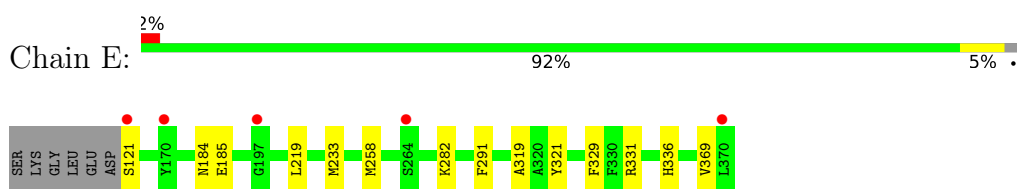
• Molecule 1: Tyrosyl-DNA phosphodiesterase 2
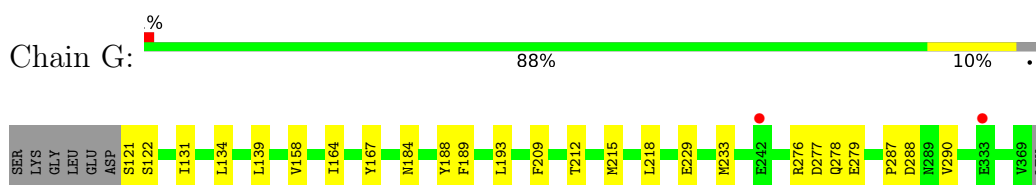
Chain I:

• Molecule 1: Tyrosyl-DNA phosphodiesterase 2

Chain O:

• Molecule 1: Tyrosyl-DNA phosphodiesterase 2
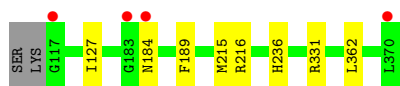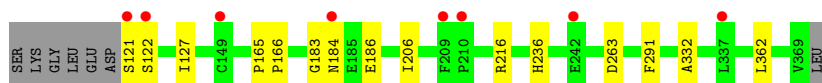
Chain E:

• Molecule 1: Tyrosyl-DNA phosphodiesterase 2

Chain G:

• Molecule 1: Tyrosyl-DNA phosphodiesterase 2

Chain B:

SER LYS G117 I127 G183 N184 F189 M215 R216 H236 R331 L362 L370

• Molecule 1: Tyrosyl-DNA phosphodiesterase 2

Chain A:

3%

91% 6%

SER LYS GLY GLU ASP S121 S122 I127 C149 P165 P166 G183 N184 E185 E186 I206 F209 P210 R216 H236 E242 D263 F291 A332 L337 L362 V369 LEU

• Molecule 1: Tyrosyl-DNA phosphodiesterase 2

Chain K:

2%

91% 7%

SER LYS GLY GLU ASP S121 I131 R144 G145 V146 Y167 R174 I180 N184 F189 L193 K200 K213 E229 S239 P262 T265 F269 D277 L337 Q340 N367 V368 V369 LEU

• Molecule 1: Tyrosyl-DNA phosphodiesterase 2

Chain M:

3%

91% 6%

SER LYS GLY GLU ASP S121 I127 L139 I164 P165 P166 Y170 L171 K172 K173 R174 I180 G226 E242 A245 D263 T266 D277 I281 K282 C283 R327 E334 L337 L362 V368 V369 L370

• Molecule 2: DNA (5'-D(P*CP*CP*GP*AP*AP*TP*TP*CP*G)-3')

Chain J:

100%

There are no outlier residues recorded for this chain.

• Molecule 2: DNA (5'-D(P*CP*CP*GP*AP*AP*TP*TP*CP*G)-3')

Chain P:

100%

There are no outlier residues recorded for this chain.

• Molecule 2: DNA (5'-D(P*CP*CP*GP*AP*AP*TP*TP*CP*G)-3')

Chain F:

100%

There are no outlier residues recorded for this chain.

• Molecule 2: DNA (5'-D(P*CP*CP*GP*AP*AP*TP*TP*CP*G)-3')

Chain H:

100%

There are no outlier residues recorded for this chain.

• Molecule 2: DNA (5'-D(P*CP*CP*GP*AP*AP*TP*TP*CP*G)-3')

Chain C: 100%

There are no outlier residues recorded for this chain.

• Molecule 2: DNA (5'-D(P*CP*CP*GP*AP*AP*TP*TP*CP*G)-3')

Chain D: 100%

There are no outlier residues recorded for this chain.

• Molecule 2: DNA (5'-D(P*CP*CP*GP*AP*AP*TP*TP*CP*G)-3')

Chain L: 100%

There are no outlier residues recorded for this chain.
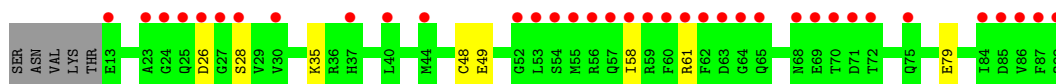
• Molecule 2: DNA (5'-D(P*CP*CP*GP*AP*AP*TP*TP*CP*G)-3')

Chain N: 100%

There are no outlier residues recorded for this chain.

• Molecule 3: Small ubiquitin-related modifier 2

Chain Q:

4   Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	106.55Å 113.77Å 125.43Å 90.00° 91.52° 90.00°	Depositor
Resolution (Å)	49.27 – 2.40 49.27 – 2.40	Depositor EDS
% Data completeness (in resolution range)	98.9 (49.27-2.40) 85.6 (49.27-2.40)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	0.66 (at 2.39Å)	Xtriage
Refinement program	PHENIX	Depositor
R, R_{free}	0.191 , 0.233 0.193 , 0.234	Depositor DCC
R_{free} test set	5914 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å^2)	28.7	Xtriage
Anisotropy	0.105	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 52.2	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.015 for h,-k,-l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	18735	wwPDB-VP
Average B, all atoms (Å^2)	55.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 20.46 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 8.6494e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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[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 ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: PO4, CL, 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	0.35	0/2020	0.52	0/2735
1	B	0.36	0/2058	0.52	0/2785
1	E	0.38	0/2029	0.55	0/2746
1	G	0.38	0/2020	0.54	0/2735
1	I	0.35	0/2020	0.50	0/2735
1	K	0.33	0/2020	0.50	0/2735
1	M	0.34	0/2029	0.52	0/2746
1	O	0.31	0/2020	0.49	0/2735
2	C	0.70	0/205	0.92	0/312
2	D	0.58	0/205	0.92	0/312
2	F	0.69	0/205	0.94	0/312
2	H	0.55	0/205	0.94	0/312
2	J	0.57	0/205	0.89	0/312
2	L	0.69	0/205	0.94	0/312
2	N	0.69	0/205	0.94	0/312
2	P	0.60	0/205	0.92	0/312
3	Q	0.30	0/626	0.45	0/840
All	All	0.38	0/18482	0.57	0/25288

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	1975	0	1968	9	0
1	B	2013	0	2003	5	0
1	E	1984	0	1979	8	0
1	G	1975	0	1968	16	0
1	I	1975	0	1968	13	0
1	K	1975	0	1968	12	0
1	M	1984	0	1979	10	0
1	O	1975	0	1968	8	0
2	C	184	0	102	0	0
2	D	184	0	102	0	0
2	F	184	0	102	0	0
2	H	184	0	102	0	0
2	J	184	0	102	0	0
2	L	184	0	102	0	0
2	N	184	0	102	0	0
2	P	184	0	102	0	0
3	Q	617	0	601	3	0
4	A	5	0	0	0	0
4	B	5	0	0	0	0
4	E	10	0	0	0	0
4	G	5	0	0	0	0
4	I	5	0	0	0	0
4	K	5	0	0	0	0
4	M	5	0	0	0	0
4	O	5	0	0	0	0
5	A	4	0	6	0	0
5	B	4	0	6	0	0
5	G	16	0	24	0	0
5	I	8	0	12	0	0
5	K	8	0	12	0	0
5	O	12	0	18	0	0
6	B	1	0	0	0	0
6	E	1	0	0	0	0
6	M	1	0	0	0	0
7	A	92	0	0	1	0
7	B	88	0	0	1	0
7	C	8	0	0	0	0
7	D	3	0	0	0	0
7	E	101	0	0	2	0
7	F	10	0	0	0	0
7	G	82	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	H	1	0	0	0	0
7	I	86	0	0	0	0
7	J	7	0	0	0	0
7	K	72	0	0	0	0
7	L	6	0	0	0	0
7	M	71	0	0	1	0
7	N	4	0	0	0	0
7	O	48	0	0	0	0
7	P	1	0	0	0	0
7	Q	10	0	0	0	0
All	All	18735	0	17296	80	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 2.

The worst 5 of 80 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:287:PRO:HD2	1:G:290:VAL:HB	1.61	0.80
1:G:276:ARG:O	1:G:279:GLU:HB2	1.94	0.67
1:B:184:ASN:HB3	1:B:189:PHE:HB3	1.78	0.65
1:G:288:ASP:OD2	1:K:144:ARG:HD3	2.01	0.61
1:G:288:ASP:OD2	1:K:144:ARG:NH1	2.35	0.60

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	247/256 (96%)	241 (98%)	6 (2%)	0	100	100
1	B	252/256 (98%)	246 (98%)	6 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	E	248/256 (97%)	241 (97%)	7 (3%)	0	100	100
1	G	247/256 (96%)	240 (97%)	7 (3%)	0	100	100
1	I	247/256 (96%)	238 (96%)	9 (4%)	0	100	100
1	K	247/256 (96%)	240 (97%)	7 (3%)	0	100	100
1	M	248/256 (97%)	239 (96%)	9 (4%)	0	100	100
1	O	247/256 (96%)	236 (96%)	11 (4%)	0	100	100
3	Q	74/81 (91%)	73 (99%)	1 (1%)	0	100	100
All	All	2057/2129 (97%)	1994 (97%)	63 (3%)	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	218/224 (97%)	218 (100%)	0	100	100
1	B	222/224 (99%)	221 (100%)	1 (0%)	88	95
1	E	219/224 (98%)	219 (100%)	0	100	100
1	G	218/224 (97%)	216 (99%)	2 (1%)	78	90
1	I	218/224 (97%)	215 (99%)	3 (1%)	67	82
1	K	218/224 (97%)	216 (99%)	2 (1%)	78	90
1	M	219/224 (98%)	218 (100%)	1 (0%)	88	95
1	O	218/224 (97%)	211 (97%)	7 (3%)	39	59
3	Q	69/74 (93%)	66 (96%)	3 (4%)	29	46
All	All	1819/1866 (98%)	1800 (99%)	19 (1%)	76	88

5 of 19 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	229	GLU

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Mol	Chain	Res	Type
1	K	239	SER
1	M	370	LEU
1	K	200	LYS
1	O	283	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	I	367	ASN
1	K	367	ASN

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 ⓘ

Of 25 ligands modelled in this entry, 3 are monoatomic - leaving 22 for Mogul analysis.

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	$\#|Z| > 2$
5	EDO	O	404	-	3,3,3	0.48	0	2,2,2	0.25	0
5	EDO	O	402	-	3,3,3	0.42	0	2,2,2	0.53	0
5	EDO	K	402	-	3,3,3	0.43	0	2,2,2	0.59	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
5	EDO	G	403	-	3,3,3	0.54	0	2,2,2	0.20	0
4	PO4	M	401	-	4,4,4	0.80	0	6,6,6	0.57	0
4	PO4	E	401	-	4,4,4	0.66	0	6,6,6	0.63	0
5	EDO	I	402	-	3,3,3	0.44	0	2,2,2	0.43	0
4	PO4	A	401	-	4,4,4	0.79	0	6,6,6	0.45	0
4	PO4	E	403	-	4,4,4	0.71	0	6,6,6	0.61	0
5	EDO	A	402	-	3,3,3	0.47	0	2,2,2	0.50	0
4	PO4	G	401	-	4,4,4	0.82	0	6,6,6	0.48	0
5	EDO	B	402	-	3,3,3	0.51	0	2,2,2	0.26	0
4	PO4	O	401	-	4,4,4	0.88	0	6,6,6	0.45	0
5	EDO	G	405	-	3,3,3	0.51	0	2,2,2	0.32	0
4	PO4	I	401	-	4,4,4	0.75	0	6,6,6	0.42	0
5	EDO	O	403	-	3,3,3	0.46	0	2,2,2	0.35	0
5	EDO	G	402	-	3,3,3	0.40	0	2,2,2	0.65	0
4	PO4	B	401	-	4,4,4	0.84	0	6,6,6	0.62	0
5	EDO	I	403	-	3,3,3	0.52	0	2,2,2	0.32	0
5	EDO	G	404	-	3,3,3	0.52	0	2,2,2	0.34	0
5	EDO	K	403	-	3,3,3	0.50	0	2,2,2	0.40	0
4	PO4	K	401	-	4,4,4	0.75	0	6,6,6	0.47	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
5	EDO	O	404	-	-	0/1/1/1	-
5	EDO	O	402	-	-	0/1/1/1	-
5	EDO	K	402	-	-	0/1/1/1	-
5	EDO	O	403	-	-	0/1/1/1	-
5	EDO	G	403	-	-	0/1/1/1	-
5	EDO	A	402	-	-	0/1/1/1	-
5	EDO	G	402	-	-	0/1/1/1	-
5	EDO	B	402	-	-	1/1/1/1	-
5	EDO	I	402	-	-	1/1/1/1	-
5	EDO	I	403	-	-	1/1/1/1	-
5	EDO	G	404	-	-	1/1/1/1	-
5	EDO	K	403	-	-	1/1/1/1	-
5	EDO	G	405	-	-	0/1/1/1	-

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
5	I	403	EDO	O1-C1-C2-O2
5	I	402	EDO	O1-C1-C2-O2
5	B	402	EDO	O1-C1-C2-O2
5	G	404	EDO	O1-C1-C2-O2
5	K	403	EDO	O1-C1-C2-O2

There are no ring outliers.

No monomer is involved in short contacts.

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(Å²)	Q<0.9
1	A	249/256 (97%)	0.13	8 (3%)	47	46	21, 46, 79, 107	0
1	B	254/256 (99%)	0.02	4 (1%)	72	70	24, 46, 75, 122	0
1	E	250/256 (97%)	-0.08	5 (2%)	65	63	24, 42, 72, 138	0
1	G	249/256 (97%)	0.06	2 (0%)	86	84	26, 47, 89, 117	0
1	I	249/256 (97%)	0.18	9 (3%)	42	42	27, 49, 92, 136	0
1	K	249/256 (97%)	0.07	4 (1%)	72	70	26, 49, 86, 124	0
1	M	250/256 (97%)	0.26	7 (2%)	53	51	35, 57, 94, 115	0
1	O	249/256 (97%)	0.40	8 (3%)	47	46	34, 62, 105, 136	0
2	C	9/9 (100%)	-0.48	0	100	100	47, 58, 86, 94	0
2	D	9/9 (100%)	-0.47	0	100	100	46, 65, 74, 78	0
2	F	9/9 (100%)	-0.12	0	100	100	38, 51, 88, 95	0
2	H	9/9 (100%)	0.54	0	100	100	61, 94, 102, 106	0
2	J	9/9 (100%)	-0.29	0	100	100	45, 64, 75, 75	0
2	L	9/9 (100%)	-0.14	0	100	100	50, 71, 90, 90	0
2	N	9/9 (100%)	-0.11	0	100	100	59, 80, 87, 90	0
2	P	9/9 (100%)	0.41	0	100	100	65, 80, 114, 119	0
3	Q	76/81 (93%)	1.97	36 (47%)	0	0	52, 72, 112, 119	0
All	All	2147/2201 (97%)	0.19	83 (3%)	39	38	21, 50, 93, 138	0

The worst 5 of 83 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	121	SER	7.1
1	E	370	LEU	6.3
3	Q	27	GLY	4.8
1	I	184	ASN	4.7

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Mol	Chain	Res	Type	RSRZ
3	Q	87	PHE	4.7

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

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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
5	EDO	G	403	4/4	0.80	0.20	68,68,69,70	0
5	EDO	G	404	4/4	0.87	0.22	47,49,50,50	0
5	EDO	G	405	4/4	0.87	0.31	54,54,55,57	0
5	EDO	O	403	4/4	0.89	0.26	58,59,59,60	0
5	EDO	G	402	4/4	0.90	0.27	45,45,48,55	0
5	EDO	B	402	4/4	0.90	0.20	54,54,55,57	0
5	EDO	I	403	4/4	0.91	0.15	49,51,55,60	0
5	EDO	A	402	4/4	0.91	0.16	44,46,48,48	0
4	PO4	O	401	5/5	0.93	0.13	70,70,73,74	0
5	EDO	O	404	4/4	0.93	0.19	55,56,58,61	0
5	EDO	I	402	4/4	0.94	0.18	42,45,45,52	0
5	EDO	K	402	4/4	0.94	0.13	39,39,39,40	0
5	EDO	K	403	4/4	0.94	0.18	59,59,60,61	0
6	CL	E	402	1/1	0.95	0.10	49,49,49,49	0
5	EDO	O	402	4/4	0.96	0.12	30,34,36,43	0
4	PO4	E	403	5/5	0.96	0.11	54,54,57,59	0
6	CL	B	403	1/1	0.96	0.21	61,61,61,61	0
6	CL	M	402	1/1	0.96	0.12	56,56,56,56	0
4	PO4	K	401	5/5	0.97	0.07	41,48,53,54	0
4	PO4	M	401	5/5	0.97	0.12	61,67,71,72	0
4	PO4	I	401	5/5	0.97	0.12	45,48,53,53	0
4	PO4	B	401	5/5	0.98	0.09	45,48,50,52	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	PO4	A	401	5/5	0.98	0.08	45,50,53,55	0
4	PO4	E	401	5/5	0.98	0.09	28,34,40,41	0
4	PO4	G	401	5/5	0.98	0.08	55,56,60,60	0

6.5 Other polymers (i)

There are no such residues in this entry.