



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 17, 2024 – 10:03 PM EST

PDB ID : 7UZP
Title : parathyroid hormone 1 receptor extracellular domain complexed with a peptide ligand containing three beta-amino acids
Authors : Yu, Z.; Bruchs, A.T.; Bingman, C.A.; Gellman, S.H.
Deposited on : 2022-05-09
Resolution : 2.29 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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) 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 : 2.36
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) : 2.36

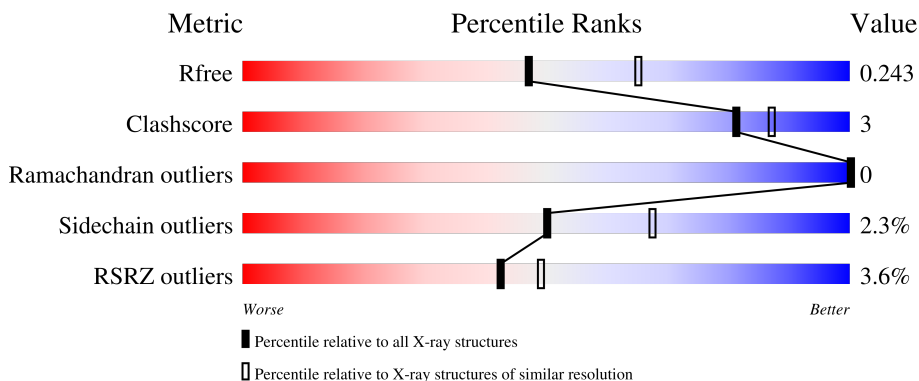
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.29 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.



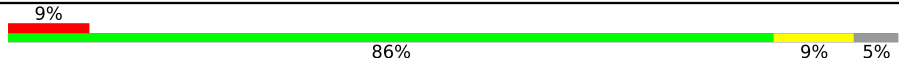
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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 $\leq 5\%$. 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	103	 3% 86% 10% ..
1	C	103	 2% 95% ..
1	E	103	 4% 94% ..
2	B	22	 73% 27%
2	D	22	 9% 73% 23% 5%

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Mol	Chain	Length	Quality of chain
2	F	22	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into four segments: a red segment on the left labeled '9%', a large green segment in the middle labeled '86%', a yellow segment on the right labeled '9%', and a small grey segment at the far right labeled '5%'.</p>

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 5969 atoms, of which 2804 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 Parathyroid hormone/parathyroid hormone-related peptide receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
1	A	101	1563	517	750	146	143	7	0	0	0
1	C	101	1570	518	754	149	142	7	0	0	0
1	E	101	1600	524	778	149	142	7	0	0	0

There are 135 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	28	GLY	-	expression tag	UNP Q03431
A	?	-	SER	deletion	UNP Q03431
A	?	-	ILE	deletion	UNP Q03431
A	?	-	MET	deletion	UNP Q03431
A	?	-	GLU	deletion	UNP Q03431
A	?	-	SER	deletion	UNP Q03431
A	?	-	ASP	deletion	UNP Q03431
A	?	-	LYS	deletion	UNP Q03431
A	?	-	GLY	deletion	UNP Q03431
A	?	-	TRP	deletion	UNP Q03431
A	?	-	THR	deletion	UNP Q03431
A	?	-	SER	deletion	UNP Q03431
A	?	-	ALA	deletion	UNP Q03431
A	?	-	SER	deletion	UNP Q03431
A	?	-	THR	deletion	UNP Q03431
A	?	-	SER	deletion	UNP Q03431
A	?	-	GLY	deletion	UNP Q03431
A	?	-	LYS	deletion	UNP Q03431
A	?	-	PRO	deletion	UNP Q03431
A	?	-	ARG	deletion	UNP Q03431
A	?	-	LYS	deletion	UNP Q03431
A	?	-	ASP	deletion	UNP Q03431

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Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	LYS	deletion	UNP Q03431
A	?	-	ALA	deletion	UNP Q03431
A	?	-	SER	deletion	UNP Q03431
A	?	-	GLY	deletion	UNP Q03431
A	?	-	LYS	deletion	UNP Q03431
A	?	-	LEU	deletion	UNP Q03431
A	?	-	TYR	deletion	UNP Q03431
A	?	-	PRO	deletion	UNP Q03431
A	?	-	GLU	deletion	UNP Q03431
A	?	-	SER	deletion	UNP Q03431
A	?	-	GLU	deletion	UNP Q03431
A	?	-	GLU	deletion	UNP Q03431
A	?	-	ASP	deletion	UNP Q03431
A	?	-	LYS	deletion	UNP Q03431
A	?	-	GLU	deletion	UNP Q03431
A	?	-	ALA	deletion	UNP Q03431
A	?	-	PRO	deletion	UNP Q03431
A	?	-	THR	deletion	UNP Q03431
A	?	-	GLY	deletion	UNP Q03431
A	?	-	SER	deletion	UNP Q03431
A	?	-	ARG	deletion	UNP Q03431
A	?	-	TYR	deletion	UNP Q03431
A	?	-	ARG	deletion	UNP Q03431
C	28	GLY	-	expression tag	UNP Q03431
C	?	-	SER	deletion	UNP Q03431
C	?	-	ILE	deletion	UNP Q03431
C	?	-	MET	deletion	UNP Q03431
C	?	-	GLU	deletion	UNP Q03431
C	?	-	SER	deletion	UNP Q03431
C	?	-	ASP	deletion	UNP Q03431
C	?	-	LYS	deletion	UNP Q03431
C	?	-	GLY	deletion	UNP Q03431
C	?	-	TRP	deletion	UNP Q03431
C	?	-	THR	deletion	UNP Q03431
C	?	-	SER	deletion	UNP Q03431
C	?	-	ALA	deletion	UNP Q03431
C	?	-	SER	deletion	UNP Q03431
C	?	-	THR	deletion	UNP Q03431
C	?	-	SER	deletion	UNP Q03431
C	?	-	GLY	deletion	UNP Q03431
C	?	-	LYS	deletion	UNP Q03431
C	?	-	PRO	deletion	UNP Q03431

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Chain	Residue	Modelled	Actual	Comment	Reference
C	?	-	ARG	deletion	UNP Q03431
C	?	-	LYS	deletion	UNP Q03431
C	?	-	ASP	deletion	UNP Q03431
C	?	-	LYS	deletion	UNP Q03431
C	?	-	ALA	deletion	UNP Q03431
C	?	-	SER	deletion	UNP Q03431
C	?	-	GLY	deletion	UNP Q03431
C	?	-	LYS	deletion	UNP Q03431
C	?	-	LEU	deletion	UNP Q03431
C	?	-	TYR	deletion	UNP Q03431
C	?	-	PRO	deletion	UNP Q03431
C	?	-	GLU	deletion	UNP Q03431
C	?	-	SER	deletion	UNP Q03431
C	?	-	GLU	deletion	UNP Q03431
C	?	-	GLU	deletion	UNP Q03431
C	?	-	ASP	deletion	UNP Q03431
C	?	-	LYS	deletion	UNP Q03431
C	?	-	GLU	deletion	UNP Q03431
C	?	-	ALA	deletion	UNP Q03431
C	?	-	PRO	deletion	UNP Q03431
C	?	-	THR	deletion	UNP Q03431
C	?	-	GLY	deletion	UNP Q03431
C	?	-	SER	deletion	UNP Q03431
C	?	-	ARG	deletion	UNP Q03431
C	?	-	TYR	deletion	UNP Q03431
C	?	-	ARG	deletion	UNP Q03431
E	28	GLY	-	expression tag	UNP Q03431
E	?	-	SER	deletion	UNP Q03431
E	?	-	ILE	deletion	UNP Q03431
E	?	-	MET	deletion	UNP Q03431
E	?	-	GLU	deletion	UNP Q03431
E	?	-	SER	deletion	UNP Q03431
E	?	-	ASP	deletion	UNP Q03431
E	?	-	LYS	deletion	UNP Q03431
E	?	-	GLY	deletion	UNP Q03431
E	?	-	TRP	deletion	UNP Q03431
E	?	-	THR	deletion	UNP Q03431
E	?	-	SER	deletion	UNP Q03431
E	?	-	ALA	deletion	UNP Q03431
E	?	-	SER	deletion	UNP Q03431
E	?	-	THR	deletion	UNP Q03431
E	?	-	SER	deletion	UNP Q03431

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Chain	Residue	Modelled	Actual	Comment	Reference
E	?	-	GLY	deletion	UNP Q03431
E	?	-	LYS	deletion	UNP Q03431
E	?	-	PRO	deletion	UNP Q03431
E	?	-	ARG	deletion	UNP Q03431
E	?	-	LYS	deletion	UNP Q03431
E	?	-	ASP	deletion	UNP Q03431
E	?	-	LYS	deletion	UNP Q03431
E	?	-	ALA	deletion	UNP Q03431
E	?	-	SER	deletion	UNP Q03431
E	?	-	GLY	deletion	UNP Q03431
E	?	-	LYS	deletion	UNP Q03431
E	?	-	LEU	deletion	UNP Q03431
E	?	-	TYR	deletion	UNP Q03431
E	?	-	PRO	deletion	UNP Q03431
E	?	-	GLU	deletion	UNP Q03431
E	?	-	SER	deletion	UNP Q03431
E	?	-	GLU	deletion	UNP Q03431
E	?	-	GLU	deletion	UNP Q03431
E	?	-	ASP	deletion	UNP Q03431
E	?	-	LYS	deletion	UNP Q03431
E	?	-	GLU	deletion	UNP Q03431
E	?	-	ALA	deletion	UNP Q03431
E	?	-	PRO	deletion	UNP Q03431
E	?	-	THR	deletion	UNP Q03431
E	?	-	GLY	deletion	UNP Q03431
E	?	-	SER	deletion	UNP Q03431
E	?	-	ARG	deletion	UNP Q03431
E	?	-	TYR	deletion	UNP Q03431
E	?	-	ARG	deletion	UNP Q03431

- Molecule 2 is a protein called PTHrP[1-36] 24,28,31 XCP.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	22	Total	C	H	N	O	0	0	0
			362	123	172	37	30			
2	D	22	Total	C	H	N	O	0	0	0
			356	119	169	38	30			
2	F	21	Total	C	H	N	O	0	0	0
			351	116	169	37	29			

- Molecule 3 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



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

- Molecule 4 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	1	Total	Zn	0	0
			1	1		

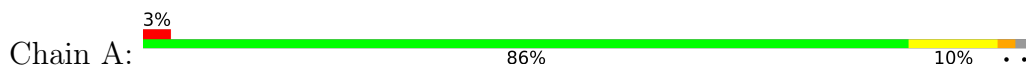
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	42	Total	O	0	1
			43	43		
5	B	7	Total	O	0	0
			7	7		
5	C	45	Total	O	0	0
			45	45		
5	D	7	Total	O	0	0
			7	7		
5	E	39	Total	O	0	0
			39	39		
5	F	5	Total	O	0	0
			5	5		

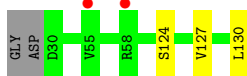
3 Residue-property plots [i](#)

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.

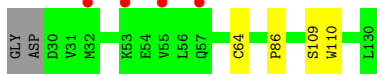
- Molecule 1: Parathyroid hormone/parathyroid hormone-related peptide receptor



- Molecule 1: Parathyroid hormone/parathyroid hormone-related peptide receptor



- Molecule 1: Parathyroid hormone/parathyroid hormone-related peptide receptor



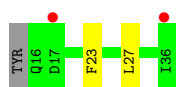
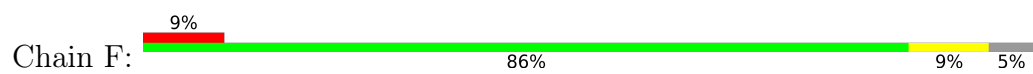
- Molecule 2: PTHrP[1-36] 24,28,31 XCP



- Molecule 2: PTHrP[1-36] 24,28,31 XCP



- Molecule 2: PTHrP[1-36] 24,28,31 XCP



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	101.65Å 58.95Å 77.92Å 90.00° 117.57° 90.00°	Depositor
Resolution (Å)	34.54 – 2.29 34.54 – 2.29	Depositor EDS
% Data completeness (in resolution range)	99.8 (34.54-2.29) 99.9 (34.54-2.29)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.47 (at 2.29Å)	Xtrriage
Refinement program	PHENIX 1.20.1-4487	Depositor
R, R_{free}	0.209 , 0.243 0.211 , 0.243	Depositor DCC
R_{free} test set	960 reflections (5.19%)	wwPDB-VP
Wilson B-factor (Å ²)	41.1	Xtrriage
Anisotropy	0.053	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 46.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.35$	Xtrriage
Estimated twinning fraction	0.207 for $1/2^*h+3/2^*k, 1/2^*h-1/2^*k, -1/2^*h-1/2^*k-l$ 0.139 for $1/2^*h-3/2^*k, -1/2^*h-1/2^*k, -1/2^*h+1/2^*k-l$	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	5969	wwPDB-VP
Average B, all atoms (Å ²)	60.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.48% 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: ZN, XCP, 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	0.25	0/840	0.51	0/1145
1	C	0.24	0/843	0.50	0/1149
1	E	0.24	0/849	0.49	0/1154
2	B	0.22	0/168	0.59	0/220
2	D	0.25	0/164	0.60	0/214
2	F	0.22	0/159	0.57	0/207
All	All	0.24	0/3023	0.51	0/4089

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	3
2	D	0	3
2	F	0	2
All	All	0	8

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (8) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	23	PHE	Peptide
2	B	27	LEU	Peptide
2	B	30	GLU	Peptide
2	D	23	PHE	Peptide

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Mol	Chain	Res	Type	Group
2	D	27	LEU	Peptide
2	D	30	GLU	Peptide
2	F	23	PHE	Peptide
2	F	27	LEU	Peptide

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	813	750	752	8	0
1	C	816	754	756	3	0
1	E	822	778	778	1	0
2	B	190	172	169	3	0
2	D	187	169	168	2	0
2	F	182	169	166	0	0
3	A	4	6	6	0	0
3	F	4	6	6	0	0
4	B	1	0	0	0	0
5	A	43	0	0	1	0
5	B	7	0	0	0	0
5	C	45	0	0	0	0
5	D	7	0	0	0	0
5	E	39	0	0	0	0
5	F	5	0	0	0	0
All	All	3165	2804	2801	15	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 3.

All (15) 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:A:32:MET:HE3	1:A:92:TYR:HB2	1.83	0.60
1:A:89:ASP:HA	1:A:96:HIS:CD2	2.37	0.58
1:A:130:LEU:O	5:A:301:HOH:O	2.18	0.55
1:C:127:VAL:HG23	1:C:130:LEU:H	1.74	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:17:ASP:OD2	2:B:20:ARG:NH2	2.45	0.49
1:A:71:ILE:HD12	2:B:31:XCP:HE	1.94	0.48
1:C:124:SER:O	1:C:130:LEU:HD22	2.14	0.48
1:C:127:VAL:HG23	1:C:130:LEU:N	2.30	0.47
1:A:30:ASP:N	1:A:30:ASP:OD2	2.50	0.45
2:D:16:GLN:OE1	2:D:19:ARG:HB2	2.16	0.45
2:D:17:ASP:N	2:D:17:ASP:OD2	2.52	0.42
1:A:31:VAL:HG22	2:B:20:ARG:NH2	2.35	0.42
1:A:128:LYS:N	1:A:128:LYS:HE2	2.36	0.41
1:A:95:ASN:HB2	1:A:128:LYS:NZ	2.36	0.41
1:E:64:CYS:HB3	1:E:110:TRP:CE2	2.56	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	99/103 (96%)	96 (97%)	3 (3%)	0	100	100
1	C	99/103 (96%)	97 (98%)	2 (2%)	0	100	100
1	E	99/103 (96%)	98 (99%)	1 (1%)	0	100	100
2	B	17/22 (77%)	17 (100%)	0	0	100	100
2	D	17/22 (77%)	16 (94%)	1 (6%)	0	100	100
2	F	16/22 (73%)	16 (100%)	0	0	100	100
All	All	347/375 (92%)	340 (98%)	7 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	84/89 (94%)	80 (95%)	4 (5%)	25	36
1	C	84/89 (94%)	84 (100%)	0	100	100
1	E	86/89 (97%)	84 (98%)	2 (2%)	50	67
2	B	15/17 (88%)	15 (100%)	0	100	100
2	D	15/17 (88%)	14 (93%)	1 (7%)	16	21
2	F	15/17 (88%)	15 (100%)	0	100	100
All	All	299/318 (94%)	292 (98%)	7 (2%)	50	67

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	30	ASP
1	A	31	VAL
1	A	49	GLU
1	A	51	ARG
2	D	17	ASP
1	E	86	PRO
1	E	109	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

9 non-standard protein/DNA/RNA residues 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
2	XCP	D	31	2	8,8,9	0.26	0	4,10,12	0.65	0
2	XCP	B	24	2	8,8,9	0.32	0	4,10,12	1.02	0
2	XCP	B	28	2	8,8,9	0.32	0	4,10,12	0.75	0
2	XCP	D	24	2	8,8,9	0.32	0	4,10,12	0.96	0
2	XCP	F	31	2	8,8,9	0.28	0	4,10,12	0.64	0
2	XCP	F	28	2	8,8,9	0.33	0	4,10,12	0.80	0
2	XCP	D	28	2	8,8,9	0.35	0	4,10,12	0.78	0
2	XCP	B	31	2	8,8,9	0.25	0	4,10,12	0.66	0
2	XCP	F	24	2	8,8,9	0.32	0	4,10,12	1.00	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
2	XCP	D	31	2	-	1/1/12/14	0/1/1/1
2	XCP	B	24	2	-	1/1/12/14	0/1/1/1
2	XCP	B	28	2	-	1/1/12/14	0/1/1/1
2	XCP	D	24	2	-	1/1/12/14	0/1/1/1
2	XCP	F	31	2	-	1/1/12/14	0/1/1/1
2	XCP	F	28	2	-	1/1/12/14	0/1/1/1
2	XCP	D	28	2	-	1/1/12/14	0/1/1/1
2	XCP	B	31	2	-	1/1/12/14	0/1/1/1
2	XCP	F	24	2	-	1/1/12/14	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	F	28	XCP	O-C-CA-CB
2	B	28	XCP	O-C-CA-CB
2	D	28	XCP	O-C-CA-CB

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Mol	Chain	Res	Type	Atoms
2	B	31	XCP	O-C-CA-CB
2	D	31	XCP	O-C-CA-CB
2	F	31	XCP	O-C-CA-CB
2	F	24	XCP	O-C-CA-CB
2	B	24	XCP	O-C-CA-CB
2	D	24	XCP	O-C-CA-CB

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	31	XCP	1	0

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 1 is monoatomic - leaving 2 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	$\# Z > 2$
3	EDO	F	101	-	3,3,3	0.48	0	2,2,2	0.30	0
3	EDO	A	201	-	3,3,3	0.47	0	2,2,2	0.28	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
3	EDO	F	101	-	-	0/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	EDO	A	201	-	-	0/1/1/1	-

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	101/103 (98%)	0.14	3 (2%) 50 57	32, 51, 95, 105	0
1	C	101/103 (98%)	-0.00	2 (1%) 65 71	32, 48, 101, 124	0
1	E	101/103 (98%)	0.06	4 (3%) 38 45	31, 48, 102, 117	0
2	B	19/22 (86%)	0.39	0 100 100	37, 46, 79, 99	0
2	D	19/22 (86%)	1.00	2 (10%) 6 8	36, 46, 98, 99	0
2	F	18/22 (81%)	0.64	2 (11%) 5 7	35, 43, 99, 100	0
All	All	359/375 (95%)	0.16	13 (3%) 42 49	31, 49, 100, 124	0

All (13) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	15	TYR	4.3
2	F	17	ASP	3.1
1	E	57	GLN	3.0
1	A	31	VAL	2.8
1	C	55	VAL	2.7
1	A	55	VAL	2.6
2	F	36	ILE	2.5
2	D	18	LEU	2.4
1	C	58	ARG	2.3
1	E	55	VAL	2.2
1	E	53	LYS	2.2
1	A	32	MET	2.2
1	E	32	MET	2.1

6.2 Non-standard residues in protein, DNA, RNA chains [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
2	XCP	B	24	8/9	0.96	0.14	36,45,54,55	0
2	XCP	D	24	8/9	0.96	0.17	32,44,52,57	0
2	XCP	F	24	8/9	0.96	0.13	35,42,50,50	0
2	XCP	D	28	8/9	0.96	0.19	30,40,51,51	0
2	XCP	D	31	8/9	0.96	0.10	30,36,42,43	0
2	XCP	F	28	8/9	0.97	0.14	29,37,48,48	0
2	XCP	B	31	8/9	0.97	0.12	31,40,51,51	0
2	XCP	B	28	8/9	0.97	0.14	31,40,51,51	0
2	XCP	F	31	8/9	0.97	0.10	31,35,42,42	0

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
3	EDO	A	201	4/4	0.72	0.24	51,61,67,70	0
3	EDO	F	101	4/4	0.74	0.19	63,77,82,83	0
4	ZN	B	101	1/1	0.99	0.27	47,47,47,47	0

6.5 Other polymers [i](#)

There are no such residues in this entry.