



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 01:23 PM UTC

PDB ID : 4PNN / pdb_00004pnn
Title : Crystal Structure of human Tankyrase 2 in complex with 4HQN.
Authors : Qiu, W.; Lam, R.; Romanov, V.; Gordon, R.; Gebremeskel, S.; Vodsedalek, J.; Thompson, C.; Beletskaya, I.; Battaile, K.P.; Pai, E.F.; Chirgadze, N.Y.
Deposited on : 2014-05-24
Resolution : 1.65 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 : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

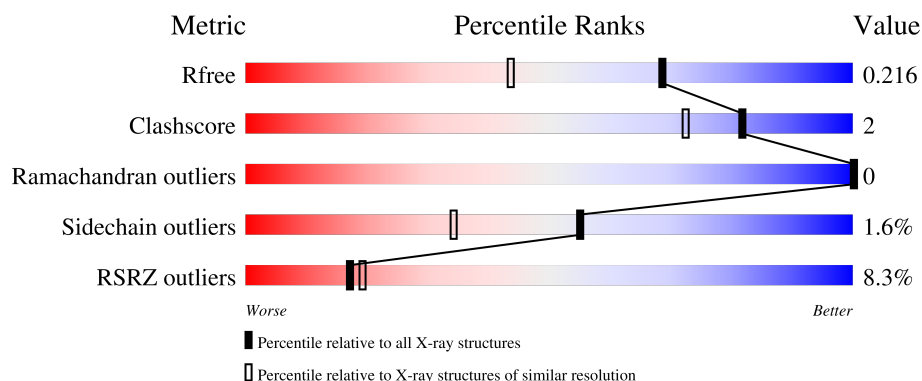
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.65 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}	180053	2563 (1.66-1.66)
Clashscore	190562	2662 (1.66-1.66)
Ramachandran outliers	187476	2621 (1.66-1.66)
Sidechain outliers	187428	2621 (1.66-1.66)
RSRZ outliers	180081	2564 (1.66-1.66)

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	227	 6% 82% 6% 12%
1	B	227	 8% 81% 8% 10%
1	C	227	 7% 85% 7% 8%
1	D	227	 9% 77% 7% 15%

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
3	JPZ	C	1201	-	X	-	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 7534 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 Tankyrase-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	199	Total	C	N	O	S	0	1	0
			1611	1016	297	286	12			
1	B	205	Total	C	N	O	S	0	0	0
			1649	1038	304	296	11			
1	C	208	Total	C	N	O	S	0	0	0
			1678	1058	308	301	11			
1	D	194	Total	C	N	O	S	0	1	0
			1570	991	290	277	12			

There are 84 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	938	MET	-	initiating methionine	UNP Q9H2K2
A	939	GLY	-	expression tag	UNP Q9H2K2
A	940	SER	-	expression tag	UNP Q9H2K2
A	941	SER	-	expression tag	UNP Q9H2K2
A	942	HIS	-	expression tag	UNP Q9H2K2
A	943	HIS	-	expression tag	UNP Q9H2K2
A	944	HIS	-	expression tag	UNP Q9H2K2
A	945	HIS	-	expression tag	UNP Q9H2K2
A	946	HIS	-	expression tag	UNP Q9H2K2
A	947	HIS	-	expression tag	UNP Q9H2K2
A	948	SER	-	expression tag	UNP Q9H2K2
A	949	SER	-	expression tag	UNP Q9H2K2
A	950	GLY	-	expression tag	UNP Q9H2K2
A	951	ARG	-	expression tag	UNP Q9H2K2
A	952	GLU	-	expression tag	UNP Q9H2K2
A	953	ASN	-	expression tag	UNP Q9H2K2
A	954	LEU	-	expression tag	UNP Q9H2K2
A	955	TYR	-	expression tag	UNP Q9H2K2
A	956	PHE	-	expression tag	UNP Q9H2K2
A	957	GLN	-	expression tag	UNP Q9H2K2
A	958	GLY	-	expression tag	UNP Q9H2K2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	938	MET	-	initiating methionine	UNP Q9H2K2
B	939	GLY	-	expression tag	UNP Q9H2K2
B	940	SER	-	expression tag	UNP Q9H2K2
B	941	SER	-	expression tag	UNP Q9H2K2
B	942	HIS	-	expression tag	UNP Q9H2K2
B	943	HIS	-	expression tag	UNP Q9H2K2
B	944	HIS	-	expression tag	UNP Q9H2K2
B	945	HIS	-	expression tag	UNP Q9H2K2
B	946	HIS	-	expression tag	UNP Q9H2K2
B	947	HIS	-	expression tag	UNP Q9H2K2
B	948	SER	-	expression tag	UNP Q9H2K2
B	949	SER	-	expression tag	UNP Q9H2K2
B	950	GLY	-	expression tag	UNP Q9H2K2
B	951	ARG	-	expression tag	UNP Q9H2K2
B	952	GLU	-	expression tag	UNP Q9H2K2
B	953	ASN	-	expression tag	UNP Q9H2K2
B	954	LEU	-	expression tag	UNP Q9H2K2
B	955	TYR	-	expression tag	UNP Q9H2K2
B	956	PHE	-	expression tag	UNP Q9H2K2
B	957	GLN	-	expression tag	UNP Q9H2K2
B	958	GLY	-	expression tag	UNP Q9H2K2
C	938	MET	-	initiating methionine	UNP Q9H2K2
C	939	GLY	-	expression tag	UNP Q9H2K2
C	940	SER	-	expression tag	UNP Q9H2K2
C	941	SER	-	expression tag	UNP Q9H2K2
C	942	HIS	-	expression tag	UNP Q9H2K2
C	943	HIS	-	expression tag	UNP Q9H2K2
C	944	HIS	-	expression tag	UNP Q9H2K2
C	945	HIS	-	expression tag	UNP Q9H2K2
C	946	HIS	-	expression tag	UNP Q9H2K2
C	947	HIS	-	expression tag	UNP Q9H2K2
C	948	SER	-	expression tag	UNP Q9H2K2
C	949	SER	-	expression tag	UNP Q9H2K2
C	950	GLY	-	expression tag	UNP Q9H2K2
C	951	ARG	-	expression tag	UNP Q9H2K2
C	952	GLU	-	expression tag	UNP Q9H2K2
C	953	ASN	-	expression tag	UNP Q9H2K2
C	954	LEU	-	expression tag	UNP Q9H2K2
C	955	TYR	-	expression tag	UNP Q9H2K2
C	956	PHE	-	expression tag	UNP Q9H2K2
C	957	GLN	-	expression tag	UNP Q9H2K2
C	958	GLY	-	expression tag	UNP Q9H2K2

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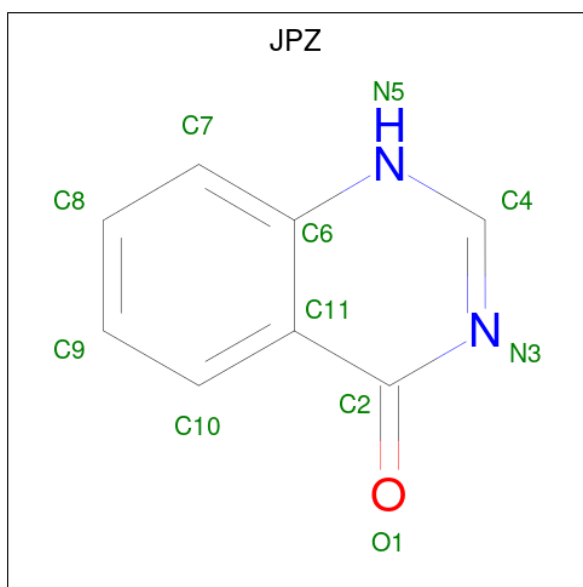
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Chain	Residue	Modelled	Actual	Comment	Reference
D	938	MET	-	initiating methionine	UNP Q9H2K2
D	939	GLY	-	expression tag	UNP Q9H2K2
D	940	SER	-	expression tag	UNP Q9H2K2
D	941	SER	-	expression tag	UNP Q9H2K2
D	942	HIS	-	expression tag	UNP Q9H2K2
D	943	HIS	-	expression tag	UNP Q9H2K2
D	944	HIS	-	expression tag	UNP Q9H2K2
D	945	HIS	-	expression tag	UNP Q9H2K2
D	946	HIS	-	expression tag	UNP Q9H2K2
D	947	HIS	-	expression tag	UNP Q9H2K2
D	948	SER	-	expression tag	UNP Q9H2K2
D	949	SER	-	expression tag	UNP Q9H2K2
D	950	GLY	-	expression tag	UNP Q9H2K2
D	951	ARG	-	expression tag	UNP Q9H2K2
D	952	GLU	-	expression tag	UNP Q9H2K2
D	953	ASN	-	expression tag	UNP Q9H2K2
D	954	LEU	-	expression tag	UNP Q9H2K2
D	955	TYR	-	expression tag	UNP Q9H2K2
D	956	PHE	-	expression tag	UNP Q9H2K2
D	957	GLN	-	expression tag	UNP Q9H2K2
D	958	GLY	-	expression tag	UNP Q9H2K2

- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Zn 1 1	0	0
2	B	1	Total Zn 1 1	0	0
2	C	1	Total Zn 1 1	0	0
2	D	1	Total Zn 1 1	0	0

- Molecule 3 is quinazolin-4(1H)-one (CCD ID: JPZ) (formula: C₈H₆N₂O).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			11	8	2	1		
3	B	1	Total	C	N	O	0	0
			11	8	2	1		
3	C	1	Total	C	N	O	0	0
			11	8	2	1		

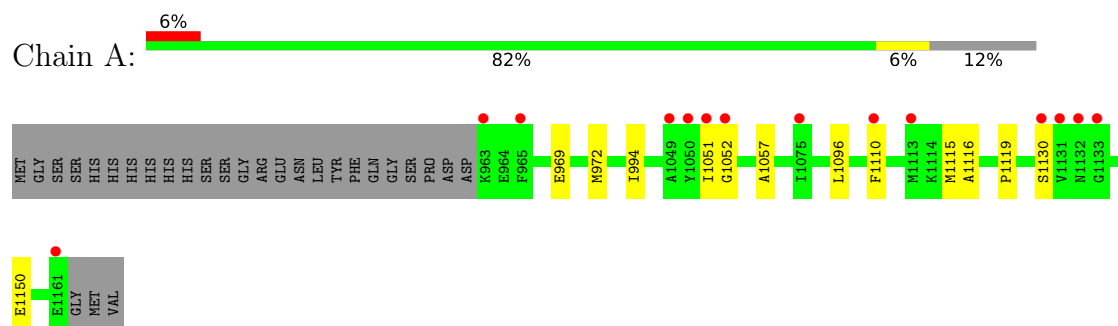
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	244	Total	O	0	0
			244	244		
4	B	255	Total	O	0	0
			255	255		
4	C	278	Total	O	0	0
			278	278		
4	D	212	Total	O	0	0
			212	212		

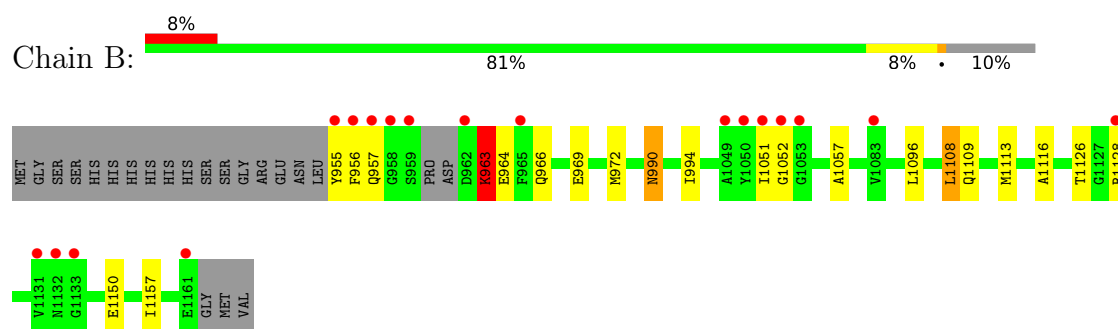
3 Residue-property plots [i](#)

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.

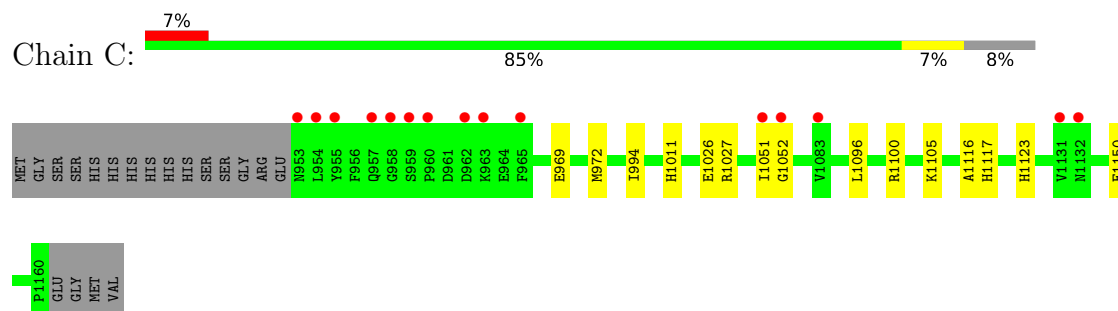
• Molecule 1: Tankyrase-2



• Molecule 1: Tankyrase-2

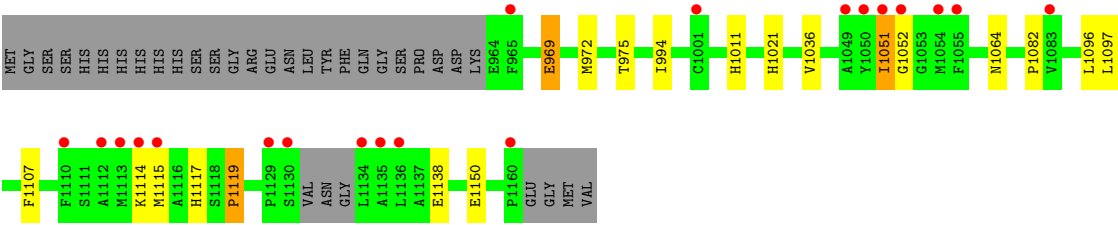


• Molecule 1: Tankyrase-2



• Molecule 1: Tankyrase-2





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	74.17Å 79.62Å 153.18Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	76.59 – 1.65 76.59 – 1.65	Depositor EDS
% Data completeness (in resolution range)	96.5 (76.59-1.65) 96.5 (76.59-1.65)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.89 (at 1.65Å)	Xtriage
Refinement program	BUSTER-TNT BUSTER 2.10.0, BUSTER 2.10.0	Depositor
R, R_{free}	0.186 , 0.220 0.186 , 0.216	Depositor DCC
R_{free} test set	1070 reflections (1.01%)	wwPDB-VP
Wilson B-factor (Å ²)	18.6	Xtriage
Anisotropy	0.466	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 53.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	7534	wwPDB-VP
Average B, all atoms (Å ²)	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 14.50% 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

5.1 Standard geometry

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

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	0.80	0/1657	1.09	4/2226 (0.2%)
1	B	0.84	0/1692	1.13	8/2272 (0.4%)
1	C	0.79	0/1724	1.11	4/2319 (0.2%)
1	D	0.81	1/1615 (0.1%)	1.12	3/2169 (0.1%)
All	All	0.81	1/6688 (0.0%)	1.11	19/8986 (0.2%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	1119	PRO	CA-C	5.34	1.54	1.51

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	956	PHE	N-CA-C	8.59	120.57	111.03
1	D	1052	GLY	N-CA-C	6.90	122.28	113.24
1	D	969	GLU	CB-CG-CD	6.73	124.03	112.60
1	B	990	ASN	CA-CB-CG	6.44	119.04	112.60
1	A	1116	ALA	N-CA-C	-6.43	105.56	113.41
1	C	969	GLU	CB-CG-CD	6.34	123.39	112.60
1	B	969	GLU	CB-CG-CD	6.28	123.28	112.60
1	B	1116	ALA	N-CA-C	-6.24	105.33	113.12
1	A	969	GLU	CB-CG-CD	6.17	123.09	112.60
1	B	963	LYS	N-CA-C	6.10	117.73	111.14
1	D	1150	GLU	N-CA-C	6.08	117.99	111.36
1	C	1116	ALA	N-CA-C	-5.99	106.10	113.41
1	A	1150	GLU	N-CA-C	5.89	117.78	111.36
1	C	1052	GLY	N-CA-C	5.62	120.60	113.24
1	B	1052	GLY	N-CA-C	5.53	120.48	113.24
1	C	1150	GLU	N-CA-C	5.46	117.31	111.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1052	GLY	N-CA-C	5.45	120.37	113.24
1	B	1150	GLU	N-CA-C	5.24	117.08	111.36
1	B	1157	ILE	N-CA-C	-5.08	102.53	109.55

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	1611	0	1552	5	0
1	B	1649	0	1573	9	0
1	C	1678	0	1603	8	0
1	D	1570	0	1502	13	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
3	A	11	0	6	0	0
3	B	11	0	6	0	0
3	C	11	0	6	0	0
4	A	244	0	0	0	0
4	B	255	0	0	1	0
4	C	278	0	0	2	0
4	D	212	0	0	4	0
All	All	7534	0	6248	32	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.

All (32) 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:C:1105:LYS:H	1:C:1123:HIS:HD2	1.21	0.86
1:C:1011:HIS:HE1	4:C:1353:HOH:O	1.84	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1057:ALA:O	1:D:1117:HIS:HE1	1.85	0.60
1:D:969:GLU:HG3	1:D:994:ILE:HD12	1.86	0.57
1:A:1057:ALA:O	1:C:1117:HIS:HE1	1.86	0.57
1:D:1117:HIS:HD2	4:D:1466:HOH:O	1.88	0.56
1:A:1115[A]:MET:SD	1:A:1119:PRO:HG3	2.45	0.56
1:C:972:MET:HG2	1:C:994:ILE:HD11	1.89	0.55
1:B:963:LYS:HG3	1:B:964:GLU:N	2.23	0.54
1:A:972:MET:HG2	1:A:994:ILE:HD11	1.89	0.53
1:C:1117:HIS:HD2	4:C:1493:HOH:O	1.91	0.52
1:A:972:MET:HE1	1:A:1096:LEU:HD12	1.94	0.50
1:B:972:MET:HG2	1:B:994:ILE:HD11	1.94	0.48
1:D:972:MET:HE1	1:D:1096:LEU:HD12	1.96	0.47
1:D:1107:PHE:CG	1:D:1119:PRO:HG2	2.49	0.47
1:B:955:TYR:N	4:B:1301:HOH:O	2.47	0.46
1:C:972:MET:HE1	1:C:1096:LEU:HD12	1.98	0.46
1:D:1036:VAL:HG13	1:D:1097:LEU:HD21	1.97	0.46
1:B:963:LYS:HA	1:B:966:GLN:HG2	1.97	0.46
1:D:1011:HIS:HE1	4:D:1473:HOH:O	1.99	0.45
1:B:972:MET:HE1	1:B:1096:LEU:HD12	1.97	0.45
1:C:1027:ARG:HD2	1:D:1021:HIS:CE1	2.52	0.45
1:D:1051:ILE:H	1:D:1051:ILE:HG13	1.58	0.44
1:D:1115[B]:MET:SD	1:D:1119:PRO:HG3	2.57	0.44
1:B:1108:LEU:HD12	1:B:1126:THR:HB	2.00	0.43
1:B:1109:GLN:HG3	1:B:1113:MET:CE	2.49	0.43
1:B:1109:GLN:HG3	1:B:1113:MET:HE2	2.01	0.43
1:D:1011:HIS:HD2	4:D:1301:HOH:O	2.02	0.43
1:C:1026:GLU:CD	1:C:1100:ARG:HG2	2.45	0.42
1:D:1082:PRO:HD2	4:D:1468:HOH:O	2.19	0.42
1:A:1110:PHE:HD2	1:A:1130:SER:HB3	1.87	0.40
1:D:975:THR:HB	1:D:1064:ASN:HA	2.02	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	198/227 (87%)	193 (98%)	5 (2%)	0	100	100
1	B	201/227 (88%)	195 (97%)	6 (3%)	0	100	100
1	C	206/227 (91%)	203 (98%)	3 (2%)	0	100	100
1	D	191/227 (84%)	185 (97%)	6 (3%)	0	100	100
All	All	796/908 (88%)	776 (98%)	20 (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	169/192 (88%)	168 (99%)	1 (1%)	78	68
1	B	172/192 (90%)	166 (96%)	6 (4%)	32	10
1	C	176/192 (92%)	175 (99%)	1 (1%)	78	68
1	D	163/192 (85%)	160 (98%)	3 (2%)	51	30
All	All	680/768 (88%)	669 (98%)	11 (2%)	55	34

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1051	ILE
1	B	957	GLN
1	B	963	LYS
1	B	990	ASN
1	B	1051	ILE
1	B	1108	LEU
1	B	1128	ARG
1	C	1051	ILE
1	D	1051	ILE
1	D	1114	LYS

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Mol	Chain	Res	Type
1	D	1138	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (30) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	998	GLN
1	A	1022	ASN
1	A	1037	ASN
1	A	1064	ASN
1	A	1095	GLN
1	B	957	GLN
1	B	966	GLN
1	B	984	HIS
1	B	990	ASN
1	B	998	GLN
1	B	1109	GLN
1	C	953	ASN
1	C	984	HIS
1	C	990	ASN
1	C	1011	HIS
1	C	1037	ASN
1	C	1048	HIS
1	C	1064	ASN
1	C	1095	GLN
1	C	1117	HIS
1	C	1123	HIS
1	C	1132	ASN
1	D	990	ASN
1	D	998	GLN
1	D	1011	HIS
1	D	1021	HIS
1	D	1064	ASN
1	D	1095	GLN
1	D	1109	GLN
1	D	1117	HIS

5.3.3 RNA ⓘ

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 7 ligands modelled in this entry, 4 are monoatomic - leaving 3 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	JPZ	B	1202	-	12,12,12	3.39	6 (50%)	16,16,16	2.23	5 (31%)
3	JPZ	C	1201	-	12,12,12	3.02	6 (50%)	16,16,16	2.22	6 (37%)
3	JPZ	A	1202	-	12,12,12	3.30	7 (58%)	16,16,16	2.17	4 (25%)

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	JPZ	B	1202	-	-	-	0/2/2/2
3	JPZ	C	1201	-	-	-	0/2/2/2
3	JPZ	A	1202	-	-	-	0/2/2/2

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	1202	JPZ	C4-N3	6.75	1.42	1.30
3	A	1202	JPZ	C4-N3	6.35	1.41	1.30
3	C	1201	JPZ	C4-N3	6.27	1.41	1.30
3	B	1202	JPZ	O1-C2	6.15	1.33	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1202	JPZ	O1-C2	5.25	1.32	1.23
3	A	1202	JPZ	C8-C9	4.71	1.48	1.38
3	C	1201	JPZ	O1-C2	4.56	1.31	1.23
3	A	1202	JPZ	C7-C6	4.48	1.47	1.39
3	B	1202	JPZ	C8-C9	4.28	1.47	1.38
3	C	1201	JPZ	C8-C9	3.75	1.46	1.38
3	B	1202	JPZ	C7-C6	3.72	1.45	1.39
3	C	1201	JPZ	C7-C6	3.65	1.45	1.39
3	B	1202	JPZ	C10-C11	3.23	1.44	1.39
3	C	1201	JPZ	C11-C6	2.70	1.45	1.41
3	A	1202	JPZ	C11-C6	2.49	1.45	1.41
3	A	1202	JPZ	C10-C11	2.30	1.43	1.39
3	B	1202	JPZ	C2-N3	-2.12	1.34	1.38
3	C	1201	JPZ	C2-N3	-2.04	1.34	1.38
3	A	1202	JPZ	C2-N3	-2.01	1.34	1.38

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	1202	JPZ	C6-N5-C4	-5.48	116.57	122.85
3	C	1201	JPZ	C6-N5-C4	-5.27	116.81	122.85
3	C	1201	JPZ	C6-C11-C2	-4.90	114.82	120.11
3	A	1202	JPZ	C6-C11-C2	-4.86	114.86	120.11
3	A	1202	JPZ	C6-N5-C4	-4.74	117.42	122.85
3	B	1202	JPZ	C6-C11-C2	-4.57	115.18	120.11
3	A	1202	JPZ	C11-C2-N3	3.18	124.17	118.32
3	B	1202	JPZ	C11-C2-N3	2.95	123.75	118.32
3	C	1201	JPZ	C11-C2-N3	2.85	123.58	118.32
3	B	1202	JPZ	C11-C6-N5	2.73	121.73	119.05
3	B	1202	JPZ	O1-C2-C11	-2.45	117.38	121.33
3	A	1202	JPZ	O1-C2-C11	-2.33	117.58	121.33
3	C	1201	JPZ	O1-C2-C11	-2.20	117.79	121.33
3	C	1201	JPZ	C11-C6-N5	2.08	121.10	119.05
3	C	1201	JPZ	C10-C11-C2	2.04	125.22	121.19

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

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	199/227 (87%)	0.20	14 (7%)	22 25	14, 24, 50, 78	1 (0%)
1	B	205/227 (90%)	0.25	18 (8%)	15 17	14, 23, 50, 81	0
1	C	208/227 (91%)	0.12	15 (7%)	21 24	14, 22, 45, 62	0
1	D	194/227 (85%)	0.48	20 (10%)	12 12	16, 27, 54, 74	1 (0%)
All	All	806/908 (88%)	0.26	67 (8%)	17 19	14, 24, 50, 81	2 (0%)

All (67) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	1051	ILE	5.7
1	B	956	PHE	5.5
1	B	1131	VAL	5.4
1	D	1134	LEU	5.3
1	D	1130	SER	5.2
1	A	1050	TYR	5.1
1	D	1113	MET	5.0
1	A	1131	VAL	5.0
1	B	955	TYR	4.9
1	B	965	PHE	4.3
1	B	962	ASP	4.3
1	B	959	SER	4.2
1	C	1052	GLY	4.1
1	C	955	TYR	3.9
1	D	1054	MET	3.8
1	B	1049	ALA	3.8
1	D	1050	TYR	3.8
1	D	1129	PRO	3.7
1	A	1049	ALA	3.6
1	B	1051	ILE	3.6
1	B	1050	TYR	3.6

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Mol	Chain	Res	Type	RSRZ
1	A	1052	GLY	3.5
1	D	1110	PHE	3.3
1	A	1132	ASN	3.2
1	C	957	GLN	3.2
1	B	1052	GLY	3.2
1	D	1114	LYS	3.1
1	A	1051	ILE	3.0
1	C	960	PRO	3.0
1	C	1132	ASN	3.0
1	C	954	LEU	2.9
1	C	965	PHE	2.9
1	A	1161	GLU	2.9
1	D	1136	LEU	2.9
1	B	1132	ASN	2.9
1	C	958	GLY	2.8
1	C	953	ASN	2.8
1	C	1083	VAL	2.8
1	D	965	PHE	2.8
1	B	1083	VAL	2.8
1	D	1112	ALA	2.7
1	A	963	LYS	2.7
1	C	962	ASP	2.7
1	B	1161	GLU	2.6
1	B	958	GLY	2.6
1	A	1110	PHE	2.6
1	D	1001	CYS	2.6
1	C	1051	ILE	2.6
1	B	957	GLN	2.6
1	A	1130	SER	2.6
1	D	1083	VAL	2.5
1	A	965	PHE	2.5
1	B	1128	ARG	2.5
1	D	1055	PHE	2.5
1	B	1053	GLY	2.4
1	B	1133	GLY	2.4
1	D	1052	GLY	2.4
1	D	1135	ALA	2.4
1	A	1113	MET	2.3
1	C	959	SER	2.3
1	A	1133	GLY	2.3
1	D	1115[A]	MET	2.3
1	C	1131	VAL	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	1049	ALA	2.1
1	D	1160	PRO	2.1
1	C	963	LYS	2.0
1	A	1075	ILE	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 oligosaccharides 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($\text{\AA}^2$)	Q<0.9
3	JPZ	A	1202	11/11	0.83	0.12	22,26,29,30	0
3	JPZ	B	1202	11/11	0.89	0.10	22,27,30,31	0
3	JPZ	C	1201	11/11	0.95	0.06	17,19,21,22	0
2	ZN	D	1200	1/1	0.99	0.03	34,34,34,34	0
2	ZN	A	1201	1/1	0.99	0.03	31,31,31,31	0
2	ZN	B	1201	1/1	0.99	0.02	28,28,28,28	0
2	ZN	C	1202	1/1	0.99	0.03	30,30,30,30	0

6.5 Other polymers [i](#)

There are no such residues in this entry.