



Full wwPDB X-ray Structure Validation Report ⓘ

Jul 19, 2017 – 05:51 PM EDT

PDB ID : 4OPX
Title : Structure of Human PARP-1 bound to a DNA double strand break in complex with (2R)-5-fluoro-2-methyl-2,3-dihydro-1-benzofuran-7-carboxamide
Authors : Pascal, J.M.; Steffen, J.D.
Deposited on : unknown
Resolution : 3.31 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

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7.2 (RC1), CSD as538be (2017)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20029824
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20029824

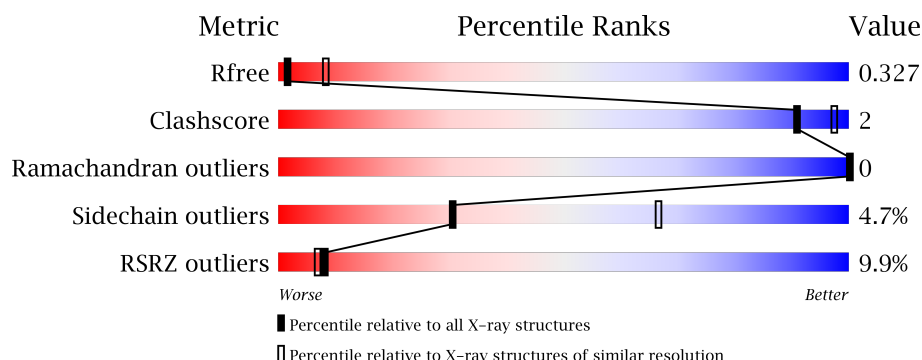
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.31 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}	100719	1002 (3.38-3.26)
Clashscore	112137	1066 (3.38-3.26)
Ramachandran outliers	110173	1048 (3.38-3.26)
Sidechain outliers	110143	1047 (3.38-3.26)
RSRZ outliers	101464	1007 (3.38-3.26)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	267	<div> <div>11%</div> <div>78% 5% 17%</div> </div>
1	D	267	<div> <div>11%</div> <div>77% 5% 17%</div> </div>
2	C	505	<div> <div>6%</div> <div>82% 9% 10%</div> </div>
2	F	505	<div> <div>15%</div> <div>82% 9% 10%</div> </div>
3	M	26	<div> <div>88% 12%</div> </div>

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
3	N	26	<div><div></div><div>96%</div><div>.</div></div>

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 11760 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 Poly [ADP-ribose] polymerase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	222	Total	C	N	O	S	0	1	0
			1755	1110	305	327	13			
1	D	222	Total	C	N	O	S	0	1	0
			1755	1110	305	327	13			

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	205	ASP	-	LINKER	UNP P09874
A	206	ILE	-	LINKER	UNP P09874
A	367	LEU	-	EXPRESSION TAG	UNP P09874
A	368	GLU	-	EXPRESSION TAG	UNP P09874
A	369	HIS	-	EXPRESSION TAG	UNP P09874
A	370	HIS	-	EXPRESSION TAG	UNP P09874
A	371	HIS	-	EXPRESSION TAG	UNP P09874
A	372	HIS	-	EXPRESSION TAG	UNP P09874
A	373	HIS	-	EXPRESSION TAG	UNP P09874
A	374	HIS	-	EXPRESSION TAG	UNP P09874
D	205	ASP	-	LINKER	UNP P09874
D	206	ILE	-	LINKER	UNP P09874
D	367	LEU	-	EXPRESSION TAG	UNP P09874
D	368	GLU	-	EXPRESSION TAG	UNP P09874
D	369	HIS	-	EXPRESSION TAG	UNP P09874
D	370	HIS	-	EXPRESSION TAG	UNP P09874
D	371	HIS	-	EXPRESSION TAG	UNP P09874
D	372	HIS	-	EXPRESSION TAG	UNP P09874
D	373	HIS	-	EXPRESSION TAG	UNP P09874
D	374	HIS	-	EXPRESSION TAG	UNP P09874

- Molecule 2 is a protein called Poly [ADP-ribose] polymerase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	456	Total 3586	C 2296	N 605	O 672	S 13	0	0	0
2	F	456	Total 3586	C 2296	N 605	O 672	S 13	0	0	0

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	1015	LEU	-	EXPRESSION TAG	UNP P09874
C	1016	GLU	-	EXPRESSION TAG	UNP P09874
C	1017	HIS	-	EXPRESSION TAG	UNP P09874
C	1018	HIS	-	EXPRESSION TAG	UNP P09874
C	1019	HIS	-	EXPRESSION TAG	UNP P09874
C	1020	HIS	-	EXPRESSION TAG	UNP P09874
C	1021	HIS	-	EXPRESSION TAG	UNP P09874
C	1022	HIS	-	EXPRESSION TAG	UNP P09874
F	1015	LEU	-	EXPRESSION TAG	UNP P09874
F	1016	GLU	-	EXPRESSION TAG	UNP P09874
F	1017	HIS	-	EXPRESSION TAG	UNP P09874
F	1018	HIS	-	EXPRESSION TAG	UNP P09874
F	1019	HIS	-	EXPRESSION TAG	UNP P09874
F	1020	HIS	-	EXPRESSION TAG	UNP P09874
F	1021	HIS	-	EXPRESSION TAG	UNP P09874
F	1022	HIS	-	EXPRESSION TAG	UNP P09874

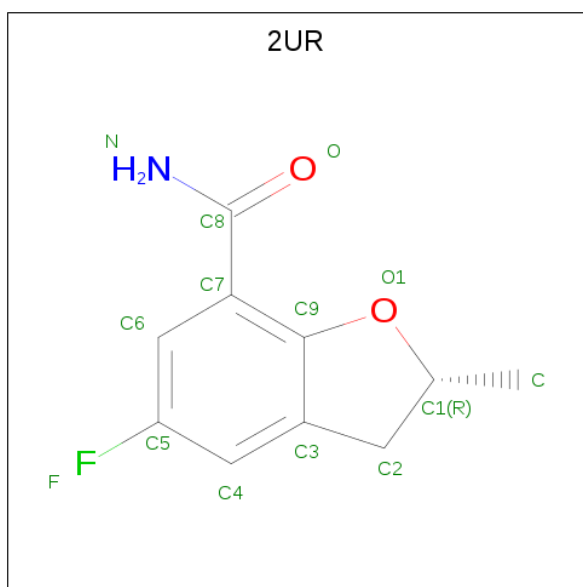
- Molecule 3 is a DNA chain called DNA (26-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	M	26	Total 530	C 251	N 100	O 154	P 25	0	0	0
3	N	26	Total 530	C 251	N 100	O 154	P 25	0	0	0

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

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total 2	Zn 2	0	0
4	D	2	Total 2	Zn 2	0	0

- Molecule 5 is (2R)-5-fluoro-2-methyl-2,3-dihydro-1-benzofuran-7-carboxamide (three-letter code: 2UR) (formula: C₁₀H₁₀FN₂O₂).

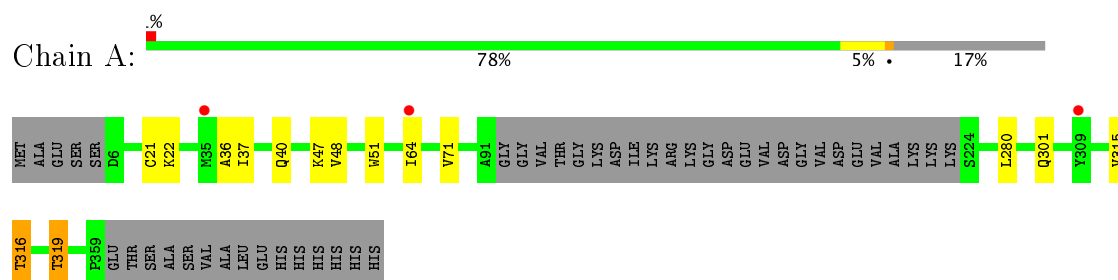


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	F	N	O		
5	C	1	14	10	1	1	2	0	0

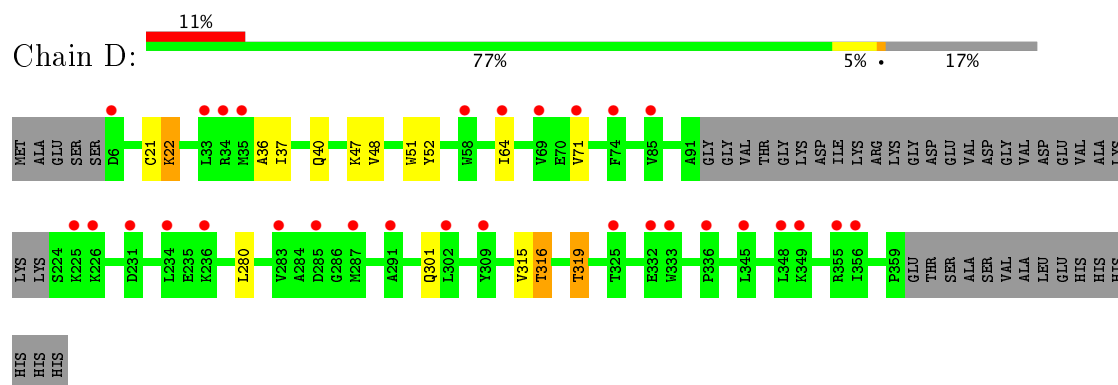
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

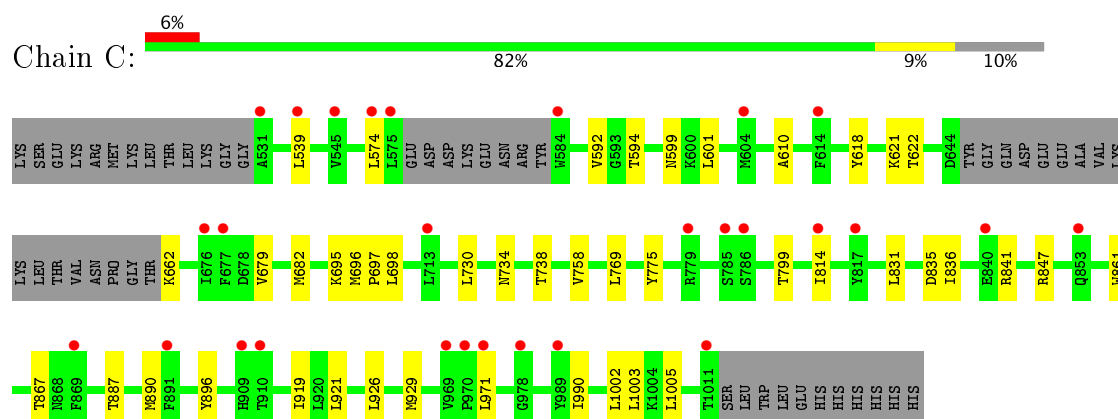
- Molecule 1: Poly [ADP-ribose] polymerase 1



- Molecule 1: Poly [ADP-ribose] polymerase 1



- Molecule 2: Poly [ADP-ribose] polymerase 1



- Molecule 2: Poly [ADP-ribose] polymerase 1



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	65.15Å 112.91Å 295.29Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 3.31 54.33 – 3.31	Depositor EDS
% Data completeness (in resolution range)	99.0 (20.00-3.31) 99.1 (54.33-3.31)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.34 (at 3.33Å)	Xtriage
Refinement program	REFMAC 5.7.0032	Depositor
R, R_{free}	0.303 , 0.325 0.299 , 0.327	Depositor DCC
R_{free} test set	1679 reflections (5.37%)	DCC
Wilson B-factor (Å ²)	131.9	Xtriage
Anisotropy	0.286	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.24 , 97.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	11760	wwPDB-VP
Average B, all atoms (Å ²)	205.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 16.02% 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: 2UR, ZN

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	0.26	0/1795	0.40	0/2416
1	D	0.26	0/1795	0.40	0/2416
2	C	0.26	0/3660	0.42	0/4940
2	F	0.26	0/3660	0.43	0/4940
3	M	0.27	0/594	0.80	0/915
3	N	0.24	0/594	0.78	2/915 (0.2%)
All	All	0.26	0/12098	0.47	2/16542 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
3	N	1	DG	C5'-C4'-O4'	5.34	119.44	109.30
3	N	1	DG	C5'-C4'-C3'	5.04	123.17	114.10

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	1755	0	1712	4	0
1	D	1755	0	1712	7	0
2	C	3586	0	3604	18	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	F	3586	0	3604	19	0
3	M	530	0	292	2	0
3	N	530	0	292	0	0
4	A	2	0	0	0	0
4	D	2	0	0	0	0
5	C	14	0	10	1	0
All	All	11760	0	11226	47	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 (47) 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:574:LEU:HD11	2:C:610:ALA:HB1	1.68	0.74
2:F:574:LEU:HD11	2:F:610:ALA:HB1	1.68	0.74
1:D:36:ALA:HB2	1:D:51:TRP:CE3	2.39	0.57
1:A:36:ALA:HB2	1:A:51:TRP:CE3	2.40	0.56
2:C:831:LEU:HD12	2:C:1005:LEU:HD23	1.89	0.54
2:F:831:LEU:HD12	2:F:1005:LEU:HD23	1.89	0.54
2:C:679:VAL:HG11	2:C:775:TYR:CZ	2.44	0.53
2:F:679:VAL:HG11	2:F:775:TYR:CZ	2.44	0.53
2:F:814:ILE:HG21	2:F:836:ILE:HD12	1.92	0.52
2:C:814:ILE:HG21	2:C:836:ILE:HD12	1.92	0.51
1:D:319:THR:HG21	2:F:731:ASP:HA	1.94	0.50
2:C:919:ILE:HG22	2:C:1005:LEU:HD11	1.93	0.49
2:F:919:ILE:HG22	2:F:1005:LEU:HD11	1.93	0.49
2:F:696:MET:N	2:F:697:PRO:HD2	2.27	0.49
1:D:319:THR:CG2	2:F:731:ASP:HA	2.43	0.49
2:C:696:MET:N	2:C:697:PRO:HD2	2.28	0.49
1:D:315:VAL:HG13	1:D:316:THR:HG22	1.96	0.48
1:A:319:THR:HG22	2:C:734:ASN:HD22	1.78	0.48
3:M:22:DT:H2''	3:M:23:DA:C8	2.49	0.47
2:C:861:TRP:CD2	2:C:921:LEU:HD21	2.50	0.47
1:A:315:VAL:HG13	1:A:316:THR:HG22	1.96	0.46
3:M:23:DA:H4'	3:M:24:DG:OP1	2.14	0.46
2:F:861:TRP:CD2	2:F:921:LEU:HD21	2.50	0.46
2:C:814:ILE:CG2	2:C:1003:LEU:HD21	2.49	0.43
2:F:799:THR:HG22	2:F:841:ARG:HA	2.00	0.43
2:F:926:LEU:HD13	2:F:929:MET:HE3	1.99	0.43
1:A:64:ILE:HD13	1:A:71:VAL:CG2	2.49	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:64:ILE:HD13	1:D:71:VAL:CG2	2.49	0.43
2:C:926:LEU:HD13	2:C:929:MET:HE3	2.01	0.43
2:C:618:TYR:CE2	2:C:622:THR:HG21	2.54	0.42
2:C:539:LEU:HD11	2:C:601:LEU:HD21	2.01	0.42
2:C:896:TYR:HB2	5:C:1101:2UR:H9	2.00	0.42
2:F:814:ILE:CG2	2:F:1003:LEU:HD21	2.49	0.42
2:C:799:THR:HG22	2:C:841:ARG:HA	2.00	0.41
2:F:696:MET:N	2:F:697:PRO:CD	2.83	0.41
2:C:990:ILE:HD12	2:C:990:ILE:N	2.36	0.41
2:C:696:MET:N	2:C:697:PRO:CD	2.83	0.41
2:F:990:ILE:HD12	2:F:990:ILE:N	2.36	0.41
2:C:682:MET:HG2	2:C:867:THR:HG22	2.02	0.41
2:F:539:LEU:HD11	2:F:601:LEU:HD21	2.01	0.41
2:C:618:TYR:O	2:C:622:THR:HG22	2.21	0.41
2:F:682:MET:HG2	2:F:867:THR:HG22	2.02	0.41
2:F:618:TYR:CE2	2:F:622:THR:HG21	2.56	0.41
2:F:618:TYR:O	2:F:622:THR:HG22	2.20	0.40
1:D:22:LYS:HB3	1:D:52:TYR:CE1	2.56	0.40
1:D:36:ALA:HB2	1:D:51:TRP:CZ3	2.57	0.40
2:F:962:ILE:HD13	2:F:971:LEU:HD11	2.03	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	219/267 (82%)	213 (97%)	6 (3%)	0	100	100
1	D	219/267 (82%)	213 (97%)	6 (3%)	0	100	100
2	C	450/505 (89%)	425 (94%)	25 (6%)	0	100	100
2	F	450/505 (89%)	424 (94%)	26 (6%)	0	100	100
All	All	1338/1544 (87%)	1275 (95%)	63 (5%)	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	189/237 (80%)	179 (95%)	10 (5%)	26	62
1	D	189/237 (80%)	179 (95%)	10 (5%)	26	62
2	C	391/443 (88%)	374 (96%)	17 (4%)	33	68
2	F	391/443 (88%)	374 (96%)	17 (4%)	33	68
All	All	1160/1360 (85%)	1106 (95%)	54 (5%)	30	66

All (54) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	21	CYS
1	A	22	LYS
1	A	37	ILE
1	A	40	GLN
1	A	47	LYS
1	A	48	VAL
1	A	280	LEU
1	A	301	GLN
1	A	316	THR
1	A	319	THR
2	C	592	VAL
2	C	594	THR
2	C	599	ASN
2	C	621	LYS
2	C	662	LYS
2	C	695	LYS
2	C	698	LEU
2	C	730	LEU
2	C	738	THR
2	C	758	VAL
2	C	769	LEU
2	C	835	ASP

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	C	847	ARG
2	C	887	THR
2	C	890	MET
2	C	971	LEU
2	C	1002	LEU
1	D	21	CYS
1	D	22	LYS
1	D	37	ILE
1	D	40	GLN
1	D	47	LYS
1	D	48	VAL
1	D	280	LEU
1	D	301	GLN
1	D	316	THR
1	D	319	THR
2	F	592	VAL
2	F	594	THR
2	F	599	ASN
2	F	621	LYS
2	F	662	LYS
2	F	695	LYS
2	F	698	LEU
2	F	730	LEU
2	F	738	THR
2	F	758	VAL
2	F	769	LEU
2	F	835	ASP
2	F	847	ARG
2	F	887	THR
2	F	890	MET
2	F	971	LEU
2	F	1002	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
2	C	573	GLN
2	C	599	ASN
2	C	613	HIS
2	C	820	ASN
2	C	856	ASN
2	C	906	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	C	961	ASN
1	D	40	GLN
2	F	573	GLN
2	F	599	ASN
2	F	613	HIS
2	F	820	ASN
2	F	856	ASN
2	F	906	ASN
2	F	961	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 5 ligands modelled in this entry, 4 are monoatomic - leaving 1 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	2UR	C	1101	-	15,15,15	0.75	1 (6%)	19,22,22	1.48	4 (21%)

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	2UR	C	1101	-	-	0/4/12/12	0/2/2/2

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	1101	2UR	C2-C1	2.16	1.57	1.53

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	1101	2UR	C9-C7-C8	-3.14	120.84	125.82
5	C	1101	2UR	C4-C3-C9	-2.47	118.11	120.12
5	C	1101	2UR	O1-C1-C2	2.32	108.73	105.32
5	C	1101	2UR	C2-C3-C9	4.03	111.04	108.06

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	C	1101	2UR	1	0

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	222/267 (83%)	0.11	3 (1%) 75 74	127, 155, 230, 244	0
1	D	222/267 (83%)	0.67	30 (13%) 3 3	175, 231, 288, 302	0
2	C	456/505 (90%)	0.60	28 (6%) 22 21	122, 181, 238, 278	0
2	F	456/505 (90%)	0.88	78 (17%) 2 1	172, 241, 308, 333	0
3	M	26/26 (100%)	-0.44	0 100 100	149, 180, 215, 219	0
3	N	26/26 (100%)	-0.38	0 100 100	144, 194, 210, 213	0
All	All	1408/1596 (88%)	0.59	139 (9%) 8 7	122, 206, 291, 333	0

All (139) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	349	LYS	6.9
1	D	33	LEU	6.5
2	F	942	PRO	6.3
2	F	951	LEU	6.2
2	F	989	TYR	6.1
2	C	575	LEU	6.0
2	F	923	GLU	6.0
1	D	309	TYR	5.9
1	D	283	VAL	5.8
2	F	836	ILE	5.4
1	D	348	LEU	5.2
2	F	1001	TYR	5.0
2	F	605	PRO	4.9
2	C	785	SER	4.8
1	D	285	ASP	4.6
2	F	676	ILE	4.6
2	F	575	LEU	4.4
2	F	959	SER	4.4
2	C	539	LEU	4.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	F	783	ASP	4.2
2	F	677	PHE	4.1
1	D	287	MET	4.0
2	C	853	GLN	3.9
2	F	785	SER	3.9
2	C	584	TRP	3.9
1	D	74	PHE	3.8
2	C	1011	THR	3.8
2	F	584	TRP	3.8
2	F	804	VAL	3.8
1	D	225	LYS	3.7
2	F	1003	LEU	3.7
2	F	997	VAL	3.7
2	F	930	TYR	3.6
1	D	35	MET	3.6
2	F	928	ASN	3.6
1	D	69	VAL	3.6
2	F	531	ALA	3.6
2	F	948	VAL	3.5
2	F	965	ASP	3.5
2	C	614	PHE	3.5
2	F	998	ASN	3.4
2	F	835	ASP	3.3
2	C	989	TYR	3.3
2	C	869	PHE	3.3
2	F	937	HIS	3.3
2	C	677	PHE	3.3
1	D	234	LEU	3.2
1	D	85	VAL	3.2
2	F	662	LYS	3.2
2	F	943	LYS	3.2
2	F	617	LEU	3.2
2	C	786	SER	3.1
2	C	817	TYR	3.1
2	F	936	SER	3.1
2	C	814	ILE	3.1
2	F	664	LYS	3.1
2	F	784	ASP	3.0
2	F	606	SER	3.0
2	F	550	GLY	3.0
2	F	891	PHE	3.0
2	C	970	PRO	2.9

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	F	944	GLY	2.9
2	F	859	LEU	2.9
2	F	922	GLY	2.9
2	F	1011	THR	2.9
2	F	999	LEU	2.9
1	D	291	ALA	2.9
2	F	541	HIS	2.9
2	F	924	VAL	2.8
1	D	71	VAL	2.8
1	D	325	THR	2.8
1	D	58	TRP	2.8
2	C	574	LEU	2.8
1	D	336	PRO	2.8
2	F	958	PRO	2.8
2	C	978	GLY	2.7
2	C	969	VAL	2.7
2	C	779	ARG	2.7
1	D	333	TRP	2.6
1	A	35	MET	2.6
2	F	801	ILE	2.6
2	F	935	ALA	2.6
2	F	1002	LEU	2.6
2	C	910	THR	2.6
1	D	332	GLU	2.5
2	F	866	THR	2.5
1	D	356	ILE	2.5
2	F	614	PHE	2.5
1	A	309	TYR	2.5
2	F	984	LEU	2.5
2	F	945	LYS	2.4
2	C	840	GLU	2.4
1	D	6	ASP	2.4
2	F	604	MET	2.4
1	A	64	ILE	2.4
1	D	236	LYS	2.4
2	F	705	GLN	2.4
1	D	226	LYS	2.4
2	F	586	PHE	2.4
2	F	814	ILE	2.4
2	F	909	HIS	2.4
2	F	946	HIS	2.4
2	C	891	PHE	2.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	F	603	GLN	2.3
2	F	552	VAL	2.3
2	F	899	ASP	2.3
2	F	793	ASN	2.3
2	C	604	MET	2.3
1	D	355	ARG	2.3
2	C	676	ILE	2.3
2	F	858	ARG	2.3
1	D	231	ASP	2.2
2	F	585	ILE	2.2
2	F	546	LEU	2.2
2	F	969	VAL	2.2
2	F	739	LEU	2.2
2	F	952	GLY	2.2
2	C	971	LEU	2.2
2	F	910	THR	2.2
1	D	64	ILE	2.1
2	C	545	VAL	2.1
2	F	1005	LEU	2.1
1	D	302	LEU	2.1
2	F	601	LEU	2.1
2	C	909	HIS	2.1
2	F	826	HIS	2.1
2	F	713	LEU	2.1
1	D	34	ARG	2.1
2	C	713	LEU	2.1
2	C	531	ALA	2.0
2	F	765	LEU	2.0
2	F	532	ALA	2.0
2	F	669	VAL	2.0
2	F	689	TYR	2.0
1	D	345	LEU	2.0
2	F	574	LEU	2.0
2	F	833	VAL	2.0
2	F	978	GLY	2.0
2	F	908	CYS	2.0

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 [i](#)

There are no carbohydrates in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(\AA^2)	Q<0.9
5	2UR	C	1101	14/14	0.90	0.34	0.75	116,117,118,119	0
4	ZN	D	402	1/1	0.96	0.06	-1.99	138,138,138,138	0
4	ZN	A	402	1/1	0.94	0.07	-2.51	71,71,71,71	0
4	ZN	D	401	1/1	0.94	0.03	-	123,123,123,123	0
4	ZN	A	401	1/1	0.96	0.06	-	83,83,83,83	0

6.5 Other polymers [i](#)

There are no such residues in this entry.