



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 20, 2026 – 07:29 AM UTC

PDB ID : 6PJJ / pdb_00006pjj
Title : Human PRPF4B bound to benzothiophene inhibitor 224
Authors : Godoi, P.H.C.; Santiago, A.S.; Fala, A.M.; Ramos, P.Z.; Sriranganadane, D.; Mascarello, A.; Segretti, N.; Azevedo, H.; Guimaraes, C.R.W.; Arruda, P.; Elkins, J.M.; Counago, R.M.; Structural Genomics Consortium (SGC)
Deposited on : 2019-06-28
Resolution : 2.40 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
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
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

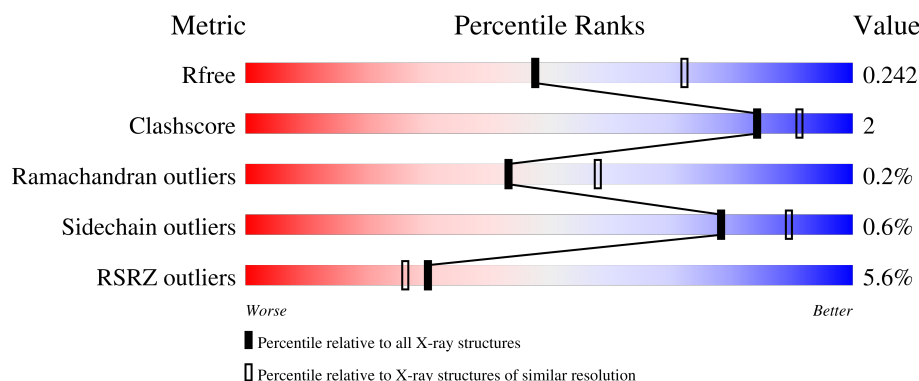
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 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}	180053	4912 (2.40-2.40)
Clashscore	190562	5391 (2.40-2.40)
Ramachandran outliers	187476	5320 (2.40-2.40)
Sidechain outliers	187428	5321 (2.40-2.40)
RSRZ outliers	180081	4916 (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 $\leq 5\%$. 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	351	5% 85% 6% 9%
1	B	351	4% 87% 5% 7%
1	C	351	5% 88% • 7%
1	D	351	7% 84% 6% 10%

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	EDO	A	1102	-	-	X	-

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 10677 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.

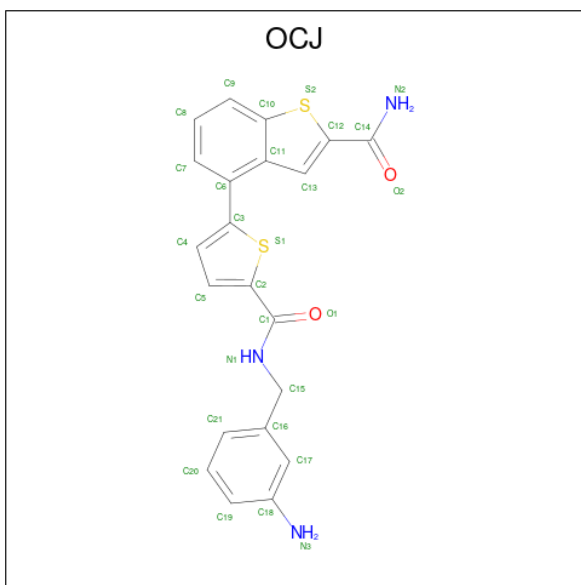
- Molecule 1 is a protein called Serine/threonine-protein kinase PRP4 homolog.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	321	Total	C	N	O	P	S	0	0	0
			2561	1647	438	460	1	15			
1	B	326	Total	C	N	O	P	S	0	0	0
			2606	1674	450	466	1	15			
1	C	326	Total	C	N	O	P	S	0	0	0
			2604	1669	450	469	1	15			
1	D	317	Total	C	N	O	P	S	0	1	0
			2496	1598	437	444	1	16			

There are 16 discrepancies between the modelled and reference sequences:

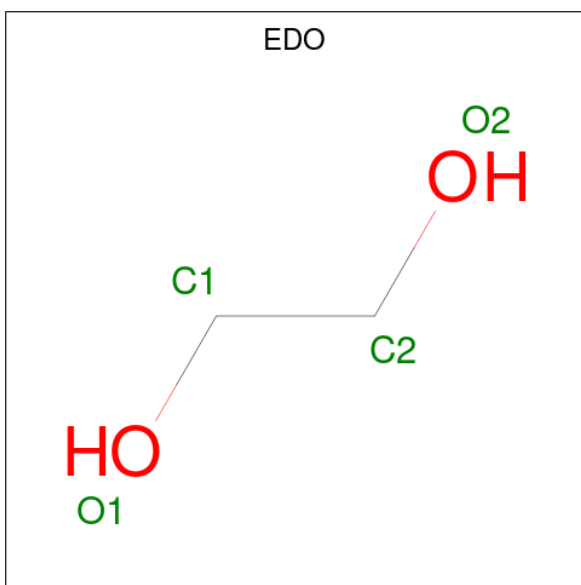
Chain	Residue	Modelled	Actual	Comment	Reference
A	655	SER	-	expression tag	UNP Q13523
A	656	MET	-	expression tag	UNP Q13523
A	754	LEU	PHE	conflict	UNP Q13523
A	851	PHE	VAL	conflict	UNP Q13523
B	655	SER	-	expression tag	UNP Q13523
B	656	MET	-	expression tag	UNP Q13523
B	754	LEU	PHE	conflict	UNP Q13523
B	851	PHE	VAL	conflict	UNP Q13523
C	655	SER	-	expression tag	UNP Q13523
C	656	MET	-	expression tag	UNP Q13523
C	754	LEU	PHE	conflict	UNP Q13523
C	851	PHE	VAL	conflict	UNP Q13523
D	655	SER	-	expression tag	UNP Q13523
D	656	MET	-	expression tag	UNP Q13523
D	754	LEU	PHE	conflict	UNP Q13523
D	851	PHE	VAL	conflict	UNP Q13523

- Molecule 2 is 4-(5-[[[3-aminophenyl)methyl]carbamoyl]thiophen-2-yl)-1-benzothiophene-2-carboxamide (CCD ID: OCJ) (formula: C₂₁H₁₇N₃O₂S₂) (labeled as "Ligand of Interest" by depositor).



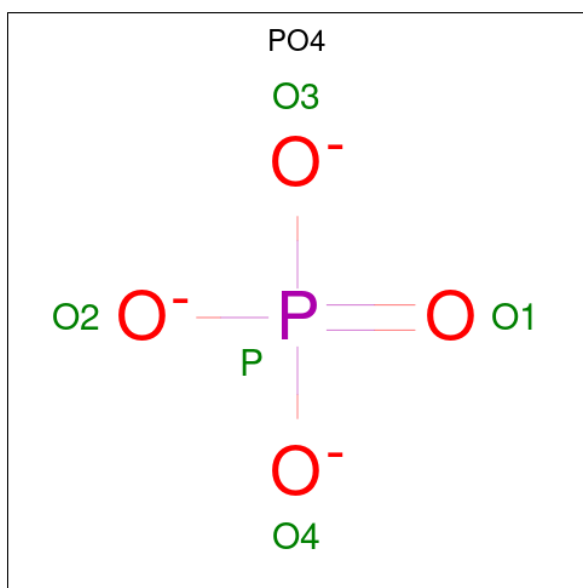
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			28	21	3	2	2		
2	B	1	Total	C	N	O	S	0	0
			28	21	3	2	2		
2	C	1	Total	C	N	O	S	0	0
			28	21	3	2	2		
2	D	1	Total	C	N	O	S	0	0
			28	21	3	2	2		

- Molecule 3 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	B	1	Total C O 4 2 2	0	0
3	C	1	Total C O 4 2 2	0	0
3	D	1	Total C O 4 2 2	0	0
3	D	1	Total C O 4 2 2	0	0
3	D	1	Total C O 4 2 2	0	0

- Molecule 4 is PHOSPHATE ION (CCD ID: PO4) (formula: O_4P).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	A	1	Total O P 5 4 1	0	0
4	B	1	Total O P 5 4 1	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total	O	P	0	0
			5	4	1		
4	C	1	Total	O	P	0	0
			5	4	1		
4	C	1	Total	O	P	0	0
			5	4	1		
4	D	1	Total	O	P	0	0
			5	4	1		

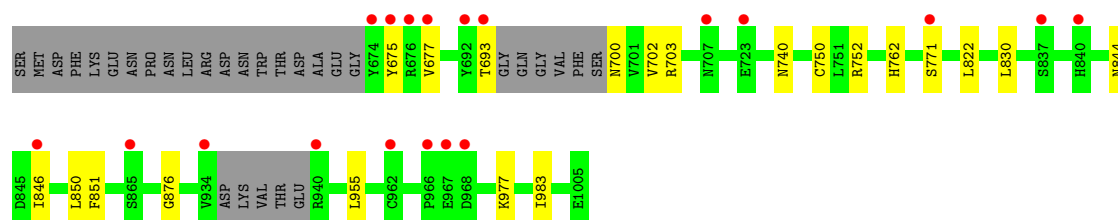
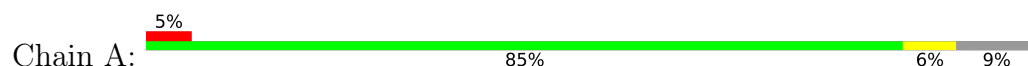
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	46	Total	O	0	0
			46	46		
5	B	70	Total	O	0	0
			70	70		
5	C	71	Total	O	0	0
			71	71		
5	D	39	Total	O	0	0
			39	39		

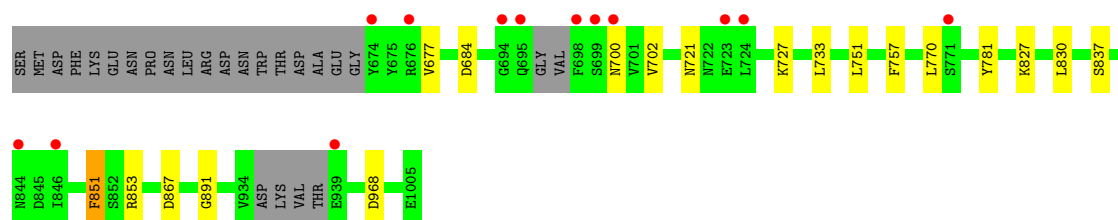
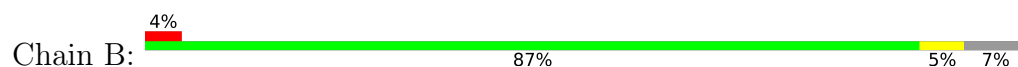
3 Residue-property plots

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

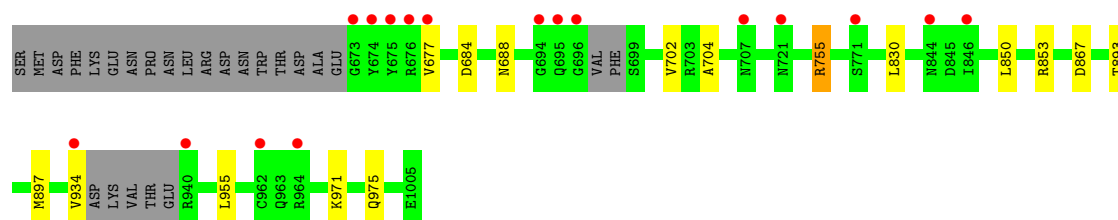
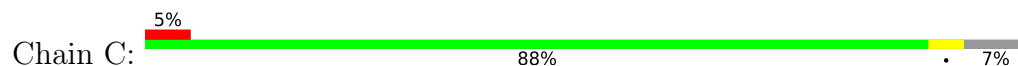
- Molecule 1: Serine/threonine-protein kinase PRP4 homolog



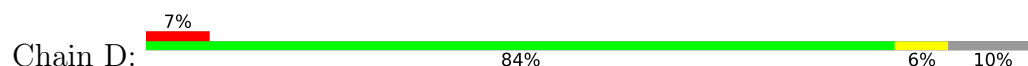
- Molecule 1: Serine/threonine-protein kinase PRP4 homolog

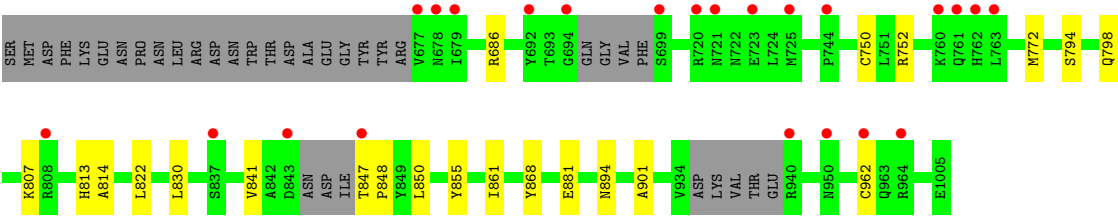


- Molecule 1: Serine/threonine-protein kinase PRP4 homolog



- Molecule 1: Serine/threonine-protein kinase PRP4 homolog





4 Data and refinement statistics

Property	Value	Source
Space group	P 65	Depositor
Cell constants a, b, c, α , β , γ	241.81Å 241.81Å 50.23Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	79.28 – 2.40 79.28 – 2.40	Depositor EDS
% Data completeness (in resolution range)	100.0 (79.28-2.40) 100.0 (79.28-2.40)	Depositor EDS
R_{merge}	0.33	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.26 (at 2.40Å)	Xtriage
Refinement program	REFMAC 5.8.0238	Depositor
R, R_{free}	0.190 , 0.240 0.197 , 0.242	Depositor DCC
R_{free} test set	3266 reflections (4.91%)	wwPDB-VP
Wilson B-factor (Å ²)	28.9	Xtriage
Anisotropy	0.183	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 33.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	0.012 for h,-h-k,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	10677	wwPDB-VP
Average B, all atoms (Å ²)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 19.17% 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: PTR, PO4, EDO, OCJ

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	0.99	0/2590	1.39	0/3491
1	B	0.98	0/2636	1.35	7/3549 (0.2%)
1	C	0.99	0/2634	1.38	2/3546 (0.1%)
1	D	1.02	0/2526	1.42	0/3407
All	All	0.99	0/10386	1.38	9/13993 (0.1%)

There are no bond length outliers.

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	968	ASP	CA-CB-CG	5.61	118.20	112.60
1	C	867	ASP	CA-C-N	5.46	128.34	120.38
1	C	867	ASP	C-N-CA	5.46	128.34	120.38
1	B	867	ASP	CA-C-N	5.32	128.15	120.38
1	B	867	ASP	C-N-CA	5.32	128.15	120.38
1	B	727	LYS	CA-C-N	5.02	127.01	120.28
1	B	727	LYS	C-N-CA	5.02	127.01	120.28
1	B	733	LEU	CA-C-N	5.01	126.95	120.44
1	B	733	LEU	C-N-CA	5.01	126.95	120.44

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	2561	0	2565	13	0
1	B	2606	0	2619	10	0
1	C	2604	0	2605	10	0
1	D	2496	0	2473	15	0
2	A	28	0	0	0	0
2	B	28	0	0	0	0
2	C	28	0	0	0	0
2	D	28	0	0	0	0
3	A	4	0	6	5	0
3	B	12	0	18	0	0
3	C	4	0	6	0	0
3	D	12	0	18	2	0
4	A	15	0	0	0	0
4	B	10	0	0	0	0
4	C	10	0	0	1	0
4	D	5	0	0	0	0
5	A	46	0	0	0	0
5	B	70	0	0	0	0
5	C	71	0	0	0	0
5	D	39	0	0	1	0
All	All	10677	0	10310	48	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 (48) 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:B:677:VAL:HG11	1:B:702:VAL:HG11	1.64	0.78
1:D:841:VAL:HG21	1:D:868:TYR:OH	1.92	0.70
1:C:853:ARG:NH1	4:C:1103:PO4:O1	2.31	0.63
1:C:677:VAL:HG11	1:C:702:VAL:HG11	1.80	0.63
1:A:750:CYS:O	3:A:1102:EDO:H22	2.01	0.60
1:B:853:ARG:HD2	1:B:891:GLY:O	2.02	0.59
1:A:750:CYS:HB2	3:A:1102:EDO:C1	2.35	0.57
1:B:721:ASN:O	1:B:721:ASN:ND2	2.38	0.57
1:A:677:VAL:HG11	1:A:702:VAL:HG11	1.88	0.56
1:B:837:SER:HB2	1:B:851:PHE:CE1	2.40	0.56
1:C:830:LEU:HD12	1:C:830:LEU:C	2.34	0.51
1:A:955:LEU:HB3	1:A:977:LYS:HD3	1.93	0.50
1:A:750:CYS:HB2	3:A:1102:EDO:H11	1.93	0.50
1:A:703:ARG:NH2	1:A:771:SER:O	2.45	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:962:CYS:SG	1:D:962:CYS:O	2.69	0.49
1:B:830:LEU:C	1:B:830:LEU:HD12	2.39	0.48
1:D:848:PRO:HB2	1:D:894:ASN:ND2	2.28	0.47
1:D:847:THR:HB	1:D:848:PRO:HD2	1.96	0.47
1:D:861:ILE:HG23	1:D:894:ASN:HB3	1.97	0.47
1:C:971:LYS:O	1:C:975:GLN:HG3	2.15	0.46
1:A:846:ILE:HA	1:A:850:LEU:HD12	1.97	0.45
1:C:830:LEU:HD12	1:C:830:LEU:O	2.16	0.45
1:D:750:CYS:O	3:D:1102:EDO:H11	2.16	0.45
1:D:752:ARG:HH11	3:D:1102:EDO:H12	1.81	0.45
1:B:684:ASP:HB2	1:B:757:PHE:CD2	2.52	0.45
1:B:781:TYR:CE2	1:B:827:LYS:HD3	2.52	0.45
1:D:850:LEU:HD23	1:D:850:LEU:HA	1.87	0.44
1:B:751:LEU:HD13	1:B:770:LEU:HD12	2.00	0.44
1:D:813:HIS:O	1:D:814:ALA:HB3	2.18	0.43
1:A:740:ASN:HA	3:A:1102:EDO:O1	2.18	0.43
1:A:822:LEU:O	1:A:830:LEU:HA	2.18	0.43
1:D:807:LYS:HA	1:D:868:TYR:CE1	2.53	0.43
1:C:850:LEU:HD23	1:C:850:LEU:HA	1.89	0.43
1:D:855:TYR:OH	1:D:881:GLU:OE1	2.35	0.43
1:D:794:SER:O	1:D:798:GLN:HG3	2.19	0.42
1:A:752:ARG:NH1	3:A:1102:EDO:H21	2.33	0.42
1:C:893:THR:O	1:C:897:MET:HG2	2.19	0.42
1:C:684:ASP:OD2	1:C:755:ARG:NH1	2.51	0.42
1:C:955:LEU:HD12	1:C:955:LEU:HA	1.95	0.42
1:C:688:ASN:O	1:C:704:ALA:HA	2.19	0.41
1:B:677:VAL:CG1	1:B:702:VAL:HG11	2.41	0.41
1:D:822:LEU:O	1:D:830:LEU:HA	2.20	0.41
1:A:876:GLY:HA3	1:A:983:ILE:HG21	2.03	0.41
1:B:830:LEU:HD12	1:B:830:LEU:O	2.20	0.41
1:A:675:TYR:HB2	1:A:762:HIS:CE1	2.55	0.41
1:D:830:LEU:C	1:D:830:LEU:HD12	2.46	0.41
1:A:830:LEU:C	1:A:830:LEU:HD12	2.46	0.41
1:D:901:ALA:HB2	5:D:1236:HOH:O	2.22	0.40

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	314/351 (90%)	301 (96%)	12 (4%)	1 (0%)	36	50
1	B	319/351 (91%)	307 (96%)	11 (3%)	1 (0%)	36	50
1	C	319/351 (91%)	295 (92%)	24 (8%)	0	100	100
1	D	309/351 (88%)	293 (95%)	15 (5%)	1 (0%)	36	50
All	All	1261/1404 (90%)	1196 (95%)	62 (5%)	3 (0%)	43	58

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	851	PHE
1	D	686	ARG
1	A	851	PHE

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	272/316 (86%)	269 (99%)	3 (1%)	65	82
1	B	277/316 (88%)	276 (100%)	1 (0%)	84	92
1	C	276/316 (87%)	274 (99%)	2 (1%)	76	88
1	D	261/316 (83%)	260 (100%)	1 (0%)	84	92
All	All	1086/1264 (86%)	1079 (99%)	7 (1%)	78	89

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

Mol	Chain	Res	Type
1	A	693	THR
1	A	700	ASN
1	A	844	ASN
1	B	700	ASN
1	C	755	ARG
1	C	934	VAL
1	D	772	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	707	ASN
1	A	726	GLN
1	A	761	GLN
1	A	762	HIS
1	A	844	ASN
1	A	921	GLN
1	A	982	GLN
1	A	996	GLN
1	B	707	ASN
1	B	711	ASN
1	B	721	ASN
1	B	844	ASN
1	C	700	ASN
1	C	925	GLN
1	C	963	GLN
1	C	999	GLN
1	D	711	ASN
1	D	756	HIS
1	D	921	GLN
1	D	963	GLN
1	D	969	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

4 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	$\# Z > 2$
1	PTR	D	849	1	15,16,17	0.45	0	17,22,24	0.53	0
1	PTR	A	849	1	15,16,17	0.54	0	17,22,24	0.63	0
1	PTR	C	849	1	15,16,17	0.55	0	17,22,24	0.58	0
1	PTR	B	849	1	15,16,17	0.52	0	17,22,24	0.55	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
1	PTR	D	849	1	-	1/10/11/13	0/1/1/1
1	PTR	A	849	1	-	0/10/11/13	0/1/1/1
1	PTR	C	849	1	-	1/10/11/13	0/1/1/1
1	PTR	B	849	1	-	0/10/11/13	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	C	849	PTR	O-C-CA-CB
1	D	849	PTR	O-C-CA-CB

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry

20 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
4	PO4	C	1103	-	4,4,4	0.55	0	6,6,6	0.53	0
3	EDO	B	1105	-	3,3,3	0.07	0	2,2,2	0.17	0
3	EDO	A	1102	-	3,3,3	0.18	0	2,2,2	0.25	0
3	EDO	C	1104	-	3,3,3	0.12	0	2,2,2	0.23	0
2	OCJ	C	1101	-	31,31,31	0.41	0	44,44,44	0.63	0
2	OCJ	D	1101	-	31,31,31	0.37	0	44,44,44	0.64	0
4	PO4	B	1102	-	4,4,4	0.73	0	6,6,6	0.47	0
3	EDO	D	1103	-	3,3,3	0.09	0	2,2,2	0.17	0
2	OCJ	A	1101	-	31,31,31	0.46	0	44,44,44	0.63	0
3	EDO	D	1102	-	3,3,3	0.11	0	2,2,2	0.24	0
4	PO4	D	1104	-	4,4,4	0.68	0	6,6,6	0.48	0
4	PO4	A	1105	-	4,4,4	0.64	0	6,6,6	0.50	0
4	PO4	A	1103	-	4,4,4	0.66	0	6,6,6	0.54	0
4	PO4	A	1104	-	4,4,4	0.69	0	6,6,6	0.46	0
3	EDO	B	1103	-	3,3,3	0.09	0	2,2,2	0.13	0
4	PO4	C	1102	-	4,4,4	0.61	0	6,6,6	0.48	0
3	EDO	B	1104	-	3,3,3	0.09	0	2,2,2	0.05	0
4	PO4	B	1106	-	4,4,4	0.58	0	6,6,6	0.48	0
3	EDO	D	1105	-	3,3,3	0.09	0	2,2,2	0.06	0
2	OCJ	B	1101	-	31,31,31	0.45	0	44,44,44	0.57	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	C	1104	-	-	1/1/1/1	-
3	EDO	B	1104	-	-	1/1/1/1	-
3	EDO	B	1105	-	-	1/1/1/1	-
2	OCJ	C	1101	-	-	0/17/17/17	0/4/4/4
2	OCJ	D	1101	-	-	0/17/17/17	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	EDO	D	1103	-	-	1/1/1/1	-
3	EDO	D	1105	-	-	1/1/1/1	-
2	OCJ	A	1101	-	-	0/17/17/17	0/4/4/4
3	EDO	B	1103	-	-	1/1/1/1	-
3	EDO	D	1102	-	-	1/1/1/1	-
3	EDO	A	1102	-	-	1/1/1/1	-
2	OCJ	B	1101	-	-	0/17/17/17	0/4/4/4

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	1103	EDO	O1-C1-C2-O2
3	C	1104	EDO	O1-C1-C2-O2
3	D	1102	EDO	O1-C1-C2-O2
3	D	1103	EDO	O1-C1-C2-O2
3	B	1104	EDO	O1-C1-C2-O2
3	B	1105	EDO	O1-C1-C2-O2
3	A	1102	EDO	O1-C1-C2-O2
3	D	1105	EDO	O1-C1-C2-O2

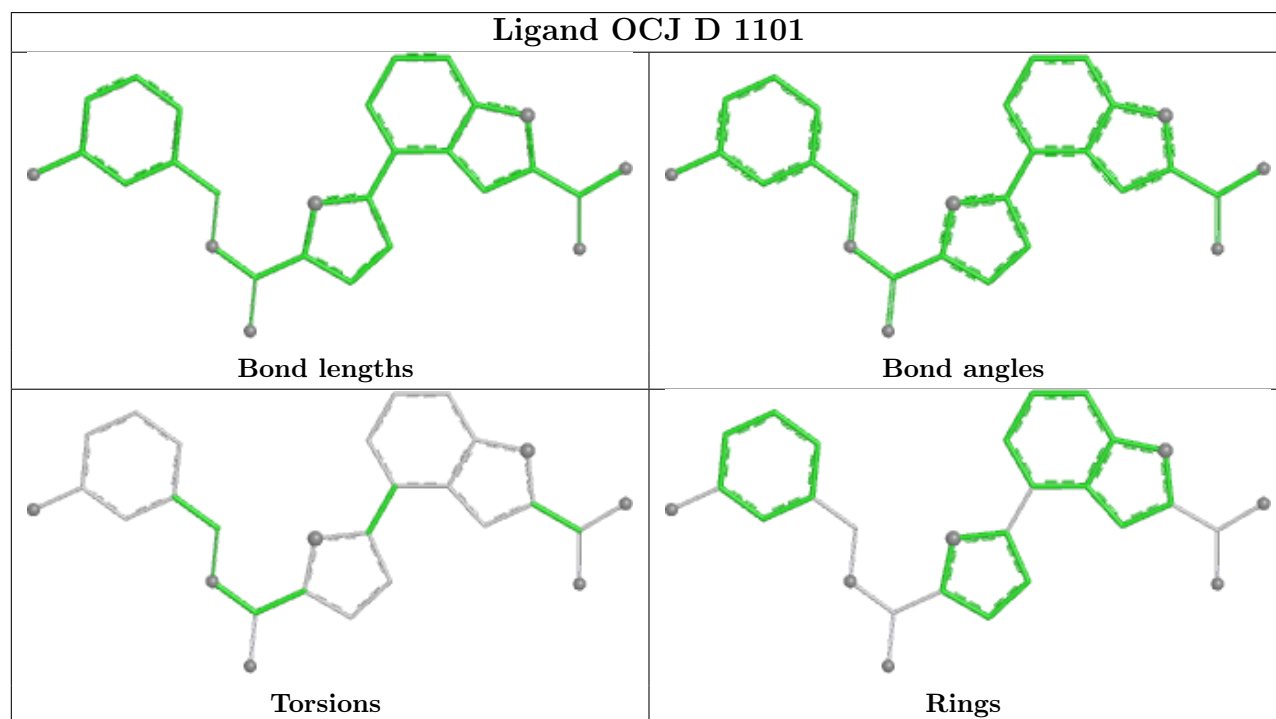
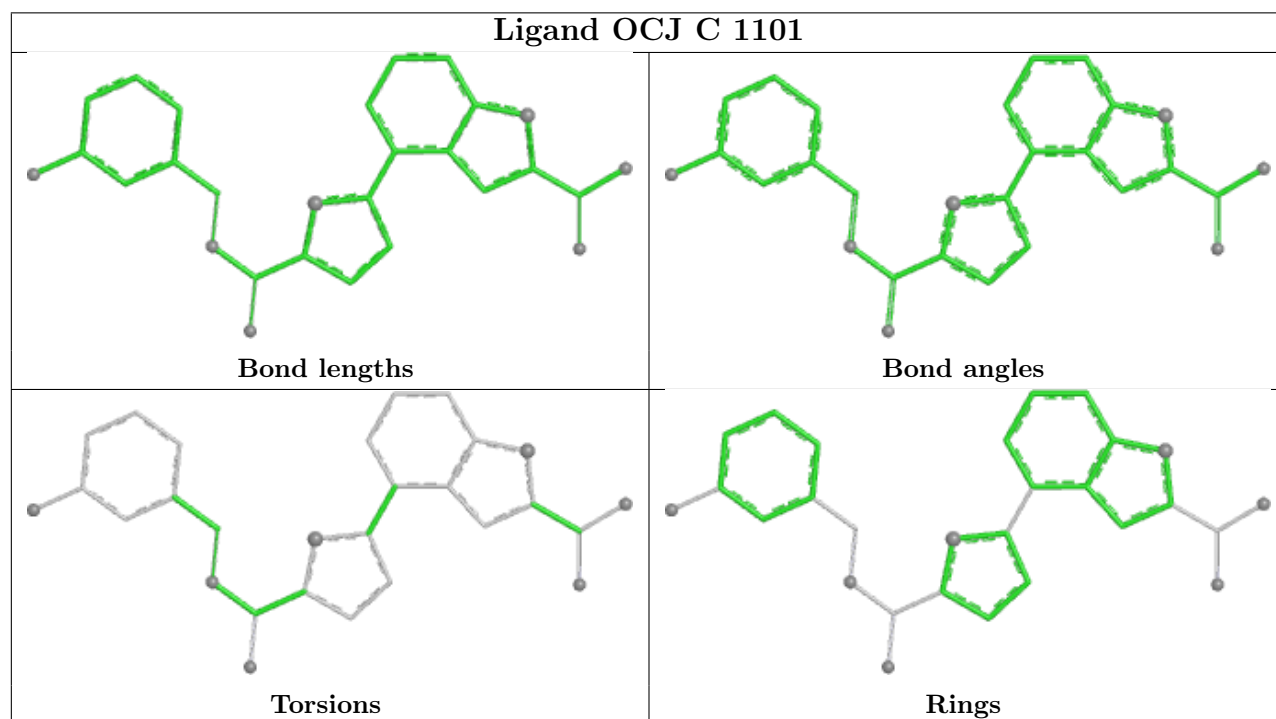
There are no ring outliers.

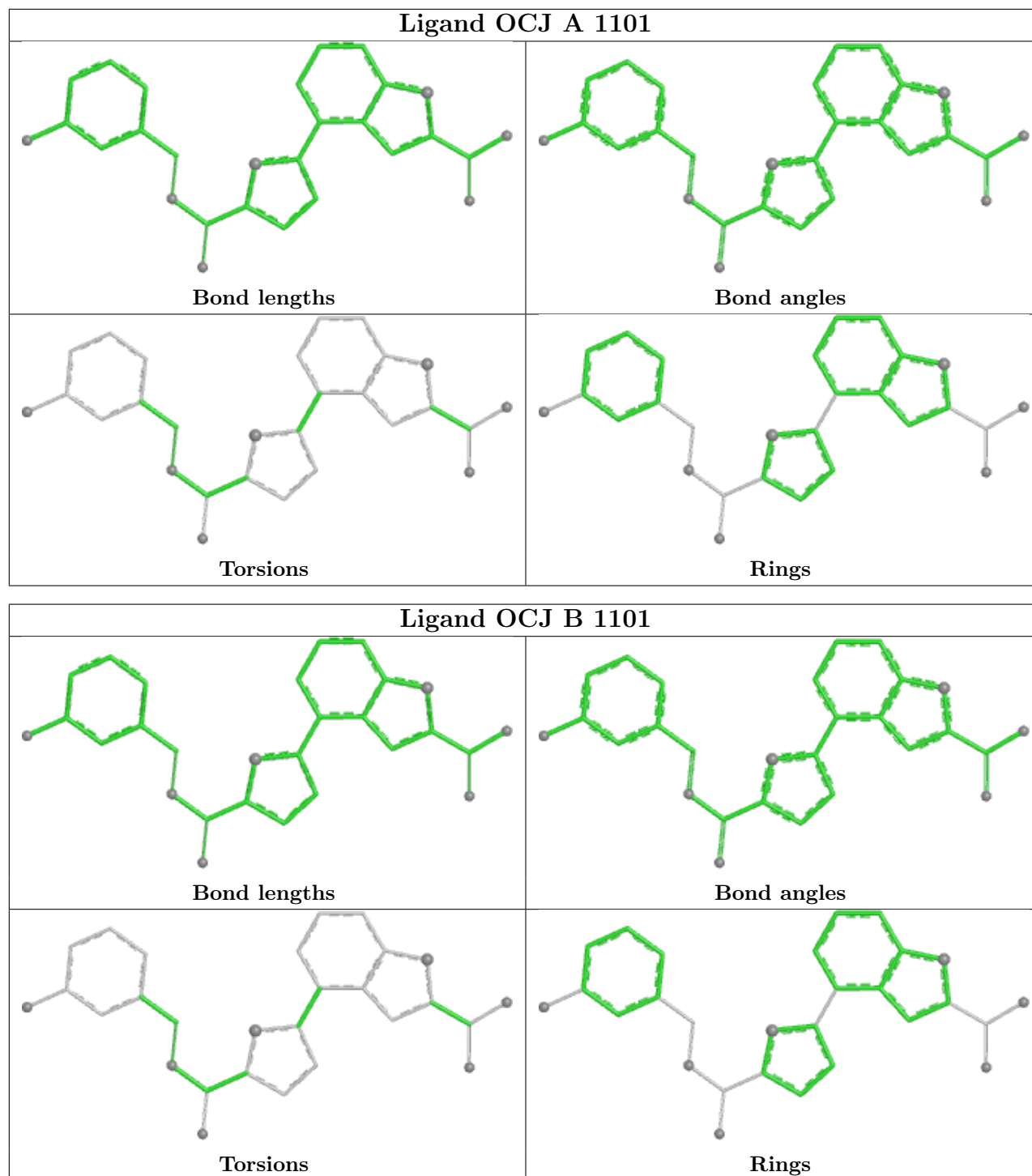
3 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	1103	PO4	1	0
3	A	1102	EDO	5	0
3	D	1102	EDO	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier.

The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ > 2		OWAB(Å ²)	Q < 0.9
1	A	320/351 (91%)	0.09	19 (5%)	28 24	22, 37, 70, 89	0
1	B	325/351 (92%)	-0.19	13 (4%)	42 38	15, 26, 57, 105	0
1	C	325/351 (92%)	-0.07	17 (5%)	33 29	14, 26, 65, 113	0
1	D	316/351 (90%)	0.39	23 (7%)	21 17	18, 40, 75, 103	1 (0%)
All	All	1286/1404 (91%)	0.05	72 (5%)	30 26	14, 32, 70, 113	1 (0%)

All (72) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	674	TYR	5.7
1	D	694	GLY	5.4
1	B	698	PHE	5.2
1	A	674	TYR	5.2
1	D	677	VAL	5.2
1	D	761	GLN	5.1
1	A	962	CYS	5.1
1	D	678	ASN	4.3
1	C	696	GLY	4.3
1	D	723	GLU	4.3
1	C	962	CYS	4.1
1	B	939	GLU	3.7
1	C	695	GLN	3.6
1	B	846	ILE	3.6
1	C	676	ARG	3.4
1	D	699	SER	3.4
1	C	674	TYR	3.3
1	C	673	GLY	3.3
1	A	677	VAL	3.2
1	B	695	GLN	3.1
1	C	940	ARG	3.1

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Mol	Chain	Res	Type	RSRZ
1	D	843	ASP	3.0
1	A	934	VAL	3.0
1	D	847	THR	3.0
1	A	967	GLU	3.0
1	D	692	TYR	3.0
1	D	760	LYS	3.0
1	D	962	CYS	3.0
1	D	721	ASN	2.9
1	B	771	SER	2.8
1	D	720	ARG	2.7
1	B	844	ASN	2.7
1	B	699	SER	2.7
1	C	934	VAL	2.7
1	A	840	HIS	2.7
1	D	725	MET	2.6
1	C	677	VAL	2.6
1	C	675	TYR	2.6
1	D	940	ARG	2.5
1	B	694	GLY	2.5
1	C	694	GLY	2.5
1	D	679	ILE	2.5
1	B	724	LEU	2.5
1	A	723	GLU	2.5
1	D	964	ARG	2.5
1	C	707	ASN	2.5
1	C	844	ASN	2.5
1	A	676	ARG	2.4
1	A	940	ARG	2.4
1	A	966	PRO	2.4
1	C	964	ARG	2.4
1	C	721	ASN	2.4
1	A	771	SER	2.3
1	B	676	ARG	2.3
1	A	675	TYR	2.3
1	B	723	GLU	2.3
1	D	950	ASN	2.3
1	D	744	PRO	2.3
1	A	837	SER	2.3
1	C	771	SER	2.3
1	D	762	HIS	2.3
1	A	693	THR	2.2
1	C	846	ILE	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	707	ASN	2.2
1	A	968	ASP	2.2
1	D	837	SER	2.2
1	A	865	SER	2.1
1	D	808	ARG	2.1
1	B	700	ASN	2.1
1	A	846	ILE	2.1
1	D	763	LEU	2.0
1	A	692	TYR	2.0

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
1	PTR	D	849	16/17	0.87	0.14	28,44,55,58	4
1	PTR	C	849	16/17	0.90	0.12	27,37,50,53	4
1	PTR	B	849	16/17	0.90	0.13	30,39,58,61	4
1	PTR	A	849	16/17	0.91	0.12	32,44,55,57	4

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.

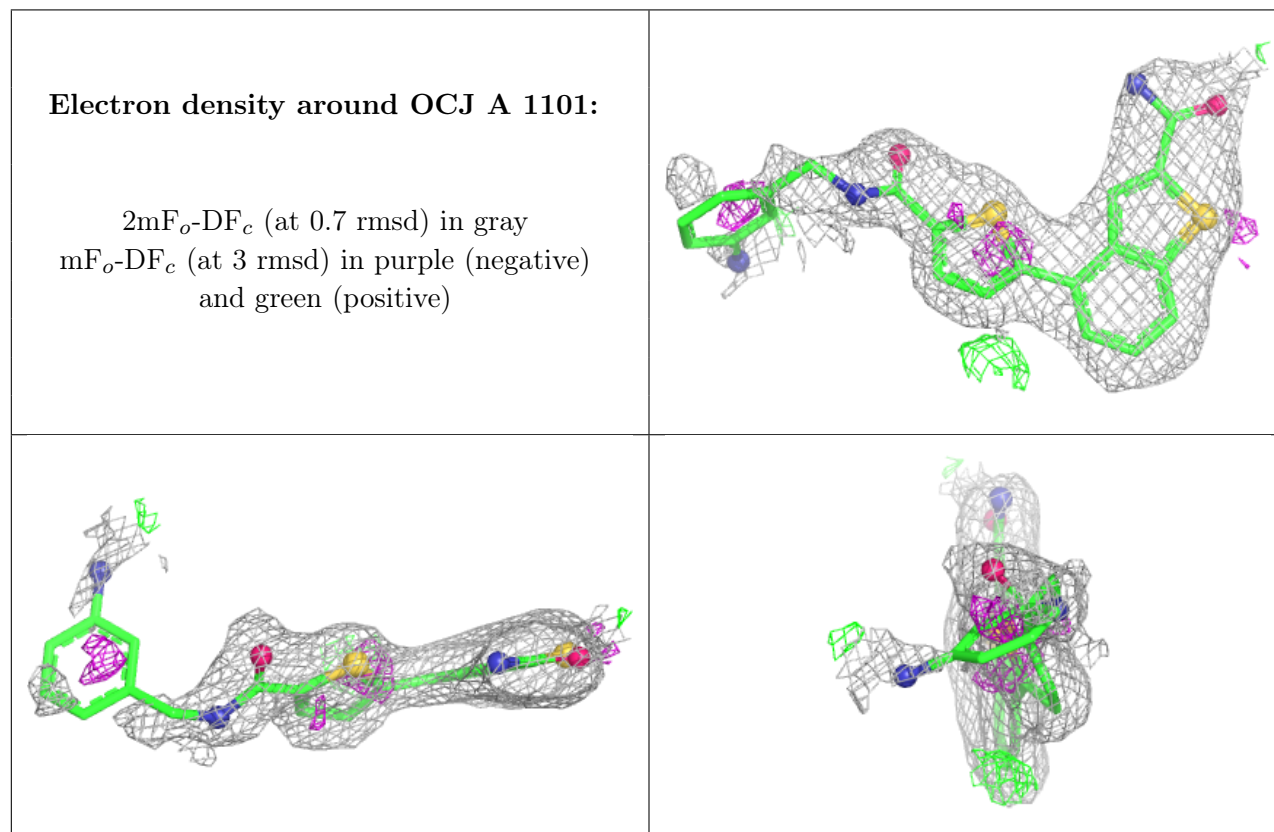
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	PO4	D	1104	5/5	0.50	0.17	73,75,93,99	0
3	EDO	B	1105	4/4	0.73	0.23	54,58,59,66	0
4	PO4	B	1106	5/5	0.74	0.15	65,71,88,106	0
3	EDO	C	1104	4/4	0.81	0.22	53,58,63,65	0
4	PO4	C	1102	5/5	0.82	0.23	55,58,66,70	0

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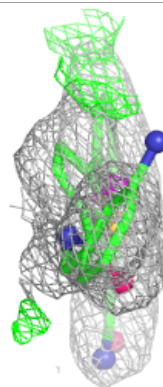
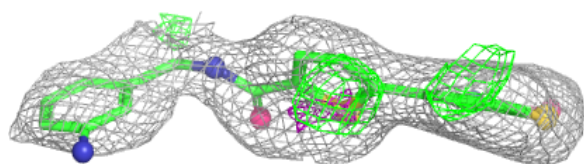
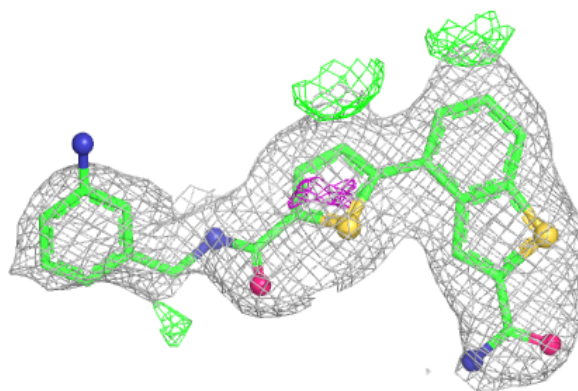
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	EDO	B	1104	4/4	0.83	0.23	53,56,59,64	0
4	PO4	A	1104	5/5	0.85	0.17	58,64,78,89	0
2	OCJ	A	1101	28/28	0.86	0.18	38,52,106,110	0
3	EDO	D	1103	4/4	0.86	0.25	55,56,60,63	0
3	EDO	A	1102	4/4	0.87	0.20	50,60,64,69	0
3	EDO	B	1103	4/4	0.88	0.17	38,40,47,61	0
4	PO4	A	1103	5/5	0.88	0.15	41,55,61,67	0
4	PO4	A	1105	5/5	0.89	0.11	73,77,85,87	0
4	PO4	C	1103	5/5	0.89	0.18	45,64,75,77	0
2	OCJ	D	1101	28/28	0.89	0.14	45,58,84,88	0
3	EDO	D	1102	4/4	0.90	0.34	65,72,79,81	0
3	EDO	D	1105	4/4	0.91	0.19	44,45,54,56	0
4	PO4	B	1102	5/5	0.91	0.14	56,63,67,73	0
2	OCJ	B	1101	28/28	0.95	0.11	23,37,75,80	0
2	OCJ	C	1101	28/28	0.96	0.10	27,36,62,70	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

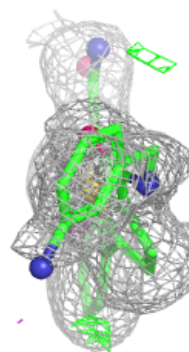
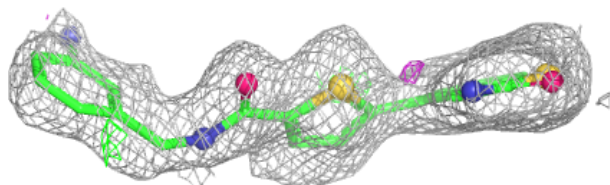
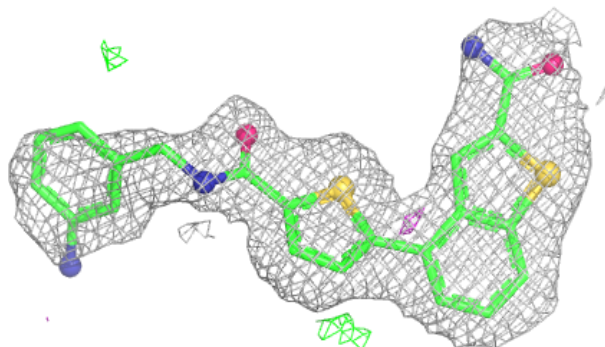


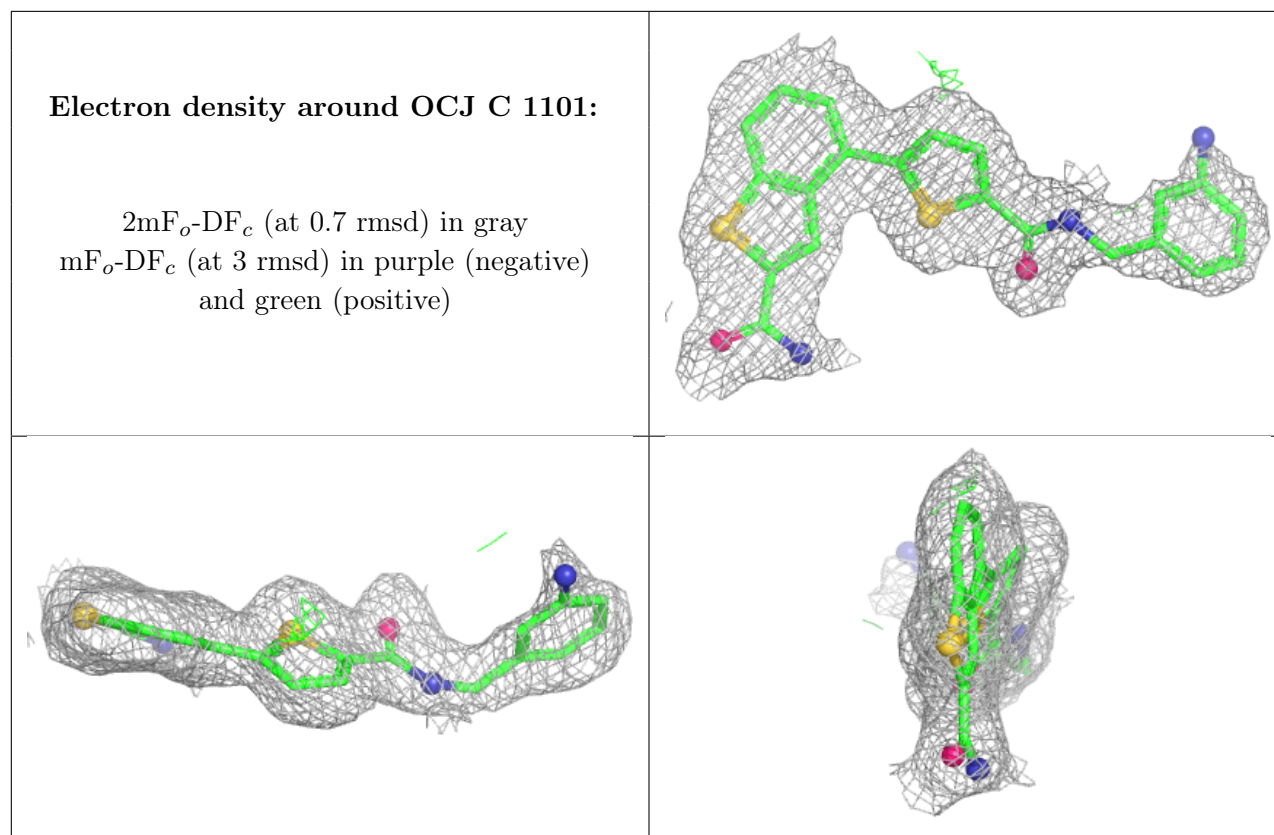
Electron density around OCJ D 1101:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

**Electron density around OCJ B 1101:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





6.5 Other polymers [i](#)

There are no such residues in this entry.