WORLDWIDE PDB

PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Oct 8, 2023 – 09:54 PM EDT

PDB ID	:	6W2J
Title	:	CPS1 bound to allosteric inhibitor H3B-374
Authors	:	Larsen, N.A.; Nguyen, T.V.
Deposited on	:	2020-03-05
Resolution	:	2.62 Å(reported)

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	:	2.35.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

1   Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.62 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.
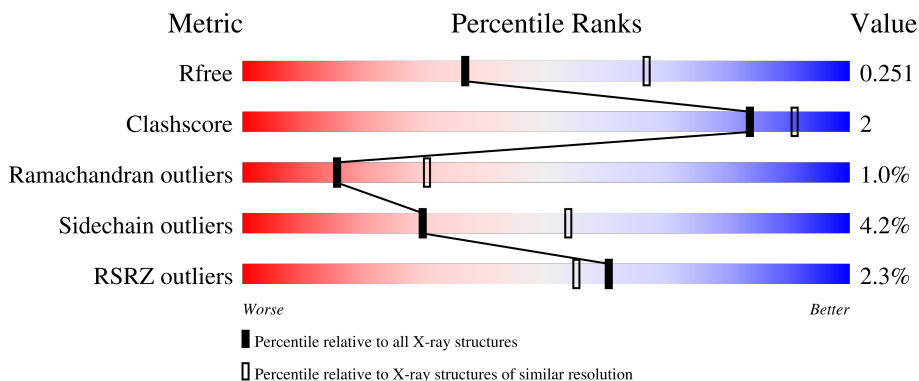
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3797 (2.64-2.60)
Clashscore	141614	4168 (2.64-2.60)
Ramachandran outliers	138981	4093 (2.64-2.60)
Sidechain outliers	138945	4093 (2.64-2.60)
RSRZ outliers	127900	3731 (2.64-2.60)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

| Mol	Chain	Length	Quality of chain
1	A	1500	85% 10% · 5%
1	B	1500	81% 9% 9%

2 Entity composition (i)

There are 5 unique types of molecules in this entry. The entry contains 21756 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 Carbamoyl-phosphate synthase [ammonia], mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	1422	Total	C	N	O	S	0	0	0
			10992	6985	1856	2092	59			
1	B	1364	Total	C	N	O	S	0	0	0
			10562	6714	1787	2006	55			

- Molecule 2 is (2-fluoranyl-4-methoxy-phenyl)-[(3 {R},5 {R})-4-(2-fluoranyl-4-methoxy-phenyl)carbonyl-3,5-dimethyl-piperazin-1-yl]methanone (three-letter code: 374) (formula: $C_{22}H_{24}F_2N_2O_4$) (labeled as "Ligand of Interest" by depositor).
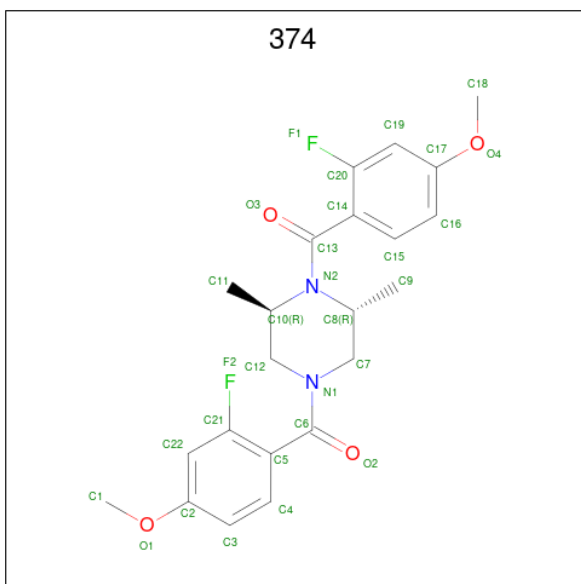
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	F	N	O	0	0
			30	22	2	2	4		
2	B	1	Total	C	F	N	O	0	0
			30	22	2	2	4		

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total 1	Zn 1	0	0
3	B	1	Total 1	Zn 1	0	0

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).

EDO

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

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	66	Total 66	O 66	0	0
5	B	70	Total 70	O 70	0	0

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: Carbamoyl-phosphate synthase [ammonia], mitochondrial
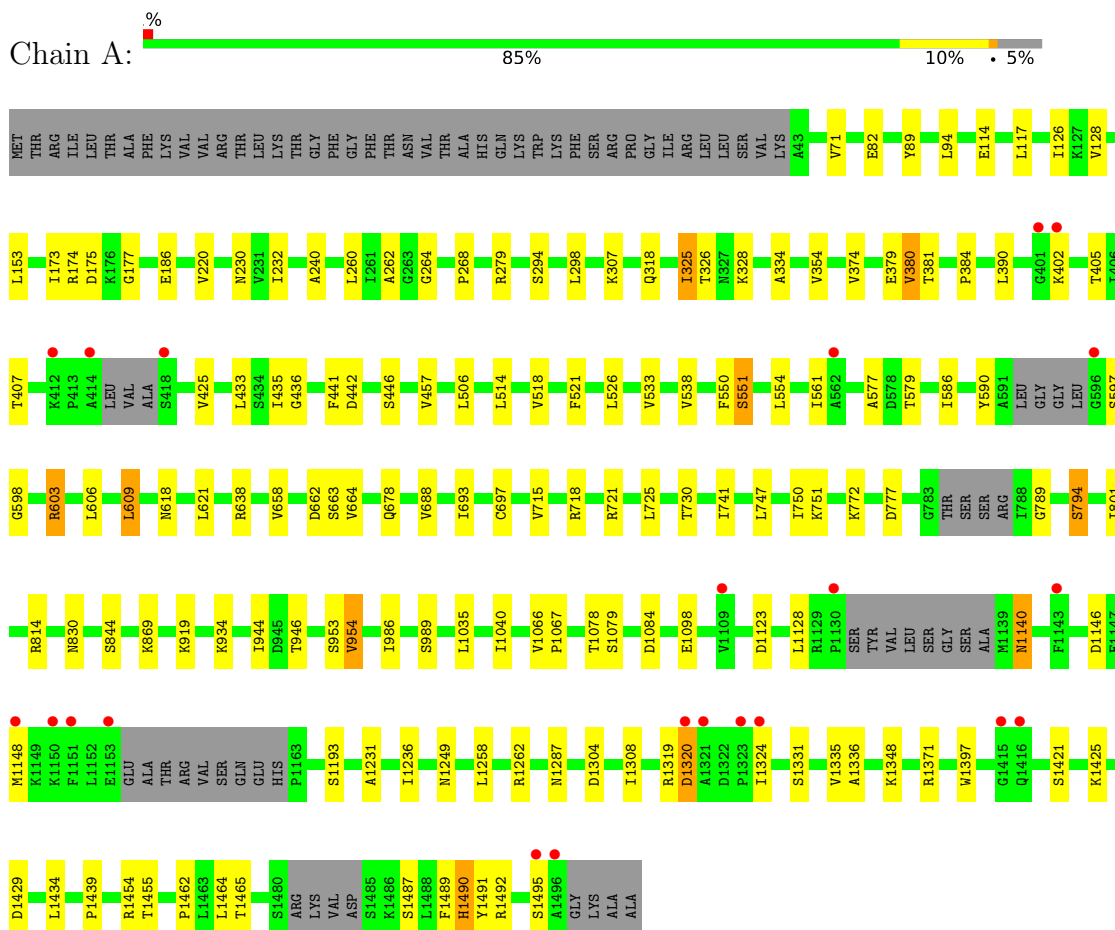
• Molecule 1: Carbamoyl-phosphate synthase [ammonia], mitochondrial
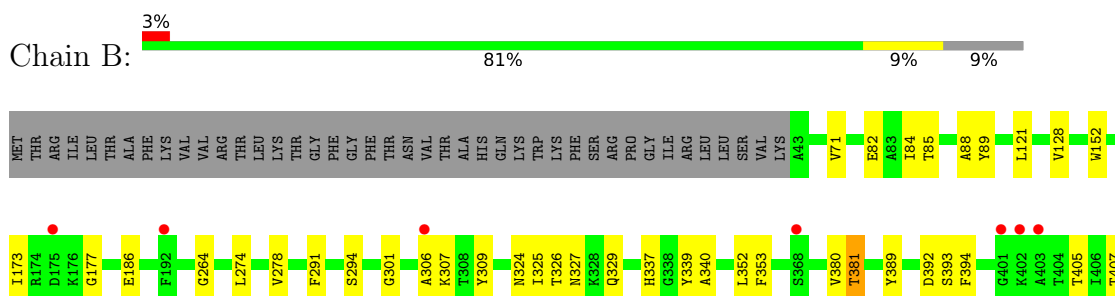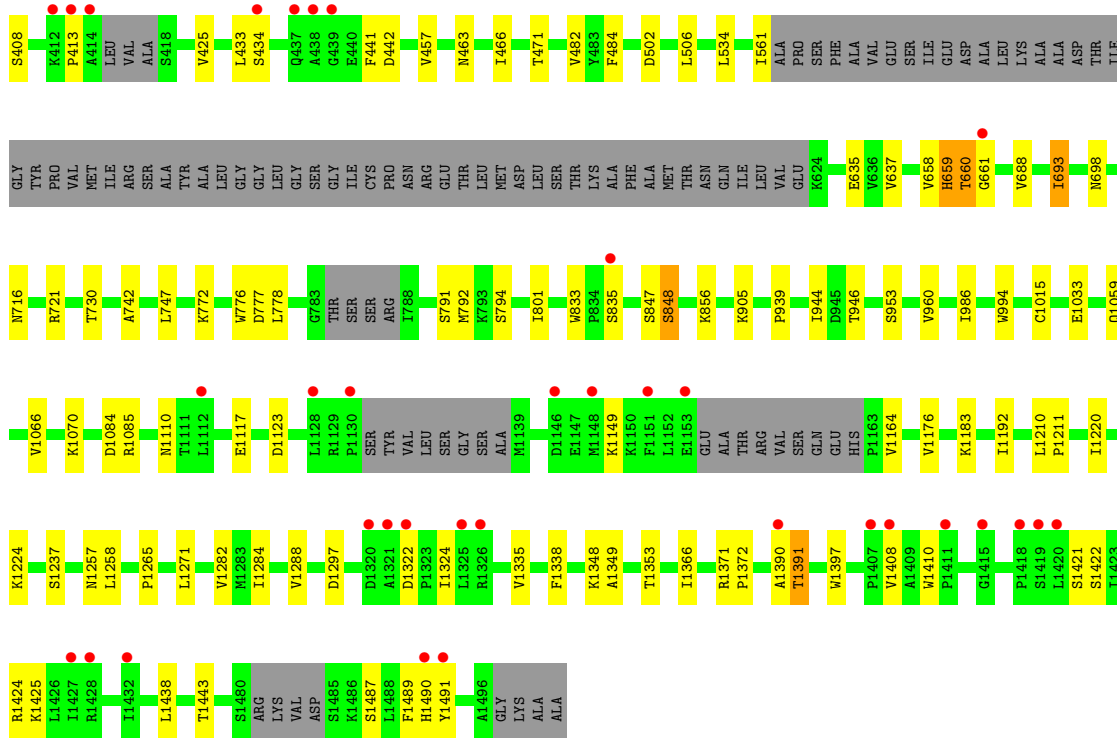
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	71.66Å 98.53Å 142.53Å 102.13° 97.94° 106.11°	Depositor
Resolution (Å)	58.96 – 2.62 58.96 – 2.62	Depositor EDS
% Data completeness (in resolution range)	96.7 (58.96-2.62) 96.7 (58.96-2.62)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.93 (at 2.61Å)	Xtriage
Refinement program	REFMAC 5.8.0158	Depositor
R, R_{free}	0.190 , 0.250 0.195 , 0.251	Depositor DCC
R_{free} test set	5170 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å^2)	45.0	Xtriage
Anisotropy	0.339	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 42.1	EDS
L-test for twinning[2]	$< |L| > = 0.51, < L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	21756	wwPDB-VP
Average B, all atoms (Å^2)	61.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.13% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5   Model quality ⓘ

5.1   Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: EDO, 374, 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	0.59	0/11205	0.77	3/15176 (0.0%)
1	B	0.58	0/10768	0.76	1/14582 (0.0%)
All	All	0.58	0/21973	0.76	4/29758 (0.0%)

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
1	A	0	3
1	B	0	2
All	All	0	5

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	1085	ARG	NE-CZ-NH1	6.88	123.74	120.30
1	A	638	ARG	NE-CZ-NH1	5.40	123.00	120.30
1	A	603	ARG	NE-CZ-NH2	5.36	122.98	120.30
1	A	1262	ARG	NE-CZ-NH2	5.35	122.97	120.30

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	597	SER	Peptide
1	A	598	GLY	Peptide

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Mol	Chain	Res	Type	Group
1	A	954	VAL	Peptide
1	B	1322	ASP	Peptide
1	B	661	GLY	Peptide

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	10992	0	11048	55	0
1	B	10562	0	10618	47	0
2	A	30	0	0	1	0
2	B	30	0	0	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	4	0	6	1	0
5	A	66	0	0	0	0
5	B	70	0	0	0	0
All	All	21756	0	21672	102	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 (102) 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:71:VAL:HG12	1:B:173:ILE:HD11	1.74	0.69
1:A:777:ASP:HB2	1:A:986:ILE:HD11	1.76	0.67
1:A:1231:ALA:HA	1:A:1236:ILE:HD12	1.79	0.63
1:A:326:THR:HG21	1:A:407:THR:HG23	1.82	0.61
1:B:425:VAL:HG23	1:B:457:VAL:HG11	1.81	0.61
1:A:554:LEU:HD12	1:A:561:ILE:HD11	1.81	0.60
1:B:425:VAL:HG23	1:B:457:VAL:CG1	2.32	0.59
1:A:268:PRO:HG3	1:A:298:LEU:HD13	1.85	0.58
1:B:291:PHE:HB2	1:B:394:PHE:CD1	2.37	0.58
1:A:518:VAL:HG22	1:A:538:VAL:HG13	1.86	0.58
1:B:1210:LEU:HD12	1:B:1211:PRO:HA	1.86	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:88:ALA:HB2	1:B:264:GLY:HA3	1.84	0.57
1:B:659:HIS:O	1:B:660:THR:HG23	2.04	0.57
1:A:551:SER:HA	1:A:561:ILE:HD13	1.87	0.57
1:B:1348:LYS:HE3	1:B:1489:PHE:CE2	2.40	0.57
1:A:561:ILE:N	1:A:561:ILE:HD12	2.20	0.57
1:A:1348:LYS:HE3	1:A:1489:PHE:CE2	2.40	0.57
1:B:801:ILE:HD13	1:B:944:ILE:HD11	1.87	0.56
1:A:741:ILE:HD11	1:A:747:LEU:HD21	1.87	0.56
1:B:324:ASN:ND2	1:B:327:ASN:HD21	2.04	0.55
1:A:554:LEU:HB2	1:A:561:ILE:HD11	1.89	0.55
1:A:71:VAL:HG12	1:A:173:ILE:HD11	1.90	0.52
1:A:1371:ARG:HB3	1:A:1397:TRP:CZ2	2.45	0.52
1:A:814:ARG:NE	4:A:1603:EDO:H11	2.25	0.52
1:B:1371:ARG:HB3	1:B:1397:TRP:CZ2	2.45	0.51
1:B:776:TRP:HE3	1:B:778:LEU:HD12	1.76	0.51
1:A:1319:ARG:HA	1:A:1320:ASP:HB2	1.93	0.51
1:A:1035:LEU:HA	1:A:1040:ILE:HD11	1.93	0.51
1:A:1078:THR:HG21	1:A:1258:LEU:HD23	1.92	0.51
1:A:688:VAL:HG13	1:A:693:ILE:HB	1.93	0.50
1:B:71:VAL:CG1	1:B:173:ILE:HD11	2.42	0.50
1:B:730:THR:O	1:B:946:THR:HG22	2.12	0.49
1:A:117:LEU:HD11	1:A:232:ILE:CG2	2.42	0.49
1:A:662:ASP:OD1	1:A:794:SER:HB2	2.12	0.49
1:B:85:THR:HG21	1:B:121:LEU:HB3	1.95	0.49
1:A:425:VAL:HG23	1:A:457:VAL:HG11	1.94	0.49
1:A:514:LEU:HD22	1:A:718:ARG:HD3	1.95	0.49
1:A:550:PHE:CZ	1:A:554:LEU:HD11	2.48	0.49
1:A:697:CYS:SG	1:A:715:VAL:HG13	2.53	0.49
1:B:534:LEU:HB3	1:B:742:ALA:HB1	1.95	0.48
1:A:425:VAL:HG23	1:A:457:VAL:CG1	2.42	0.48
1:B:89:TYR:HB3	1:B:128:VAL:HG12	1.95	0.48
1:B:1366:ILE:HG22	1:B:1438:LEU:HD12	1.95	0.48
1:B:274:LEU:O	1:B:278:VAL:HG23	2.13	0.47
1:A:747:LEU:HA	1:A:750:ILE:HD12	1.95	0.47
1:B:301:GLY:O	1:B:306:ALA:HB3	2.15	0.47
1:A:384:PRO:HA	1:A:678:GLN:OE1	2.14	0.47
1:B:352:LEU:HG	1:B:353:PHE:CD1	2.50	0.47
1:B:777:ASP:HB2	1:B:986:ILE:HD11	1.97	0.47
1:B:1176:VAL:HG13	1:B:1192:ILE:HG23	1.97	0.47
1:B:1349:ALA:O	1:B:1353:THR:HG23	2.15	0.47
1:B:1015:CYS:HB3	1:B:1033:GLU:O	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:801:ILE:HD13	1:A:944:ILE:HD11	1.96	0.46
1:B:1066:VAL:O	1:B:1070:LYS:HG3	2.15	0.46
1:A:325:ILE:HD11	1:A:354:VAL:HB	1.98	0.45
1:A:380:VAL:HG11	1:A:384:PRO:O	2.17	0.45
1:B:1371:ARG:HB2	1:B:1372:PRO:HD3	1.99	0.45
1:A:82:GLU:HG2	1:A:381:THR:HG22	1.99	0.44
1:B:309:TYR:CZ	1:B:340:ALA:HB3	2.51	0.44
1:A:326:THR:CG2	1:A:407:THR:HG23	2.47	0.44
1:A:89:TYR:HB3	1:A:128:VAL:HG12	1.99	0.44
1:B:994:TRP:CE3	1:B:1265:PRO:HG3	2.52	0.44
1:B:1220:ILE:HG22	1:B:1224:LYS:HE2	2.00	0.44
1:A:590:TYR:CE1	1:A:1454:ARG:HD2	2.53	0.44
1:B:1390:ALA:O	1:B:1408:VAL:HG22	2.18	0.44
1:A:586:ILE:HD11	1:A:609:LEU:HB3	1.99	0.43
1:B:635:GLU:OE2	1:B:698:ASN:ND2	2.48	0.43
1:A:1439:PRO:HD3	1:A:1465:THR:O	2.18	0.43
1:B:637:VAL:HG12	1:B:747:LEU:HD11	1.99	0.43
1:A:1434:LEU:HD12	1:A:1462:PRO:O	2.18	0.43
1:A:117:LEU:HD11	1:A:232:ILE:HG21	2.00	0.43
1:A:725:LEU:HD22	1:A:772:LYS:HD3	1.98	0.43
1:B:84:ILE:HD11	1:B:152:TRP:CZ3	2.53	0.43
1:A:89:TYR:CE1	1:A:94:LEU:HD13	2.54	0.43
1:B:833:TRP:NE1	1:B:856:LYS:HD2	2.34	0.43
1:B:82:GLU:HG2	1:B:381:THR:HG22	1.99	0.43
1:B:463:ASN:O	1:B:484:PHE:HA	2.19	0.43
1:B:1391:THR:HG21	1:B:1410:TRP:CD2	2.54	0.43
1:A:664:VAL:HG21	2:A:1601:374:C2	2.48	0.42
1:B:1183:LYS:HG3	1:B:1282:VAL:HG13	2.01	0.42
1:B:337:HIS:ND1	1:B:339:TYR:O	2.43	0.42
1:A:577:ALA:HB2	1:A:606:LEU:HD13	2.01	0.42
1:B:847:SER:O	1:B:848:SER:CB	2.67	0.42
1:B:939:PRO:HB2	1:B:960:VAL:CG1	2.49	0.42
1:A:521:PHE:HB2	1:A:526:LEU:HD12	2.02	0.42
1:A:730:THR:O	1:A:946:THR:HG22	2.20	0.42
1:A:1434:LEU:HD11	1:A:1464:LEU:HG	2.02	0.41
1:A:533:VAL:HG21	1:A:538:VAL:HG23	2.01	0.41
1:A:260:LEU:HD21	1:A:262:ALA:HB2	2.03	0.41
1:A:318:GLN:HA	1:A:334:ALA:HA	2.01	0.41
1:B:688:VAL:HG13	1:B:693:ILE:HB	2.03	0.41
1:A:374:VAL:HG11	1:A:390:LEU:HD13	2.02	0.41
1:B:471:THR:HG21	1:B:482:VAL:HG11	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:126:ILE:HD13	1:A:153:LEU:HD23	2.02	0.41
1:B:466:ILE:HD13	1:B:1338:PHE:CZ	2.56	0.41
1:B:833:TRP:CD1	1:B:856:LYS:HD2	2.56	0.41
1:A:220:VAL:HG23	1:A:240:ALA:HB1	2.03	0.41
1:A:230:ASN:HB3	1:A:379:GLU:HB2	2.03	0.41
1:B:392:ASP:O	1:B:393:SER:C	2.59	0.41
1:A:1066:VAL:HB	1:A:1067:PRO:HD3	2.03	0.40
1:A:1308:ILE:O	1:A:1336:ALA:HA	2.21	0.40
1:A:1140:ASN:HD22	1:A:1140:ASN:N	2.19	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	1408/1500 (94%)	1330 (94%)	62 (4%)	16 (1%)	14	27
1	B	1350/1500 (90%)	1277 (95%)	62 (5%)	11 (1%)	19	36
All	All	2758/3000 (92%)	2607 (94%)	124 (4%)	27 (1%)	15	30

All (27) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1490	HIS
1	A	1491	TYR
1	A	1495	SER
1	B	693	ILE
1	B	1490	HIS
1	A	175	ASP
1	A	177	GLY
1	A	325	ILE
1	A	1320	ASP

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Mol	Chain	Res	Type
1	B	389	TYR
1	B	413	PRO
1	B	1491	TYR
1	A	264	GLY
1	A	294	SER
1	A	380	VAL
1	A	1123	ASP
1	B	177	GLY
1	B	326	THR
1	B	380	VAL
1	B	1123	ASP
1	A	174	ARG
1	A	663	SER
1	B	294	SER
1	A	789	GLY
1	A	435	ILE
1	B	325	ILE
1	A	436	GLY

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	1210/1274 (95%)	1159 (96%)	51 (4%)	30	53
1	B	1164/1274 (91%)	1115 (96%)	49 (4%)	30	53
All	All	2374/2548 (93%)	2274 (96%)	100 (4%)	30	53

All (100) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	114	GLU
1	A	186	GLU
1	A	279	ARG
1	A	307	LYS
1	A	328	LYS

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Mol	Chain	Res	Type
1	A	402	LYS
1	A	405	THR
1	A	433	LEU
1	A	441	PHE
1	A	442	ASP
1	A	446	SER
1	A	506	LEU
1	A	551	SER
1	A	579	THR
1	A	603	ARG
1	A	609	LEU
1	A	618	ASN
1	A	621	LEU
1	A	658	VAL
1	A	721	ARG
1	A	751	LYS
1	A	794	SER
1	A	830	ASN
1	A	844	SER
1	A	869	LYS
1	A	919	LYS
1	A	934	LYS
1	A	953	SER
1	A	954	VAL
1	A	989	SER
1	A	1079	SER
1	A	1084	ASP
1	A	1098	GLU
1	A	1128	LEU
1	A	1140	ASN
1	A	1146	ASP
1	A	1148	MET
1	A	1193	SER
1	A	1249	ASN
1	A	1287	ASN
1	A	1304	ASP
1	A	1324	ILE
1	A	1331	SER
1	A	1335	VAL
1	A	1421	SER
1	A	1425	LYS
1	A	1429	ASP

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Mol	Chain	Res	Type
1	A	1455	THR
1	A	1487	SER
1	A	1490	HIS
1	A	1492	ARG
1	B	186	GLU
1	B	307	LYS
1	B	329	GLN
1	B	381	THR
1	B	405	THR
1	B	407	THR
1	B	408	SER
1	B	433	LEU
1	B	434	SER
1	B	441	PHE
1	B	442	ASP
1	B	502	ASP
1	B	506	LEU
1	B	561	ILE
1	B	658	VAL
1	B	659	HIS
1	B	660	THR
1	B	716	ASN
1	B	721	ARG
1	B	772	LYS
1	B	791	SER
1	B	792	MET
1	B	794	SER
1	B	835	SER
1	B	848	SER
1	B	905	LYS
1	B	953	SER
1	B	1059	GLN
1	B	1084	ASP
1	B	1110	ASN
1	B	1117	GLU
1	B	1149	LYS
1	B	1164	VAL
1	B	1237	SER
1	B	1257	ASN
1	B	1258	LEU
1	B	1271	LEU
1	B	1284	ILE

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Mol	Chain	Res	Type
1	B	1288	VAL
1	B	1297	ASP
1	B	1324	ILE
1	B	1335	VAL
1	B	1391	THR
1	B	1421	SER
1	B	1422	SER
1	B	1424	ARG
1	B	1425	LYS
1	B	1443	THR
1	B	1487	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1103	GLN
1	A	1140	ASN
1	A	1243	GLN
1	A	1382	HIS
1	B	324	ASN
1	B	329	GLN
1	B	478	GLN
1	B	1359	GLN
1	B	1442	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 5 ligands modelled in this entry, 2 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	$\#|Z| > 2$
4	EDO	A	1603	-	3,3,3	0.81	0	2,2,2	0.67	0
2	374	B	1601	-	32,32,32	2.29	4 (12%)	40,46,46	1.71	10 (25%)
2	374	A	1601	-	32,32,32	2.03	5 (15%)	40,46,46	1.57	7 (17%)

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
4	EDO	A	1603	-	-	1/1/1/1	-
2	374	B	1601	-	-	0/20/36/36	0/3/3/3
2	374	A	1601	-	-	4/20/36/36	0/3/3/3

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1601	374	C14-C13	-8.05	1.38	1.50
2	A	1601	374	C5-C6	-6.96	1.39	1.50
2	A	1601	374	C14-C13	-6.90	1.40	1.50
2	B	1601	374	C5-C6	-6.65	1.40	1.50
2	B	1601	374	F1-C20	-6.39	1.19	1.35
2	A	1601	374	C8-N2	-2.49	1.46	1.48
2	B	1601	374	C5-C21	2.22	1.41	1.38
2	A	1601	374	C7-N1	2.19	1.49	1.46
2	A	1601	374	F2-C21	2.12	1.41	1.35

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	1601	374	C5-C6-N1	4.17	124.94	118.28
2	B	1601	374	C5-C6-N1	4.15	124.91	118.28
2	B	1601	374	C15-C14-C20	3.97	121.18	116.67
2	B	1601	374	C19-C20-C14	-3.36	119.95	123.53
2	A	1601	374	C22-C21-C5	-3.26	120.06	123.53
2	B	1601	374	F2-C21-C5	3.04	124.82	119.67
2	B	1601	374	C22-C21-C5	-3.01	120.32	123.53
2	A	1601	374	C15-C14-C20	2.98	120.06	116.67
2	A	1601	374	C19-C20-C14	-2.81	120.54	123.53
2	A	1601	374	O2-C6-C5	-2.79	114.43	120.06
2	A	1601	374	F2-C21-C5	2.75	124.34	119.67
2	B	1601	374	O2-C6-C5	-2.74	114.53	120.06
2	B	1601	374	C12-N1-C6	-2.23	116.36	122.44
2	B	1601	374	C11-C10-N2	-2.17	108.62	112.30
2	A	1601	374	C12-N1-C6	-2.13	116.63	122.44
2	B	1601	374	C4-C5-C21	2.11	119.06	116.67
2	B	1601	374	O3-C13-C14	-2.05	115.92	120.06

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1603	EDO	O1-C1-C2-O2
2	A	1601	374	C3-C2-O1-C1
2	A	1601	374	C22-C2-O1-C1
2	A	1601	374	C16-C17-O4-C18
2	A	1601	374	C19-C17-O4-C18

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1603	EDO	1	0
2	A	1601	374	1	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 then 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.

Ligand 374 B 1601

Bond lengths

Bond angles

Torsions

Rings

Ligand 374 A 1601

Bond lengths

Bond angles

Torsions

Rings
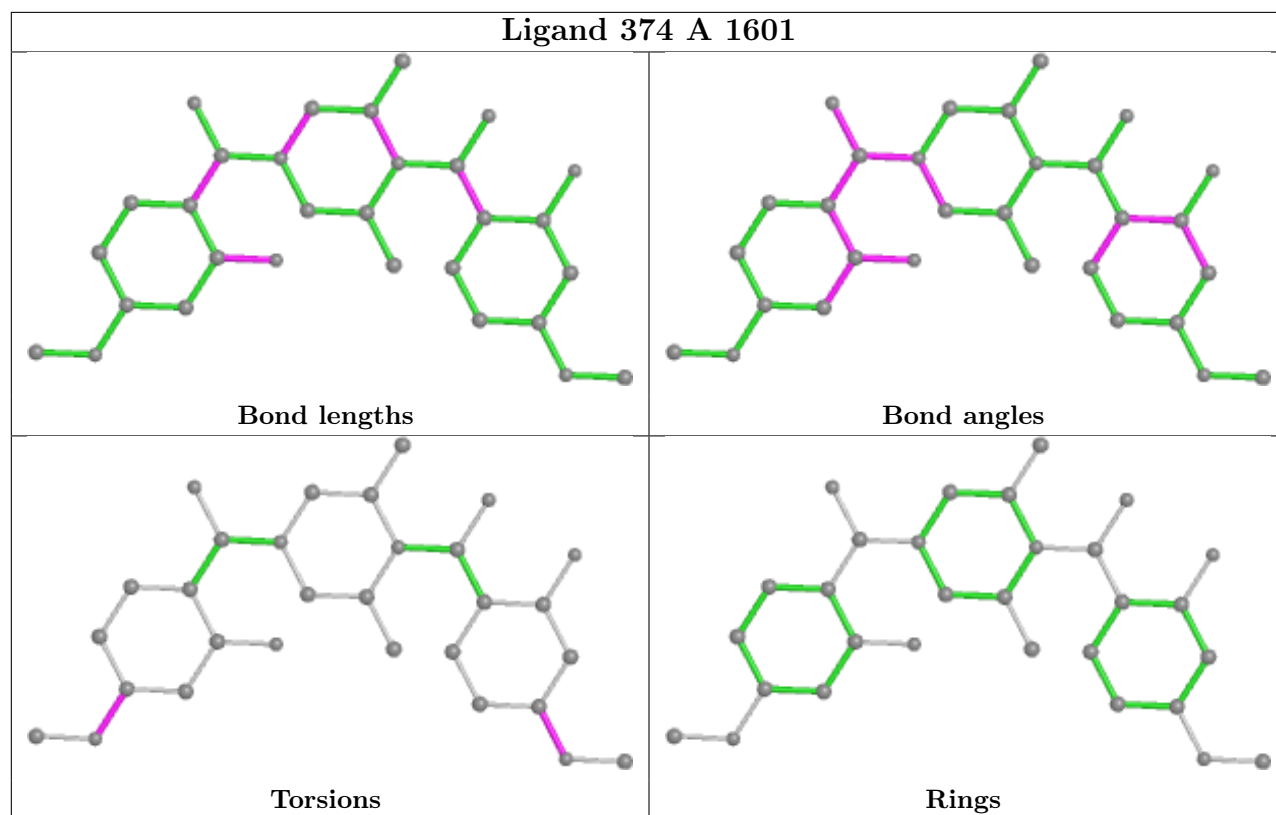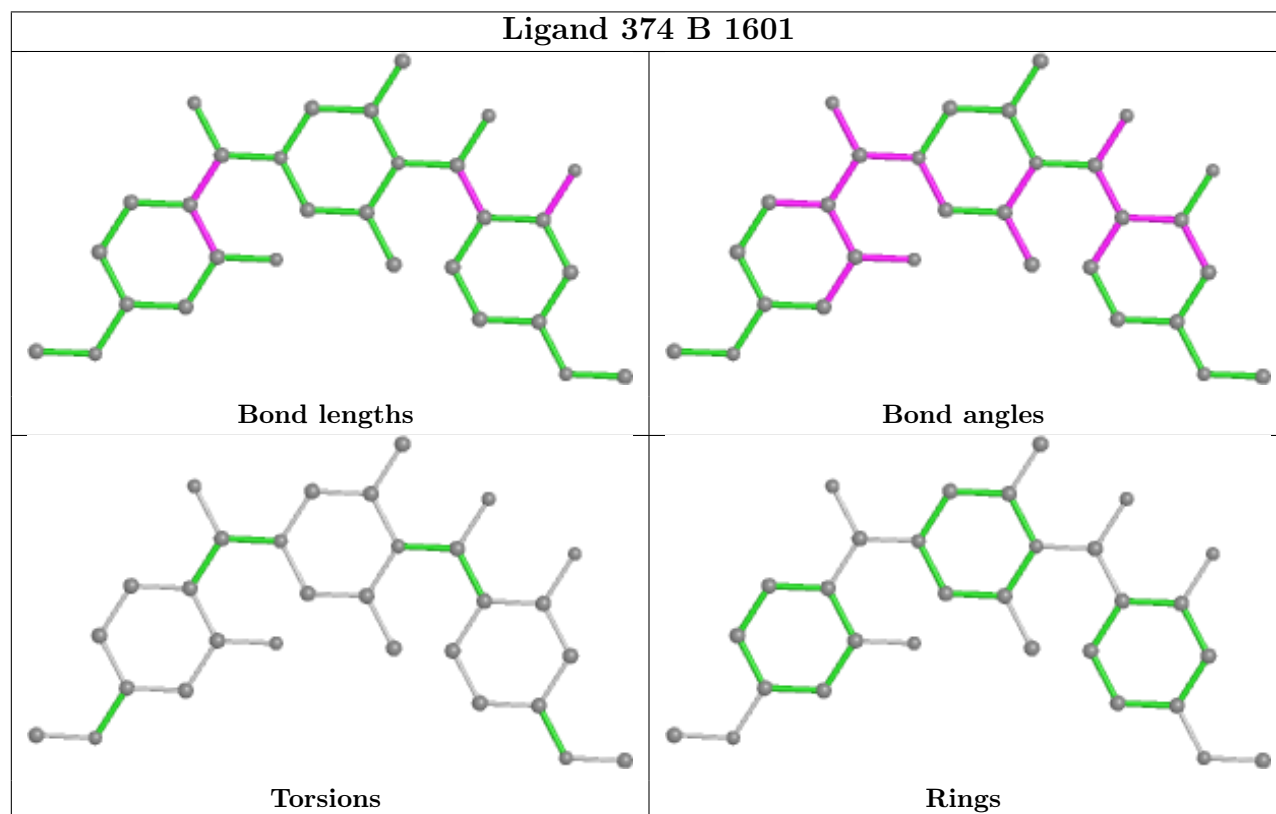
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6　Fit of model and data ⓘ

6.1　Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	1422/1500 (94%)	-0.30	22 (1%)	73	70	34, 55, 103, 162	0
1	B	1364/1500 (90%)	-0.18	41 (3%)	50	44	36, 56, 105, 193	0
All	All	2786/3000 (92%)	-0.24	63 (2%)	60	55	34, 56, 104, 193	0

All (63) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	1321	ALA	8.7
1	B	413	PRO	6.2
1	A	1148	MET	5.9
1	B	439	GLY	5.7
1	A	596	GLY	5.3
1	A	1323	PRO	5.3
1	A	1415	GLY	5.1
1	B	1153	GLU	4.9
1	B	1130	PRO	4.8
1	B	401	GLY	4.8
1	B	412	LYS	4.5
1	B	437	GLN	4.4
1	A	1324	ILE	4.3
1	A	414	ALA	4.2
1	B	835	SER	3.7
1	A	1320	ASP	3.7
1	B	1148	MET	3.6
1	B	1490	HIS	3.5
1	A	401	GLY	3.5
1	A	1496	ALA	3.5
1	B	1320	ASP	3.4
1	B	1326	ARG	3.3
1	B	414	ALA	3.3
1	B	1112	LEU	3.2

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Mol	Chain	Res	Type	RSRZ
1	A	1151	PHE	3.2
1	A	1150	LYS	3.2
1	B	403	ALA	3.1
1	A	1153	GLU	3.0
1	B	661	GLY	2.9
1	B	438	ALA	2.8
1	B	1415	GLY	2.8
1	B	1146	ASP	2.7
1	B	1420	LEU	2.7
1	B	368	SER	2.7
1	B	1322	ASP	2.6
1	B	1408	VAL	2.6
1	A	1143	PHE	2.6
1	B	434	SER	2.6
1	B	1128	LEU	2.5
1	B	1427	ILE	2.5
1	A	1109	VAL	2.5
1	B	1428	ARG	2.4
1	B	1432	ILE	2.4
1	A	412	LYS	2.4
1	B	1491	TYR	2.3
1	B	1407	PRO	2.3
1	B	1411	PRO	2.3
1	B	402	LYS	2.3
1	A	1495	SER	2.3
1	A	1416	GLN	2.3
1	A	402	LYS	2.2
1	B	1151	PHE	2.2
1	A	1321	ALA	2.2
1	A	418	SER	2.1
1	B	1419	SER	2.1
1	A	562	ALA	2.1
1	B	1325	LEU	2.1
1	B	1390	ALA	2.1
1	A	1130	PRO	2.1
1	B	1418	PRO	2.0
1	B	306	ALA	2.0
1	B	175	ASP	2.0
1	B	192	PHE	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 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
2	374	B	1601	30/30	0.97	0.14	40,44,47,48	0
4	EDO	A	1603	4/4	0.97	0.14	42,48,48,49	0
3	ZN	B	1602	1/1	0.98	0.10	74,74,74,74	0
2	374	A	1601	30/30	0.98	0.14	37,43,46,48	0
3	ZN	A	1602	1/1	0.99	0.12	60,60,60,60	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 374 B 1601:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
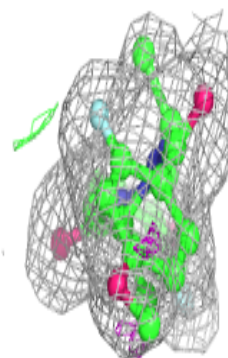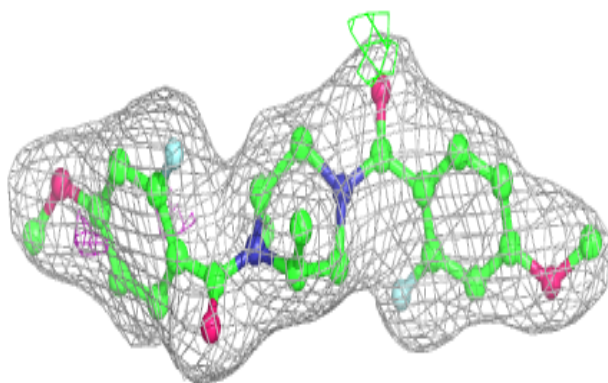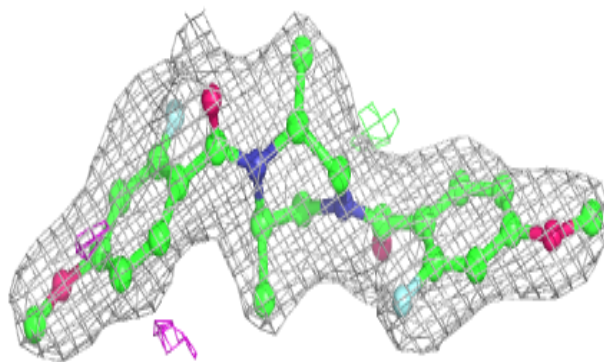
Electron density around 374 A 1601:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
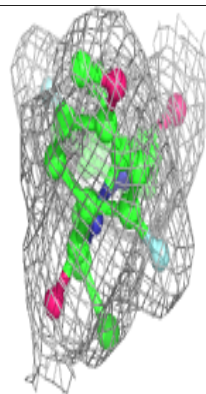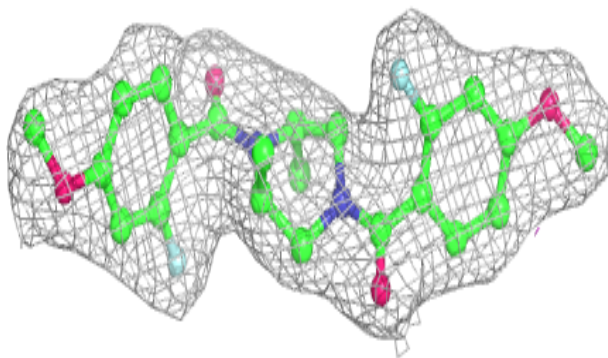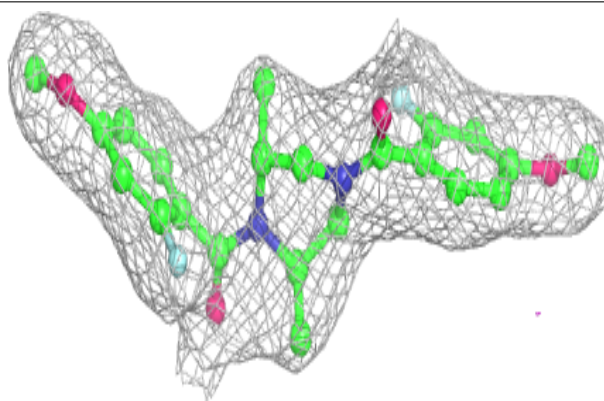
6.5 Other polymers (i)

There are no such residues in this entry.