Full wwPDB X-ray Structure Validation Report ⓘ

May 28, 2020 – 02:20 am BST

PDB ID	:	5NCL
Title	:	Crystal structure of the Cbk1-Mob2 kinase-coactivator complex with an SSD1 peptide
Authors	:	Gogl, G.; Remenyi, A.; Parker, B.; Weiss, E.
Deposited on	:	2017-03-06
Resolution	:	3.15 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 following versions of software and data (see references ⓘ) were used in the production of this report:

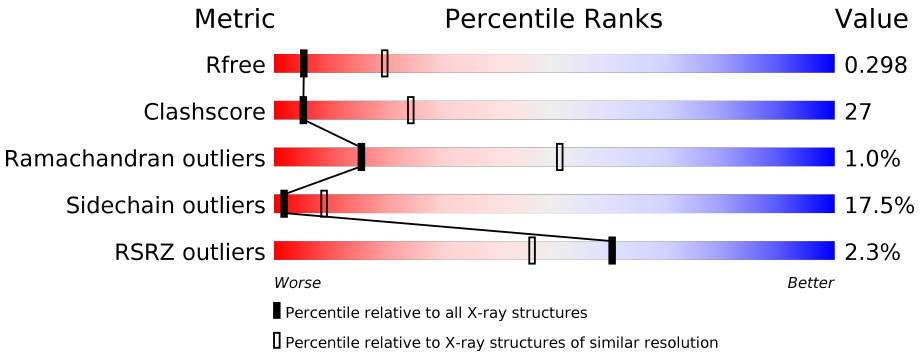
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.11
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

1 Overall quality at a glance (i)

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

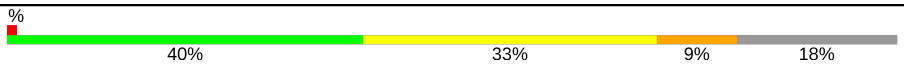
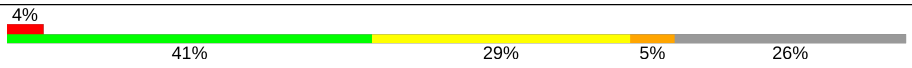
The reported resolution of this entry is 3.15 Å.

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	1665 (3.20-3.12)
Clashscore	141614	1804 (3.20-3.12)
Ramachandran outliers	138981	1770 (3.20-3.12)
Sidechain outliers	138945	1769 (3.20-3.12)
RSRZ outliers	127900	1616 (3.20-3.12)

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 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	508	
2	B	244	
3	D	10	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 4746 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 CBK1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	418	Total	C	N	O	S	0	0	0
			3292	2102	568	610	12			

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	249	GLY	-	expression tag	UNP P53894
A	250	SER	-	expression tag	UNP P53894
A	475	ALA	ASP	engineered mutation	UNP P53894

- Molecule 2 is a protein called CBK1 kinase activator protein MOB2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	181	Total	C	N	O	S	0	0	0
			1383	912	224	244	3			

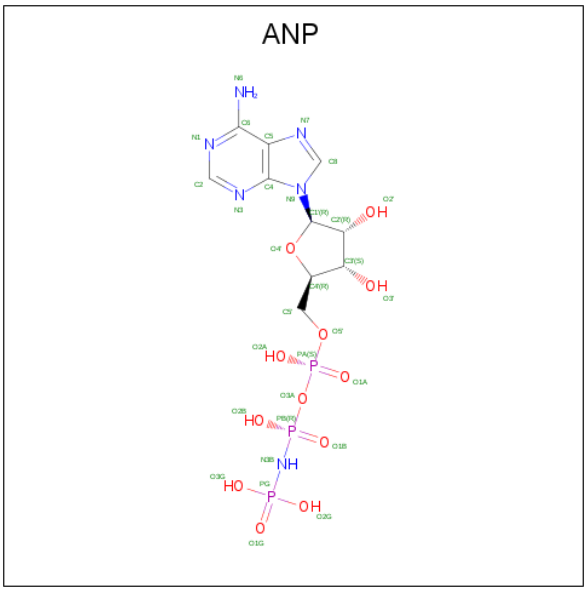
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	44	GLY	-	expression tag	UNP P43563
B	45	SER	-	expression tag	UNP P43563

- Molecule 3 is a protein called Protein SSD1.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	D	5	Total	C	N	O	0	0	0
			40	29	5	6			

- Molecule 4 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (three-letter code: ANP) (formula: $C_{10}H_{17}N_6O_{12}P_3$).



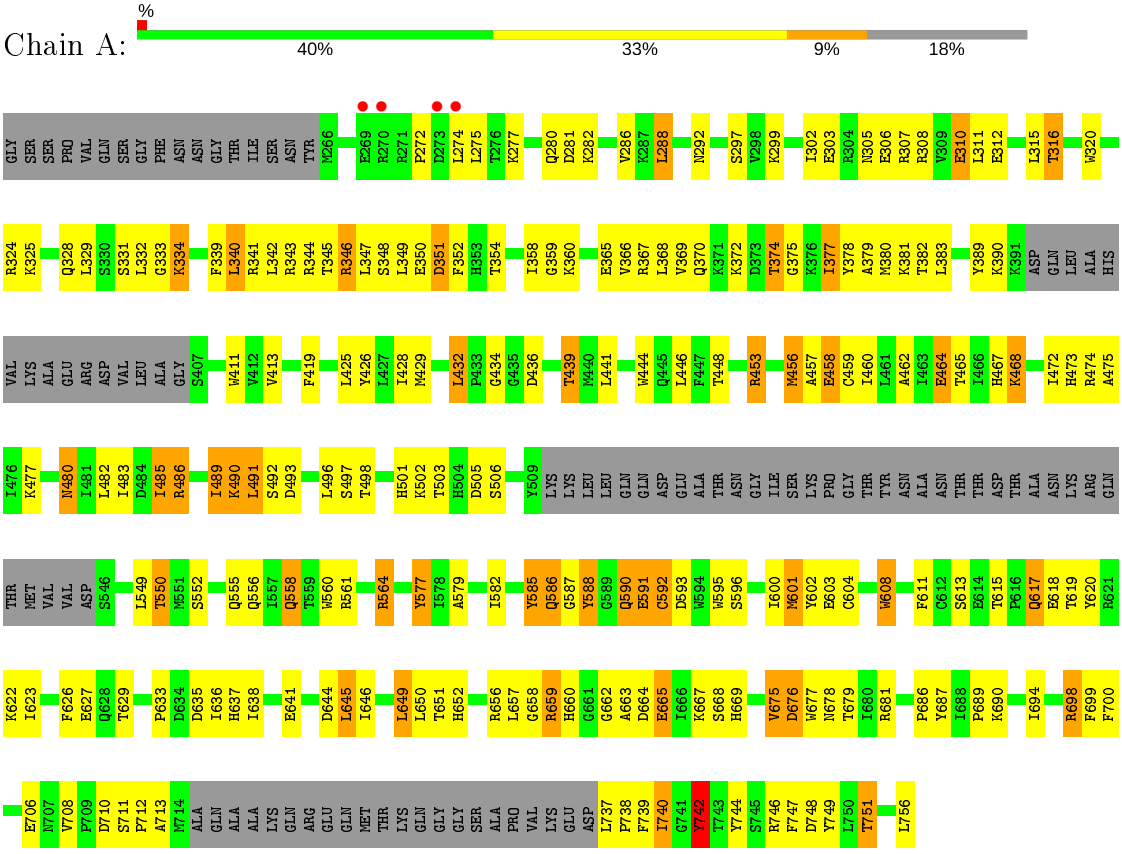
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
4	A	1	31	10	6	12	3	0	0

3 Residue-property plots (i)

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.

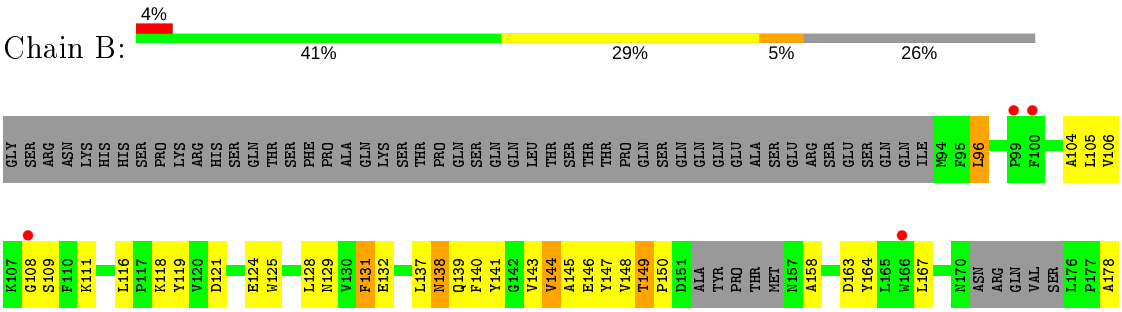
- Molecule 1: Serine/threonine-protein kinase CBK1

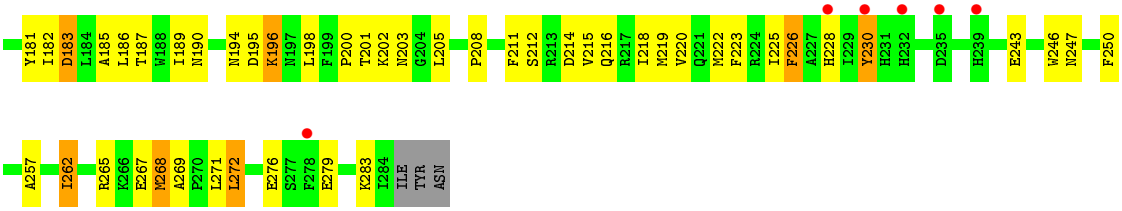
Chain A:



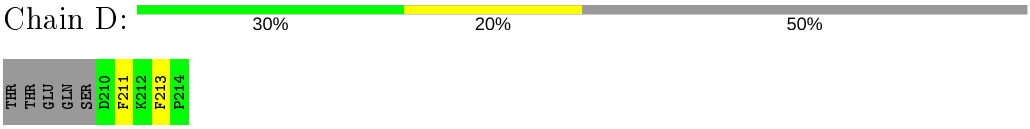
- Molecule 2: CBK1 kinase activator protein MOB2

Chain B:





- Molecule 3: Protein SSD1



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	138.43Å 79.99Å 117.59Å 90.00° 117.60° 90.00°	Depositor
Resolution (Å)	44.59 – 3.15 44.60 – 3.15	Depositor EDS
% Data completeness (in resolution range)	99.9 (44.59-3.15) 99.9 (44.60-3.15)	Depositor EDS
R_{merge}	0.17	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.03 (at 3.12Å)	Xtriage
Refinement program	PHENIX (dev_2420: ???)	Depositor
R, R_{free}	0.233 , 0.298 0.233 , 0.298	Depositor DCC
R_{free} test set	1000 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	80.4	Xtriage
Anisotropy	0.420	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.26 , 73.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	4746	wwPDB-VP
Average B, all atoms (Å^2)	96.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.86% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: ANP

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	0.57	2/3370 (0.1%)	0.74	1/4568 (0.0%)
2	B	0.40	0/1426	0.54	1/1950 (0.1%)
3	D	0.55	0/42	0.40	0/55
All	All	0.53	2/4838 (0.0%)	0.69	2/6573 (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

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	459	CYS	CB-SG	-5.89	1.72	1.81
1	A	592	CYS	CB-SG	-5.62	1.72	1.81

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	96	LEU	CA-CB-CG	6.47	130.19	115.30
1	A	649	LEU	CB-CG-CD1	-6.32	100.25	111.00

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	635	ASP	Peptide
1	A	712	PRO	Peptide
1	A	742	TYR	Peptide

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3292	0	3101	185	0
2	B	1383	0	1239	68	0
3	D	40	0	28	2	0
4	A	31	0	13	5	0
All	All	4746	0	4381	244	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 27.

All (244) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:591:GLU:HG2	1:A:659:ARG:HG2	1.54	0.87
2:B:212:SER:O	2:B:216:GLN:NE2	2.09	0.85
2:B:223:PHE:HA	2:B:226:PHE:HB2	1.60	0.84
1:A:348:SER:HG	1:A:737:LEU:N	1.75	0.84
1:A:552:SER:HA	1:A:555:GLN:HB2	1.65	0.79
1:A:737:LEU:HD11	2:B:196:LYS:NZ	1.96	0.79
1:A:595:TRP:HB2	1:A:656:ARG:NH1	2.01	0.75
1:A:367:ARG:HB2	1:A:380:MET:HB3	1.69	0.73
1:A:636:ILE:O	1:A:638:ILE:N	2.22	0.72
1:A:586:GLN:NE2	1:A:586:GLN:O	2.22	0.72
1:A:344:ARG:HG3	2:B:131:PHE:HD2	1.56	0.70
1:A:277:LYS:HA	1:A:280:GLN:HB2	1.72	0.69
1:A:561:ARG:NE	1:A:564:ARG:HH12	1.89	0.69
2:B:182:ILE:HD11	2:B:228:HIS:CD2	2.28	0.68
1:A:344:ARG:HG3	2:B:131:PHE:CD2	2.28	0.68
1:A:645:LEU:HG	1:A:669:HIS:CD2	2.29	0.68
1:A:434:GLY:HA3	1:A:483:ILE:HB	1.74	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:627:GLU:OE2	1:A:652:HIS:NE2	2.27	0.67
1:A:411:TRP:CZ3	1:A:458:GLU:HG3	2.30	0.67
1:A:485:ILE:H	1:A:485:ILE:HD13	1.60	0.67
1:A:690:LYS:O	1:A:698:ARG:NH2	2.27	0.67
1:A:457:ALA:HA	1:A:460:ILE:HD12	1.75	0.67
1:A:453:ARG:HB2	1:A:453:ARG:HH11	1.60	0.67
1:A:432:LEU:HD21	1:A:490:LYS:HE2	1.77	0.66
1:A:737:LEU:HD11	2:B:196:LYS:HZ3	1.60	0.66
2:B:276:GLU:HA	2:B:279:GLU:HG3	1.78	0.66
1:A:585:TYR:CE1	1:A:587:GLY:HA3	2.31	0.65
2:B:185:ALA:HB3	2:B:225:ILE:HD11	1.79	0.65
2:B:149:THR:HB	2:B:150:PRO:HD2	1.79	0.64
1:A:585:TYR:CZ	1:A:587:GLY:HA3	2.33	0.64
1:A:658:GLY:N	1:A:665:GLU:OE1	2.28	0.63
2:B:208:PRO:HD2	2:B:211:PHE:HB2	1.80	0.63
1:A:662:GLY:HA2	1:A:665:GLU:HB3	1.81	0.63
1:A:552:SER:OG	1:A:552:SER:O	2.17	0.63
1:A:370:GLN:HG3	1:A:375:GLY:HA2	1.80	0.62
1:A:561:ARG:HE	1:A:564:ARG:HH12	1.46	0.62
2:B:125:TRP:O	2:B:129:ASN:ND2	2.33	0.62
1:A:595:TRP:CH2	1:A:611:PHE:HE2	2.18	0.61
1:A:742:TYR:HB3	1:A:744:TYR:CE1	2.35	0.61
1:A:708:VAL:O	1:A:710:ASP:N	2.32	0.61
1:A:626:PHE:HA	1:A:629:THR:OG1	2.00	0.61
1:A:425:LEU:HD22	1:A:426:TYR:H	1.64	0.61
1:A:315:LEU:HD13	1:A:325:LYS:HA	1.83	0.61
1:A:462:ALA:HB1	1:A:491:LEU:HD22	1.83	0.60
2:B:140:PHE:O	2:B:143:VAL:HG12	2.01	0.60
2:B:189:ILE:HG23	2:B:218:ILE:HG23	1.84	0.60
1:A:303:GLU:HB2	1:A:307:ARG:NH1	2.18	0.59
1:A:316:THR:HG23	1:A:325:LYS:NZ	2.17	0.59
2:B:146:GLU:HB3	2:B:147:TYR:CD1	2.38	0.59
1:A:346:ARG:HD2	2:B:194:ASN:OD1	2.02	0.59
1:A:382:THR:O	1:A:383:LEU:HD23	2.02	0.59
3:D:211:PHE:CE1	3:D:213:PHE:HB2	2.39	0.58
1:A:737:LEU:HD11	2:B:196:LYS:HZ1	1.65	0.58
1:A:347:LEU:HD22	1:A:351:ASP:OD2	2.03	0.58
1:A:303:GLU:HA	1:A:306:GLU:HB2	1.86	0.58
1:A:603:GLU:HA	1:A:608:TRP:O	2.04	0.58
1:A:556:GLN:OE1	1:A:556:GLN:N	2.37	0.58
1:A:436:ASP:OD1	1:A:439:THR:N	2.36	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:613:SER:OG	1:A:622:LYS:HE3	2.04	0.57
2:B:109:SER:O	2:B:111:LYS:N	2.37	0.57
1:A:453:ARG:HH11	1:A:453:ARG:CB	2.16	0.57
1:A:602:TYR:HH	1:A:608:TRP:HZ3	1.51	0.57
1:A:664:ASP:HB2	1:A:667:LYS:HD2	1.87	0.57
2:B:268:MET:O	2:B:272:LEU:N	2.38	0.57
1:A:496:LEU:O	1:A:497:SER:OG	2.23	0.56
1:A:675:VAL:C	1:A:677:TRP:H	2.07	0.56
2:B:196:LYS:HD2	2:B:201:THR:HG23	1.88	0.56
1:A:286:VAL:HG22	2:B:139:GLN:HG2	1.87	0.56
1:A:591:GLU:HG2	1:A:659:ARG:CG	2.31	0.56
2:B:223:PHE:HE1	2:B:271:LEU:HD12	1.68	0.56
1:A:501:HIS:CG	1:A:502:LYS:H	2.22	0.56
1:A:358:ILE:HD11	1:A:368:LEU:HB2	1.88	0.56
1:A:676:ASP:OD1	1:A:676:ASP:N	2.22	0.56
1:A:649:LEU:HD23	1:A:657:LEU:HB3	1.88	0.55
2:B:163:ASP:OD1	2:B:164:TYR:N	2.39	0.55
1:A:411:TRP:O	1:A:490:LYS:HB2	2.06	0.55
1:A:462:ALA:O	1:A:465:THR:OG1	2.21	0.55
1:A:425:LEU:HD22	1:A:426:TYR:N	2.22	0.55
1:A:619:THR:O	1:A:623:ILE:HG13	2.07	0.55
2:B:183:ASP:O	2:B:187:THR:OG1	2.16	0.55
1:A:315:LEU:HD11	1:A:328:GLN:HB2	1.88	0.54
1:A:345:THR:HB	1:A:742:TYR:HE1	1.73	0.54
1:A:595:TRP:CH2	1:A:611:PHE:CE2	2.96	0.53
1:A:346:ARG:HB3	1:A:740:ILE:HA	1.91	0.53
1:A:473:HIS:CE1	1:A:475:ALA:HB3	2.44	0.53
1:A:602:TYR:OH	1:A:608:TRP:HZ3	1.91	0.53
2:B:141:TYR:CE1	2:B:148:VAL:HG21	2.43	0.53
1:A:444:TRP:CH2	1:A:687:TYR:HB2	2.44	0.53
1:A:742:TYR:HB3	1:A:744:TYR:CD1	2.43	0.53
1:A:485:ILE:H	1:A:485:ILE:CD1	2.20	0.53
2:B:182:ILE:HG23	2:B:225:ILE:HD13	1.91	0.53
1:A:308:ARG:HA	1:A:332:LEU:HD21	1.91	0.52
1:A:477:LYS:HG3	1:A:480:ASN:HB2	1.91	0.52
1:A:651:THR:OG1	1:A:652:HIS:N	2.41	0.52
1:A:419:PHE:HA	1:A:739:PHE:HE2	1.74	0.52
1:A:467:HIS:CG	1:A:590:GLN:HG2	2.43	0.52
1:A:316:THR:HG23	1:A:325:LYS:HZ1	1.73	0.52
1:A:593:ASP:O	1:A:596:SER:OG	2.25	0.52
1:A:358:ILE:HB	1:A:366:VAL:HG13	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:358:ILE:HG23	1:A:700:PHE:CD1	2.45	0.52
2:B:178:ALA:O	2:B:182:ILE:HG13	2.09	0.51
1:A:501:HIS:CG	1:A:502:LYS:N	2.79	0.51
1:A:383:LEU:HD12	1:A:425:LEU:HD12	1.91	0.51
2:B:222:MET:O	2:B:226:PHE:N	2.33	0.51
1:A:646:ILE:HG22	1:A:650:LEU:HD22	1.93	0.51
1:A:622:LYS:HA	1:A:629:THR:HG21	1.93	0.51
1:A:458:GLU:HG2	1:A:489:ILE:HG22	1.92	0.50
1:A:486:ARG:NH1	1:A:681:ARG:O	2.44	0.50
1:A:342:LEU:O	1:A:345:THR:N	2.36	0.50
2:B:141:TYR:HA	2:B:144:VAL:HG22	1.93	0.50
2:B:182:ILE:O	2:B:186:LEU:HB2	2.11	0.50
2:B:141:TYR:O	2:B:145:ALA:N	2.45	0.50
1:A:600:ILE:O	1:A:603:GLU:N	2.44	0.50
1:A:561:ARG:HG2	1:A:564:ARG:NH2	2.27	0.49
1:A:307:ARG:HH21	1:A:746:ARG:HD3	1.76	0.49
2:B:226:PHE:CE1	2:B:250:PHE:HD1	2.30	0.49
1:A:275:LEU:O	1:A:280:GLN:HG3	2.11	0.49
4:A:801:ANP:H8	4:A:801:ANP:H5'2	1.93	0.49
1:A:305:ASN:HA	1:A:308:ARG:NH2	2.27	0.49
1:A:349:LEU:C	1:A:351:ASP:H	2.16	0.49
1:A:582:ILE:HG12	1:A:588:TYR:CD2	2.48	0.49
1:A:456:MET:HE3	1:A:456:MET:HA	1.95	0.48
1:A:746:ARG:O	1:A:749:TYR:HB3	2.13	0.48
2:B:186:LEU:HA	2:B:189:ILE:HD12	1.94	0.48
2:B:141:TYR:CZ	2:B:148:VAL:HG21	2.49	0.48
1:A:288:LEU:HD23	1:A:288:LEU:HA	1.70	0.48
2:B:230:TYR:CZ	2:B:246:TRP:NE1	2.81	0.48
1:A:359:GLY:H	1:A:366:VAL:HG12	1.78	0.48
2:B:138:ASN:ND2	2:B:138:ASN:O	2.40	0.48
1:A:331:SER:O	1:A:334:LYS:HB3	2.14	0.48
1:A:464:GLU:OE1	1:A:468:LYS:NZ	2.47	0.48
1:A:601:MET:HE1	1:A:645:LEU:HD13	1.96	0.47
1:A:307:ARG:NE	1:A:746:ARG:HG2	2.28	0.47
1:A:644:ASP:C	1:A:644:ASP:OD1	2.53	0.47
1:A:369:VAL:HG23	1:A:378:TYR:HB2	1.95	0.47
1:A:483:ILE:HG12	1:A:489:ILE:HD11	1.97	0.47
1:A:627:GLU:OE2	1:A:652:HIS:CE1	2.67	0.47
1:A:359:GLY:N	1:A:366:VAL:HG12	2.30	0.47
1:A:748:ASP:HA	1:A:751:THR:CG2	2.45	0.47
1:A:675:VAL:CG1	1:A:677:TRP:H	2.27	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:675:VAL:C	1:A:677:TRP:N	2.68	0.47
1:A:747:PHE:O	1:A:751:THR:HG22	2.14	0.47
2:B:200:PRO:HB3	2:B:205:LEU:HD12	1.96	0.47
2:B:223:PHE:CE1	2:B:271:LEU:HD12	2.48	0.47
1:A:346:ARG:O	1:A:347:LEU:HD23	2.15	0.47
1:A:595:TRP:HH2	1:A:611:PHE:CE2	2.32	0.47
1:A:659:ARG:HD3	1:A:660:HIS:ND1	2.30	0.47
1:A:458:GLU:HG2	1:A:489:ILE:HB	1.96	0.46
1:A:483:ILE:HG12	1:A:489:ILE:CD1	2.46	0.46
1:A:676:ASP:C	1:A:678:ASN:H	2.18	0.46
1:A:307:ARG:HA	1:A:310:GLU:HB3	1.97	0.46
1:A:411:TRP:C	1:A:490:LYS:HB2	2.35	0.46
1:A:601:MET:HG2	1:A:646:ILE:HG12	1.97	0.46
1:A:315:LEU:O	1:A:325:LYS:HE2	2.16	0.46
1:A:472:ILE:O	1:A:472:ILE:HG13	2.16	0.46
1:A:352:PHE:O	1:A:372:LYS:HE3	2.15	0.46
1:A:311:LEU:HD23	1:A:332:LEU:HD22	1.98	0.46
1:A:374:THR:HG23	1:A:375:GLY:H	1.81	0.46
1:A:675:VAL:O	1:A:677:TRP:N	2.49	0.46
4:A:801:ANP:O1A	4:A:801:ANP:O1G	2.33	0.46
1:A:303:GLU:C	1:A:307:ARG:NH1	2.70	0.45
1:A:555:GLN:HB3	1:A:556:GLN:OE1	2.17	0.45
1:A:377:ILE:HG12	1:A:377:ILE:O	2.16	0.45
1:A:458:GLU:HG2	1:A:489:ILE:CG2	2.47	0.45
4:A:801:ANP:O2G	4:A:801:ANP:O2B	2.35	0.45
2:B:182:ILE:HD11	2:B:228:HIS:CG	2.52	0.45
2:B:195:ASP:OD2	2:B:198:LEU:HG	2.17	0.45
2:B:269:ALA:HA	2:B:272:LEU:HB2	1.97	0.45
1:A:641:GLU:N	1:A:641:GLU:OE2	2.50	0.44
1:A:687:TYR:HE2	1:A:699:PHE:CE2	2.35	0.44
2:B:129:ASN:HA	2:B:132:GLU:HB2	1.99	0.44
1:A:737:LEU:N	1:A:738:PRO:HD2	2.33	0.44
1:A:379:ALA:N	1:A:429:MET:O	2.37	0.44
1:A:381:LYS:HE3	4:A:801:ANP:O2A	2.17	0.44
2:B:141:TYR:CE1	2:B:182:ILE:HD12	2.53	0.44
1:A:350:GLU:O	1:A:372:LYS:HD2	2.17	0.44
2:B:158:ALA:HB3	2:B:163:ASP:CG	2.38	0.44
2:B:211:PHE:O	2:B:215:VAL:HG23	2.18	0.44
1:A:350:GLU:HA	1:A:372:LYS:NZ	2.32	0.43
1:A:681:ARG:HH11	1:A:681:ARG:HG2	1.83	0.43
1:A:472:ILE:HG22	1:A:590:GLN:HG3	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:474:ARG:HB3	1:A:474:ARG:CZ	2.47	0.43
1:A:329:LEU:HD23	1:A:329:LEU:HA	1.74	0.43
1:A:339:PHE:CE2	1:A:746:ARG:HA	2.53	0.43
1:A:579:ALA:HA	1:A:595:TRP:CE3	2.53	0.43
1:A:615:THR:OG1	1:A:618:GLU:HG3	2.19	0.43
1:A:582:ILE:HD11	1:A:592:CYS:SG	2.59	0.43
1:A:617:GLN:O	1:A:620:TYR:HB3	2.18	0.43
2:B:106:VAL:O	2:B:108:GLY:N	2.52	0.43
1:A:441:LEU:HD21	1:A:604:CYS:HB3	2.00	0.43
1:A:608:TRP:CH2	1:A:633:PRO:HG3	2.54	0.43
2:B:104:ALA:O	2:B:105:LEU:HB2	2.19	0.43
1:A:686:PRO:HA	3:D:211:PHE:CD2	2.54	0.43
1:A:561:ARG:HG2	1:A:564:ARG:HH22	1.84	0.43
1:A:464:GLU:HG2	1:A:663:ALA:HB1	2.01	0.43
2:B:186:LEU:HA	2:B:186:LEU:HD23	1.84	0.43
2:B:198:LEU:HA	2:B:208:PRO:HG2	2.00	0.43
1:A:556:GLN:C	1:A:558:GLN:N	2.72	0.42
2:B:265:ARG:HA	2:B:268:MET:SD	2.58	0.42
2:B:198:LEU:C	2:B:200:PRO:HD3	2.39	0.42
1:A:341:ARG:NH2	2:B:200:PRO:O	2.50	0.42
1:A:341:ARG:NH1	2:B:203:ASN:O	2.46	0.42
1:A:432:LEU:HD23	1:A:483:ILE:C	2.40	0.42
2:B:137:LEU:O	2:B:140:PHE:HB2	2.20	0.42
1:A:482:LEU:HD12	1:A:492:SER:HB3	2.01	0.42
1:A:601:MET:CE	1:A:645:LEU:HD13	2.48	0.42
2:B:190:ASN:OD1	2:B:194:ASN:ND2	2.53	0.42
1:A:460:ILE:HG13	1:A:460:ILE:H	1.71	0.42
1:A:292:ASN:N	1:A:292:ASN:OD1	2.52	0.42
1:A:315:LEU:HD23	1:A:315:LEU:HA	1.82	0.42
1:A:498:THR:CG2	4:A:801:ANP:HNB1	2.33	0.41
2:B:243:GLU:O	2:B:247:ASN:HB2	2.20	0.41
1:A:649:LEU:O	1:A:656:ARG:HD3	2.20	0.41
1:A:333:GLY:HA3	2:B:119:TYR:O	2.20	0.41
2:B:124:GLU:OE2	2:B:124:GLU:HA	2.20	0.41
1:A:475:ALA:O	1:A:477:LYS:HG2	2.20	0.41
1:A:491:LEU:HD12	1:A:491:LEU:HA	1.88	0.41
1:A:577:TYR:O	1:A:596:SER:HB3	2.20	0.41
1:A:645:LEU:HG	1:A:669:HIS:CG	2.55	0.41
1:A:602:TYR:HB2	1:A:646:ILE:HG21	2.02	0.41
2:B:106:VAL:HG13	2:B:106:VAL:O	2.20	0.41
2:B:216:GLN:O	2:B:220:VAL:HG22	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:262:ILE:H	2:B:262:ILE:HG12	1.60	0.41
1:A:342:LEU:HD22	1:A:749:TYR:CD1	2.56	0.41
1:A:413:VAL:HG22	1:A:432:LEU:HD13	2.03	0.41
1:A:308:ARG:CD	2:B:118:LYS:HB3	2.50	0.41
1:A:377:ILE:HG21	1:A:694:ILE:O	2.21	0.41
1:A:489:ILE:HD12	1:A:489:ILE:HA	1.71	0.41
2:B:196:LYS:HA	2:B:196:LYS:HD3	1.83	0.41
2:B:219:MET:CE	2:B:257:ALA:HB2	2.49	0.41
1:A:550:THR:HG21	1:A:555:GLN:HG3	2.02	0.41
1:A:687:TYR:CE2	1:A:689:PRO:HA	2.55	0.41
2:B:121:ASP:OD1	2:B:121:ASP:N	2.54	0.41
1:A:675:VAL:HG13	1:A:676:ASP:N	2.35	0.41
1:A:339:PHE:CD2	1:A:746:ARG:HD2	2.55	0.41
1:A:340:LEU:HB3	2:B:128:LEU:HD22	2.03	0.41
1:A:360:LYS:HE2	1:A:706:GLU:HA	2.03	0.41
1:A:282:LYS:CB	2:B:143:VAL:HG23	2.51	0.40
1:A:664:ASP:CB	1:A:667:LYS:HD2	2.51	0.40
1:A:675:VAL:HG13	1:A:677:TRP:H	1.85	0.40
2:B:140:PHE:O	2:B:144:VAL:HG13	2.21	0.40
1:A:320:TRP:HB3	1:A:324:ARG:HD3	2.03	0.40
1:A:444:TRP:CZ2	1:A:687:TYR:HB2	2.56	0.40
1:A:312:GLU:HG3	1:A:329:LEU:HD21	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	410/508 (81%)	316 (77%)	88 (22%)	6 (2%)	10 41
2	B	175/244 (72%)	146 (83%)	29 (17%)	0	100 100
3	D	3/10 (30%)	2 (67%)	1 (33%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	588/762 (77%)	464 (79%)	118 (20%)	6 (1%)	15 51

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	637	HIS
1	A	274	LEU
1	A	713	ALA
1	A	390	LYS
1	A	505	ASP
1	A	272	PRO

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	333/449 (74%)	270 (81%)	63 (19%)	1 7
2	B	133/223 (60%)	114 (86%)	19 (14%)	3 14
3	D	3/10 (30%)	3 (100%)	0	100 100
All	All	469/682 (69%)	387 (82%)	82 (18%)	2 9

All (82) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	281	ASP
1	A	288	LEU
1	A	297	SER
1	A	299	LYS
1	A	302	ILE
1	A	310	GLU
1	A	316	THR
1	A	334	LYS
1	A	340	LEU
1	A	343	ARG

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Mol	Chain	Res	Type
1	A	346	ARG
1	A	351	ASP
1	A	354	THR
1	A	365	GLU
1	A	374	THR
1	A	377	ILE
1	A	389	TYR
1	A	428	ILE
1	A	432	LEU
1	A	439	THR
1	A	446	LEU
1	A	448	THR
1	A	453	ARG
1	A	456	MET
1	A	458	GLU
1	A	464	GLU
1	A	468	LYS
1	A	480	ASN
1	A	485	ILE
1	A	486	ARG
1	A	489	ILE
1	A	490	LYS
1	A	491	LEU
1	A	493	ASP
1	A	503	THR
1	A	506	SER
1	A	549	LEU
1	A	550	THR
1	A	558	GLN
1	A	560	TRP
1	A	564	ARG
1	A	577	TYR
1	A	585	TYR
1	A	586	GLN
1	A	588	TYR
1	A	590	GLN
1	A	591	GLU
1	A	601	MET
1	A	608	TRP
1	A	617	GLN
1	A	645	LEU
1	A	659	ARG

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Mol	Chain	Res	Type
1	A	665	GLU
1	A	668	SER
1	A	675	VAL
1	A	676	ASP
1	A	679	THR
1	A	698	ARG
1	A	711	SER
1	A	740	ILE
1	A	742	TYR
1	A	751	THR
1	A	756	LEU
2	B	96	LEU
2	B	116	LEU
2	B	131	PHE
2	B	138	ASN
2	B	144	VAL
2	B	149	THR
2	B	167	LEU
2	B	181	TYR
2	B	183	ASP
2	B	196	LYS
2	B	202	LYS
2	B	214	ASP
2	B	226	PHE
2	B	230	TYR
2	B	262	ILE
2	B	267	GLU
2	B	268	MET
2	B	272	LEU
2	B	283	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	129	ASN
2	B	216	GLN
2	B	233	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 carbohydrates in this entry.

5.6 Ligand geometry (i)

1 ligand is 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	ANP	A	801	-	29,33,33	0.94	1 (3%)	31,52,52	1.29	3 (9%)

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	ANP	A	801	-	-	4/14/38/38	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	801	ANP	PG-O1G	2.57	1.50	1.46

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	801	ANP	O1B-PB-N3B	-4.56	105.05	111.77
4	A	801	ANP	PA-O3A-PB	-2.89	122.44	132.62
4	A	801	ANP	C5-C6-N6	2.21	123.70	120.35

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	801	ANP	PB-N3B-PG-O1G
4	A	801	ANP	C5'-O5'-PA-O1A
4	A	801	ANP	C5'-O5'-PA-O2A
4	A	801	ANP	C5'-O5'-PA-O3A

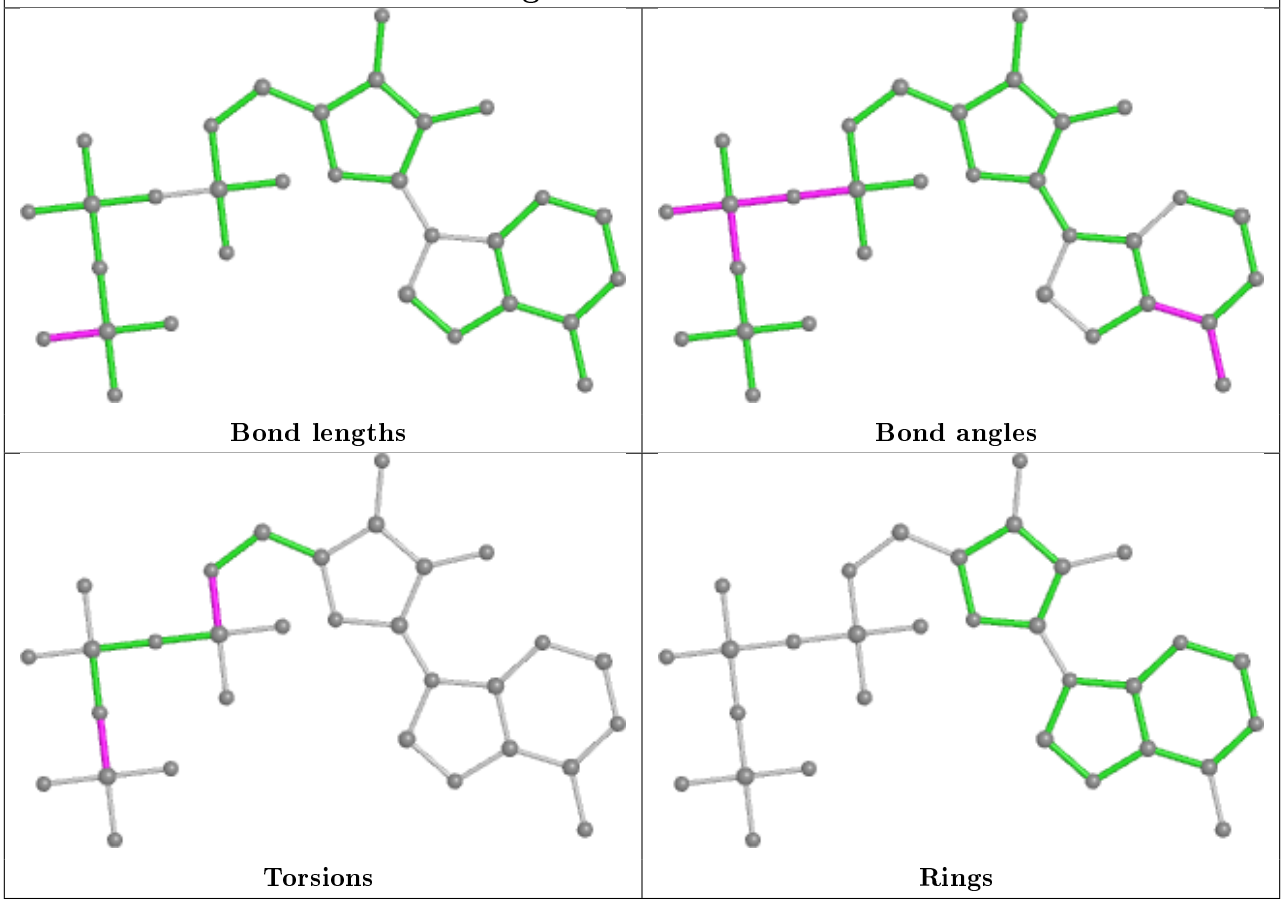
There are no ring outliers.

1 monomer is involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	801	ANP	5	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 ANP A 801



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, 95^{th} 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	418/508 (82%)	-0.31	4 (0%) 82 73	35, 73, 145, 194	0
2	B	181/244 (74%)	0.04	10 (5%) 25 13	82, 137, 184, 209	0
3	D	5/10 (50%)	-0.22	0 100 100	58, 64, 82, 91	0
All	All	604/762 (79%)	-0.20	14 (2%) 60 46	35, 94, 172, 209	0

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	166	TRP	3.7
1	A	274	LEU	3.6
1	A	270	ARG	3.4
2	B	99	PRO	3.4
2	B	278	PHE	2.7
2	B	235	ASP	2.6
2	B	100	PHE	2.6
2	B	108	GLY	2.6
1	A	269	GLU	2.4
2	B	232	HIS	2.4
2	B	230	TYR	2.3
2	B	228	HIS	2.2
2	B	239	HIS	2.1
1	A	273	ASP	2.1

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)

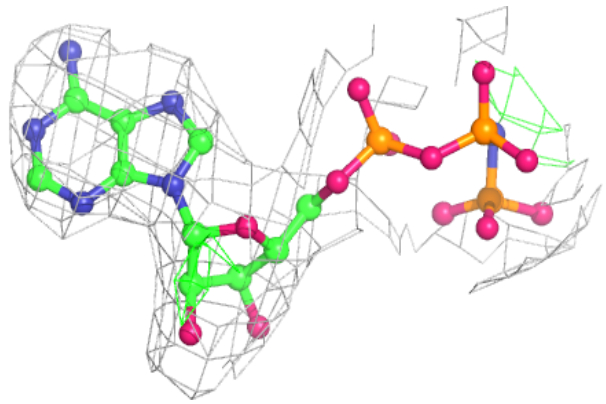
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

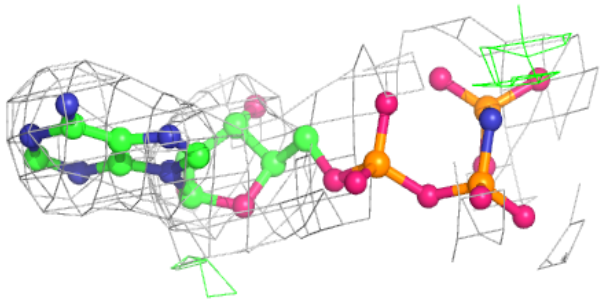
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	ANP	A	801	31/31	0.91	0.22	54,81,130,131	0

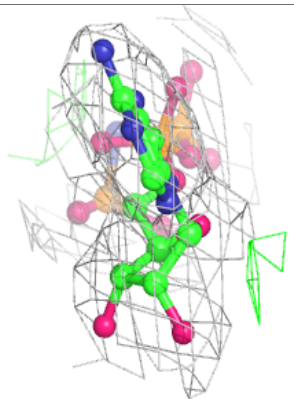
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around ANP A 801:

$2mF_o$-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.