



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 18, 2026 – 12:27 AM UTC

PDB ID : 5XIG / pdb_00005xig
Title : Crystal Structure of Toxoplasma gondii Prolyl-tRNA Synthetase (TgPRS) in complex with Inhibitor 1
Authors : Jain, V.; Manickam, Y.; Sharma, A.
Deposited on : 2017-04-26
Resolution : 2.41 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

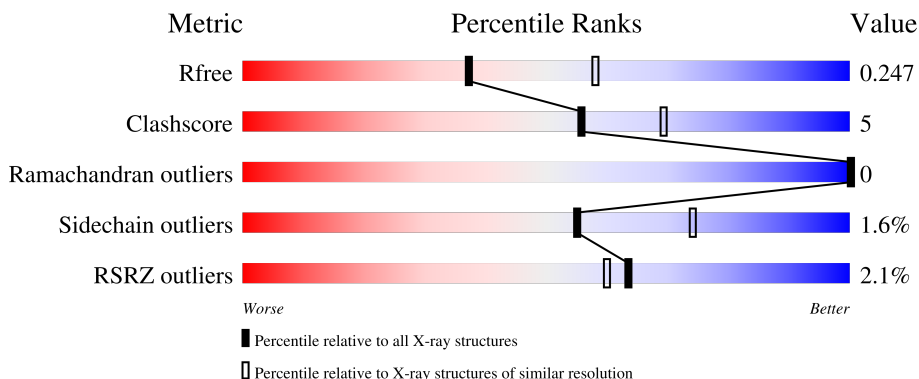
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

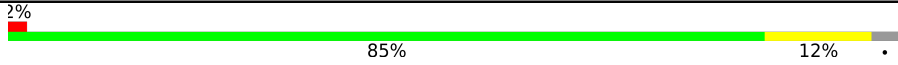
The reported resolution of this entry is 2.41 Å.

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	6062 (2.44-2.40)
Clashscore	190562	6562 (2.44-2.40)
Ramachandran outliers	187476	6481 (2.44-2.40)
Sidechain outliers	187428	6482 (2.44-2.40)
RSRZ outliers	180081	6066 (2.44-2.40)

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	500	
1	B	500	
1	C	500	
1	D	500	

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 16302 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.

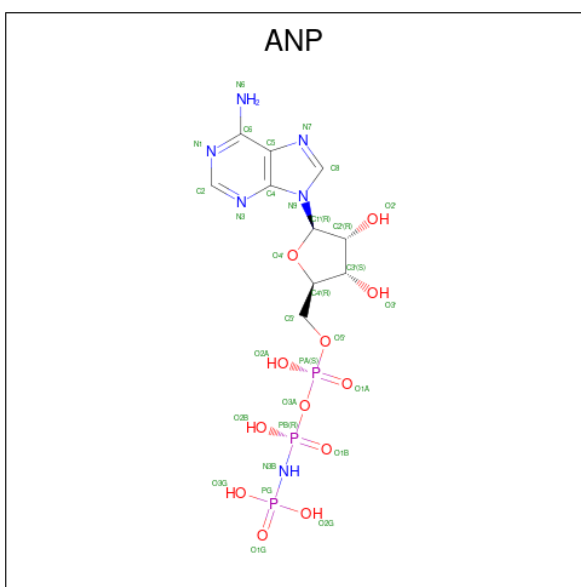
- Molecule 1 is a protein called Prolyl-tRNA synthetase (ProRS).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	486	Total	C	N	O	S	0	5	0
			3994	2567	683	722	22			
1	B	478	Total	C	N	O	S	0	4	0
			3927	2524	676	705	22			
1	C	477	Total	C	N	O	S	0	2	0
			3881	2496	664	699	22			
1	D	478	Total	C	N	O	S	0	0	0
			3861	2480	662	698	21			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	331	GLY	-	expression tag	UNP S8G8I1
A	332	ALA	-	expression tag	UNP S8G8I1
A	333	MET	-	expression tag	UNP S8G8I1
B	331	GLY	-	expression tag	UNP S8G8I1
B	332	ALA	-	expression tag	UNP S8G8I1
B	333	MET	-	expression tag	UNP S8G8I1
C	331	GLY	-	expression tag	UNP S8G8I1
C	332	ALA	-	expression tag	UNP S8G8I1
C	333	MET	-	expression tag	UNP S8G8I1
D	331	GLY	-	expression tag	UNP S8G8I1
D	332	ALA	-	expression tag	UNP S8G8I1
D	333	MET	-	expression tag	UNP S8G8I1

- Molecule 2 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (CCD ID: ANP) (formula: C₁₀H₁₇N₆O₁₂P₃).

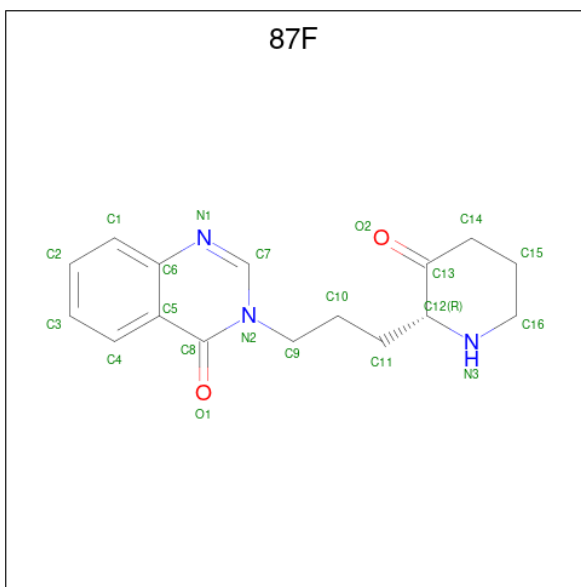


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	B	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	C	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
2	D	1	Total	C	N	O	P	0	0
			31	10	6	12	3		

- Molecule 3 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total	Mg	0	0
			2	2		
3	B	2	Total	Mg	0	0
			2	2		
3	C	2	Total	Mg	0	0
			2	2		
3	D	2	Total	Mg	0	0
			2	2		

- Molecule 4 is 3-[3-[(2R)-3-oxidanylidene-piperidin-2-yl]propyl]quinazolin-4-one (CCD ID: 87F) (formula: C₁₆H₁₉N₃O₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			21	16	3	2		
4	B	1	Total	C	N	O	0	0
			21	16	3	2		
4	C	1	Total	C	N	O	0	0
			21	16	3	2		
4	D	1	Total	C	N	O	0	0
			21	16	3	2		

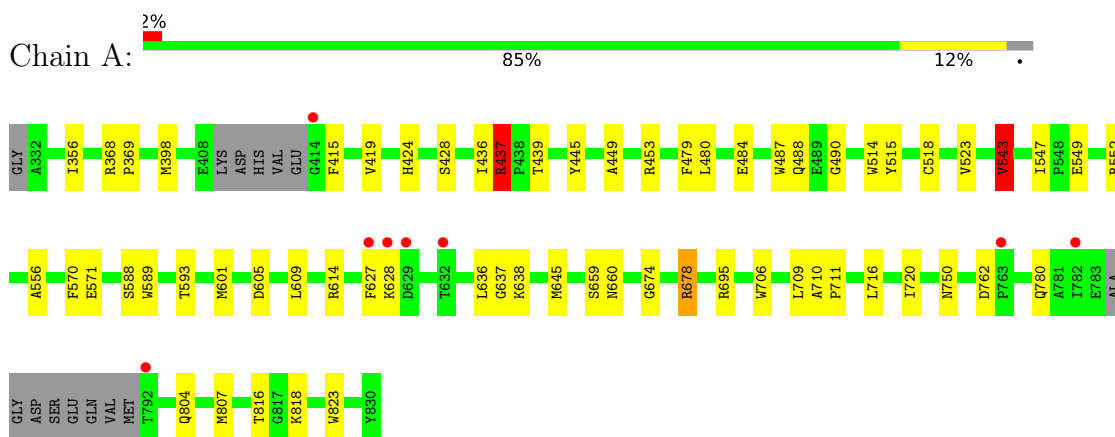
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	154	Total	O	0	1
			155	155		
5	B	87	Total	O	0	1
			88	88		
5	C	94	Total	O	0	1
			95	95		
5	D	83	Total	O	0	2
			85	85		

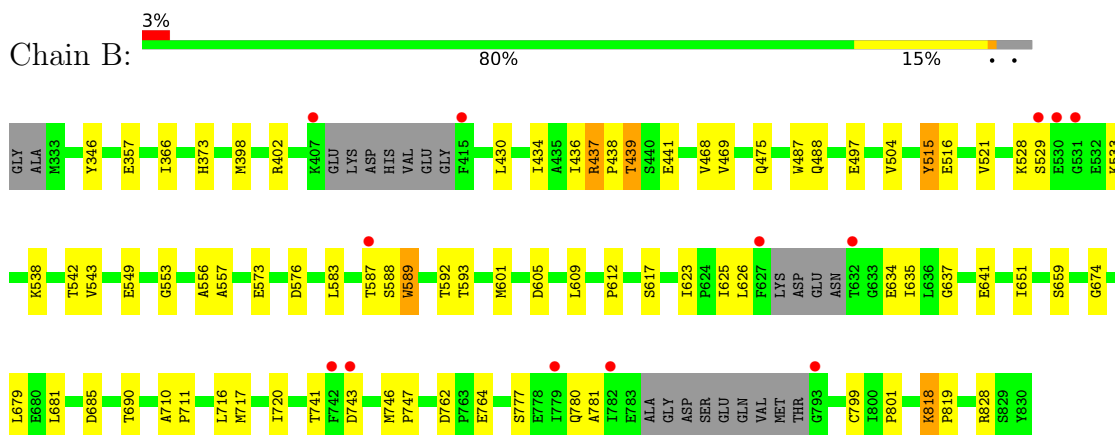
3 Residue-property plots [i](#)

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

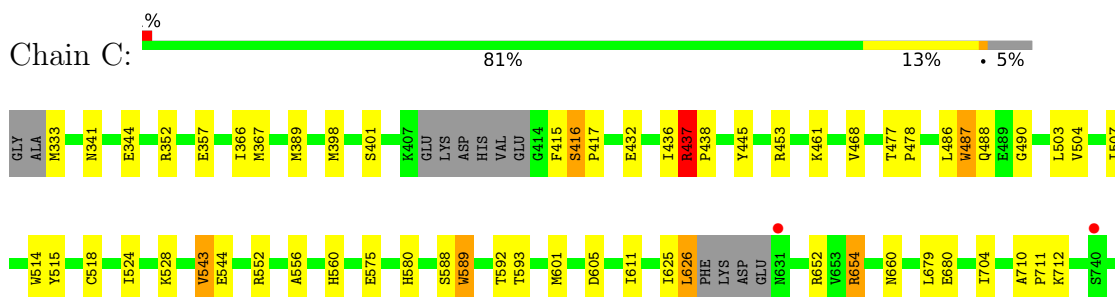
• Molecule 1: Prolyl-tRNA synthetase (ProRS)

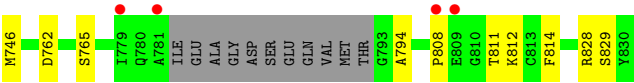


• Molecule 1: Prolyl-tRNA synthetase (ProRS)

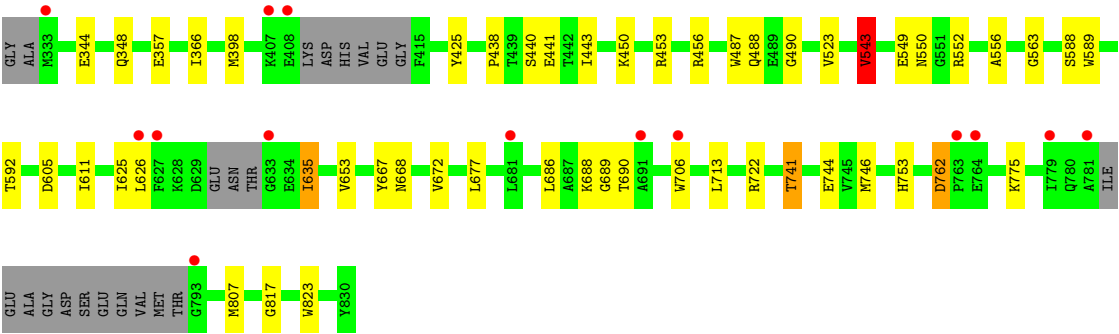
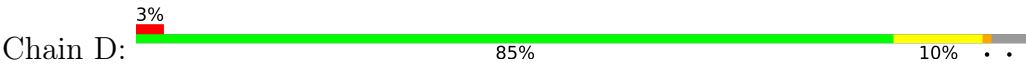


• Molecule 1: Prolyl-tRNA synthetase (ProRS)





● Molecule 1: Prolyl-tRNA synthetase (ProRS)



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	76.76Å 90.38Å 93.21Å 89.90° 99.58° 104.22°	Depositor
Resolution (Å)	43.81 – 2.41 43.81 – 2.41	Depositor EDS
% Data completeness (in resolution range)	98.2 (43.81-2.41) 98.4 (43.81-2.41)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.82 (at 2.39Å)	Xtriage
Refinement program	REFMAC 5.7.0029	Depositor
R, R_{free}	0.182 , 0.245 0.190 , 0.247	Depositor DCC
R_{free} test set	4565 reflections (4.92%)	wwPDB-VP
Wilson B-factor (Å ²)	35.6	Xtriage
Anisotropy	0.122	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 29.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	16302	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.02% 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: 87F, MG, 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	1.02	1/4117 (0.0%)	1.10	14/5566 (0.3%)
1	B	0.96	3/4041 (0.1%)	1.07	14/5462 (0.3%)
1	C	1.04	5/3992 (0.1%)	1.08	10/5399 (0.2%)
1	D	0.96	1/3965 (0.0%)	1.07	17/5368 (0.3%)
All	All	0.99	10/16115 (0.1%)	1.08	55/21795 (0.3%)

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	416	SER	C-O	-6.52	1.18	1.24
1	C	611	ILE	N-CA	-6.07	1.41	1.46
1	B	436	ILE	C-O	-6.04	1.17	1.24
1	B	438	PRO	C-O	-5.63	1.16	1.24
1	C	524	ILE	C-O	-5.49	1.18	1.24
1	C	438	PRO	C-O	-5.42	1.17	1.24
1	D	722	ARG	C-O	-5.30	1.18	1.24
1	B	515	TYR	N-CA	-5.25	1.40	1.46
1	A	436	ILE	C-O	-5.07	1.18	1.24
1	C	543	VAL	C-O	-5.02	1.18	1.24

All (55) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	440	SER	N-CA-C	8.70	124.13	113.17
1	C	445	TYR	CA-C-N	-7.86	110.86	119.19
1	C	445	TYR	C-N-CA	-7.86	110.86	119.19
1	B	475	GLN	CA-C-N	-7.77	112.19	120.66
1	B	475	GLN	C-N-CA	-7.77	112.19	120.66
1	A	818	LYS	CA-C-N	-7.43	112.11	119.76
1	A	818	LYS	C-N-CA	-7.43	112.11	119.76

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	450	LYS	N-CA-C	7.35	119.37	111.36
1	D	746	MET	CA-C-N	-6.87	111.42	119.05
1	D	746	MET	C-N-CA	-6.87	111.42	119.05
1	A	627	PHE	N-CA-C	-6.65	100.37	110.14
1	B	781	ALA	N-CA-C	6.42	118.28	111.28
1	D	611	ILE	CA-C-N	-6.22	113.97	120.38
1	D	611	ILE	C-N-CA	-6.22	113.97	120.38
1	A	543	VAL	CB-CA-C	6.05	118.59	110.42
1	B	659	SER	N-CA-C	6.02	117.71	111.03
1	A	445	TYR	CA-C-N	-6.01	112.82	119.19
1	A	445	TYR	C-N-CA	-6.01	112.82	119.19
1	D	817	GLY	N-CA-C	-6.01	107.15	113.58
1	A	816	THR	N-CA-C	6.01	117.91	111.36
1	C	560	HIS	N-CA-C	5.99	119.30	109.72
1	B	553	GLY	N-CA-C	-5.93	103.59	113.02
1	D	762	ASP	CB-CA-C	5.93	116.88	108.76
1	A	552	ARG	N-CA-C	5.76	118.35	109.07
1	C	794	ALA	N-CA-C	5.73	118.28	110.55
1	A	437	ARG	N-CA-C	5.68	117.67	109.48
1	B	439	THR	CA-C-N	-5.68	113.74	122.60
1	B	439	THR	C-N-CA	-5.68	113.74	122.60
1	D	741	THR	N-CA-C	5.67	118.31	109.52
1	D	543	VAL	CB-CA-C	5.63	118.55	110.33
1	B	469	VAL	N-CA-C	5.49	115.80	108.11
1	C	829	SER	N-CA-C	5.47	115.51	108.34
1	C	437	ARG	N-CA-C	5.44	119.10	109.58
1	D	592	THR	N-CA-C	5.39	116.84	109.18
1	B	623	ILE	N-CA-C	5.35	113.45	108.15
1	B	437	ARG	N-CA-C	5.33	118.90	109.58
1	A	614	ARG	N-CA-C	5.28	117.78	111.71
1	C	812	LYS	N-CA-C	5.26	117.48	108.90
1	D	635	ILE	N-CA-C	5.26	116.62	110.62
1	C	746	MET	CA-C-N	-5.19	113.84	119.24
1	C	746	MET	C-N-CA	-5.19	113.84	119.24
1	A	547	ILE	N-CA-C	5.17	112.67	107.55
1	B	818	LYS	CA-C-N	-5.16	114.49	119.90
1	B	818	LYS	C-N-CA	-5.16	114.49	119.90
1	D	443	ILE	N-CA-C	-5.15	107.38	111.81
1	D	543	VAL	N-CA-C	-5.13	100.73	108.12
1	D	653	VAL	N-CA-C	5.12	115.49	108.12
1	D	438	PRO	CA-C-N	5.12	132.30	121.91
1	D	438	PRO	C-N-CA	5.12	132.30	121.91

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	439	THR	N-CA-C	-5.11	99.94	108.07
1	B	612	PRO	CA-C-N	5.10	125.14	119.32
1	B	612	PRO	C-N-CA	5.10	125.14	119.32
1	A	804	GLN	CA-C-N	-5.04	115.19	120.38
1	A	804	GLN	C-N-CA	-5.04	115.19	120.38
1	C	814	PHE	N-CA-C	5.02	118.89	112.87

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3994	0	3947	36	0
1	B	3927	0	3883	42	0
1	C	3881	0	3822	45	0
1	D	3861	0	3776	30	0
2	A	31	0	13	0	0
2	B	31	0	13	0	0
2	C	31	0	13	0	0
2	D	31	0	13	0	0
3	A	2	0	0	0	0
3	B	2	0	0	0	0
3	C	2	0	0	0	0
3	D	2	0	0	0	0
4	A	21	0	0	1	0
4	B	21	0	0	1	0
4	C	21	0	0	0	0
4	D	21	0	0	2	0
5	A	155	0	0	1	0
5	B	88	0	0	1	0
5	C	95	0	0	4	0
5	D	85	0	0	2	0
All	All	16302	0	15480	147	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 5.

All (147) 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:398:MET:HE1	1:C:398:MET:HE1	1.17	1.13
1:C:528:LYS:NZ	1:C:544:GLU:OE2	1.96	0.98
1:A:398:MET:HE1	1:D:398:MET:HE1	1.48	0.96
1:C:808:PRO:HB2	1:C:811:THR:OG1	1.67	0.93
1:B:681:LEU:HD12	1:B:685:ASP:HB2	1.59	0.85
1:B:543:VAL:HG23	1:B:556:ALA:HB3	1.59	0.84
1:B:504:VAL:HG22	1:B:587:THR:HG23	1.73	0.71
1:A:543:VAL:HG13	1:A:556:ALA:HB3	1.73	0.71
1:D:625:ILE:HD11	1:D:667:TYR:OH	1.91	0.70
1:B:402[A]:ARG:HG2	1:B:402[A]:ARG:HH11	1.57	0.69
1:B:626:LEU:HD21	1:B:635:ILE:HD12	1.74	0.68
1:C:333:MET:HE3	1:C:352:ARG:HD3	1.77	0.67
4:B:1004:87F:N1	5:B:1101:HOH:O	2.28	0.66
1:C:626:LEU:HD12	1:C:626:LEU:O	1.96	0.66
1:B:716:LEU:O	1:B:720:ILE:HG13	1.97	0.65
1:B:402[A]:ARG:HG2	1:B:402[A]:ARG:NH1	2.12	0.63
1:D:688:LYS:CB	1:D:690:THR:HG22	2.28	0.63
1:D:441:GLU:OE2	4:D:1004:87F:N3	2.32	0.63
1:A:480:LEU:HD11	1:A:601:MET:CE	2.29	0.62
1:C:808:PRO:CB	1:C:811:THR:OG1	2.45	0.62
1:B:777:SER:OG	1:B:828:ARG:NH2	2.33	0.61
1:A:480:LEU:HD11	1:A:601:MET:HE1	1.82	0.60
1:A:716:LEU:O	1:A:720:ILE:HG12	2.02	0.59
1:A:807:MET:HE2	1:A:823:TRP:CD1	2.39	0.58
1:D:807:MET:HE2	1:D:823:TRP:CD1	2.39	0.57
1:A:678:ARG:HD3	5:A:1167:HOH:O	2.04	0.57
1:C:710:ALA:HB3	1:C:711:PRO:HD3	1.88	0.56
1:C:437:ARG:HG2	1:C:437:ARG:O	2.04	0.56
1:B:588:SER:C	1:B:589:TRP:CD1	2.85	0.54
1:D:550:ASN:CG	1:D:552:ARG:HG3	2.33	0.54
1:A:750:ASN:OD1	1:A:780:GLN:NE2	2.32	0.54
1:A:628:LYS:HD2	1:A:659:SER:HB2	1.90	0.53
1:C:333:MET:HE3	1:C:352:ARG:CD	2.38	0.53
1:C:389:MET:O	1:C:461:LYS:NZ	2.41	0.53
1:A:515:TYR:CZ	1:A:556:ALA:HB1	2.44	0.53
1:C:341:ASN:ND2	1:C:344[B]:GLU:OE1	2.42	0.53
1:C:704:ILE:HD13	1:C:712:LYS:HG2	1.90	0.53
1:D:563:GLY:HA2	5:D:1118:HOH:O	2.09	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:677:LEU:HD13	1:D:713:LEU:HD22	1.89	0.53
1:A:570:PHE:O	1:A:571:GLU:HB2	2.08	0.52
1:B:468:VAL:HG21	1:B:487:TRP:CE2	2.44	0.52
1:D:550:ASN:OD1	1:D:552:ARG:HG3	2.09	0.52
1:C:552:ARG:CZ	1:C:828:ARG:HG2	2.40	0.52
1:B:515:TYR:CZ	1:B:556:ALA:HB1	2.45	0.52
1:C:490:GLY:O	1:C:588:SER:HA	2.09	0.51
1:B:529:SER:O	1:B:533:LYS:N	2.43	0.51
1:A:480:LEU:HD21	1:A:601:MET:HE2	1.92	0.51
1:B:430:LEU:HD13	1:B:434:ILE:HD12	1.92	0.50
1:C:486:LEU:HB2	1:C:593:THR:CG2	2.41	0.50
1:B:679:LEU:HD23	1:B:679:LEU:C	2.36	0.50
1:D:543:VAL:HG13	1:D:556:ALA:HB3	1.94	0.50
1:B:576:ASP:OD1	1:B:576:ASP:C	2.54	0.49
1:B:504:VAL:HG22	1:B:587:THR:CG2	2.40	0.49
1:C:357:GLU:HB3	1:C:366:ILE:HB	1.93	0.49
1:C:625:ILE:HD11	1:C:680:GLU:HB3	1.94	0.49
1:A:645:MET:HE1	1:A:709:LEU:HB2	1.94	0.49
1:D:741:THR:O	1:D:744:GLU:HG3	2.13	0.49
1:A:437:ARG:O	1:A:437:ARG:HG2	2.12	0.49
1:B:439:THR:HG23	1:B:441:GLU:OE1	2.13	0.49
1:B:818:LYS:HB3	1:B:819:PRO:HD2	1.95	0.49
1:C:575:GLU:HA	1:C:580:HIS:O	2.13	0.49
1:C:333:MET:HE3	1:C:352:ARG:HG2	1.95	0.49
1:B:741:THR:OG1	1:B:743:ASP:OD1	2.31	0.49
1:D:344:GLU:O	1:D:348:GLN:HG3	2.13	0.48
1:B:625:ILE:HD13	1:B:625:ILE:N	2.27	0.48
1:A:695:ARG:HB2	1:A:720:ILE:HD11	1.94	0.48
1:D:490:GLY:O	1:D:588:SER:HA	2.14	0.48
1:D:357:GLU:HB3	1:D:366:ILE:HB	1.95	0.48
1:A:484:GLU:CD	1:D:398:MET:HG2	2.38	0.47
1:C:486:LEU:HB2	1:C:593:THR:HG23	1.96	0.47
1:C:605:ASP:C	1:C:605:ASP:OD1	2.56	0.47
1:B:487:TRP:HB3	1:B:592:THR:HG22	1.96	0.47
1:C:416:SER:HB2	1:C:417:PRO:HD3	1.95	0.47
1:B:543:VAL:HG23	1:B:543:VAL:O	2.13	0.46
1:D:626:LEU:CD2	1:D:635:ILE:HD11	2.45	0.46
1:D:775:LYS:HD2	1:D:775:LYS:N	2.30	0.46
1:A:419:VAL:O	1:D:425:TYR:HA	2.15	0.46
1:A:523:VAL:CG2	1:A:543:VAL:HG22	2.46	0.46
1:B:497:GLU:OE2	1:B:538:LYS:NZ	2.47	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:601:MET:HE1	5:C:1112:HOH:O	2.16	0.46
1:D:753:HIS:NE2	5:D:1101:HOH:O	2.36	0.46
1:B:651:ILE:HG12	1:B:717:MET:HE1	1.97	0.46
1:C:515:TYR:CZ	1:C:556:ALA:HB1	2.51	0.46
1:C:333:MET:HE3	1:C:352:ARG:CG	2.45	0.45
1:C:401:SER:HB2	1:C:432:GLU:OE2	2.15	0.45
1:D:605:ASP:OD1	1:D:605:ASP:C	2.57	0.45
1:B:573:GLU:HG2	1:B:583:LEU:HD23	1.99	0.45
1:B:637:GLY:O	1:B:641:GLU:HG3	2.16	0.45
1:C:487:TRP:HB3	1:C:592:THR:HG22	1.97	0.45
1:C:453:ARG:HA	1:C:453:ARG:HD3	1.79	0.45
1:A:490:GLY:O	1:A:588:SER:HA	2.15	0.45
1:A:514:TRP:O	1:A:518:CYS:HB2	2.17	0.45
1:C:762:ASP:O	1:C:765:SER:OG	2.34	0.45
1:A:356:ILE:HD11	1:A:479:PHE:CZ	2.52	0.45
1:A:638:LYS:HE2	1:A:706:TRP:CZ3	2.52	0.44
1:B:346:TYR:CE1	1:B:601:MET:HE3	2.53	0.44
1:C:487:TRP:C	1:C:487:TRP:CD1	2.96	0.44
1:C:710:ALA:HB3	1:C:711:PRO:CD	2.48	0.44
1:B:605:ASP:OD1	1:B:605:ASP:C	2.61	0.44
1:A:543:VAL:CG1	1:A:556:ALA:HB3	2.45	0.44
1:A:660[B]:ASN:OD1	1:D:456:ARG:NH1	2.51	0.44
1:C:652:ARG:NH2	5:C:1109:HOH:O	2.50	0.44
1:C:514:TRP:O	1:C:518:CYS:HB2	2.18	0.44
1:B:710:ALA:HB3	1:B:711:PRO:CD	2.48	0.43
1:A:398:MET:CE	1:D:398:MET:HE1	2.34	0.43
1:C:468:VAL:HG21	1:C:487:TRP:CE2	2.53	0.43
1:A:449:ALA:O	1:A:453:ARG:NH2	2.52	0.43
1:C:477:THR:O	1:C:478:PRO:C	2.61	0.43
1:C:808:PRO:HB2	1:C:811:THR:HG1	1.77	0.43
1:B:685:ASP:HB3	1:B:690:THR:O	2.18	0.43
1:C:654:ARG:HD2	5:C:1164:HOH:O	2.16	0.43
1:B:357:GLU:HB3	1:B:366:ILE:HB	2.00	0.43
1:B:746:MET:N	1:B:747:PRO:HD2	2.34	0.43
1:B:799:CYS:O	1:B:801:PRO:HD3	2.19	0.43
1:C:626:LEU:H	1:C:626:LEU:HG	1.54	0.43
1:D:668:ASN:O	1:D:672:VAL:HG23	2.18	0.43
1:C:367:MET:HE2	1:C:367:MET:HB3	1.89	0.43
1:A:424[B]:HIS:HB2	1:A:428:SER:O	2.18	0.42
1:C:679:LEU:C	1:C:679:LEU:HD23	2.45	0.42
1:B:373:HIS:CE1	1:B:617:SER:HA	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:543:VAL:CG1	1:D:556:ALA:HB3	2.50	0.42
1:B:762:ASP:OD2	1:B:764:GLU:HG3	2.20	0.42
1:D:635:ILE:HG22	1:D:686:LEU:HD22	2.01	0.42
1:A:415:PHE:HB3	4:A:1004:87F:C2	2.49	0.42
1:A:368:ARG:HB3	1:A:369:PRO:HD2	2.02	0.42
1:B:556:ALA:O	1:B:557:ALA:HB2	2.20	0.42
1:B:609:LEU:O	1:B:674:GLY:HA2	2.20	0.42
1:C:503:LEU:O	1:C:504:VAL:C	2.63	0.42
1:D:523:VAL:CG2	1:D:543:VAL:HG22	2.50	0.41
1:A:549:GLU:OE1	1:A:549:GLU:N	2.53	0.41
1:A:605:ASP:OD1	1:A:605:ASP:C	2.64	0.41
1:A:636:LEU:O	1:A:637:GLY:C	2.63	0.41
1:C:507:ILE:HG21	1:C:589:TRP:CG	2.54	0.41
1:A:710:ALA:HB3	1:A:711:PRO:HD3	2.02	0.41
1:C:398:MET:CE	1:C:436:ILE:HG23	2.51	0.41
1:A:609:LEU:O	1:A:674:GLY:HA2	2.20	0.41
1:C:415:PHE:HD1	1:C:415:PHE:HA	1.70	0.41
1:B:402[A]:ARG:HH11	1:B:402[A]:ARG:CG	2.25	0.41
1:A:515:TYR:CE1	1:A:556:ALA:HB1	2.56	0.41
1:B:516:GLU:HG2	1:B:521:VAL:O	2.21	0.41
1:D:441:GLU:OE2	4:D:1004:87F:C16	2.69	0.41
1:B:528:LYS:HD3	1:B:542:THR:HG21	2.03	0.40
1:C:660:ASN:HB2	5:C:1128:HOH:O	2.21	0.40
1:B:549:GLU:OE1	1:B:549:GLU:N	2.50	0.40
1:D:689:GLY:HA2	1:D:706:TRP:CE2	2.55	0.40
1:A:660[A]:ASN:OD1	1:D:456:ARG:HD3	2.21	0.40
1:D:549:GLU:OE1	1:D:549:GLU:N	2.54	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	485/500 (97%)	474 (98%)	11 (2%)	0	100	100
1	B	474/500 (95%)	454 (96%)	20 (4%)	0	100	100
1	C	471/500 (94%)	456 (97%)	15 (3%)	0	100	100
1	D	470/500 (94%)	455 (97%)	15 (3%)	0	100	100
All	All	1900/2000 (95%)	1839 (97%)	61 (3%)	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	426/436 (98%)	418 (98%)	8 (2%)	50	70
1	B	417/436 (96%)	411 (99%)	6 (1%)	59	77
1	C	410/436 (94%)	403 (98%)	7 (2%)	53	73
1	D	405/436 (93%)	399 (98%)	6 (2%)	57	75
All	All	1658/1744 (95%)	1631 (98%)	27 (2%)	55	74

All (27) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	437	ARG
1	A	487	TRP
1	A	488	GLN
1	A	543	VAL
1	A	589	TRP
1	A	593	THR
1	A	678	ARG
1	A	762	ASP
1	B	437	ARG
1	B	488	GLN
1	B	589	TRP
1	B	593	THR
1	B	634	GLU

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Mol	Chain	Res	Type
1	B	780	GLN
1	C	437	ARG
1	C	487	TRP
1	C	488	GLN
1	C	543	VAL
1	C	589	TRP
1	C	626	LEU
1	C	654	ARG
1	D	453	ARG
1	D	487	TRP
1	D	488	GLN
1	D	543	VAL
1	D	589	TRP
1	D	762	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	379	GLN
1	A	488	GLN
1	A	669	HIS
1	A	750	ASN
1	A	780	GLN
1	B	475	GLN
1	B	488	GLN
1	B	586	GLN
1	C	488	GLN
1	C	750	ASN
1	C	780	GLN
1	D	488	GLN
1	D	750	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 [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 16 ligands modelled in this entry, 8 are monoatomic - leaving 8 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
2	ANP	B	1001	3	33,33,33	1.49	2 (6%)	45,52,52	0.92	2 (4%)
2	ANP	A	1001	3	33,33,33	1.50	2 (6%)	45,52,52	0.90	1 (2%)
2	ANP	D	1001	3	33,33,33	1.48	2 (6%)	45,52,52	0.91	1 (2%)
4	87F	C	1004	-	23,23,23	1.69	4 (17%)	28,31,31	1.60	3 (10%)
4	87F	D	1004	-	23,23,23	2.02	8 (34%)	28,31,31	1.76	3 (10%)
4	87F	A	1004	-	23,23,23	1.73	4 (17%)	28,31,31	1.67	3 (10%)
4	87F	B	1004	-	23,23,23	1.75	6 (26%)	28,31,31	1.67	3 (10%)
2	ANP	C	1001	3	33,33,33	1.53	2 (6%)	45,52,52	0.91	2 (4%)

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
2	ANP	B	1001	3	-	4/18/38/38	0/3/3/3
2	ANP	A	1001	3	-	5/18/38/38	0/3/3/3
2	ANP	D	1001	3	-	5/18/38/38	0/3/3/3
4	87F	C	1004	-	-	0/6/17/17	0/3/3/3
4	87F	D	1004	-	-	2/6/17/17	0/3/3/3
4	87F	A	1004	-	-	1/6/17/17	0/3/3/3
4	87F	B	1004	-	-	0/6/17/17	0/3/3/3
2	ANP	C	1001	3	-	6/18/38/38	0/3/3/3

All (30) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1001	ANP	PG-O1G	6.72	1.56	1.46
2	B	1001	ANP	PG-O1G	6.72	1.56	1.46
2	D	1001	ANP	PG-O1G	6.72	1.56	1.46
2	C	1001	ANP	PG-O1G	6.70	1.56	1.46
4	A	1004	87F	C5-C8	-5.09	1.37	1.47
4	B	1004	87F	C5-C8	-4.91	1.37	1.47
4	C	1004	87F	C5-C8	-4.64	1.38	1.47
4	D	1004	87F	C5-C8	-4.53	1.38	1.47
4	D	1004	87F	C14-C13	-4.27	1.43	1.50
4	A	1004	87F	C14-C13	-4.03	1.43	1.50
2	C	1001	ANP	PG-O3G	-3.96	1.46	1.56
2	A	1001	ANP	PG-O3G	-3.95	1.46	1.56
2	B	1001	ANP	PG-O3G	-3.95	1.46	1.56
2	D	1001	ANP	PG-O3G	-3.92	1.46	1.56
4	C	1004	87F	C14-C13	-3.83	1.44	1.50
4	B	1004	87F	C14-C13	-3.22	1.45	1.50
4	D	1004	87F	C8-N2	-2.80	1.36	1.39
4	B	1004	87F	C8-N2	-2.75	1.36	1.39
4	D	1004	87F	C12-C13	-2.56	1.45	1.52
4	D	1004	87F	C5-C6	-2.55	1.37	1.40
4	D	1004	87F	C6-N1	-2.42	1.36	1.40
4	D	1004	87F	C7-N1	2.33	1.31	1.28
4	C	1004	87F	C6-N1	-2.30	1.36	1.40
4	B	1004	87F	C7-N1	2.20	1.31	1.28
4	B	1004	87F	C6-N1	-2.16	1.36	1.40
4	D	1004	87F	C4-C5	-2.12	1.36	1.39
4	A	1004	87F	C5-C6	-2.08	1.37	1.40
4	A	1004	87F	C15-C14	-2.04	1.45	1.52
4	B	1004	87F	C15-C14	-2.02	1.45	1.52
4	C	1004	87F	C7-N1	2.01	1.31	1.28

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	1004	87F	N2-C7-N1	-6.06	121.26	126.31
4	B	1004	87F	N2-C7-N1	-5.78	121.49	126.31
4	A	1004	87F	N2-C7-N1	-5.74	121.53	126.31
4	C	1004	87F	N2-C7-N1	-5.46	121.76	126.31
4	B	1004	87F	C5-C8-N2	4.93	116.68	113.76
4	D	1004	87F	C5-C8-N2	4.85	116.64	113.76
4	A	1004	87F	C5-C8-N2	4.67	116.53	113.76
4	C	1004	87F	C5-C8-N2	4.30	116.31	113.76

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1001	ANP	O2G-PG-O1G	-3.14	105.57	113.45
2	C	1001	ANP	O2G-PG-O1G	-3.14	105.57	113.45
2	B	1001	ANP	O2G-PG-O1G	-3.13	105.59	113.45
2	D	1001	ANP	O2G-PG-O1G	-3.13	105.61	113.45
4	D	1004	87F	C6-N1-C7	2.80	119.54	116.69
4	A	1004	87F	C6-N1-C7	2.66	119.40	116.69
4	C	1004	87F	C6-N1-C7	2.42	119.16	116.69
4	B	1004	87F	C6-N1-C7	2.25	118.98	116.69
2	C	1001	ANP	C5-C4-N3	-2.09	123.84	126.72
2	B	1001	ANP	C5-C4-N3	-2.01	123.94	126.72

There are no chirality outliers.

All (23) torsion outliers are listed below:

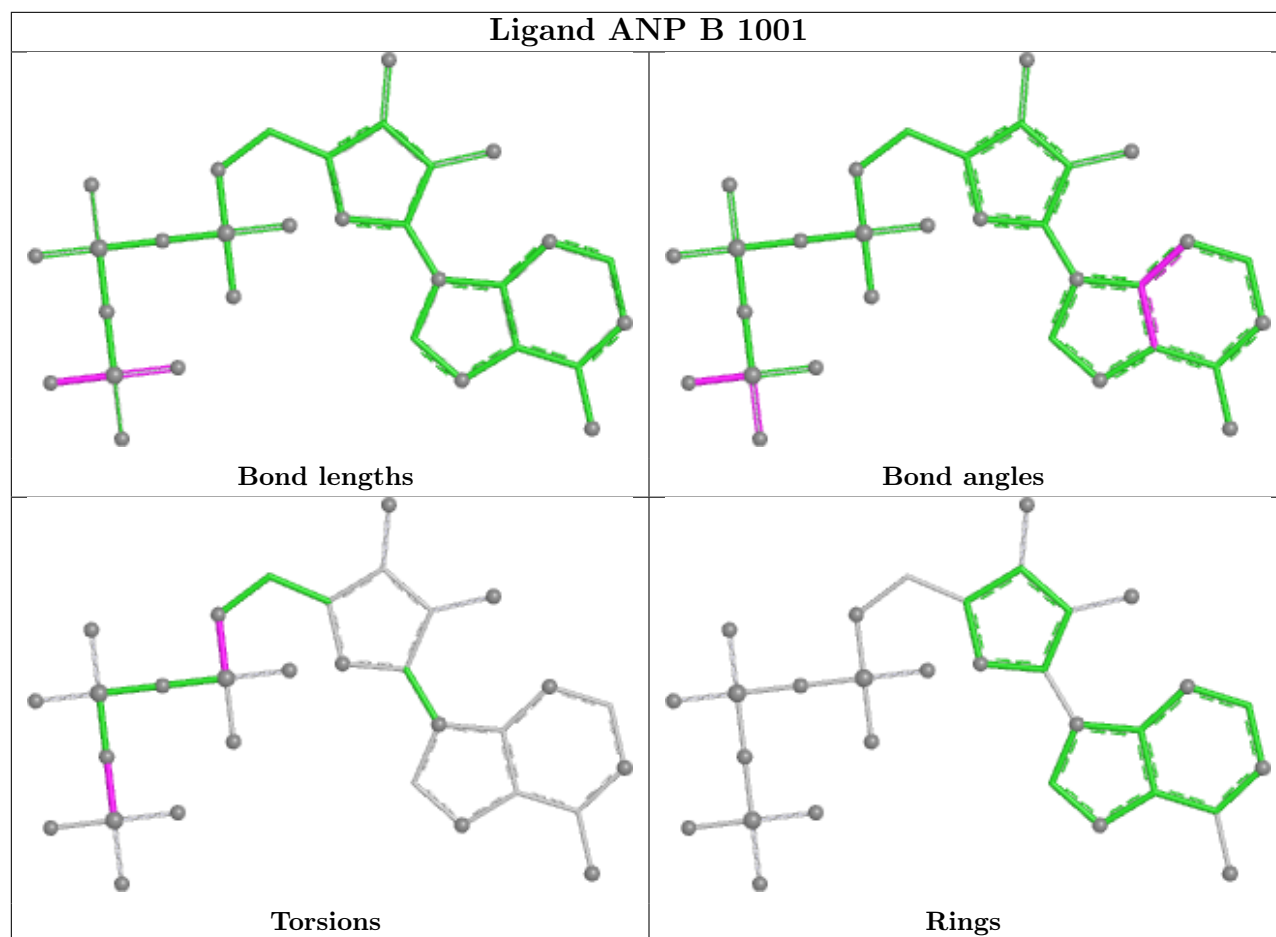
Mol	Chain	Res	Type	Atoms
2	A	1001	ANP	PB-N3B-PG-O1G
2	A	1001	ANP	C5'-O5'-PA-O2A
2	A	1001	ANP	C5'-O5'-PA-O3A
2	B	1001	ANP	PB-N3B-PG-O1G
2	B	1001	ANP	C5'-O5'-PA-O2A
2	B	1001	ANP	C5'-O5'-PA-O3A
2	C	1001	ANP	PB-N3B-PG-O1G
2	C	1001	ANP	PA-O3A-PB-O2B
2	C	1001	ANP	C5'-O5'-PA-O1A
2	C	1001	ANP	C5'-O5'-PA-O2A
2	C	1001	ANP	C5'-O5'-PA-O3A
2	D	1001	ANP	PB-N3B-PG-O1G
2	D	1001	ANP	C5'-O5'-PA-O1A
2	D	1001	ANP	C5'-O5'-PA-O2A
2	D	1001	ANP	C5'-O5'-PA-O3A
4	D	1004	87F	C10-C11-C12-N3
2	A	1001	ANP	C5'-O5'-PA-O1A
2	B	1001	ANP	C5'-O5'-PA-O1A
4	A	1004	87F	C11-C10-C9-N2
2	D	1001	ANP	PA-O3A-PB-O2B
2	A	1001	ANP	O4'-C4'-C5'-O5'
2	C	1001	ANP	O4'-C4'-C5'-O5'
4	D	1004	87F	C10-C11-C12-C13

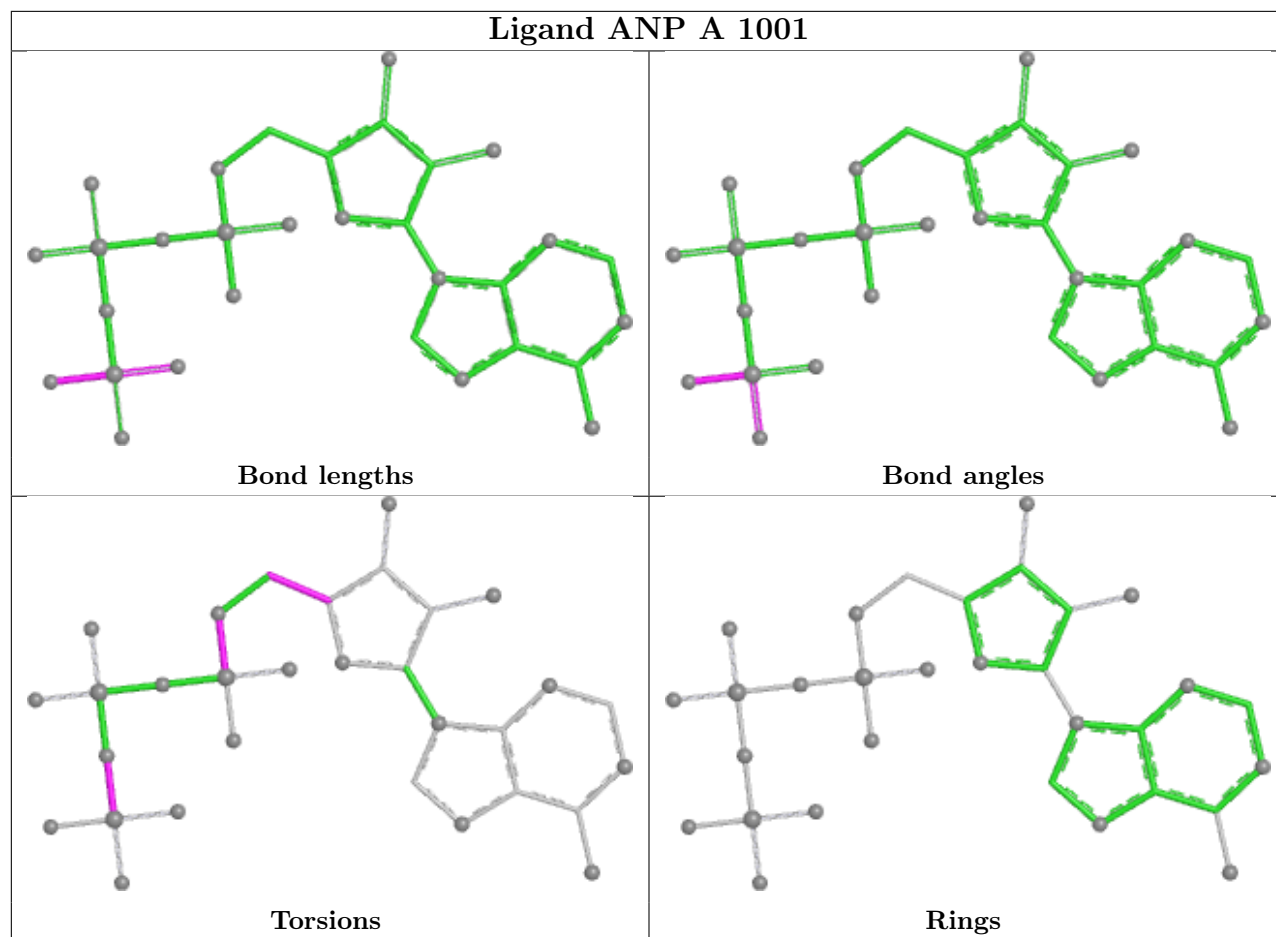
There are no ring outliers.

3 monomers are involved in 4 short contacts:

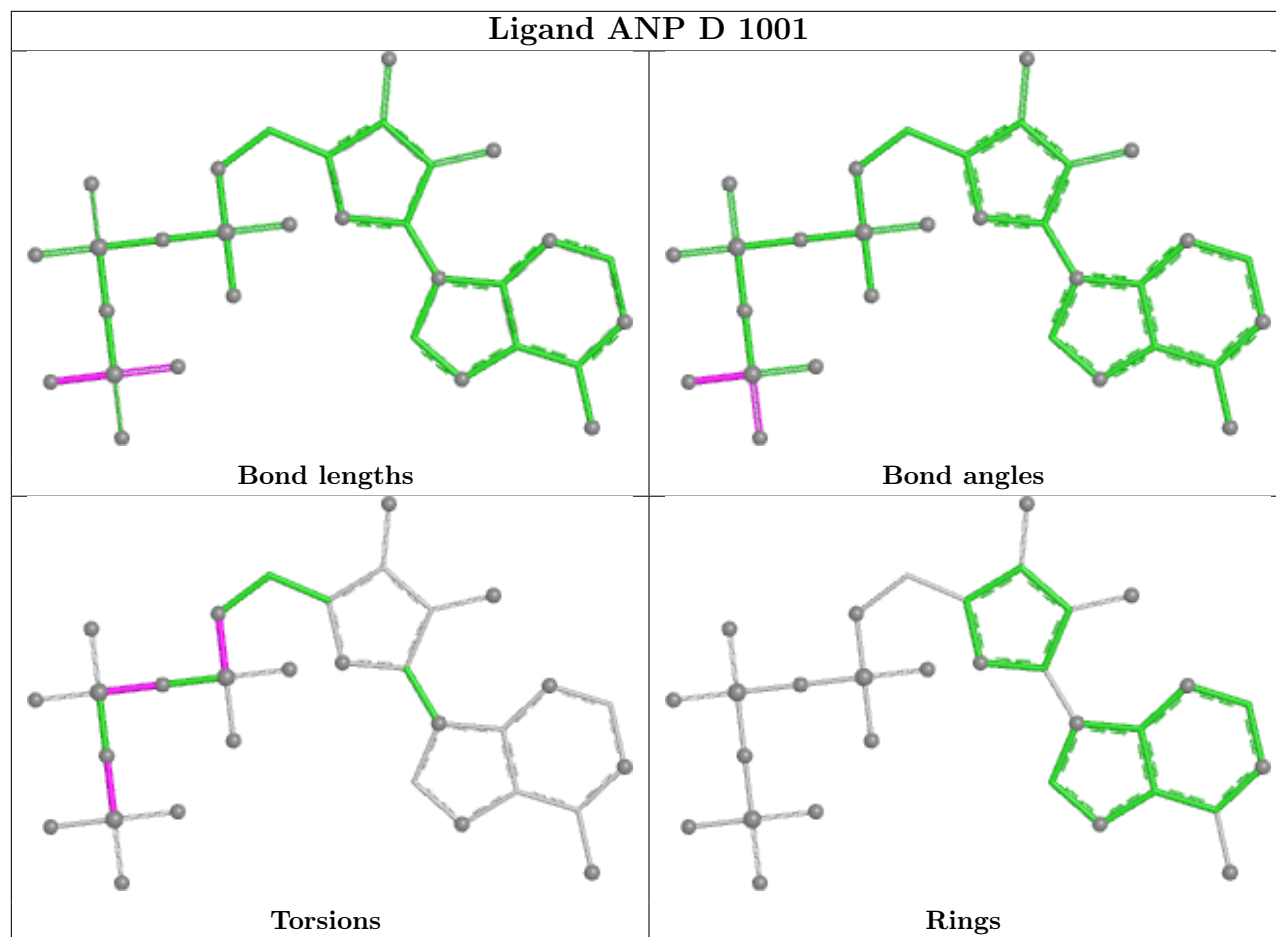
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	1004	87F	2	0
4	A	1004	87F	1	0
4	B	1004	87F	1	0

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 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.

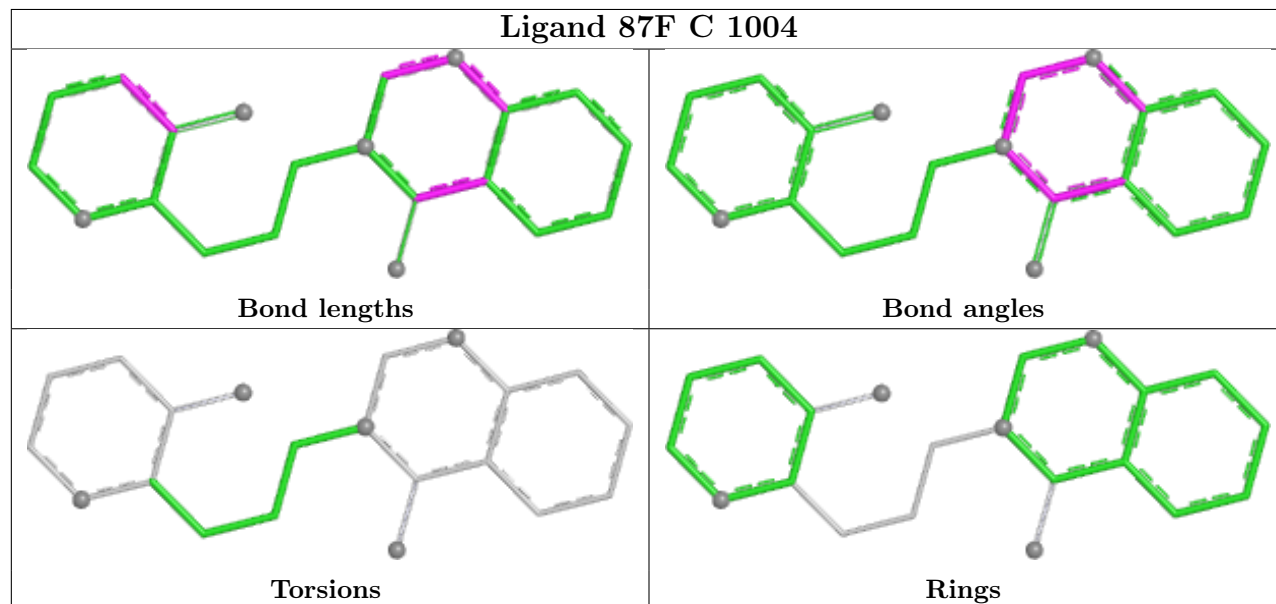




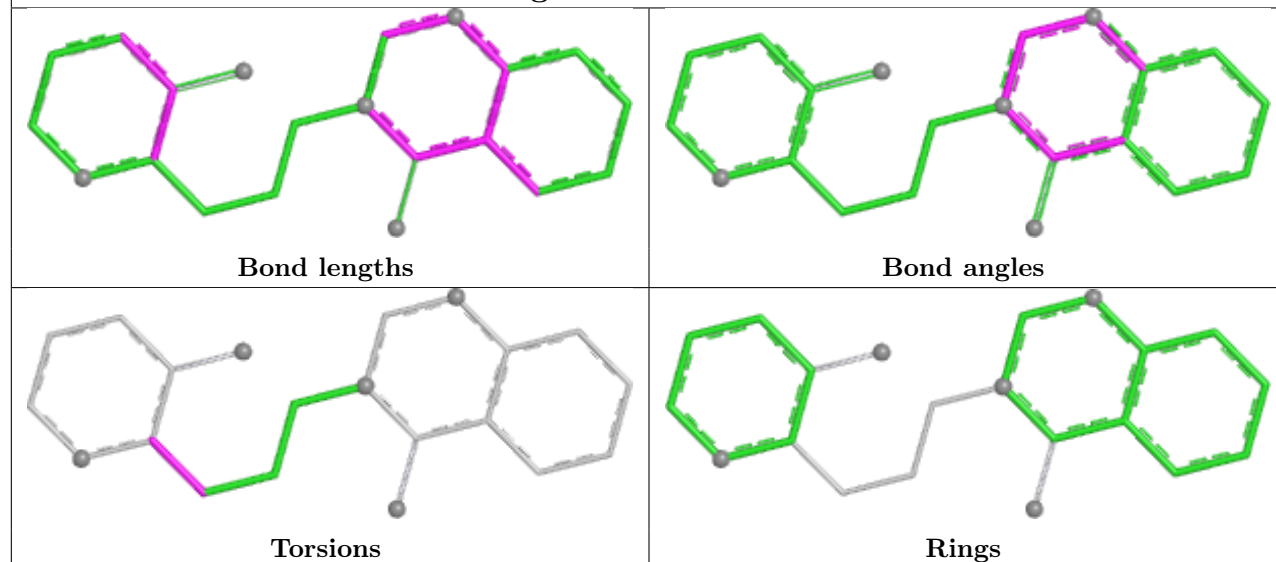
Ligand ANP D 1001



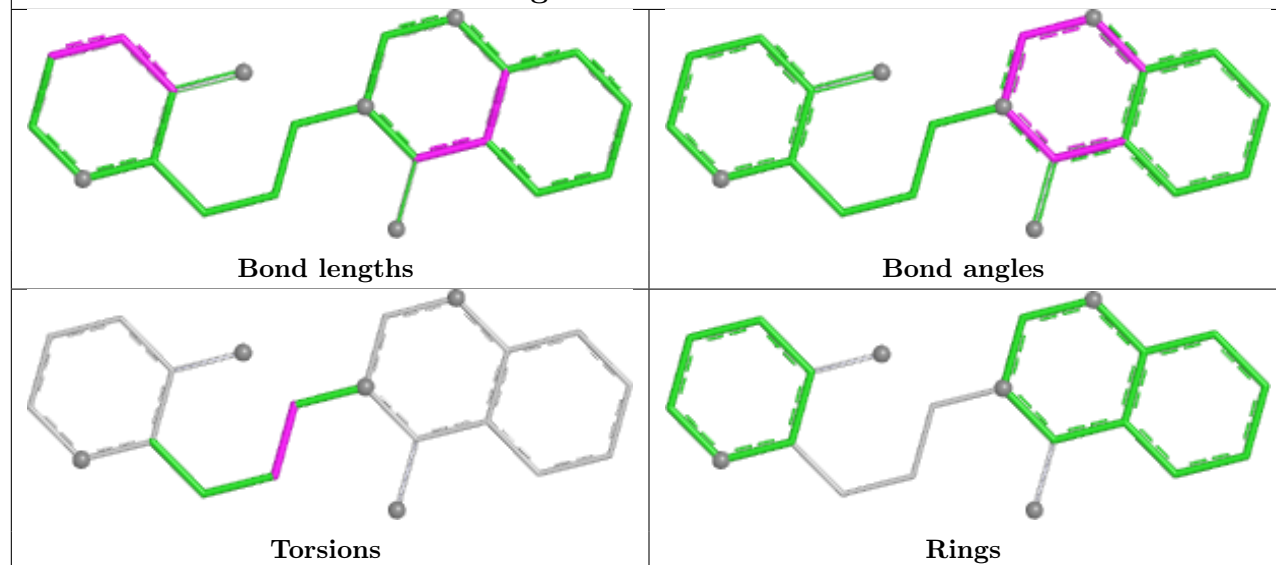
Ligand 87F C 1004

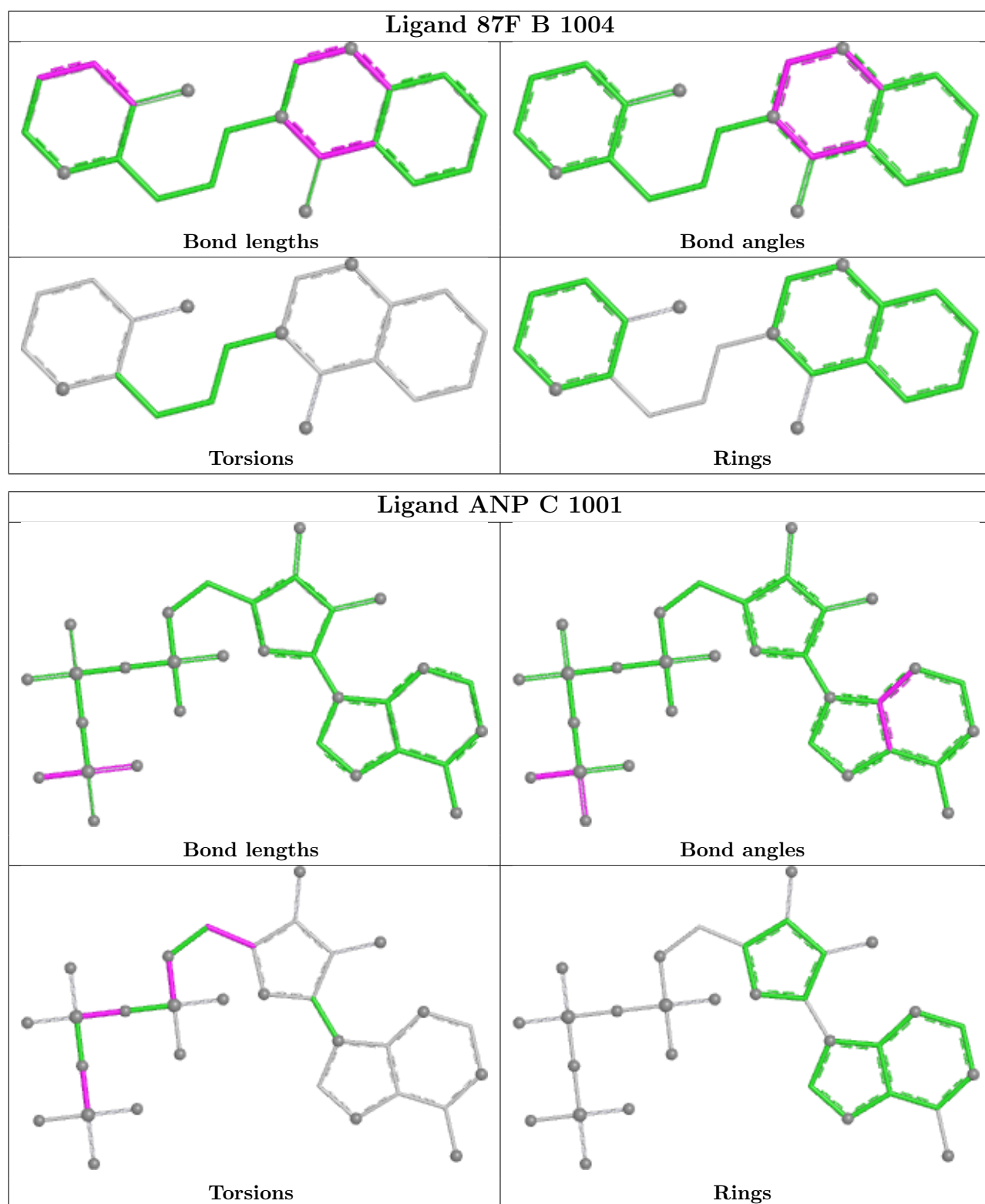


Ligand 87F D 1004



Ligand 87F A 1004





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	486/500 (97%)	-0.33	8 (1%) 70 67	15, 29, 56, 103	5 (1%)
1	B	478/500 (95%)	-0.11	13 (2%) 56 52	17, 36, 65, 88	4 (0%)
1	C	477/500 (95%)	-0.14	6 (1%) 75 72	19, 36, 68, 88	2 (0%)
1	D	478/500 (95%)	-0.07	14 (2%) 53 50	20, 38, 73, 89	0
All	All	1919/2000 (95%)	-0.16	41 (2%) 63 60	15, 35, 67, 103	11 (0%)

All (41) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	627	PHE	4.6
1	D	781	ALA	3.9
1	D	333	MET	3.7
1	D	627	PHE	3.7
1	B	632	THR	3.7
1	C	631	ASN	3.6
1	D	779	ILE	3.4
1	D	626	LEU	3.1
1	A	629	ASP	3.1
1	D	408	GLU	3.0
1	C	808	PRO	3.0
1	D	633	GLY	2.9
1	D	763	PRO	2.9
1	A	414	GLY	2.9
1	B	529	SER	2.8
1	D	706	TRP	2.7
1	B	587	THR	2.7
1	A	628	LYS	2.6
1	A	782	ILE	2.6
1	B	779	ILE	2.6
1	B	782	ILE	2.5

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Mol	Chain	Res	Type	RSRZ
1	B	531	GLY	2.5
1	C	781	ALA	2.5
1	A	792	THR	2.5
1	A	627	PHE	2.3
1	B	415	PHE	2.3
1	B	530	GLU	2.3
1	C	740	SER	2.3
1	A	632	THR	2.3
1	D	681	LEU	2.2
1	B	407	LYS	2.2
1	D	764	GLU	2.1
1	B	743	ASP	2.1
1	D	793	GLY	2.1
1	C	809	GLU	2.1
1	D	407	LYS	2.1
1	D	691	ALA	2.1
1	C	779	ILE	2.1
1	A	763	PRO	2.0
1	B	742	PHE	2.0
1	B	793	GLY	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

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

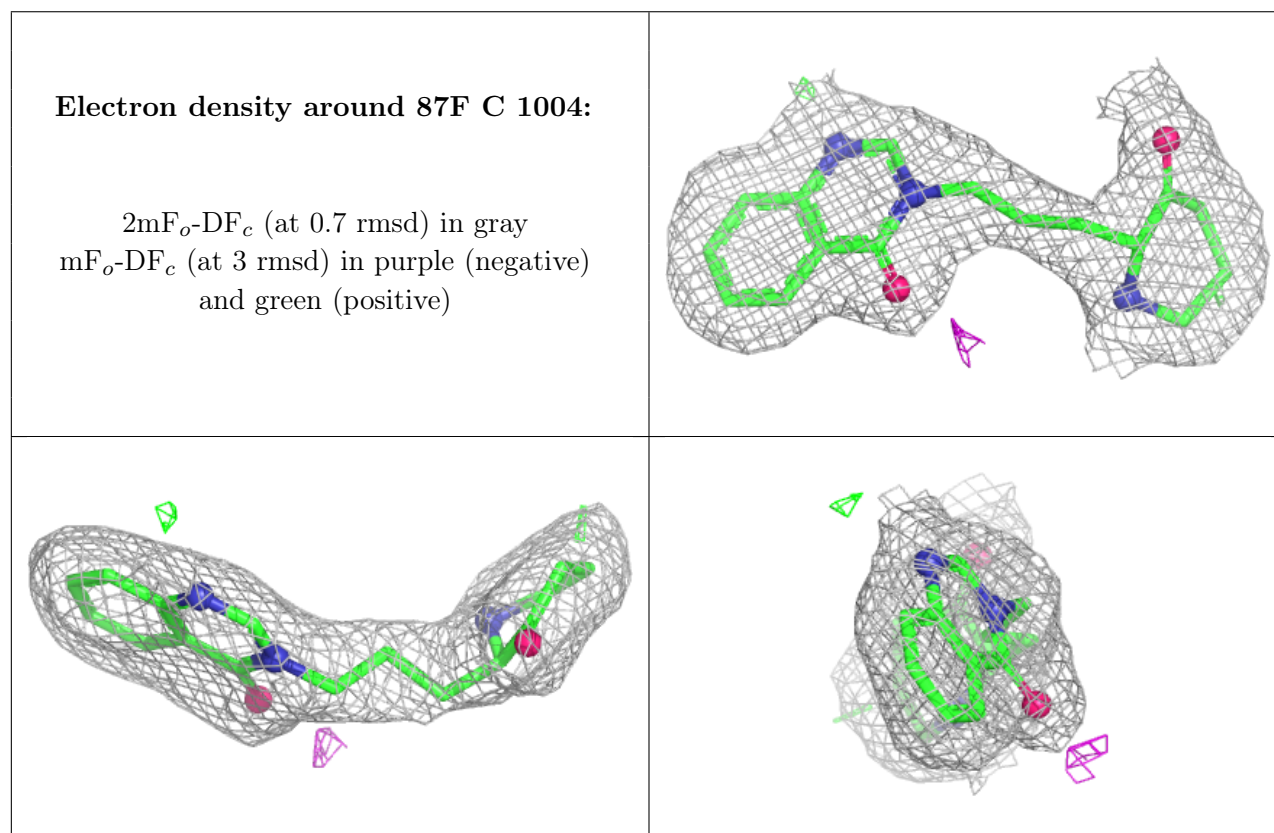
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	MG	D	1002	1/1	0.86	0.09	20,20,20,20	0
3	MG	A	1003	1/1	0.89	0.06	30,30,30,30	0
4	87F	C	1004	21/21	0.91	0.09	24,28,31,32	0

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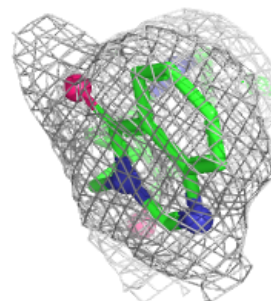
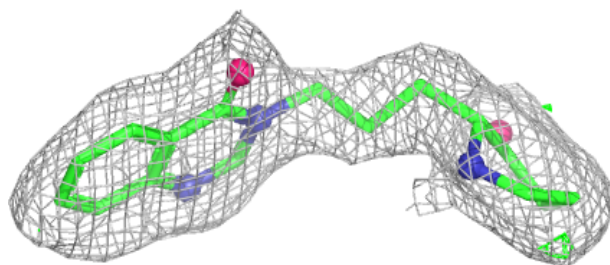
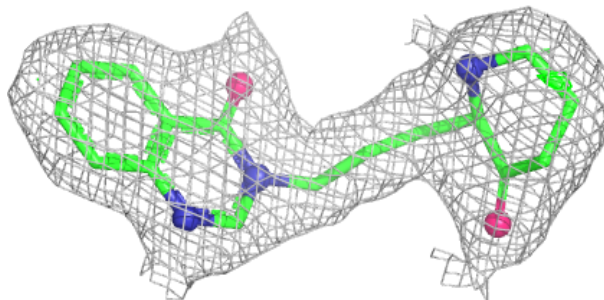
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	MG	B	1002	1/1	0.92	0.06	21,21,21,21	0
4	87F	A	1004	21/21	0.93	0.09	21,24,24,25	0
3	MG	D	1003	1/1	0.93	0.05	35,35,35,35	0
4	87F	B	1004	21/21	0.94	0.07	23,25,27,28	0
3	MG	A	1002	1/1	0.94	0.06	20,20,20,20	0
2	ANP	A	1001	31/31	0.96	0.07	18,21,25,26	0
2	ANP	C	1001	31/31	0.96	0.07	22,27,29,33	0
4	87F	D	1004	21/21	0.96	0.05	21,24,25,26	0
2	ANP	D	1001	31/31	0.97	0.05	22,24,28,30	0
2	ANP	B	1001	31/31	0.97	0.07	22,25,33,40	0
3	MG	B	1003	1/1	0.98	0.06	32,32,32,32	0
3	MG	C	1002	1/1	0.98	0.04	24,24,24,24	0
3	MG	C	1003	1/1	0.99	0.04	51,51,51,51	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.

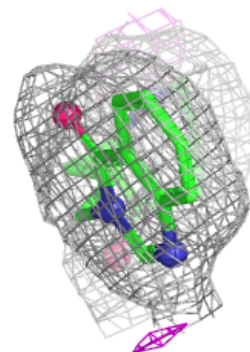
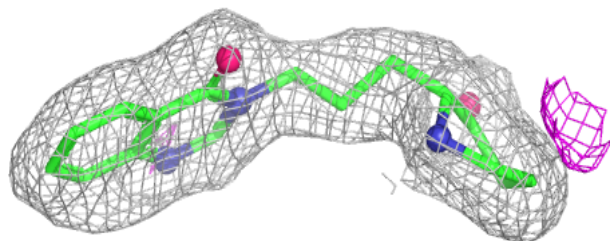
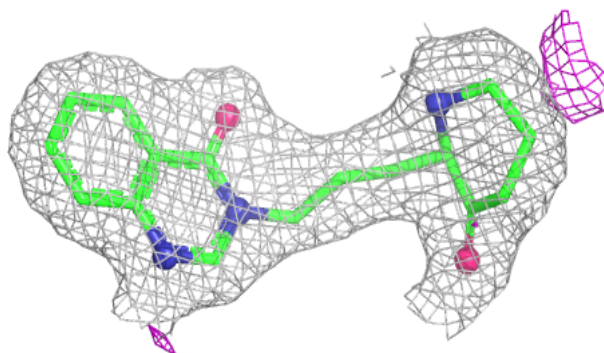


Electron density around 87F A 1004:

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

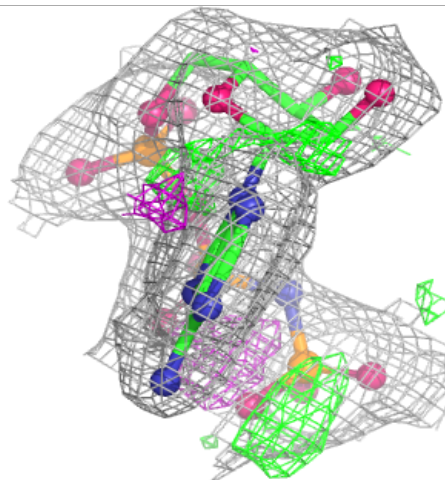
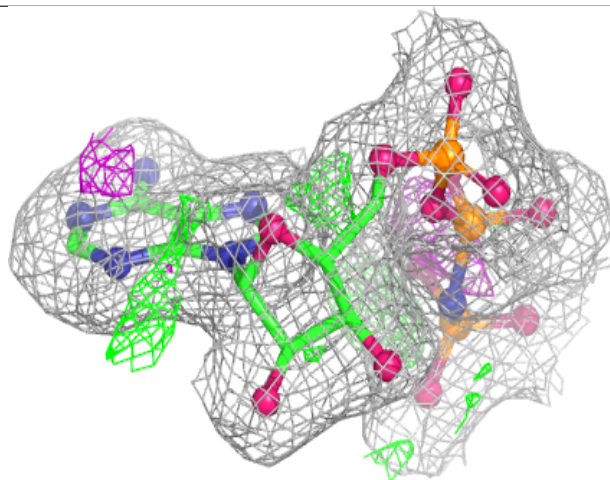
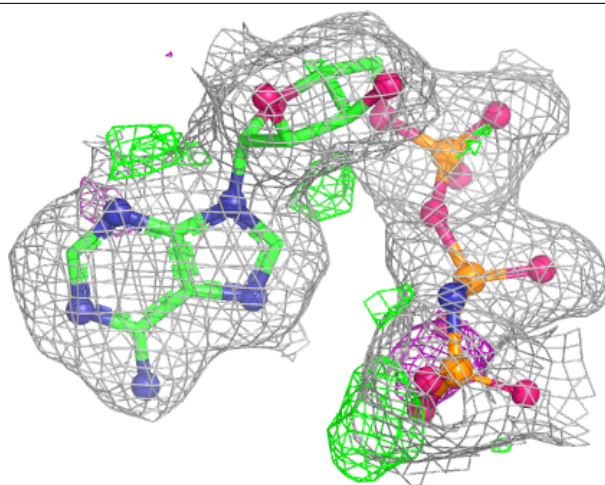
**Electron density around 87F B 1004:**

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



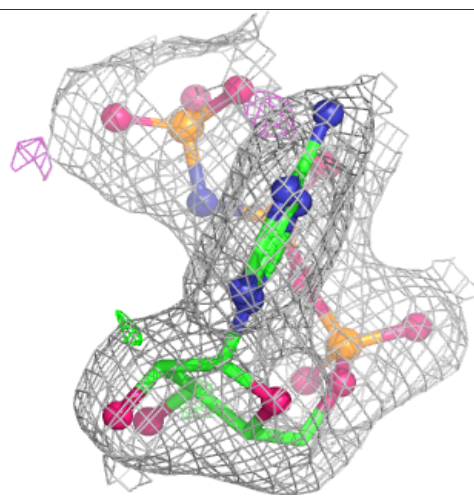
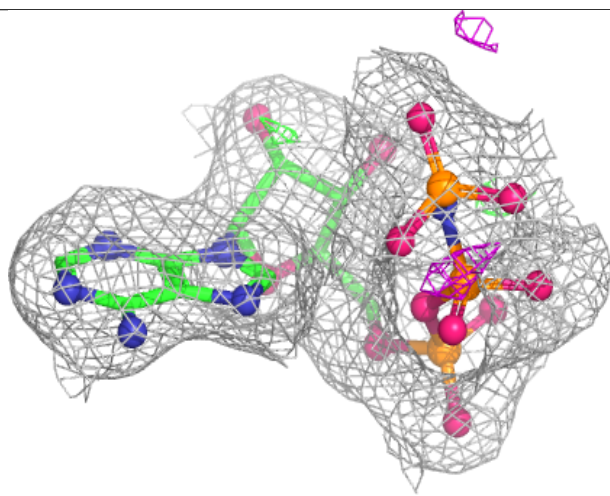
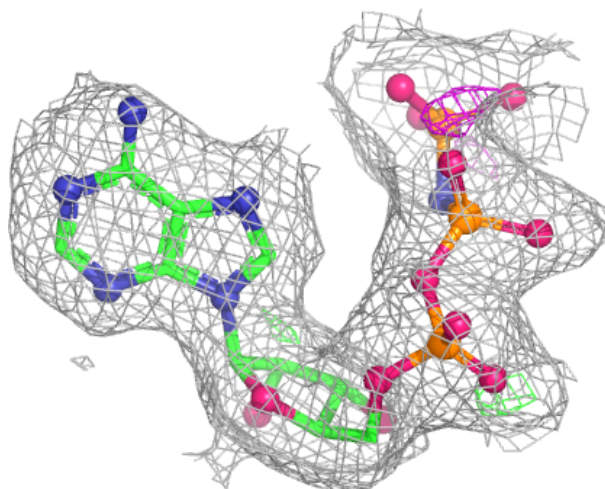
Electron density around ANP A 1001:

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



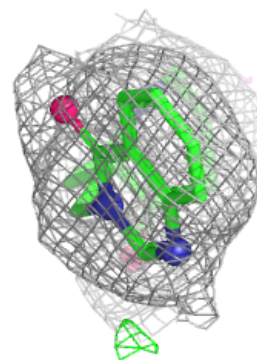
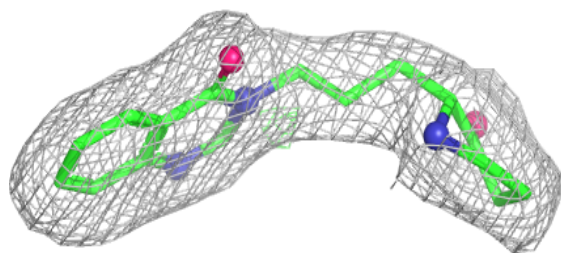
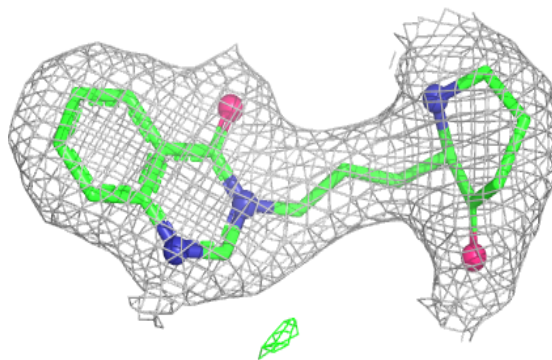
Electron density around ANP C 1001:

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



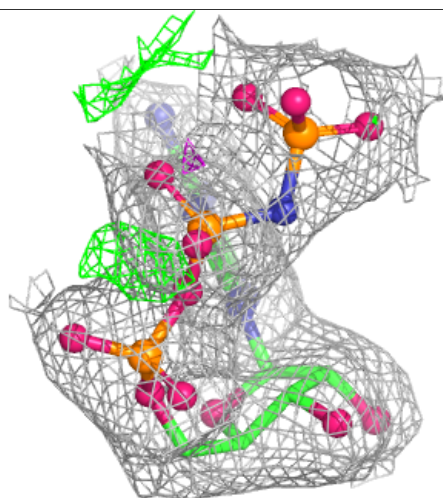
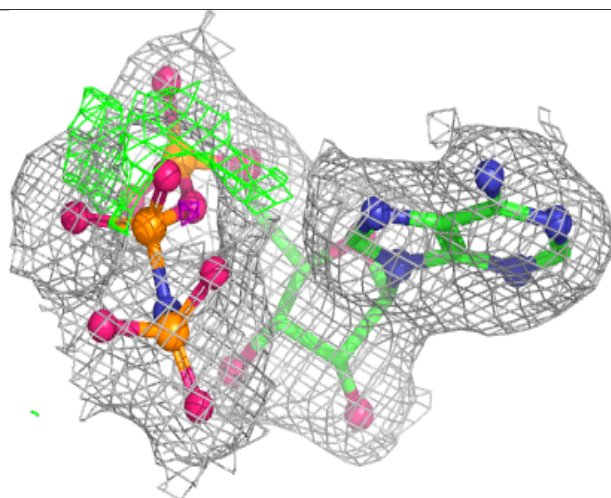
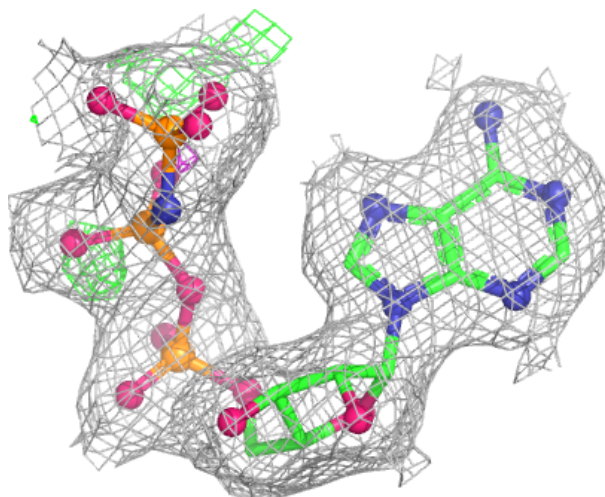
Electron density around 87F D 1004:

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



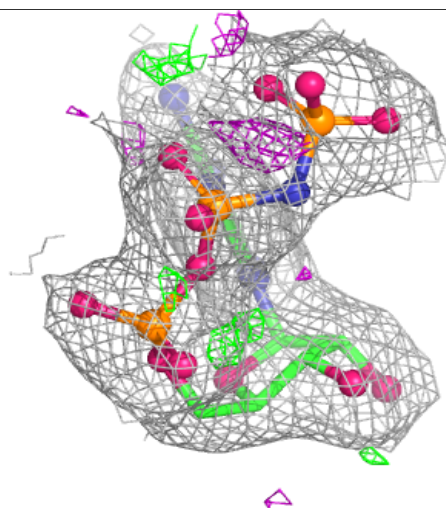
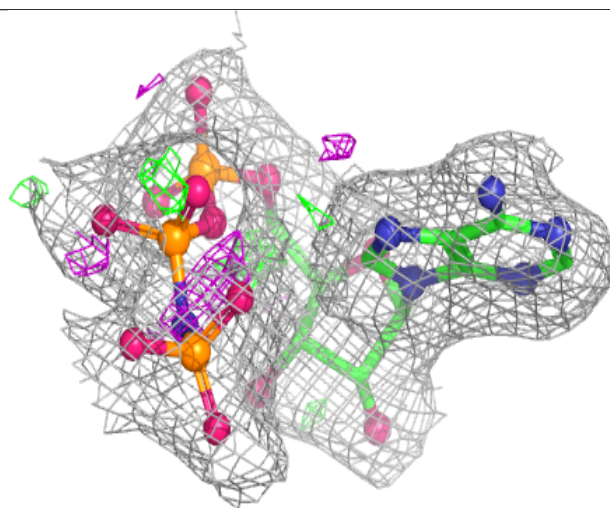
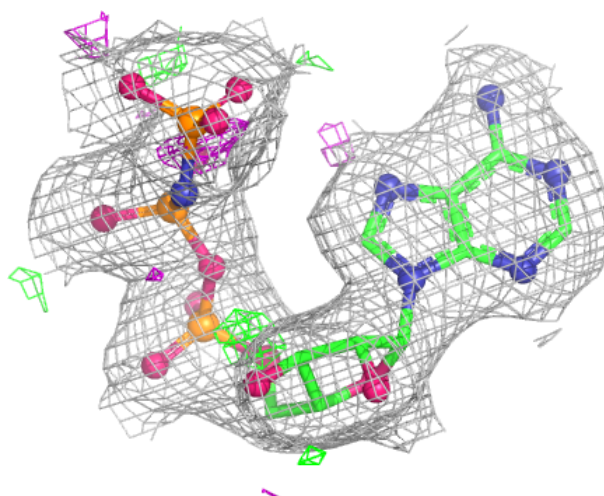
Electron density around ANP D 1001:

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



Electron density around ANP B 1001:

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



6.5 Other polymers ⓘ

There are no such residues in this entry.