



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 03:25 PM UTC

PDB ID : 6TEO / pdb_00006teo
Title : Crystal structure of a yeast Snu114-Prp8 complex
Authors : Ganichkin, O.; Jia, J.; Loll, B.; Absmeier, E.; Wahl, M.C.
Deposited on : 2019-11-12
Resolution : 3.10 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

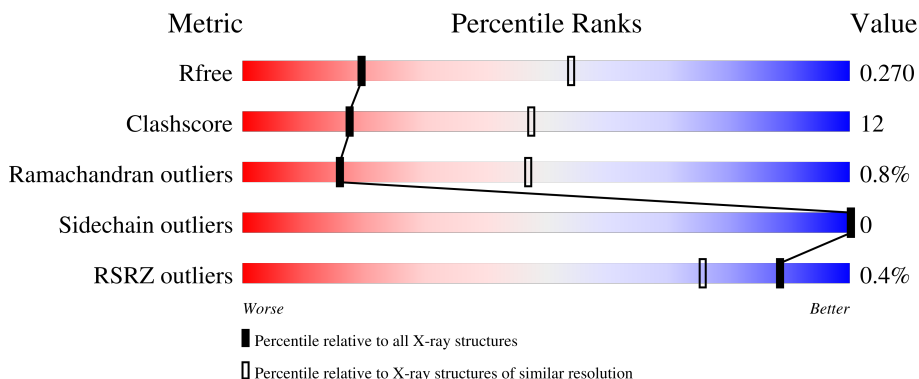
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.10 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	1456 (3.10-3.10)
Clashscore	190562	1539 (3.10-3.10)
Ramachandran outliers	187476	1467 (3.10-3.10)
Sidechain outliers	187428	1467 (3.10-3.10)
RSRZ outliers	180081	1456 (3.10-3.10)

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	946	 66% 25% 9%
1	C	946	 64% 28% 8%
2	B	250	 40% 18% 41%
2	D	250	 44% 12% 44%

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 16330 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 Pre-mRNA-splicing factor SNU114.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	863	Total	C	N	O	S	0	1	0
			6907	4464	1148	1266	29			
1	C	867	Total	C	N	O	S	0	0	0
			6933	4483	1151	1271	28			

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	71	MET	-	initiating methionine	UNP P36048
A	1009	TRP	-	expression tag	UNP P36048
A	1010	SER	-	expression tag	UNP P36048
A	1011	HIS	-	expression tag	UNP P36048
A	1012	PRO	-	expression tag	UNP P36048
A	1013	GLN	-	expression tag	UNP P36048
A	1014	PHE	-	expression tag	UNP P36048
A	1015	GLU	-	expression tag	UNP P36048
A	1016	LYS	-	expression tag	UNP P36048
C	71	MET	-	initiating methionine	UNP P36048
C	1009	TRP	-	expression tag	UNP P36048
C	1010	SER	-	expression tag	UNP P36048
C	1011	HIS	-	expression tag	UNP P36048
C	1012	PRO	-	expression tag	UNP P36048
C	1013	GLN	-	expression tag	UNP P36048
C	1014	PHE	-	expression tag	UNP P36048
C	1015	GLU	-	expression tag	UNP P36048
C	1016	LYS	-	expression tag	UNP P36048

- Molecule 2 is a protein called Pre-mRNA-splicing factor 8.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	148	Total	C	N	O	S	0	0	0
			1231	805	206	217	3			

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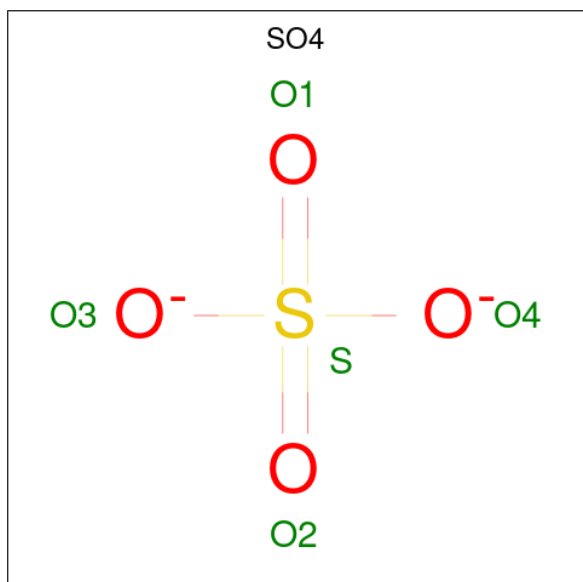
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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	141	Total	C	N	O	S	0	0	0
			1178	772	199	204	3			

There are 18 discrepancies between the modelled and reference sequences:

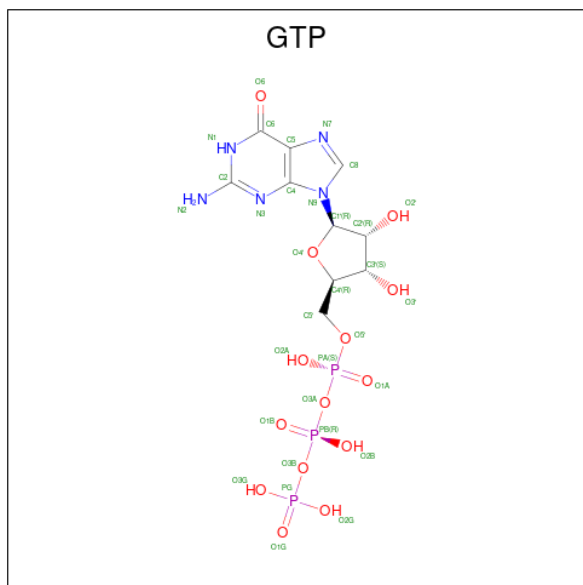
Chain	Residue	Modelled	Actual	Comment	Reference
B	306	MET	-	initiating methionine	UNP P33334
B	307	TRP	-	expression tag	UNP P33334
B	308	SER	-	expression tag	UNP P33334
B	309	HIS	-	expression tag	UNP P33334
B	310	PRO	-	expression tag	UNP P33334
B	311	GLN	-	expression tag	UNP P33334
B	312	PHE	-	expression tag	UNP P33334
B	313	GLU	-	expression tag	UNP P33334
B	314	LYS	-	expression tag	UNP P33334
D	306	MET	-	initiating methionine	UNP P33334
D	307	TRP	-	expression tag	UNP P33334
D	308	SER	-	expression tag	UNP P33334
D	309	HIS	-	expression tag	UNP P33334
D	310	PRO	-	expression tag	UNP P33334
D	311	GLN	-	expression tag	UNP P33334
D	312	PHE	-	expression tag	UNP P33334
D	313	GLU	-	expression tag	UNP P33334
D	314	LYS	-	expression tag	UNP P33334

- Molecule 3 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		

- Molecule 4 is GUANOSINE-5'-TRIPHOSPHATE (CCD ID: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total 32	C 10	N 5	O 14	P 3	0	0
4	C	1	Total 32	C 10	N 5	O 14	P 3	0	0

- Molecule 5 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Mg	0	0
			1	1		
5	C	1	Total	Mg	0	0
			1	1		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	O	0	0
			1	1		

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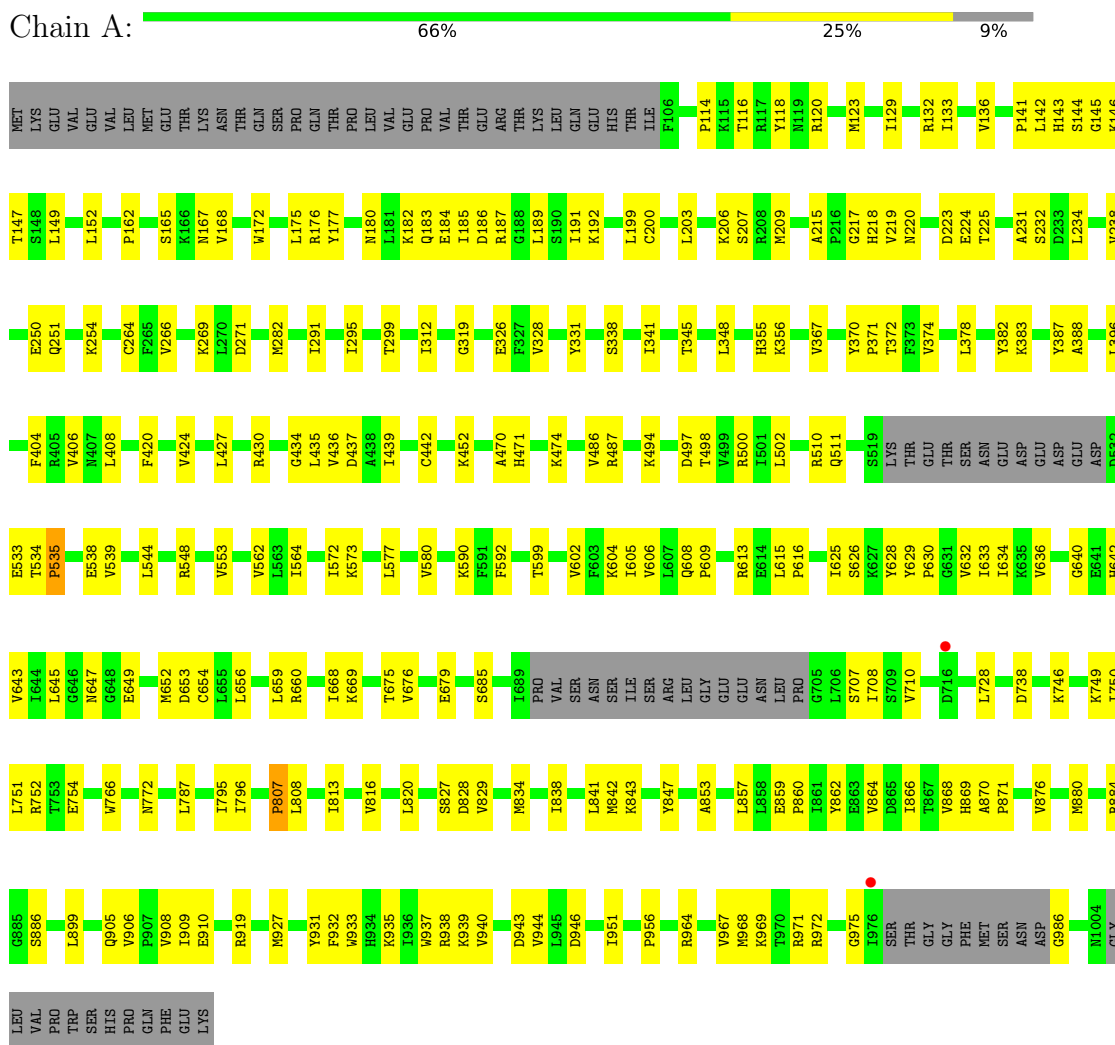
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	B	1	Total 1	O 1	0	0
6	C	2	Total 2	O 2	0	0
6	D	1	Total 1	O 1	0	0

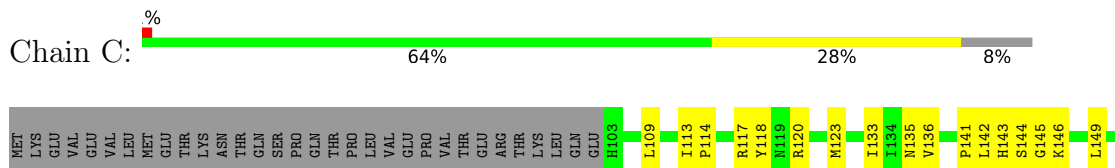
3 Residue-property plots

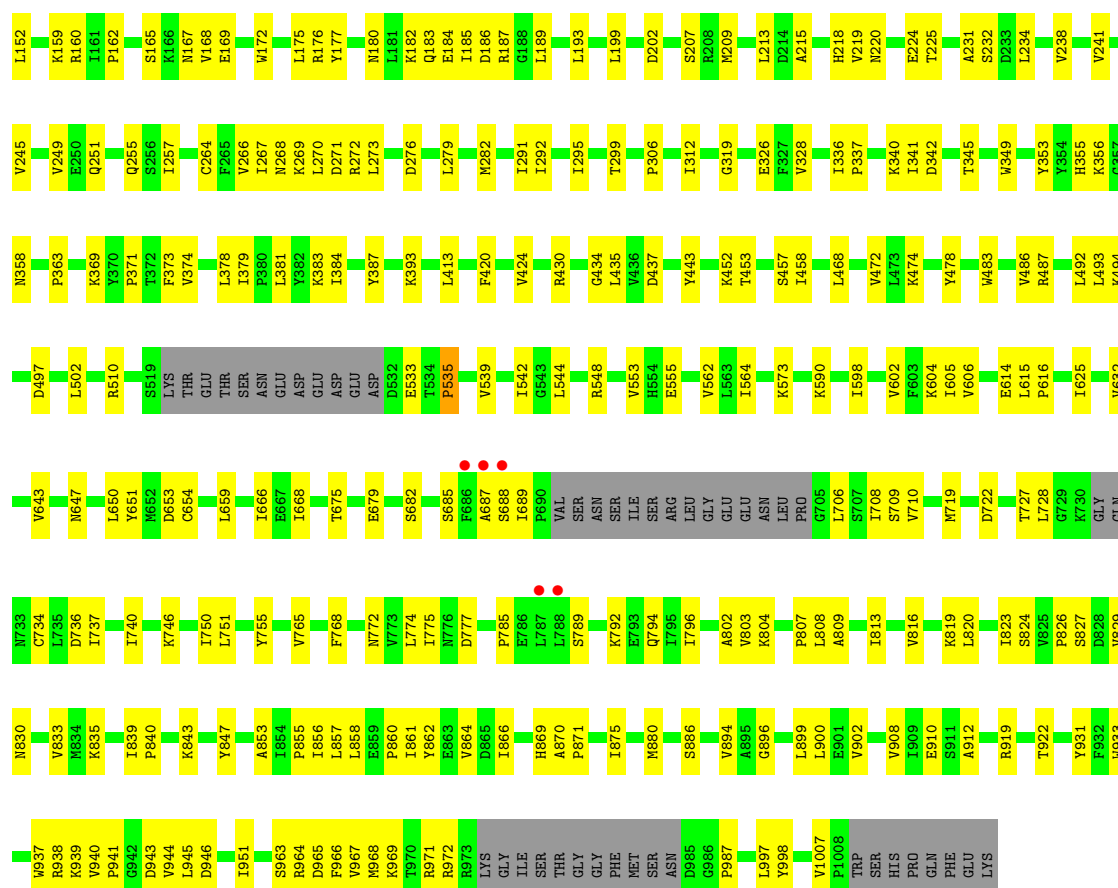
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Pre-mRNA-splicing factor SNU114



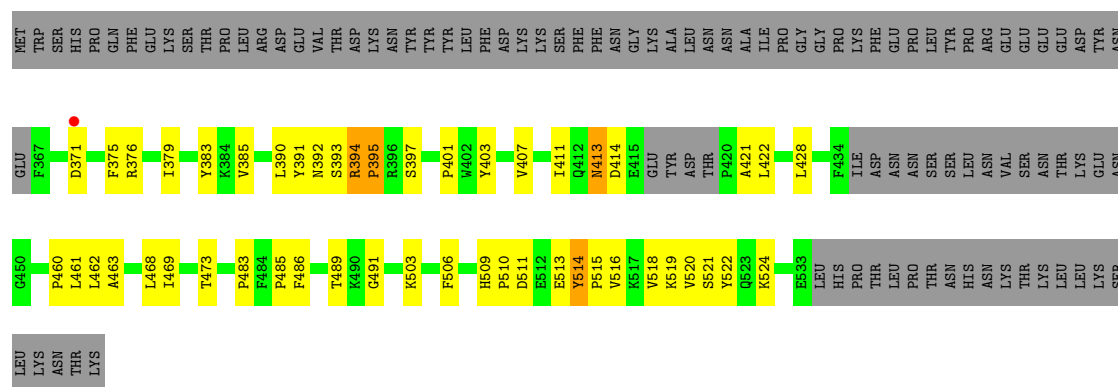
• Molecule 1: Pre-mRNA-splicing factor SNU114





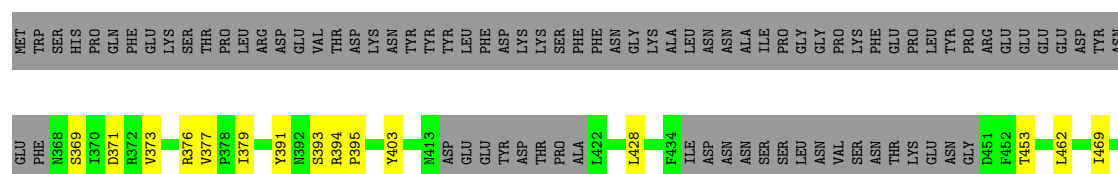
• Molecule 2: Pre-mRNA-splicing factor 48

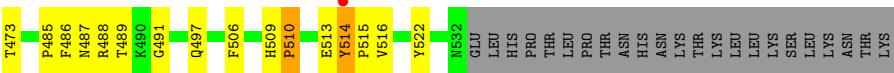
Chain B: 40% 18% 41%



• Molecule 2: Pre-mRNA-splicing factor 48

Chain D: 44% 12% 44%





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	173.11Å 158.59Å 110.70Å 90.00° 116.54° 90.00°	Depositor
Resolution (Å)	47.50 – 3.10 47.50 – 3.10	Depositor EDS
% Data completeness (in resolution range)	99.5 (47.50-3.10) 99.5 (47.50-3.10)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.16 (at 3.12Å)	Xtriage
Refinement program	PHENIX (1.15.2_3472: ???)	Depositor
R, R_{free}	0.230 , 0.271 0.230 , 0.270	Depositor DCC
R_{free} test set	2412 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å ²)	103.3	Xtriage
Anisotropy	0.492	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 52.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	16330	wwPDB-VP
Average B, all atoms (Å ²)	102.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.93% 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: GTP, SO4, MG

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	0.14	0/7052	0.39	0/9543
1	C	0.14	0/7080	0.38	0/9585
2	B	0.20	0/1270	0.50	0/1726
2	D	0.18	0/1215	0.56	0/1652
All	All	0.15	0/16617	0.41	0/22506

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
2	B	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	413	ASN	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	6907	0	7094	171	0
1	C	6933	0	7119	189	0
2	B	1231	0	1214	47	0
2	D	1178	0	1173	28	0
3	A	5	0	0	0	0
3	C	5	0	0	0	0
4	A	32	0	12	3	0
4	C	32	0	12	3	0
5	A	1	0	0	0	0
5	C	1	0	0	0	0
6	A	1	0	0	1	0
6	B	1	0	0	0	0
6	C	2	0	0	0	0
6	D	1	0	0	0	0
All	All	16330	0	16624	408	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 12.

All (408) 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:C:167:ASN:HB3	1:C:172:TRP:HB2	1.39	1.01
1:C:336:ILE:HG13	1:C:341:ILE:HG22	1.51	0.93
1:A:629:TYR:O	1:A:632:VAL:HG12	1.69	0.92
1:A:669:LYS:HA	2:B:394:ARG:HH12	1.35	0.89
1:C:606:VAL:HG12	1:C:643:VAL:HG12	1.53	0.88
1:A:147:THR:OG1	6:A:1201:HOH:O	1.91	0.87
1:C:689:ILE:HG13	1:C:709:SER:HB3	1.56	0.87
1:A:167:ASN:HB3	1:A:172:TRP:HB2	1.57	0.86
1:A:168:VAL:HG11	1:A:175:LEU:HB2	1.57	0.85
1:A:282:MET:HE1	1:A:371:PRO:HD2	1.63	0.81
2:B:509:HIS:O	2:B:511:ASP:N	2.13	0.81
1:A:795:ILE:HG23	1:A:842:MET:HE3	1.64	0.79
2:B:411:ILE:HD11	2:B:428:LEU:HD21	1.64	0.79
1:C:232:SER:O	1:C:452:LYS:NZ	2.17	0.77
1:C:220:ASN:HD22	1:C:650:LEU:HB3	1.50	0.77
1:A:905:GLN:OE1	1:A:938:ARG:NH2	2.21	0.74
1:C:809:ALA:HB2	1:C:967:VAL:HG13	1.67	0.74
1:C:533:GLU:HG3	1:C:535:PRO:HD2	1.69	0.74
1:C:602:VAL:HG12	1:C:908:VAL:HG11	1.69	0.73
1:A:374:VAL:HA	1:A:378:LEU:HB2	1.70	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:187:ARG:NH2	1:C:653:ASP:OD1	2.21	0.73
1:C:794:GLN:HG2	1:C:835:LYS:HB3	1.72	0.72
1:C:393:LYS:HB3	1:C:413:LEU:HD22	1.72	0.71
1:C:919:ARG:NH1	2:D:403:TYR:O	2.24	0.71
1:C:282:MET:HE1	1:C:371:PRO:HD2	1.73	0.70
1:A:707:SER:HA	1:A:841:LEU:HD21	1.74	0.69
1:A:573:LYS:NZ	1:A:626:SER:O	2.26	0.69
1:C:312:ILE:HD13	1:C:435:LEU:HG	1.75	0.68
2:D:393:SER:O	2:D:395:PRO:HD2	1.93	0.68
2:B:421:ALA:HA	2:B:469:ILE:HD12	1.76	0.68
1:A:766:TRP:HB3	1:A:796:ILE:HD11	1.75	0.67
1:A:608:GLN:HG3	1:A:609:PRO:HD2	1.76	0.66
1:C:772:ASN:OD1	1:C:816:VAL:N	2.26	0.66
1:C:374:VAL:HA	1:C:378:LEU:HB2	1.77	0.66
1:A:382:TYR:HB3	2:B:468:LEU:HD21	1.76	0.66
1:A:927:MET:HE2	2:B:407:VAL:HG23	1.77	0.66
1:A:114:PRO:O	1:A:120:ARG:NH1	2.26	0.66
1:C:614:GLU:HB3	1:C:666:ILE:HD13	1.79	0.65
1:C:220:ASN:O	1:C:647:ASN:ND2	2.28	0.65
1:A:710:VAL:HG12	1:A:820:LEU:HA	1.78	0.64
1:A:606:VAL:HG12	1:A:643:VAL:HG12	1.80	0.64
1:A:232:SER:O	1:A:452:LYS:NZ	2.25	0.64
1:A:859:GLU:OE2	1:A:884:ARG:NH2	2.31	0.64
1:C:971:ARG:HD3	1:C:987:PRO:HG3	1.80	0.64
1:C:869:HIS:ND1	2:D:522:TYR:OH	2.31	0.63
1:A:843:LYS:HG2	1:A:847:TYR:HE2	1.64	0.62
1:C:775:ILE:HD11	1:C:819:LYS:HG2	1.82	0.62
1:A:176:ARG:NH2	1:A:184:GLU:O	2.33	0.62
2:B:394:ARG:HB2	2:B:395:PRO:HD2	1.82	0.62
1:C:381:LEU:HD23	1:C:384:ILE:HD11	1.82	0.61
1:A:231:ALA:O	1:A:487:ARG:NH1	2.31	0.61
1:C:866:ILE:HB	1:C:902:VAL:HG13	1.80	0.61
1:A:383:LYS:HD2	2:B:462:LEU:HB3	1.82	0.61
1:C:341:ILE:HG13	1:C:342:ASP:N	2.16	0.60
1:A:604:LYS:O	1:A:605:ILE:HD12	2.01	0.60
1:C:114:PRO:O	1:C:120:ARG:NH1	2.34	0.60
1:A:388:ALA:HA	1:A:396:LEU:HD11	1.84	0.60
1:C:176:ARG:NH2	1:C:184:GLU:O	2.35	0.60
1:A:187:ARG:NH2	1:A:653:ASP:OD1	2.34	0.59
1:C:502:LEU:HD21	1:C:510:ARG:HG3	1.84	0.59
1:C:807:PRO:HB3	1:C:847:TYR:CG	2.36	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:142:LEU:HD13	1:A:218:HIS:HD2	1.67	0.59
1:C:604:LYS:O	1:C:605:ILE:HD12	2.02	0.59
1:C:964:ARG:NH1	1:C:968:MET:SD	2.65	0.59
1:C:777:ASP:OD2	1:C:819:LYS:NZ	2.32	0.59
1:C:142:LEU:HD13	1:C:218:HIS:HD2	1.67	0.59
1:C:710:VAL:HG12	1:C:820:LEU:HA	1.85	0.59
1:A:869:HIS:HA	1:A:899:LEU:HA	1.84	0.58
1:A:219:VAL:HG11	1:A:931:TYR:HB3	1.83	0.58
2:B:460:PRO:HG2	2:B:463:ALA:HB2	1.85	0.58
1:A:772:ASN:OD1	1:A:816:VAL:N	2.29	0.58
1:A:152:LEU:HD21	1:A:319:GLY:HA2	1.84	0.58
1:A:312:ILE:HD13	1:A:435:LEU:HG	1.86	0.58
1:A:964:ARG:HH12	1:A:986:GLY:HA3	1.68	0.58
1:C:165:SER:HA	1:C:169:GLU:HB2	1.86	0.57
1:C:241:VAL:HG23	1:C:268:ASN:O	2.03	0.57
1:C:219:VAL:HG11	1:C:931:TYR:HB3	1.84	0.57
1:C:494:LYS:HB2	1:C:497:ASP:HB2	1.86	0.57
1:A:165:SER:O	1:A:165:SER:OG	2.20	0.57
2:B:514:TYR:N	2:B:515:PRO:HD2	2.20	0.57
2:D:514:TYR:CD1	2:D:515:PRO:HD2	2.40	0.57
1:A:829:VAL:HG21	1:A:834:MET:HE2	1.87	0.56
1:C:141:PRO:HD3	1:C:249:VAL:HG12	1.86	0.56
1:C:910:GLU:OE2	2:D:376:ARG:NE	2.26	0.56
1:C:109:LEU:O	1:C:113:ILE:HG23	2.05	0.56
1:A:328:VAL:HG21	1:A:345:THR:HG22	1.88	0.56
1:C:737:ILE:HA	1:C:740:ILE:HD12	1.86	0.56
1:C:231:ALA:O	1:C:487:ARG:NH1	2.38	0.56
1:A:910:GLU:OE1	2:B:376:ARG:NE	2.27	0.56
1:A:331:TYR:HB3	2:B:461:LEU:HD21	1.88	0.56
1:C:241:VAL:HG22	1:C:267:ILE:HG12	1.86	0.56
1:C:969:LYS:NZ	2:D:373:VAL:O	2.26	0.55
1:A:118:TYR:HE2	1:A:123:MET:HE3	1.71	0.55
1:A:919:ARG:NH1	2:B:403:TYR:O	2.39	0.55
2:B:422:LEU:HG	2:B:469:ILE:HD11	1.88	0.55
1:A:533:GLU:HG3	1:A:535:PRO:HD2	1.89	0.55
1:C:152:LEU:HD21	1:C:319:GLY:HA2	1.87	0.55
1:C:257:ILE:HD11	1:C:299:THR:HA	1.88	0.55
1:A:544:LEU:HG	1:A:553:VAL:HG21	1.88	0.55
1:A:668:ILE:O	2:B:394:ARG:NH1	2.40	0.55
1:C:220:ASN:ND2	1:C:650:LEU:HB3	2.19	0.55
1:C:337:PRO:HG2	1:C:340:LYS:HD2	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:129:ILE:HD13	1:A:132:ARG:HE	1.71	0.54
1:C:383:LYS:HD2	2:D:462:LEU:HB3	1.89	0.54
1:C:963:SER:O	1:C:967:VAL:HG23	2.07	0.54
1:C:650:LEU:HB2	2:D:403:TYR:HE2	1.72	0.54
1:A:609:PRO:HA	1:A:668:ILE:HD12	1.88	0.54
1:A:234:LEU:HD22	1:A:439:ILE:HG23	1.89	0.54
1:C:224:GLU:OE2	1:C:474:LYS:NZ	2.41	0.54
2:B:394:ARG:HB2	2:B:395:PRO:CD	2.36	0.54
1:C:972:ARG:HD2	2:D:371:ASP:O	2.07	0.54
1:C:182:LYS:NZ	1:C:186:ASP:OD2	2.41	0.54
2:D:485:PRO:HG2	2:D:486:PHE:CD2	2.43	0.54
1:A:943:ASP:OD1	1:A:944:VAL:N	2.41	0.53
1:C:510:ARG:NH1	1:C:533:GLU:OE1	2.36	0.53
1:C:785:PRO:O	1:C:789:SER:OG	2.20	0.53
1:A:215:ALA:HB1	1:A:225:THR:HG22	1.90	0.53
1:A:494:LYS:HB2	1:A:497:ASP:OD2	2.08	0.53
1:C:803:VAL:HG23	1:C:813:ILE:HB	1.90	0.53
1:A:511:GLN:HE22	1:A:590:LYS:HA	1.72	0.53
1:A:868:VAL:HG11	1:A:876:VAL:HG21	1.90	0.53
1:A:808:LEU:H	1:A:808:LEU:HD23	1.72	0.53
1:C:241:VAL:HG11	1:C:273:LEU:HD11	1.91	0.53
1:C:706:LEU:HB3	1:C:826:PRO:HG2	1.90	0.53
1:A:708:ILE:HD11	1:A:842:MET:HA	1.89	0.53
1:A:470:ALA:HB3	1:A:577:LEU:HB3	1.90	0.53
1:A:539:VAL:HG23	1:A:564:ILE:HG23	1.91	0.53
1:C:880:MET:O	1:C:886:SER:OG	2.27	0.53
2:B:520:VAL:HG12	2:B:524:LYS:HD2	1.91	0.53
1:A:219:VAL:CG1	1:A:931:TYR:HB3	2.38	0.53
1:A:182:LYS:NZ	1:A:186:ASP:OD2	2.37	0.52
1:A:175:LEU:O	1:A:177:TYR:N	2.43	0.52
1:C:337:PRO:O	1:C:341:ILE:HG23	2.09	0.52
1:C:602:VAL:HG11	1:C:908:VAL:HG21	1.92	0.52
1:A:355:HIS:CE1	1:A:356:LYS:HD3	2.45	0.52
1:C:238:VAL:HG12	1:C:266:VAL:CG1	2.39	0.52
1:A:264[B]:CYS:HB2	1:A:442:CYS:SG	2.49	0.52
1:C:544:LEU:HG	1:C:553:VAL:HG21	1.91	0.52
1:A:142:LEU:HD13	1:A:218:HIS:CD2	2.45	0.52
1:A:971:ARG:O	1:A:975:GLY:N	2.42	0.52
1:A:625:ILE:HD12	1:A:659:LEU:HD13	1.92	0.52
1:C:117:ARG:HA	1:C:159:LYS:HE3	1.91	0.52
1:A:843:LYS:CG	1:A:847:TYR:HE2	2.23	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:542:ILE:HB	1:C:553:VAL:O	2.10	0.51
1:C:941:PRO:O	1:C:963:SER:OG	2.27	0.51
1:A:880:MET:O	1:A:886:SER:OG	2.27	0.51
2:B:392:ASN:OD1	2:B:394:ARG:NH2	2.44	0.51
2:B:397:SER:O	2:B:397:SER:OG	2.29	0.51
1:A:220:ASN:O	1:A:647:ASN:ND2	2.40	0.51
1:A:602:VAL:HG11	1:A:908:VAL:HG11	1.94	0.51
1:C:282:MET:HE1	1:C:374:VAL:HG11	1.93	0.51
1:C:912:ALA:HB3	2:D:377:VAL:HG11	1.92	0.51
1:A:749:LYS:HD2	1:A:752:ARG:HH11	1.76	0.50
1:A:199:LEU:HD11	1:A:207:SER:HB3	1.92	0.50
1:A:238:VAL:HG12	1:A:266:VAL:CG1	2.42	0.50
1:C:839:ILE:HB	1:C:840:PRO:HD3	1.94	0.50
1:C:943:ASP:OD1	1:C:944:VAL:N	2.44	0.50
2:D:506:PHE:HB2	2:D:514:TYR:CD1	2.46	0.50
1:A:864:VAL:HG22	1:A:866:ILE:HG13	1.93	0.50
1:C:215:ALA:HB1	1:C:225:THR:HG22	1.93	0.50
1:C:269:LYS:HG2	4:C:1102:GTP:C6	2.46	0.50
1:A:271:ASP:OD2	4:A:1102:GTP:N2	2.27	0.50
1:A:269:LYS:HG2	4:A:1102:GTP:C6	2.47	0.50
2:B:469:ILE:HG23	2:B:473:THR:OG1	2.11	0.50
1:C:946:ASP:O	1:C:964:ARG:HD3	2.12	0.50
1:C:328:VAL:HG21	1:C:345:THR:HG22	1.94	0.50
1:C:807:PRO:HG3	1:C:847:TYR:HA	1.94	0.50
1:C:510:ARG:NH2	1:C:533:GLU:OE2	2.40	0.50
1:A:772:ASN:HD21	1:A:813:ILE:C	2.20	0.50
1:C:136:VAL:HA	1:C:234:LEU:O	2.11	0.50
1:A:141:PRO:HD2	1:A:238:VAL:O	2.12	0.49
1:C:722:ASP:OD2	1:C:755:TYR:OH	2.18	0.49
1:A:652:MET:HB3	2:B:390:LEU:HD13	1.93	0.49
2:B:411:ILE:CD1	2:B:428:LEU:HD21	2.39	0.49
1:A:191:ILE:HG22	1:A:192:LYS:HG2	1.94	0.49
1:C:510:ARG:HH22	1:C:533:GLU:CD	2.19	0.49
1:C:688:SER:C	1:C:689:ILE:HD12	2.37	0.49
1:A:203:LEU:HB2	1:A:437:ASP:OD2	2.12	0.49
1:A:500:ARG:HD3	1:A:533:GLU:HB3	1.93	0.49
1:A:884:ARG:HH22	1:A:909:ILE:HD11	1.78	0.49
2:B:514:TYR:H	2:B:515:PRO:HD2	1.77	0.49
1:C:864:VAL:HG22	1:C:866:ILE:HG13	1.94	0.49
1:C:269:LYS:HB3	1:C:272:ARG:HG3	1.93	0.49
1:C:383:LYS:HD3	1:C:387:TYR:CE2	2.47	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:193:LEU:HD21	1:C:213:LEU:HD13	1.95	0.49
1:C:968:MET:O	1:C:972:ARG:HG3	2.13	0.49
1:C:562:VAL:HG23	1:C:564:ILE:HD11	1.95	0.48
1:C:291:ILE:O	1:C:295:ILE:HG13	2.13	0.48
1:C:573:LYS:NZ	1:C:632:VAL:O	2.31	0.48
1:C:219:VAL:CG1	1:C:931:TYR:HB3	2.43	0.48
1:C:271:ASP:OD2	4:C:1102:GTP:N2	2.47	0.48
1:C:458:ILE:HD11	1:C:590:LYS:HD2	1.94	0.48
1:A:750:ILE:HG23	1:A:754:GLU:HG3	1.94	0.48
1:C:968:MET:HE1	1:C:971:ARG:HH21	1.77	0.48
1:A:884:ARG:HH12	1:A:909:ILE:HD11	1.78	0.48
1:C:273:LEU:HD22	1:C:279:LEU:HD12	1.96	0.48
1:C:875:ILE:HD11	1:C:922:THR:HG22	1.94	0.48
1:A:355:HIS:CD2	1:A:367:VAL:HG21	2.49	0.48
1:A:404:PHE:CE2	2:B:461:LEU:HD13	2.50	0.47
1:C:998:TYR:HE1	1:C:1007:VAL:HG11	1.79	0.47
1:A:951:ILE:O	1:A:951:ILE:HG13	2.14	0.47
1:C:420:PHE:O	1:C:424:VAL:HG12	2.15	0.47
1:A:145:GLY:O	1:A:149:LEU:N	2.47	0.47
1:A:886:SER:HB3	1:A:906:VAL:HG23	1.96	0.47
2:B:383:TYR:HB3	2:B:391:TYR:CD2	2.50	0.47
1:A:116:THR:HG23	1:A:120:ARG:CZ	2.45	0.47
1:A:182:LYS:HA	1:A:185:ILE:HD12	1.97	0.47
1:C:824:SER:C	1:C:826:PRO:HD3	2.40	0.47
1:C:951:ILE:HG13	1:C:951:ILE:O	2.15	0.47
1:A:649:GLU:OE1	2:B:391:TYR:OH	2.23	0.47
1:A:144:SER:OG	1:A:238:VAL:HG23	2.15	0.47
2:B:385:VAL:O	2:B:401:PRO:HG3	2.15	0.46
1:C:199:LEU:HD11	1:C:207:SER:HB3	1.96	0.46
1:C:180:ASN:ND2	1:C:548:ARG:HA	2.30	0.46
1:C:492:LEU:HD21	1:C:555:GLU:HB2	1.96	0.46
1:A:291:ILE:O	1:A:295:ILE:HG13	2.15	0.46
1:A:184:GLU:HG3	1:A:191:ILE:HB	1.97	0.46
1:A:420:PHE:O	1:A:424:VAL:HG12	2.14	0.46
1:C:142:LEU:HD13	1:C:218:HIS:CD2	2.50	0.46
1:A:679:GLU:OE1	1:A:807:PRO:HD2	2.15	0.46
1:C:625:ILE:HD11	1:C:659:LEU:HB2	1.97	0.46
1:C:146:LYS:NZ	4:C:1102:GTP:O1B	2.47	0.46
1:C:802:ALA:HB2	1:C:843:LYS:HA	1.96	0.46
2:D:469:ILE:HG23	2:D:473:THR:OG1	2.16	0.46
1:A:746:LYS:O	1:A:750:ILE:HG12	2.14	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:544:LEU:HD23	1:C:562:VAL:HG12	1.96	0.46
1:A:636:VAL:HB	1:A:642:HIS:ND1	2.31	0.46
1:A:862:TYR:CG	1:A:908:VAL:HG12	2.50	0.46
1:C:182:LYS:HA	1:C:185:ILE:HD12	1.98	0.46
1:C:114:PRO:HB3	1:C:160:ARG:O	2.16	0.46
1:A:250:GLU:O	1:A:254:LYS:HG3	2.16	0.46
1:A:497:ASP:O	1:A:539:VAL:HG12	2.16	0.46
1:A:675:THR:HG21	1:A:860:PRO:HD2	1.98	0.45
2:B:514:TYR:N	2:B:515:PRO:CD	2.79	0.45
1:C:306:PRO:HG2	1:C:349:TRP:CD2	2.51	0.45
1:C:774:LEU:HD23	1:C:796:ILE:HD13	1.97	0.45
2:D:369:SER:HB2	2:D:371:ASP:OD1	2.15	0.45
2:D:509:HIS:O	2:D:510:PRO:C	2.59	0.45
1:A:502:LEU:HD21	1:A:510:ARG:HG3	1.98	0.45
1:A:633:ILE:HB	1:A:645:LEU:HB2	1.99	0.45
1:A:675:THR:HG22	1:A:676:VAL:N	2.32	0.45
1:A:932:PHE:CZ	1:A:935:LYS:HA	2.51	0.45
2:B:485:PRO:HG2	2:B:486:PHE:CD2	2.51	0.45
1:C:220:ASN:HB3	1:C:651:TYR:HB2	1.98	0.45
1:A:857:LEU:HD22	1:A:967:VAL:HG23	1.99	0.45
2:B:394:ARG:O	2:B:395:PRO:C	2.59	0.45
1:C:830:ASN:OD1	1:C:833:VAL:HB	2.17	0.45
2:B:413:ASN:OD1	2:B:414:ASP:N	2.50	0.45
1:A:498:THR:HA	1:A:538:GLU:HA	1.98	0.44
1:A:544:LEU:HD23	1:A:562:VAL:HG12	2.00	0.44
2:B:489:THR:C	2:B:491:GLY:H	2.25	0.44
1:C:114:PRO:HG3	1:C:162:PRO:HD2	2.00	0.44
1:C:650:LEU:HD22	2:D:403:TYR:CE2	2.53	0.44
1:A:500:ARG:HD3	1:A:533:GLU:CB	2.47	0.44
2:B:503:LYS:HA	2:B:506:PHE:CE1	2.52	0.44
1:C:363:PRO:HB3	1:C:369:LYS:HB3	1.99	0.44
1:C:682:SER:HB3	1:C:856:ILE:HD13	1.98	0.44
1:C:827:SER:O	1:C:829:VAL:HG23	2.18	0.44
1:C:894:VAL:HB	1:C:899:LEU:O	2.17	0.44
1:C:736:ASP:O	1:C:740:ILE:HG13	2.18	0.44
1:A:500:ARG:NH1	1:A:533:GLU:HB3	2.33	0.44
1:C:145:GLY:O	1:C:149:LEU:N	2.47	0.44
1:C:168:VAL:HG11	1:C:175:LEU:HB2	2.00	0.44
1:C:234:LEU:HD11	1:C:264:CYS:SG	2.58	0.44
1:C:804:LYS:HB2	1:C:804:LYS:HE3	1.59	0.44
2:B:469:ILE:HG23	2:B:473:THR:HG1	1.82	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:123:MET:HB2	1:C:199:LEU:HB2	1.98	0.44
1:A:355:HIS:ND1	1:A:356:LYS:HD3	2.33	0.44
1:A:968:MET:O	1:A:972:ARG:HG2	2.18	0.44
1:A:183:GLN:OE1	1:A:654:CYS:HA	2.18	0.44
1:C:860:PRO:HG3	1:C:937:TRP:CZ3	2.53	0.44
2:D:487:ASN:ND2	2:D:488:ARG:HG2	2.32	0.44
1:C:685:SER:HB3	1:C:853:ALA:HA	1.99	0.43
1:C:792:LYS:O	1:C:796:ILE:HG12	2.18	0.43
2:D:513:GLU:O	2:D:514:TYR:HB3	2.18	0.43
1:A:146:LYS:HZ1	1:A:217:GLY:HA3	1.82	0.43
1:C:751:LEU:HD13	1:C:765:VAL:HG21	1.99	0.43
1:C:679:GLU:OE1	1:C:808:LEU:N	2.43	0.43
1:A:471:HIS:HB2	1:A:592:PHE:CZ	2.52	0.43
1:A:956:PRO:HD3	2:B:375:PHE:HE2	1.83	0.43
1:C:326:GLU:HB2	1:C:434:GLY:HA3	2.01	0.43
2:D:391:TYR:HD1	2:D:391:TYR:HA	1.69	0.43
1:A:224:GLU:OE2	1:A:474:LYS:NZ	2.51	0.43
1:A:295:ILE:O	1:A:299:THR:HG23	2.19	0.43
1:A:486:VAL:HG21	1:A:564:ILE:HD12	1.99	0.43
1:C:266:VAL:HA	1:C:312:ILE:O	2.19	0.43
1:C:379:ILE:HG22	1:C:383:LYS:NZ	2.34	0.43
1:A:180:ASN:ND2	1:A:548:ARG:HA	2.34	0.43
1:A:406:VAL:HG13	1:A:427:LEU:HD23	2.01	0.43
1:C:143:HIS:HE2	1:C:189:LEU:HB3	1.84	0.43
1:C:145:GLY:HA3	1:C:268:ASN:HD22	1.84	0.43
1:C:238:VAL:HG12	1:C:266:VAL:HG13	2.01	0.43
1:C:896:GLY:O	2:D:428:LEU:HD22	2.18	0.43
1:A:534:THR:HB	1:A:535:PRO:HD3	2.00	0.43
1:C:202:ASP:HB2	1:C:437:ASP:OD1	2.18	0.43
1:C:688:SER:OG	1:C:997:LEU:HD21	2.19	0.43
1:A:136:VAL:HG21	1:A:439:ILE:HG21	2.01	0.43
1:A:656:LEU:O	1:A:660:ARG:N	2.48	0.43
1:A:884:ARG:HG2	1:A:910:GLU:HG3	2.01	0.43
1:C:668:ILE:HD12	1:C:668:ILE:HA	1.90	0.43
1:C:719:MET:HE3	1:C:768:PHE:HE2	1.83	0.43
1:A:136:VAL:HA	1:A:234:LEU:O	2.18	0.43
1:A:738:ASP:OD1	1:A:738:ASP:N	2.52	0.43
1:C:245:VAL:HA	1:C:249:VAL:HG21	2.01	0.43
1:C:708:ILE:HB	1:C:823:ILE:HG22	1.99	0.43
1:C:857:LEU:HD23	1:C:940:VAL:HG21	2.01	0.43
1:A:118:TYR:CE2	1:A:123:MET:HE3	2.53	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:358:ASN:OD1	1:C:358:ASN:N	2.51	0.42
1:C:856:ILE:HB	1:C:939:LYS:HD3	2.01	0.42
1:C:870:ALA:HB3	1:C:871:PRO:HD3	2.01	0.42
1:A:628:TYR:O	1:A:630:PRO:HD3	2.19	0.42
1:A:820:LEU:HD13	1:A:842:MET:HE1	2.00	0.42
1:A:864:VAL:HG11	1:A:880:MET:HE1	2.01	0.42
1:C:118:TYR:CE1	1:C:123:MET:HE3	2.54	0.42
1:C:175:LEU:HD21	1:C:177:TYR:HD1	1.85	0.42
1:C:255:GLN:CD	1:C:598:ILE:HD12	2.44	0.42
1:C:292:ILE:HD12	1:C:349:TRP:CZ2	2.55	0.42
1:C:722:ASP:HB3	1:C:727:THR:O	2.19	0.42
1:C:746:LYS:O	1:C:750:ILE:HG12	2.18	0.42
1:A:251:GLN:HG3	1:A:933:TRP:NE1	2.34	0.42
1:A:370:TYR:HB3	1:A:374:VAL:CG2	2.49	0.42
2:B:519:LYS:HA	2:B:522:TYR:HD2	1.85	0.42
1:C:241:VAL:HG22	1:C:267:ILE:CG1	2.50	0.42
1:C:615:LEU:N	1:C:616:PRO:HD2	2.35	0.42
2:D:462:LEU:HD23	2:D:462:LEU:HA	1.92	0.42
1:A:599:THR:HG22	1:A:933:TRP:HB3	2.00	0.42
1:A:884:ARG:HH12	1:A:909:ILE:CD1	2.33	0.42
2:B:393:SER:O	2:B:395:PRO:HD2	2.20	0.42
1:C:271:ASP:OD1	1:C:271:ASP:N	2.52	0.42
1:C:353:TYR:HD1	1:C:371:PRO:HA	1.84	0.42
1:C:478:TYR:HB3	1:C:483:TRP:CD1	2.54	0.42
1:C:944:VAL:HG13	1:C:945:LEU:CD1	2.50	0.42
1:A:408:LEU:HD12	1:A:408:LEU:HA	1.82	0.42
1:A:827:SER:OG	1:A:828:ASP:N	2.48	0.42
1:C:251:GLN:HG3	1:C:933:TRP:NE1	2.34	0.42
2:D:497:GLN:H	2:D:497:GLN:HG3	1.63	0.42
1:A:114:PRO:HG3	1:A:162:PRO:HD2	2.02	0.42
2:B:516:VAL:O	2:B:521:SER:N	2.53	0.42
1:C:272:ARG:HD2	1:C:276:ASP:OD2	2.20	0.42
1:A:338:SER:O	1:A:341:ILE:HG12	2.19	0.42
1:A:341:ILE:O	1:A:345:THR:HG23	2.20	0.42
1:A:787:LEU:HD23	1:A:787:LEU:HA	1.89	0.42
1:C:251:GLN:HG3	1:C:933:TRP:CE2	2.55	0.42
1:A:133:ILE:HD12	1:A:133:ILE:O	2.19	0.42
1:A:675:THR:HG21	1:A:908:VAL:HG21	2.01	0.42
1:A:685:SER:HB3	1:A:853:ALA:HB2	2.02	0.42
1:A:860:PRO:HG3	1:A:937:TRP:CZ3	2.54	0.42
1:A:870:ALA:HB3	1:A:871:PRO:HD3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:472:VAL:HA	1:C:486:VAL:HG22	2.02	0.42
1:A:132:ARG:HH22	1:A:206:LYS:HE2	1.85	0.41
1:A:200:CYS:HB3	1:A:436:VAL:HG11	2.02	0.41
1:C:118:TYR:HE1	1:C:123:MET:HE3	1.84	0.41
1:A:834:MET:O	1:A:838:ILE:HG13	2.20	0.41
1:C:133:ILE:HA	1:C:209:MET:O	2.19	0.41
1:C:539:VAL:HG21	1:C:542:ILE:HD11	2.01	0.41
1:C:383:LYS:HD2	2:D:462:LEU:CB	2.50	0.41
1:C:861:ILE:HG13	1:C:938:ARG:HG3	2.02	0.41
2:D:379:ILE:O	2:D:379:ILE:HG13	2.20	0.41
1:A:613:ARG:HD2	1:A:613:ARG:HA	1.87	0.41
2:B:514:TYR:H	2:B:515:PRO:CD	2.32	0.41
1:C:135:ASN:HD22	1:C:487:ARG:CZ	2.33	0.41
1:C:353:TYR:CD1	1:C:371:PRO:HA	2.56	0.41
1:C:870:ALA:HA	1:C:900:LEU:CD1	2.51	0.41
2:D:516:VAL:O	2:D:516:VAL:HG23	2.21	0.41
1:A:223:ASP:OD1	1:A:223:ASP:N	2.52	0.41
1:A:234:LEU:HD11	1:A:442:CYS:SG	2.61	0.41
1:A:269:LYS:HG2	4:A:1102:GTP:N1	2.36	0.41
1:C:358:ASN:HB3	2:D:453:THR:HG22	2.02	0.41
1:C:468:LEU:HD21	1:C:493:LEU:HD23	2.02	0.41
1:C:355:HIS:CD2	1:C:356:LYS:HG2	2.56	0.41
1:C:965:ASP:OD1	1:C:969:LYS:HE3	2.20	0.41
1:A:326:GLU:HB2	1:A:434:GLY:HA3	2.03	0.41
1:A:348:LEU:HD23	1:A:372:THR:HB	2.03	0.41
1:A:946:ASP:O	1:A:964:ARG:HD3	2.21	0.41
1:C:144:SER:HB2	1:C:238:VAL:HG23	2.03	0.41
1:C:453:THR:O	1:C:457:SER:OG	2.39	0.41
1:C:858:LEU:HD23	1:C:939:LYS:HA	2.02	0.41
2:D:489:THR:C	2:D:491:GLY:H	2.29	0.41
1:A:123:MET:HG2	1:A:209:MET:HE3	2.03	0.41
1:A:383:LYS:HD3	1:A:387:TYR:CE2	2.56	0.41
1:A:728:LEU:HD12	1:A:728:LEU:HA	1.82	0.41
1:A:751:LEU:HD12	1:A:751:LEU:HA	1.85	0.41
1:A:939:LYS:HD2	1:A:940:VAL:O	2.21	0.41
2:B:483:PRO:HG2	2:B:513:GLU:HG3	2.03	0.41
2:B:516:VAL:HG12	2:B:521:SER:OG	2.21	0.41
1:C:373:PHE:CE1	1:C:378:LEU:HG	2.56	0.41
1:C:855:PRO:HG2	1:C:945:LEU:CD1	2.50	0.41
1:C:675:THR:HG21	1:C:860:PRO:HD2	2.02	0.41
2:B:379:ILE:O	2:B:379:ILE:HG13	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:241:VAL:HG21	1:C:270:LEU:HD12	2.03	0.40
1:A:383:LYS:HD2	2:B:462:LEU:CB	2.50	0.40
1:A:632:VAL:HG22	1:A:634:ILE:HG23	2.03	0.40
2:B:461:LEU:HD23	2:B:461:LEU:HA	1.90	0.40
2:B:485:PRO:HG2	2:B:486:PHE:CE2	2.56	0.40
2:B:503:LYS:HD2	2:B:506:PHE:CZ	2.56	0.40
1:C:860:PRO:HG3	1:C:937:TRP:CH2	2.56	0.40
1:C:966:PHE:CZ	2:D:376:ARG:HD3	2.56	0.40
1:A:969:LYS:HD3	2:B:371:ASP:O	2.22	0.40
1:C:728:LEU:O	1:C:734:CYS:HA	2.21	0.40
1:C:862:TYR:CD1	1:C:908:VAL:HG22	2.56	0.40
1:A:572:ILE:HD11	1:A:626:SER:OG	2.20	0.40
1:C:369:LYS:H	1:C:369:LYS:HG2	1.66	0.40
1:A:143:HIS:NE2	1:A:189:LEU:HB3	2.36	0.40
1:A:494:LYS:HB2	1:A:497:ASP:CG	2.46	0.40
1:A:500:ARG:HD2	1:A:580:VAL:HG13	2.03	0.40
1:A:572:ILE:HG23	1:A:573:LYS:H	1.87	0.40
1:A:615:LEU:N	1:A:616:PRO:HD2	2.37	0.40
1:C:183:GLN:OE1	1:C:654:CYS:HA	2.21	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	856/946 (90%)	819 (96%)	33 (4%)	4 (0%)	24	57
1	C	857/946 (91%)	821 (96%)	32 (4%)	4 (0%)	24	57
2	B	142/250 (57%)	120 (84%)	17 (12%)	5 (4%)	3	16
2	D	135/250 (54%)	116 (86%)	16 (12%)	3 (2%)	5	24
All	All	1990/2392 (83%)	1876 (94%)	98 (5%)	16 (1%)	16	47

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	394	ARG
2	D	394	ARG
2	D	510	PRO
2	B	510	PRO
2	B	518	VAL
1	A	430	ARG
1	C	430	ARG
1	C	443	TYR
1	A	535	PRO
1	A	807	PRO
1	C	687	ALA
2	D	514	TYR
2	B	514	TYR
1	A	640	GLY
2	B	395	PRO
1	C	535	PRO

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	778/856 (91%)	778 (100%)	0	100	100
1	C	782/856 (91%)	782 (100%)	0	100	100
2	B	138/235 (59%)	138 (100%)	0	100	100
2	D	133/235 (57%)	133 (100%)	0	100	100
All	All	1831/2182 (84%)	1831 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	128	ASN
1	A	211	ASN

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Mol	Chain	Res	Type
1	A	255	GLN
1	A	260	ASN
1	C	403	ASN
1	C	444	GLN
1	C	554	HIS
1	C	929	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 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	GTP	A	1102	-	33,34,34	0.91	1 (3%)	50,54,54	1.58	9 (18%)
4	GTP	C	1102	5	33,34,34	0.91	1 (3%)	50,54,54	1.58	8 (16%)
3	SO4	C	1101	-	4,4,4	0.24	0	6,6,6	0.08	0
3	SO4	A	1101	-	4,4,4	0.24	0	6,6,6	0.07	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the

Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns.
'-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GTP	C	1102	5	-	7/22/38/38	0/3/3/3
4	GTP	A	1102	-	-	7/22/38/38	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	1102	GTP	C2-N3	2.16	1.38	1.33
4	A	1102	GTP	C2-N3	2.04	1.38	1.33

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	1102	GTP	C5-C4-N3	-5.00	120.43	128.39
4	A	1102	GTP	C5-C4-N3	-4.88	120.62	128.39
4	C	1102	GTP	C2-N3-C4	4.61	120.25	112.30
4	A	1102	GTP	C2-N3-C4	4.56	120.16	112.30
4	C	1102	GTP	N9-C4-N3	3.22	132.40	125.95
4	A	1102	GTP	N9-C4-N3	2.96	131.87	125.95
4	A	1102	GTP	C2-N1-C6	-2.90	119.85	125.11
4	C	1102	GTP	C2-N1-C6	-2.89	119.87	125.11
4	A	1102	GTP	N9-C8-N7	-2.64	108.50	113.40
4	C	1102	GTP	N9-C8-N7	-2.56	108.65	113.40
4	A	1102	GTP	C8-N7-C5	2.56	108.82	104.26
4	C	1102	GTP	C5-C6-N1	2.46	119.51	113.25
4	C	1102	GTP	C8-N7-C5	2.46	108.64	104.26
4	A	1102	GTP	O6-C6-C5	-2.41	120.18	126.53
4	C	1102	GTP	O6-C6-C5	-2.40	120.19	126.53
4	A	1102	GTP	C5-C6-N1	2.37	119.28	113.25
4	A	1102	GTP	C3'-C2'-C1'	2.05	105.35	101.46

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1102	GTP	C5'-O5'-PA-O1A
4	A	1102	GTP	C5'-O5'-PA-O2A
4	C	1102	GTP	C5'-O5'-PA-O1A
4	C	1102	GTP	C5'-O5'-PA-O2A
4	A	1102	GTP	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
4	A	1102	GTP	C3'-C4'-C5'-O5'
4	C	1102	GTP	O4'-C4'-C5'-O5'
4	C	1102	GTP	C3'-C4'-C5'-O5'
4	A	1102	GTP	PA-O3A-PB-O1B
4	C	1102	GTP	PA-O3A-PB-O1B
4	A	1102	GTP	C5'-O5'-PA-O3A
4	C	1102	GTP	C5'-O5'-PA-O3A
4	A	1102	GTP	PA-O3A-PB-O2B
4	C	1102	GTP	PA-O3A-PB-O2B

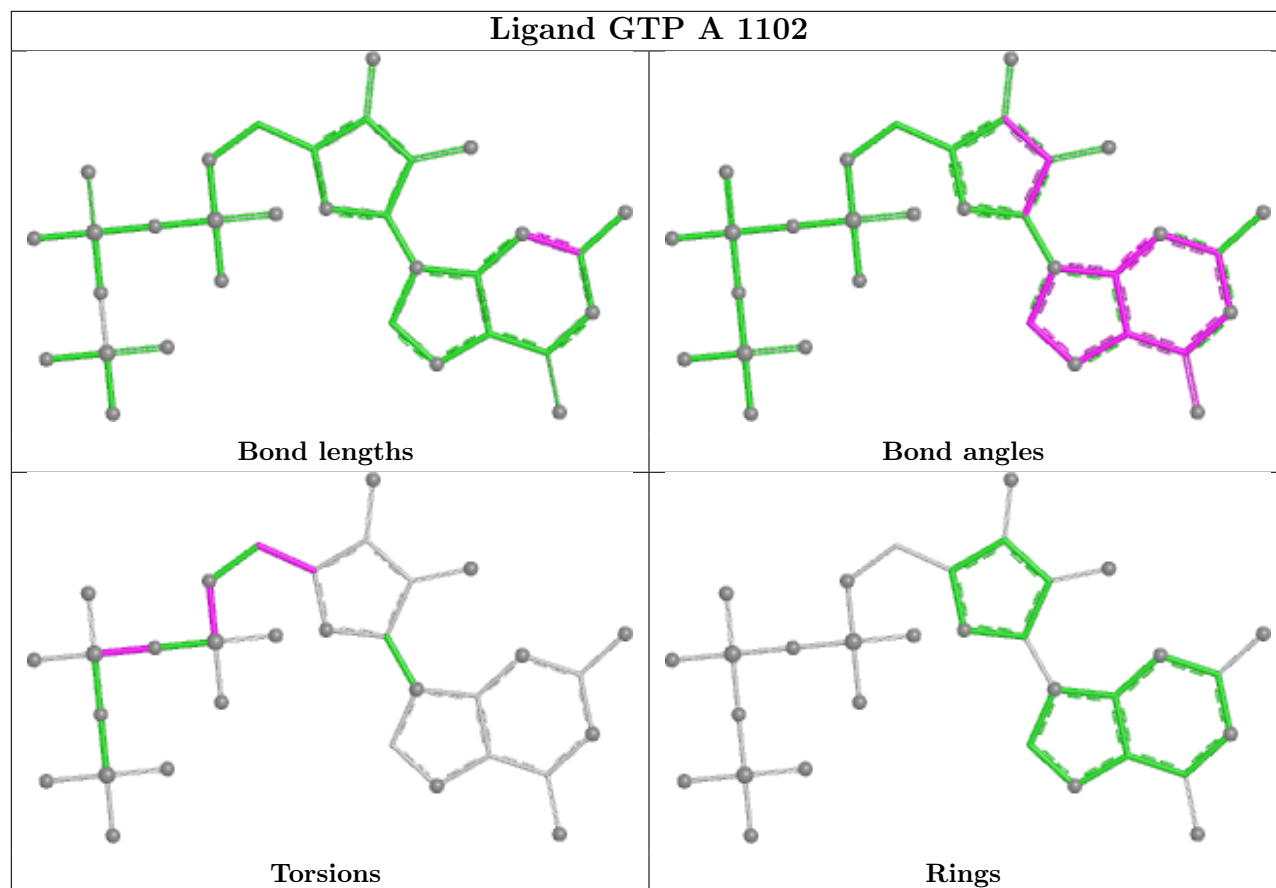
There are no ring outliers.

2 monomers are involved in 6 short contacts:

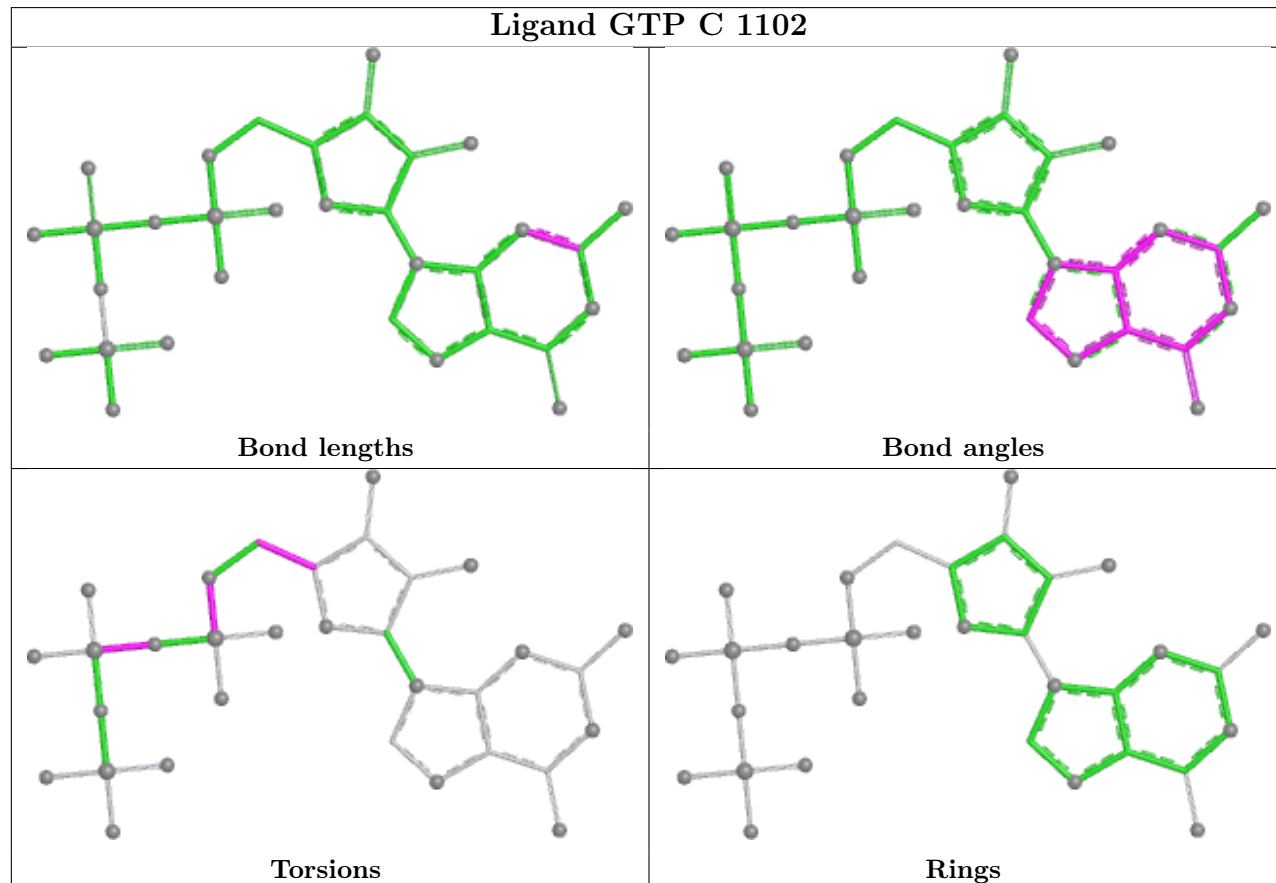
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1102	GTP	3	0
4	C	1102	GTP	3	0

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 GTP A 1102



Ligand GTP C 1102



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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	863/946 (91%)	-0.00	2 (0%) 91 83	34, 94, 137, 180	1 (0%)
1	C	867/946 (91%)	0.03	5 (0%) 85 70	59, 96, 168, 197	0
2	B	148/250 (59%)	0.15	1 (0%) 84 68	76, 104, 155, 167	0
2	D	141/250 (56%)	0.13	1 (0%) 84 68	70, 104, 146, 163	0
All	All	2019/2392 (84%)	0.03	9 (0%) 88 76	34, 96, 157, 197	1 (0%)

All (9) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	716	ASP	2.5
1	C	788	LEU	2.5
1	C	686	PHE	2.5
1	A	976	ILE	2.2
1	C	787	LEU	2.2
1	C	688	SER	2.2
2	D	514	TYR	2.1
1	C	687	ALA	2.1
2	B	371	ASP	2.1

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](#)

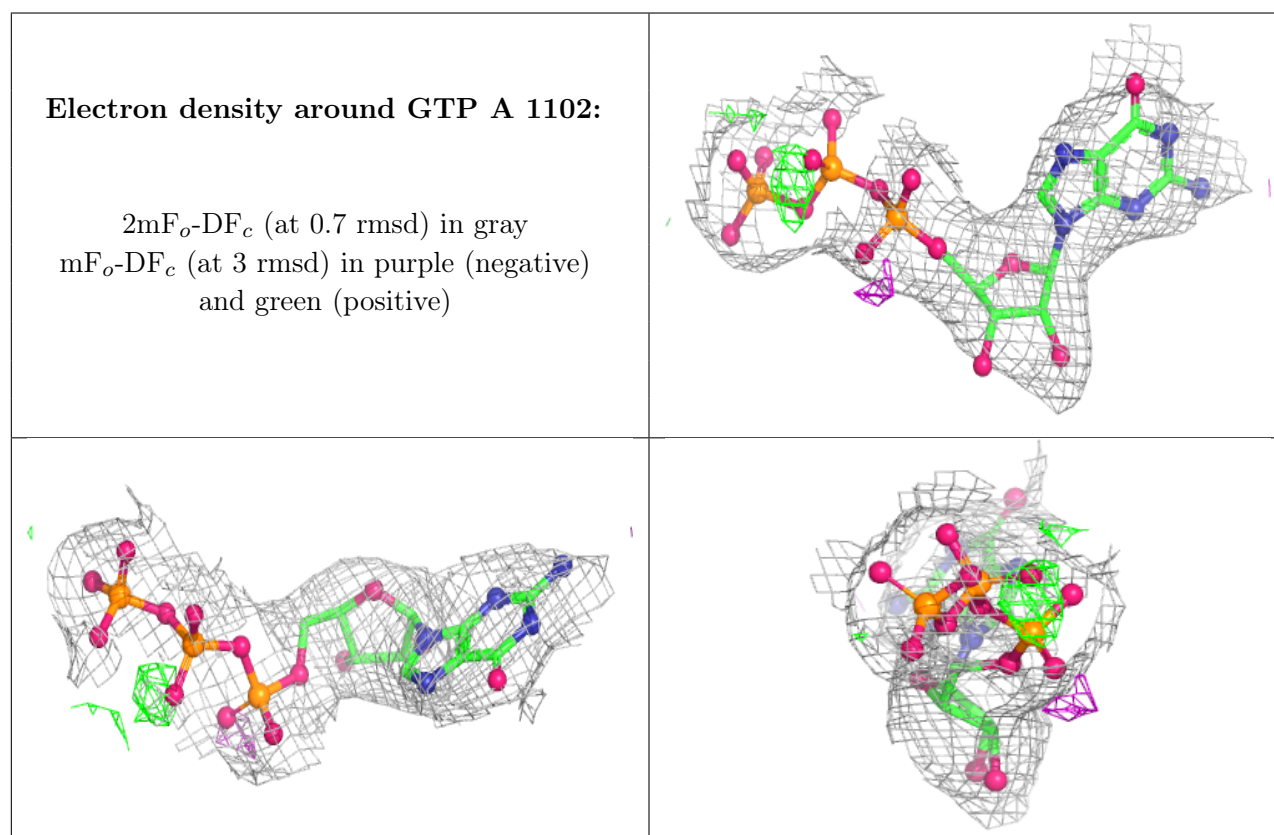
There are no oligosaccharides in this entry.

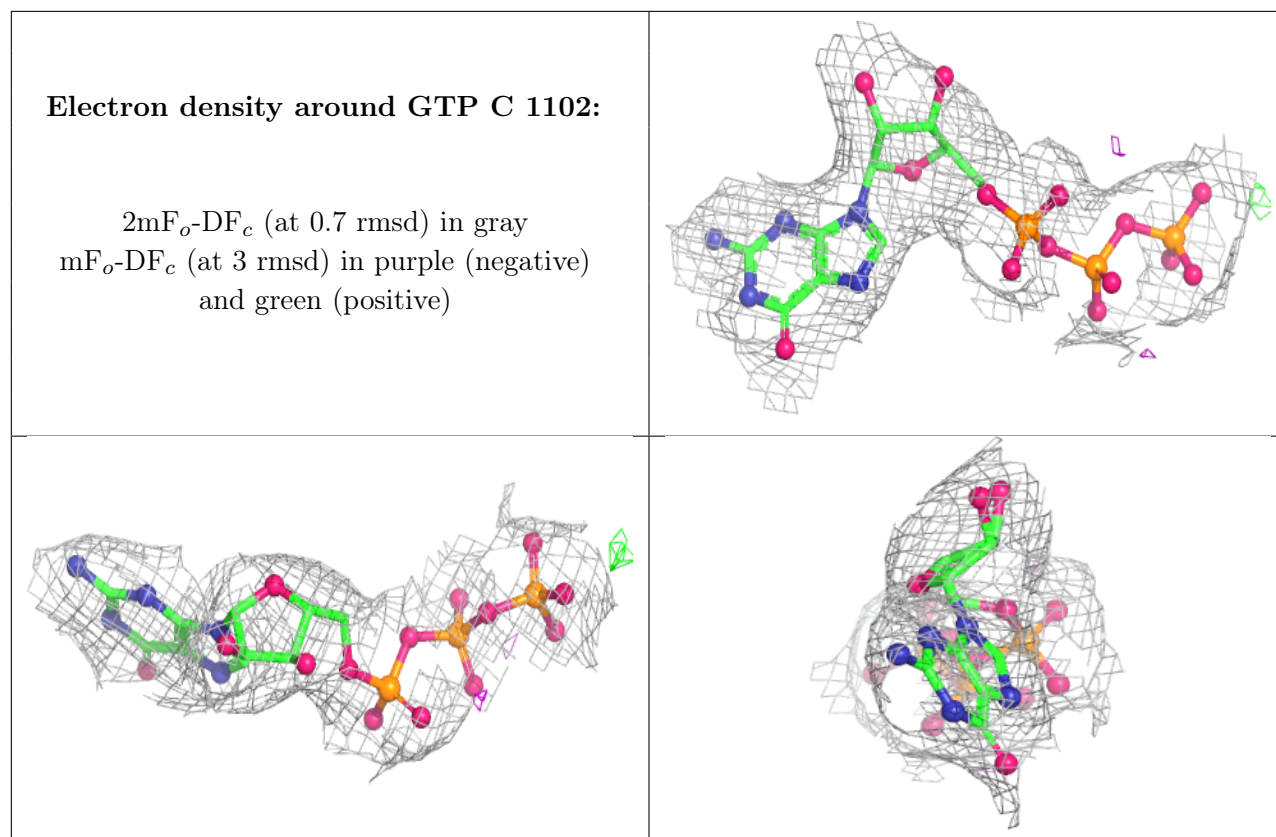
6.4 Ligands ⓘ

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
3	SO4	C	1101	5/5	0.86	0.10	97,107,114,119	0
3	SO4	A	1101	5/5	0.89	0.09	101,104,110,112	0
5	MG	A	1103	1/1	0.89	0.11	80,80,80,80	0
4	GTP	A	1102	32/32	0.94	0.09	65,76,83,101	0
5	MG	C	1103	1/1	0.95	0.08	69,69,69,69	0
4	GTP	C	1102	32/32	0.96	0.06	53,70,78,89	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.





6.5 Other polymers [i](#)

There are no such residues in this entry.