



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 01:46 AM UTC

PDB ID : 1R4A / pdb_00001r4a
Title : Crystal Structure of GTP-bound ADP-ribosylation Factor Like Protein 1 (Arl1) and GRIP Domain of Golgin245 COMPLEX
Authors : Wu, M.; Lu, L.; Hong, W.; Song, H.
Deposited on : 2003-10-04
Resolution : 2.30 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

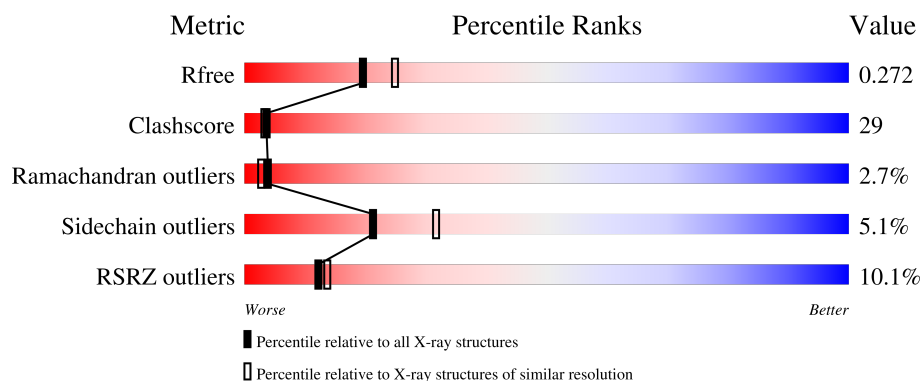
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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	6319 (2.30-2.30)
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)
RSRZ outliers	180081	6325 (2.30-2.30)

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	165	8% 58% 35% 6%
1	B	165	10% 63% 29% 7%
1	C	165	12% 59% 33% 7%
1	D	165	14% 64% 27% 7%
2	E	51	12% 49% 43% 8%

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Mol	Chain	Length	Quality of chain
2	F	51	8% 65% 31%
2	G	51	2% 63% 29% 8%
2	H	51	8% 61% 33% 6%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 7380 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 ADP-ribosylation factor-like protein 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	165	Total	C	N	O	S	0	0	0
			1312	835	221	248	8			
1	B	165	Total	C	N	O	S	0	0	0
			1312	835	221	248	8			
1	C	165	Total	C	N	O	S	0	0	0
			1312	835	221	248	8			
1	D	165	Total	C	N	O	S	0	0	0
			1312	835	221	248	8			

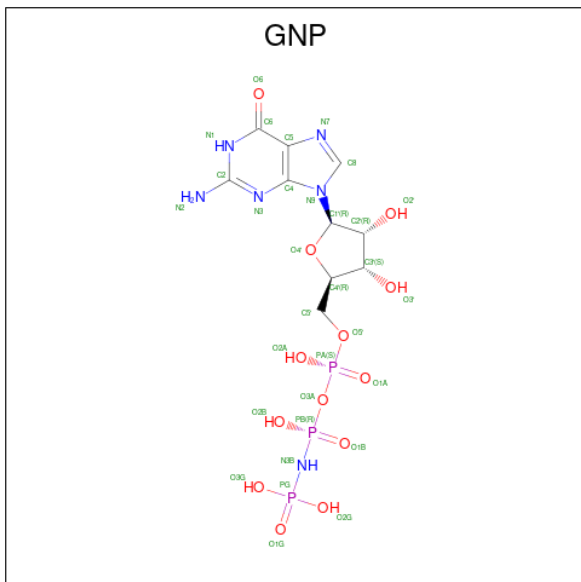
- Molecule 2 is a protein called Golgi autoantigen, golgin subfamily A member 4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	E	51	Total	C	N	O	S	0	0	0
			433	279	70	80	4			
2	F	51	Total	C	N	O	S	0	0	0
			433	279	70	80	4			
2	G	51	Total	C	N	O	S	0	0	0
			433	279	70	80	4			
2	H	51	Total	C	N	O	S	0	0	0
			433	279	70	80	4			

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

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	Mg	0	0
			1	1		
3	B	1	Total	Mg	0	0
			1	1		
3	C	1	Total	Mg	0	0
			1	1		
3	D	1	Total	Mg	0	0
			1	1		

- Molecule 4 is PHOSPHOAMINOPHOSPHONIC ACID-GUANYLATE ESTER (CCD ID: GNP) (formula: $C_{10}H_{17}N_6O_{13}P_3$).



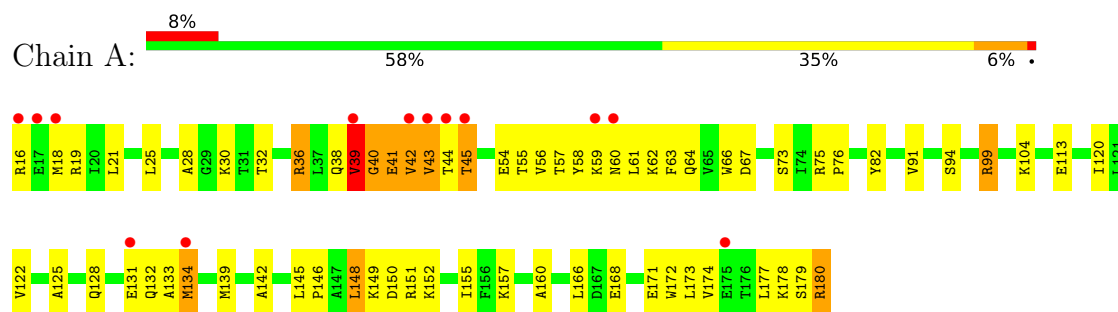
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	D	64	Total	O	0	0
			64	64		
5	H	18	Total	O	0	0
			18	18		

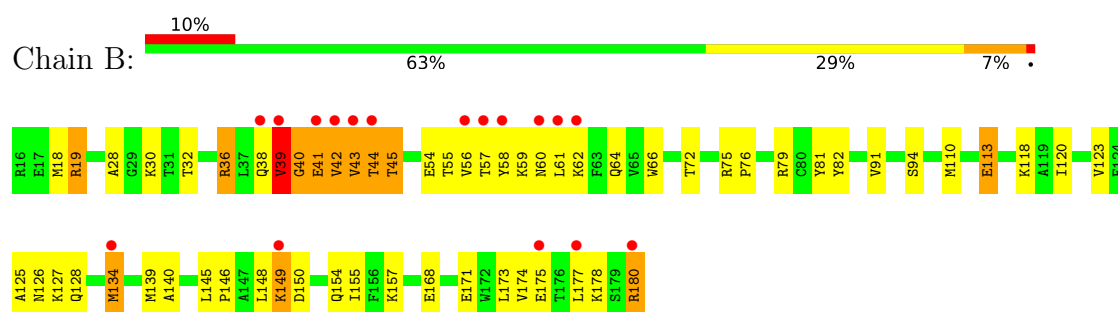
3 Residue-property plots [i](#)

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.

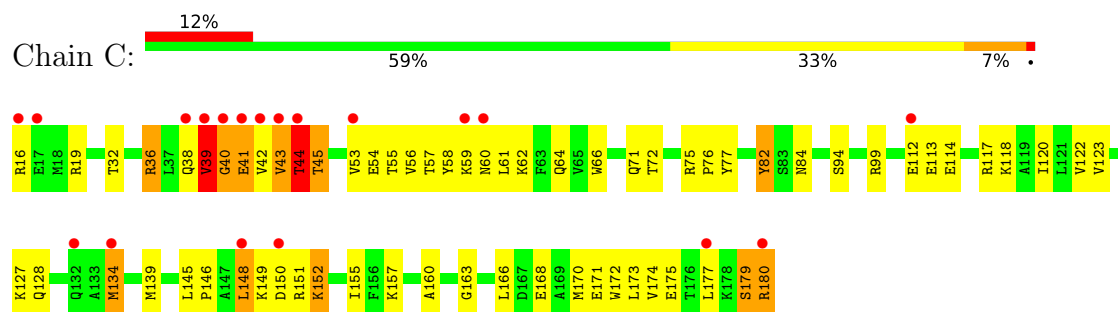
• Molecule 1: ADP-ribosylation factor-like protein 1



• Molecule 1: ADP-ribosylation factor-like protein 1

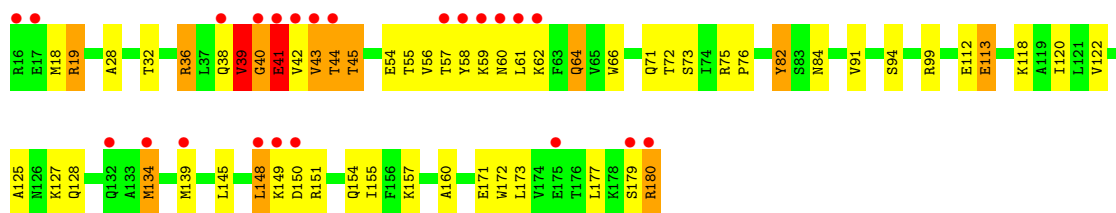


• Molecule 1: ADP-ribosylation factor-like protein 1



• Molecule 1: ADP-ribosylation factor-like protein 1

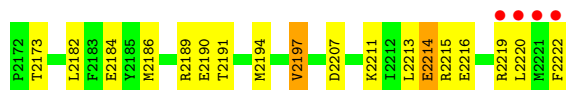




- Molecule 2: Golgi autoantigen, golgin subfamily A member 4



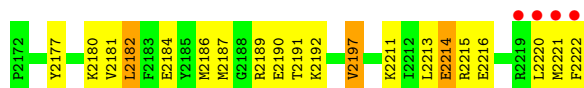
- Molecule 2: Golgi autoantigen, golgin subfamily A member 4



- Molecule 2: Golgi autoantigen, golgin subfamily A member 4



- Molecule 2: Golgi autoantigen, golgin subfamily A member 4



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	42.08Å 86.92Å 86.25Å 118.11° 99.65° 95.47°	Depositor
Resolution (Å)	20.00 – 2.30 20.00 – 2.30	Depositor EDS
% Data completeness (in resolution range)	97.3 (20.00-2.30) 97.3 (20.00-2.30)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.89 (at 2.10Å)	Xtriage
Refinement program	REFMAC 5.0	Depositor
R, R_{free}	0.246 , 0.260 (Not available) , 0.272	Depositor DCC
R_{free} test set	2806 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å ²)	31.7	Xtriage
Anisotropy	0.747	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 53.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	0.000 for -h,-k,h+k+l	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	7380	wwPDB-VP
Average B, all atoms (Å ²)	23.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.32% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GNP, 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	0.46	0/1333	0.93	3/1802 (0.2%)
1	B	0.47	0/1333	0.97	4/1802 (0.2%)
1	C	0.54	0/1333	0.97	6/1802 (0.3%)
1	D	0.54	0/1333	1.01	7/1802 (0.4%)
2	E	0.49	0/440	1.00	3/586 (0.5%)
2	F	0.50	0/440	0.95	3/586 (0.5%)
2	G	0.51	0/440	0.99	3/586 (0.5%)
2	H	0.53	0/440	0.97	2/586 (0.3%)
All	All	0.51	0/7092	0.97	31/9552 (0.3%)

There are no bond length outliers.

All (31) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	2215	ARG	N-CA-C	-9.99	100.47	111.36
2	H	2215	ARG	N-CA-C	-9.35	101.17	111.36
2	F	2215	ARG	N-CA-C	-8.71	101.86	111.36
1	C	82	TYR	N-CA-C	7.87	120.75	111.71
1	D	82	TYR	N-CA-C	7.14	121.25	112.54
1	D	36	ARG	N-CA-C	-7.02	103.63	111.28
1	C	36	ARG	N-CA-C	-6.97	103.69	111.28
1	D	99	ARG	N-CA-C	6.91	121.42	112.92
1	C	72	THR	N-CA-C	6.83	122.58	111.37
1	B	44	THR	N-CA-C	-6.81	97.74	108.63
2	G	2215	ARG	N-CA-C	-6.79	103.96	111.36
2	H	2191	THR	N-CA-C	6.63	119.36	111.33
1	B	72	THR	N-CA-C	6.41	121.95	111.37
1	C	99	ARG	N-CA-C	6.20	120.54	112.92
2	G	2173	THR	N-CA-C	-6.13	104.15	111.69
1	D	72	THR	N-CA-C	6.07	121.33	111.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	44	THR	N-CA-C	-5.71	98.65	110.80
1	C	152	LYS	N-CA-C	-5.61	100.66	109.25
1	C	44	THR	N-CA-C	-5.45	99.19	110.80
1	A	99	ARG	N-CA-C	5.40	119.18	112.59
2	F	2191	THR	N-CA-C	5.32	117.83	111.71
1	B	36	ARG	N-CA-C	-5.31	105.66	111.82
1	A	73	SER	N-CA-C	5.30	118.53	111.75
1	D	64	GLN	N-CA-C	-5.27	99.94	108.52
2	E	2176	GLU	N-CA-C	-5.24	105.74	111.82
1	A	36	ARG	N-CA-C	-5.22	105.70	111.71
1	B	30	LYS	N-CA-C	5.19	116.62	111.07
2	F	2173	THR	N-CA-C	-5.19	106.10	112.90
1	D	112	GLU	N-CA-C	-5.15	106.85	113.23
2	G	2191	THR	N-CA-C	5.10	116.84	111.28
2	E	2173	THR	N-CA-C	-5.08	105.83	112.23

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	1312	0	1337	85	0
1	B	1312	0	1337	87	0
1	C	1312	0	1337	91	0
1	D	1312	0	1337	87	0
2	E	433	0	444	28	0
2	F	433	0	444	20	0
2	G	433	0	444	17	0
2	H	433	0	444	19	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
4	A	32	0	13	1	0
4	B	32	0	13	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	C	32	0	13	4	0
4	D	32	0	13	3	0
5	A	38	0	0	14	0
5	B	46	0	0	15	1
5	C	64	0	0	15	0
5	D	64	0	0	23	1
5	E	14	0	0	8	0
5	F	13	0	0	5	0
5	G	11	0	0	1	0
5	H	18	0	0	3	0
All	All	7380	0	7176	415	1

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 29.

All (415) 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)
2:E:2222:PHE:HA	5:E:138:HOH:O	1.20	1.34
1:C:175:GLU:HG2	5:C:1261:HOH:O	1.23	1.29
1:B:149:LYS:HA	5:B:1210:HOH:O	1.26	1.25
1:D:19:ARG:HB2	5:D:1227:HOH:O	1.38	1.20
1:A:128:GLN:HG3	1:A:157:LYS:HB2	1.23	1.18
1:D:151:ARG:HD2	5:D:1251:HOH:O	1.43	1.14
1:D:151:ARG:CD	5:D:1251:HOH:O	1.95	1.14
1:C:128:GLN:HG3	1:C:157:LYS:HB2	1.25	1.14
1:D:19:ARG:CD	5:D:1227:HOH:O	1.96	1.13
2:F:2182:LEU:HG	2:F:2186:MET:HE2	1.30	1.09
1:B:44:THR:HA	5:B:1228:HOH:O	1.58	1.04
1:B:128:GLN:HG3	1:B:157:LYS:HB2	1.39	1.03
1:C:113:GLU:HG3	5:C:1235:HOH:O	1.60	1.01
1:B:60:ASN:HB2	1:C:60:ASN:HD21	1.23	1.00
1:A:16:ARG:O	5:A:1212:HOH:O	1.81	0.99
1:D:38:GLN:HB2	1:D:56:VAL:HG13	1.43	0.99
1:B:120:ILE:HD11	1:B:173:LEU:HD12	1.46	0.97
1:B:149:LYS:CA	5:B:1210:HOH:O	1.90	0.96
1:C:112:GLU:OE2	5:C:1224:HOH:O	1.83	0.95
1:B:149:LYS:HD2	5:B:1229:HOH:O	1.64	0.95
1:A:64:GLN:HE21	1:A:66:TRP:HE1	1.14	0.95
1:B:150:ASP:N	5:B:1210:HOH:O	1.90	0.94
1:C:145:LEU:HA	1:C:148:LEU:HD23	1.50	0.94

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:145:LEU:HA	1:B:148:LEU:HD23	1.50	0.94
1:D:19:ARG:HD2	5:D:1227:HOH:O	1.62	0.93
1:D:120:ILE:HD11	1:D:173:LEU:HD12	1.47	0.93
1:D:180:ARG:N	5:D:1223:HOH:O	2.01	0.92
4:B:1202:GNP:O2G	5:B:1203:HOH:O	1.85	0.92
1:B:60:ASN:HB2	5:C:1209:HOH:O	1.69	0.91
1:A:36:ARG:HH11	1:A:41:GLU:HG3	1.36	0.90
2:F:2213:LEU:O	2:F:2214:GLU:HG3	1.71	0.90
1:A:120:ILE:HD11	1:A:173:LEU:HD12	1.52	0.89
1:B:139:MET:HE2	1:B:155:ILE:HD11	1.54	0.89
1:D:179:SER:HB3	5:D:1223:HOH:O	1.71	0.89
1:C:36:ARG:HH11	1:C:41:GLU:HG3	1.37	0.89
1:D:179:SER:CB	5:D:1223:HOH:O	2.20	0.89
1:C:38:GLN:HB2	1:C:56:VAL:HG13	1.53	0.89
1:D:150:ASP:N	5:D:1232:HOH:O	1.80	0.88
1:A:139:MET:HE2	1:A:155:ILE:HD11	1.55	0.88
1:D:19:ARG:HD3	1:D:84:ASN:O	1.73	0.88
4:D:1204:GNP:O1G	5:D:1207:HOH:O	1.89	0.88
1:A:134:MET:SD	1:A:139:MET:HB2	2.13	0.88
1:C:139:MET:HE2	1:C:155:ILE:HD11	1.54	0.88
1:B:43:VAL:O	5:B:1206:HOH:O	1.92	0.87
1:B:120:ILE:HD11	1:B:173:LEU:CD1	2.03	0.87
1:C:59:LYS:HE3	5:C:1209:HOH:O	1.74	0.87
1:D:149:LYS:HA	5:D:1232:HOH:O	1.74	0.87
1:A:38:GLN:HB2	1:A:56:VAL:HG13	1.58	0.84
1:D:134:MET:SD	1:D:139:MET:HB2	2.19	0.82
1:B:55:THR:HG21	1:B:62:LYS:HE3	1.63	0.81
1:D:57:THR:HG22	1:D:62:LYS:HD2	1.63	0.80
1:A:16:ARG:HG3	5:A:1225:HOH:O	1.82	0.79
1:C:16:ARG:O	5:C:1262:HOH:O	2.00	0.78
1:D:151:ARG:HD3	5:D:1251:HOH:O	1.73	0.78
1:A:64:GLN:NE2	1:A:66:TRP:HE1	1.81	0.77
1:D:120:ILE:HD11	1:D:173:LEU:CD1	2.14	0.77
1:D:19:ARG:CG	5:D:1227:HOH:O	2.21	0.77
1:A:60:ASN:HA	5:A:1233:HOH:O	1.84	0.77
1:D:64:GLN:NE2	1:D:66:TRP:HE1	1.83	0.75
1:A:18:MET:HE2	1:A:177:LEU:HD13	1.67	0.75
1:A:59:LYS:HG2	5:A:1235:HOH:O	1.86	0.74
1:B:61:LEU:HB2	5:B:1227:HOH:O	1.86	0.74
1:D:145:LEU:HA	1:D:148:LEU:HD23	1.69	0.74
1:B:145:LEU:HA	1:B:148:LEU:CD2	2.17	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:128:GLN:HG3	1:D:157:LYS:HB2	1.69	0.73
1:C:57:THR:HA	1:C:61:LEU:O	1.88	0.73
1:C:120:ILE:HD11	1:C:173:LEU:CD1	2.19	0.72
1:C:66:TRP:CH2	2:G:2190:GLU:HG2	2.25	0.72
1:A:94:SER:HA	1:A:134:MET:HE2	1.69	0.72
1:D:128:GLN:HG3	1:D:157:LYS:CB	2.19	0.72
2:F:2222:PHE:CB	5:F:172:HOH:O	2.37	0.71
1:C:112:GLU:CD	5:C:1224:HOH:O	2.29	0.71
1:A:55:THR:HG21	1:A:62:LYS:HE3	1.71	0.71
1:B:60:ASN:CB	5:C:1209:HOH:O	2.34	0.71
1:A:120:ILE:HG22	1:A:152:LYS:HD2	1.71	0.71
1:C:120:ILE:HD11	1:C:173:LEU:HD12	1.71	0.71
1:A:57:THR:HG22	1:A:62:LYS:HD2	1.72	0.71
2:G:2219:ARG:HG2	5:G:164:HOH:O	1.90	0.71
1:C:163:GLY:O	5:C:1208:HOH:O	2.09	0.70
1:D:179:SER:C	5:D:1223:HOH:O	2.33	0.70
1:A:36:ARG:NH1	1:A:41:GLU:HG3	2.07	0.70
1:C:66:TRP:HH2	2:G:2190:GLU:HG2	1.57	0.69
1:B:60:ASN:CB	1:C:60:ASN:HD21	2.02	0.69
2:F:2182:LEU:HG	2:F:2186:MET:CE	2.17	0.69
1:D:55:THR:HG21	1:D:62:LYS:HE3	1.74	0.69
1:C:58:TYR:CD2	1:C:174:VAL:HG21	2.27	0.69
1:B:64:GLN:HE21	1:B:66:TRP:HE1	1.41	0.68
2:G:2192:LYS:HA	2:G:2216:GLU:HG2	1.76	0.68
1:D:94:SER:CB	1:D:134:MET:HE2	2.23	0.68
2:E:2213:LEU:O	2:E:2214:GLU:HG3	1.94	0.68
1:B:66:TRP:HH2	2:F:2190:GLU:HG2	1.59	0.68
1:A:94:SER:O	1:A:134:MET:HG3	1.93	0.67
2:F:2222:PHE:C	5:F:172:HOH:O	2.35	0.67
1:D:44:THR:HA	5:D:1262:HOH:O	1.95	0.67
1:D:122:VAL:HG22	1:D:172:TRP:HZ3	1.60	0.67
1:A:145:LEU:HA	1:A:148:LEU:HD23	1.77	0.66
2:E:2179:ARG:HD2	2:G:2202:LEU:O	1.96	0.66
1:C:57:THR:HG22	1:C:62:LYS:HD2	1.78	0.66
1:D:73:SER:O	5:D:1226:HOH:O	2.13	0.66
1:B:82:TYR:HD2	1:B:113:GLU:HG2	1.60	0.65
1:A:55:THR:CG2	1:A:62:LYS:HE3	2.25	0.65
1:A:66:TRP:HH2	2:E:2190:GLU:HG2	1.60	0.65
1:C:82:TYR:HD2	1:C:113:GLU:HG2	1.61	0.65
1:C:43:VAL:O	1:C:45:THR:N	2.29	0.65
1:B:43:VAL:HG12	5:B:1206:HOH:O	1.97	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:134:MET:SD	1:C:139:MET:HB2	2.37	0.65
1:D:18:MET:HE2	1:D:177:LEU:HD13	1.79	0.65
1:C:170:MET:O	1:C:174:VAL:HG23	1.96	0.64
1:B:60:ASN:HB2	1:C:60:ASN:ND2	2.06	0.64
1:D:139:MET:HE2	1:D:155:ILE:HD11	1.78	0.64
1:B:64:GLN:NE2	1:B:66:TRP:HE1	1.96	0.64
1:A:148:LEU:HD12	1:A:151:ARG:HG3	1.79	0.63
1:D:82:TYR:HD2	1:D:113:GLU:HG2	1.62	0.63
1:D:125:ALA:HA	1:D:139:MET:HE1	1.78	0.63
1:B:36:ARG:HH11	1:B:41:GLU:HG3	1.63	0.63
1:A:180:ARG:NH1	5:A:1221:HOH:O	2.32	0.63
1:A:128:GLN:HG3	1:A:157:LYS:CB	2.15	0.63
1:C:38:GLN:O	1:C:39:VAL:HG23	1.99	0.63
1:D:38:GLN:O	1:D:39:VAL:HG23	1.99	0.62
1:A:38:GLN:O	1:A:39:VAL:HG23	1.99	0.62
1:A:66:TRP:CH2	2:E:2190:GLU:HG2	2.33	0.62
1:C:64:GLN:NE2	1:C:66:TRP:HE1	1.97	0.62
1:D:134:MET:SD	1:D:139:MET:SD	2.98	0.62
1:A:19:ARG:HH21	1:A:21:LEU:HD21	1.63	0.62
1:B:82:TYR:CD2	1:B:113:GLU:HG2	2.34	0.62
1:A:43:VAL:HG11	4:A:1201:GNP:O2'	1.99	0.62
2:H:2182:LEU:HG	2:H:2186:MET:HE2	1.81	0.62
1:A:41:GLU:OE1	1:A:43:VAL:HG23	1.99	0.61
1:B:32:THR:HG23	1:B:43:VAL:HG22	1.81	0.61
2:F:2184:GLU:OE2	2:F:2189:ARG:HD2	2.00	0.61
2:H:2213:LEU:O	2:H:2214:GLU:HG3	2.01	0.61
1:D:134:MET:HE1	1:D:139:MET:SD	2.41	0.60
1:A:40:GLY:O	1:A:41:GLU:HB2	2.01	0.60
1:A:179:SER:O	1:A:180:ARG:HD3	2.01	0.60
1:B:173:LEU:O	1:B:177:LEU:HG	2.01	0.60
1:C:145:LEU:HA	1:C:148:LEU:CD2	2.28	0.60
1:A:82:TYR:HD2	1:A:113:GLU:HG2	1.66	0.60
1:D:32:THR:HG23	1:D:43:VAL:HG22	1.83	0.60
1:A:134:MET:HE1	1:A:139:MET:SD	2.42	0.60
1:A:120:ILE:HD11	1:A:173:LEU:CD1	2.29	0.59
1:A:16:ARG:CG	5:A:1225:HOH:O	2.45	0.59
2:G:2213:LEU:O	2:G:2214:GLU:HG3	2.02	0.59
1:B:38:GLN:HB2	1:B:56:VAL:HG13	1.84	0.59
2:H:2220:LEU:C	2:H:2222:PHE:H	2.10	0.59
1:B:40:GLY:O	1:B:41:GLU:HB2	2.01	0.59
2:F:2216:GLU:O	2:F:2219:ARG:HB3	2.02	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:58:TYR:OH	1:C:171:GLU:HG2	2.03	0.59
1:A:149:LYS:HD2	1:A:149:LYS:O	2.03	0.59
1:C:43:VAL:HG11	4:C:1203:GNP:O2'	2.02	0.59
1:D:66:TRP:CH2	2:H:2190:GLU:HG2	2.37	0.59
1:D:66:TRP:HH2	2:H:2190:GLU:HG2	1.66	0.59
1:C:149:LYS:HD2	1:C:149:LYS:O	2.04	0.58
1:A:122:VAL:HG21	1:A:173:LEU:HD13	1.85	0.58
1:D:134:MET:CE	1:D:139:MET:SD	2.92	0.58
1:D:64:GLN:HE21	1:D:66:TRP:HE1	1.51	0.58
1:C:36:ARG:NH1	1:C:41:GLU:HG3	2.13	0.58
1:C:120:ILE:HG22	1:C:152:LYS:HD2	1.85	0.58
2:E:2205:PRO:HB2	5:E:132:HOH:O	2.03	0.58
2:E:2181:VAL:HG13	2:E:2194:MET:SD	2.44	0.58
1:A:132:GLN:HG2	5:A:1229:HOH:O	2.02	0.58
1:C:39:VAL:CG1	1:C:40:GLY:N	2.67	0.58
1:C:36:ARG:HD2	1:C:41:GLU:HB2	1.86	0.58
1:A:36:ARG:HD2	1:A:41:GLU:HB2	1.86	0.57
1:D:149:LYS:HD2	1:D:149:LYS:O	2.03	0.57
1:C:45:THR:HA	5:C:1248:HOH:O	2.03	0.57
1:D:179:SER:O	1:D:180:ARG:HD3	2.03	0.57
2:E:2216:GLU:O	2:E:2219:ARG:HB3	2.04	0.57
1:B:55:THR:CG2	1:B:62:LYS:HE3	2.34	0.57
2:F:2222:PHE:OXT	5:F:172:HOH:O	2.17	0.57
5:D:1256:HOH:O	2:H:2180:LYS:HE3	2.04	0.57
1:B:58:TYR:CD2	1:B:174:VAL:HG21	2.40	0.57
1:A:149:LYS:O	1:A:150:ASP:HB2	2.04	0.56
1:B:66:TRP:CH2	2:F:2190:GLU:HG2	2.40	0.56
1:C:19:ARG:HD3	1:C:84:ASN:O	2.05	0.56
1:D:36:ARG:HH11	1:D:41:GLU:HG3	1.68	0.56
1:B:94:SER:HA	1:B:134:MET:HE2	1.86	0.56
1:D:58:TYR:OH	1:D:171:GLU:HG2	2.05	0.56
1:A:99:ARG:HA	5:A:1232:HOH:O	2.06	0.56
2:E:2205:PRO:CA	5:E:3:HOH:O	2.54	0.56
1:A:42:VAL:C	1:A:44:THR:H	2.13	0.56
1:D:36:ARG:NH1	1:D:41:GLU:HG3	2.21	0.56
1:B:18:MET:HE2	1:B:177:LEU:HD13	1.87	0.56
1:D:148:LEU:HD12	1:D:151:ARG:HG3	1.87	0.56
1:C:82:TYR:CD2	1:C:113:GLU:HG2	2.41	0.55
1:A:43:VAL:HG12	1:A:43:VAL:O	2.07	0.55
1:C:64:GLN:HE21	1:C:66:TRP:HE1	1.53	0.55
1:D:43:VAL:HG12	1:D:43:VAL:O	2.05	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:2219:ARG:HD3	2:H:2222:PHE:CZ	2.42	0.55
1:D:55:THR:CG2	1:D:62:LYS:HE3	2.37	0.55
2:F:2211:LYS:HG3	2:H:2187:MET:CE	2.36	0.55
1:C:179:SER:O	1:C:180:ARG:HD3	2.06	0.55
1:A:122:VAL:CG2	1:A:173:LEU:HD13	2.37	0.54
1:B:41:GLU:OE1	1:B:42:VAL:N	2.40	0.54
1:D:125:ALA:HB1	1:D:134:MET:HE1	1.89	0.54
1:C:173:LEU:O	1:C:177:LEU:HG	2.07	0.54
1:B:57:THR:HG21	5:C:1255:HOH:O	2.07	0.54
1:B:57:THR:HG22	1:B:62:LYS:CD	2.37	0.54
1:B:145:LEU:CA	1:B:148:LEU:HD23	2.32	0.54
1:D:45:THR:HG21	4:D:1204:GNP:O2A	2.08	0.54
1:D:36:ARG:HD3	1:D:160:ALA:O	2.07	0.54
2:F:2222:PHE:HB2	5:F:172:HOH:O	2.05	0.54
1:B:59:LYS:HG2	5:B:1225:HOH:O	2.08	0.54
1:B:75:ARG:NH2	5:B:1208:HOH:O	2.39	0.54
1:A:58:TYR:CD2	1:A:174:VAL:HG21	2.43	0.53
1:C:43:VAL:O	1:C:43:VAL:HG12	2.07	0.53
1:B:36:ARG:HD2	1:B:41:GLU:HB2	1.90	0.53
1:C:123:VAL:HG11	1:C:139:MET:HE3	1.90	0.53
1:B:75:ARG:N	1:B:76:PRO:CD	2.72	0.53
1:C:114:GLU:O	1:C:117:ARG:HG2	2.08	0.53
2:G:2210:GLN:O	2:G:2213:LEU:O	2.27	0.53
1:D:32:THR:OG1	1:D:43:VAL:HG13	2.08	0.53
1:D:32:THR:HG22	1:D:160:ALA:HB1	1.91	0.53
1:C:77:TYR:HB2	5:C:1231:HOH:O	2.09	0.53
1:D:19:ARG:CZ	5:D:1227:HOH:O	2.57	0.53
1:B:42:VAL:C	1:B:44:THR:H	2.16	0.53
1:B:41:GLU:O	1:B:42:VAL:HG23	2.09	0.53
1:C:42:VAL:C	1:C:44:THR:H	2.17	0.53
1:B:134:MET:SD	1:B:139:MET:HB2	2.48	0.52
1:A:28:ALA:HB1	1:A:91:VAL:HG12	1.91	0.52
1:A:16:ARG:NH2	5:A:1216:HOH:O	2.43	0.52
1:B:28:ALA:HB1	1:B:91:VAL:HG12	1.91	0.52
2:E:2215:ARG:NE	5:E:51:HOH:O	2.12	0.52
1:D:94:SER:OG	1:D:134:MET:HE2	2.08	0.52
2:F:2219:ARG:HD2	2:F:2219:ARG:O	2.10	0.52
1:D:82:TYR:CD2	1:D:113:GLU:HG2	2.44	0.52
1:D:127:LYS:HG2	4:D:1204:GNP:C6	2.40	0.52
2:G:2182:LEU:HG	2:G:2186:MET:HE2	1.92	0.52
2:E:2222:PHE:CA	5:E:138:HOH:O	2.06	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:75:ARG:N	1:C:76:PRO:CD	2.74	0.51
2:E:2207:ASP:OD2	2:E:2208:GLN:N	2.39	0.51
1:B:58:TYR:HD2	1:B:174:VAL:HG21	1.76	0.51
1:B:61:LEU:HD11	1:B:178:LYS:HE3	1.93	0.51
1:C:122:VAL:HG22	1:C:172:TRP:HZ3	1.75	0.51
1:A:59:LYS:HE3	5:A:1235:HOH:O	2.10	0.51
2:F:2222:PHE:HB3	5:F:172:HOH:O	2.05	0.51
1:C:59:LYS:O	1:C:59:LYS:HG2	2.09	0.51
1:B:94:SER:O	1:B:134:MET:HG3	2.11	0.51
1:D:19:ARG:NE	5:D:1227:HOH:O	2.29	0.51
2:F:2213:LEU:O	2:F:2214:GLU:CG	2.53	0.51
1:C:59:LYS:O	1:C:60:ASN:CG	2.54	0.51
1:D:125:ALA:CA	1:D:139:MET:HE1	2.41	0.51
1:B:125:ALA:HA	1:B:139:MET:HE1	1.92	0.50
1:B:180:ARG:HD3	1:B:180:ARG:C	2.36	0.50
2:H:2184:GLU:OE2	2:H:2189:ARG:HD2	2.11	0.50
1:A:43:VAL:O	1:A:45:THR:N	2.45	0.50
2:G:2181:VAL:HG13	2:G:2194:MET:SD	2.52	0.50
1:A:122:VAL:HG22	1:A:172:TRP:HZ3	1.76	0.50
1:B:59:LYS:CG	5:B:1225:HOH:O	2.59	0.50
1:C:123:VAL:CG1	1:C:139:MET:HE3	2.41	0.50
1:A:139:MET:HE2	1:A:155:ILE:CD1	2.35	0.50
1:D:94:SER:O	1:D:134:MET:HG3	2.11	0.50
1:B:128:GLN:CG	1:B:157:LYS:HB2	2.27	0.49
1:B:168:GLU:OE1	1:B:168:GLU:N	2.37	0.49
1:C:57:THR:CG2	1:C:62:LYS:NZ	2.75	0.49
1:C:94:SER:O	1:C:134:MET:HG3	2.12	0.49
1:A:61:LEU:HD11	1:A:178:LYS:HE3	1.93	0.49
1:C:122:VAL:HG22	1:C:172:TRP:CZ3	2.48	0.49
1:B:126:ASN:O	1:B:127:LYS:HB2	2.12	0.49
2:E:2184:GLU:OE2	2:E:2189:ARG:HD2	2.13	0.49
1:A:82:TYR:CD2	1:A:113:GLU:HG2	2.46	0.49
1:A:125:ALA:HA	1:A:139:MET:HE1	1.94	0.49
1:C:55:THR:HG21	1:C:62:LYS:HE3	1.95	0.49
1:A:131:GLU:HB3	5:A:1229:HOH:O	2.12	0.49
2:F:2207:ASP:N	2:F:2207:ASP:OD2	2.44	0.49
1:B:110:MET:O	1:B:113:GLU:HB2	2.13	0.48
2:E:2205:PRO:HA	5:E:3:HOH:O	2.10	0.48
2:G:2197:VAL:O	2:G:2201:VAL:HG23	2.13	0.48
1:A:177:LEU:HD12	1:A:178:LYS:N	2.28	0.48
1:C:45:THR:HG21	4:C:1203:GNP:O2A	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:2192:LYS:HA	2:H:2216:GLU:HG2	1.95	0.48
2:G:2192:LYS:HA	2:G:2216:GLU:CG	2.43	0.48
1:D:40:GLY:O	1:D:41:GLU:HB2	2.11	0.48
1:A:16:ARG:NE	5:A:1225:HOH:O	2.34	0.48
1:D:41:GLU:OE1	1:D:43:VAL:HG23	2.14	0.48
1:A:58:TYR:OH	1:A:171:GLU:HG2	2.13	0.48
1:B:57:THR:HA	1:B:61:LEU:O	2.14	0.48
1:A:36:ARG:NH1	1:A:41:GLU:CG	2.77	0.48
1:C:36:ARG:HD3	1:C:160:ALA:O	2.14	0.48
1:D:43:VAL:O	1:D:45:THR:N	2.47	0.48
1:B:134:MET:HE1	1:B:139:MET:SD	2.54	0.48
1:C:57:THR:CG2	1:C:62:LYS:HZ2	2.27	0.48
2:E:2215:ARG:NH1	5:E:51:HOH:O	2.46	0.47
1:C:57:THR:HG23	1:C:62:LYS:HZ2	1.79	0.47
1:B:19:ARG:NH2	1:B:81:TYR:O	2.47	0.47
2:H:2181:VAL:HG11	2:H:2197:VAL:HG22	1.96	0.47
2:E:2197:VAL:O	2:E:2201:VAL:HG23	2.14	0.47
1:D:134:MET:SD	1:D:139:MET:CB	2.98	0.47
1:C:134:MET:HE3	1:C:134:MET:O	2.15	0.47
1:B:44:THR:CA	5:B:1228:HOH:O	2.37	0.47
1:C:149:LYS:O	1:C:150:ASP:HB2	2.14	0.47
1:C:134:MET:HE1	1:C:139:MET:HB2	1.96	0.47
1:D:128:GLN:HG3	1:D:157:LYS:HB3	1.93	0.47
1:A:104:LYS:HD2	1:A:142:ALA:O	2.15	0.47
1:C:148:LEU:HD12	1:C:151:ARG:HG3	1.96	0.47
2:H:2220:LEU:C	2:H:2222:PHE:N	2.73	0.46
2:E:2180:LYS:O	2:E:2180:LYS:HD3	2.16	0.46
1:D:75:ARG:N	1:D:76:PRO:CD	2.79	0.46
2:F:2194:MET:O	2:F:2197:VAL:HG13	2.15	0.46
1:D:122:VAL:HG22	1:D:172:TRP:CZ3	2.46	0.46
1:D:180:ARG:HD3	1:D:180:ARG:C	2.40	0.46
1:B:125:ALA:CA	1:B:139:MET:HE1	2.45	0.46
2:H:2211:LYS:NZ	5:H:102:HOH:O	2.49	0.46
2:E:2211:LYS:HG3	2:G:2187:MET:CE	2.45	0.46
1:C:36:ARG:HG2	1:C:166:LEU:CD1	2.45	0.46
1:C:145:LEU:CA	1:C:148:LEU:HD23	2.35	0.46
1:C:38:GLN:O	1:C:39:VAL:CB	2.63	0.46
1:A:59:LYS:C	1:A:61:LEU:H	2.24	0.45
2:E:2221:MET:C	2:E:2222:PHE:CD1	2.93	0.45
1:B:123:VAL:CG1	1:B:139:MET:HE3	2.45	0.45
1:D:59:LYS:HG2	5:D:1235:HOH:O	2.15	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:38:GLN:HE22	1:A:57:THR:HG23	1.82	0.45
1:D:19:ARG:NH1	5:D:1227:HOH:O	2.49	0.45
2:H:2221:MET:C	2:H:2222:PHE:CD1	2.94	0.45
1:D:19:ARG:CD	1:D:84:ASN:O	2.57	0.45
2:H:2222:PHE:HB3	5:H:67:HOH:O	2.16	0.45
1:A:59:LYS:O	1:A:60:ASN:CG	2.60	0.45
1:D:118:LYS:HA	1:D:118:LYS:HD3	1.83	0.45
1:A:64:GLN:NE2	1:A:66:TRP:NE1	2.58	0.45
1:B:154:GLN:HA	1:B:154:GLN:OE1	2.16	0.45
1:C:32:THR:OG1	1:C:43:VAL:HG13	2.16	0.45
1:A:145:LEU:N	1:A:146:PRO:CD	2.79	0.45
1:D:42:VAL:C	1:D:44:THR:H	2.23	0.45
2:E:2211:LYS:HG3	2:G:2187:MET:HE1	1.98	0.45
2:E:2179:ARG:HG2	2:G:2204:PHE:CE1	2.51	0.44
1:C:42:VAL:HG12	1:C:44:THR:OG1	2.17	0.44
1:B:42:VAL:O	1:B:44:THR:N	2.49	0.44
1:B:60:ASN:CG	1:C:60:ASN:ND2	2.75	0.44
1:C:38:GLN:O	1:C:39:VAL:CG2	2.64	0.44
1:C:152:LYS:NZ	5:C:1249:HOH:O	2.37	0.44
1:D:149:LYS:CA	5:D:1232:HOH:O	2.43	0.44
1:B:45:THR:HG21	4:B:1202:GNP:O2A	2.16	0.44
1:A:38:GLN:NE2	1:A:57:THR:HG23	2.33	0.44
1:B:32:THR:OG1	1:B:43:VAL:HG13	2.17	0.44
1:B:41:GLU:OE1	1:B:43:VAL:N	2.51	0.44
2:G:2219:ARG:HD3	2:H:2222:PHE:HZ	1.80	0.44
1:D:59:LYS:O	1:D:60:ASN:CG	2.61	0.44
1:A:42:VAL:O	1:A:44:THR:N	2.48	0.44
1:A:94:SER:HB3	1:A:133:ALA:HB1	1.98	0.44
1:D:41:GLU:C	1:D:41:GLU:CD	2.85	0.44
1:A:25:LEU:O	1:A:30:LYS:NZ	2.50	0.44
1:D:149:LYS:O	1:D:150:ASP:HB2	2.18	0.43
1:C:41:GLU:C	1:C:41:GLU:OE1	2.61	0.43
1:A:57:THR:HA	1:A:61:LEU:O	2.18	0.43
2:E:2208:GLN:O	2:E:2212:ILE:HG13	2.17	0.43
1:B:57:THR:HG22	1:B:62:LYS:HD2	1.99	0.43
1:C:36:ARG:NH1	1:C:41:GLU:CG	2.81	0.43
1:A:122:VAL:HG22	1:A:172:TRP:CZ3	2.54	0.43
2:E:2215:ARG:CZ	5:E:51:HOH:O	2.62	0.43
1:B:38:GLN:O	1:B:39:VAL:HB	2.17	0.43
1:D:28:ALA:HB1	1:D:91:VAL:HG12	1.99	0.43
1:D:71:GLN:HG2	5:D:1248:HOH:O	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:120:ILE:CG2	1:A:152:LYS:HD2	2.45	0.43
1:C:168:GLU:OE1	1:C:168:GLU:N	2.39	0.43
1:C:175:GLU:CG	5:C:1261:HOH:O	2.09	0.43
1:C:127:LYS:HG2	4:C:1203:GNP:C6	2.49	0.43
1:D:57:THR:HA	1:D:61:LEU:O	2.19	0.43
1:A:75:ARG:N	1:A:76:PRO:CD	2.82	0.43
1:C:134:MET:HE1	1:C:139:MET:SD	2.59	0.43
1:B:145:LEU:N	1:B:146:PRO:CD	2.82	0.42
1:C:179:SER:O	1:C:180:ARG:CD	2.67	0.42
2:E:2182:LEU:O	2:E:2186:MET:HG3	2.19	0.42
1:C:41:GLU:OE1	1:C:42:VAL:N	2.52	0.42
1:A:132:GLN:NE2	5:A:1220:HOH:O	2.51	0.42
1:B:41:GLU:OE1	1:B:43:VAL:HG23	2.19	0.42
1:B:79:ARG:HA	1:B:82:TYR:CD2	2.54	0.42
1:B:38:GLN:O	1:B:39:VAL:CB	2.67	0.42
1:B:58:TYR:O	1:B:60:ASN:N	2.53	0.42
1:A:42:VAL:C	1:A:44:THR:N	2.78	0.42
1:D:59:LYS:C	1:D:61:LEU:H	2.26	0.42
1:B:177:LEU:HD12	1:B:178:LYS:N	2.34	0.42
1:C:36:ARG:HG2	1:C:166:LEU:HD12	2.01	0.42
1:B:57:THR:CG2	1:B:62:LYS:NZ	2.82	0.42
1:B:118:LYS:HA	1:B:118:LYS:HD3	1.75	0.42
2:F:2189:ARG:O	2:F:2190:GLU:C	2.61	0.42
2:F:2222:PHE:CD1	2:F:2222:PHE:N	2.88	0.42
1:D:148:LEU:HD13	1:D:148:LEU:HA	1.89	0.42
1:A:36:ARG:HG2	1:A:166:LEU:CD1	2.49	0.41
2:G:2215:ARG:NH2	2:H:2221:MET:HE3	2.34	0.41
1:D:134:MET:HE3	1:D:134:MET:O	2.20	0.41
2:F:2220:LEU:C	2:F:2222:PHE:N	2.78	0.41
1:D:58:TYR:HH	1:D:171:GLU:HG2	1.85	0.41
1:B:125:ALA:HB2	1:B:139:MET:CE	2.51	0.41
1:B:171:GLU:O	1:B:175:GLU:HG3	2.20	0.41
1:C:32:THR:HG23	1:C:43:VAL:HG22	2.01	0.41
2:E:2222:PHE:CD1	2:E:2222:PHE:N	2.88	0.41
1:B:42:VAL:C	1:B:44:THR:N	2.79	0.41
2:E:2192:LYS:HD3	2:E:2216:GLU:HG3	2.03	0.41
1:C:43:VAL:HG11	4:C:1203:GNP:C2'	2.50	0.41
1:D:43:VAL:O	1:D:45:THR:HB	2.21	0.41
1:A:16:ARG:CZ	5:A:1216:HOH:O	2.69	0.41
1:B:140:ALA:O	1:B:146:PRO:HD3	2.20	0.41
1:C:118:LYS:HA	1:C:118:LYS:HD3	1.79	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:128:GLN:CG	1:C:157:LYS:HB2	2.19	0.41
1:D:59:LYS:C	1:D:61:LEU:N	2.78	0.41
1:D:154:GLN:OE1	1:D:154:GLN:HA	2.21	0.41
2:E:2219:ARG:HH22	2:H:2222:PHE:HA	1.85	0.41
1:B:59:LYS:CD	5:B:1225:HOH:O	2.68	0.41
2:H:2177:TYR:OH	5:H:92:HOH:O	2.14	0.41
1:C:58:TYR:CD2	1:C:59:LYS:N	2.89	0.41
1:C:134:MET:CE	1:C:139:MET:HB2	2.51	0.41
1:A:18:MET:HB2	1:A:63:PHE:CD2	2.56	0.41
1:B:125:ALA:HB2	1:B:139:MET:HE2	2.02	0.41
2:E:2180:LYS:HD3	2:E:2180:LYS:C	2.46	0.40
1:B:41:GLU:OE1	1:B:42:VAL:CA	2.69	0.40
1:A:32:THR:HG22	1:A:160:ALA:HB1	2.03	0.40
1:A:41:GLU:OE1	1:A:43:VAL:N	2.54	0.40
1:C:32:THR:HG22	1:C:160:ALA:HB1	2.03	0.40
1:C:39:VAL:HG12	1:C:40:GLY:N	2.35	0.40
1:A:39:VAL:CG1	1:A:40:GLY:N	2.82	0.40
1:A:125:ALA:CA	1:A:139:MET:HE1	2.50	0.40
1:A:168:GLU:OE1	1:A:168:GLU:N	2.50	0.40
1:C:145:LEU:HB2	1:C:146:PRO:HD3	2.02	0.40
1:B:149:LYS:C	5:B:1210:HOH:O	2.20	0.40
1:A:59:LYS:C	1:A:61:LEU:N	2.79	0.40
1:C:71:GLN:HG2	5:C:1223:HOH:O	2.21	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:B:1223:HOH:O	5:D:1205:HOH:O[1_444]	2.08	0.12

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	163/165 (99%)	147 (90%)	11 (7%)	5 (3%)	3	2
1	B	163/165 (99%)	146 (90%)	12 (7%)	5 (3%)	3	2
1	C	163/165 (99%)	148 (91%)	10 (6%)	5 (3%)	3	2
1	D	163/165 (99%)	150 (92%)	9 (6%)	4 (2%)	4	3
2	E	49/51 (96%)	47 (96%)	1 (2%)	1 (2%)	6	5
2	F	49/51 (96%)	47 (96%)	1 (2%)	1 (2%)	6	5
2	G	49/51 (96%)	48 (98%)	0	1 (2%)	6	5
2	H	49/51 (96%)	46 (94%)	2 (4%)	1 (2%)	6	5
All	All	848/864 (98%)	779 (92%)	46 (5%)	23 (3%)	4	3

All (23) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	39	VAL
1	A	43	VAL
1	B	39	VAL
1	B	43	VAL
2	F	2214	GLU
1	C	39	VAL
2	G	2214	GLU
1	D	39	VAL
1	A	40	GLY
1	A	41	GLU
2	E	2214	GLU
1	B	40	GLY
1	B	42	VAL
1	C	43	VAL
1	C	179	SER
1	D	40	GLY
1	D	41	GLU
1	D	43	VAL
2	H	2214	GLU
1	B	41	GLU
1	C	44	THR
1	C	40	GLY
1	A	42	VAL

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	143/143 (100%)	136 (95%)	7 (5%)	22	34
1	B	143/143 (100%)	135 (94%)	8 (6%)	19	28
1	C	143/143 (100%)	135 (94%)	8 (6%)	19	28
1	D	143/143 (100%)	134 (94%)	9 (6%)	16	23
2	E	48/48 (100%)	46 (96%)	2 (4%)	26	40
2	F	48/48 (100%)	47 (98%)	1 (2%)	47	66
2	G	48/48 (100%)	46 (96%)	2 (4%)	26	40
2	H	48/48 (100%)	46 (96%)	2 (4%)	26	40
All	All	764/764 (100%)	725 (95%)	39 (5%)	21	32

All (39) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	39	VAL
1	A	45	THR
1	A	54	GLU
1	A	67	ASP
1	A	134	MET
1	A	148	LEU
1	A	180	ARG
2	E	2182	LEU
2	E	2197	VAL
1	B	19	ARG
1	B	39	VAL
1	B	45	THR
1	B	54	GLU
1	B	113	GLU
1	B	134	MET
1	B	149	LYS
1	B	180	ARG
2	F	2197	VAL
1	C	39	VAL

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Mol	Chain	Res	Type
1	C	41	GLU
1	C	45	THR
1	C	53	VAL
1	C	54	GLU
1	C	134	MET
1	C	148	LEU
1	C	180	ARG
2	G	2182	LEU
2	G	2197	VAL
1	D	19	ARG
1	D	39	VAL
1	D	41	GLU
1	D	45	THR
1	D	54	GLU
1	D	113	GLU
1	D	134	MET
1	D	148	LEU
1	D	180	ARG
2	H	2182	LEU
2	H	2197	VAL

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	64	GLN
1	A	84	ASN
1	B	64	GLN
1	C	60	ASN
1	C	64	GLN
1	C	71	GLN
1	D	64	GLN
1	D	141	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 8 ligands modelled in this entry, 4 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	GNP	A	1201	3	34,34,34	2.12	11 (32%)	47,54,54	1.88	8 (17%)
4	GNP	C	1203	3	34,34,34	2.07	12 (35%)	47,54,54	1.83	8 (17%)
4	GNP	B	1202	3	34,34,34	2.21	12 (35%)	47,54,54	1.77	8 (17%)
4	GNP	D	1204	3	34,34,34	2.09	11 (32%)	47,54,54	1.76	8 (17%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GNP	A	1201	3	-	3/18/38/38	0/3/3/3
4	GNP	C	1203	3	-	3/18/38/38	0/3/3/3
4	GNP	B	1202	3	-	3/18/38/38	0/3/3/3
4	GNP	D	1204	3	-	3/18/38/38	0/3/3/3

All (46) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	1202	GNP	C5-N7	5.08	1.49	1.39
4	A	1201	GNP	C5-N7	5.07	1.49	1.39
4	D	1204	GNP	C5-N7	4.94	1.49	1.39
4	D	1204	GNP	PG-N3B	4.81	1.75	1.63
4	C	1203	GNP	C5-N7	4.77	1.48	1.39
4	B	1202	GNP	PG-N3B	4.59	1.75	1.63

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	1202	GNP	PA-O3A	-4.55	1.54	1.59
4	A	1201	GNP	C8-N9	4.42	1.47	1.37
4	C	1203	GNP	PG-N3B	4.30	1.74	1.63
4	D	1204	GNP	C8-N9	4.21	1.47	1.37
4	C	1203	GNP	C2-N2	4.15	1.43	1.34
4	B	1202	GNP	C2-N2	4.12	1.43	1.34
4	B	1202	GNP	C8-N9	4.06	1.46	1.37
4	D	1204	GNP	C2-N2	3.96	1.43	1.34
4	A	1201	GNP	C2-N2	3.95	1.43	1.34
4	C	1203	GNP	C8-N9	3.80	1.46	1.37
4	A	1201	GNP	PB-O3A	3.59	1.63	1.59
4	A	1201	GNP	PG-N3B	3.41	1.72	1.63
4	A	1201	GNP	PG-O1G	3.38	1.51	1.46
4	D	1204	GNP	PA-O3A	-3.33	1.55	1.59
4	C	1203	GNP	O6-C6	-3.06	1.17	1.23
4	B	1202	GNP	PG-O3G	-2.93	1.49	1.56
4	A	1201	GNP	O6-C6	-2.87	1.18	1.23
4	C	1203	GNP	O4'-C4'	-2.85	1.38	1.45
4	C	1203	GNP	PB-O2B	-2.80	1.49	1.56
4	A	1201	GNP	PA-O3A	-2.68	1.56	1.59
4	C	1203	GNP	PG-O1G	2.67	1.50	1.46
4	D	1204	GNP	PB-O2B	-2.67	1.49	1.56
4	B	1202	GNP	O6-C6	-2.65	1.18	1.23
4	D	1204	GNP	O6-C6	-2.55	1.18	1.23
4	B	1202	GNP	PB-O2B	-2.54	1.50	1.56
4	A	1201	GNP	PG-O3G	-2.50	1.50	1.56
4	B	1202	GNP	PG-O2G	-2.46	1.50	1.56
4	C	1203	GNP	PB-O3A	2.45	1.62	1.59
4	B	1202	GNP	O4'-C4'	-2.43	1.39	1.45
4	A	1201	GNP	PB-O2B	-2.42	1.50	1.56
4	C	1203	GNP	PG-O3G	-2.41	1.50	1.56
4	D	1204	GNP	PG-O3G	-2.37	1.50	1.56
4	D	1204	GNP	PB-O3A	2.35	1.62	1.59
4	C	1203	GNP	PA-O3A	-2.28	1.57	1.59
4	C	1203	GNP	PB-N3B	2.26	1.69	1.63
4	B	1202	GNP	PB-O3A	2.14	1.61	1.59
4	B	1202	GNP	PB-N3B	2.14	1.68	1.63
4	D	1204	GNP	PG-O1G	2.09	1.49	1.46
4	A	1201	GNP	O4'-C4'	-2.09	1.40	1.45
4	D	1204	GNP	O4'-C4'	-2.03	1.40	1.45

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	1201	GNP	O1G-PG-N3B	-6.65	101.97	111.77
4	C	1203	GNP	O1G-PG-N3B	-6.54	102.14	111.77
4	D	1204	GNP	O1G-PG-N3B	-6.16	102.70	111.77
4	B	1202	GNP	N1-C2-N3	5.89	134.10	123.32
4	D	1204	GNP	N1-C2-N3	5.73	133.81	123.32
4	A	1201	GNP	N1-C2-N3	5.67	133.69	123.32
4	B	1202	GNP	O1G-PG-N3B	-5.66	103.44	111.77
4	C	1203	GNP	N1-C2-N3	5.64	133.64	123.32
4	A	1201	GNP	O2B-PB-O1B	3.86	118.16	109.87
4	B	1202	GNP	N2-C2-N1	-3.48	109.43	116.76
4	A	1201	GNP	N2-C2-N1	-3.42	109.54	116.76
4	B	1202	GNP	O2B-PB-O1B	3.41	117.19	109.87
4	C	1203	GNP	O2B-PB-O1B	3.38	117.12	109.87
4	D	1204	GNP	N2-C2-N1	-3.37	109.64	116.76
4	C	1203	GNP	N2-C2-N1	-3.37	109.65	116.76
4	A	1201	GNP	O1B-PB-N3B	-3.33	106.86	111.77
4	C	1203	GNP	C2-N1-C6	-3.32	119.09	125.11
4	B	1202	GNP	C2-N1-C6	-3.24	119.23	125.11
4	A	1201	GNP	C2-N1-C6	-3.21	119.29	125.11
4	D	1204	GNP	C2-N1-C6	-3.21	119.30	125.11
4	D	1204	GNP	O2B-PB-O1B	3.16	116.65	109.87
4	B	1202	GNP	C2-N3-C4	-3.05	107.04	112.30
4	A	1201	GNP	C2-N3-C4	-2.96	107.19	112.30
4	D	1204	GNP	C2-N3-C4	-2.90	107.31	112.30
4	C	1203	GNP	C2-N3-C4	-2.79	107.49	112.30
4	C	1203	GNP	O1B-PB-N3B	-2.52	108.06	111.77
4	D	1204	GNP	O4'-C4'-C5'	2.34	116.84	109.33
4	B	1202	GNP	O4'-C4'-C5'	2.32	116.75	109.33
4	C	1203	GNP	O4'-C4'-C5'	2.18	116.31	109.33
4	A	1201	GNP	O4'-C4'-C5'	2.16	116.26	109.33
4	B	1202	GNP	O1B-PB-N3B	-2.05	108.76	111.77
4	D	1204	GNP	O2B-PB-O3A	2.01	111.33	104.64

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1201	GNP	PG-N3B-PB-O1B
4	A	1201	GNP	PA-O3A-PB-O2B
4	B	1202	GNP	PG-N3B-PB-O1B
4	B	1202	GNP	PA-O3A-PB-O2B
4	C	1203	GNP	PG-N3B-PB-O1B
4	C	1203	GNP	PA-O3A-PB-O2B

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Mol	Chain	Res	Type	Atoms
4	D	1204	GNP	PG-N3B-PB-O1B
4	D	1204	GNP	PA-O3A-PB-O2B
4	A	1201	GNP	PA-O3A-PB-O1B
4	B	1202	GNP	PA-O3A-PB-O1B
4	C	1203	GNP	PA-O3A-PB-O1B
4	D	1204	GNP	PA-O3A-PB-O1B

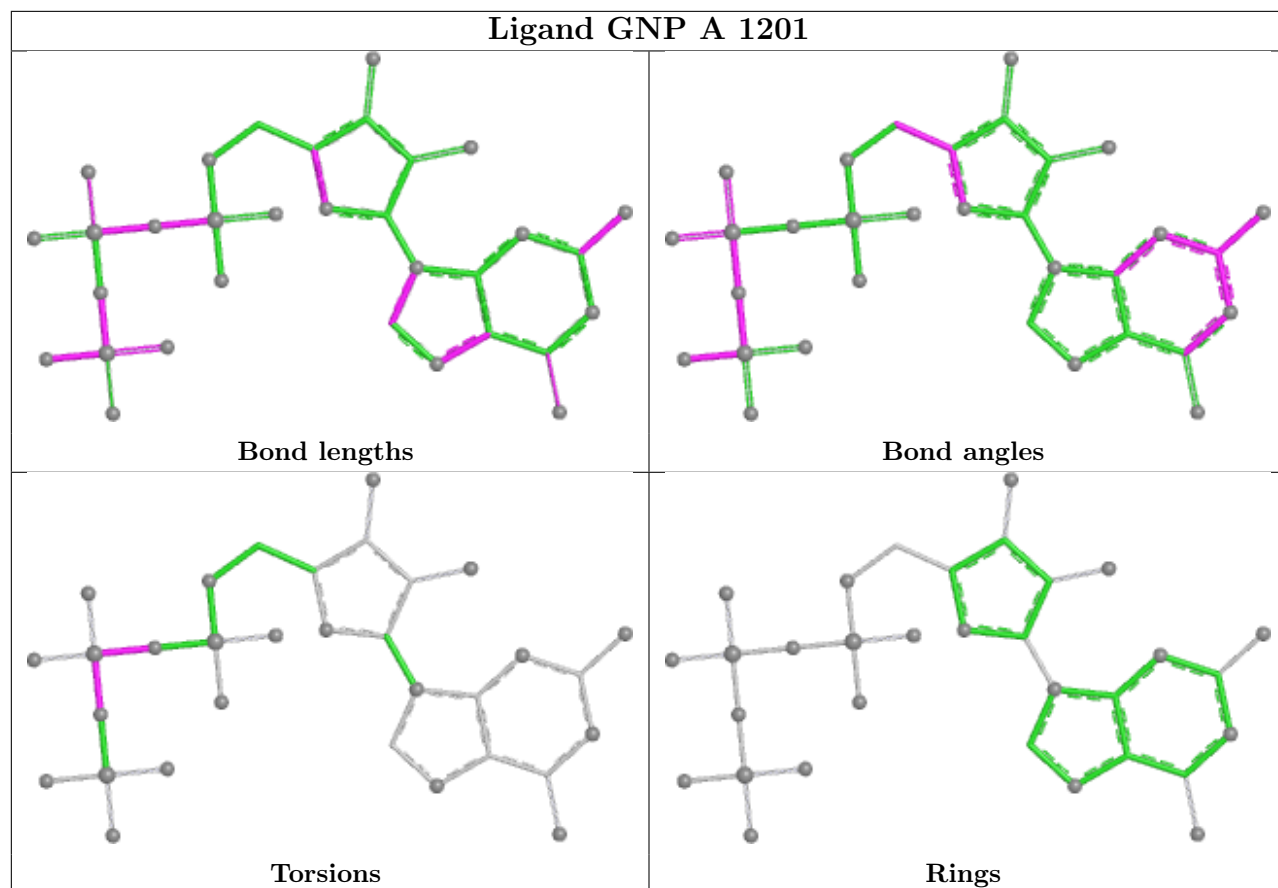
There are no ring outliers.

4 monomers are involved in 10 short contacts:

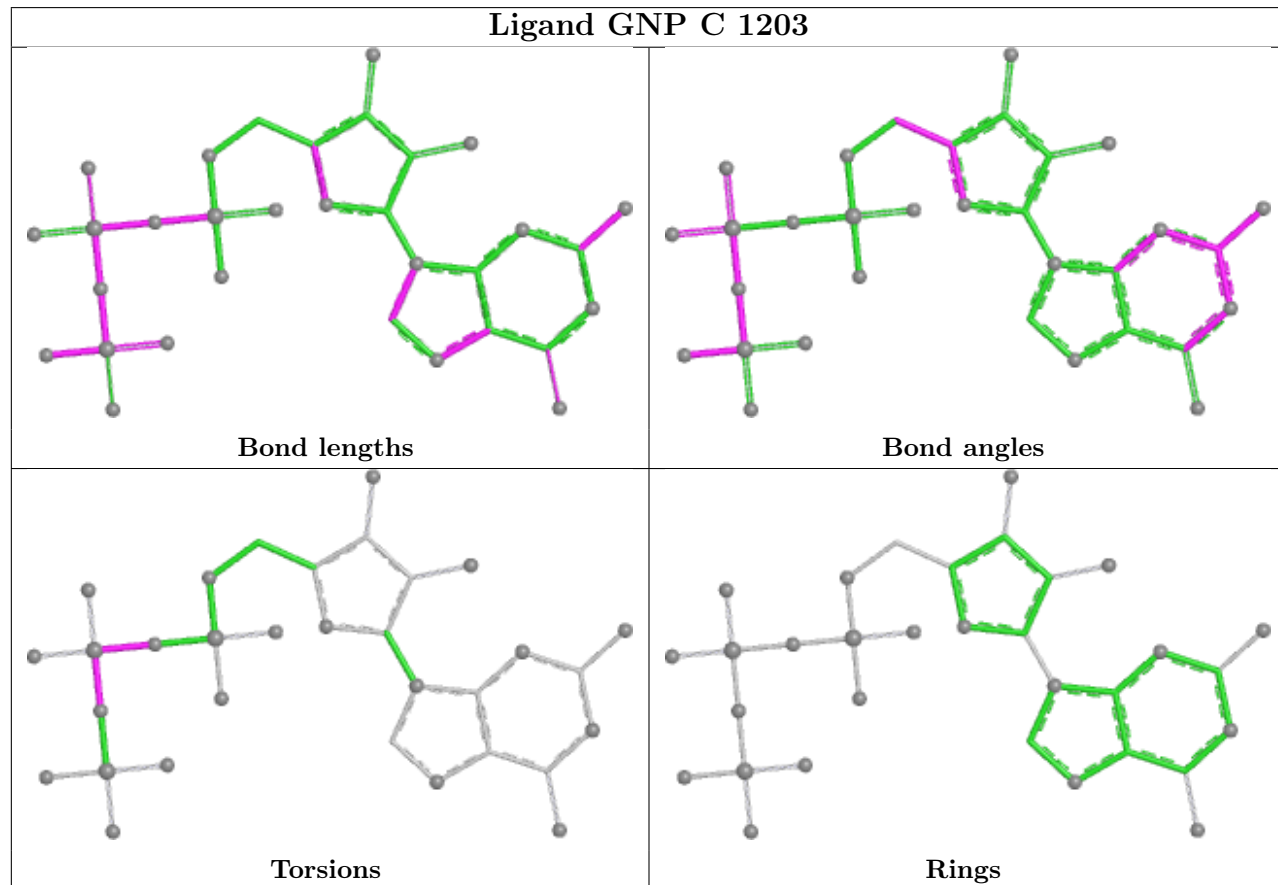
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1201	GNP	1	0
4	C	1203	GNP	4	0
4	B	1202	GNP	2	0
4	D	1204	GNP	3	0

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.

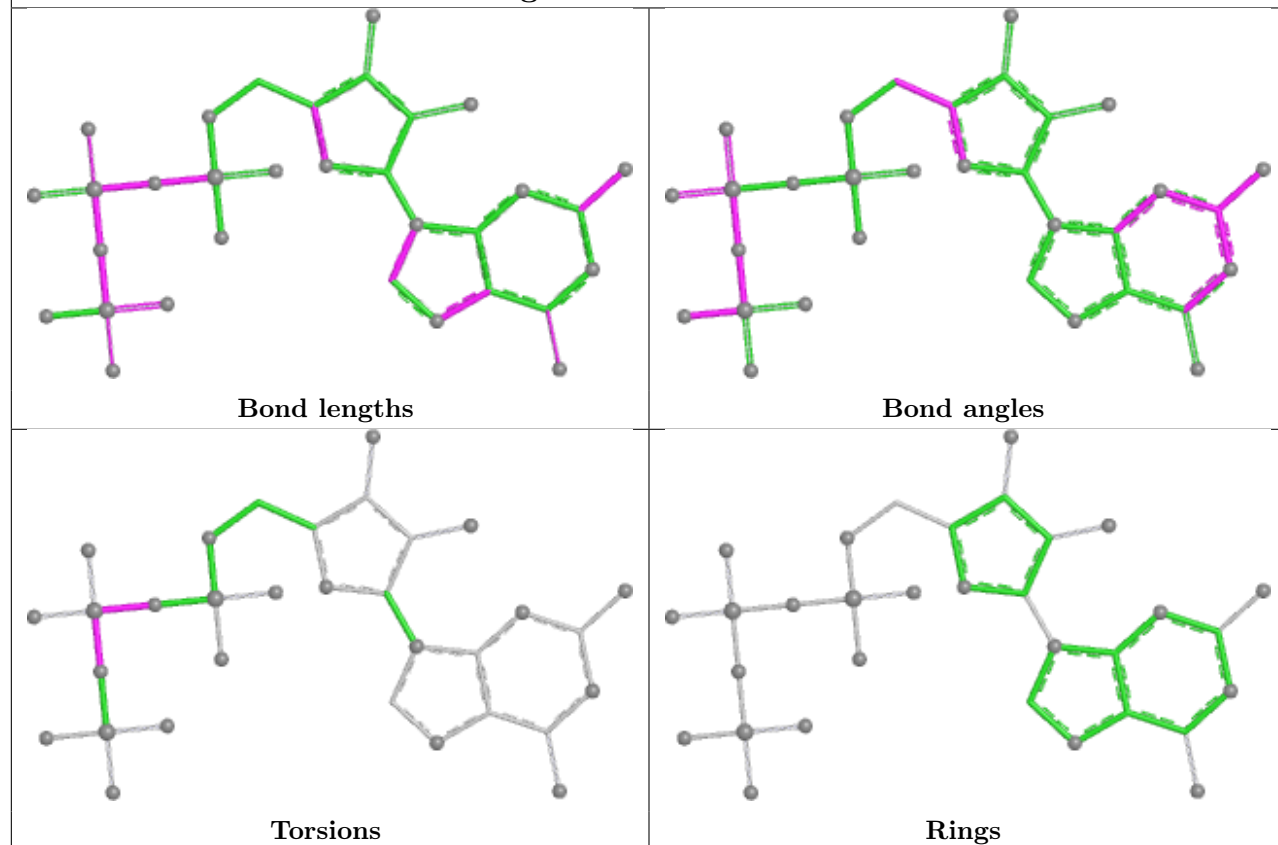
Ligand GNP A 1201



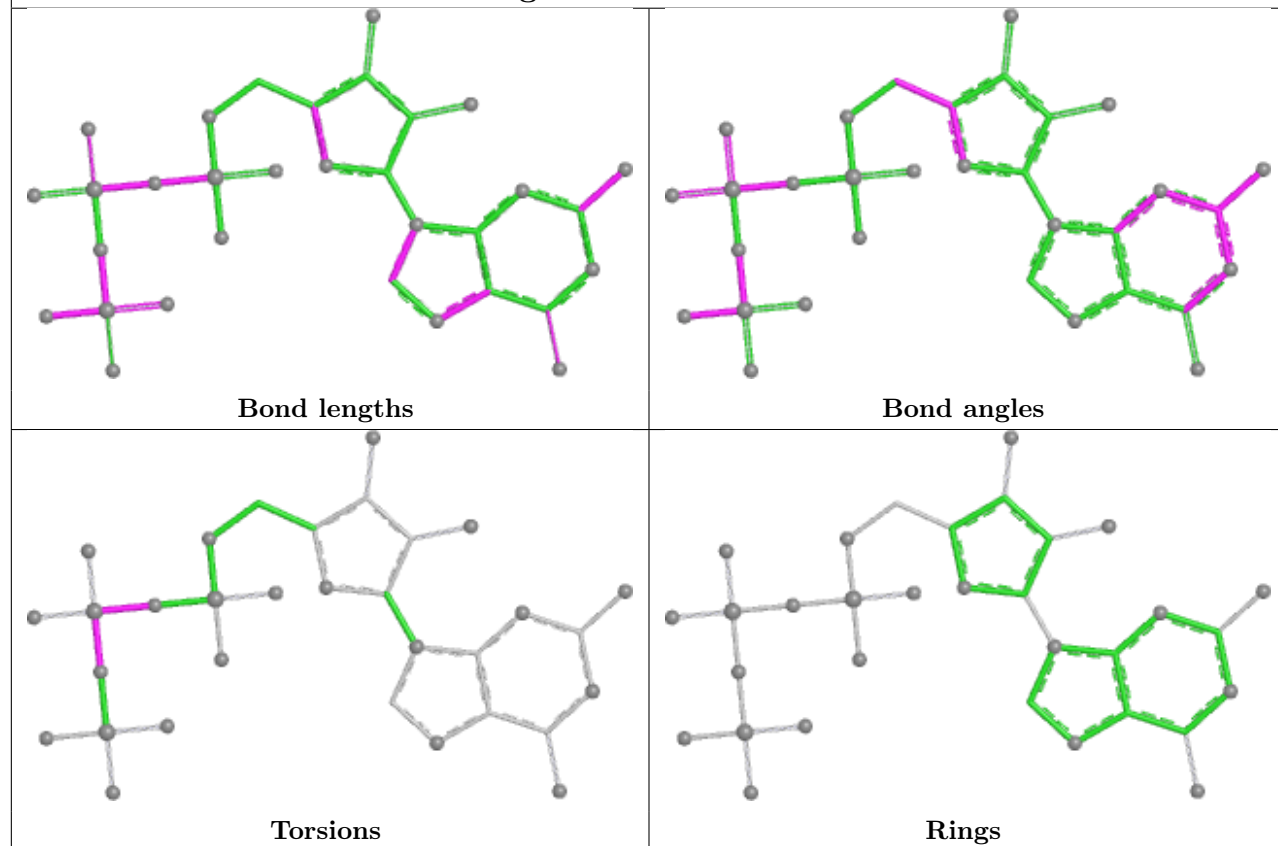
Ligand GNP C 1203



Ligand GNP B 1202



Ligand GNP D 1204



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, 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	165/165 (100%)	0.71	13 (7%)	18 20	14, 21, 30, 33	0
1	B	165/165 (100%)	0.57	17 (10%)	12 13	14, 21, 30, 35	0
1	C	165/165 (100%)	0.65	19 (11%)	9 10	16, 21, 31, 36	0
1	D	165/165 (100%)	0.91	23 (13%)	6 7	15, 21, 33, 38	0
2	E	51/51 (100%)	0.73	6 (11%)	9 10	15, 22, 29, 30	0
2	F	51/51 (100%)	0.46	4 (7%)	19 21	15, 22, 30, 33	0
2	G	51/51 (100%)	0.52	1 (1%)	65 66	13, 22, 28, 30	0
2	H	51/51 (100%)	0.57	4 (7%)	19 21	15, 22, 31, 35	0
All	All	864/864 (100%)	0.68	87 (10%)	12 14	13, 21, 31, 38	0

All (87) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	43	VAL	11.1
1	C	43	VAL	8.1
1	C	42	VAL	7.1
1	D	42	VAL	6.5
1	D	16	ARG	6.4
2	H	2222	PHE	6.3
1	A	43	VAL	5.9
1	B	42	VAL	5.4
1	B	43	VAL	5.4
1	D	60	ASN	5.3
1	D	150	ASP	5.1
1	A	42	VAL	4.9
1	D	17	GLU	4.9
1	D	59	LYS	4.8
1	B	60	ASN	4.6
1	C	38	GLN	4.3

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Mol	Chain	Res	Type	RSRZ
1	D	62	LYS	4.1
1	D	139	MET	3.9
1	D	180	ARG	3.9
1	D	61	LEU	3.8
1	B	61	LEU	3.8
2	E	2221	MET	3.7
1	C	16	ARG	3.7
1	D	58	TYR	3.6
1	C	60	ASN	3.5
1	A	16	ARG	3.5
1	C	180	ARG	3.4
2	E	2220	LEU	3.3
1	B	44	THR	3.3
1	A	134	MET	3.2
2	F	2220	LEU	3.2
2	H	2220	LEU	3.2
1	B	62	LYS	3.1
1	C	59	LYS	3.0
1	D	40	GLY	3.0
1	A	131	GLU	2.9
1	B	177	LEU	2.9
1	D	132	GLN	2.9
2	E	2222	PHE	2.9
1	D	38	GLN	2.8
1	D	134	MET	2.8
1	D	44	THR	2.8
1	C	148	LEU	2.7
1	A	60	ASN	2.7
2	H	2221	MET	2.7
1	D	175	GLU	2.6
2	F	2222	PHE	2.6
1	C	39	VAL	2.6
1	C	44	THR	2.6
1	D	41	GLU	2.5
1	C	17	GLU	2.5
1	C	40	GLY	2.5
1	B	57	THR	2.5
1	B	38	GLN	2.5
1	B	39	VAL	2.4
1	B	180	ARG	2.4
1	D	149	LYS	2.4
1	A	17	GLU	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	175	GLU	2.4
2	F	2221	MET	2.3
1	C	177	LEU	2.3
1	B	58	TYR	2.3
2	G	2214	GLU	2.3
2	E	2213	LEU	2.2
1	C	132	GLN	2.2
1	B	149	LYS	2.2
1	D	148	LEU	2.2
1	B	175	GLU	2.2
1	A	44	THR	2.2
1	C	134	MET	2.2
1	C	112	GLU	2.2
1	A	59	LYS	2.2
2	E	2210	GLN	2.2
1	D	57	THR	2.2
1	C	53	VAL	2.1
1	D	179	SER	2.1
1	B	41	GLU	2.1
1	C	150	ASP	2.1
1	A	39	VAL	2.1
1	B	56	VAL	2.1
2	E	2219	ARG	2.1
1	A	18	MET	2.1
1	B	134	MET	2.1
2	F	2219	ARG	2.1
1	C	41	GLU	2.0
1	A	45	THR	2.0
2	H	2219	ARG	2.0

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 ⓘ

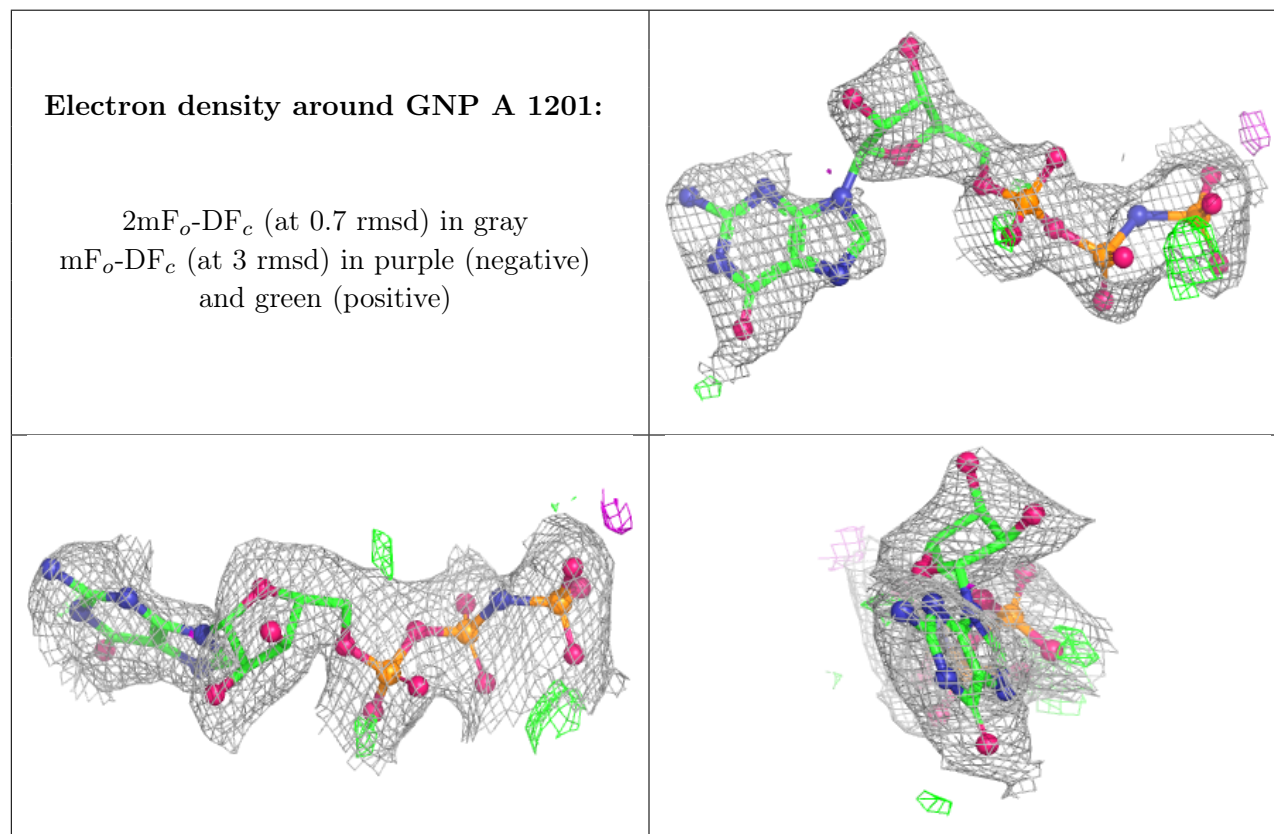
There are no oligosaccharides in this entry.

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.

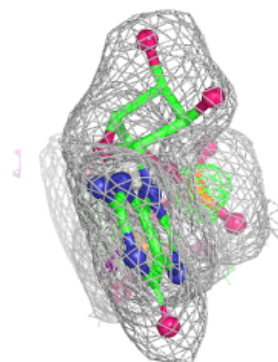
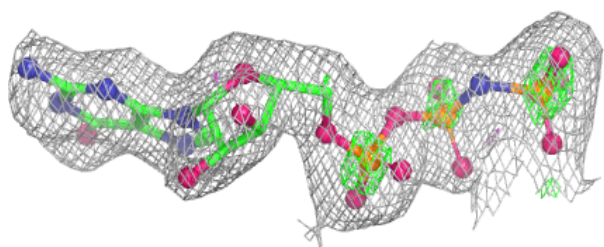
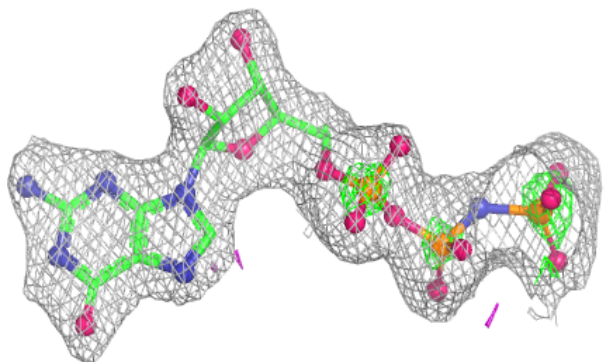
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	MG	B	902	1/1	0.82	0.17	39,39,39,39	0
3	MG	D	904	1/1	0.84	0.21	41,41,41,41	0
3	MG	A	901	1/1	0.87	0.15	54,54,54,54	0
3	MG	C	903	1/1	0.88	0.28	38,38,38,38	0
4	GNP	A	1201	32/32	0.88	0.14	35,47,56,57	0
4	GNP	B	1202	32/32	0.94	0.13	27,40,43,43	0
4	GNP	D	1204	32/32	0.94	0.13	27,35,40,42	0
4	GNP	C	1203	32/32	0.95	0.13	28,33,39,41	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.

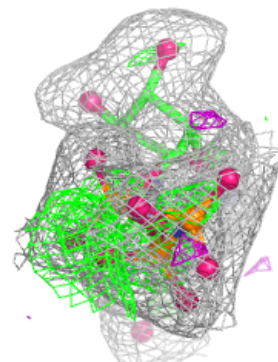
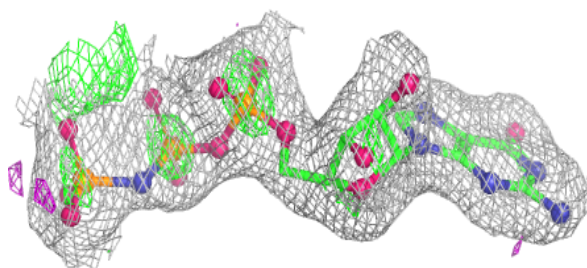
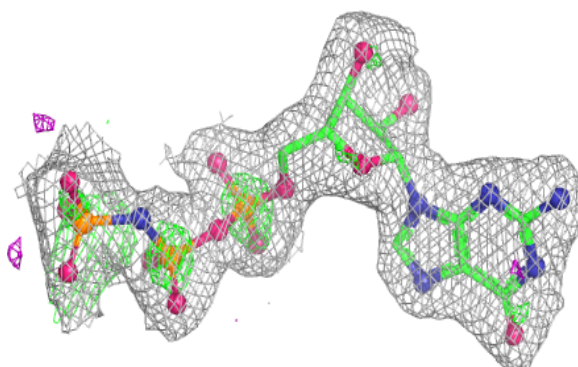


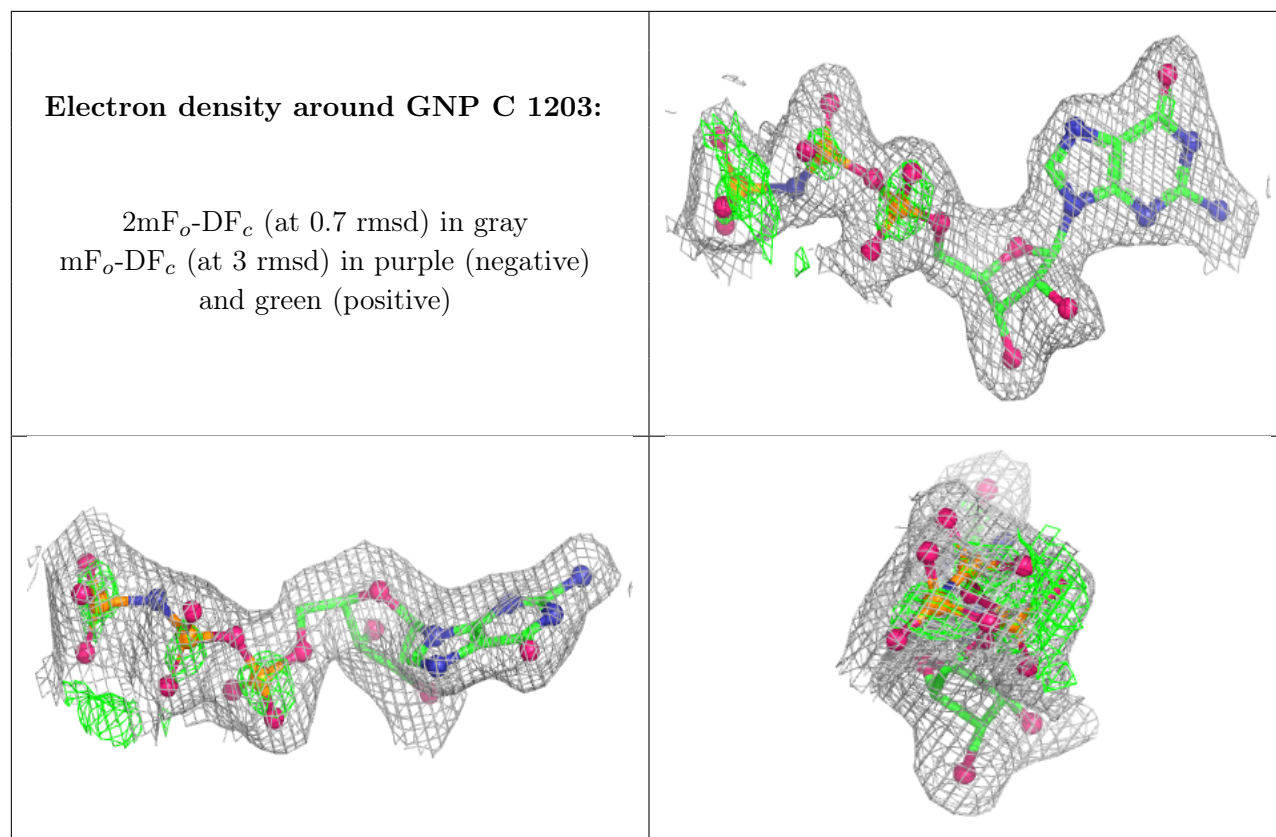
Electron density around GNP B 1202:

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

**Electron density around GNP D 1204:**

$2mF_o-DF_c$ (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.