WORLDWIDE PDB
PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Jun 26, 2024 – 02:26 AM EDT

PDB ID	:	6Y32
Title	:	Structure of the GTPase heterodimer of human SRP54 and SRalpha
Authors	:	Juaire, K.D.; Becker, M.M.M.; Wild, K.; Sinning, I.
Deposited on	:	2020-02-17
Resolution	:	2.60 Å(reported)

The following versions of software and data (see references ⓘ) were used in the production of this report:

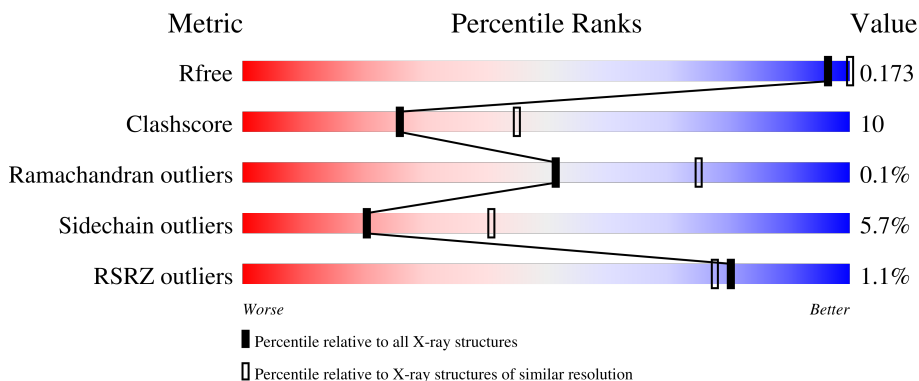|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.37.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.60 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.
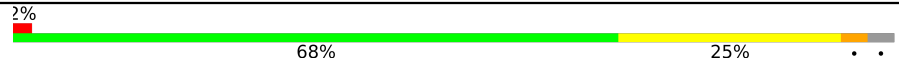
Metric	Percentile Ranks	Value
Rfree		0.173
Clashscore		10
Ramachandran outliers		0.1%
Sidechain outliers		5.7%
RSRZ outliers		1.1%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	3163 (2.60-2.60)
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)
RSRZ outliers	127900	3104 (2.60-2.60)

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

Mol	Chain	Length	Quality of chain
1	A	304	68% 20% • 10%
1	C	304	2% 68% 19% • 12%
1	E	304	% 68% 18% • 12%
1	G	304	% 63% 23% • 12%
2	B	315	% 73% 20% • •

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
2	D	315	2% 68% 25%
2	F	315	71% 22%
2	H	315	.% 73% 21% 5%

2 Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 18356 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 Signal recognition particle 54 kDa protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	274	Total	C	N	O	S	0	0	0
			2120	1353	354	401	12			
1	C	268	Total	C	N	O	S	0	0	0
			2075	1326	348	390	11			
1	E	268	Total	C	N	O	S	0	0	0
			2075	1326	348	390	11			
1	G	267	Total	C	N	O	S	0	0	0
			2067	1322	346	388	11			

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-7	MET	-	initiating methionine	UNP P61011
A	-6	GLY	-	expression tag	UNP P61011
A	-5	HIS	-	expression tag	UNP P61011
A	-4	HIS	-	expression tag	UNP P61011
A	-3	HIS	-	expression tag	UNP P61011
A	-2	HIS	-	expression tag	UNP P61011
A	-1	HIS	-	expression tag	UNP P61011
A	0	HIS	-	expression tag	UNP P61011
C	-7	MET	-	initiating methionine	UNP P61011
C	-6	GLY	-	expression tag	UNP P61011
C	-5	HIS	-	expression tag	UNP P61011
C	-4	HIS	-	expression tag	UNP P61011
C	-3	HIS	-	expression tag	UNP P61011
C	-2	HIS	-	expression tag	UNP P61011
C	-1	HIS	-	expression tag	UNP P61011
C	0	HIS	-	expression tag	UNP P61011
E	-7	MET	-	initiating methionine	UNP P61011
E	-6	GLY	-	expression tag	UNP P61011
E	-5	HIS	-	expression tag	UNP P61011
E	-4	HIS	-	expression tag	UNP P61011
E	-3	HIS	-	expression tag	UNP P61011

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
E	-2	HIS	-	expression tag	UNP P61011
E	-1	HIS	-	expression tag	UNP P61011
E	0	HIS	-	expression tag	UNP P61011
G	-7	MET	-	initiating methionine	UNP P61011
G	-6	GLY	-	expression tag	UNP P61011
G	-5	HIS	-	expression tag	UNP P61011
G	-4	HIS	-	expression tag	UNP P61011
G	-3	HIS	-	expression tag	UNP P61011
G	-2	HIS	-	expression tag	UNP P61011
G	-1	HIS	-	expression tag	UNP P61011
G	0	HIS	-	expression tag	UNP P61011

- Molecule 2 is a protein called Signal recognition particle receptor subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	302	Total 2297	C 1444	N 407	O 430	S 16	0	0	0
2	D	305	Total 2322	C 1460	N 412	O 434	S 16	0	0	0
2	F	304	Total 2316	C 1456	N 411	O 433	S 16	0	0	0
2	H	300	Total 2284	C 1436	N 404	O 428	S 16	0	0	0

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	330	MET	-	initiating methionine	UNP P08240
B	331	GLY	-	expression tag	UNP P08240
B	639	HIS	-	expression tag	UNP P08240
B	640	HIS	-	expression tag	UNP P08240
B	641	HIS	-	expression tag	UNP P08240
B	642	HIS	-	expression tag	UNP P08240
B	643	HIS	-	expression tag	UNP P08240
B	644	HIS	-	expression tag	UNP P08240
D	330	MET	-	initiating methionine	UNP P08240
D	331	GLY	-	expression tag	UNP P08240
D	639	HIS	-	expression tag	UNP P08240
D	640	HIS	-	expression tag	UNP P08240
D	641	HIS	-	expression tag	UNP P08240
D	642	HIS	-	expression tag	UNP P08240
D	643	HIS	-	expression tag	UNP P08240

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
D	644	HIS	-	expression tag	UNP P08240
F	330	MET	-	initiating methionine	UNP P08240
F	331	GLY	-	expression tag	UNP P08240
F	639	HIS	-	expression tag	UNP P08240
F	640	HIS	-	expression tag	UNP P08240
F	641	HIS	-	expression tag	UNP P08240
F	642	HIS	-	expression tag	UNP P08240
F	643	HIS	-	expression tag	UNP P08240
F	644	HIS	-	expression tag	UNP P08240
H	330	MET	-	initiating methionine	UNP P08240
H	331	GLY	-	expression tag	UNP P08240
H	639	HIS	-	expression tag	UNP P08240
H	640	HIS	-	expression tag	UNP P08240
H	641	HIS	-	expression tag	UNP P08240
H	642	HIS	-	expression tag	UNP P08240
H	643	HIS	-	expression tag	UNP P08240
H	644	HIS	-	expression tag	UNP P08240

- Molecule 3 is PHOSPHOAMINOPHOSPHONIC ACID-GUANYLATE ESTER (three-letter code: GNP) (formula: $C_{10}H_{17}N_6O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).

GNP
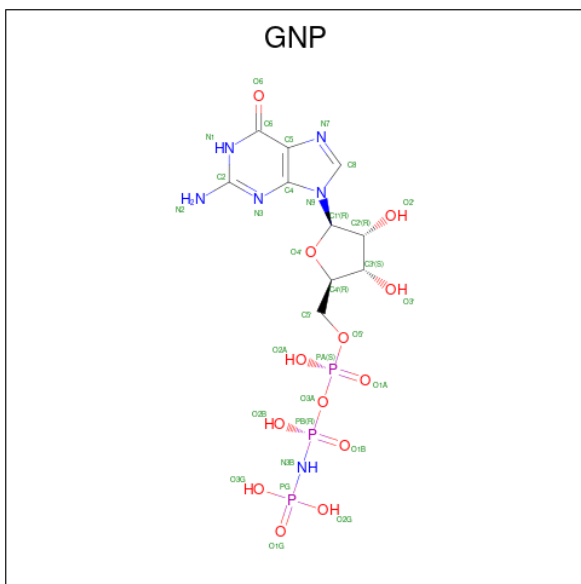
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	B	1	Total	C	N	O	P	0	0
			32	10	6	13	3		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	C	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	D	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	E	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	F	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	G	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	H	1	Total	C	N	O	P	0	0
			32	10	6	13	3		

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Mg	0	0
			1	1		
4	B	1	Total	Mg	0	0
			1	1		
4	C	1	Total	Mg	0	0
			1	1		
4	D	1	Total	Mg	0	0
			1	1		
4	E	1	Total	Mg	0	0
			1	1		
4	F	1	Total	Mg	0	0
			1	1		
4	G	1	Total	Mg	0	0
			1	1		
4	H	1	Total	Mg	0	0
			1	1		

- Molecule 5 is SULFATE ION (three-letter code: SO4) (formula: O_4S).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	B	1	Total 5	O 4	S 1	0	0
5	B	1	Total 5	O 4	S 1	0	0
5	B	1	Total 5	O 4	S 1	0	0
5	C	1	Total 5	O 4	S 1	0	0
5	D	1	Total 5	O 4	S 1	0	0
5	F	1	Total 5	O 4	S 1	0	0
5	F	1	Total 5	O 4	S 1	0	0
5	F	1	Total 5	O 4	S 1	0	0
5	G	1	Total 5	O 4	S 1	0	0
5	H	1	Total 5	O 4	S 1	0	0
5	H	1	Total 5	O 4	S 1	0	0
5	H	1	Total 5	O 4	S 1	0	0
5	H	1	Total 5	O 4	S 1	0	0
5	H	1	Total 5	O 4	S 1	0	0

• Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	56	Total 56	O 56	0	0
6	B	80	Total 80	O 80	0	0
6	C	47	Total 47	O 47	0	0
6	D	50	Total 50	O 50	0	0
6	E	49	Total 49	O 49	0	0
6	F	55	Total 55	O 55	0	0
6	G	45	Total 45	O 45	0	0
6	H	84	Total 84	O 84	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: Signal recognition particle 54 kDa protein

Chain A:

• Molecule 1: Signal recognition particle 54 kDa protein

Chain C:

• Molecule 1: Signal recognition particle 54 kDa protein

Chain E:

K239 V240 A243 V247 T248 K249 L250 D251 G252 H253 S261 A265 G276 F282 T287 Q288 P289 S292 K293 G296

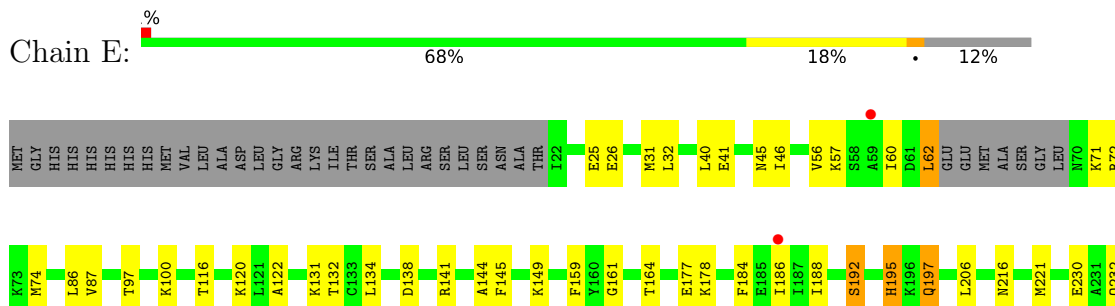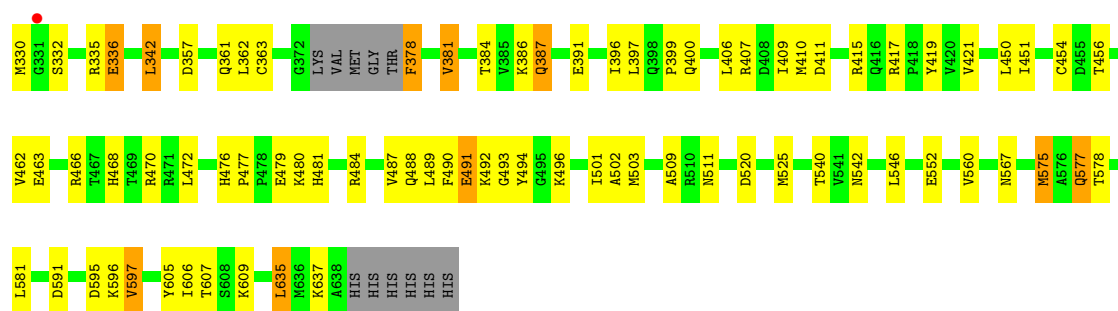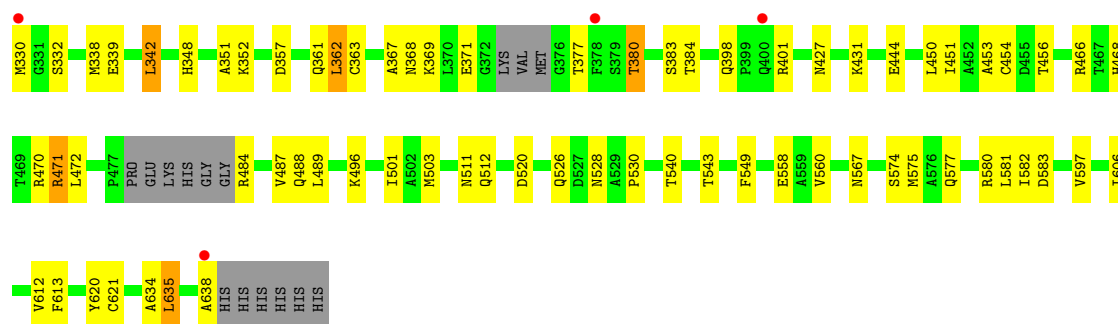• Molecule 1: Signal recognition particle 54 kDa protein

Chain G:

%

63%　　　　23%　　　•　　12%

MET GLY HIS HIS HIS HIS HIS MET VAL LEU ALA ASP GLY ARG LYS ILE THR SER ALA LEU ARG SER LEU SER ASN ALA THR I22 I23 N24 V27 M31 L32 E41 I46 Q51 N55 V56 D61 L62 GLU GLU MET ALA SER GLY LEU ASN K71 R72 K73

L83 V87 G111 S112 G113 K114 T117 K120 Y123 R127 T132 C133 C136 A137 D138 R141 A144 F145 D146 Q147 L148 K149 Q150 K154 A155 R156 I157 Y163 D167 I170 F184 E185 I186 G193 R194 H195 K196 Q197 E198 D199 S200 L201

E204 I212 Q213 P214 Q232 F236 V240 I246 V247 T248 K249 L250 D251 G252 H253 A254 K255 G256 G257 L260 F272 T275 G276 D280 P284 F285 K286 P289 F290 I291 L294 L295 G296

• Molecule 2: Signal recognition particle receptor subunit alpha

Chain B:

%

73%　　　　20%　　　•　　•

M330 G331 S332 L333 M338 L342 H348 K352 L362 L370 K373 VAL MET GLY T377 T380 T384 V385 I396 P399 Q400 R401 L406 R407 M410 R415 Q416 R417 V426 N427 G428 V429 G430 K431 E444 S448 V449 A453 C454 D455 T456

R466 R470 A474 L475 H476 P477 PRO GLU LYS HIS G482 G483 R484 T485 M486 V487 Q488 L489 F490 E491 A502 I506 D515 D520 R524 M525 Q526 T540 F549 E552 V555 A559 V560 L563 V564 K565 F566 L570 S574 Q577 T578 I582

T588 K589 V597 S602 I606 T607 S608 R624 V631 L635 A638 HIS HIS HIS HIS HIS

• Molecule 2: Signal recognition particle receptor subunit alpha

Chain D:

2%

68%　　　　25%　　　•　　•

M330 G331 S332 L333 M338 E339 L342 D343 H348 L349 I350 A351 K352 A356 L370 E371 G372 LYS VAL MET GLY T377 F378 S379 T380 V381 T382 V385 K386 Q395 I396 L397 R401 R402 V403 D404 M405 L406 M410 V426 N427 K431 N434 K437 I438 V449

L450 I451 C454 R458 R466 T467 H468 T469 R470 R471 L472 L475 K480 H481 R484 V487 Q488 L489 V516 V517 L518 V519 D520 R524 M525 Q526 D527 N528 L531 M532 L546 E558 A559 V560 L563 V564 K565 F566 N567 S574 M575 A576 Q577 T578 P579 R580

L581 I582 D583 F590 D594 D595 K596 V597 I601 I606 F613 T619 Y620 L623 A634 L635 A638 HIS HIS HIS HIS HIS HIS

• Molecule 2: Signal recognition particle receptor subunit alpha

Chain F:　　71%　　　　22%　　　•　　•

M330 G331 S332 R335 E336 L342 D357 Q361 L362 C363 G372 LYS VAL MET GLY THR F378 V381 T384 V385 K386 Q387 E391 I396 L397 Q398 P399 Q400 L406 R407 D408 I409 M410 D411 R415 Q416 R417 P418 Y419 V420 V421 L450 I451 C454 D455 T456

V462 E463 R466 T467 H468 T469 R470 R471 L472 H476 P477 P478 E479 K480 H481 R484 V487 Q488 L489 F490 E491 K492 G493 Y494 G495 K496 I501 A502 M503 A509 R510 N511 D520 M525 T540 V541 N542 L546 E552 V560 N567 M575 A576 Q577 T578

L581 D591 D595 K596 V597 Y605 I606 T607 S608 K609 L635 M636 K637 A638 HIS HIS HIS HIS HIS HIS

• Molecule 2: Signal recognition particle receptor subunit alpha

Chain H:

73%　　　　　21%　　• 5%

M330 G331 S332 M338 E339 L342 H348 A351 K352 D357 Q361 L362 C363 A367 N368 K369 L370 E371 G372 LYS VAL MET G376 T377 F378 S379 T380 S383 T384 Q398 P399 Q400 R401 N427 K431 E444 L450 I451 A452 A453 C454 D455 T456 R466 T467 H468

T469 R470 R471 L472 P477 PRO GLU LYS HIS GLY GLY R484 V487 Q488 L489 K496 I501 A502 M503 N511 Q512 D520 Q526 D527 N528 A529 P530 T540 T543 F549 E558 A559 V560 N567 S574 M575 A576 Q577 R580 L581 I582 D583 V597 I606

V612 F613 Y620 C621 A634 L635 A638 HIS HIS HIS HIS HIS HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	155.82Å 70.63Å 172.57Å 90.00° 116.81° 90.00°	Depositor
Resolution (Å)	49.55 – 2.60 49.55 – 2.60	Depositor EDS
% Data completeness (in resolution range)	99.5 (49.55-2.60) 99.4 (49.55-2.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.39 (at 2.61Å)	Xtriage
Refinement program	PHENIX 1.15.2_3472	Depositor
R, R_{free}	0.149 , 0.184 0.151 , 0.173	Depositor DCC
R_{free} test set	5157 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å^2)	44.9	Xtriage
Anisotropy	0.822	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 41.2	EDS
L-test for twinning[2]	$< \lvert L \rvert > = 0.42, < L^2 > = 0.24$	Xtriage
Estimated twinning fraction	0.254 for h,-k,-h-l	Xtriage
Reported twinning fraction	0.260 for h,-k,-h-l	Depositor
Outliers	0 of 103282 reflections	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	18356	wwPDB-VP
Average B, all atoms (Å^2)	59.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.04% of the height of the origin peak. No significant pseudotranslation is detected.*

---

[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< \lvert L \rvert >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: SO4, MG, GNP

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	0.39	0/2153	0.55	0/2899
1	C	0.38	0/2108	0.55	0/2839
1	E	0.40	0/2108	0.54	0/2839
1	G	0.36	0/2100	0.52	0/2828
2	B	0.43	0/2323	0.63	1/3136 (0.0%)
2	D	0.41	0/2351	0.59	0/3177
2	F	0.41	0/2345	0.56	0/3168
2	H	0.42	0/2310	0.59	0/3120
All	All	0.40	0/17798	0.57	1/24006 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	333	LEU	CA-CB-CG	5.48	127.90	115.30

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	2120	0	2165	41	0
1	C	2075	0	2123	38	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	2075	0	2123	41	0
1	G	2067	0	2117	50	0
2	B	2297	0	2361	58	0
2	D	2322	0	2379	61	0
2	F	2316	0	2376	53	0
2	H	2284	0	2346	48	0
3	A	32	0	13	3	0
3	B	32	0	13	1	0
3	C	32	0	13	1	0
3	D	32	0	13	2	0
3	E	32	0	13	2	0
3	F	32	0	13	0	0
3	G	32	0	13	5	0
3	H	32	0	13	1	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
4	F	1	0	0	0	0
4	G	1	0	0	0	0
4	H	1	0	0	0	0
5	B	15	0	0	1	0
5	C	5	0	0	0	0
5	D	5	0	0	1	0
5	F	15	0	0	0	0
5	G	5	0	0	1	0
5	H	25	0	0	1	0
6	A	56	0	0	0	0
6	B	80	0	0	6	0
6	C	47	0	0	2	0
6	D	50	0	0	4	0
6	E	49	0	0	4	0
6	F	55	0	0	4	0
6	G	45	0	0	2	0
6	H	84	0	0	6	0
All	All	18356	0	18094	378	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 10.

All (378) 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:F:560:VAL:HG13	2:F:606:ILE:CD1	1.47	1.44
2:F:560:VAL:HG13	2:F:606:ILE:HD11	1.14	1.13
2:F:560:VAL:CG1	2:F:606:ILE:HD11	1.87	1.03
2:F:560:VAL:HG13	2:F:606:ILE:HD13	1.37	1.00
2:F:560:VAL:CG1	2:F:606:ILE:CD1	2.41	0.97
2:D:330:MET:N	2:D:330:MET:SD	2.45	0.89
2:H:580:ARG:NH2	2:H:583:ASP:OD2	2.13	0.81
2:F:597:VAL:HG12	2:F:635:LEU:HD13	1.61	0.81
2:B:540:THR:HG21	2:B:574:SER:HA	1.62	0.80
2:B:399:PRO:O	6:B:801:HOH:O	2.01	0.79
2:D:330:MET:N	2:D:332:SER:H	1.82	0.78
2:B:563:LEU:HD13	2:B:606:ILE:HD11	1.65	0.77
2:B:415:ARG:NH2	6:B:803:HOH:O	2.18	0.77
1:E:141:ARG:HB3	1:E:144:ALA:HB2	1.67	0.76
2:F:477:PRO:HG2	2:F:480:LYS:HB2	1.69	0.74
2:B:352:LYS:HD3	2:B:635:LEU:HD12	1.69	0.73
2:D:352:LYS:HE2	2:D:634:ALA:O	1.89	0.73
2:H:348:HIS:CE1	2:H:638:ALA:HB2	2.25	0.72
2:B:484:ARG:HE	2:B:485:THR:H	1.37	0.72
2:B:427:ASN:OD1	6:B:802:HOH:O	2.08	0.71
1:G:163:TYR:N	5:G:303:SO4:O4	2.23	0.71
2:H:369:LYS:NZ	6:H:802:HOH:O	2.24	0.70
1:E:141:ARG:NH1	3:E:301:GNP:O3G	2.25	0.69
1:G:154:LYS:NZ	6:G:402:HOH:O	2.24	0.69
1:G:255:LYS:NZ	1:G:296:GLY:OXT	2.26	0.69
1:G:24:ASN:OD1	1:G:62:LEU:HG	1.92	0.69
1:A:277:GLU:OE1	3:A:301:GNP:O2'	2.10	0.69
2:B:444:GLU:HG2	2:D:619:THR:HB	1.75	0.68
2:F:342:LEU:HG	2:F:363:CYS:HB3	1.76	0.68
2:F:378:PHE:HB3	2:F:381:VAL:HB	1.75	0.68
2:H:342:LEU:HG	2:H:363:CYS:HB3	1.76	0.68
2:F:407:ARG:HH12	2:F:411:ASP:HB2	1.59	0.68
2:H:348:HIS:HE1	2:H:638:ALA:HB2	1.56	0.67
2:B:407:ARG:NE	1:C:203:GLU:HG3	2.10	0.67
1:C:141:ARG:HB3	1:C:144:ALA:HB2	1.76	0.66
2:F:417:ARG:NH1	6:F:803:HOH:O	2.29	0.66
2:H:352:LYS:HZ1	2:H:638:ALA:H	1.42	0.66
2:F:330:MET:HB3	2:F:335:ARG:NH1	2.11	0.66
2:D:348:HIS:NE2	2:D:638:ALA:HB3	2.11	0.65
1:G:198:GLU:OE2	1:G:200:SER:OG	2.14	0.65
2:D:580:ARG:NH2	2:D:583:ASP:OD2	2.30	0.65
2:D:527:ASP:OD2	6:D:801:HOH:O	2.15	0.65

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:580:ARG:NH1	6:H:805:HOH:O	2.30	0.64
2:B:475:LEU:HD13	2:D:471:ARG:HD3	1.78	0.64
1:G:87:VAL:HG21	1:G:291:ILE:HD11	1.79	0.64
2:B:475:LEU:HB3	2:B:477:PRO:HG3	1.79	0.64
2:F:330:MET:HB3	2:F:335:ARG:HH11	1.63	0.64
2:F:362:LEU:HD11	2:F:396:ILE:HD11	1.81	0.63
2:H:401:ARG:NH1	6:H:807:HOH:O	2.32	0.63
1:G:71:LYS:NZ	1:G:72:ARG:HG3	2.14	0.63
2:B:624:ARG:NH1	5:B:704:SO4:O1	2.31	0.63
1:G:141:ARG:NH1	3:G:301:GNP:O2G	2.31	0.63
1:C:165:GLU:OE2	6:C:401:HOH:O	2.16	0.62
2:D:377:THR:HB	2:D:380:THR:OG1	2.00	0.62
1:A:24:ASN:HB3	1:A:62:LEU:HD13	1.82	0.61
1:G:248:THR:OG1	1:G:249:LYS:HG3	2.02	0.60
2:H:560:VAL:HG13	2:H:606:ILE:HG21	1.83	0.60
1:A:47:LYS:NZ	1:A:230:GLU:OE2	2.33	0.60
2:D:397:LEU:HD21	2:D:601:ILE:HD12	1.83	0.60
2:F:332:SER:O	2:F:336:GLU:HB2	2.02	0.60
1:A:249:LYS:NZ	2:B:427:ASN:O	2.34	0.60
1:A:251:ASP:HB3	1:A:275:THR:O	2.02	0.59
1:E:206:LEU:HB2	1:E:239:LYS:HE3	1.85	0.59
2:D:560:VAL:HG13	2:D:606:ILE:HG21	1.83	0.59
2:D:574:SER:OG	2:D:575:MET:N	2.34	0.59
2:F:454:CYS:HB2	2:F:520:ASP:O	2.03	0.59
2:B:453:ALA:HB2	2:B:489:LEU:HD11	1.84	0.58
2:B:606:ILE:HD12	2:B:607:THR:N	2.18	0.58
2:F:450:LEU:HD11	2:F:490:PHE:HB2	1.84	0.58
2:H:496:LYS:HB2	2:H:501:ILE:HD11	1.85	0.58
2:F:496:LYS:HB2	2:F:501:ILE:HD11	1.86	0.58
1:C:23:ILE:HD12	1:C:23:ILE:H	1.68	0.58
1:C:120:LYS:HD3	1:C:282:PHE:HB2	1.85	0.58
2:H:597:VAL:HG12	2:H:635:LEU:HD13	1.87	0.57
1:G:83:LEU:HD11	1:G:295:LEU:HD13	1.86	0.57
2:H:454:CYS:HB2	2:H:520:ASP:O	2.05	0.57
2:H:466:ARG:HD3	2:H:470:ARG:NH1	2.19	0.57
1:E:32:LEU:HD11	1:E:56:VAL:HG11	1.87	0.56
2:F:491:GLU:HG2	2:F:493:GLY:H	1.70	0.56
2:D:466:ARG:HD3	2:D:470:ARG:CZ	2.36	0.56
2:D:352:LYS:HZ2	2:D:638:ALA:HB2	1.70	0.56
1:G:167:ASP:HB3	1:G:170:ILE:HD12	1.88	0.56
2:B:400:GLN:OE1	2:B:608:SER:O	2.24	0.56

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:560:VAL:HG13	2:B:606:ILE:HG21	1.88	0.56
1:C:145:PHE:CE1	1:C:161:GLY:HA3	2.41	0.56
1:G:251:ASP:HB3	1:G:275:THR:O	2.06	0.55
3:A:301:GNP:O4'	2:B:427:ASN:HB3	2.06	0.55
2:H:549:PHE:HB2	2:H:582:ILE:HD13	1.87	0.55
1:A:86:LEU:HB3	1:A:260:LEU:HD22	1.88	0.55
1:C:250:LEU:HA	1:C:254:ALA:HB3	1.89	0.55
2:F:450:LEU:HD12	2:F:488:GLN:O	2.07	0.55
1:E:195:HIS:CD2	1:E:197:GLN:HG2	2.41	0.55
1:A:250:LEU:HA	1:A:254:ALA:HB3	1.89	0.55
1:E:72:ARG:NH1	6:E:404:HOH:O	2.30	0.55
2:D:352:LYS:HD3	2:D:635:LEU:HD12	1.89	0.54
2:F:462:VAL:HG11	2:F:491:GLU:HG3	1.90	0.54
1:E:31:MET:SD	1:E:72:ARG:HD3	2.48	0.54
2:B:429:VAL:HG12	2:B:552:GLU:HG2	1.90	0.54
2:B:484:ARG:NE	2:B:485:THR:H	2.04	0.54
2:F:466:ARG:HD3	2:F:470:ARG:CZ	2.37	0.54
3:G:301:GNP:O4'	2:H:427:ASN:HB3	2.08	0.54
1:E:288:GLN:O	1:E:292:SER:OG	2.17	0.54
2:B:417:ARG:NH1	6:B:812:HOH:O	2.39	0.53
1:C:288:GLN:O	1:C:292:SER:OG	2.21	0.53
1:G:136:CYS:HB2	1:G:148:LEU:HD22	1.89	0.53
1:C:35:VAL:HG11	1:C:79:VAL:HG11	1.90	0.53
1:E:251:ASP:N	1:E:251:ASP:OD1	2.41	0.53
1:A:87:VAL:HG13	1:A:260:LEU:HD21	1.90	0.53
2:D:524:ARG:HH11	2:D:531:LEU:HB3	1.73	0.53
5:H:706:SO4:O1	6:H:801:HOH:O	2.15	0.53
1:E:62:LEU:HD21	1:E:71:LYS:HE3	1.91	0.53
1:G:51:GLN:O	1:G:55:ASN:ND2	2.41	0.53
2:H:621:CYS:HB2	6:H:817:HOH:O	2.09	0.52
1:C:250:LEU:HD12	1:C:273:ILE:HB	1.91	0.52
1:E:45:ASN:ND2	1:E:230:GLU:OE2	2.41	0.52
1:G:71:LYS:HZ2	1:G:72:ARG:HG3	1.73	0.52
1:G:123:TYR:CZ	1:G:127:ARG:HD2	2.45	0.52
1:A:198:GLU:HG2	1:A:201:LEU:HD12	1.91	0.52
2:H:380:THR:O	2:H:384:THR:OG1	2.23	0.52
2:D:560:VAL:HA	2:D:606:ILE:HD13	1.92	0.51
2:H:453:ALA:HB2	2:H:489:LEU:HD11	1.92	0.51
2:H:540:THR:HG21	2:H:575:MET:HG2	1.92	0.51
2:D:613:PHE:HB3	2:D:623:LEU:HD11	1.92	0.51
1:A:35:VAL:HG21	1:A:79:VAL:HG21	1.92	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:577:GLN:CD	2:B:577:GLN:H	2.12	0.51
1:E:248:THR:OG1	1:E:249:LYS:HG3	2.10	0.51
1:G:212:ILE:HG13	1:G:214:PRO:HD3	1.92	0.51
1:C:60:ILE:HG22	1:C:62:LEU:HB2	1.92	0.51
1:C:138:ASP:OD1	1:C:192:SER:HB3	2.11	0.51
2:B:348:HIS:NE2	2:B:638:ALA:HB3	2.26	0.51
1:G:249:LYS:NZ	2:H:427:ASN:O	2.41	0.51
1:E:197:GLN:OE1	1:E:232:GLN:NE2	2.44	0.51
2:H:540:THR:CG2	2:H:575:MET:HG2	2.41	0.51
2:F:456:THR:HG21	2:F:501:ILE:HD12	1.93	0.51
2:F:540:THR:HG21	2:F:575:MET:H	1.76	0.51
1:G:198:GLU:HG2	1:G:201:LEU:HG	1.92	0.51
2:D:352:LYS:HE3	2:D:595:ASP:O	2.11	0.50
1:E:122:ALA:HB2	1:E:188:ILE:HD12	1.93	0.50
1:E:138:ASP:OD1	1:E:192:SER:HB3	2.11	0.50
2:D:526:GLN:HB2	2:D:565:LYS:HB2	1.93	0.50
3:C:301:GNP:O4'	2:D:427:ASN:HB3	2.11	0.50
1:A:136:CYS:HB2	1:A:148:LEU:HD13	1.93	0.50
1:E:230:GLU:HB2	1:E:261:SER:HB3	1.93	0.50
2:F:577:GLN:O	2:F:578:THR:OG1	2.27	0.50
1:G:155:ALA:O	1:G:157:ILE:HG13	2.11	0.50
1:A:32:LEU:HD11	1:A:56:VAL:HG11	1.92	0.50
2:D:450:LEU:HD12	2:D:488:GLN:O	2.11	0.50
2:H:357:ASP:OD1	2:H:361:GLN:NE2	2.43	0.50
2:H:450:LEU:HD12	2:H:488:GLN:O	2.12	0.50
2:D:352:LYS:NZ	2:D:595:ASP:OD2	2.45	0.49
3:E:301:GNP:H5'1	6:E:406:HOH:O	2.12	0.49
2:H:398:GLN:O	2:H:398:GLN:HG2	2.13	0.49
2:B:526:GLN:HB2	2:B:565:LYS:HB2	1.94	0.49
1:G:112:SER:O	1:G:249:LYS:HE3	2.12	0.49
2:B:577:GLN:NE2	6:B:806:HOH:O	2.34	0.49
1:C:23:ILE:O	1:C:27:VAL:HG23	2.12	0.49
2:F:552:GLU:OE1	6:F:801:HOH:O	2.20	0.49
1:G:145:PHE:O	1:G:149:LYS:HB2	2.13	0.49
1:A:138:ASP:OD1	1:A:192:SER:HB3	2.13	0.49
2:B:577:GLN:HA	1:E:292:SER:HB3	1.93	0.49
1:E:87:VAL:HG21	1:E:287:THR:HG23	1.94	0.49
1:G:286:LYS:O	1:G:289:PRO:HD2	2.12	0.49
2:F:479:GLU:HG2	2:F:480:LYS:N	2.27	0.49
2:B:602:SER:O	2:B:606:ILE:HG13	2.12	0.49
2:H:352:LYS:HZ1	2:H:638:ALA:N	2.10	0.49

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:574:SER:OG	2:H:575:MET:N	2.44	0.49
1:A:87:VAL:HG21	1:A:287:THR:HG23	1.94	0.49
2:F:357:ASP:O	2:F:361:GLN:HG3	2.12	0.49
1:E:149:LYS:HG3	1:E:159:PHE:CE2	2.48	0.49
1:E:216:ASN:OD1	1:E:243:ALA:HB3	2.12	0.49
2:B:484:ARG:NE	2:B:485:THR:O	2.46	0.48
2:B:549:PHE:HB2	2:B:582:ILE:HD13	1.95	0.48
1:G:113:GLY:HA2	3:G:301:GNP:H5'2	1.95	0.48
2:B:338:MET:O	2:B:342:LEU:HG	2.12	0.48
1:C:97:THR:HB	1:C:100:LYS:HG2	1.95	0.48
2:F:362:LEU:HD12	2:F:362:LEU:HA	1.66	0.48
1:G:87:VAL:CG2	1:G:291:ILE:HD11	2.43	0.48
2:F:387:GLN:O	2:F:391:GLU:HG3	2.12	0.48
2:D:454:CYS:HB2	2:D:520:ASP:O	2.13	0.48
2:F:407:ARG:NH1	2:F:411:ASP:HB2	2.27	0.48
1:G:195:HIS:CD2	1:G:197:GLN:HG2	2.49	0.48
2:B:555:VAL:HG13	2:B:559:ALA:HB2	1.95	0.48
2:F:406:LEU:O	2:F:410:MET:HG3	2.13	0.48
1:G:46:ILE:HG21	2:H:351:ALA:HB2	1.96	0.48
1:A:196:LYS:HB3	1:A:232:GLN:OE1	2.14	0.48
2:B:474:ALA:HB3	2:D:475:LEU:HD23	1.96	0.48
1:A:32:LEU:HD12	1:A:32:LEU:HA	1.62	0.47
2:B:477:PRO:HD3	6:B:804:HOH:O	2.14	0.47
2:D:382:THR:O	2:D:386:LYS:HB2	2.14	0.47
1:G:204:GLU:OE1	6:G:401:HOH:O	2.20	0.47
1:A:131:LYS:HD3	1:A:184:PHE:HA	1.97	0.47
1:C:46:ILE:HG21	2:D:351:ALA:HB2	1.96	0.47
1:C:196:LYS:NZ	2:D:594:ASP:OD2	2.25	0.47
1:C:280:ASP:OD1	1:C:280:ASP:N	2.41	0.47
1:E:138:ASP:CG	1:E:192:SER:HB3	2.35	0.47
1:A:271:ILE:HG13	1:A:272:PHE:CD2	2.50	0.47
3:A:301:GNP:H8	3:A:301:GNP:H5'2	1.95	0.47
2:D:370:LEU:HD23	2:D:370:LEU:HA	1.67	0.47
1:E:288:GLN:HG3	1:E:289:PRO:HD3	1.96	0.47
1:C:167:ASP:HB3	1:C:170:ILE:HD12	1.95	0.47
1:G:138:ASP:HB3	1:G:144:ALA:HB1	1.96	0.47
2:F:468:HIS:O	2:F:472:LEU:HG	2.15	0.47
2:D:338:MET:HG2	2:D:342:LEU:HD22	1.96	0.47
2:F:567:ASN:OD1	2:F:581:LEU:HB3	2.15	0.47
1:G:194:ARG:NH1	1:G:201:LEU:O	2.48	0.47
1:C:60:ILE:HG22	1:C:62:LEU:H	1.78	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:450:LEU:HD23	2:F:509:ALA:HB2	1.97	0.47
2:H:352:LYS:NZ	2:H:634:ALA:O	2.41	0.47
2:D:378:PHE:O	2:D:381:VAL:HG23	2.14	0.46
2:D:517:VAL:O	2:D:518:LEU:HD23	2.14	0.46
2:B:466:ARG:HD3	2:B:470:ARG:CZ	2.45	0.46
1:E:221:MET:HG3	1:E:247:VAL:HG22	1.98	0.46
2:D:397:LEU:HD23	2:D:397:LEU:HA	1.76	0.46
2:H:338:MET:SD	2:H:367:ALA:HA	2.56	0.46
1:A:176:VAL:HG21	1:A:212:ILE:HB	1.97	0.46
2:B:400:GLN:HB3	2:B:401:ARG:H	1.52	0.46
1:C:196:LYS:HA	1:C:202:PHE:CE2	2.50	0.46
2:F:596:LYS:NZ	6:F:814:HOH:O	2.48	0.46
2:B:502:ALA:O	2:B:506:ILE:HG13	2.16	0.46
2:D:468:HIS:O	2:D:472:LEU:HG	2.16	0.46
1:E:131:LYS:HG2	1:E:184:PHE:CD1	2.51	0.46
1:E:134:LEU:HD23	1:E:188:ILE:HB	1.97	0.46
1:E:177:GLU:HG3	1:E:178:LYS:N	2.31	0.46
1:G:120:LYS:NZ	1:G:276:GLY:O	2.40	0.46
2:B:407:ARG:HE	1:C:203:GLU:HG3	1.80	0.46
1:E:132:THR:HG22	1:E:186:ILE:HB	1.97	0.46
1:E:197:GLN:HG3	2:F:591:ASP:O	2.16	0.46
2:F:595:ASP:O	2:F:597:VAL:N	2.48	0.46
1:C:251:ASP:N	1:C:251:ASP:OD1	2.49	0.45
1:A:47:LYS:HB3	1:A:47:LYS:HE3	1.76	0.45
1:A:234:LYS:HE2	1:A:238:ASP:OD2	2.17	0.45
2:F:454:CYS:SG	2:F:502:ALA:HB2	2.56	0.45
1:A:198:GLU:HG2	1:A:201:LEU:HG	1.99	0.45
1:A:198:GLU:HG2	1:A:201:LEU:CD1	2.46	0.45
2:B:407:ARG:CZ	1:C:203:GLU:HG3	2.46	0.45
2:D:370:LEU:CD1	2:D:385:VAL:HG12	2.46	0.45
2:F:451:ILE:O	2:F:489:LEU:HD12	2.16	0.45
1:C:123:TYR:CZ	1:C:127:ARG:HD2	2.52	0.45
1:C:149:LYS:HE3	1:C:159:PHE:CZ	2.52	0.45
2:D:480:LYS:HD2	2:D:481:HIS:CE1	2.51	0.45
2:B:597:VAL:CG1	2:B:631:VAL:HG13	2.47	0.45
1:E:120:LYS:HD3	1:E:282:PHE:HB2	1.99	0.45
1:A:196:LYS:HA	1:A:202:PHE:CE2	2.52	0.45
1:G:133:CYS:HB3	1:G:184:PHE:CE1	2.51	0.45
2:B:555:VAL:CG1	2:B:559:ALA:HB2	2.47	0.45
1:E:149:LYS:HG3	1:E:159:PHE:CZ	2.52	0.45
1:G:146:ASP:O	1:G:150:GLN:HG3	2.17	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:348:HIS:HE1	2:H:638:ALA:CB	2.26	0.44
2:D:377:THR:O	2:D:381:VAL:HG22	2.17	0.44
2:B:454:CYS:HB2	2:B:520:ASP:O	2.17	0.44
2:H:451:ILE:O	2:H:489:LEU:HD12	2.17	0.44
1:E:57:LYS:O	1:E:60:ILE:HG22	2.16	0.44
1:A:122:ALA:HB2	1:A:188:ILE:HD12	2.00	0.44
1:A:132:THR:HG22	1:A:186:ILE:HB	1.99	0.44
2:B:444:GLU:CG	2:D:619:THR:HB	2.47	0.44
2:F:421:VAL:HG22	2:F:546:LEU:HB3	2.00	0.44
2:H:468:HIS:O	2:H:472:LEU:HG	2.18	0.44
1:E:265:ALA:O	6:E:401:HOH:O	2.21	0.44
2:H:431:LYS:NZ	3:H:701:GNP:O3G	2.48	0.44
1:G:132:THR:HG22	1:G:186:ILE:HB	2.00	0.44
1:A:31:MET:SD	1:A:72:ARG:HA	2.58	0.43
2:B:426:VAL:HA	2:B:524:ARG:O	2.18	0.43
1:E:120:LYS:NZ	1:E:276:GLY:O	2.38	0.43
1:A:83:LEU:HD11	1:A:295:LEU:HD13	2.01	0.43
2:F:357:ASP:OD1	2:F:361:GLN:NE2	2.50	0.43
1:E:32:LEU:HD12	1:E:32:LEU:HA	1.71	0.43
1:E:86:LEU:HD23	1:E:86:LEU:HA	1.81	0.43
1:A:173:SER:O	1:A:177:GLU:HG2	2.18	0.43
1:A:259:ALA:HB1	1:A:270:ILE:HD11	1.99	0.43
1:C:28:LEU:O	1:C:31:MET:N	2.51	0.43
1:C:149:LYS:HE3	1:C:159:PHE:HZ	1.82	0.43
2:D:528:ASN:O	2:D:532:MET:HG2	2.19	0.43
2:F:476:HIS:HD2	2:F:481:HIS:CE1	2.37	0.43
1:G:71:LYS:HB3	1:G:71:LYS:HE3	1.76	0.43
2:F:463:GLU:OE2	2:F:494:TYR:OH	2.32	0.43
2:H:368:ASN:O	2:H:371:GLU:HG2	2.19	0.43
2:D:426:VAL:HG22	6:D:802:HOH:O	2.19	0.43
2:D:434:ASN:O	2:D:438:ILE:HG13	2.19	0.43
1:A:120:LYS:NZ	1:A:276:GLY:O	2.37	0.43
2:B:338:MET:HE3	2:B:342:LEU:HD11	2.01	0.43
2:B:606:ILE:HD12	2:B:607:THR:HG23	2.00	0.43
1:E:62:LEU:HD11	1:E:71:LYS:HE3	2.01	0.43
1:E:116:THR:HG22	1:E:120:LYS:HE3	2.01	0.43
1:G:280:ASP:OD1	1:G:280:ASP:N	2.47	0.43
2:H:362:LEU:HD12	2:H:362:LEU:HA	1.79	0.43
2:D:431:LYS:NZ	3:D:701:GNP:O2G	2.47	0.43
2:D:449:VAL:HA	2:D:516:VAL:O	2.18	0.43
2:H:577:GLN:HB2	6:H:806:HOH:O	2.19	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:149:LYS:HG3	1:C:159:PHE:CZ	2.53	0.43
2:D:525:MET:HB3	6:D:801:HOH:O	2.18	0.43
2:D:590:PHE:CZ	2:D:597:VAL:HG23	2.54	0.43
1:G:257:GLY:HA2	1:G:294:LEU:HD11	1.99	0.43
2:D:563:LEU:HD23	2:D:563:LEU:HA	1.90	0.42
2:B:380:THR:O	2:B:384:THR:OG1	2.25	0.42
1:G:61:ASP:OD2	1:G:62:LEU:N	2.52	0.42
1:G:141:ARG:HB3	1:G:144:ALA:HB2	2.01	0.42
1:G:32:LEU:HD12	1:G:32:LEU:HA	1.62	0.42
1:A:149:LYS:HG3	1:A:159:PHE:CE2	2.55	0.42
1:C:166:MET:HE2	1:C:166:MET:HB3	1.92	0.42
2:D:350:ILE:HG12	2:D:356:ALA:HA	2.01	0.42
2:F:415:ARG:NH2	6:F:808:HOH:O	2.36	0.42
1:G:286:LYS:HD3	1:G:286:LYS:HA	1.84	0.42
2:B:362:LEU:HD12	2:B:362:LEU:HA	1.70	0.42
6:E:430:HOH:O	2:F:525:MET:HE1	2.20	0.42
1:A:65:MET:HB2	1:A:71:LYS:NZ	2.35	0.42
1:C:134:LEU:HD12	1:C:152:ALA:HB2	2.01	0.42
1:A:39:LEU:HA	1:A:39:LEU:HD23	1.75	0.42
2:B:362:LEU:HD11	2:B:396:ILE:CD1	2.50	0.42
1:G:111:GLY:HA2	3:G:301:GNP:HNB3	1.84	0.42
2:H:330:MET:HA	2:H:332:SER:N	2.34	0.42
1:C:194:ARG:HD2	1:C:205:MET:SD	2.59	0.42
1:C:195:HIS:CD2	1:C:197:GLN:HG2	2.55	0.42
2:D:470:ARG:NH1	5:D:703:SO4:O3	2.53	0.42
2:D:567:ASN:OD1	2:D:581:LEU:HB3	2.20	0.42
1:E:145:PHE:CE1	1:E:161:GLY:HA3	2.55	0.42
1:A:230:GLU:HB2	1:A:261:SER:HB3	2.01	0.42
1:C:288:GLN:HB3	1:C:289:PRO:HD3	2.02	0.42
2:D:451:ILE:O	2:D:489:LEU:HD12	2.19	0.42
2:B:566:PHE:O	2:B:570:LEU:HG	2.20	0.41
2:D:577:GLN:O	2:D:578:THR:OG1	2.34	0.41
2:B:380:THR:O	2:B:384:THR:N	2.50	0.41
2:B:448:SER:O	2:B:515:ASP:HB2	2.20	0.41
2:D:406:LEU:O	2:D:410:MET:HG3	2.20	0.41
1:E:40:LEU:HD23	1:E:40:LEU:HA	1.91	0.41
1:G:232:GLN:O	1:G:236:PHE:HD1	2.03	0.41
2:H:528:ASN:OD1	2:H:530:PRO:HD2	2.20	0.41
2:H:612:VAL:HG12	2:H:613:PHE:CD2	2.55	0.41
1:C:28:LEU:HA	1:C:31:MET:HE2	2.01	0.41
1:C:80:PHE:HZ	1:C:288:GLN:HG2	1.85	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:397:LEU:O	2:F:399:PRO:HD3	2.20	0.41
2:B:476:HIS:N	2:B:477:PRO:HD3	2.35	0.41
1:C:133:CYS:HB3	1:C:184:PHE:CE1	2.56	0.41
1:E:40:LEU:HD21	1:E:46:ILE:HG13	2.03	0.41
1:A:69:LEU:HB2	2:H:503:MET:SD	2.61	0.41
2:B:606:ILE:HD12	2:B:607:THR:H	1.83	0.41
1:G:117:THR:HG21	1:G:246:ILE:HG21	2.02	0.41
2:H:456:THR:HG21	2:H:501:ILE:HD12	2.01	0.41
1:A:45:ASN:OD1	1:A:47:LYS:HB3	2.20	0.41
1:A:116:THR:HG22	1:A:120:LYS:HE3	2.03	0.41
2:D:403:VAL:N	6:D:814:HOH:O	2.52	0.41
2:F:397:LEU:HD23	2:F:397:LEU:HA	1.85	0.41
2:F:607:THR:HB	2:F:609:LYS:HG2	2.03	0.41
2:B:431:LYS:NZ	3:B:701:GNP:O2G	2.41	0.41
2:B:577:GLN:H	2:B:577:GLN:NE2	2.19	0.41
6:C:411:HOH:O	2:D:558:GLU:HB2	2.21	0.41
2:D:458:ARG:CZ	2:D:458:ARG:HB3	2.50	0.41
2:F:409:ILE:HG12	2:F:419:TYR:CD1	2.56	0.41
1:A:56:VAL:HG23	1:A:78:ALA:HB1	2.03	0.41
2:B:588:THR:OG1	2:B:589:LYS:HG3	2.20	0.41
2:D:371:GLU:HA	2:D:372:GLY:HA2	1.54	0.41
2:F:503:MET:HA	2:F:542:ASN:OD1	2.21	0.41
1:G:23:ILE:HG13	1:G:27:VAL:HG23	2.03	0.41
1:A:60:ILE:HD13	1:A:75:ILE:HG12	2.02	0.40
2:D:381:VAL:O	2:D:385:VAL:HG13	2.20	0.40
2:F:491:GLU:HG2	2:F:492:LYS:N	2.36	0.40
2:H:526:GLN:NE2	2:H:558:GLU:OE2	2.54	0.40
2:H:560:VAL:HA	2:H:606:ILE:HD13	2.03	0.40
2:B:406:LEU:O	2:B:410:MET:HG3	2.21	0.40
2:D:402:ARG:HH11	2:D:402:ARG:HB2	1.87	0.40
2:D:437:LYS:HG2	2:D:620:TYR:HA	2.03	0.40
2:H:471:ARG:HD2	2:H:620:TYR:HE2	1.85	0.40
2:H:567:ASN:OD1	2:H:581:LEU:HB3	2.22	0.40
1:C:234:LYS:HE2	1:C:238:ASP:OD2	2.21	0.40
2:F:362:LEU:HD13	2:F:605:TYR:HE1	1.87	0.40
1:G:114:LYS:H	3:G:301:GNP:PB	2.45	0.40
2:B:370:LEU:HD12	2:B:385:VAL:HG12	2.02	0.40
1:C:212:ILE:HG13	1:C:214:PRO:HD3	2.03	0.40
1:E:97:THR:HB	1:E:100:LYS:HE2	2.03	0.40
1:G:198:GLU:HG3	1:G:201:LEU:H	1.87	0.40
1:G:272:PHE:CD1	1:G:284:PRO:HA	2.57	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:511:ASN:HD22	2:H:512:GLN:NE2	2.20	0.40
2:H:597:VAL:CG1	2:H:635:LEU:HD13	2.50	0.40
1:A:124:TYR:O	1:A:128:LYS:HG2	2.22	0.40
2:D:352:LYS:HZ2	2:D:638:ALA:CB	2.35	0.40
2:D:431:LYS:H	3:D:701:GNP:PB	2.45	0.40
1:G:87:VAL:HG22	1:G:260:LEU:HD21	2.02	0.40
1:G:114:LYS:HE3	1:G:193:GLY:HA2	2.02	0.40
2:H:377:THR:OG1	2:H:380:THR:OG1	2.30	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	270/304 (89%)	267 (99%)	3 (1%)	0	100	100
1	C	264/304 (87%)	255 (97%)	8 (3%)	1 (0%)	34	57
1	E	264/304 (87%)	257 (97%)	7 (3%)	0	100	100
1	G	263/304 (86%)	258 (98%)	4 (2%)	1 (0%)	34	57
2	B	296/315 (94%)	284 (96%)	12 (4%)	0	100	100
2	D	301/315 (96%)	286 (95%)	15 (5%)	0	100	100
2	F	300/315 (95%)	289 (96%)	11 (4%)	0	100	100
2	H	294/315 (93%)	285 (97%)	9 (3%)	0	100	100
All	All	2252/2476 (91%)	2181 (97%)	69 (3%)	2 (0%)	51	75

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	252	GLY
1	G	252	GLY

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	229/253 (90%)	218 (95%)	11 (5%)	25	49
1	C	224/253 (88%)	209 (93%)	15 (7%)	16	33
1	E	224/253 (88%)	211 (94%)	13 (6%)	20	40
1	G	223/253 (88%)	215 (96%)	8 (4%)	35	61
2	B	247/259 (95%)	233 (94%)	14 (6%)	20	41
2	D	249/259 (96%)	230 (92%)	19 (8%)	13	26
2	F	249/259 (96%)	232 (93%)	17 (7%)	16	32
2	H	246/259 (95%)	235 (96%)	11 (4%)	27	52
All	All	1891/2048 (92%)	1783 (94%)	108 (6%)	20	41

All (108) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	24	ASN
1	A	32	LEU
1	A	61	ASP
1	A	65	MET
1	A	70	ASN
1	A	87	VAL
1	A	196	LYS
1	A	197	GLN
1	A	240	VAL
1	A	251	ASP
1	A	288	GLN
2	B	332	SER
2	B	352	LYS
2	B	362	LEU
2	B	444	GLU
2	B	449	VAL
2	B	456	THR
2	B	475	LEU
2	B	476	HIS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	B	484	ARG
2	B	487	VAL
2	B	491	GLU
2	B	577	GLN
2	B	578	THR
2	B	597	VAL
1	C	23	ILE
1	C	24	ASN
1	C	25	GLU
1	C	26	GLU
1	C	31	MET
1	C	32	LEU
1	C	41	GLU
1	C	62	LEU
1	C	76	GLN
1	C	87	VAL
1	C	197	GLN
1	C	199	ASP
1	C	240	VAL
1	C	251	ASP
1	C	293	LYS
2	D	330	MET
2	D	333	LEU
2	D	339	GLU
2	D	342	LEU
2	D	343	ASP
2	D	378	PHE
2	D	379	SER
2	D	381	VAL
2	D	395	GLN
2	D	405	MET
2	D	449	VAL
2	D	458	ARG
2	D	484	ARG
2	D	487	VAL
2	D	527	ASP
2	D	546	LEU
2	D	558	GLU
2	D	577	GLN
2	D	635	LEU
1	E	25	GLU
1	E	26	GLU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	E	41	GLU
1	E	62	LEU
1	E	74	MET
1	E	164	THR
1	E	192	SER
1	E	195	HIS
1	E	197	GLN
1	E	240	VAL
1	E	251	ASP
1	E	288	GLN
1	E	293	LYS
2	F	336	GLU
2	F	342	LEU
2	F	378	PHE
2	F	381	VAL
2	F	384	THR
2	F	386	LYS
2	F	387	GLN
2	F	400	GLN
2	F	484	ARG
2	F	487	VAL
2	F	491	GLU
2	F	511	ASN
2	F	575	MET
2	F	577	GLN
2	F	597	VAL
2	F	635	LEU
2	F	637	LYS
1	G	41	GLU
1	G	62	LEU
1	G	71	LYS
1	G	72	ARG
1	G	73	LYS
1	G	197	GLN
1	G	240	VAL
1	G	251	ASP
2	H	339	GLU
2	H	342	LEU
2	H	362	LEU
2	H	380	THR
2	H	383	SER
2	H	444	GLU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	H	471	ARG
2	H	484	ARG
2	H	487	VAL
2	H	543	THR
2	H	635	LEU

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	216	ASN
1	C	55	ASN
1	E	55	ASN
2	F	476	HIS
2	F	481	HIS
1	G	55	ASN
2	H	348	HIS
2	H	512	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 30 ligands modelled in this entry, 8 are monoatomic - leaving 22 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
5	SO4	B	705	-	4,4,4	0.16	0	6,6,6	0.15	0
3	GNP	E	301	4	29,34,34	1.58	6 (20%)	33,54,54	2.22	9 (27%)
5	SO4	H	706	-	4,4,4	0.13	0	6,6,6	0.31	0
3	GNP	C	301	4	29,34,34	1.55	7 (24%)	33,54,54	2.20	8 (24%)
3	GNP	G	301	4	29,34,34	1.57	6 (20%)	33,54,54	2.39	10 (30%)
5	SO4	G	303	-	4,4,4	0.22	0	6,6,6	0.61	0
5	SO4	H	703	-	4,4,4	0.17	0	6,6,6	0.33	0
5	SO4	F	705	-	4,4,4	0.17	0	6,6,6	0.38	0
5	SO4	B	703	-	4,4,4	0.15	0	6,6,6	0.25	0
5	SO4	F	703	-	4,4,4	0.18	0	6,6,6	0.41	0
3	GNP	B	701	4	29,34,34	1.52	7 (24%)	33,54,54	2.32	10 (30%)
3	GNP	H	701	4	29,34,34	1.41	5 (17%)	33,54,54	2.37	6 (18%)
3	GNP	F	701	4	29,34,34	1.44	7 (24%)	33,54,54	2.21	8 (24%)
5	SO4	H	705	-	4,4,4	0.15	0	6,6,6	0.07	0
3	GNP	A	301	4	29,34,34	1.60	8 (27%)	33,54,54	2.35	13 (39%)
3	GNP	D	701	4	29,34,34	1.45	6 (20%)	33,54,54	2.25	10 (30%)
5	SO4	D	703	-	4,4,4	0.15	0	6,6,6	0.36	0
5	SO4	H	704	-	4,4,4	0.16	0	6,6,6	0.05	0
5	SO4	C	303	-	4,4,4	0.11	0	6,6,6	0.12	0
5	SO4	B	704	-	4,4,4	0.13	0	6,6,6	0.20	0
5	SO4	H	707	-	4,4,4	0.14	0	6,6,6	0.40	0
5	SO4	F	704	-	4,4,4	0.16	0	6,6,6	0.15	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
3	GNP	D	701	4	-	3/14/38/38	0/3/3/3
3	GNP	B	701	4	-	3/14/38/38	0/3/3/3
3	GNP	C	301	4	-	4/14/38/38	0/3/3/3
3	GNP	H	701	4	-	2/14/38/38	0/3/3/3
3	GNP	G	301	4	-	8/14/38/38	0/3/3/3
3	GNP	F	701	4	-	8/14/38/38	0/3/3/3
3	GNP	E	301	4	-	4/14/38/38	0/3/3/3

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	GNP	A	301	4	-	4/14/38/38	0/3/3/3

All (52) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	301	GNP	PG-N3B	3.63	1.72	1.63
3	E	301	GNP	PG-N3B	3.62	1.72	1.63
3	C	301	GNP	PG-O1G	3.58	1.51	1.46
3	E	301	GNP	PB-O3A	3.49	1.63	1.59
3	G	301	GNP	C6-N1	3.38	1.38	1.33
3	A	301	GNP	PG-N3B	3.38	1.72	1.63
3	E	301	GNP	PB-O1B	3.31	1.51	1.46
3	C	301	GNP	C6-N1	3.28	1.38	1.33
3	B	701	GNP	PG-O1G	3.19	1.51	1.46
3	G	301	GNP	PB-O3A	3.11	1.63	1.59
3	C	301	GNP	PG-N3B	3.10	1.71	1.63
3	E	301	GNP	C6-N1	3.09	1.38	1.33
3	F	701	GNP	C6-N1	3.04	1.38	1.33
3	B	701	GNP	PB-O3A	3.01	1.62	1.59
3	B	701	GNP	C6-N1	3.00	1.38	1.33
3	H	701	GNP	C6-N1	2.99	1.38	1.33
3	B	701	GNP	PG-N3B	2.99	1.71	1.63
3	D	701	GNP	C6-N1	2.93	1.38	1.33
3	A	301	GNP	PG-O1G	2.92	1.50	1.46
3	A	301	GNP	C6-N1	2.91	1.38	1.33
3	F	701	GNP	PB-O2B	-2.89	1.49	1.56
3	D	701	GNP	PB-O3A	2.86	1.62	1.59
3	A	301	GNP	PA-O2A	-2.82	1.42	1.55
3	A	301	GNP	PB-O1B	2.76	1.50	1.46
3	H	701	GNP	PB-O2B	-2.71	1.49	1.56
3	F	701	GNP	PG-O1G	2.67	1.50	1.46
3	F	701	GNP	PB-O3A	2.65	1.62	1.59
3	D	701	GNP	PG-O1G	2.65	1.50	1.46
3	D	701	GNP	PB-O2B	-2.64	1.49	1.56
3	C	301	GNP	PB-O3A	2.62	1.62	1.59
3	H	701	GNP	PG-N3B	2.62	1.70	1.63
3	E	301	GNP	PG-O1G	2.60	1.50	1.46
3	F	701	GNP	PG-N3B	2.49	1.69	1.63
3	A	301	GNP	PB-O2B	-2.47	1.50	1.56
3	C	301	GNP	PB-O1B	2.44	1.50	1.46
3	D	701	GNP	PB-O1B	2.44	1.50	1.46
3	G	301	GNP	PB-O1B	2.41	1.50	1.46

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	701	GNP	PB-O2B	-2.38	1.50	1.56
3	H	701	GNP	PB-O3A	2.38	1.62	1.59
3	G	301	GNP	PB-O2B	-2.34	1.50	1.56
3	C	301	GNP	PB-O2B	-2.33	1.50	1.56
3	F	701	GNP	C5-C6	2.32	1.45	1.41
3	C	301	GNP	C5-C6	2.29	1.45	1.41
3	H	701	GNP	C5-C6	2.27	1.45	1.41
3	G	301	GNP	PG-O1G	2.23	1.49	1.46
3	A	301	GNP	PB-O3A	2.22	1.61	1.59
3	F	701	GNP	PB-O1B	2.20	1.49	1.46
3	D	701	GNP	C5-C6	2.19	1.45	1.41
3	B	701	GNP	PA-O2A	-2.19	1.45	1.55
3	E	301	GNP	PB-O2B	-2.16	1.50	1.56
3	A	301	GNP	PA-O5'	-2.13	1.50	1.59
3	B	701	GNP	C5-C6	2.13	1.45	1.41

All (74) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	G	301	GNP	C5-C6-N1	-8.44	111.89	123.43
3	E	301	GNP	C5-C6-N1	-8.42	111.91	123.43
3	C	301	GNP	C5-C6-N1	-8.36	111.99	123.43
3	F	701	GNP	C5-C6-N1	-8.27	112.12	123.43
3	A	301	GNP	C5-C6-N1	-8.23	112.18	123.43
3	B	701	GNP	C5-C6-N1	-8.17	112.26	123.43
3	D	701	GNP	C5-C6-N1	-8.17	112.26	123.43
3	H	701	GNP	C5-C6-N1	-8.07	112.40	123.43
3	E	301	GNP	C2-N1-C6	5.80	125.14	115.93
3	B	701	GNP	C2-N1-C6	5.77	125.10	115.93
3	D	701	GNP	C2-N1-C6	5.76	125.09	115.93
3	F	701	GNP	C2-N1-C6	5.71	125.00	115.93
3	A	301	GNP	C2-N1-C6	5.70	124.99	115.93
3	G	301	GNP	C2-N1-C6	5.58	124.80	115.93
3	C	301	GNP	C2-N1-C6	5.56	124.77	115.93
3	H	701	GNP	C2-N1-C6	5.49	124.65	115.93
3	H	701	GNP	O1G-PG-N3B	-5.45	103.75	111.77
3	G	301	GNP	PB-O3A-PA	-4.29	117.50	132.62
3	H	701	GNP	PB-O3A-PA	-4.16	117.97	132.62
3	G	301	GNP	O3G-PG-O1G	-3.08	105.72	113.45
3	B	701	GNP	O2G-PG-O1G	-3.07	105.73	113.45
3	B	701	GNP	O3A-PB-N3B	-3.07	98.08	106.59
3	B	701	GNP	PB-O3A-PA	-3.01	122.00	132.62

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	F	701	GNP	PB-O3A-PA	-2.99	122.07	132.62
3	G	301	GNP	O2A-PA-O5'	-2.97	93.96	107.75
3	A	301	GNP	C4-C5-C6	-2.93	118.00	120.80
3	E	301	GNP	O2G-PG-O1G	-2.92	106.11	113.45
3	A	301	GNP	N3-C2-N1	-2.92	123.33	127.22
3	F	701	GNP	C4-C5-C6	-2.92	118.01	120.80
3	H	701	GNP	N3-C2-N1	-2.91	123.34	127.22
3	C	301	GNP	C4-C5-C6	-2.91	118.02	120.80
3	F	701	GNP	N3-C2-N1	-2.90	123.35	127.22
3	D	701	GNP	N3-C2-N1	-2.89	123.37	127.22
3	G	301	GNP	N3-C2-N1	-2.87	123.39	127.22
3	B	701	GNP	C4-C5-C6	-2.85	118.08	120.80
3	A	301	GNP	PB-O3A-PA	-2.82	122.70	132.62
3	B	701	GNP	N3-C2-N1	-2.79	123.50	127.22
3	E	301	GNP	N3-C2-N1	-2.79	123.51	127.22
3	H	701	GNP	C4-C5-C6	-2.78	118.14	120.80
3	D	701	GNP	C4-C5-C6	-2.76	118.16	120.80
3	E	301	GNP	C4-C5-C6	-2.76	118.17	120.80
3	G	301	GNP	O2A-PA-O1A	2.76	125.86	112.24
3	C	301	GNP	O1G-PG-N3B	-2.75	107.73	111.77
3	C	301	GNP	N3-C2-N1	-2.68	123.64	127.22
3	D	701	GNP	O1G-PG-N3B	-2.67	107.84	111.77
3	C	301	GNP	O2G-PG-O1G	-2.67	106.75	113.45
3	A	301	GNP	O2A-PA-O5'	-2.59	95.69	107.75
3	B	701	GNP	O2B-PB-O1B	-2.53	104.61	109.92
3	C	301	GNP	C1'-N9-C4	-2.43	122.38	126.64
3	G	301	GNP	O5'-C5'-C4'	-2.38	100.81	108.99
3	G	301	GNP	C4-C5-C6	-2.35	118.55	120.80
3	D	701	GNP	O3A-PB-N3B	-2.33	100.13	106.59
3	A	301	GNP	C1'-N9-C4	-2.31	122.58	126.64
3	D	701	GNP	PB-O3A-PA	-2.30	124.52	132.62
3	F	701	GNP	O3G-PG-O1G	-2.29	107.69	113.45
3	D	701	GNP	O2B-PB-O1B	-2.29	105.13	109.92
3	A	301	GNP	O1G-PG-N3B	-2.26	108.45	111.77
3	A	301	GNP	O3G-PG-O1G	-2.24	107.81	113.45
3	A	301	GNP	O2A-PA-O1A	2.23	123.25	112.24
3	E	301	GNP	C2-N3-C4	-2.20	112.85	115.36
3	D	701	GNP	O2A-PA-O1A	2.18	123.01	112.24
3	E	301	GNP	PB-O3A-PA	-2.17	124.97	132.62
3	G	301	GNP	C2-N3-C4	-2.17	112.88	115.36
3	A	301	GNP	O1B-PB-N3B	2.16	114.95	111.77
3	E	301	GNP	O2A-PA-O1A	2.16	122.90	112.24

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	301	GNP	O2B-PB-O1B	-2.15	105.41	109.92
3	A	301	GNP	C2-N3-C4	-2.15	112.90	115.36
3	F	701	GNP	O2A-PA-O1A	2.08	122.53	112.24
3	E	301	GNP	O2B-PB-O1B	-2.08	105.56	109.92
3	B	701	GNP	O2B-PB-O3A	2.06	111.53	104.64
3	D	701	GNP	C2-N3-C4	-2.02	113.05	115.36
3	C	301	GNP	C2-N3-C4	-2.01	113.06	115.36
3	F	701	GNP	O1G-PG-N3B	-2.01	108.82	111.77
3	B	701	GNP	C2-N3-C4	-2.00	113.07	115.36

There are no chirality outliers.

All (36) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	301	GNP	PB-N3B-PG-O1G
3	A	301	GNP	PG-N3B-PB-O1B
3	A	301	GNP	PG-N3B-PB-O3A
3	B	701	GNP	PB-N3B-PG-O1G
3	B	701	GNP	PG-N3B-PB-O1B
3	B	701	GNP	PG-N3B-PB-O3A
3	C	301	GNP	PG-N3B-PB-O1B
3	C	301	GNP	PG-N3B-PB-O3A
3	C	301	GNP	PA-O3A-PB-O1B
3	D	701	GNP	PB-N3B-PG-O1G
3	D	701	GNP	PG-N3B-PB-O1B
3	D	701	GNP	PG-N3B-PB-O3A
3	E	301	GNP	PB-N3B-PG-O1G
3	E	301	GNP	PG-N3B-PB-O1B
3	E	301	GNP	PG-N3B-PB-O3A
3	F	701	GNP	PB-N3B-PG-O1G
3	F	701	GNP	PG-N3B-PB-O1B
3	F	701	GNP	PG-N3B-PB-O3A
3	F	701	GNP	C5'-O5'-PA-O3A
3	F	701	GNP	C5'-O5'-PA-O1A
3	F	701	GNP	C5'-O5'-PA-O2A
3	G	301	GNP	PB-N3B-PG-O1G
3	G	301	GNP	PG-N3B-PB-O1B
3	G	301	GNP	C5'-O5'-PA-O3A
3	H	701	GNP	PG-N3B-PB-O1B
3	H	701	GNP	PG-N3B-PB-O3A
3	F	701	GNP	C3'-C4'-C5'-O5'
3	G	301	GNP	O4'-C4'-C5'-O5'

Continued on next page...
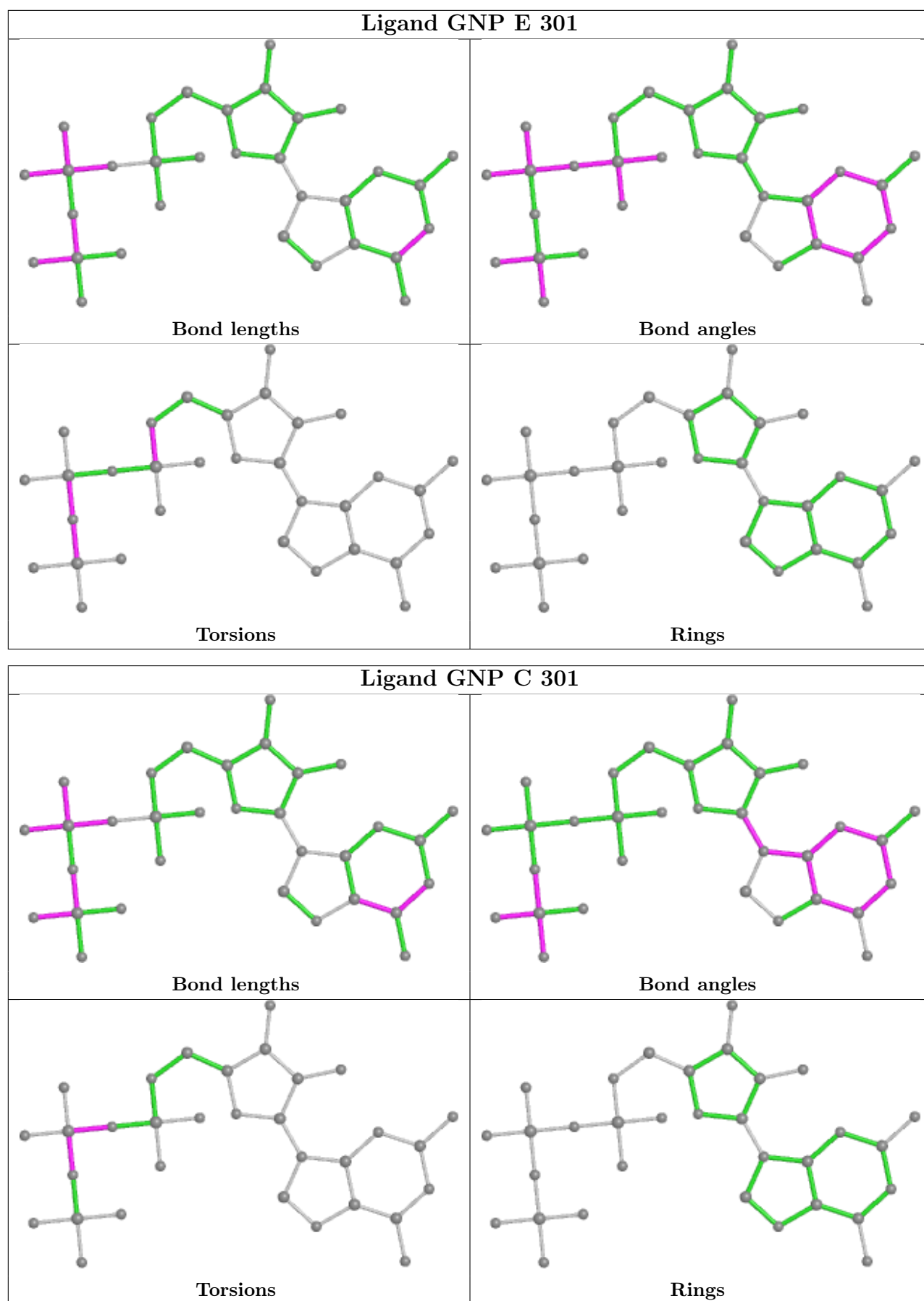
Continued from previous page...

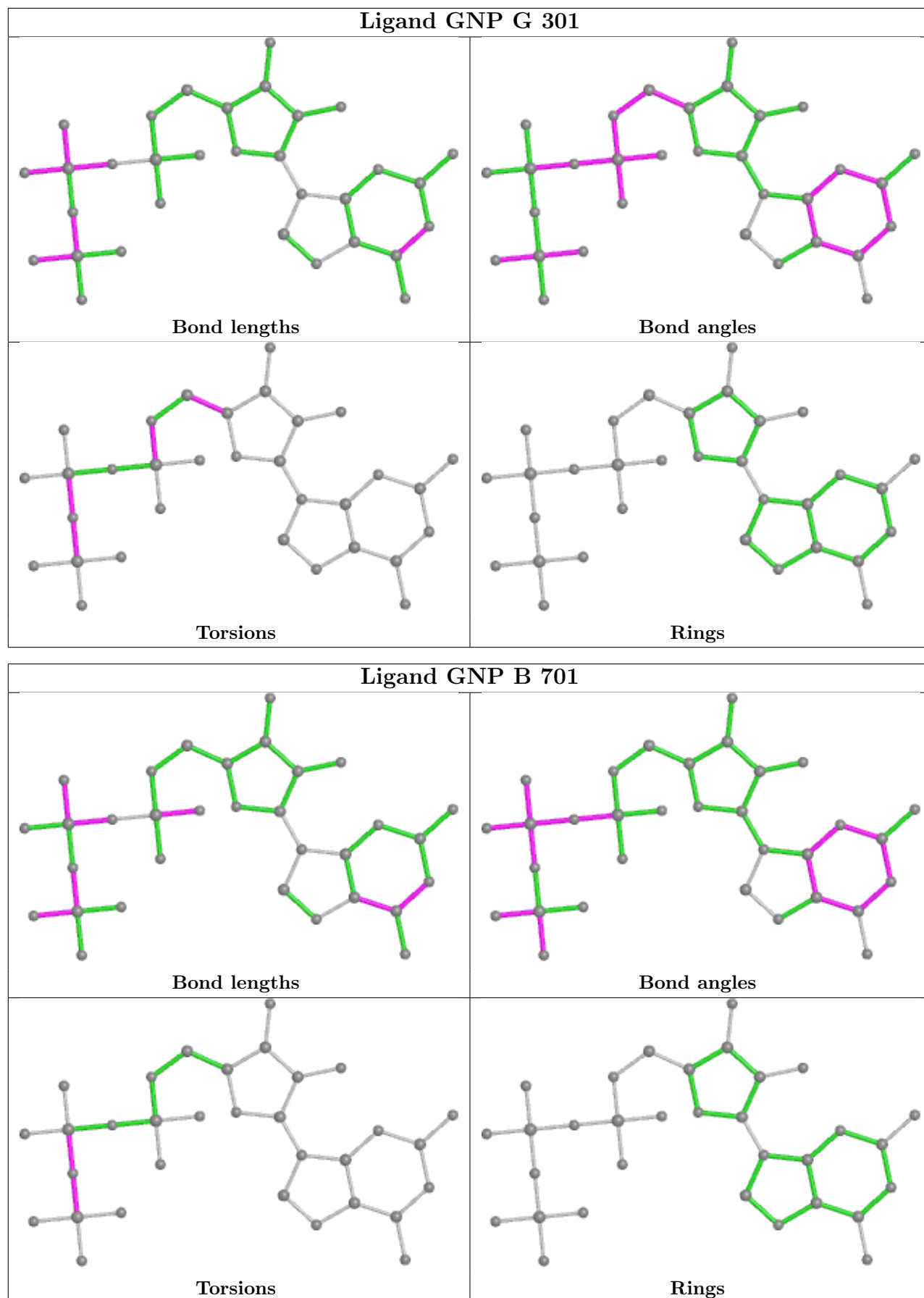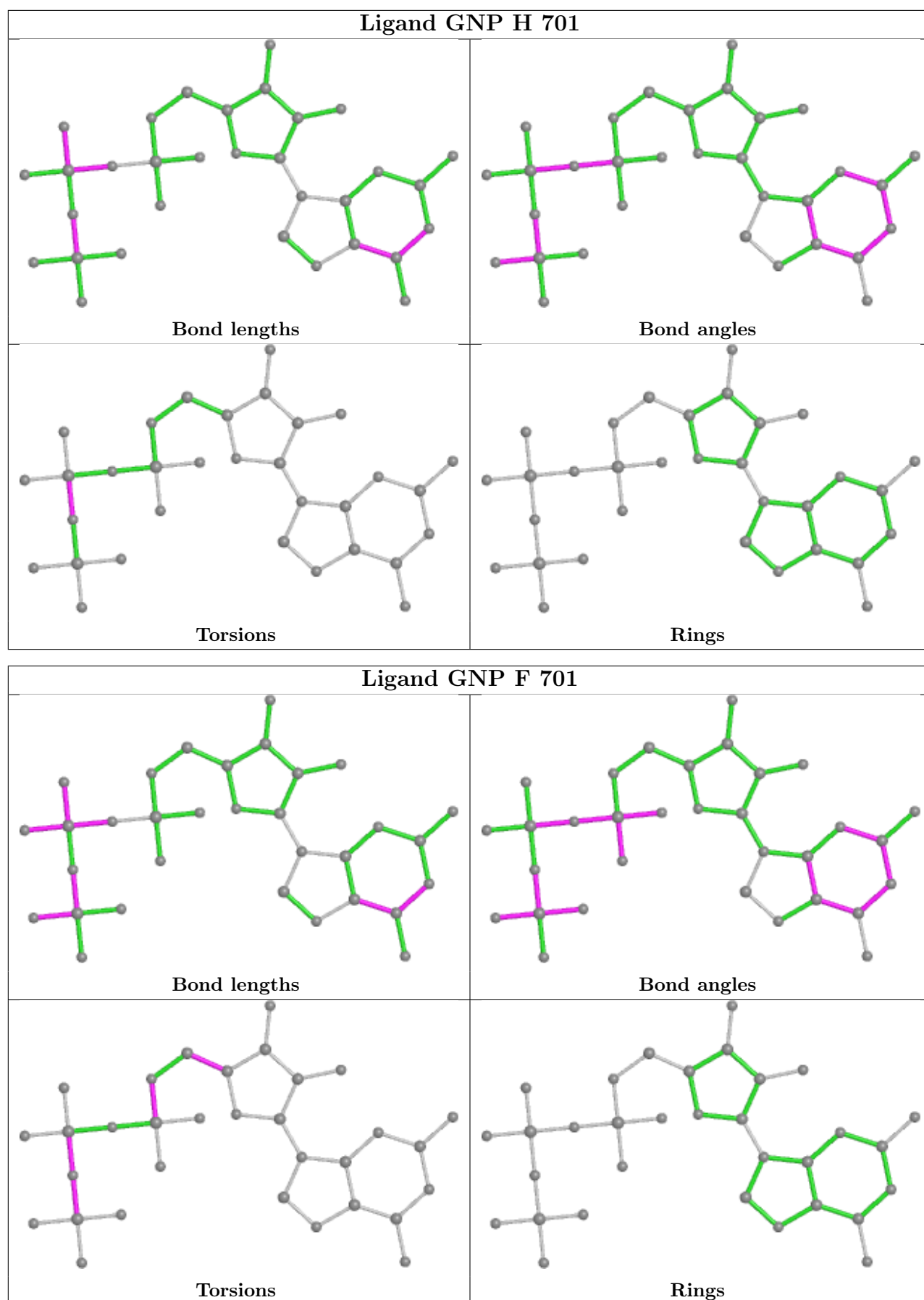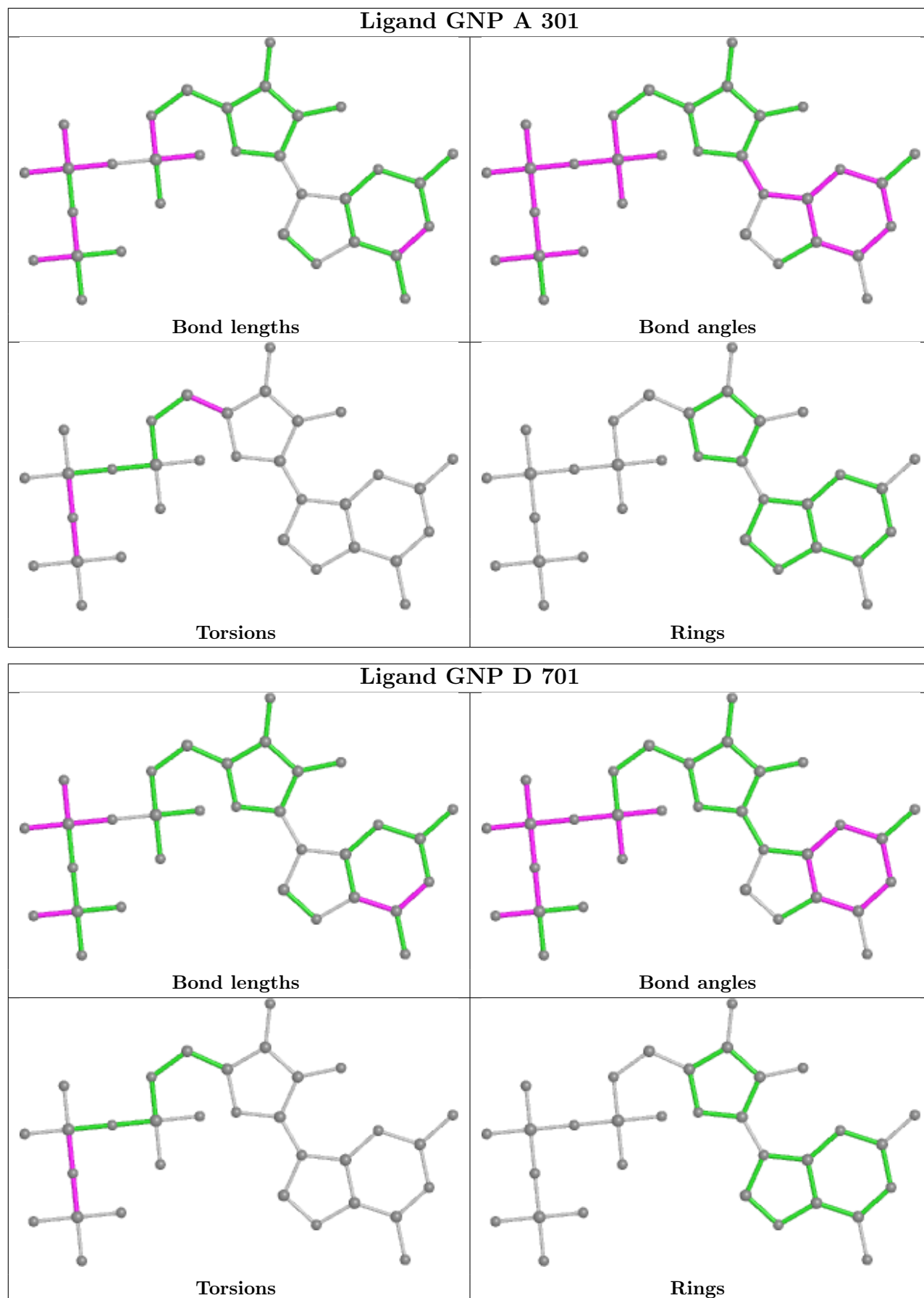| Mol	Chain	Res	Type	Atoms
3	F	701	GNP	O4'-C4'-C5'-O5'
3	G	301	GNP	C3'-C4'-C5'-O5'
3	G	301	GNP	C5'-O5'-PA-O1A
3	G	301	GNP	C5'-O5'-PA-O2A
3	A	301	GNP	O4'-C4'-C5'-O5'
3	C	301	GNP	PA-O3A-PB-O2B
3	E	301	GNP	C5'-O5'-PA-O3A
3	G	301	GNP	PG-N3B-PB-O3A

There are no ring outliers.

11 monomers are involved in 19 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	301	GNP	2	0
5	H	706	SO4	1	0
3	C	301	GNP	1	0
3	G	301	GNP	5	0
5	G	303	SO4	1	0
3	B	701	GNP	1	0
3	H	701	GNP	1	0
3	A	301	GNP	3	0
3	D	701	GNP	2	0
5	D	703	SO4	1	0
5	B	704	SO4	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand GNP E 301

Bond lengths

Bond angles

Torsions

Rings

Ligand GNP C 301

Bond lengths

Bond angles

Torsions

Rings

Ligand GNP G 301

Bond lengths

Bond angles

Torsions

Rings

Ligand GNP B 701

Bond lengths

Bond angles

Torsions

Rings

Ligand GNP H 701

Bond lengths

Bond angles

Torsions

Rings

Ligand GNP F 701

Bond lengths

Bond angles

Torsions

Rings

Ligand GNP A 301

Bond lengths

Bond angles

Torsions

Rings

Ligand GNP D 701

Bond lengths

Bond angles

Torsions

Rings

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	274/304 (90%)	-0.14	1 (0%)	92	91	38, 59, 95, 118	0
1	C	268/304 (88%)	-0.09	5 (1%)	66	62	37, 57, 98, 145	0
1	E	268/304 (88%)	-0.15	3 (1%)	80	78	32, 57, 97, 124	0
1	G	267/304 (87%)	-0.10	4 (1%)	73	70	35, 61, 99, 139	0
2	B	302/315 (95%)	-0.11	3 (0%)	82	80	34, 46, 91, 130	0
2	D	305/315 (96%)	-0.08	5 (1%)	72	68	31, 52, 98, 149	0
2	F	304/315 (96%)	-0.15	1 (0%)	94	93	29, 53, 98, 139	0
2	H	300/315 (95%)	-0.13	4 (1%)	77	73	34, 48, 92, 130	0
All	All	2288/2476 (92%)	-0.12	26 (1%)	80	78	29, 54, 97, 149	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	638	ALA	7.2
2	B	638	ALA	5.7
2	F	331	GLY	5.6
1	E	59	ALA	5.5
1	C	296	GLY	4.9
2	D	578	THR	4.1
2	H	330	MET	3.7
2	H	400	GLN	3.7
1	A	31	MET	3.4
1	C	60	ILE	3.0
2	B	331	GLY	2.8
1	C	23	ILE	2.8
2	H	378	PHE	2.8
2	H	638	ALA	2.7
2	D	401	ARG	2.7
1	E	253	HIS	2.7

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	G	253	HIS	2.7
2	B	477	PRO	2.5
1	G	31	MET	2.4
1	E	186	ILE	2.2
1	G	56	VAL	2.2
1	C	99	GLY	2.1
1	G	23	ILE	2.1
2	D	377	THR	2.1
2	D	402	ARG	2.0
1	C	25	GLU	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 monosaccharides 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.

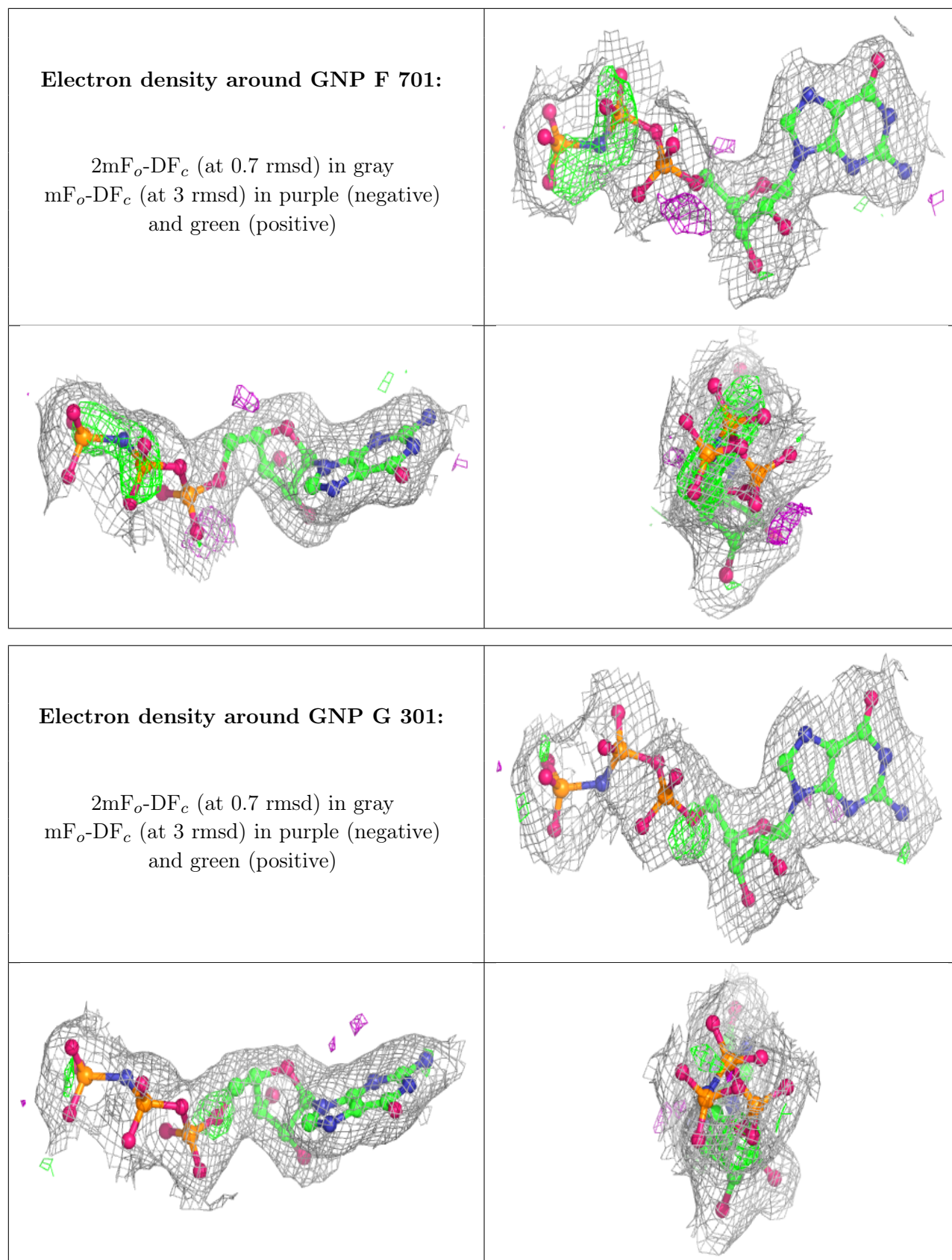| Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	SO4	G	303	5/5	0.79	0.28	122,124,126,131	0
5	SO4	D	703	5/5	0.85	0.30	119,121,123,125	0
5	SO4	H	707	5/5	0.86	0.14	113,114,115,117	0
5	SO4	H	705	5/5	0.88	0.14	122,125,126,126	0
5	SO4	F	705	5/5	0.89	0.18	140,142,143,144	0
5	SO4	H	704	5/5	0.89	0.33	176,176,177,178	0
5	SO4	H	706	5/5	0.90	0.17	122,125,126,129	0
5	SO4	F	703	5/5	0.91	0.14	83,84,87,87	0
5	SO4	B	704	5/5	0.93	0.18	111,111,112,112	0
5	SO4	H	703	5/5	0.93	0.17	90,91,92,93	0
5	SO4	C	303	5/5	0.94	0.10	126,127,127,127	0
4	MG	D	702	1/1	0.95	0.18	34,34,34,34	0
5	SO4	F	704	5/5	0.95	0.12	84,87,88,91	0

Continued on next page...

Continued from previous page...

| Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($Å^2$)	Q<0.9
5	SO4	B	705	5/5	0.95	0.20	105,108,108,113	0
5	SO4	B	703	5/5	0.96	0.16	74,77,78,78	0
4	MG	G	302	1/1	0.96	0.14	30,30,30,30	0
4	MG	E	302	1/1	0.97	0.10	38,38,38,38	0
4	MG	F	702	1/1	0.98	0.10	31,31,31,31	0
3	GNP	D	701	32/32	0.98	0.17	23,34,45,62	0
3	GNP	F	701	32/32	0.98	0.17	19,36,55,98	0
3	GNP	G	301	32/32	0.98	0.16	20,35,49,53	0
3	GNP	H	701	32/32	0.98	0.17	17,36,47,76	0
4	MG	A	302	1/1	0.98	0.12	35,35,35,35	0
3	GNP	A	301	32/32	0.98	0.15	13,36,44,50	0
3	GNP	C	301	32/32	0.98	0.16	27,39,51,52	0
4	MG	H	702	1/1	0.99	0.18	29,29,29,29	0
3	GNP	B	701	32/32	0.99	0.16	21,32,42,45	0
3	GNP	E	301	32/32	0.99	0.14	21,40,50,51	0
4	MG	B	702	1/1	0.99	0.13	30,30,30,30	0
4	MG	C	302	1/1	0.99	0.10	32,32,32,32	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.
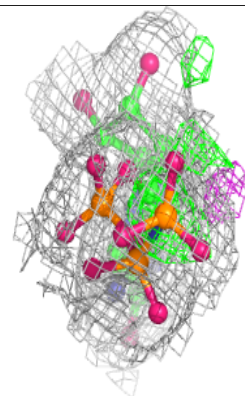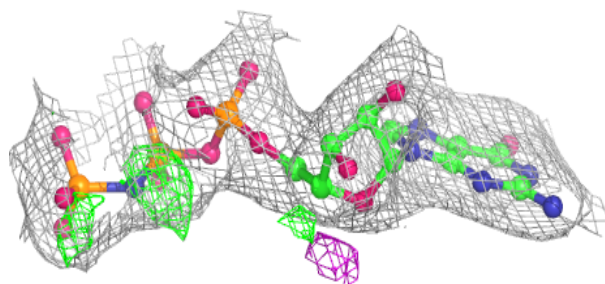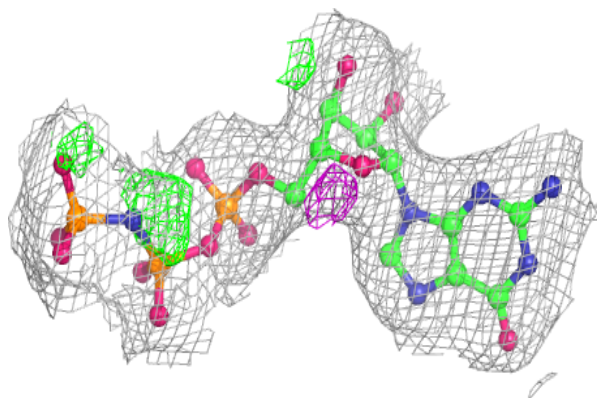

Electron density around GNP D 701:

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

Electron density around GNP F 701:

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

Electron density around GNP G 301:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
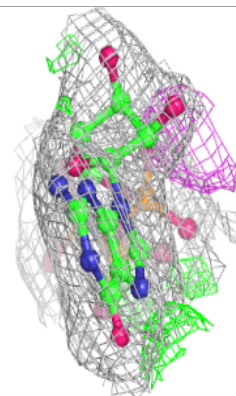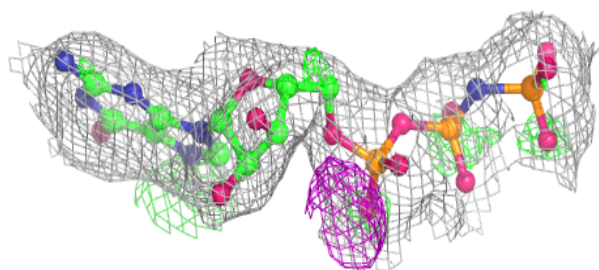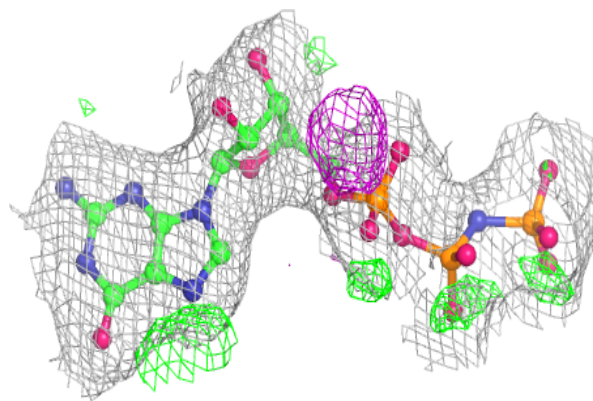$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
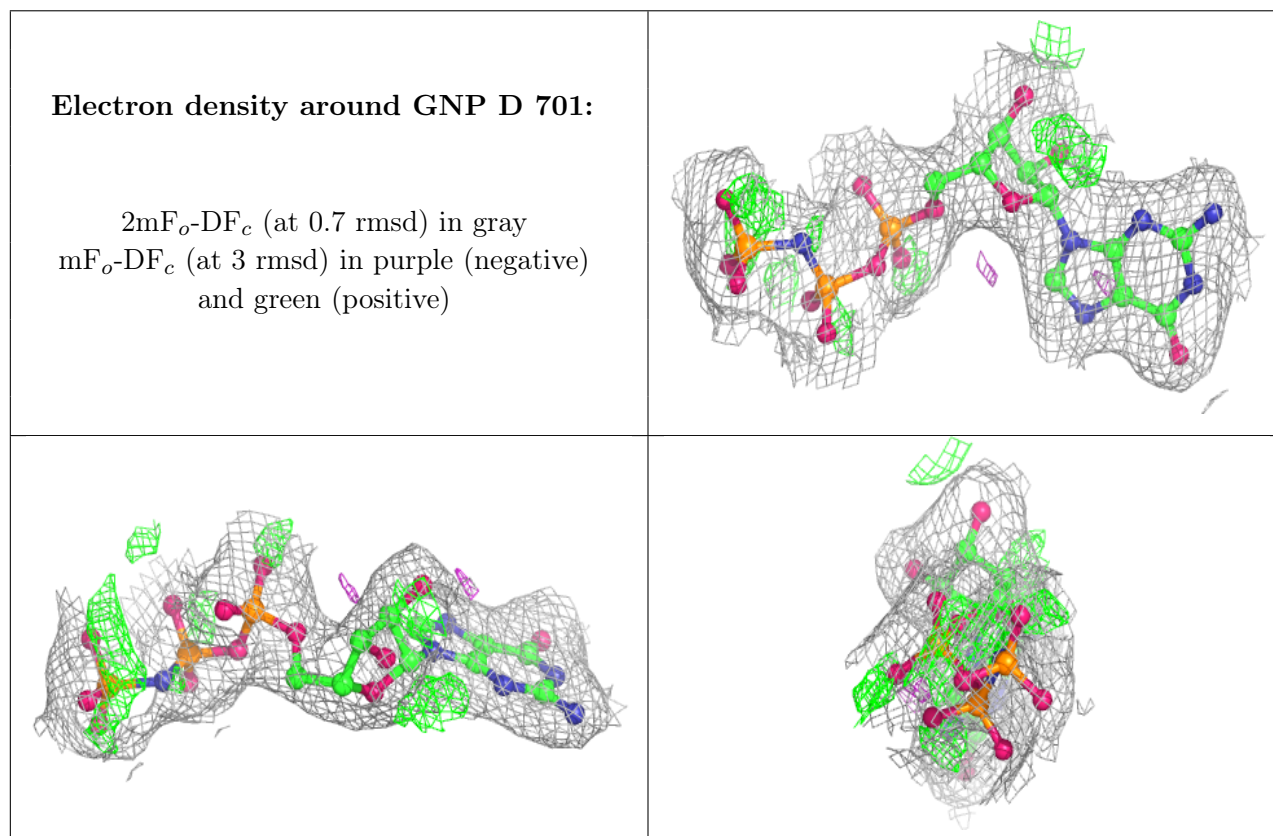
Electron density around GNP H 701:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
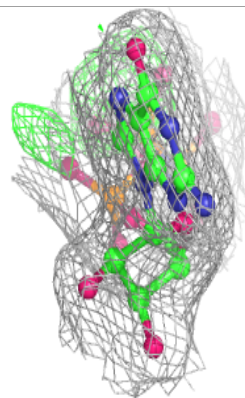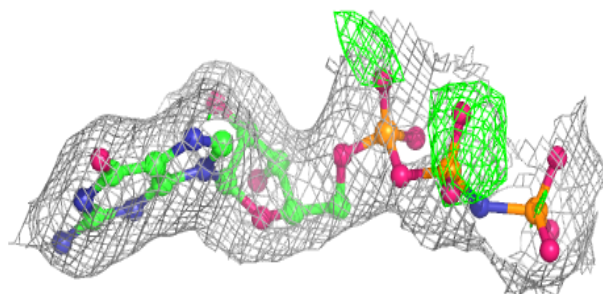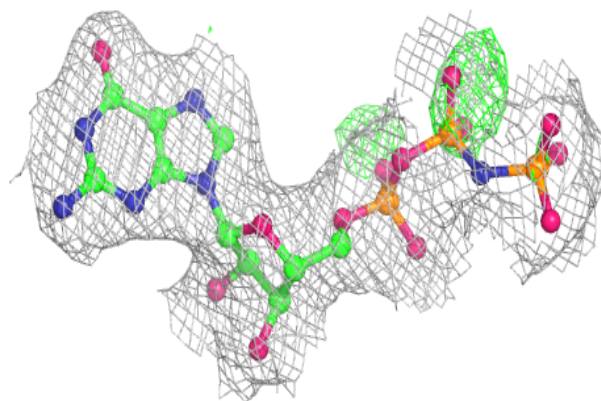
Electron density around GNP A 301:

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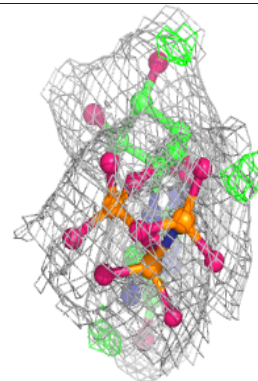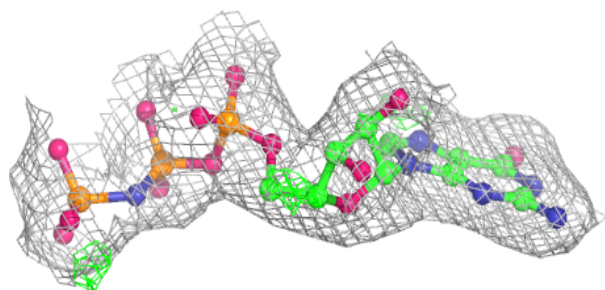mF_o-DF_c (at 3 rmsd) in purple (negative)
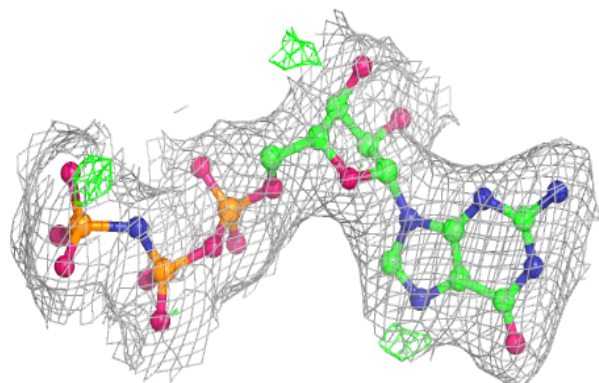and green (positive)

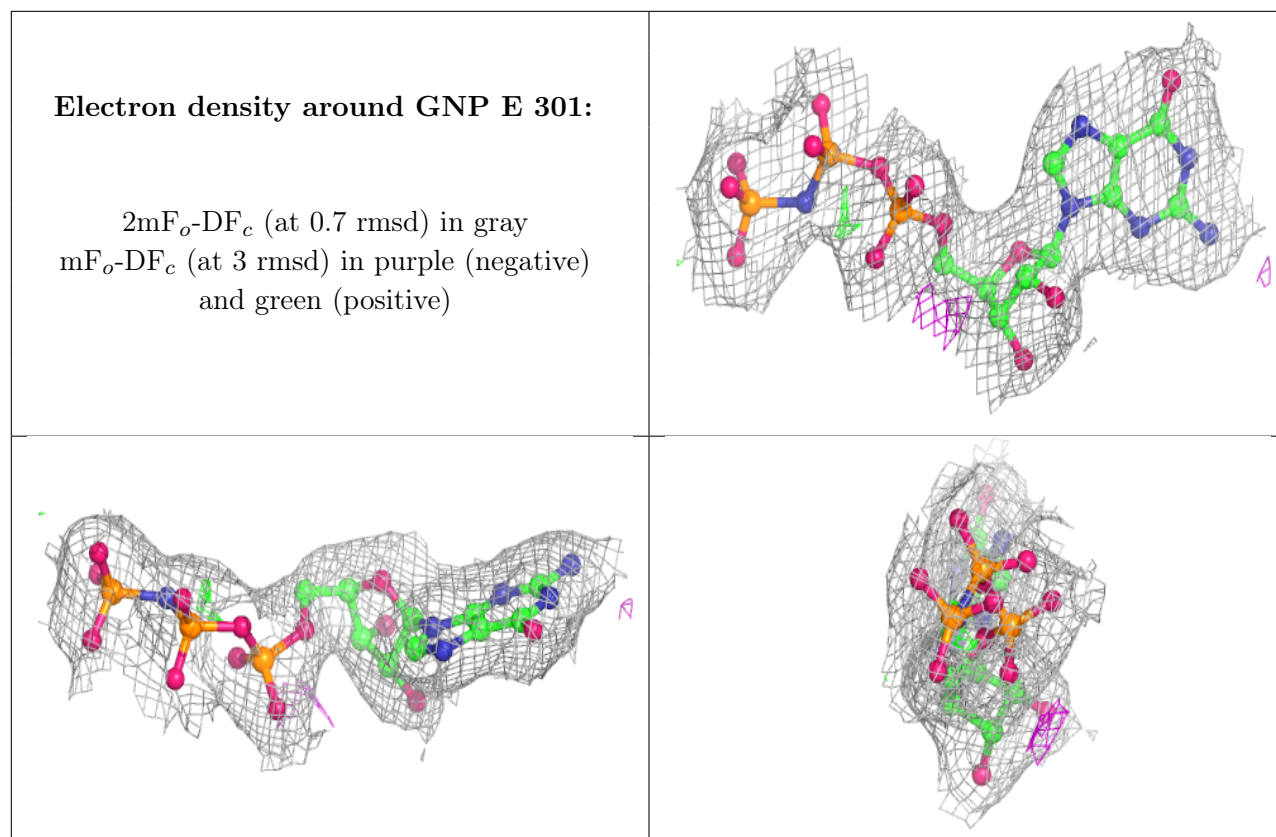**Electron density around GNP C 301:**

$2mF_o$-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 B 701:

$2mF_o$-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 E 301:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.