Full wwPDB X-ray Structure Validation Report ⓘ

Nov 16, 2023 – 05:24 AM JST

PDB ID	:	6KYH
Title	:	Crystal structure of Shank3 NTD-ANK A42K mutant in complex with HRas
Authors	:	Cai, Q.; Zhang, M.
Deposited on	:	2019-09-18
Resolution	:	3.30 Å(reported)

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

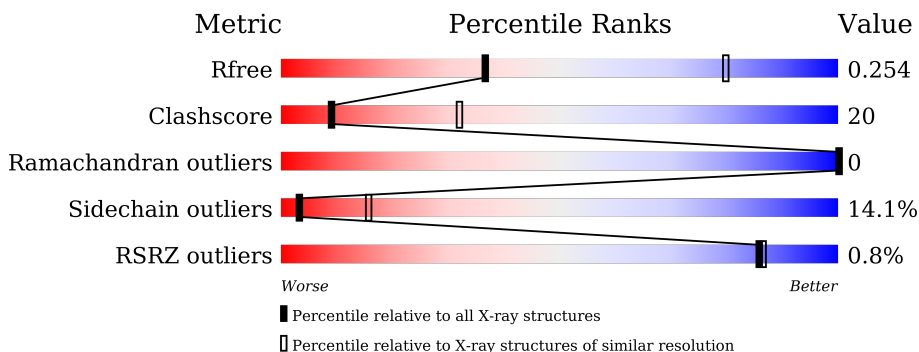|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1　Overall quality at a glance ⓘ

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

The reported resolution of this entry is 3.30 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	Percentile Ranks	Value
Rfree		0.254
Clashscore		20
Ramachandran outliers		0
Sidechain outliers		14.1%
RSRZ outliers		0.8%

■ 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	1149 (3.34-3.26)
Clashscore	141614	1205 (3.34-3.26)
Ramachandran outliers	138981	1183 (3.34-3.26)
Sidechain outliers	138945	1182 (3.34-3.26)
RSRZ outliers	127900	1115 (3.34-3.26)

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	361	66% 25% 6%
1	B	361	69% 23% 5%
1	C	361	71% 21% 5%
1	D	361	72% 23%
2	E	171	47% 42% 8%
2	F	171	49% 42% 7%

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Mol	Chain	Length	Quality of chain
2	G	171	49% 40% 8%
2	H	171	2% 44% 44% 9%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	GNP	G	201	-	-	X	-
3	GNP	H	201	-	-	X	-
4	MG	E	202	-	-	X	-
4	MG	F	202	-	-	X	-

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 16429 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 SH3 and multiple ankyrin repeat domains protein 3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	349	Total 2750	C 1726	N 505	O 508	S 11	0	0	0
1	B	349	Total 2750	C 1726	N 505	O 508	S 11	0	0	0
1	C	349	Total 2750	C 1726	N 505	O 508	S 11	0	0	0
1	D	349	Total 2750	C 1726	N 505	O 508	S 11	0	0	0

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	2	GLY	-	expression tag	UNP Q4ACU6
A	3	PRO	-	expression tag	UNP Q4ACU6
A	4	GLY	-	expression tag	UNP Q4ACU6
A	5	SER	-	expression tag	UNP Q4ACU6
A	6	GLU	-	expression tag	UNP Q4ACU6
A	7	PHE	-	expression tag	UNP Q4ACU6
A	42	LYS	ALA	engineered mutation	UNP Q4ACU6
A	231	ARG	LEU	engineered mutation	UNP Q4ACU6
A	304	TYR	PHE	engineered mutation	UNP Q4ACU6
B	2	GLY	-	expression tag	UNP Q4ACU6
B	3	PRO	-	expression tag	UNP Q4ACU6
B	4	GLY	-	expression tag	UNP Q4ACU6
B	5	SER	-	expression tag	UNP Q4ACU6
B	6	GLU	-	expression tag	UNP Q4ACU6
B	7	PHE	-	expression tag	UNP Q4ACU6
B	42	LYS	ALA	engineered mutation	UNP Q4ACU6
B	231	ARG	LEU	engineered mutation	UNP Q4ACU6
B	304	TYR	PHE	engineered mutation	UNP Q4ACU6
C	2	GLY	-	expression tag	UNP Q4ACU6
C	3	PRO	-	expression tag	UNP Q4ACU6
C	4	GLY	-	expression tag	UNP Q4ACU6

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Chain	Residue	Modelled	Actual	Comment	Reference
C	5	SER	-	expression tag	UNP Q4ACU6
C	6	GLU	-	expression tag	UNP Q4ACU6
C	7	PHE	-	expression tag	UNP Q4ACU6
C	42	LYS	ALA	engineered mutation	UNP Q4ACU6
C	231	ARG	LEU	engineered mutation	UNP Q4ACU6
C	304	TYR	PHE	engineered mutation	UNP Q4ACU6
D	2	GLY	-	expression tag	UNP Q4ACU6
D	3	PRO	-	expression tag	UNP Q4ACU6
D	4	GLY	-	expression tag	UNP Q4ACU6
D	5	SER	-	expression tag	UNP Q4ACU6
D	6	GLU	-	expression tag	UNP Q4ACU6
D	7	PHE	-	expression tag	UNP Q4ACU6
D	42	LYS	ALA	engineered mutation	UNP Q4ACU6
D	231	ARG	LEU	engineered mutation	UNP Q4ACU6
D	304	TYR	PHE	engineered mutation	UNP Q4ACU6

- Molecule 2 is a protein called GTPase HRas.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	F	167	Total 1331	C 830	N 230	O 264	S 7	0	0	0
2	G	166	Total 1322	C 824	N 228	O 263	S 7	0	0	0
2	H	166	Total 1322	C 824	N 228	O 263	S 7	0	0	0
2	E	166	Total 1322	C 824	N 228	O 263	S 7	0	0	0

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	-3	GLY	-	expression tag	UNP Q61411
F	-2	PRO	-	expression tag	UNP Q61411
F	-1	GLY	-	expression tag	UNP Q61411
F	0	SER	-	expression tag	UNP Q61411
G	-3	GLY	-	expression tag	UNP Q61411
G	-2	PRO	-	expression tag	UNP Q61411
G	-1	GLY	-	expression tag	UNP Q61411
G	0	SER	-	expression tag	UNP Q61411
H	-3	GLY	-	expression tag	UNP Q61411
H	-2	PRO	-	expression tag	UNP Q61411
H	-1	GLY	-	expression tag	UNP Q61411

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Chain	Residue	Modelled	Actual	Comment	Reference
H	0	SER	-	expression tag	UNP Q61411
E	-3	GLY	-	expression tag	UNP Q61411
E	-2	PRO	-	expression tag	UNP Q61411
E	-1	GLY	-	expression tag	UNP Q61411
E	0	SER	-	expression tag	UNP Q61411

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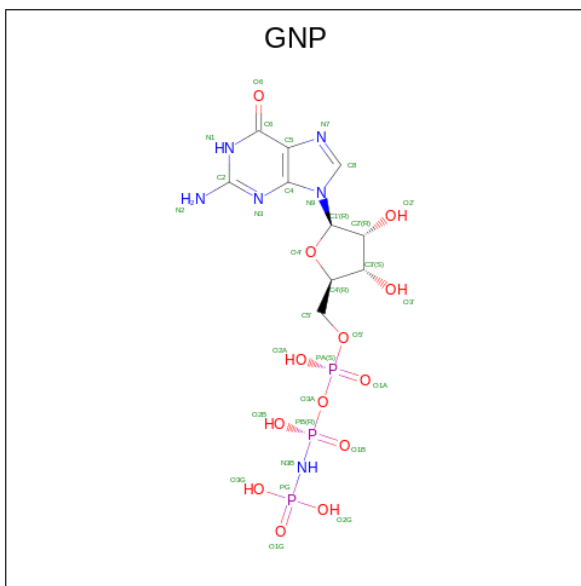
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	F	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	G	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	H	1	Total	C	N	O	P	0	0
			32	10	6	13	3		
3	E	1	Total	C	N	O	P	0	0
			32	10	6	13	3		

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	F	1	Total	Mg	0	0
			1	1		
4	G	1	Total	Mg	0	0
			1	1		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	H	1	Total 1	Mg 1	0	0
4	E	1	Total 1	Mg 1	0	0

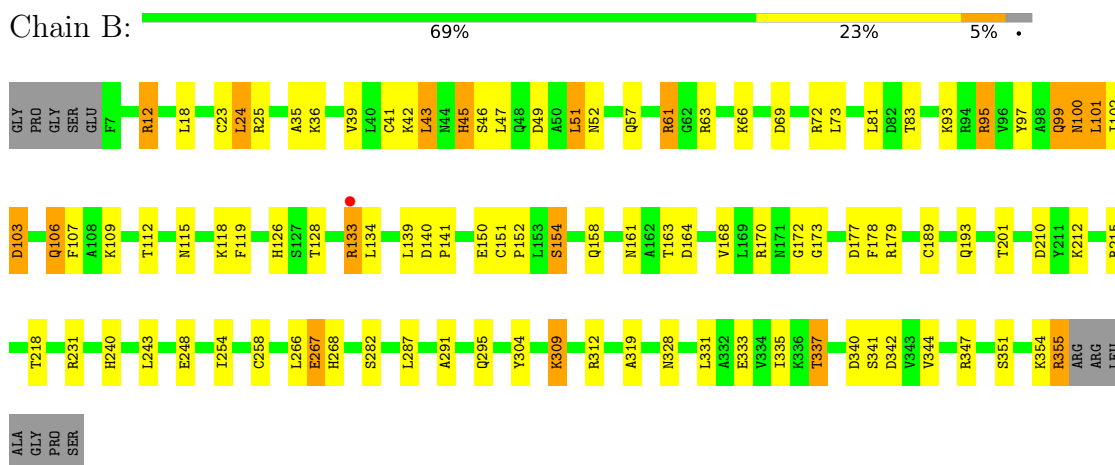# 3 Residue-property plots (i)

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.

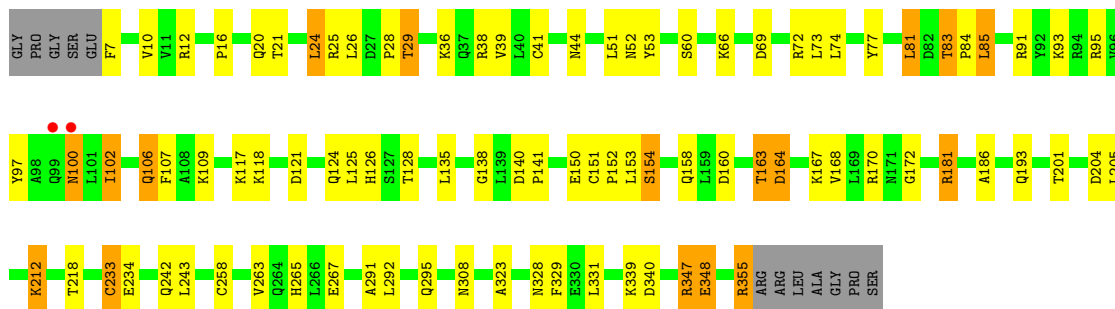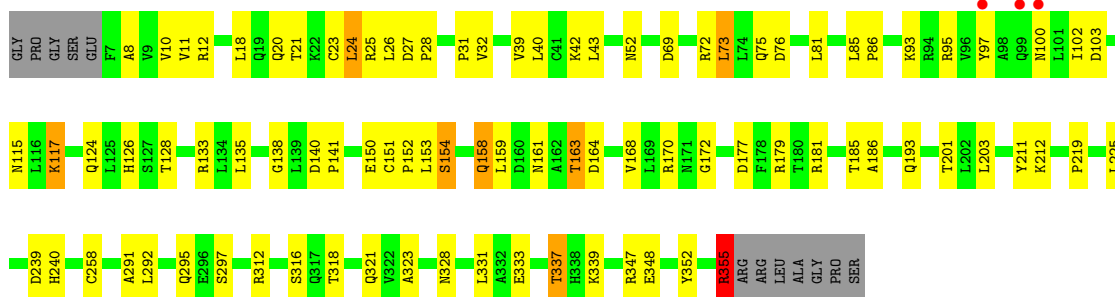• Molecule 1: SH3 and multiple ankyrin repeat domains protein 3
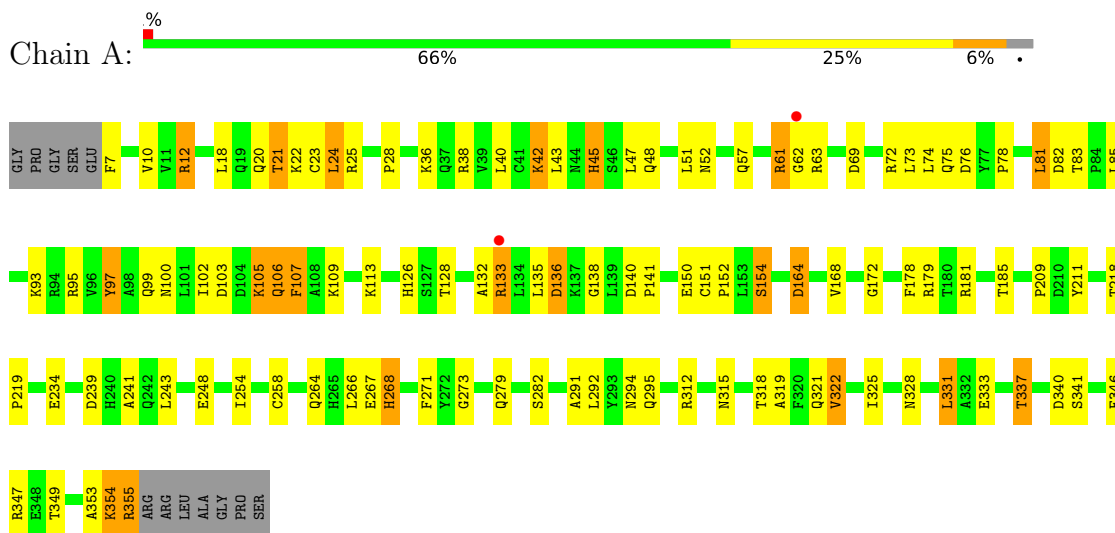
Chain A:

• Molecule 1: SH3 and multiple ankyrin repeat domains protein 3

Chain B:

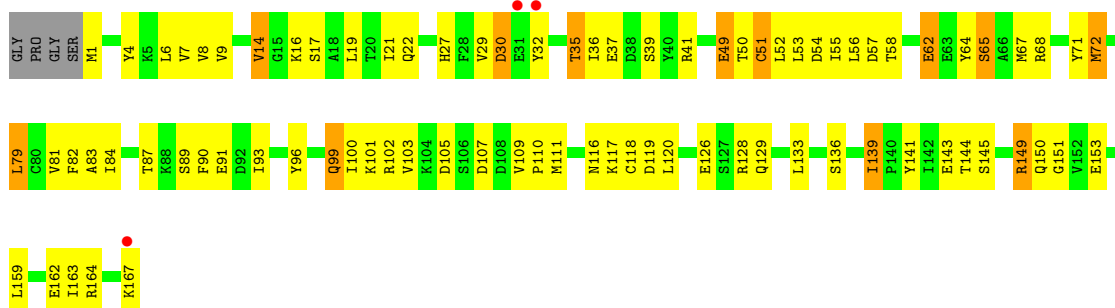• Molecule 1: SH3 and multiple ankyrin repeat domains protein 3

Chain C:

• Molecule 1: SH3 and multiple ankyrin repeat domains protein 3

Chain D:
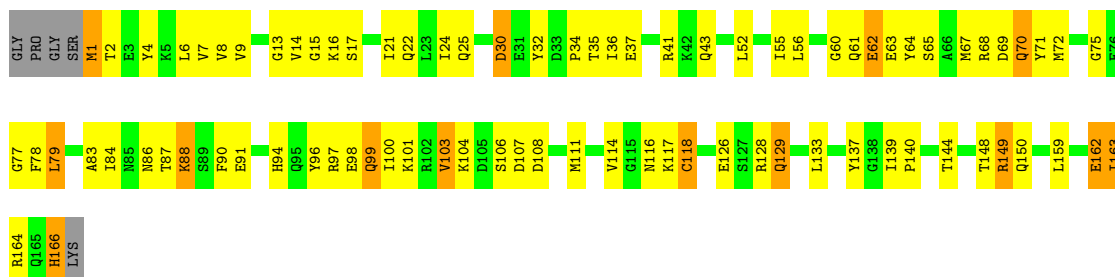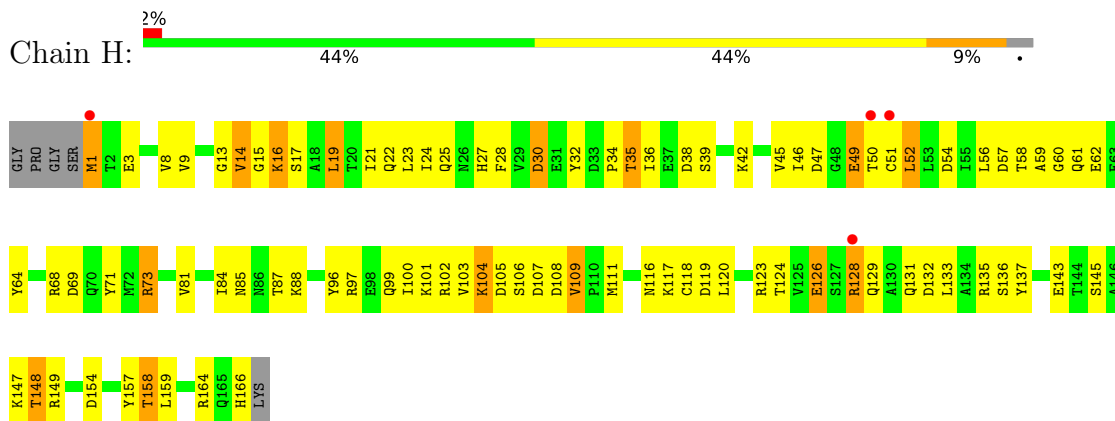

• Molecule 2: GTPase HRas

Chain F:

• Molecule 2: GTPase HRas

Chain G:

• Molecule 2: GTPase HRas

Chain H:

• Molecule 2: GTPase HRas

Chain E:
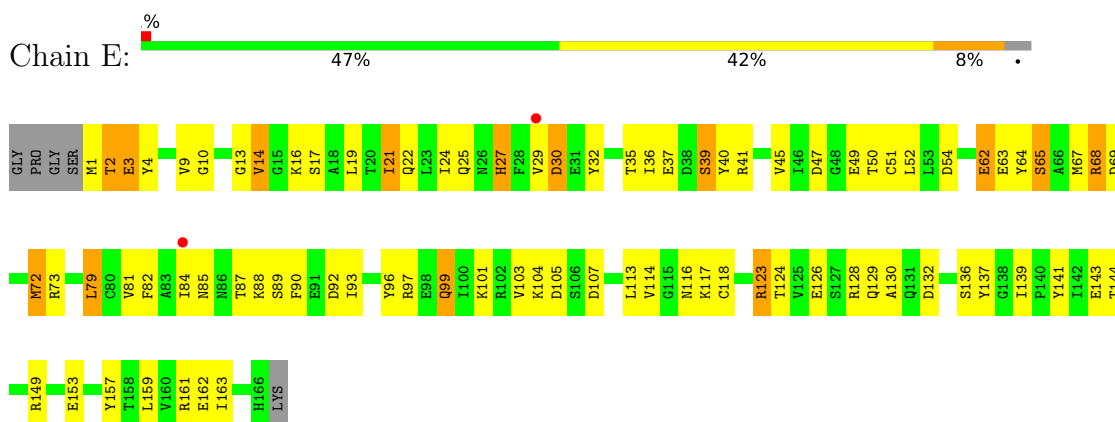
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	80.57Å 154.46Å 116.95Å 90.00° 108.35° 90.00°	Depositor
Resolution (Å)	46.75 – 3.30 46.71 – 3.30	Depositor EDS
% Data completeness (in resolution range)	98.6 (46.75-3.30) 98.7 (46.71-3.30)	Depositor EDS
R_{merge}	0.23	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.46 (at 3.32Å)	Xtriage
Refinement program	REFMAC 5.8.0238	Depositor
R, R_{free}	0.227 , 0.257 0.227 , 0.254	Depositor DCC
R_{free} test set	1980 reflections (4.89%)	wwPDB-VP
Wilson B-factor (Å^2)	50.8	Xtriage
Anisotropy	0.277	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 3.1	EDS
L-test for twinning[2]	$< |L| > = 0.44, < L^2 > = 0.27$	Xtriage
Estimated twinning fraction	0.077 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.88	EDS
Total number of atoms	16429	wwPDB-VP
Average B, all atoms (Å^2)	58.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.34% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.62	0/2810	0.73	0/3810
1	B	0.64	0/2810	0.72	0/3810
1	C	0.64	0/2810	0.72	0/3810
1	D	0.65	0/2810	0.77	4/3810 (0.1%)
2	E	0.63	0/1341	0.78	0/1810
2	F	0.63	0/1350	0.80	0/1821
2	G	0.64	0/1341	0.79	0/1810
2	H	0.62	0/1341	0.77	0/1810
All	All	0.63	0/16613	0.75	4/22491 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	C	0	1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	355	ARG	NE-CZ-NH1	11.23	125.91	120.30
1	D	355	ARG	NE-CZ-NH2	-10.58	115.01	120.30
1	D	355	ARG	CD-NE-CZ	6.85	133.20	123.60
1	D	355	ARG	CG-CD-NE	6.43	125.29	111.80

There are no chirality outliers.

All (1) planarity outliers are listed below:

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Mol	Chain	Res	Type	Group
1	C	233	CYS	Mainchain

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	2750	0	2708	89	0
1	B	2750	0	2708	79	0
1	C	2750	0	2706	60	1
1	D	2750	0	2707	75	0
2	E	1322	0	1295	89	0
2	F	1331	0	1307	79	0
2	G	1322	0	1294	88	0
2	H	1322	0	1294	104	1
3	E	32	0	13	6	0
3	F	32	0	13	4	0
3	G	32	0	13	12	0
3	H	32	0	13	13	0
4	E	1	0	0	2	0
4	F	1	0	0	2	0
4	G	1	0	0	0	0
4	H	1	0	0	0	0
All	All	16429	0	16071	653	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 20.

All (653) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:95:ARG:CB	1:A:140:ASP:OD1	1.69	1.39
2:F:118:CYS:SG	2:F:145:SER:HB2	1.66	1.35
1:D:12:ARG:NH1	1:D:23:CYS:SG	2.03	1.30
2:H:97:ARG:HD3	2:H:137:TYR:CE1	1.68	1.28
1:B:333:GLU:O	1:B:337:THR:HG23	1.27	1.28
2:H:108:ASP:OD1	2:H:166:HIS:NE2	1.67	1.27
1:A:321:GLN:O	1:A:325:ILE:CD1	1.81	1.26

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:333:GLU:O	1:D:337:THR:HG23	1.19	1.26
1:A:333:GLU:O	1:A:337:THR:CG2	1.84	1.25
2:F:22:GLN:OE1	2:F:149:ARG:CG	1.85	1.24
1:D:8:ALA:HB1	1:D:26:LEU:C	1.60	1.21
1:D:8:ALA:HB1	1:D:26:LEU:O	1.41	1.21
1:A:321:GLN:O	1:A:325:ILE:HD12	1.05	1.21
2:F:22:GLN:OE1	2:F:149:ARG:HG3	1.32	1.20
2:H:97:ARG:HD3	2:H:137:TYR:CD1	1.77	1.18
2:H:123:ARG:NH2	2:H:143:GLU:OE1	1.78	1.16
1:B:52:ASN:O	1:B:93:LYS:HG3	1.47	1.15
1:A:95:ARG:HB2	1:A:140:ASP:OD1	1.41	1.13
2:E:62:GLU:O	2:E:65:SER:OG	1.63	1.12
1:A:333:GLU:O	1:A:337:THR:HG23	0.93	1.11
2:G:97:ARG:HD3	2:G:137:TYR:CE1	1.85	1.11
2:E:97:ARG:NE	2:E:137:TYR:CD1	2.20	1.10
1:A:52:ASN:O	1:A:93:LYS:HG3	1.51	1.10
2:F:62:GLU:O	2:F:65:SER:OG	1.70	1.10
1:D:21:THR:HB	2:H:39:SER:OG	1.54	1.08
2:G:99:GLN:O	2:G:103:VAL:HG22	1.53	1.08
2:H:154:ASP:O	2:H:158:THR:OG1	1.69	1.08
2:H:16:LYS:HG3	3:H:201:GNP:O1B	1.55	1.06
2:E:97:ARG:HD3	2:E:137:TYR:CE1	1.91	1.05
1:A:95:ARG:HB3	1:A:140:ASP:OD1	1.47	1.05
1:A:95:ARG:HB3	1:A:140:ASP:CG	1.75	1.04
2:H:97:ARG:NH2	2:H:111:MET:SD	2.30	1.04
2:F:118:CYS:SG	2:F:145:SER:CB	2.47	1.02
1:C:163:THR:OG1	1:C:201:THR:OG1	1.78	1.00
1:C:204:ASP:OD1	1:C:355:ARG:NH2	1.93	1.00
2:E:88:LYS:O	2:E:92:ASP:OD1	1.79	0.99
2:G:77:GLY:HA3	2:G:163:ILE:HD11	1.44	0.99
2:G:99:GLN:O	2:G:103:VAL:CG2	2.11	0.98
1:B:158:GLN:HG2	1:B:193:GLN:HG3	1.45	0.98
2:H:108:ASP:OD1	2:H:166:HIS:CD2	2.18	0.97
1:B:333:GLU:O	1:B:337:THR:CG2	2.13	0.97
1:D:333:GLU:O	1:D:337:THR:CG2	2.12	0.96
2:H:68:ARG:NH2	2:H:96:TYR:CE1	2.34	0.95
1:A:95:ARG:NH1	1:A:172:GLY:O	2.01	0.94
2:E:16:LYS:N	3:E:201:GNP:O1B	1.99	0.93
2:H:15:GLY:O	2:H:19:LEU:HD12	1.67	0.93
1:C:158:GLN:HG2	1:C:193:GLN:HG3	1.51	0.93
2:G:97:ARG:NE	2:G:137:TYR:CD1	2.37	0.93

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:16:LYS:NZ	3:G:201:GNP:O1B	2.02	0.92
2:H:97:ARG:CD	2:H:137:TYR:CD1	2.52	0.92
2:G:97:ARG:CZ	2:G:137:TYR:CD1	2.53	0.92
2:F:84:ILE:HD11	2:F:117:LYS:O	1.70	0.92
2:F:22:GLN:CD	2:F:149:ARG:HG3	1.89	0.91
2:G:75:GLY:O	2:G:104:LYS:NZ	2.02	0.91
2:H:108:ASP:OD2	2:H:166:HIS:CD2	2.24	0.91
1:A:97:TYR:HE2	1:A:138:GLY:O	1.55	0.90
2:H:108:ASP:CG	2:H:166:HIS:CD2	2.46	0.90
2:F:99:GLN:O	2:F:103:VAL:HG23	1.74	0.88
2:H:99:GLN:O	2:H:103:VAL:HG23	1.74	0.88
2:E:17:SER:OG	4:E:202:MG:MG	1.17	0.87
2:E:123:ARG:NH2	2:E:143:GLU:OE1	2.08	0.87
1:D:21:THR:HB	2:H:39:SER:HG	1.37	0.87
2:G:37:GLU:OE2	2:G:67:MET:HB3	1.75	0.87
2:H:68:ARG:HA	2:H:71:TYR:CE2	2.10	0.87
2:H:16:LYS:NZ	3:H:201:GNP:O1B	2.07	0.86
2:E:84:ILE:HD11	2:E:117:LYS:O	1.75	0.86
2:G:90:PHE:HE1	2:G:133:LEU:HD22	1.41	0.85
2:F:37:GLU:OE2	2:F:67:MET:SD	2.35	0.85
2:G:84:ILE:HD11	2:G:117:LYS:O	1.77	0.85
1:D:318:THR:OG1	1:D:321:GLN:HG3	1.78	0.84
2:F:16:LYS:N	3:F:201:GNP:O1B	2.10	0.84
2:H:68:ARG:HH21	2:H:96:TYR:HE1	1.23	0.84
1:C:181:ARG:HE	1:C:181:ARG:HA	1.43	0.84
2:G:1:MET:HE2	2:G:52:LEU:N	1.92	0.83
1:D:312:ARG:NH1	1:D:316:SER:O	2.12	0.83
2:H:85:ASN:O	2:H:124:THR:OG1	1.96	0.82
1:D:52:ASN:O	1:D:93:LYS:HG3	1.79	0.82
1:D:158:GLN:HG2	1:D:193:GLN:HG3	1.60	0.82
1:A:95:ARG:HG3	1:A:97:TYR:CE1	2.14	0.82
1:D:95:ARG:CB	1:D:140:ASP:OD1	2.28	0.82
1:C:95:ARG:CB	1:C:140:ASP:OD1	2.28	0.81
2:G:97:ARG:CZ	2:G:137:TYR:HD1	1.93	0.81
1:B:163:THR:HG1	1:B:201:THR:HG1	1.22	0.80
2:E:97:ARG:CD	2:E:137:TYR:CE1	2.64	0.80
1:A:18:LEU:HD12	1:A:43:LEU:HD21	1.62	0.80
1:B:49:ASP:OD2	1:B:52:ASN:ND2	2.13	0.80
2:F:118:CYS:SG	2:F:145:SER:N	2.54	0.80
2:H:133:LEU:HD11	2:H:137:TYR:CE2	2.16	0.80
2:H:24:ILE:HG22	2:H:25:GLN:HG2	1.62	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:68:ARG:NH2	2:H:96:TYR:HE1	1.74	0.80
1:B:95:ARG:HB3	1:B:140:ASP:OD1	1.82	0.79
2:F:118:CYS:SG	2:F:144:THR:C	2.61	0.79
2:F:118:CYS:HG	2:F:145:SER:HB2	1.46	0.79
1:C:95:ARG:HB2	1:C:140:ASP:OD1	1.82	0.79
1:C:347:ARG:H	1:C:347:ARG:HD2	1.46	0.79
2:H:118:CYS:SG	2:H:143:GLU:HB3	2.23	0.79
1:C:170:ARG:HG2	1:C:205:LEU:HD22	1.63	0.79
1:B:95:ARG:CB	1:B:140:ASP:OD1	2.32	0.78
2:E:90:PHE:O	2:E:93:ILE:HG12	1.84	0.78
1:D:8:ALA:CB	1:D:26:LEU:O	2.29	0.78
2:E:118:CYS:SG	2:E:143:GLU:HB3	2.24	0.77
1:C:135:LEU:HD21	1:C:141:PRO:HG3	1.66	0.77
1:A:234:GLU:HB2	1:A:268:HIS:CD2	2.19	0.77
2:F:141:TYR:OH	2:F:143:GLU:OE1	2.00	0.77
2:E:97:ARG:CD	2:E:137:TYR:CD1	2.67	0.77
1:B:18:LEU:CD1	1:B:43:LEU:CD2	2.62	0.77
2:F:22:GLN:OE1	2:F:149:ARG:CD	2.33	0.77
2:G:97:ARG:CD	2:G:137:TYR:CD1	2.67	0.77
2:F:126:GLU:HB2	2:F:129:GLN:HG2	1.67	0.77
2:G:118:CYS:SG	2:G:144:THR:O	2.43	0.77
1:B:95:ARG:NH1	1:B:139:LEU:O	2.18	0.76
1:D:8:ALA:CB	1:D:26:LEU:C	2.48	0.76
2:G:97:ARG:CD	2:G:137:TYR:CE1	2.67	0.76
2:F:4:TYR:CE2	2:F:51:CYS:SG	2.79	0.76
3:E:201:GNP:O5'	3:E:201:GNP:H8	1.84	0.76
2:E:30:ASP:O	3:E:201:GNP:O2'	2.03	0.76
2:H:8:VAL:O	2:H:58:THR:OG1	2.03	0.75
1:C:263:VAL:O	1:C:267:GLU:HG3	1.87	0.75
2:H:47:ASP:OD2	2:H:164:ARG:NH2	2.20	0.75
2:F:117:LYS:HB3	2:F:120:LEU:CD1	2.16	0.75
1:B:212:LYS:HZ2	1:B:218:THR:HG22	1.51	0.75
1:A:97:TYR:CE2	1:A:138:GLY:O	2.40	0.74
1:B:150:GLU:OE1	1:B:154:SER:OG	2.04	0.74
2:H:61:GLN:NE2	3:H:201:GNP:O1G	2.20	0.74
2:H:108:ASP:CG	2:H:166:HIS:NE2	2.38	0.74
2:H:13:GLY:H	3:H:201:GNP:HNB3	1.32	0.74
1:B:52:ASN:O	1:B:93:LYS:CG	2.33	0.74
2:F:118:CYS:SG	2:F:145:SER:CA	2.76	0.74
1:A:52:ASN:O	1:A:93:LYS:CG	2.32	0.74
1:D:203:LEU:CB	1:D:355:ARG:HH21	1.99	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:68:ARG:HA	2:H:71:TYR:CD2	2.22	0.74
2:G:118:CYS:SG	2:G:144:THR:C	2.66	0.74
1:A:25:ARG:O	1:A:38:ARG:NH1	2.20	0.74
2:F:4:TYR:HE2	2:F:51:CYS:SG	2.11	0.74
1:A:95:ARG:CA	1:A:140:ASP:OD1	2.36	0.73
1:B:18:LEU:HD12	1:B:43:LEU:HD21	1.69	0.73
2:F:30:ASP:OD1	2:F:30:ASP:N	2.21	0.73
1:D:95:ARG:HB2	1:D:140:ASP:OD1	1.88	0.73
2:E:97:ARG:HD3	2:E:137:TYR:CZ	2.23	0.73
1:A:18:LEU:CD1	1:A:43:LEU:CD2	2.66	0.73
2:G:108:ASP:OD2	2:G:166:HIS:CD2	2.28	0.73
2:F:117:LYS:HB3	2:F:120:LEU:HD12	1.70	0.73
2:E:89:SER:O	2:E:93:ILE:CD1	2.36	0.73
2:H:84:ILE:HD11	2:H:117:LYS:O	1.88	0.72
1:A:18:LEU:CD1	1:A:43:LEU:HD21	2.19	0.72
2:H:30:ASP:OD1	2:H:30:ASP:N	2.21	0.72
2:G:97:ARG:NH1	2:G:101:LYS:HZ3	1.86	0.72
2:E:21:ILE:HG22	2:E:27:HIS:O	1.90	0.72
1:B:18:LEU:HD12	1:B:43:LEU:CD2	2.20	0.72
1:D:124:GLN:O	1:D:124:GLN:NE2	2.22	0.72
2:E:17:SER:HG	4:E:202:MG:MG	0.94	0.72
2:E:47:ASP:OD1	2:E:161:ARG:NH2	2.22	0.71
2:H:60:GLY:N	3:H:201:GNP:O2G	2.20	0.71
2:E:126:GLU:H	2:E:129:GLN:HE21	1.39	0.71
1:B:103:ASP:OD1	1:B:103:ASP:N	2.20	0.71
2:F:89:SER:O	2:F:93:ILE:CD1	2.38	0.71
1:C:100:ASN:ND2	1:C:100:ASN:H	1.89	0.70
2:E:97:ARG:HE	2:E:137:TYR:HD1	1.39	0.70
1:D:203:LEU:HB2	1:D:355:ARG:HH21	1.56	0.70
1:D:8:ALA:HB2	1:D:27:ASP:CA	2.22	0.70
2:G:97:ARG:HD3	2:G:137:TYR:CZ	2.26	0.70
2:G:90:PHE:CE1	2:G:133:LEU:HD22	2.26	0.69
2:G:13:GLY:H	3:G:201:GNP:HNB3	1.39	0.69
2:G:97:ARG:HD3	2:G:137:TYR:CD1	2.27	0.69
2:E:62:GLU:C	2:E:65:SER:OG	2.31	0.69
1:C:29:THR:O	1:C:73:LEU:HD13	1.92	0.69
1:A:52:ASN:OD1	1:A:178:PHE:CD1	2.46	0.69
2:G:1:MET:CE	2:G:52:LEU:HB2	2.23	0.69
1:C:347:ARG:HD2	1:C:347:ARG:N	2.08	0.68
2:H:46:ILE:HD13	2:H:157:TYR:CG	2.28	0.68
1:C:121:ASP:O	1:C:125:LEU:HG	1.93	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:8:ALA:HB2	1:D:27:ASP:HA	1.76	0.68
2:G:126:GLU:HB2	2:G:129:GLN:HE21	1.58	0.68
2:G:30:ASP:N	2:G:30:ASP:OD1	2.27	0.68
1:C:135:LEU:CD2	1:C:141:PRO:HG3	2.24	0.68
2:H:145:SER:HB3	2:H:148:THR:HG23	1.76	0.67
2:E:4:TYR:HD2	2:E:163:ILE:HG21	1.59	0.67
2:H:15:GLY:HA2	3:H:201:GNP:O2A	1.94	0.67
2:E:30:ASP:OD1	2:E:30:ASP:N	2.25	0.67
1:D:11:VAL:HG13	1:D:86:PRO:HB2	1.76	0.67
2:F:6:LEU:HD11	2:F:53:LEU:HD22	1.75	0.67
1:A:52:ASN:OD1	1:A:178:PHE:CE1	2.47	0.67
1:A:135:LEU:CD2	1:A:141:PRO:HG3	2.25	0.67
3:H:201:GNP:O2B	3:H:201:GNP:O1A	2.13	0.67
1:B:12:ARG:HG3	1:B:23:CYS:SG	2.35	0.67
2:E:123:ARG:HH22	2:E:143:GLU:CD	1.98	0.66
1:A:97:TYR:OH	1:A:140:ASP:HB2	1.95	0.66
1:A:318:THR:O	1:A:322:VAL:HG23	1.96	0.66
2:G:9:VAL:HG13	2:G:96:TYR:CD1	2.29	0.66
2:F:84:ILE:HG12	2:F:116:ASN:O	1.95	0.66
1:D:8:ALA:CB	1:D:27:ASP:HA	2.25	0.66
2:G:15:GLY:HA2	3:G:201:GNP:H8	1.78	0.66
2:H:1:MET:HA	2:H:1:MET:CE	2.26	0.66
1:A:355:ARG:HG2	1:A:355:ARG:HH11	1.60	0.66
3:G:201:GNP:O2B	3:G:201:GNP:O1A	2.14	0.66
2:F:90:PHE:O	2:F:93:ILE:HG12	1.96	0.66
1:D:69:ASP:HB3	1:D:72:ARG:HB2	1.78	0.65
2:H:38:ASP:O	2:H:56:LEU:HD12	1.97	0.65
1:A:69:ASP:HB3	1:A:72:ARG:HB2	1.76	0.65
2:G:4:TYR:OH	2:G:164:ARG:HD3	1.96	0.65
2:H:16:LYS:HZ2	3:H:201:GNP:PB	2.17	0.65
1:B:119:PHE:HD1	1:B:134:LEU:HD12	1.62	0.65
2:E:113:LEU:HD23	2:E:141:TYR:CD1	2.32	0.65
1:A:103:ASP:HB2	1:A:106:GLN:HB2	1.79	0.65
1:D:163:THR:OG1	1:D:201:THR:OG1	2.08	0.64
2:F:36:ILE:HD13	2:F:64:TYR:CE1	2.32	0.64
2:E:126:GLU:H	2:E:129:GLN:NE2	1.95	0.64
2:E:89:SER:O	2:E:93:ILE:HD11	1.97	0.64
2:H:68:ARG:HB2	2:H:71:TYR:CE2	2.32	0.64
2:H:23:LEU:O	2:H:42:LYS:NZ	2.31	0.63
2:H:9:VAL:CG1	2:H:96:TYR:CD1	2.81	0.63
2:F:22:GLN:OE1	2:F:149:ARG:HD2	1.98	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:212:LYS:HE3	1:C:218:THR:CG2	2.29	0.63
2:G:60:GLY:N	3:G:201:GNP:O2G	2.27	0.63
2:H:15:GLY:HA2	3:H:201:GNP:H8	1.79	0.63
2:H:97:ARG:HH22	2:H:111:MET:CE	2.12	0.63
2:E:47:ASP:CG	2:E:161:ARG:HH21	2.01	0.63
2:H:73:ARG:CZ	2:H:73:ARG:HB3	2.29	0.63
2:H:16:LYS:CG	3:H:201:GNP:O1B	2.41	0.63
2:G:77:GLY:CA	2:G:163:ILE:HD11	2.25	0.62
1:A:95:ARG:HB3	1:A:140:ASP:CB	2.29	0.62
2:G:9:VAL:CG1	2:G:96:TYR:CD1	2.82	0.62
2:E:36:ILE:HD13	2:E:64:TYR:CE1	2.34	0.62
1:D:97:TYR:HE1	1:D:138:GLY:HA2	1.63	0.62
2:F:83:ALA:HB1	2:F:117:LYS:HD2	1.81	0.62
1:C:347:ARG:H	1:C:347:ARG:CD	2.08	0.62
2:H:97:ARG:NH2	2:H:111:MET:CE	2.63	0.62
2:H:97:ARG:NE	2:H:137:TYR:CD1	2.68	0.62
2:E:116:ASN:ND2	3:E:201:GNP:O6	2.33	0.62
2:H:45:VAL:HG22	2:H:50:THR:HG22	1.82	0.62
2:H:3:GLU:HG3	2:H:52:LEU:HD23	1.81	0.62
2:E:9:VAL:CG1	2:E:96:TYR:CD1	2.82	0.62
2:F:6:LEU:HD12	2:F:55:ILE:HG12	1.82	0.61
2:H:1:MET:HA	2:H:1:MET:HE2	1.83	0.61
1:B:258:CYS:O	1:B:295:GLN:HG3	1.99	0.61
1:D:154:SER:O	1:D:158:GLN:NE2	2.33	0.61
2:H:68:ARG:CA	2:H:71:TYR:CE2	2.84	0.61
2:F:9:VAL:CG1	2:F:96:TYR:CD1	2.82	0.61
1:B:212:LYS:NZ	1:B:218:THR:HG22	2.15	0.61
1:B:12:ARG:HD2	1:B:23:CYS:SG	2.40	0.61
1:A:95:ARG:N	1:A:140:ASP:OD1	2.33	0.61
1:D:24:LEU:HD23	1:D:42:LYS:HD2	1.82	0.61
2:H:16:LYS:CE	2:H:58:THR:O	2.49	0.61
2:F:22:GLN:OE1	2:F:149:ARG:HG2	1.94	0.61
1:C:102:ILE:HG13	1:C:107:PHE:HB2	1.84	0.60
2:E:22:GLN:OE1	2:E:149:ARG:HG3	2.00	0.60
2:G:99:GLN:O	2:G:103:VAL:HG23	1.98	0.60
2:F:35:THR:OG1	4:F:202:MG:MG	1.44	0.60
1:A:211:TYR:O	1:A:219:PRO:HD3	2.02	0.60
2:F:89:SER:O	2:F:93:ILE:HD11	2.02	0.60
2:G:22:GLN:O	2:G:149:ARG:NH2	2.35	0.60
2:E:84:ILE:HG12	2:E:116:ASN:O	2.01	0.60
1:D:150:GLU:OE1	1:D:154:SER:OG	2.20	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:135:LEU:HD21	1:A:141:PRO:HG3	1.84	0.59
1:D:258:CYS:O	1:D:295:GLN:HG3	2.01	0.59
1:B:212:LYS:HZ2	1:B:218:THR:CG2	2.15	0.59
1:D:72:ARG:NH1	1:D:76:ASP:OD2	2.36	0.59
1:A:72:ARG:NH1	1:A:76:ASP:OD2	2.34	0.59
2:H:133:LEU:CD1	2:H:137:TYR:CE2	2.86	0.59
2:E:126:GLU:HB2	2:E:129:GLN:HE21	1.66	0.59
1:D:291:ALA:O	1:D:328:ASN:ND2	2.35	0.59
2:F:144:THR:HG22	2:F:151:GLY:C	2.23	0.59
2:E:97:ARG:NE	2:E:137:TYR:CE1	2.69	0.59
1:D:12:ARG:HG2	1:D:12:ARG:HH11	1.67	0.59
2:E:62:GLU:O	2:E:62:GLU:HG3	2.02	0.59
1:A:132:ALA:O	1:A:136:ASP:OD1	2.19	0.59
1:C:258:CYS:O	1:C:295:GLN:HG3	2.02	0.59
1:A:258:CYS:O	1:A:295:GLN:HG3	2.01	0.58
1:B:355:ARG:HG3	1:B:355:ARG:HH11	1.68	0.58
2:H:38:ASP:HB2	2:H:57:ASP:HB3	1.85	0.58
1:B:291:ALA:O	1:B:328:ASN:ND2	2.36	0.58
1:C:291:ALA:O	1:C:328:ASN:ND2	2.36	0.58
2:G:70:GLN:OE1	2:G:70:GLN:HA	2.03	0.58
2:E:14:VAL:HG13	2:E:81:VAL:HG12	1.85	0.58
2:F:41:ARG:NH1	2:F:52:LEU:HD21	2.19	0.58
1:A:12:ARG:HG3	1:A:23:CYS:SG	2.44	0.58
1:A:150:GLU:OE1	1:A:154:SER:OG	2.20	0.58
1:C:52:ASN:O	1:C:93:LYS:HG3	2.04	0.58
1:D:93:LYS:NZ	1:D:177:ASP:OD2	2.29	0.58
1:B:43:LEU:HD13	1:B:47:LEU:HD11	1.86	0.58
1:B:287:LEU:HD23	1:B:319:ALA:CB	2.34	0.58
1:B:99:GLN:OE1	1:B:99:GLN:HA	2.04	0.57
2:F:16:LYS:NZ	3:F:201:GNP:N3B	2.52	0.57
2:F:159:LEU:HD12	2:F:159:LEU:O	2.03	0.57
2:G:1:MET:HE2	2:G:52:LEU:CB	2.34	0.57
2:H:133:LEU:HD11	2:H:137:TYR:HE2	1.66	0.57
1:A:353:ALA:CB	1:A:355:ARG:NH1	2.67	0.57
1:A:321:GLN:C	1:A:325:ILE:CD1	2.71	0.57
1:D:8:ALA:CB	1:D:27:ASP:CA	2.83	0.57
2:F:90:PHE:CZ	2:F:133:LEU:HD22	2.40	0.57
2:H:128:ARG:NH2	2:H:128:ARG:O	2.38	0.57
1:A:291:ALA:O	1:A:328:ASN:ND2	2.38	0.56
1:B:100:ASN:C	1:B:100:ASN:HD22	2.09	0.56
2:E:24:ILE:HD13	2:E:40:TYR:CB	2.34	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:68:ARG:HG3	2:E:72:MET:HE2	1.87	0.56
1:C:170:ARG:CG	1:C:205:LEU:HD22	2.34	0.56
2:E:159:LEU:O	2:E:159:LEU:HD12	2.05	0.56
2:F:90:PHE:CE1	2:F:133:LEU:HD22	2.41	0.56
1:D:95:ARG:HB3	1:D:140:ASP:OD1	2.05	0.56
2:E:22:GLN:OE1	2:E:149:ARG:CG	2.53	0.56
1:A:36:LYS:NZ	1:A:51:LEU:O	2.29	0.56
1:B:18:LEU:CD1	1:B:43:LEU:HD22	2.34	0.56
1:B:210:ASP:O	1:B:212:LYS:NZ	2.33	0.56
2:E:22:GLN:OE1	2:E:149:ARG:HD2	2.06	0.56
1:A:333:GLU:HG3	1:A:337:THR:CG2	2.35	0.56
1:C:25:ARG:O	1:C:38:ARG:NH1	2.39	0.55
1:B:57:GLN:NE2	1:B:66:LYS:HE2	2.21	0.55
1:A:105:LYS:HD2	1:A:105:LYS:O	2.06	0.55
2:H:8:VAL:HG12	2:H:16:LYS:HB3	1.88	0.55
2:H:19:LEU:HD11	2:H:116:ASN:OD1	2.06	0.55
2:E:13:GLY:CA	2:E:32:TYR:OH	2.55	0.55
1:B:24:LEU:HD23	1:B:42:LYS:HG2	1.88	0.55
1:A:28:PRO:O	1:A:75:GLN:HB3	2.06	0.55
1:D:158:GLN:CG	1:D:193:GLN:HG3	2.32	0.55
2:E:2:THR:HB	2:E:4:TYR:CE1	2.42	0.55
2:G:16:LYS:HB2	3:G:201:GNP:O1B	2.07	0.54
1:A:95:ARG:H	1:A:140:ASP:CG	2.11	0.54
2:E:114:VAL:HG13	2:E:144:THR:HG23	1.89	0.54
2:H:15:GLY:CA	3:H:201:GNP:O2A	2.55	0.54
2:H:17:SER:O	2:H:21:ILE:HG12	2.08	0.54
1:A:97:TYR:CD1	1:A:97:TYR:N	2.75	0.54
1:D:8:ALA:HA	1:D:28:PRO:HD3	1.88	0.54
2:F:72:MET:CE	2:F:99:GLN:HB3	2.38	0.54
2:H:8:VAL:CG1	2:H:16:LYS:HB3	2.38	0.54
1:B:109:LYS:O	1:B:115:ASN:ND2	2.40	0.54
2:G:1:MET:HE2	2:G:52:LEU:HB2	1.89	0.54
2:E:62:GLU:CA	2:E:65:SER:OG	2.55	0.54
1:A:61:ARG:HH22	1:B:268:HIS:CE1	2.26	0.54
1:D:135:LEU:HD22	1:D:172:GLY:HA3	1.90	0.54
2:H:159:LEU:HD12	2:H:159:LEU:O	2.08	0.54
1:B:24:LEU:CD2	1:B:42:LYS:HG2	2.39	0.53
2:G:159:LEU:O	2:G:159:LEU:HD12	2.08	0.53
2:E:41:ARG:NH1	2:E:52:LEU:HD21	2.23	0.53
2:E:149:ARG:HG2	2:E:149:ARG:O	2.07	0.53
1:A:62:GLY:HA3	1:B:267:GLU:CD	2.28	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:203:LEU:HB3	1:D:355:ARG:HH21	1.70	0.53
2:H:68:ARG:NH2	2:H:96:TYR:CZ	2.75	0.53
2:E:41:ARG:NH1	2:E:52:LEU:CD2	2.72	0.53
2:F:72:MET:HE1	2:F:99:GLN:HB3	1.90	0.53
2:F:22:GLN:NE2	2:F:149:ARG:HG3	2.23	0.53
2:F:118:CYS:SG	2:F:144:THR:O	2.67	0.53
1:A:254:ILE:HG22	1:A:266:LEU:HD12	1.91	0.53
2:F:72:MET:HG2	2:F:100:ILE:HA	1.91	0.53
2:F:149:ARG:NH1	2:F:153:GLU:HG3	2.24	0.53
2:E:89:SER:O	2:E:93:ILE:HD13	2.09	0.53
1:A:21:THR:HB	2:E:39:SER:HB2	1.90	0.53
1:B:69:ASP:HB3	1:B:72:ARG:HB2	1.91	0.53
1:D:331:LEU:HD23	1:D:331:LEU:O	2.08	0.53
1:A:10:VAL:HG12	1:A:85:LEU:HD22	1.91	0.52
2:G:1:MET:HE2	2:G:52:LEU:CA	2.38	0.52
1:B:158:GLN:HE21	1:B:189:CYS:HB3	1.73	0.52
2:G:7:VAL:HG11	2:G:71:TYR:CD1	2.44	0.52
1:C:29:THR:O	1:C:73:LEU:HD22	2.10	0.52
1:B:18:LEU:HD11	1:B:43:LEU:HD22	1.91	0.52
2:G:15:GLY:HA2	3:G:201:GNP:O2A	2.10	0.52
2:G:111:MET:HB2	2:G:139:ILE:HG21	1.90	0.52
2:G:86:ASN:HD21	2:G:88:LYS:HD2	1.74	0.52
2:F:36:ILE:HG23	2:F:64:TYR:CD1	2.45	0.52
1:B:170:ARG:HD2	1:B:170:ARG:O	2.10	0.51
2:F:7:VAL:HG13	2:F:56:LEU:HD23	1.92	0.51
2:F:99:GLN:OE1	2:F:103:VAL:CG2	2.58	0.51
1:D:8:ALA:HB1	1:D:27:ASP:N	2.23	0.51
1:C:10:VAL:HG13	1:C:85:LEU:HD21	1.92	0.51
1:C:212:LYS:HE3	1:C:218:THR:HG23	1.92	0.51
1:D:24:LEU:CD2	1:D:42:LYS:HD2	2.40	0.51
1:D:28:PRO:O	1:D:75:GLN:HB3	2.11	0.51
2:E:68:ARG:O	2:E:72:MET:CG	2.58	0.51
2:G:97:ARG:NH2	2:G:137:TYR:CE1	2.78	0.51
1:B:309:LYS:HE3	1:B:335:ILE:O	2.11	0.51
1:D:95:ARG:HD2	1:D:172:GLY:O	2.10	0.51
2:E:62:GLU:HA	2:E:65:SER:OG	2.10	0.51
1:C:347:ARG:HD3	1:C:348:GLU:HG3	1.92	0.51
2:F:14:VAL:HG13	2:F:81:VAL:HG12	1.91	0.51
2:G:77:GLY:HA3	2:G:163:ILE:CD1	2.31	0.51
1:C:158:GLN:CG	1:C:193:GLN:HG3	2.34	0.51
2:F:17:SER:O	2:F:21:ILE:HG12	2.10	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:9:VAL:HG13	2:H:96:TYR:CD1	2.45	0.51
2:G:17:SER:O	2:G:21:ILE:HG12	2.11	0.51
2:E:13:GLY:HA3	2:E:32:TYR:OH	2.11	0.51
2:G:61:GLN:NE2	3:G:201:GNP:O1G	2.41	0.51
2:G:140:PRO:CG	2:G:162:GLU:OE2	2.59	0.51
2:H:17:SER:HA	2:H:57:ASP:OD2	2.11	0.50
2:H:58:THR:HG21	2:H:71:TYR:CE1	2.46	0.50
2:H:131:GLN:O	2:H:135:ARG:HG3	2.11	0.50
1:B:95:ARG:CD	1:B:173:GLY:HA3	2.41	0.50
1:B:179:ARG:HG3	1:B:179:ARG:HH11	1.76	0.50
2:G:97:ARG:CZ	2:G:101:LYS:HZ3	2.24	0.50
2:E:116:ASN:HA	2:E:144:THR:O	2.12	0.50
2:F:35:THR:HG1	4:F:202:MG:MG	1.19	0.50
2:G:78:PHE:CG	2:G:100:ILE:HD13	2.46	0.50
1:C:181:ARG:HA	1:C:181:ARG:NE	2.21	0.50
2:E:69:ASP:OD2	2:E:73:ARG:NH1	2.45	0.50
1:A:271:PHE:HD1	1:A:346:PHE:CD2	2.30	0.49
1:A:126:HIS:NE2	1:A:164:ASP:OD2	2.46	0.49
1:C:234:GLU:HG2	1:C:234:GLU:O	2.12	0.49
1:D:12:ARG:NH2	1:D:21:THR:HG21	2.27	0.49
2:G:1:MET:HE1	2:G:52:LEU:HB2	1.94	0.49
2:H:14:VAL:HG13	2:H:81:VAL:HG12	1.94	0.49
2:E:10:GLY:CA	2:E:16:LYS:HD3	2.42	0.49
1:D:21:THR:CB	2:H:39:SER:OG	2.44	0.49
2:H:132:ASP:O	2:H:135:ARG:HB2	2.13	0.49
1:A:133:ARG:N	1:A:133:ARG:HD3	2.25	0.49
2:H:145:SER:CB	2:H:148:THR:HG23	2.42	0.49
1:C:95:ARG:N	1:C:140:ASP:OD1	2.45	0.49
1:C:212:LYS:HE3	1:C:218:THR:HG22	1.95	0.49
1:D:95:ARG:H	1:D:140:ASP:CG	2.15	0.49
1:A:95:ARG:CG	1:A:97:TYR:CE1	2.93	0.48
2:H:22:GLN:OE1	2:H:149:ARG:HD2	2.13	0.48
1:A:105:LYS:HD2	1:A:109:LYS:HG3	1.95	0.48
1:D:170:ARG:HD2	1:D:170:ARG:O	2.13	0.48
2:E:32:TYR:CD2	3:E:201:GNP:H4'	2.48	0.48
1:A:151:CYS:SG	1:A:154:SER:HB3	2.53	0.48
1:A:318:THR:O	1:A:322:VAL:CG2	2.60	0.48
1:C:36:LYS:HE3	1:C:53:TYR:O	2.14	0.48
2:E:64:TYR:HB3	2:E:67:MET:HE3	1.96	0.48
2:E:68:ARG:O	2:E:72:MET:HG2	2.13	0.48
1:A:209:PRO:HB2	1:A:241:ALA:HB2	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:95:ARG:NH1	1:B:172:GLY:O	2.47	0.48
2:E:24:ILE:HG22	2:E:25:GLN:HG2	1.95	0.48
2:F:17:SER:HA	2:F:57:ASP:OD2	2.13	0.48
2:H:34:PRO:HA	3:H:201:GNP:O1G	2.14	0.48
1:D:10:VAL:HG12	1:D:85:LEU:HD22	1.95	0.48
2:E:36:ILE:HG23	2:E:64:TYR:CD1	2.49	0.48
1:A:353:ALA:HB3	1:A:355:ARG:NH1	2.29	0.47
1:C:24:LEU:HD11	1:C:39:VAL:HG22	1.96	0.47
1:C:233:CYS:HB2	1:C:265:HIS:CD2	2.48	0.47
1:D:8:ALA:CB	1:D:27:ASP:N	2.76	0.47
1:A:81:LEU:HD22	1:B:231:ARG:NH1	2.29	0.47
1:B:18:LEU:HD21	1:B:45:HIS:NE2	2.29	0.47
2:H:69:ASP:O	2:H:73:ARG:HG2	2.14	0.47
2:G:24:ILE:HD11	2:G:55:ILE:HD12	1.95	0.47
1:A:24:LEU:HD22	1:A:42:LYS:HD2	1.95	0.47
1:A:239:ASP:OD2	1:A:355:ARG:NH1	2.48	0.47
2:G:63:GLU:HB3	2:G:64:TYR:CE1	2.50	0.47
2:G:84:ILE:HG13	2:G:116:ASN:O	2.14	0.47
1:B:18:LEU:HD21	1:B:45:HIS:CD2	2.49	0.47
1:D:12:ARG:HG2	1:D:23:CYS:SG	2.55	0.47
2:G:140:PRO:HG2	2:G:162:GLU:OE2	2.14	0.47
2:H:68:ARG:HB2	2:H:71:TYR:HE2	1.76	0.47
1:C:181:ARG:HE	1:C:181:ARG:CA	2.21	0.47
2:F:84:ILE:CD1	2:F:117:LYS:O	2.54	0.47
1:C:151:CYS:SG	1:C:154:SER:HB3	2.55	0.47
2:F:117:LYS:CB	2:F:120:LEU:HD12	2.44	0.47
2:E:101:LYS:O	2:E:105:ASP:N	2.45	0.47
2:F:159:LEU:O	2:F:163:ILE:HG13	2.15	0.47
2:G:97:ARG:HH22	2:G:101:LYS:HZ1	1.63	0.47
1:B:61:ARG:HG2	1:B:61:ARG:NH2	2.29	0.46
2:G:68:ARG:HA	2:G:71:TYR:CE2	2.50	0.46
1:B:45:HIS:CD2	1:B:45:HIS:C	2.88	0.46
1:C:95:ARG:HB3	1:C:140:ASP:OD1	2.13	0.46
1:C:106:GLN:HA	1:C:109:LYS:HG3	1.96	0.46
2:F:16:LYS:HZ3	3:F:201:GNP:PB	2.38	0.46
2:F:101:LYS:O	2:F:105:ASP:N	2.46	0.46
2:H:35:THR:O	2:H:59:ALA:HB2	2.15	0.46
1:B:95:ARG:N	1:B:140:ASP:OD1	2.48	0.46
2:F:41:ARG:NH1	2:F:52:LEU:CD2	2.78	0.46
2:E:114:VAL:HG13	2:E:144:THR:CG2	2.45	0.46
1:C:126:HIS:NE2	1:C:164:ASP:OD2	2.44	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:45:HIS:ND1	1:A:45:HIS:N	2.63	0.46
1:A:97:TYR:HB3	1:A:100:ASN:HB2	1.98	0.46
1:D:32:VAL:HG23	1:D:72:ARG:O	2.16	0.46
2:F:22:GLN:CD	2:F:149:ARG:CG	2.64	0.46
2:E:82:PHE:HB3	2:E:93:ILE:HD11	1.97	0.46
1:B:340:ASP:N	1:B:340:ASP:OD1	2.47	0.46
2:G:16:LYS:CE	3:G:201:GNP:O1B	2.63	0.46
1:A:76:ASP:O	1:A:78:PRO:HD3	2.15	0.46
1:B:95:ARG:HB2	1:B:140:ASP:OD1	2.15	0.46
2:E:3:GLU:HG3	2:E:52:LEU:HD23	1.97	0.46
1:A:294:ASN:HA	1:A:331:LEU:HD12	1.98	0.46
1:B:258:CYS:SG	1:B:266:LEU:HD13	2.56	0.46
2:H:15:GLY:C	2:H:19:LEU:HD12	2.33	0.46
2:G:97:ARG:NH2	2:G:101:LYS:NZ	2.64	0.45
1:B:35:ALA:O	1:B:39:VAL:HG23	2.16	0.45
1:B:25:ARG:NH1	2:F:64:TYR:OH	2.49	0.45
2:H:116:ASN:ND2	3:H:201:GNP:O6	2.50	0.45
2:H:128:ARG:HA	2:H:128:ARG:HH21	1.81	0.45
2:E:85:ASN:O	2:E:124:THR:CG2	2.65	0.45
1:B:141:PRO:O	1:B:152:PRO:HD2	2.16	0.45
1:C:141:PRO:O	1:C:152:PRO:HD2	2.17	0.45
2:F:79:LEU:HD12	2:F:159:LEU:HD22	1.99	0.45
2:E:157:TYR:O	2:E:161:ARG:HG3	2.16	0.45
1:A:273:GLY:O	1:C:308:ASN:ND2	2.50	0.45
1:B:133:ARG:HA	1:B:133:ARG:HD3	1.56	0.45
2:E:68:ARG:O	2:E:72:MET:HG3	2.17	0.45
1:A:319:ALA:HA	1:A:322:VAL:HG23	1.98	0.45
1:B:61:ARG:HG2	1:B:61:ARG:HH21	1.82	0.45
1:C:153:LEU:HD23	1:C:186:ALA:HB2	1.98	0.45
2:G:83:ALA:HB3	2:G:86:ASN:HB3	1.99	0.45
2:H:68:ARG:CB	2:H:71:TYR:CE2	2.99	0.45
2:G:8:VAL:CG1	2:G:16:LYS:HB3	2.47	0.45
2:G:144:THR:HA	2:G:150:GLN:O	2.17	0.45
1:B:97:TYR:HH	1:B:107:PHE:HE1	1.62	0.45
2:F:149:ARG:HH11	2:F:153:GLU:HG3	1.80	0.45
1:A:128:THR:CG2	1:A:168:VAL:HG21	2.47	0.45
1:A:355:ARG:HH11	1:A:355:ARG:CG	2.29	0.45
1:C:167:LYS:HE3	1:D:348:GLU:OE1	2.17	0.45
1:D:40:LEU:O	1:D:43:LEU:HB2	2.17	0.45
2:H:123:ARG:HH22	2:H:143:GLU:CD	2.08	0.45
2:G:116:ASN:ND2	3:G:201:GNP:O6	2.51	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:40:LEU:O	1:A:43:LEU:O	2.35	0.44
1:D:97:TYR:HE1	1:D:138:GLY:CA	2.30	0.44
1:A:18:LEU:O	1:A:20:GLN:HG3	2.17	0.44
1:D:159:LEU:HD23	1:D:159:LEU:N	2.31	0.44
1:D:239:ASP:OD2	1:D:355:ARG:CZ	2.65	0.44
2:G:72:MET:O	2:G:104:LYS:HE3	2.16	0.44
2:G:100:ILE:O	2:G:104:LYS:HB2	2.17	0.44
2:H:36:ILE:HD12	2:H:36:ILE:H	1.83	0.44
2:H:38:ASP:O	2:H:56:LEU:CD1	2.64	0.44
2:H:126:GLU:H	2:H:129:GLN:HE21	1.65	0.44
1:D:117:LYS:O	1:D:117:LYS:HD3	2.17	0.44
2:F:93:ILE:HD13	2:F:93:ILE:N	2.33	0.44
1:B:12:ARG:CB	1:B:12:ARG:HH11	2.30	0.44
1:C:135:LEU:HD22	1:C:172:GLY:HA3	2.00	0.44
2:G:8:VAL:HG11	2:G:16:LYS:HB3	1.99	0.44
2:F:29:VAL:HG23	2:F:29:VAL:O	2.18	0.44
2:H:21:ILE:HG23	2:H:25:GLN:HG3	1.99	0.44
1:B:128:THR:CG2	1:B:168:VAL:HG21	2.48	0.44
1:C:128:THR:HG23	1:C:168:VAL:HG21	2.00	0.44
2:F:19:LEU:HD21	2:F:116:ASN:OD1	2.18	0.44
2:E:4:TYR:CD2	2:E:163:ILE:HG21	2.47	0.44
2:E:10:GLY:HA3	2:E:16:LYS:HD3	2.00	0.44
2:E:113:LEU:HD23	2:E:141:TYR:HD1	1.81	0.44
1:A:239:ASP:OD1	1:A:239:ASP:O	2.36	0.43
1:B:163:THR:OG1	1:B:201:THR:OG1	2.01	0.43
2:G:140:PRO:CD	2:G:162:GLU:OE2	2.66	0.43
2:E:65:SER:O	2:E:68:ARG:HB2	2.18	0.43
2:G:79:LEU:HD12	2:G:159:LEU:HD22	1.99	0.43
2:E:93:ILE:HD13	2:E:93:ILE:N	2.32	0.43
1:D:128:THR:CG2	1:D:168:VAL:HG21	2.48	0.43
1:D:153:LEU:HD23	1:D:186:ALA:HB2	1.99	0.43
2:F:111:MET:HB3	2:F:139:ILE:HG21	2.00	0.43
2:H:46:ILE:CD1	2:H:157:TYR:CD1	3.02	0.43
2:H:97:ARG:CD	2:H:137:TYR:CE1	2.64	0.43
1:B:36:LYS:NZ	1:B:51:LEU:O	2.29	0.43
2:E:21:ILE:HG21	2:E:29:VAL:HG13	1.99	0.43
1:B:161:ASN:HB3	1:C:329:PHE:CZ	2.53	0.43
1:D:18:LEU:O	1:D:20:GLN:HG3	2.19	0.43
2:G:94:HIS:CE1	2:G:98:GLU:HG2	2.53	0.43
2:H:101:LYS:O	2:H:105:ASP:N	2.45	0.43
1:A:291:ALA:HA	1:A:331:LEU:HD13	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:353:ALA:HB1	1:A:355:ARG:NH1	2.31	0.43
1:D:95:ARG:N	1:D:140:ASP:OD1	2.50	0.43
1:D:141:PRO:O	1:D:152:PRO:HD2	2.18	0.43
2:F:144:THR:HA	2:F:150:GLN:O	2.18	0.43
2:E:85:ASN:O	2:E:124:THR:HG23	2.19	0.43
1:C:66:LYS:HE3	1:C:77:TYR:HE2	1.84	0.43
1:A:95:ARG:HG3	1:A:97:TYR:CD1	2.52	0.43
1:A:141:PRO:O	1:A:152:PRO:HD2	2.18	0.43
1:B:151:CYS:SG	1:B:154:SER:HB3	2.58	0.43
1:C:83:THR:HG22	1:C:84:PRO:HD2	1.99	0.43
1:D:81:LEU:CD1	1:D:81:LEU:N	2.82	0.43
2:F:56:LEU:HD23	2:F:58:THR:CG2	2.49	0.43
1:B:177:ASP:O	1:B:178:PHE:C	2.57	0.43
2:H:46:ILE:HD11	2:H:157:TYR:CD1	2.54	0.43
2:H:49:GLU:O	2:H:49:GLU:HG3	2.19	0.43
2:E:29:VAL:O	2:E:29:VAL:HG23	2.19	0.43
1:A:61:ARG:NH2	1:B:268:HIS:ND1	2.67	0.43
2:F:64:TYR:HB3	2:F:67:MET:HE3	2.01	0.43
2:G:4:TYR:OH	2:G:164:ARG:CD	2.67	0.43
2:G:62:GLU:OE2	2:G:62:GLU:HA	2.19	0.42
2:G:97:ARG:CZ	2:G:101:LYS:NZ	2.81	0.42
2:G:148:THR:O	2:G:149:ARG:HB2	2.18	0.42
2:F:89:SER:O	2:F:93:ILE:HD13	2.18	0.42
2:G:97:ARG:CZ	2:G:137:TYR:CE1	3.00	0.42
2:G:98:GLU:OE1	2:G:98:GLU:HA	2.19	0.42
1:B:100:ASN:O	1:B:100:ASN:ND2	2.52	0.42
2:E:128:ARG:NH1	2:E:132:ASP:OD1	2.52	0.42
2:H:25:GLN:HB2	2:H:27:HIS:HD2	1.83	0.42
2:E:22:GLN:OE1	2:E:149:ARG:CD	2.67	0.42
2:E:24:ILE:HD13	2:E:40:TYR:HB2	2.01	0.42
2:H:109:VAL:HB	2:H:111:MET:HE2	2.01	0.42
1:D:126:HIS:HE1	1:D:161:ASN:O	2.02	0.42
1:D:151:CYS:SG	1:D:154:SER:HB3	2.60	0.42
2:H:14:VAL:HG12	2:H:16:LYS:HG2	2.01	0.42
2:E:99:GLN:O	2:E:103:VAL:HG23	2.19	0.42
1:D:25:ARG:NH1	2:H:64:TYR:OH	2.52	0.42
2:F:82:PHE:HB3	2:F:93:ILE:HD11	2.01	0.42
2:H:135:ARG:HG2	2:H:135:ARG:HH21	1.84	0.42
1:C:95:ARG:HD2	1:C:172:GLY:O	2.19	0.42
1:D:179:ARG:HG2	1:D:185:THR:HG22	2.02	0.42
2:G:114:VAL:HG13	2:G:144:THR:HG23	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:82:ASP:O	1:B:351:SER:HB2	2.20	0.42
1:B:309:LYS:HB2	1:B:309:LYS:HE2	1.72	0.42
1:C:24:LEU:HD12	1:C:26:LEU:HD21	2.02	0.42
2:E:17:SER:OG	3:E:201:GNP:O2B	2.29	0.42
1:D:8:ALA:HB2	1:D:27:ASP:CB	2.49	0.42
2:G:1:MET:HE3	2:G:43:GLN:HG3	2.02	0.42
2:H:100:ILE:O	2:H:104:LYS:HB2	2.19	0.42
2:E:19:LEU:HD21	2:E:116:ASN:OD1	2.20	0.42
2:E:45:VAL:HG22	2:E:50:THR:HG22	2.02	0.42
1:A:28:PRO:HA	1:A:74:LEU:HB3	2.01	0.41
1:C:97:TYR:OH	1:C:138:GLY:O	2.32	0.41
2:G:9:VAL:HG13	2:G:96:TYR:CE1	2.56	0.41
2:G:97:ARG:NH2	2:G:101:LYS:HZ1	2.18	0.41
1:A:61:ARG:H	1:A:61:ARG:HG3	1.70	0.41
1:B:12:ARG:HH11	1:B:12:ARG:HB3	1.86	0.41
1:B:95:ARG:HD3	1:B:173:GLY:HA3	2.02	0.41
1:B:102:ILE:HG22	1:B:106:GLN:HB3	2.02	0.41
1:D:102:ILE:N	1:D:102:ILE:HD13	2.35	0.41
3:G:201:GNP:O2B	3:G:201:GNP:O3G	2.36	0.41
2:H:85:ASN:OD1	2:H:85:ASN:N	2.52	0.41
2:E:72:MET:O	2:E:104:LYS:HE2	2.20	0.41
2:G:77:GLY:CA	2:G:163:ILE:CD1	2.97	0.41
2:H:35:THR:O	2:H:59:ALA:CB	2.69	0.41
2:E:84:ILE:CD1	2:E:117:LYS:O	2.58	0.41
1:B:355:ARG:HG3	1:B:355:ARG:NH1	2.35	0.41
2:G:56:LEU:HD23	2:G:71:TYR:HB2	2.02	0.41
1:B:254:ILE:HG22	1:B:266:LEU:HD12	2.03	0.41
1:C:128:THR:CG2	1:C:168:VAL:HG21	2.50	0.41
2:F:36:ILE:O	2:F:37:GLU:HG3	2.20	0.41
1:A:95:ARG:CB	1:A:140:ASP:HA	2.49	0.41
1:B:100:ASN:C	1:B:100:ASN:ND2	2.74	0.41
1:C:16:PRO:HG2	1:C:91:ARG:HD3	2.03	0.41
2:G:41:ARG:NH1	2:G:52:LEU:HD21	2.36	0.41
1:A:179:ARG:HG2	1:A:185:THR:HG22	2.01	0.41
1:A:211:TYR:O	1:A:218:THR:HA	2.21	0.41
1:D:24:LEU:HD11	1:D:39:VAL:HG22	2.02	0.41
2:F:110:PRO:CG	2:F:163:ILE:HA	2.51	0.41
3:F:201:GNP:O2B	3:F:201:GNP:O3G	2.37	0.41
2:H:84:ILE:HG13	2:H:116:ASN:O	2.20	0.41
1:A:107:PHE:CD1	1:A:107:PHE:C	2.94	0.41
1:B:109:LYS:O	1:B:112:THR:HG23	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:304:TYR:CE1	1:B:344:VAL:HG23	2.55	0.41
1:C:150:GLU:OE1	1:C:154:SER:OG	2.39	0.41
1:D:31:PRO:HA	1:D:73:LEU:HD22	2.03	0.41
1:D:211:TYR:O	1:D:219:PRO:HD3	2.20	0.41
2:F:8:VAL:CG1	2:F:16:LYS:HB3	2.51	0.41
2:G:24:ILE:HG22	2:G:25:GLN:HG2	2.02	0.41
2:G:84:ILE:CD1	2:G:117:LYS:O	2.60	0.41
2:H:128:ARG:HH21	2:H:128:ARG:CA	2.34	0.41
2:E:79:LEU:HD12	2:E:159:LEU:HD22	2.03	0.41
2:E:99:GLN:OE1	2:E:99:GLN:HA	2.21	0.41
1:A:354:LYS:H	1:A:354:LYS:HG2	1.50	0.41
1:B:101:LEU:HD12	1:B:102:ILE:H	1.86	0.41
2:F:49:GLU:OE2	2:F:164:ARG:NH1	2.54	0.41
2:G:34:PRO:HA	3:G:201:GNP:O1G	2.20	0.41
1:C:291:ALA:HB1	1:C:323:ALA:HB2	2.03	0.40
2:H:149:ARG:HG2	2:H:149:ARG:O	2.22	0.40
1:A:18:LEU:HD12	1:A:43:LEU:CD2	2.35	0.40
2:G:4:TYR:HB3	2:G:6:LEU:HD21	2.03	0.40
1:C:28:PRO:HA	1:C:74:LEU:HB3	2.03	0.40
1:C:81:LEU:HD12	1:C:81:LEU:HA	1.93	0.40
2:G:36:ILE:O	2:G:37:GLU:HG3	2.21	0.40
2:H:1:MET:HA	2:H:1:MET:HE3	2.02	0.40
2:H:28:PHE:CD1	2:H:147:LYS:HA	2.56	0.40
2:E:130:ALA:HB1	2:E:141:TYR:CE1	2.56	0.40
1:C:100:ASN:H	1:C:100:ASN:HD22	1.64	0.40
2:F:90:PHE:C	2:F:93:ILE:HG12	2.42	0.40
2:F:126:GLU:H	2:F:129:GLN:HE21	1.69	0.40
1:A:312:ARG:HE	1:C:242:GLN:HG2	1.86	0.40
1:D:240:HIS:CD2	1:D:352:TYR:CD1	3.10	0.40
1:D:291:ALA:HB1	1:D:323:ALA:HB2	2.04	0.40
2:F:49:GLU:O	2:F:49:GLU:HG3	2.20	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)
1:C:124:GLN:NE2	2:H:50:THR:OG1[2_455]	2.07	0.13

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	347/361 (96%)	341 (98%)	6 (2%)	0	100	100
1	B	347/361 (96%)	342 (99%)	5 (1%)	0	100	100
1	C	347/361 (96%)	339 (98%)	8 (2%)	0	100	100
1	D	347/361 (96%)	340 (98%)	7 (2%)	0	100	100
2	E	164/171 (96%)	163 (99%)	1 (1%)	0	100	100
2	F	165/171 (96%)	162 (98%)	3 (2%)	0	100	100
2	G	164/171 (96%)	161 (98%)	3 (2%)	0	100	100
2	H	164/171 (96%)	164 (100%)	0	0	100	100
All	All	2045/2128 (96%)	2012 (98%)	33 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2　Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	291/299 (97%)	246 (84%)	45 (16%)	2	12
1	B	291/299 (97%)	253 (87%)	38 (13%)	4	17
1	C	291/299 (97%)	257 (88%)	34 (12%)	5	21
1	D	291/299 (97%)	271 (93%)	20 (7%)	15	44
2	E	144/147 (98%)	117 (81%)	27 (19%)	1	6
2	F	145/147 (99%)	115 (79%)	30 (21%)	1	4

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	G	144/147 (98%)	119 (83%)	25 (17%)	2	8
2	H	144/147 (98%)	117 (81%)	27 (19%)	1	6
All	All	1741/1784 (98%)	1495 (86%)	246 (14%)	3	16

All (246) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	7	PHE
1	A	12	ARG
1	A	21	THR
1	A	22	LYS
1	A	24	LEU
1	A	42	LYS
1	A	45	HIS
1	A	47	LEU
1	A	48	GLN
1	A	57	GLN
1	A	61	ARG
1	A	63	ARG
1	A	73	LEU
1	A	81	LEU
1	A	83	THR
1	A	97	TYR
1	A	99	GLN
1	A	102	ILE
1	A	105	LYS
1	A	106	GLN
1	A	107	PHE
1	A	113	LYS
1	A	133	ARG
1	A	136	ASP
1	A	154	SER
1	A	164	ASP
1	A	181	ARG
1	A	243	LEU
1	A	248	GLU
1	A	264	GLN
1	A	267	GLU
1	A	268	HIS
1	A	279	GLN
1	A	282	SER

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Mol	Chain	Res	Type
1	A	292	LEU
1	A	315	ASN
1	A	322	VAL
1	A	331	LEU
1	A	337	THR
1	A	340	ASP
1	A	341	SER
1	A	347	ARG
1	A	349	THR
1	A	354	LYS
1	A	355	ARG
1	B	12	ARG
1	B	24	LEU
1	B	41	CYS
1	B	43	LEU
1	B	45	HIS
1	B	46	SER
1	B	51	LEU
1	B	61	ARG
1	B	63	ARG
1	B	73	LEU
1	B	81	LEU
1	B	83	THR
1	B	95	ARG
1	B	99	GLN
1	B	100	ASN
1	B	101	LEU
1	B	103	ASP
1	B	106	GLN
1	B	118	LYS
1	B	126	HIS
1	B	133	ARG
1	B	154	SER
1	B	164	ASP
1	B	215	ARG
1	B	240	HIS
1	B	243	LEU
1	B	248	GLU
1	B	267	GLU
1	B	282	SER
1	B	309	LYS
1	B	312	ARG

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Mol	Chain	Res	Type
1	B	331	LEU
1	B	337	THR
1	B	341	SER
1	B	342	ASP
1	B	347	ARG
1	B	354	LYS
1	B	355	ARG
1	C	7	PHE
1	C	12	ARG
1	C	20	GLN
1	C	21	THR
1	C	24	LEU
1	C	29	THR
1	C	41	CYS
1	C	44	ASN
1	C	51	LEU
1	C	60	SER
1	C	69	ASP
1	C	72	ARG
1	C	81	LEU
1	C	83	THR
1	C	85	LEU
1	C	100	ASN
1	C	102	ILE
1	C	106	GLN
1	C	117	LYS
1	C	118	LYS
1	C	154	SER
1	C	160	ASP
1	C	163	THR
1	C	164	ASP
1	C	181	ARG
1	C	212	LYS
1	C	243	LEU
1	C	292	LEU
1	C	331	LEU
1	C	339	LYS
1	C	340	ASP
1	C	347	ARG
1	C	348	GLU
1	C	355	ARG
1	D	24	LEU

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Mol	Chain	Res	Type
1	D	73	LEU
1	D	100	ASN
1	D	103	ASP
1	D	115	ASN
1	D	117	LYS
1	D	133	ARG
1	D	154	SER
1	D	158	GLN
1	D	163	THR
1	D	164	ASP
1	D	181	ARG
1	D	212	LYS
1	D	225	LEU
1	D	292	LEU
1	D	297	SER
1	D	337	THR
1	D	339	LYS
1	D	347	ARG
1	D	355	ARG
2	F	1	MET
2	F	14	VAL
2	F	27	HIS
2	F	30	ASP
2	F	32	TYR
2	F	35	THR
2	F	39	SER
2	F	49	GLU
2	F	50	THR
2	F	51	CYS
2	F	54	ASP
2	F	62	GLU
2	F	65	SER
2	F	68	ARG
2	F	71	TYR
2	F	72	MET
2	F	79	LEU
2	F	87	THR
2	F	91	GLU
2	F	99	GLN
2	F	102	ARG
2	F	107	ASP
2	F	109	VAL

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Mol	Chain	Res	Type
2	F	119	ASP
2	F	128	ARG
2	F	136	SER
2	F	139	ILE
2	F	149	ARG
2	F	162	GLU
2	F	167	LYS
2	G	1	MET
2	G	2	THR
2	G	14	VAL
2	G	30	ASP
2	G	32	TYR
2	G	35	THR
2	G	62	GLU
2	G	65	SER
2	G	69	ASP
2	G	70	GLN
2	G	79	LEU
2	G	87	THR
2	G	88	LYS
2	G	91	GLU
2	G	99	GLN
2	G	103	VAL
2	G	106	SER
2	G	107	ASP
2	G	118	CYS
2	G	128	ARG
2	G	129	GLN
2	G	149	ARG
2	G	162	GLU
2	G	163	ILE
2	G	166	HIS
2	H	1	MET
2	H	14	VAL
2	H	16	LYS
2	H	19	LEU
2	H	30	ASP
2	H	32	TYR
2	H	35	THR
2	H	49	GLU
2	H	51	CYS
2	H	52	LEU

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Mol	Chain	Res	Type
2	H	54	ASP
2	H	62	GLU
2	H	73	ARG
2	H	87	THR
2	H	88	LYS
2	H	102	ARG
2	H	104	LYS
2	H	106	SER
2	H	107	ASP
2	H	109	VAL
2	H	119	ASP
2	H	120	LEU
2	H	126	GLU
2	H	128	ARG
2	H	136	SER
2	H	148	THR
2	H	158	THR
2	E	1	MET
2	E	2	THR
2	E	3	GLU
2	E	14	VAL
2	E	21	ILE
2	E	27	HIS
2	E	30	ASP
2	E	35	THR
2	E	37	GLU
2	E	39	SER
2	E	49	GLU
2	E	51	CYS
2	E	54	ASP
2	E	62	GLU
2	E	63	GLU
2	E	65	SER
2	E	68	ARG
2	E	72	MET
2	E	79	LEU
2	E	87	THR
2	E	99	GLN
2	E	107	ASP
2	E	123	ARG
2	E	136	SER
2	E	139	ILE

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Mol	Chain	Res	Type
2	E	153	GLU
2	E	162	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (28) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	106	GLN
1	A	242	GLN
1	A	265	HIS
1	A	268	HIS
1	B	45	HIS
1	B	57	GLN
1	B	100	ASN
1	B	115	ASN
1	B	158	GLN
1	B	242	GLN
1	B	265	HIS
1	C	20	GLN
1	C	80	ASN
1	C	100	ASN
1	C	242	GLN
1	C	265	HIS
1	D	238	HIS
1	D	240	HIS
1	D	242	GLN
2	F	27	HIS
2	F	129	GLN
2	G	94	HIS
2	G	99	GLN
2	G	129	GLN
2	H	27	HIS
2	E	27	HIS
2	E	61	GLN
2	E	129	GLN

5.3.3 RNA (i)

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 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	$\#\|Z\| > 2$
3	GNP	E	201	4	29,34,34	1.45	6 (20%)	33,54,54	2.15	9 (27%)
3	GNP	G	201	4	29,34,34	1.34	3 (10%)	33,54,54	2.34	9 (27%)
3	GNP	H	201	4	29,34,34	1.31	3 (10%)	33,54,54	2.39	9 (27%)
3	GNP	F	201	4	29,34,34	1.44	4 (13%)	33,54,54	2.34	7 (21%)

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	E	201	4	-	5/14/38/38	0/3/3/3
3	GNP	G	201	4	-	5/14/38/38	0/3/3/3
3	GNP	H	201	4	-	4/14/38/38	0/3/3/3
3	GNP	F	201	4	-	7/14/38/38	0/3/3/3

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	201	GNP	C6-N1	4.14	1.40	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	201	GNP	C6-N1	4.10	1.40	1.33
3	H	201	GNP	C6-N1	4.03	1.40	1.33
3	E	201	GNP	C6-N1	3.98	1.40	1.33
3	E	201	GNP	PG-O1G	3.46	1.51	1.46
3	H	201	GNP	PG-O1G	3.45	1.51	1.46
3	G	201	GNP	PG-O1G	3.11	1.51	1.46
3	F	201	GNP	PG-O1G	2.99	1.50	1.46
3	F	201	GNP	PB-O1B	2.56	1.50	1.46
3	F	201	GNP	PB-O2B	-2.55	1.49	1.56
3	E	201	GNP	PB-O2B	-2.39	1.50	1.56
3	E	201	GNP	PB-O1B	2.24	1.49	1.46
3	H	201	GNP	PB-O2B	-2.21	1.50	1.56
3	G	201	GNP	PB-O1B	2.05	1.49	1.46
3	E	201	GNP	PB-O3A	2.04	1.61	1.59
3	E	201	GNP	PG-O2G	-2.04	1.51	1.56

All (34) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	F	201	GNP	C5-C6-N1	-8.98	111.15	123.43
3	G	201	GNP	C5-C6-N1	-8.38	111.97	123.43
3	H	201	GNP	C5-C6-N1	-8.36	111.99	123.43
3	E	201	GNP	C5-C6-N1	-8.13	112.32	123.43
3	F	201	GNP	C2-N1-C6	5.93	125.35	115.93
3	G	201	GNP	C2-N1-C6	5.66	124.92	115.93
3	H	201	GNP	C2-N1-C6	5.63	124.88	115.93
3	E	201	GNP	C2-N1-C6	5.32	124.38	115.93
3	H	201	GNP	PB-O3A-PA	-4.57	116.51	132.62
3	G	201	GNP	PB-O3A-PA	-3.79	119.28	132.62
3	F	201	GNP	O2G-PG-O1G	-3.67	104.22	113.45
3	G	201	GNP	O2B-PB-O1B	3.62	117.50	109.92
3	F	201	GNP	PB-O3A-PA	-3.46	120.44	132.62
3	H	201	GNP	O1B-PB-N3B	-3.08	107.24	111.77
3	G	201	GNP	O1B-PB-N3B	-3.05	107.28	111.77
3	G	201	GNP	N3-C2-N1	-3.01	123.21	127.22
3	H	201	GNP	O2B-PB-O1B	2.97	116.15	109.92
3	H	201	GNP	N3-C2-N1	-2.90	123.36	127.22
3	H	201	GNP	O2G-PG-O1G	-2.87	106.25	113.45
3	F	201	GNP	O2B-PB-O1B	2.85	115.90	109.92
3	F	201	GNP	N3-C2-N1	-2.79	123.50	127.22
3	E	201	GNP	O2B-PB-O1B	2.77	115.72	109.92
3	E	201	GNP	N3-C2-N1	-2.61	123.75	127.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	F	201	GNP	C2-N3-C4	-2.58	112.41	115.36
3	E	201	GNP	C3'-C2'-C1'	2.49	104.72	100.98
3	E	201	GNP	O3G-PG-O1G	-2.34	107.57	113.45
3	E	201	GNP	O2G-PG-O1G	-2.25	107.79	113.45
3	G	201	GNP	O3G-PG-O1G	-2.24	107.83	113.45
3	H	201	GNP	O3G-PG-O1G	-2.14	108.07	113.45
3	E	201	GNP	PB-O3A-PA	-2.09	125.26	132.62
3	H	201	GNP	C2-N3-C4	-2.08	112.98	115.36
3	G	201	GNP	C2-N3-C4	-2.08	112.99	115.36
3	G	201	GNP	O1G-PG-N3B	-2.06	108.73	111.77
3	E	201	GNP	C2-N3-C4	-2.01	113.06	115.36

There are no chirality outliers.

All (21) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	F	201	GNP	PB-N3B-PG-O1G
3	F	201	GNP	PG-N3B-PB-O1B
3	F	201	GNP	PA-O3A-PB-O1B
3	F	201	GNP	PA-O3A-PB-O2B
3	G	201	GNP	PB-N3B-PG-O1G
3	G	201	GNP	PG-N3B-PB-O1B
3	G	201	GNP	PA-O3A-PB-O1B
3	G	201	GNP	PA-O3A-PB-O2B
3	G	201	GNP	C5'-O5'-PA-O1A
3	H	201	GNP	PB-N3B-PG-O1G
3	H	201	GNP	PG-N3B-PB-O1B
3	H	201	GNP	PA-O3A-PB-O1B
3	H	201	GNP	PA-O3A-PB-O2B
3	E	201	GNP	PB-N3B-PG-O1G
3	E	201	GNP	PG-N3B-PB-O1B
3	E	201	GNP	PA-O3A-PB-O2B
3	F	201	GNP	C3'-C4'-C5'-O5'
3	F	201	GNP	O4'-C4'-C5'-O5'
3	E	201	GNP	O4'-C4'-C5'-O5'
3	E	201	GNP	C3'-C4'-C5'-O5'
3	F	201	GNP	C5'-O5'-PA-O1A

There are no ring outliers.

4 monomers are involved in 35 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	201	GNP	6	0
3	G	201	GNP	12	0
3	H	201	GNP	13	0
3	F	201	GNP	4	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 201

Ligand GNP G 201

Bond lengths

Bond angles

Torsions

Rings

Ligand GNP H 201

Bond lengths

Bond angles

Torsions

Rings

Ligand GNP F 201

Bond lengths

Bond angles

Torsions

Rings
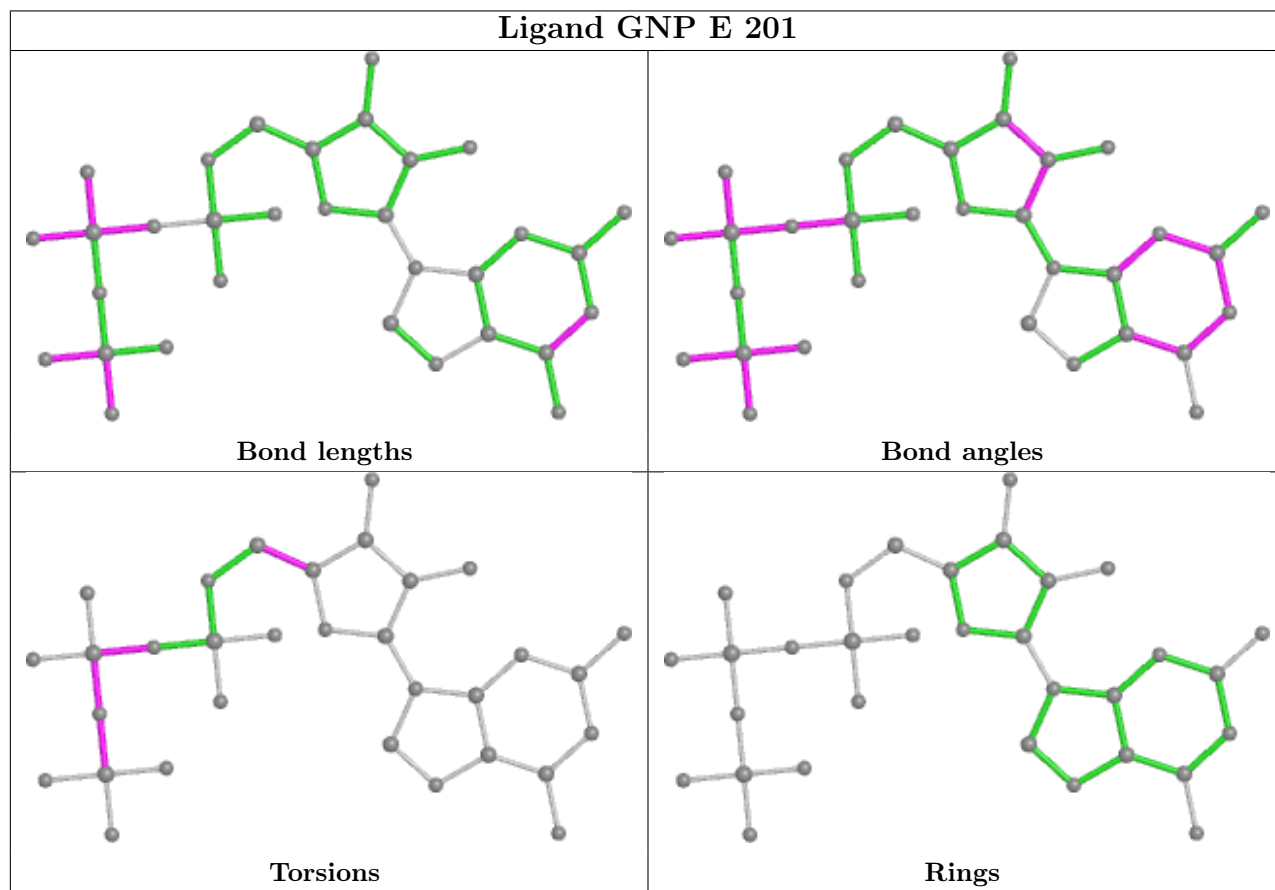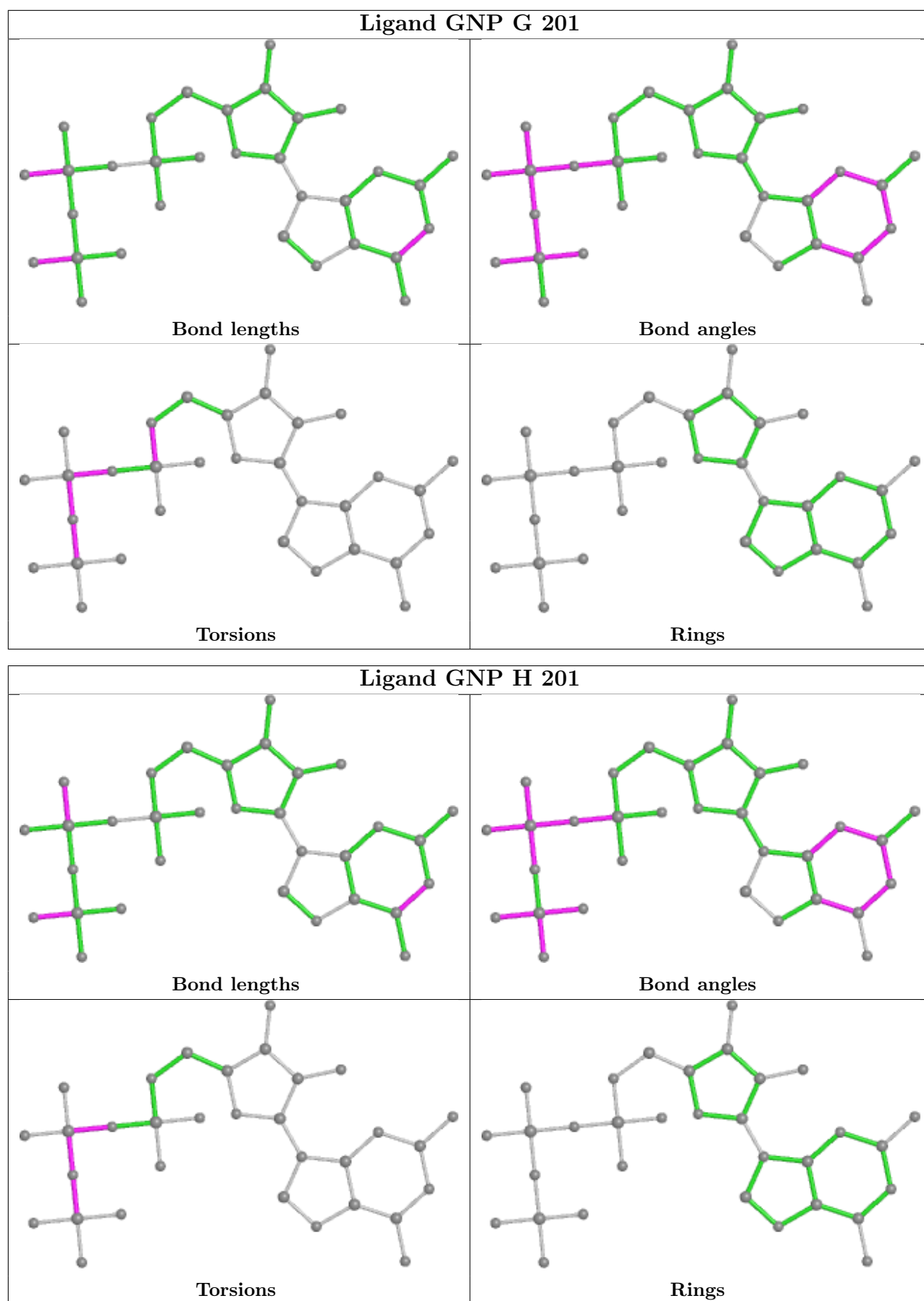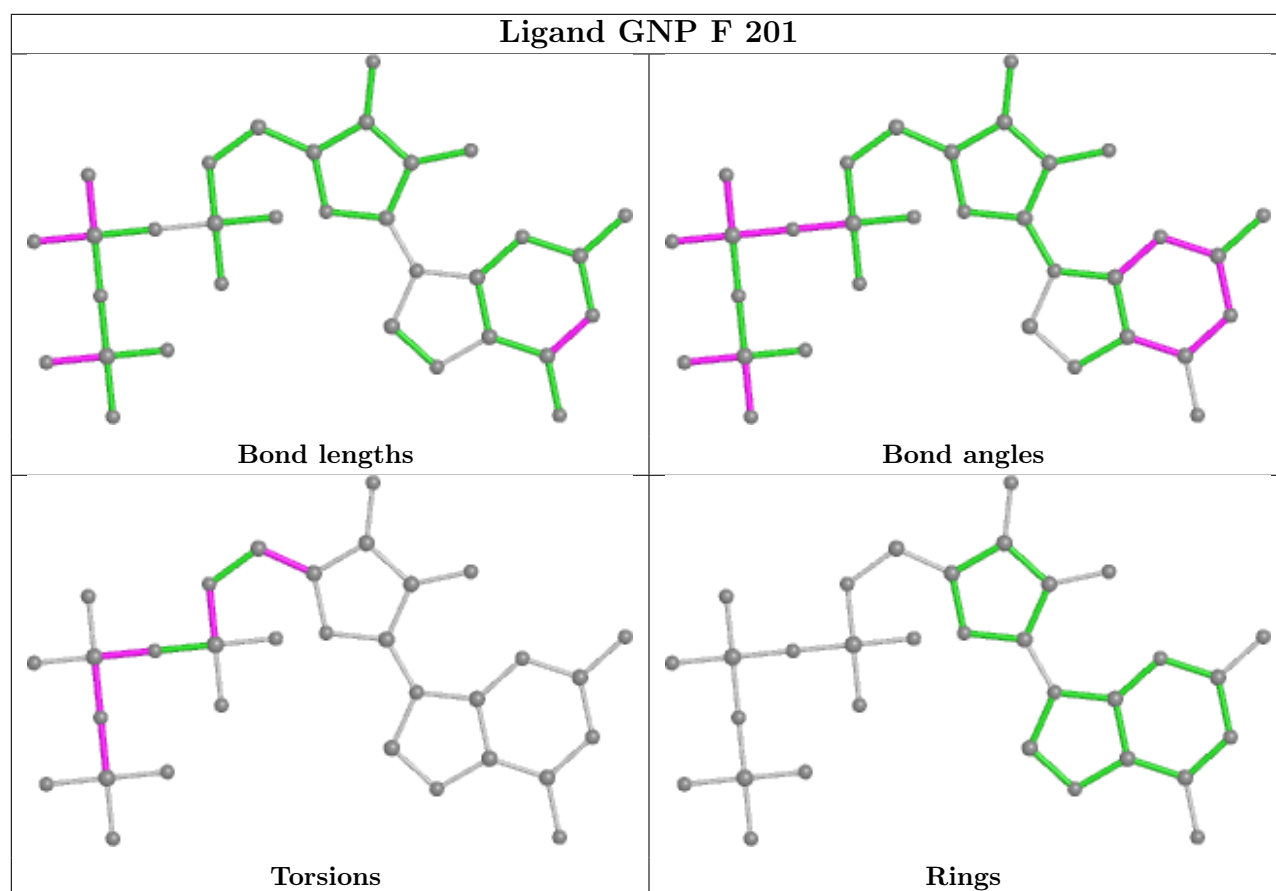
5.7 Other polymers ⓘ

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(Å²)	Q<0.9
1	A	349/361 (96%)	-0.21	2 (0%)	89	90	23, 42, 82, 118	0
1	B	349/361 (96%)	-0.18	1 (0%)	94	94	23, 43, 82, 125	0
1	C	349/361 (96%)	-0.17	2 (0%)	89	90	26, 48, 95, 133	0
1	D	349/361 (96%)	-0.14	3 (0%)	84	84	25, 48, 94, 134	0
2	E	166/171 (97%)	0.20	2 (1%)	79	78	40, 77, 106, 126	0
2	F	167/171 (97%)	0.07	3 (1%)	68	67	37, 69, 102, 126	0
2	G	166/171 (97%)	0.02	0	100	100	39, 66, 92, 117	0
2	H	166/171 (97%)	0.10	4 (2%)	59	56	42, 71, 95, 126	0
All	All	2061/2128 (96%)	-0.09	17 (0%)	86	86	23, 53, 97, 134	0

All (17) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	H	1	MET	4.0
2	H	50	THR	3.8
2	H	51	CYS	3.5
1	D	99	GLN	3.2
1	C	100	ASN	3.1
2	F	31	GLU	2.9
2	E	29	VAL	2.7
1	B	133	ARG	2.5
2	F	167	LYS	2.4
2	F	32	TYR	2.4
2	E	84	ILE	2.3
1	D	100	ASN	2.3
1	A	133	ARG	2.1
1	D	97	TYR	2.1
2	H	128	ARG	2.0
1	C	99	GLN	2.0

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Mol	Chain	Res	Type	RSRZ
1	A	62	GLY	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
3	GNP	E	201	32/32	0.95	0.19	60,80,89,93	0
4	MG	F	202	1/1	0.95	0.05	63,63,63,63	0
3	GNP	F	201	32/32	0.96	0.21	57,71,81,81	0
3	GNP	G	201	32/32	0.97	0.15	50,56,67,74	0
3	GNP	H	201	32/32	0.97	0.14	54,60,71,76	0
4	MG	E	202	1/1	0.97	0.05	60,60,60,60	0
4	MG	H	202	1/1	0.99	0.08	50,50,50,50	0
4	MG	G	202	1/1	0.99	0.07	42,42,42,42	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.

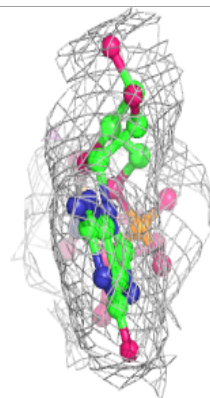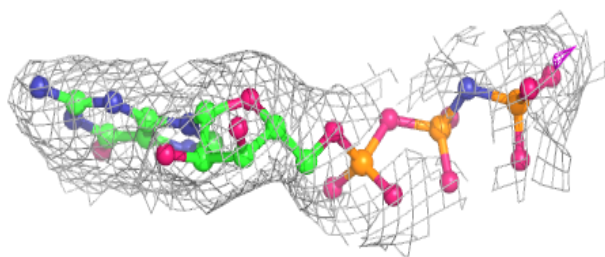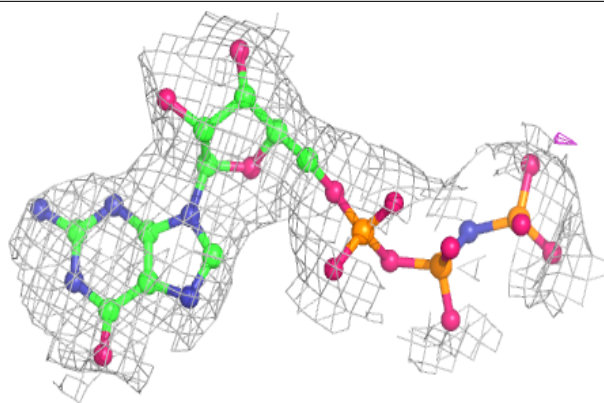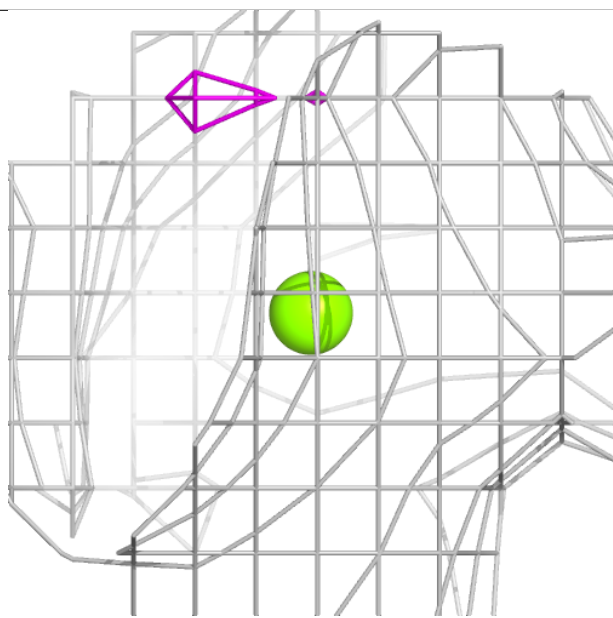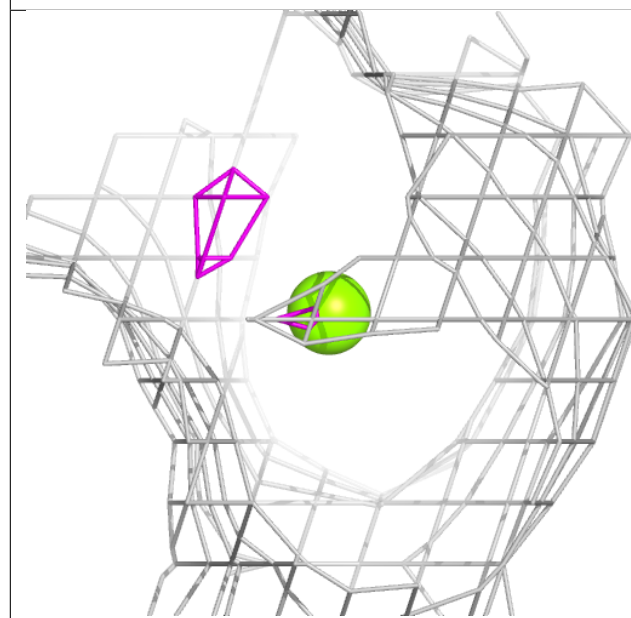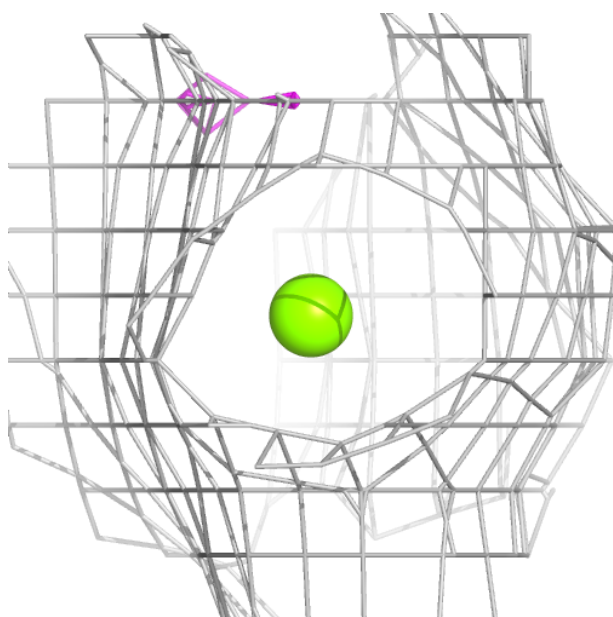**Electron density around GNP E 201:**

$2mF_o$-DF_c (at 0.7 rmsd) in gray
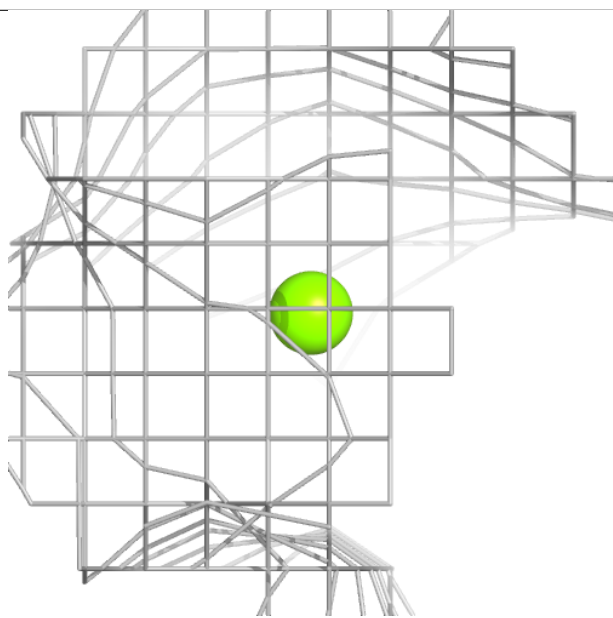mF_o-DF_c (at 3 rmsd) in purple (negative)
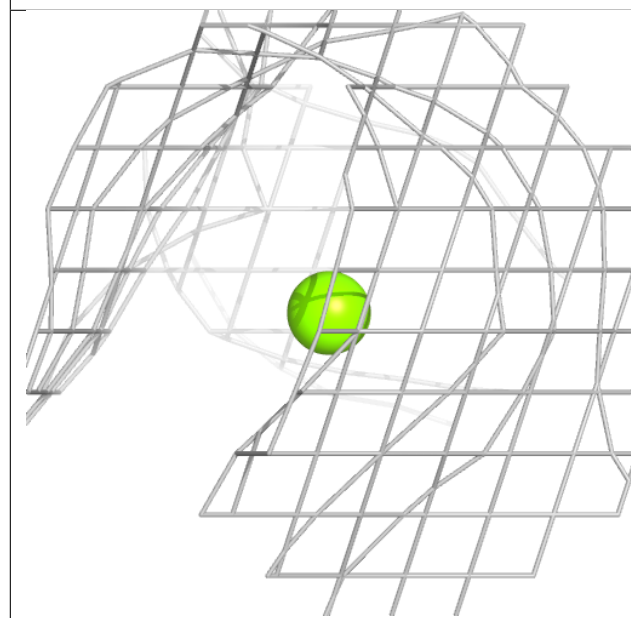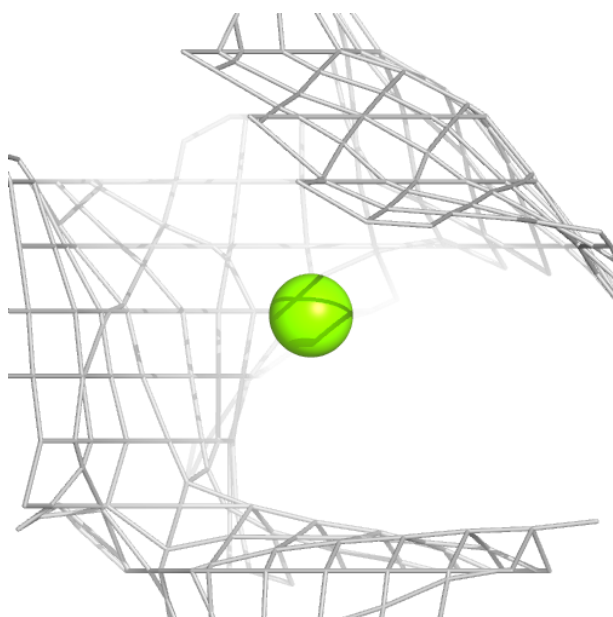and green (positive)
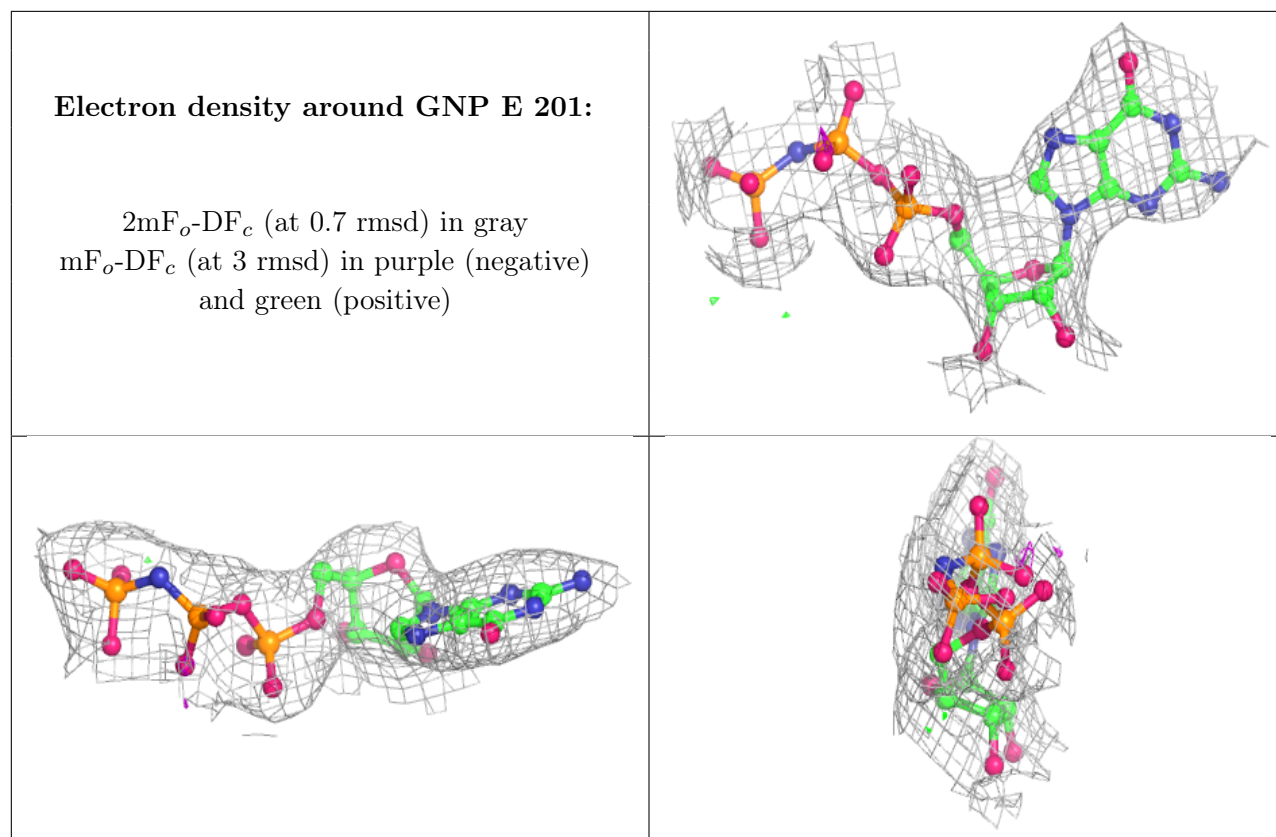
Electron density around MG F 202:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
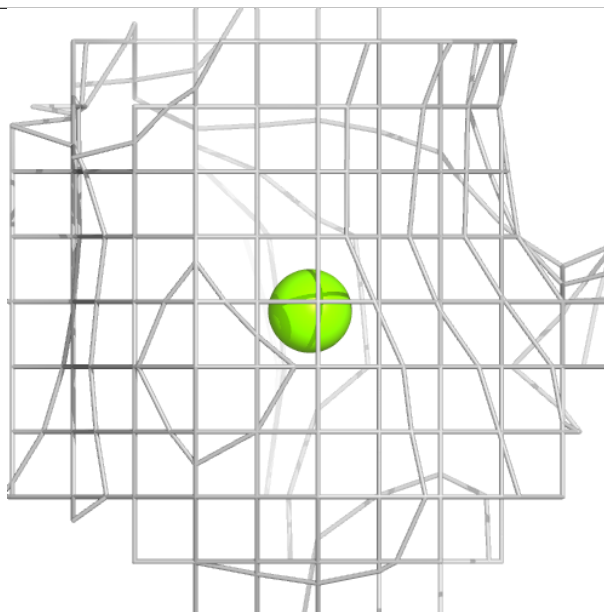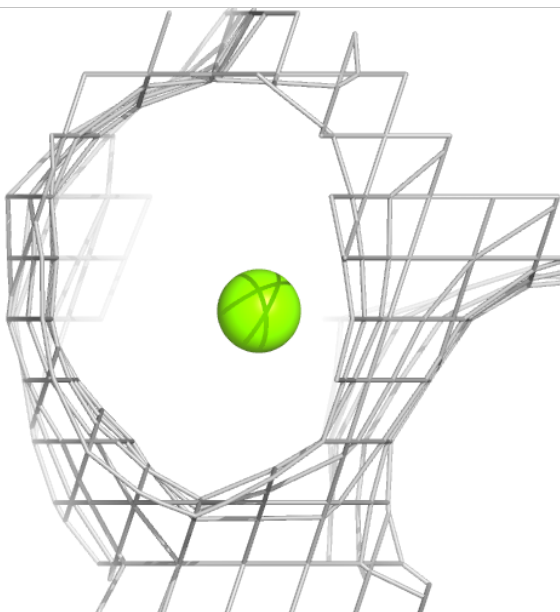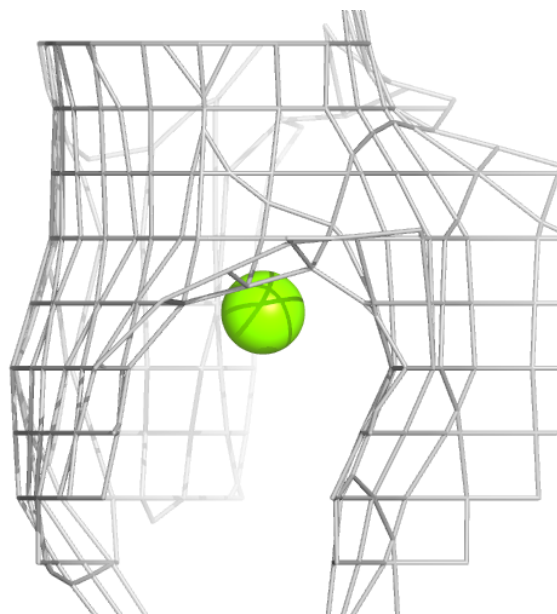
Electron density around GNP F 201:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
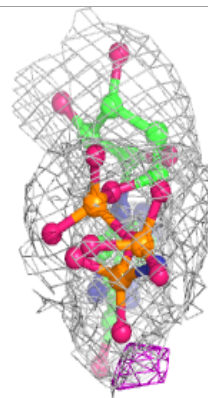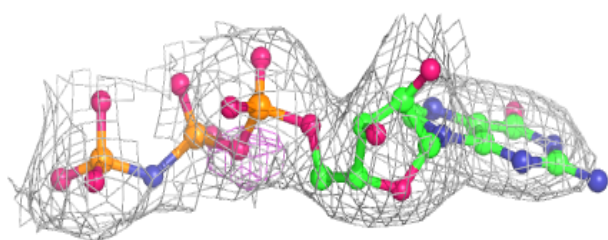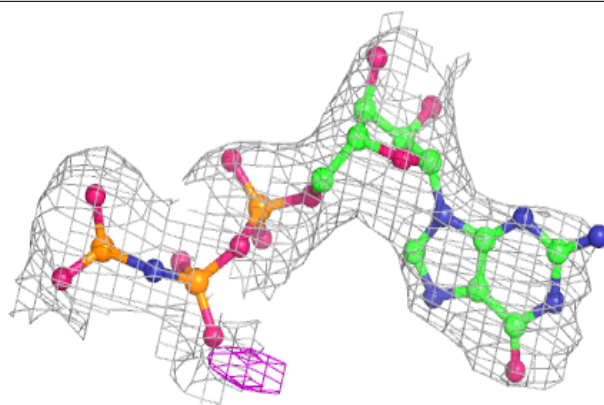
Electron density around GNP G 201:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
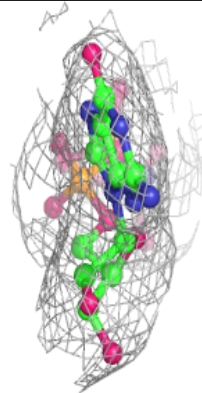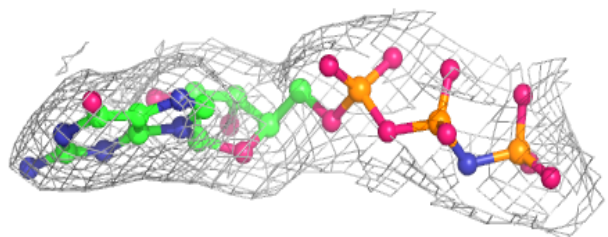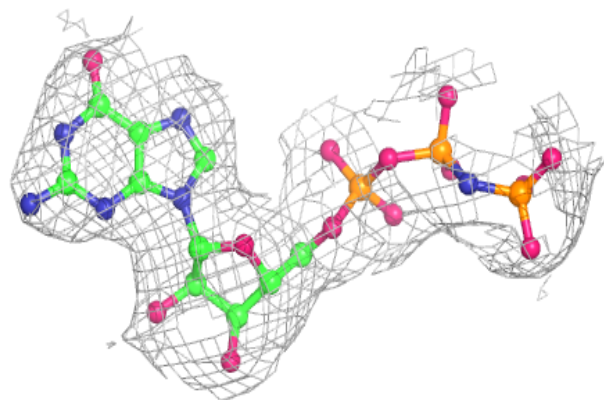
Electron density around GNP H 201:

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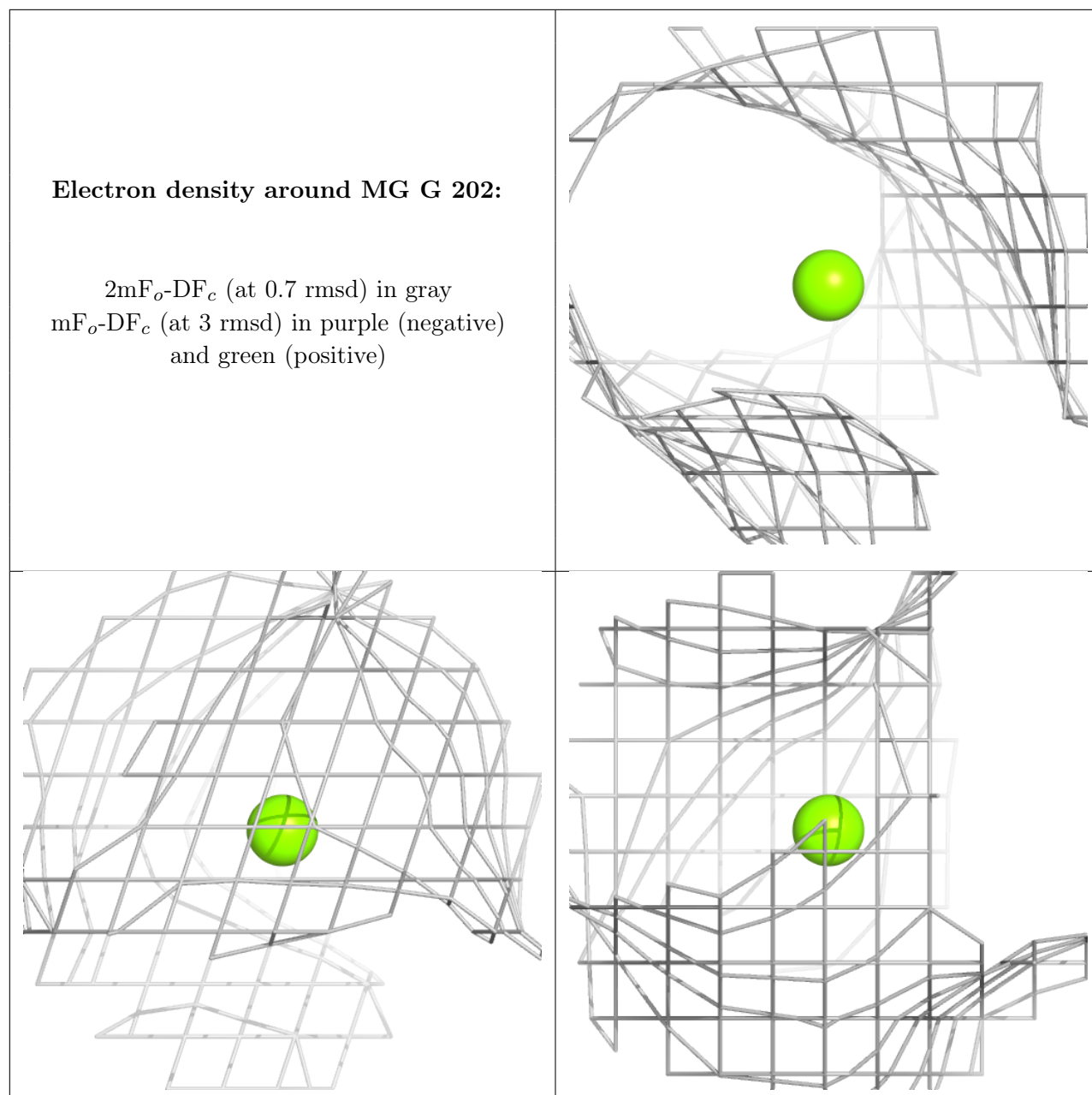and green (positive)

Electron density around MG E 202:

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

Electron density around MG H 202:

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

Electron density around MG G 202:

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

6.5　Other polymers ⓘ

There are no such residues in this entry.