Full wwPDB X-ray Structure Validation Report (i)

Nov 17, 2025 – 01:12 PM EST

PDB ID	:	9Z4X / pdb_00009z4x
Title	:	MENIN IN COMPLEX WITH JNJ-75276617 (Bleximenib)
Authors	:	Shaffer, P.L.
Deposited on	:	2025-11-11
Resolution	:	2.95 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

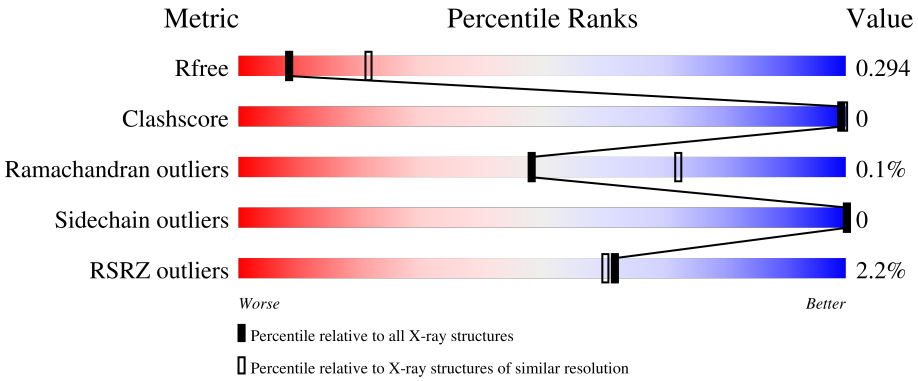
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.95 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1044 (2.98-2.94)
Clashscore	180529	1097 (2.98-2.94)
Ramachandran outliers	177936	1049 (2.98-2.94)
Sidechain outliers	177891	1049 (2.98-2.94)
RSRZ outliers	164620	1044 (2.98-2.94)

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	539	89% 10%
1	B	539	89% 11%
1	C	539	90% 10%
1	D	539	89% 10%

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 15547 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 Menin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	484	Total	C	N	O	S	159	0	0
			3814	2443	653	704	14			
1	B	482	Total	C	N	O	S	158	0	0
			3803	2436	651	702	14			
1	C	486	Total	C	N	O	S	155	0	0
			3827	2451	656	706	14			
1	D	484	Total	C	N	O	S	167	0	0
			3812	2442	653	703	14			

There are 296 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	GLY	-	expression tag	UNP O00255
A	1	SER	-	expression tag	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	ARG	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
A	?	-	GLY	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	GLN	deletion	UNP O00255
A	?	-	SER	deletion	UNP O00255
A	?	-	GLN	deletion	UNP O00255
A	?	-	GLY	deletion	UNP O00255
A	?	-	THR	deletion	UNP O00255
A	?	-	GLN	deletion	UNP O00255
A	?	-	ARG	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	ALA	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	ALA	deletion	UNP O00255
A	?	-	ALA	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255

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Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	ALA	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
A	?	-	TRP	deletion	UNP O00255
A	?	-	GLY	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	ALA	deletion	UNP O00255
A	?	-	ARG	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	GLY	deletion	UNP O00255
A	?	-	ARG	deletion	UNP O00255
A	?	-	ARG	deletion	UNP O00255
A	?	-	ARG	deletion	UNP O00255
A	?	-	GLY	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
A	?	-	ARG	deletion	UNP O00255
A	?	-	ARG	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	SER	deletion	UNP O00255
A	?	-	LYS	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	GLU	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
A	?	-	LYS	deletion	UNP O00255
A	?	-	LYS	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
A	?	-	ALA	deletion	UNP O00255
A	?	-	LEU	deletion	UNP O00255
A	?	-	ASP	deletion	UNP O00255
A	?	-	LYS	deletion	UNP O00255
A	?	-	GLY	deletion	UNP O00255
A	?	-	LEU	deletion	UNP O00255
A	?	-	GLY	deletion	UNP O00255
A	?	-	THR	deletion	UNP O00255
A	?	-	GLY	deletion	UNP O00255
A	?	-	GLN	deletion	UNP O00255

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Chain	Residue	Modelled	Actual	Comment	Reference
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A	?	-	ALA	deletion	UNP O00255
A	?	-	VAL	deletion	UNP O00255
A	?	-	SER	deletion	UNP O00255
A	?	-	GLY	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
A	?	-	ARG	deletion	UNP O00255
A	?	-	LYS	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
A	?	-	PRO	deletion	UNP O00255
B	0	GLY	-	expression tag	UNP O00255
B	1	SER	-	expression tag	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	ARG	deletion	UNP O00255
B	?	-	PRO	deletion	UNP O00255
B	?	-	GLY	deletion	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	GLN	deletion	UNP O00255
B	?	-	SER	deletion	UNP O00255
B	?	-	GLN	deletion	UNP O00255
B	?	-	GLY	deletion	UNP O00255
B	?	-	THR	deletion	UNP O00255
B	?	-	GLN	deletion	UNP O00255
B	?	-	ARG	deletion	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	ALA	deletion	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	ALA	deletion	UNP O00255
B	?	-	ALA	deletion	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	ALA	deletion	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	PRO	deletion	UNP O00255
B	?	-	TRP	deletion	UNP O00255
B	?	-	GLY	deletion	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	ALA	deletion	UNP O00255
B	?	-	ARG	deletion	UNP O00255

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Chain	Residue	Modelled	Actual	Comment	Reference
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B	?	-	GLY	deletion	UNP O00255
B	?	-	ARG	deletion	UNP O00255
B	?	-	ARG	deletion	UNP O00255
B	?	-	ARG	deletion	UNP O00255
B	?	-	GLY	deletion	UNP O00255
B	?	-	PRO	deletion	UNP O00255
B	?	-	ARG	deletion	UNP O00255
B	?	-	ARG	deletion	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	SER	deletion	UNP O00255
B	?	-	LYS	deletion	UNP O00255
B	?	-	PRO	deletion	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	GLU	deletion	UNP O00255
B	?	-	PRO	deletion	UNP O00255
B	?	-	PRO	deletion	UNP O00255
B	?	-	PRO	deletion	UNP O00255
B	?	-	PRO	deletion	UNP O00255
B	?	-	LYS	deletion	UNP O00255
B	?	-	LYS	deletion	UNP O00255
B	?	-	PRO	deletion	UNP O00255
B	?	-	ALA	deletion	UNP O00255
B	?	-	LEU	deletion	UNP O00255
B	?	-	ASP	deletion	UNP O00255
B	?	-	LYS	deletion	UNP O00255
B	?	-	GLY	deletion	UNP O00255
B	?	-	LEU	deletion	UNP O00255
B	?	-	GLY	deletion	UNP O00255
B	?	-	THR	deletion	UNP O00255
B	?	-	GLY	deletion	UNP O00255
B	?	-	GLN	deletion	UNP O00255
B	?	-	GLY	deletion	UNP O00255
B	?	-	ALA	deletion	UNP O00255
B	?	-	VAL	deletion	UNP O00255
B	?	-	SER	deletion	UNP O00255
B	?	-	GLY	deletion	UNP O00255
B	?	-	PRO	deletion	UNP O00255
B	?	-	PRO	deletion	UNP O00255
B	?	-	ARG	deletion	UNP O00255
B	?	-	LYS	deletion	UNP O00255
B	?	-	PRO	deletion	UNP O00255

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Chain	Residue	Modelled	Actual	Comment	Reference
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C	1	SER	-	expression tag	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	ARG	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
C	?	-	GLY	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	GLN	deletion	UNP O00255
C	?	-	SER	deletion	UNP O00255
C	?	-	GLN	deletion	UNP O00255
C	?	-	GLY	deletion	UNP O00255
C	?	-	THR	deletion	UNP O00255
C	?	-	GLN	deletion	UNP O00255
C	?	-	ARG	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	ALA	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	ALA	deletion	UNP O00255
C	?	-	ALA	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	ALA	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
C	?	-	TRP	deletion	UNP O00255
C	?	-	GLY	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	ALA	deletion	UNP O00255
C	?	-	ARG	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	GLY	deletion	UNP O00255
C	?	-	ARG	deletion	UNP O00255
C	?	-	ARG	deletion	UNP O00255
C	?	-	ARG	deletion	UNP O00255
C	?	-	GLY	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
C	?	-	ARG	deletion	UNP O00255
C	?	-	ARG	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255

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Chain	Residue	Modelled	Actual	Comment	Reference
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C	?	-	LYS	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	GLU	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
C	?	-	LYS	deletion	UNP O00255
C	?	-	LYS	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
C	?	-	ALA	deletion	UNP O00255
C	?	-	LEU	deletion	UNP O00255
C	?	-	ASP	deletion	UNP O00255
C	?	-	LYS	deletion	UNP O00255
C	?	-	GLY	deletion	UNP O00255
C	?	-	LEU	deletion	UNP O00255
C	?	-	GLY	deletion	UNP O00255
C	?	-	THR	deletion	UNP O00255
C	?	-	GLY	deletion	UNP O00255
C	?	-	GLN	deletion	UNP O00255
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C	?	-	ALA	deletion	UNP O00255
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C	?	-	SER	deletion	UNP O00255
C	?	-	GLY	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
C	?	-	ARG	deletion	UNP O00255
C	?	-	LYS	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
C	?	-	PRO	deletion	UNP O00255
D	0	GLY	-	expression tag	UNP O00255
D	1	SER	-	expression tag	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	ARG	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255
D	?	-	GLY	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	GLN	deletion	UNP O00255

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Chain	Residue	Modelled	Actual	Comment	Reference
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D	?	-	GLN	deletion	UNP O00255
D	?	-	GLY	deletion	UNP O00255
D	?	-	THR	deletion	UNP O00255
D	?	-	GLN	deletion	UNP O00255
D	?	-	ARG	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	ALA	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	ALA	deletion	UNP O00255
D	?	-	ALA	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	ALA	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255
D	?	-	TRP	deletion	UNP O00255
D	?	-	GLY	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	ALA	deletion	UNP O00255
D	?	-	ARG	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	GLY	deletion	UNP O00255
D	?	-	ARG	deletion	UNP O00255
D	?	-	ARG	deletion	UNP O00255
D	?	-	ARG	deletion	UNP O00255
D	?	-	GLY	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255
D	?	-	ARG	deletion	UNP O00255
D	?	-	ARG	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	SER	deletion	UNP O00255
D	?	-	LYS	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	GLU	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255
D	?	-	LYS	deletion	UNP O00255

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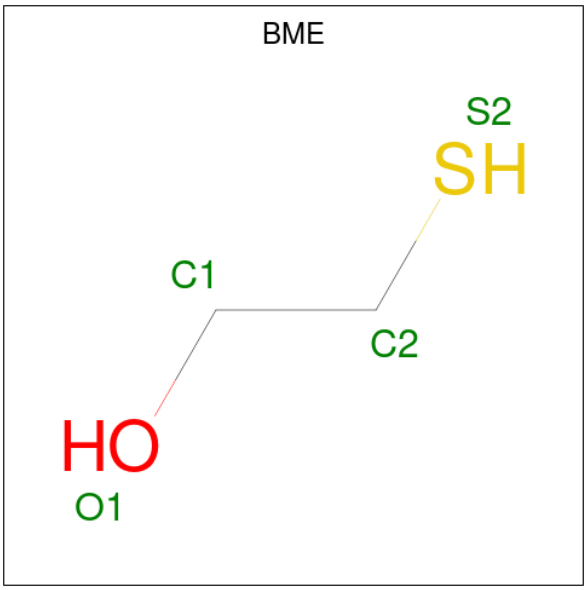
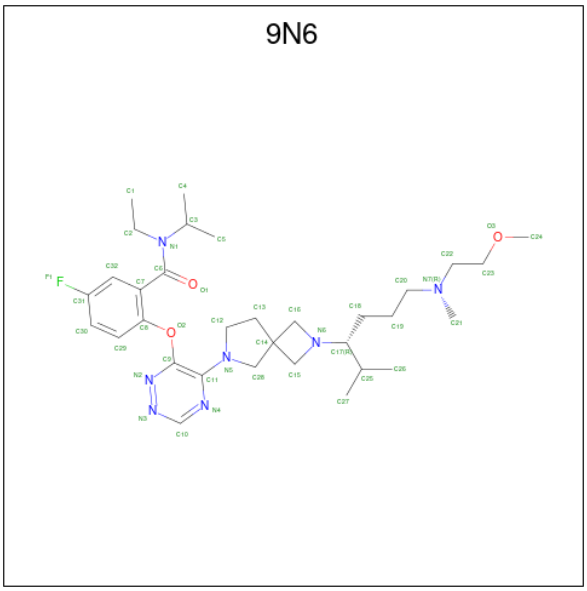
Chain	Residue	Modelled	Actual	Comment	Reference
D	?	-	LYS	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255
D	?	-	ALA	deletion	UNP O00255
D	?	-	LEU	deletion	UNP O00255
D	?	-	ASP	deletion	UNP O00255
D	?	-	LYS	deletion	UNP O00255
D	?	-	GLY	deletion	UNP O00255
D	?	-	LEU	deletion	UNP O00255
D	?	-	GLY	deletion	UNP O00255
D	?	-	THR	deletion	UNP O00255
D	?	-	GLY	deletion	UNP O00255
D	?	-	GLN	deletion	UNP O00255
D	?	-	GLY	deletion	UNP O00255
D	?	-	ALA	deletion	UNP O00255
D	?	-	VAL	deletion	UNP O00255
D	?	-	SER	deletion	UNP O00255
D	?	-	GLY	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255
D	?	-	ARG	deletion	UNP O00255
D	?	-	LYS	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255
D	?	-	PRO	deletion	UNP O00255

- Molecule 2 is BETA-MERCAPTOETHANOL (CCD ID: BME) (formula: C_2H_6OS).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O S 4 2 1 1	0	0
2	B	1	Total C O S 4 2 1 1	0	0

- Molecule 3 is N-ethyl-5-fluoro-2-{[5-(2-{(3R)-6-[(2-methoxyethyl)(methyl)amino]-2-methylhexan-3-yl}-2,6-diazaspiro[3.4]octan-6-yl)-1,2,4-triazin-6-yl]oxy}-N-(propan-2-yl)benzamide (CCD ID: 9N6) (formula: $C_{32}H_{50}FN_7O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C F N O 43 32 1 7 3	3	0
3	B	1	Total C F N O 43 32 1 7 3	3	0
3	C	1	Total C F N O 43 32 1 7 3	3	0
3	D	1	Total C F N O 43 32 1 7 3	3	0

- Molecule 4 is SODIUM ION (CCD ID: NA) (formula: Na) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total Na 1 1	0	0
4	B	1	Total Na 1 1	0	0

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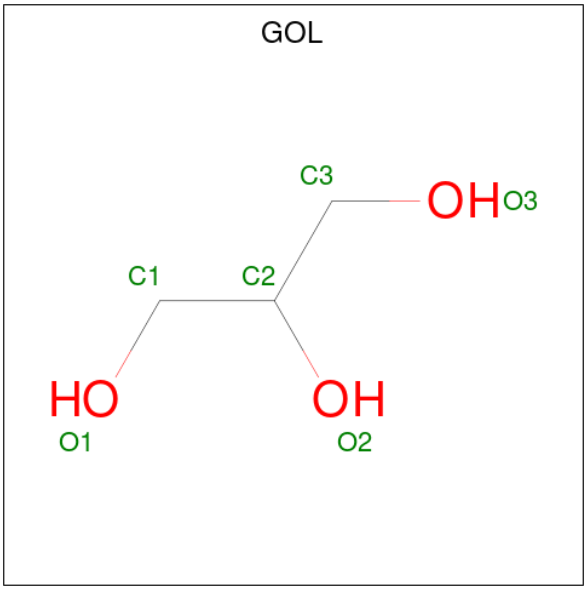
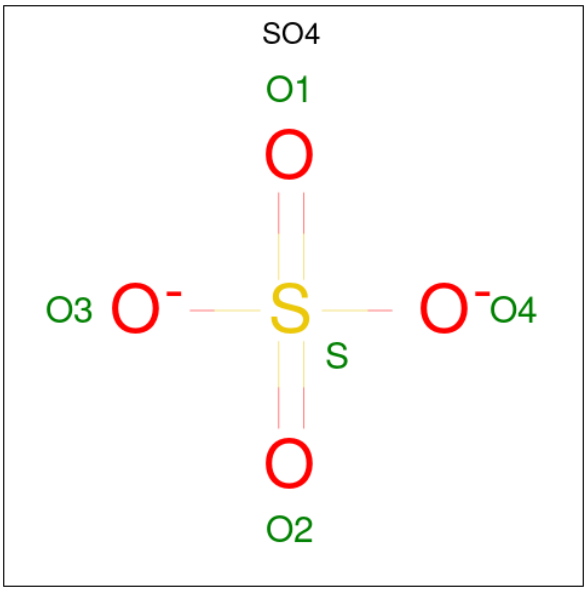
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	C	1	Total Na 1 1	0	0
4	D	1	Total Na 1 1	0	0

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 6 3 3	0	0
5	B	1	Total C O 6 3 3	0	0
5	B	1	Total C O 6 3 3	0	0

- Molecule 6 is SULFATE ION (CCD ID: SO4) (formula: O_4S).



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

- Molecule 7 is water.

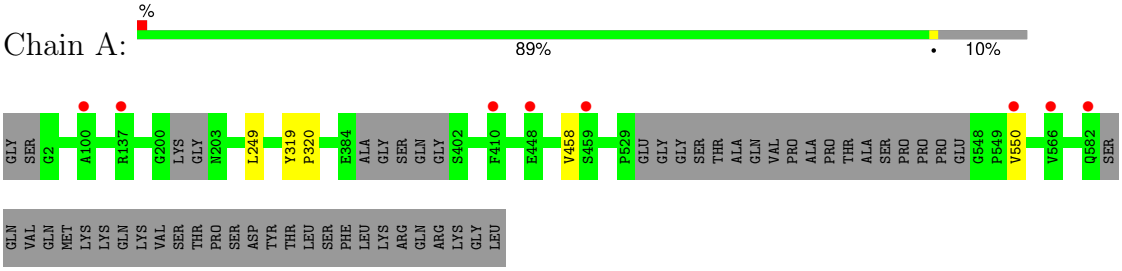
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	19	Total O 19 19	0	0
7	B	22	Total O 22 22	0	0
7	C	19	Total O 19 19	0	0
7	D	24	Total O 24 24	0	0

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.

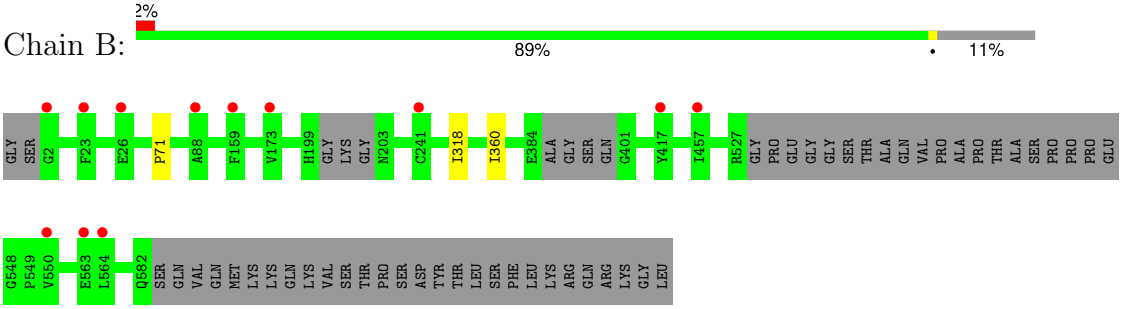
• Molecule 1: Menin

Chain A:



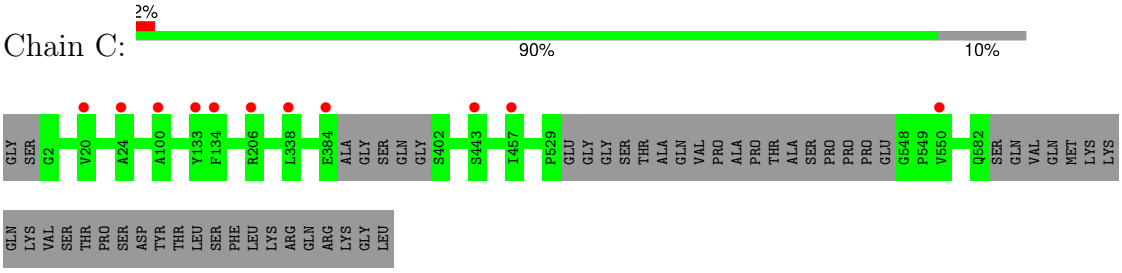
• Molecule 1: Menin

Chain B:



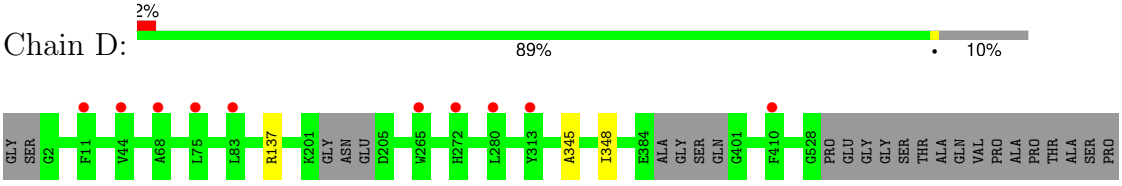
• Molecule 1: Menin

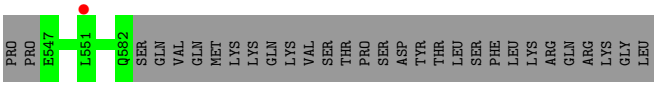
Chain C:



• Molecule 1: Menin

Chain D:




PRO
PRO
E547
L551
Q582
SER
GLN
VAL
GLN
MET
LYS
LYS
GLN
LYS
VAL
SER
THR
PRO
SER
ASP
TYR
THR
LEU
SER
PHE
LEU
LYS
ARG
GLN
ARG
LYS
GLY
LEU

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	143.37Å 70.49Å 145.56Å 90.00° 91.68° 90.00°	Depositor
Resolution (Å)	145.50 – 2.95 145.50 – 2.96	Depositor EDS
% Data completeness (in resolution range)	89.9 (145.50-2.95) 66.4 (145.50-2.96)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.16	Depositor
$< I/\sigma(I) >$ [1]	1.62 (at 2.96Å)	Xtriage
Refinement program	REFMAC 5.8.0049	Depositor
R, R_{free}	0.233 , 0.297 0.234 , 0.294	Depositor DCC
R_{free} test set	2014 reflections (3.27%)	wwPDB-VP
Wilson B-factor (Å^2)	75.1	Xtriage
Anisotropy	0.186	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 68.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	0.023 for l,k,-h 0.028 for h,-k,-l 0.024 for l,-k,h	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	15547	wwPDB-VP
Average B, all atoms (Å^2)	82.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.59% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: SO4, NA, BME, 9N6, GOL

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	0.56	0/3902	0.88	0/5300
1	B	0.55	0/3890	0.87	0/5283
1	C	0.56	0/3916	0.87	0/5319
1	D	0.58	1/3899 (0.0%)	0.88	0/5293
All	All	0.56	1/15607 (0.0%)	0.87	0/21195

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	137	ARG	NE-CZ	6.34	1.40	1.33

There are no bond angle outliers.

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	3814	0	3788	2	0
1	B	3803	0	3778	1	0
1	C	3827	0	3806	0	0
1	D	3812	0	3792	1	0
2	A	4	0	5	0	0
2	B	4	0	5	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	43	0	0	0	0
3	B	43	0	0	0	0
3	C	43	0	0	0	0
3	D	43	0	0	0	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
5	A	6	0	8	0	0
5	B	12	0	16	0	0
6	A	5	0	0	0	0
7	A	19	0	0	0	0
7	B	22	0	0	0	0
7	C	19	0	0	0	0
7	D	24	0	0	0	0
All	All	15547	0	15198	4	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 0.

All (4) 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:D:345:ALA:HA	1:D:348:ILE:HG22	1.97	0.47
1:B:318:ILE:HG21	1:B:360:ILE:HD11	1.96	0.47
1:A:458:VAL:HG22	1:A:550:VAL:HG13	2.00	0.42
1:A:319:TYR:N	1:A:320:PRO:HD2	2.37	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	476/539 (88%)	451 (95%)	24 (5%)	1 (0%)	44 67
1	B	474/539 (88%)	454 (96%)	19 (4%)	1 (0%)	44 67
1	C	480/539 (89%)	456 (95%)	24 (5%)	0	100 100
1	D	476/539 (88%)	447 (94%)	29 (6%)	0	100 100
All	All	1906/2156 (88%)	1808 (95%)	96 (5%)	2 (0%)	48 72

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	249	LEU
1	B	71	PRO

5.3.2 Protein sidechains (i)

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	407/451 (90%)	407 (100%)	0	100 100
1	B	406/451 (90%)	406 (100%)	0	100 100
1	C	408/451 (90%)	408 (100%)	0	100 100
1	D	406/451 (90%)	406 (100%)	0	100 100
All	All	1627/1804 (90%)	1627 (100%)	0	100 100

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

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

Mol	Chain	Res	Type
1	A	282	ASN
1	A	433	HIS
1	B	272	HIS
1	B	282	ASN
1	B	352	ASN
1	B	578	GLN

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Mol	Chain	Res	Type
1	C	244	ASN
1	C	258	GLN
1	C	272	HIS
1	C	282	ASN
1	C	328	HIS
1	D	258	GLN
1	D	282	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 14 ligands modelled in this entry, 4 are monoatomic - leaving 10 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	$\#\|Z\| > 2$
6	SO4	A	705	-	4,4,4	0.43	0	6,6,6	0.09	0
3	9N6	A	702	-	46,46,46	1.00	2 (4%)	45,65,65	1.85	10 (22%)
2	BME	B	701	-	3,3,3	0.31	0	2,2,2	0.35	0
3	9N6	C	701	-	46,46,46	0.98	2 (4%)	45,65,65	1.85	10 (22%)
5	GOL	B	705	-	5,5,5	0.36	0	5,5,5	0.60	0
5	GOL	A	704	-	5,5,5	0.32	0	5,5,5	0.22	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
3	9N6	B	702	-	46,46,46	1.01	2 (4%)	45,65,65	2.02	10 (22%)
3	9N6	D	701	-	46,46,46	1.04	2 (4%)	45,65,65	1.77	10 (22%)
5	GOL	B	704	-	5,5,5	0.29	0	5,5,5	0.14	0
2	BME	A	701	-	3,3,3	0.28	0	2,2,2	0.38	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	9N6	A	702	-	-	4/36/61/61	0/4/4/4
2	BME	B	701	-	-	1/1/1/1	-
3	9N6	C	701	-	-	5/36/61/61	0/4/4/4
5	GOL	B	705	-	-	2/4/4/4	-
5	GOL	A	704	-	-	0/4/4/4	-
3	9N6	B	702	-	-	5/36/61/61	0/4/4/4
3	9N6	D	701	-	-	4/36/61/61	0/4/4/4
5	GOL	B	704	-	-	2/4/4/4	-
2	BME	A	701	-	-	1/1/1/1	-

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	702	9N6	N3-N2	-3.31	1.29	1.34
3	B	702	9N6	N3-N2	-3.23	1.29	1.34
3	D	701	9N6	N3-N2	-3.22	1.29	1.34
3	C	701	9N6	N3-N2	-3.18	1.29	1.34
3	D	701	9N6	C9-N2	2.95	1.34	1.31
3	C	701	9N6	C9-N2	2.74	1.34	1.31
3	B	702	9N6	C9-N2	2.63	1.34	1.31
3	A	702	9N6	C9-N2	2.35	1.33	1.31

All (40) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	702	9N6	N4-C10-N3	-5.57	120.15	128.58
3	C	701	9N6	N4-C10-N3	-5.31	120.55	128.58
3	D	701	9N6	N4-C10-N3	-5.26	120.63	128.58
3	B	702	9N6	N4-C10-N3	-5.26	120.63	128.58

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	B	702	9N6	C7-C6-N1	5.24	125.03	117.85
3	B	702	9N6	C8-O2-C9	4.79	124.80	117.86
3	A	702	9N6	C10-N3-N2	4.72	121.24	117.20
3	B	702	9N6	C10-N3-N2	4.44	121.00	117.20
3	C	701	9N6	C10-N3-N2	4.25	120.84	117.20
3	D	701	9N6	C10-N4-C11	4.23	122.17	111.83
3	C	701	9N6	C7-C6-N1	4.23	123.64	117.85
3	C	701	9N6	C10-N4-C11	4.09	121.82	111.83
3	A	702	9N6	C10-N4-C11	4.08	121.80	111.83
3	B	702	9N6	C10-N4-C11	3.96	121.51	111.83
3	D	701	9N6	C10-N3-N2	3.94	120.57	117.20
3	D	701	9N6	C7-C6-N1	3.78	123.02	117.85
3	B	702	9N6	C28-N5-C11	-3.66	112.96	123.60
3	C	701	9N6	C8-O2-C9	3.60	123.07	117.86
3	C	701	9N6	C28-N5-C11	-3.57	113.21	123.60
3	A	702	9N6	C28-N5-C11	-3.26	114.11	123.60
3	A	702	9N6	O2-C9-C11	3.21	122.89	116.72
3	A	702	9N6	C7-C6-N1	3.19	122.21	117.85
3	D	701	9N6	C28-N5-C11	-3.15	114.44	123.60
3	D	701	9N6	O2-C9-C11	3.09	122.67	116.72
3	B	702	9N6	O1-C6-C7	-2.94	114.29	120.06
3	A	702	9N6	C8-O2-C9	2.91	122.07	117.86
3	B	702	9N6	O2-C9-C11	2.80	122.10	116.72
3	C	701	9N6	O2-C9-C11	2.70	121.92	116.72
3	D	701	9N6	C8-O2-C9	2.70	121.77	117.86
3	B	702	9N6	C30-C31-C32	-2.65	119.73	123.23
3	C	701	9N6	O1-C6-C7	-2.49	115.17	120.06
3	D	701	9N6	C30-C31-C32	-2.38	120.09	123.23
3	A	702	9N6	C12-C13-C14	-2.32	100.81	104.33
3	A	702	9N6	C30-C31-C32	-2.30	120.19	123.23
3	D	701	9N6	C9-N2-N3	2.19	122.21	119.01
3	D	701	9N6	O1-C6-C7	-2.13	115.88	120.06
3	A	702	9N6	C9-N2-N3	2.12	122.11	119.01
3	C	701	9N6	C9-N2-N3	2.07	122.04	119.01
3	C	701	9N6	C30-C31-C32	-2.04	120.53	123.23
3	B	702	9N6	C9-N2-N3	2.03	121.97	119.01

There are no chirality outliers.

All (24) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	702	9N6	C9-C11-N5-C28

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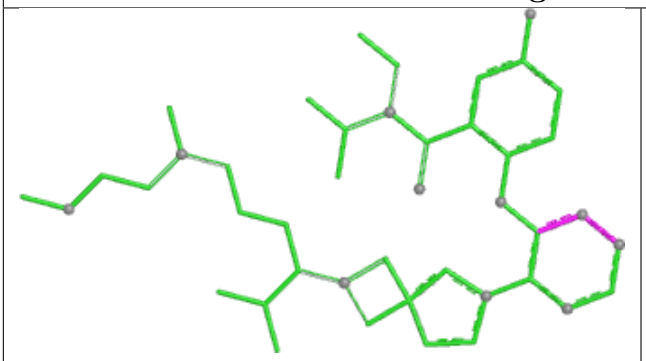
Mol	Chain	Res	Type	Atoms
3	A	702	9N6	N4-C11-N5-C28
3	B	702	9N6	C9-C11-N5-C28
3	B	702	9N6	N4-C11-N5-C28
3	B	702	9N6	C25-C17-C18-C19
3	C	701	9N6	C9-C11-N5-C28
3	C	701	9N6	N4-C11-N5-C28
3	D	701	9N6	C9-C11-N5-C28
3	D	701	9N6	N4-C11-N5-C28
5	B	705	GOL	O1-C1-C2-C3
5	B	704	GOL	O2-C2-C3-O3
3	D	701	9N6	N6-C17-C18-C19
5	B	704	GOL	C1-C2-C3-O3
3	C	701	9N6	C25-C17-C18-C19
3	D	701	9N6	C25-C17-C18-C19
3	C	701	9N6	N6-C17-C18-C19
3	A	702	9N6	N6-C17-C18-C19
3	B	702	9N6	N6-C17-C18-C19
5	B	705	GOL	O1-C1-C2-O2
2	A	701	BME	O1-C1-C2-S2
3	A	702	9N6	C25-C17-C18-C19
3	B	702	9N6	C22-C23-O3-C24
2	B	701	BME	O1-C1-C2-S2
3	C	701	9N6	C22-C23-O3-C24

There are no ring outliers.

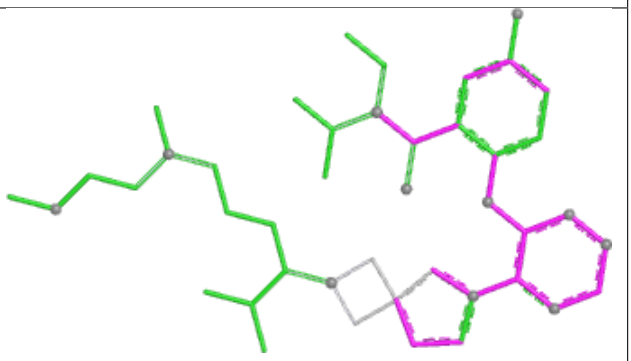
No monomer is involved in short contacts.

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.

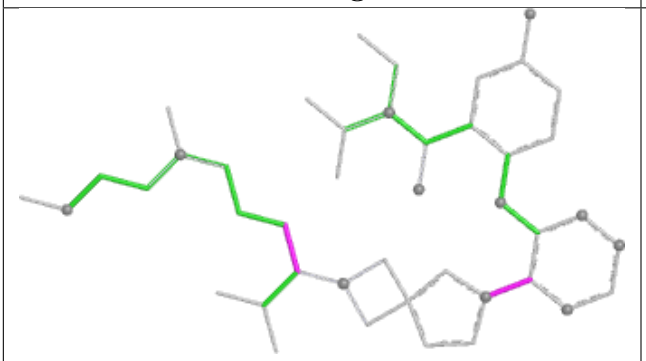
Ligand 9N6 A 702



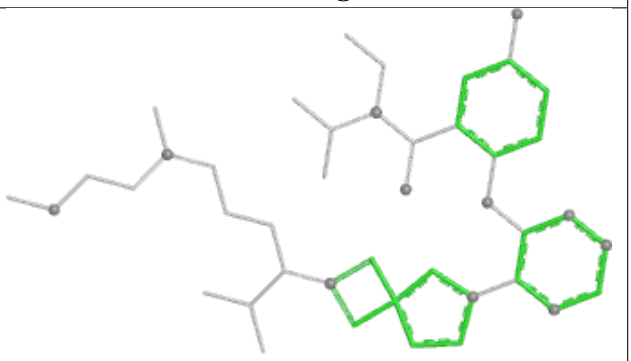
Bond lengths



Bond angles

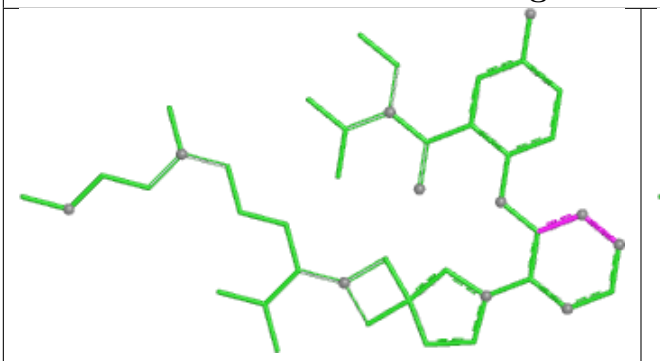


Torsions

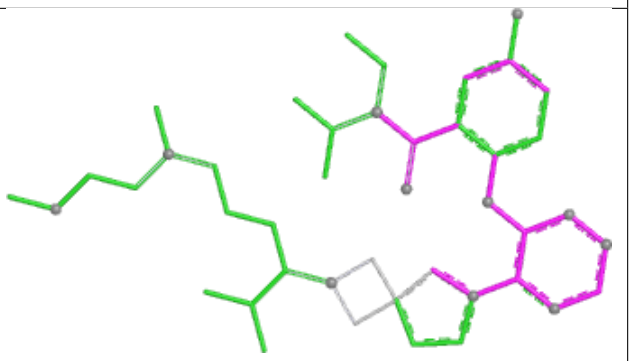


Rings

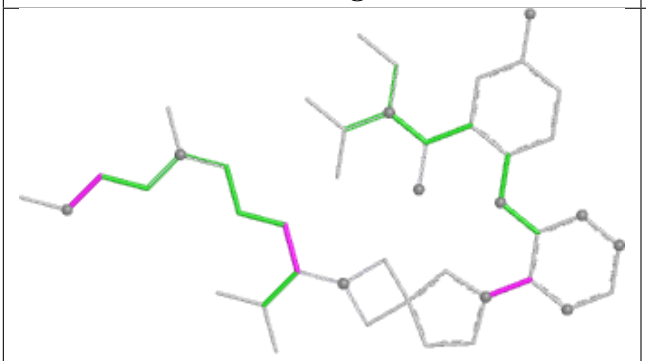
Ligand 9N6 C 701



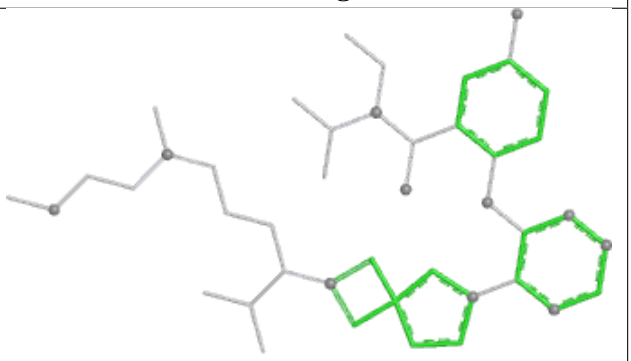
Bond lengths



Bond angles

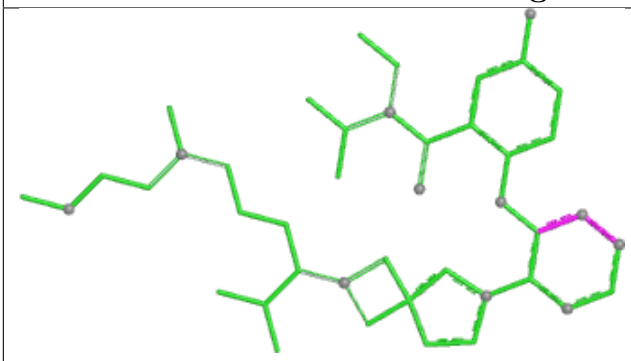


Torsions

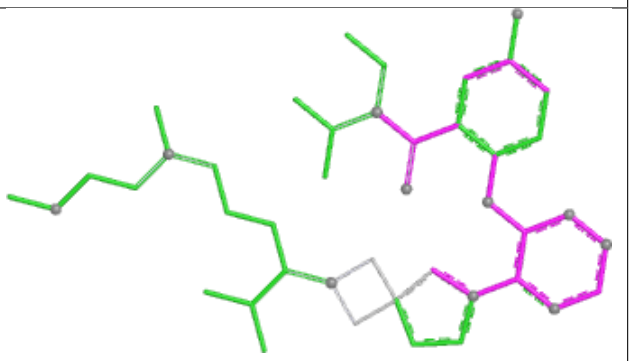


Rings

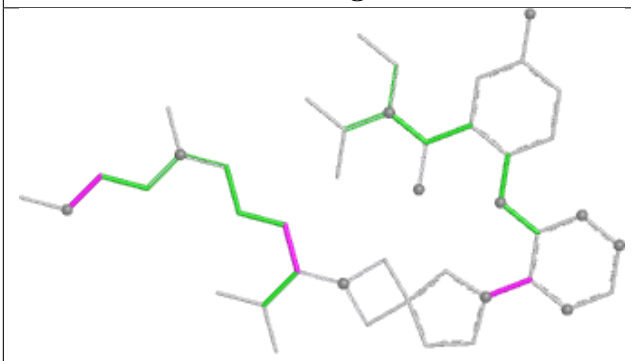
Ligand 9N6 B 702



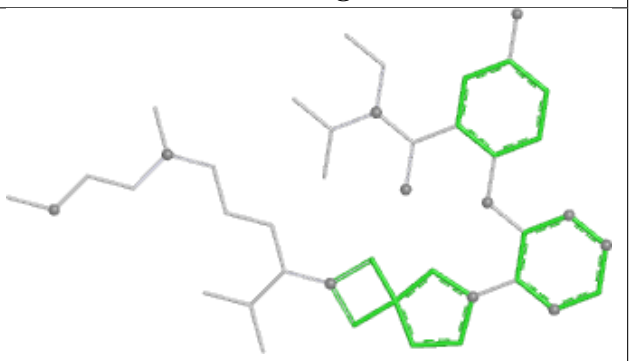
Bond lengths



Bond angles

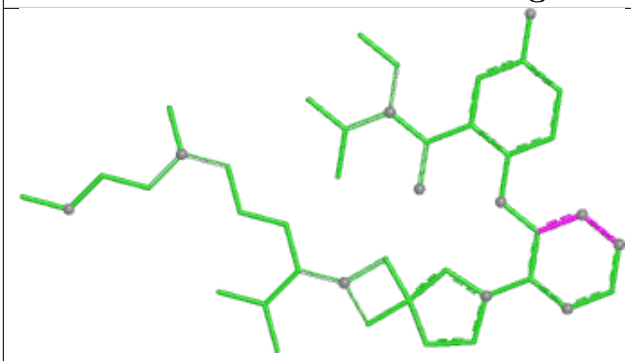


Torsions

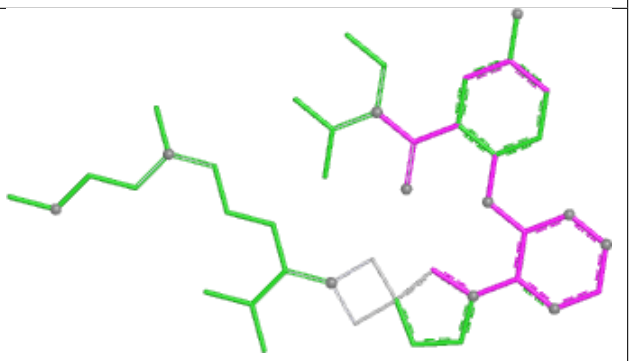


Rings

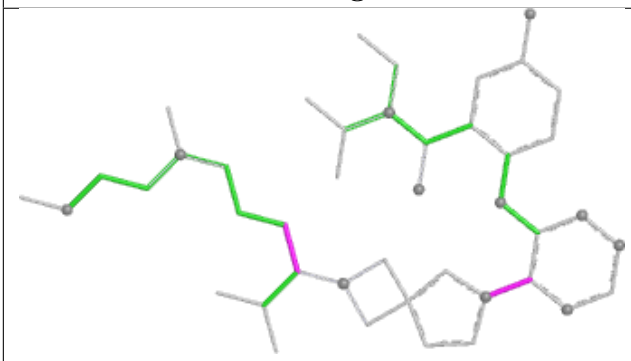
Ligand 9N6 D 701



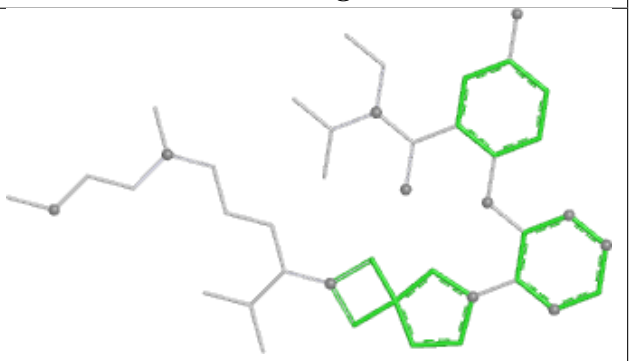
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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	484/539 (89%)	0.19	8 (1%)	69	66	38, 75, 117, 152	52 (10%)
1	B	482/539 (89%)	0.14	12 (2%)	58	56	38, 77, 116, 149	52 (10%)
1	C	486/539 (90%)	0.26	11 (2%)	61	59	39, 75, 125, 156	52 (10%)
1	D	484/539 (89%)	0.20	11 (2%)	61	59	37, 75, 110, 161	52 (10%)
All	All	1936/2156 (89%)	0.20	42 (2%)	62	60	37, 76, 118, 161	208 (10%)

All (42) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	443	SER	4.5
1	B	550	VAL	3.9
1	D	280	LEU	3.6
1	B	23	PHE	3.1
1	C	550	VAL	3.1
1	B	563	GLU	3.1
1	A	582	GLN	3.0
1	C	206	ARG	3.0
1	A	459	SER	2.9
1	D	410	PHE	2.9
1	B	457	ILE	2.8
1	B	417	TYR	2.8
1	B	564	LEU	2.8
1	C	338	LEU	2.8
1	D	551	LEU	2.7
1	D	272	HIS	2.7
1	C	24	ALA	2.7
1	B	159	PHE	2.5
1	C	100	ALA	2.5
1	B	241	CYS	2.5
1	C	133	TYR	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	448	GLU	2.4
1	D	44	VAL	2.4
1	B	26	GLU	2.4
1	D	11	PHE	2.4
1	A	550	VAL	2.3
1	D	265	TRP	2.3
1	D	68	ALA	2.3
1	D	75	LEU	2.3
1	D	313	TYR	2.3
1	B	88	ALA	2.3
1	A	100	ALA	2.2
1	A	137	ARG	2.2
1	D	83	LEU	2.2
1	A	410	PHE	2.2
1	B	2	GLY	2.1
1	C	20	VAL	2.1
1	C	457	ILE	2.1
1	A	566	VAL	2.1
1	C	134	PHE	2.1
1	C	384	GLU	2.0
1	B	173	VAL	2.0

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

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

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} 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	GOL	A	704	6/6	0.67	0.24	78,81,84,86	0
6	SO4	A	705	5/5	0.67	0.14	52,53,59,61	5

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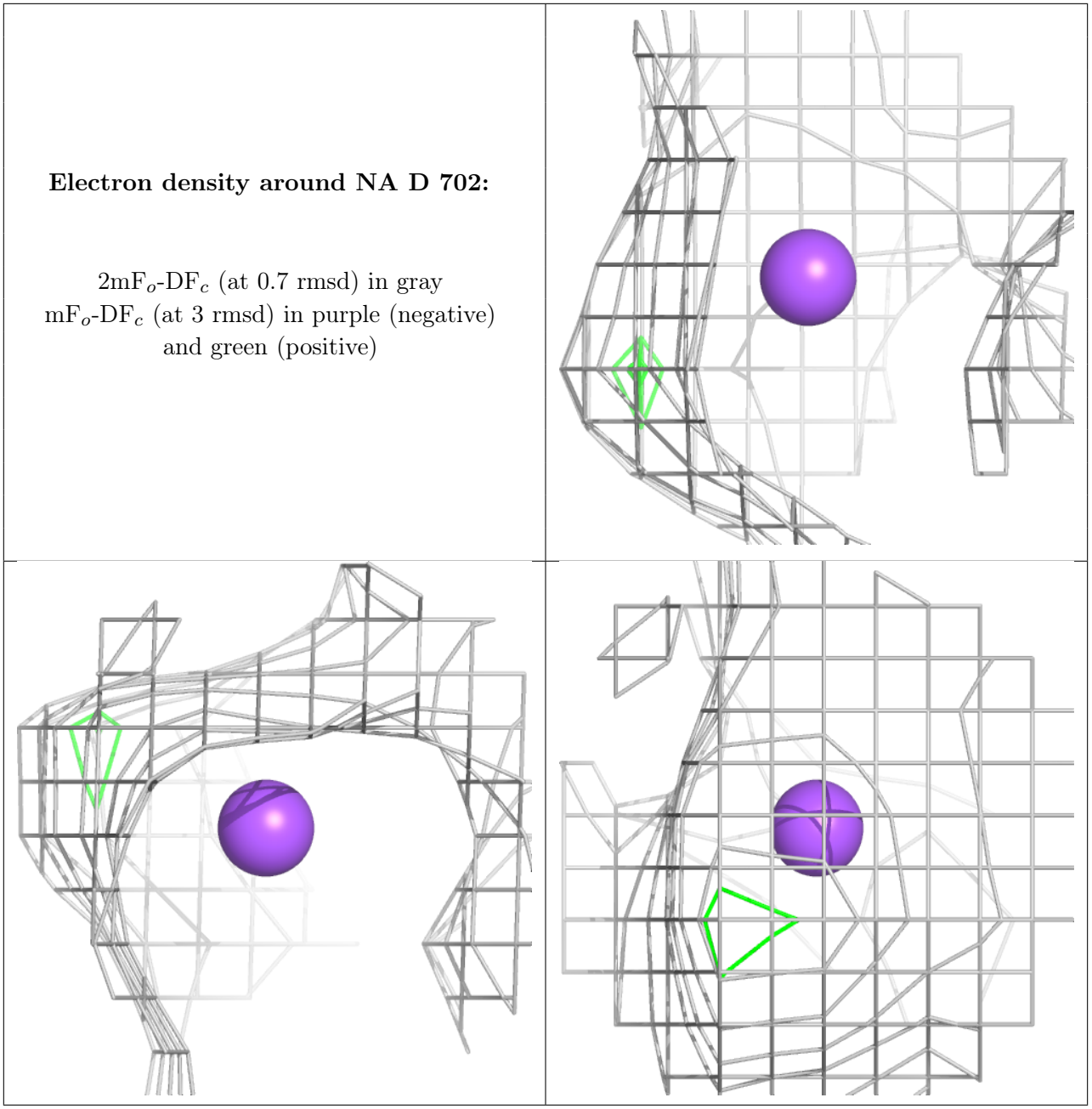
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	BME	B	701	4/4	0.71	0.17	101,102,107,117	0
5	GOL	B	705	6/6	0.72	0.15	59,63,68,75	0
4	NA	D	702	1/1	0.78	0.08	50,50,50,50	0
2	BME	A	701	4/4	0.83	0.13	89,92,99,115	0
4	NA	A	703	1/1	0.84	0.09	69,69,69,69	0
3	9N6	C	701	43/43	0.87	0.15	53,66,93,109	3
5	GOL	B	704	6/6	0.87	0.21	59,64,66,71	0
3	9N6	B	702	43/43	0.91	0.12	43,62,76,81	3
3	9N6	A	702	43/43	0.92	0.10	48,60,67,69	3
3	9N6	D	701	43/43	0.93	0.10	52,67,80,83	3
4	NA	C	702	1/1	0.96	0.12	44,44,44,44	0
4	NA	B	703	1/1	0.96	0.05	58,58,58,58	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.

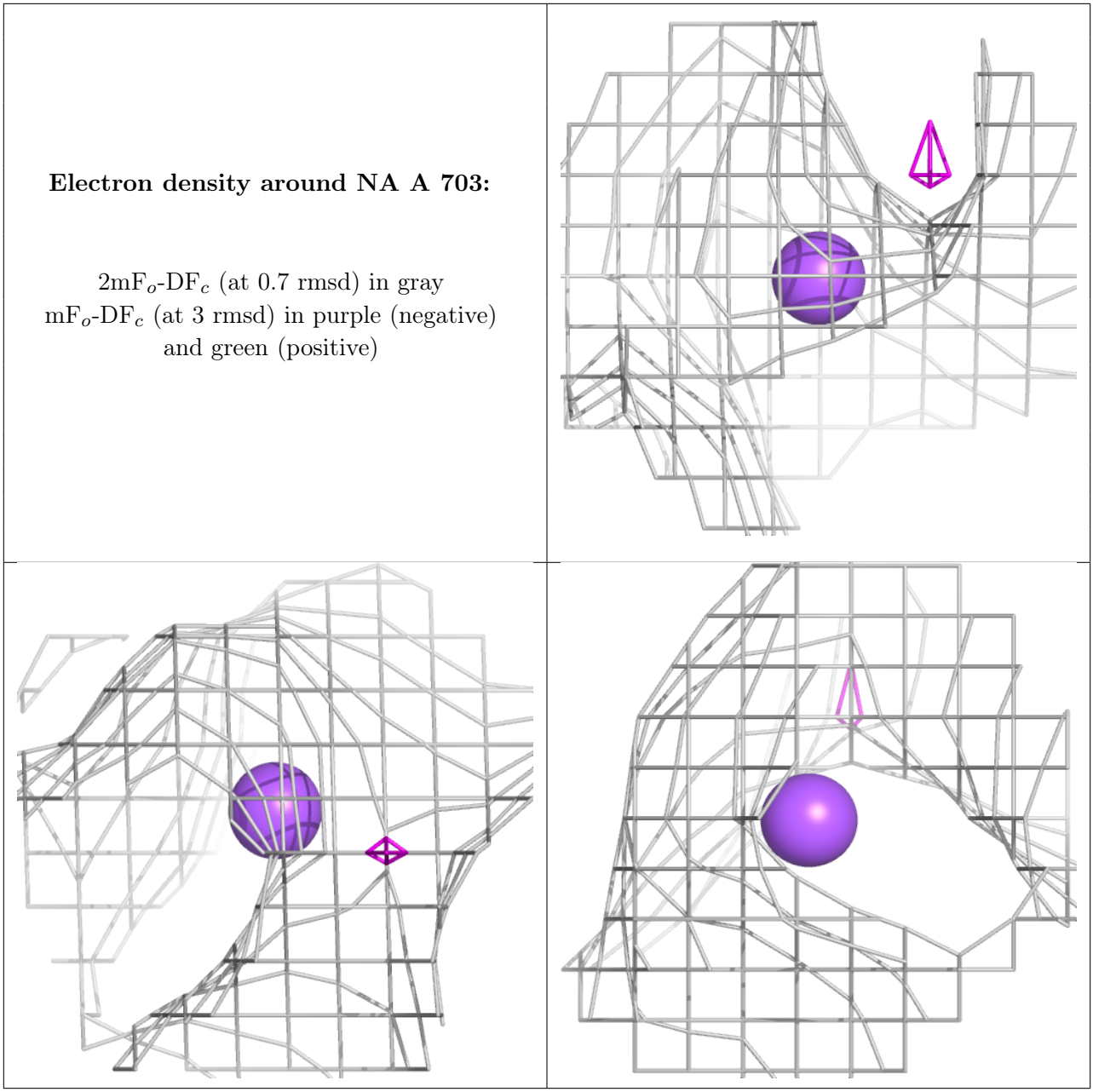
Electron density around NA D 702:

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



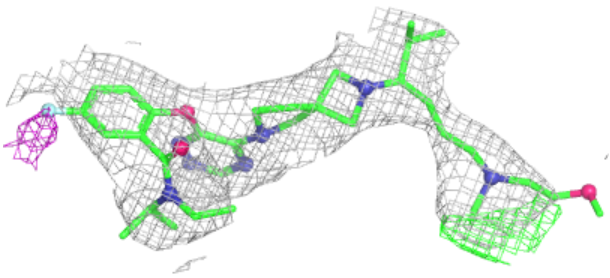
Electron density around NA A 703:

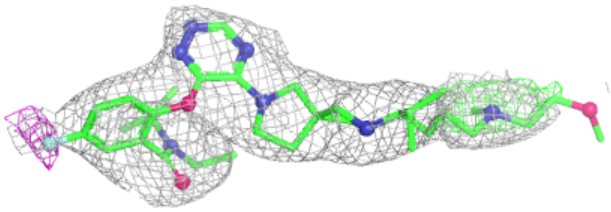
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

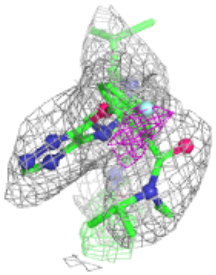


Electron density around 9N6 C 701:

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

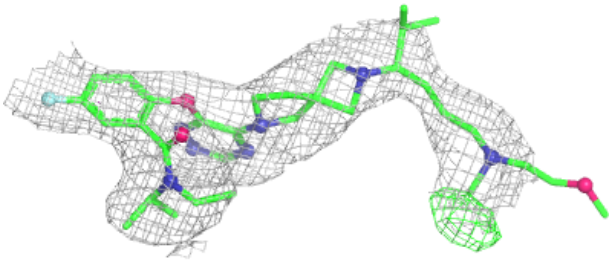


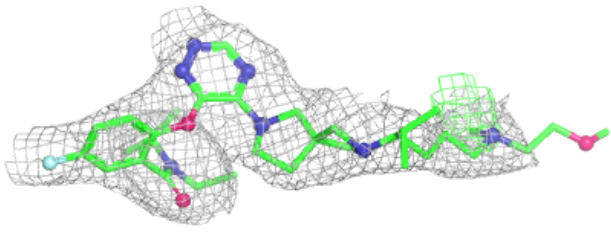


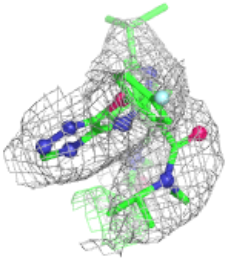


Electron density around 9N6 B 702:

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

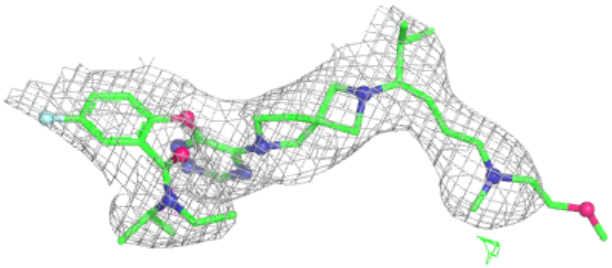


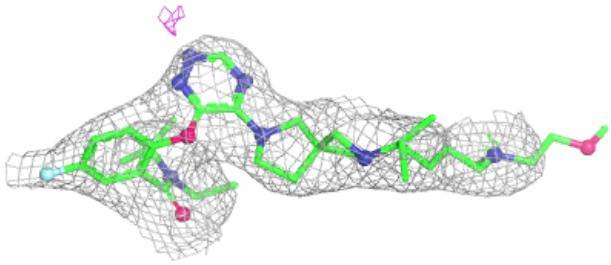


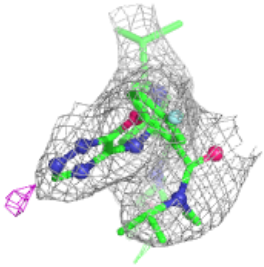


Electron density around 9N6 A 702:

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

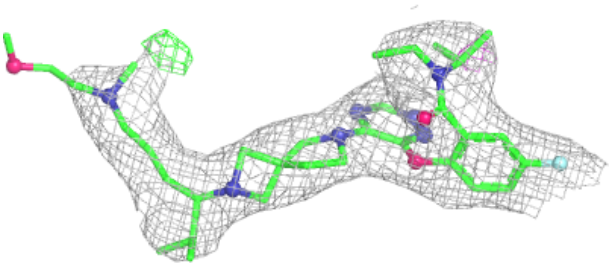


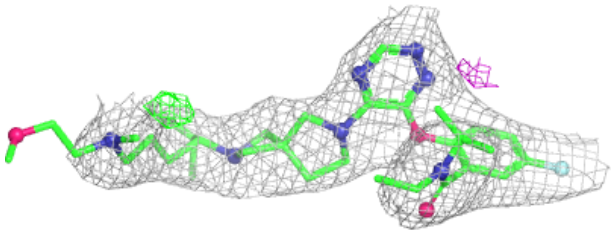


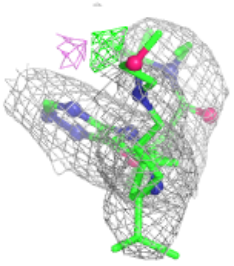


Electron density around 9N6 D 701:

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

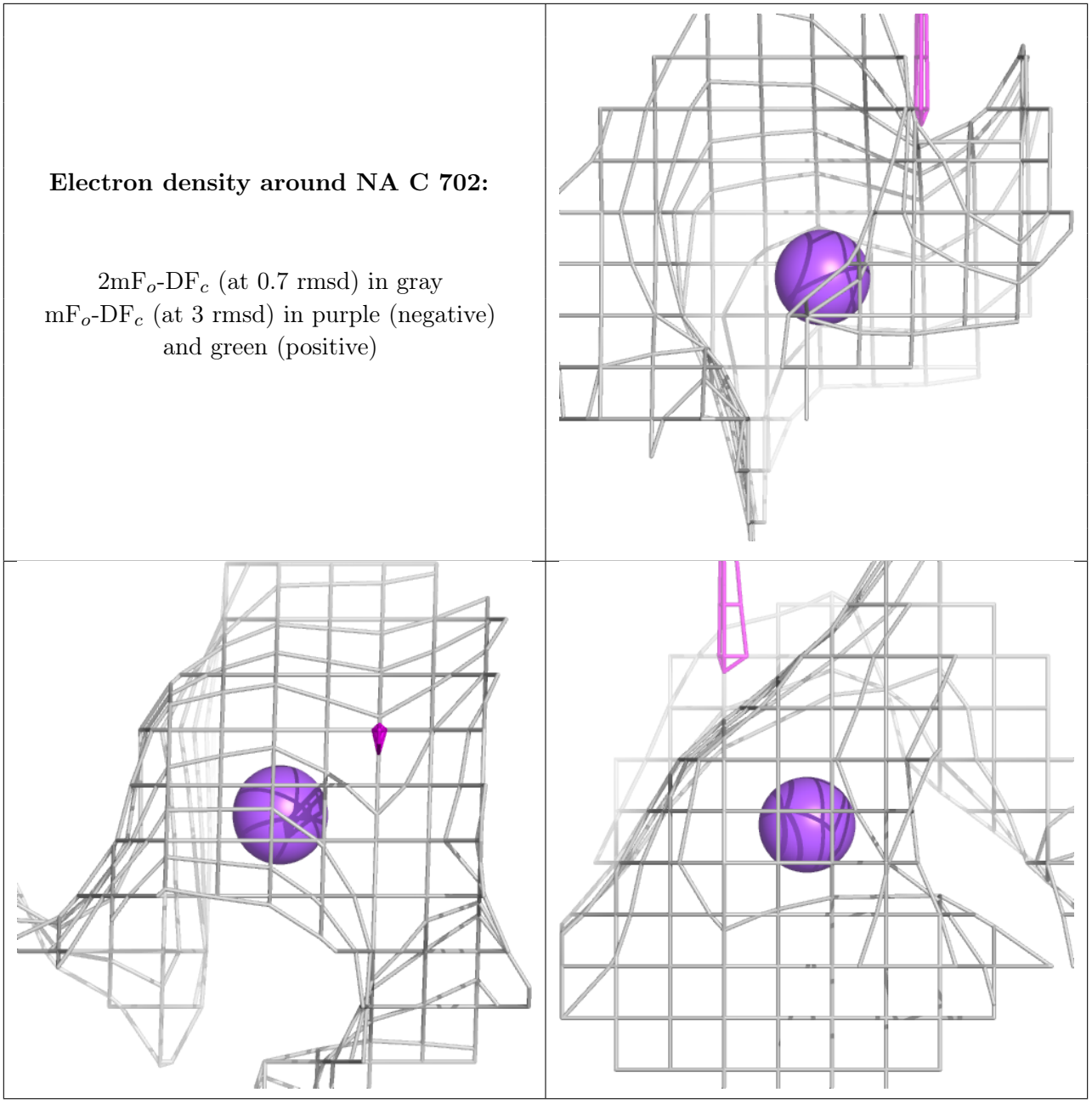






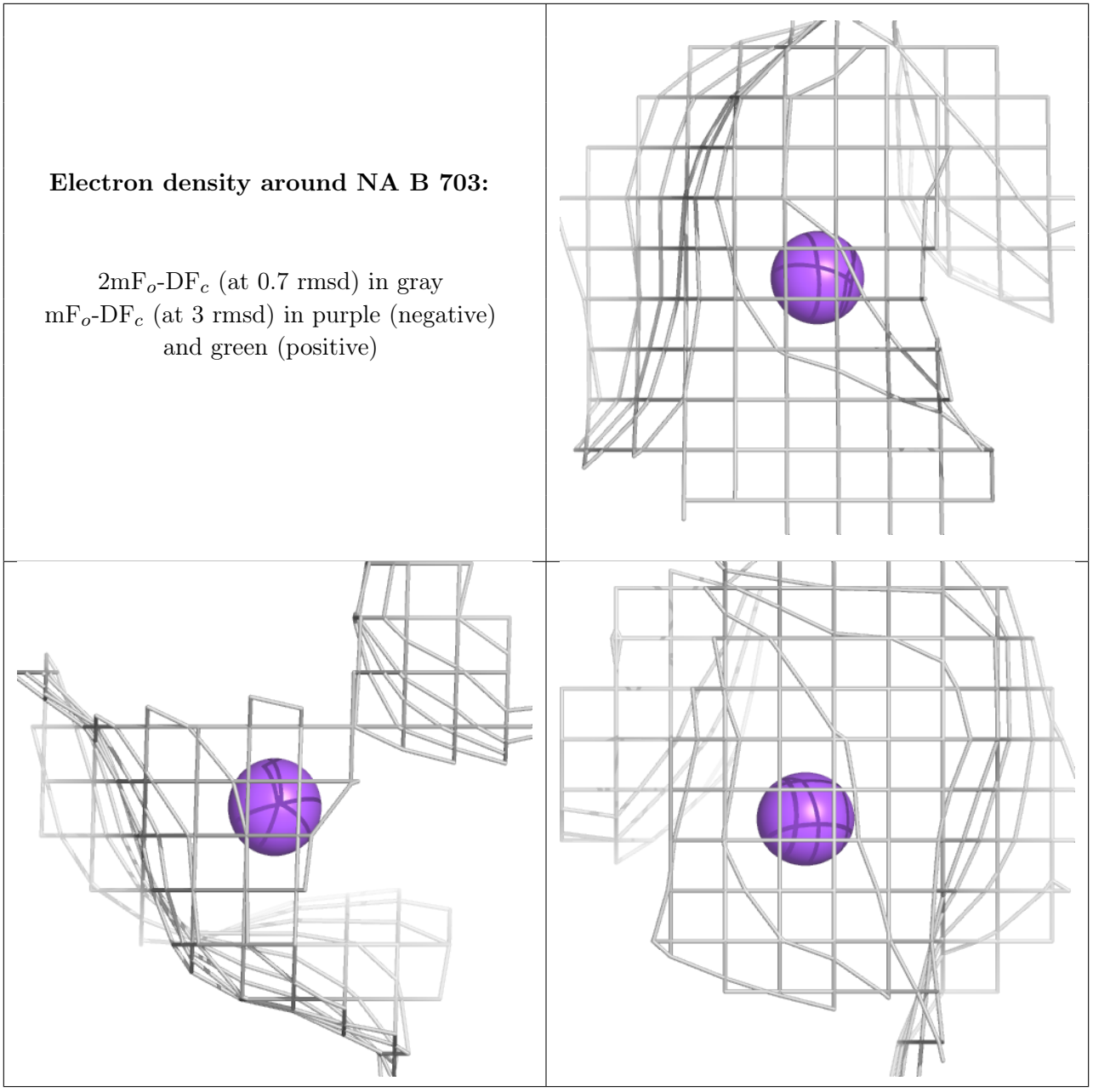
Electron density around NA C 702:

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



Electron density around NA B 703:

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



6.5 Other polymers (i)

There are no such residues in this entry.