Full wwPDB X-ray Structure Validation Report (i)

Aug 21, 2023 – 03:54 PM EDT

PDB ID	:	7ULV
Title	:	Human DDAH1 soaked with its inactivator S-((4-chloropyridin-2-yl)methyl)-L-cysteine
Authors	:	Zheng, Y.; Butrin, A.; Tuley, A.; Liu, D.; Fast, W.
Deposited on	:	2022-04-05
Resolution	:	2.37 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
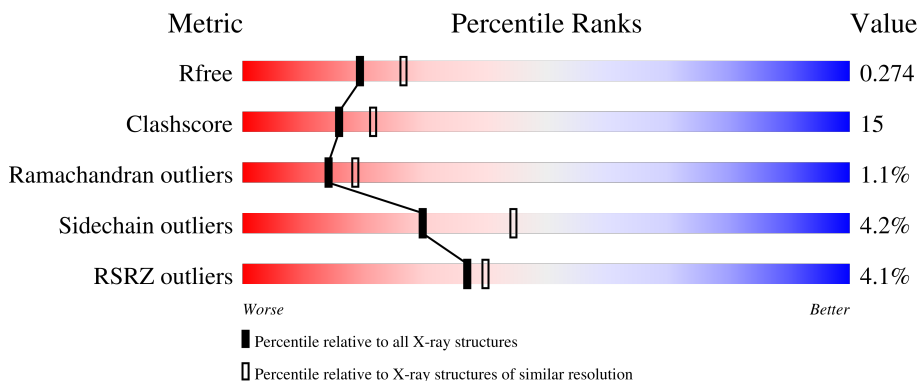http://www.wwpdb.org/validation/2017/FAQs#types.

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1   Overall quality at a glance   ⓘ

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

The reported resolution of this entry is 2.37 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.
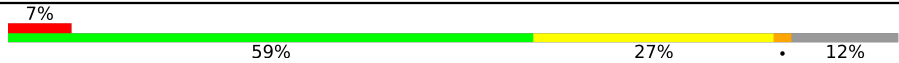
Metric	Percentile Ranks	Value
Rfree		0.274
Clashscore		15
Ramachandran outliers		1.1%
Sidechain outliers		4.2%
RSRZ outliers		4.1%

Worse .... *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5509 (2.40-2.36)
Clashscore	141614	6082 (2.40-2.36)
Ramachandran outliers	138981	5973 (2.40-2.36)
Sidechain outliers	138945	5975 (2.40-2.36)
RSRZ outliers	127900	5397 (2.40-2.36)

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	308	% 61% 27% 12%
1	B	308	3% 58% 29% • 12%
1	C	308	4% 64% 22% • 12%
1	D	308	3% 63% 25% • 12%
1	E	308	4% 57% 30% • 12%

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Mol	Chain	Length	Quality of chain
1	F	308	

7%

59% 27% • 12%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 13115 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 N(G),N(G)-dimethylarginine dimethylaminohydrolase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	272	Total	C	N	O	S	0	0	0
			2087	1310	362	401	14			
1	B	272	Total	C	N	O	S	0	0	0
			2087	1310	362	401	14			
1	C	272	Total	C	N	O	S	0	0	0
			2087	1310	362	401	14			
1	D	272	Total	C	N	O	S	0	0	0
			2087	1310	362	401	14			
1	E	272	Total	C	N	O	S	0	0	0
			2087	1310	362	401	14			
1	F	272	Total	C	N	O	S	0	0	0
			2087	1310	362	401	14			

There are 138 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-22	MET	-	initiating methionine	UNP O94760
A	-21	GLY	-	expression tag	UNP O94760
A	-20	SER	-	expression tag	UNP O94760
A	-19	SER	-	expression tag	UNP O94760
A	-18	HIS	-	expression tag	UNP O94760
A	-17	HIS	-	expression tag	UNP O94760
A	-16	HIS	-	expression tag	UNP O94760
A	-15	HIS	-	expression tag	UNP O94760
A	-14	HIS	-	expression tag	UNP O94760
A	-13	HIS	-	expression tag	UNP O94760
A	-12	SER	-	expression tag	UNP O94760
A	-11	SER	-	expression tag	UNP O94760
A	-10	GLY	-	expression tag	UNP O94760
A	-9	LEU	-	expression tag	UNP O94760
A	-8	VAL	-	expression tag	UNP O94760
A	-7	PRO	-	expression tag	UNP O94760
A	-6	ARG	-	expression tag	UNP O94760

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	GLY	-	expression tag	UNP O94760
A	-4	SER	-	expression tag	UNP O94760
A	-3	HIS	-	expression tag	UNP O94760
A	-2	MET	-	expression tag	UNP O94760
A	-1	ALA	-	expression tag	UNP O94760
A	0	SER	-	expression tag	UNP O94760
B	-22	MET	-	initiating methionine	UNP O94760
B	-21	GLY	-	expression tag	UNP O94760
B	-20	SER	-	expression tag	UNP O94760
B	-19	SER	-	expression tag	UNP O94760
B	-18	HIS	-	expression tag	UNP O94760
B	-17	HIS	-	expression tag	UNP O94760
B	-16	HIS	-	expression tag	UNP O94760
B	-15	HIS	-	expression tag	UNP O94760
B	-14	HIS	-	expression tag	UNP O94760
B	-13	HIS	-	expression tag	UNP O94760
B	-12	SER	-	expression tag	UNP O94760
B	-11	SER	-	expression tag	UNP O94760
B	-10	GLY	-	expression tag	UNP O94760
B	-9	LEU	-	expression tag	UNP O94760
B	-8	VAL	-	expression tag	UNP O94760
B	-7	PRO	-	expression tag	UNP O94760
B	-6	ARG	-	expression tag	UNP O94760
B	-5	GLY	-	expression tag	UNP O94760
B	-4	SER	-	expression tag	UNP O94760
B	-3	HIS	-	expression tag	UNP O94760
B	-2	MET	-	expression tag	UNP O94760
B	-1	ALA	-	expression tag	UNP O94760
B	0	SER	-	expression tag	UNP O94760
C	-22	MET	-	initiating methionine	UNP O94760
C	-21	GLY	-	expression tag	UNP O94760
C	-20	SER	-	expression tag	UNP O94760
C	-19	SER	-	expression tag	UNP O94760
C	-18	HIS	-	expression tag	UNP O94760
C	-17	HIS	-	expression tag	UNP O94760
C	-16	HIS	-	expression tag	UNP O94760
C	-15	HIS	-	expression tag	UNP O94760
C	-14	HIS	-	expression tag	UNP O94760
C	-13	HIS	-	expression tag	UNP O94760
C	-12	SER	-	expression tag	UNP O94760
C	-11	SER	-	expression tag	UNP O94760
C	-10	GLY	-	expression tag	UNP O94760

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-9	LEU	-	expression tag	UNP O94760
C	-8	VAL	-	expression tag	UNP O94760
C	-7	PRO	-	expression tag	UNP O94760
C	-6	ARG	-	expression tag	UNP O94760
C	-5	GLY	-	expression tag	UNP O94760
C	-4	SER	-	expression tag	UNP O94760
C	-3	HIS	-	expression tag	UNP O94760
C	-2	MET	-	expression tag	UNP O94760
C	-1	ALA	-	expression tag	UNP O94760
C	0	SER	-	expression tag	UNP O94760
D	-22	MET	-	initiating methionine	UNP O94760
D	-21	GLY	-	expression tag	UNP O94760
D	-20	SER	-	expression tag	UNP O94760
D	-19	SER	-	expression tag	UNP O94760
D	-18	HIS	-	expression tag	UNP O94760
D	-17	HIS	-	expression tag	UNP O94760
D	-16	HIS	-	expression tag	UNP O94760
D	-15	HIS	-	expression tag	UNP O94760
D	-14	HIS	-	expression tag	UNP O94760
D	-13	HIS	-	expression tag	UNP O94760
D	-12	SER	-	expression tag	UNP O94760
D	-11	SER	-	expression tag	UNP O94760
D	-10	GLY	-	expression tag	UNP O94760
D	-9	LEU	-	expression tag	UNP O94760
D	-8	VAL	-	expression tag	UNP O94760
D	-7	PRO	-	expression tag	UNP O94760
D	-6	ARG	-	expression tag	UNP O94760
D	-5	GLY	-	expression tag	UNP O94760
D	-4	SER	-	expression tag	UNP O94760
D	-3	HIS	-	expression tag	UNP O94760
D	-2	MET	-	expression tag	UNP O94760
D	-1	ALA	-	expression tag	UNP O94760
D	0	SER	-	expression tag	UNP O94760
E	-22	MET	-	initiating methionine	UNP O94760
E	-21	GLY	-	expression tag	UNP O94760
E	-20	SER	-	expression tag	UNP O94760
E	-19	SER	-	expression tag	UNP O94760
E	-18	HIS	-	expression tag	UNP O94760
E	-17	HIS	-	expression tag	UNP O94760
E	-16	HIS	-	expression tag	UNP O94760
E	-15	HIS	-	expression tag	UNP O94760
E	-14	HIS	-	expression tag	UNP O94760

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-13	HIS	-	expression tag	UNP O94760
E	-12	SER	-	expression tag	UNP O94760
E	-11	SER	-	expression tag	UNP O94760
E	-10	GLY	-	expression tag	UNP O94760
E	-9	LEU	-	expression tag	UNP O94760
E	-8	VAL	-	expression tag	UNP O94760
E	-7	PRO	-	expression tag	UNP O94760
E	-6	ARG	-	expression tag	UNP O94760
E	-5	GLY	-	expression tag	UNP O94760
E	-4	SER	-	expression tag	UNP O94760
E	-3	HIS	-	expression tag	UNP O94760
E	-2	MET	-	expression tag	UNP O94760
E	-1	ALA	-	expression tag	UNP O94760
E	0	SER	-	expression tag	UNP O94760
F	-22	MET	-	initiating methionine	UNP O94760
F	-21	GLY	-	expression tag	UNP O94760
F	-20	SER	-	expression tag	UNP O94760
F	-19	SER	-	expression tag	UNP O94760
F	-18	HIS	-	expression tag	UNP O94760
F	-17	HIS	-	expression tag	UNP O94760
F	-16	HIS	-	expression tag	UNP O94760
F	-15	HIS	-	expression tag	UNP O94760
F	-14	HIS	-	expression tag	UNP O94760
F	-13	HIS	-	expression tag	UNP O94760
F	-12	SER	-	expression tag	UNP O94760
F	-11	SER	-	expression tag	UNP O94760
F	-10	GLY	-	expression tag	UNP O94760
F	-9	LEU	-	expression tag	UNP O94760
F	-8	VAL	-	expression tag	UNP O94760
F	-7	PRO	-	expression tag	UNP O94760
F	-6	ARG	-	expression tag	UNP O94760
F	-5	GLY	-	expression tag	UNP O94760
F	-4	SER	-	expression tag	UNP O94760
F	-3	HIS	-	expression tag	UNP O94760
F	-2	MET	-	expression tag	UNP O94760
F	-1	ALA	-	expression tag	UNP O94760
F	0	SER	-	expression tag	UNP O94760

- Molecule 2 is S-[(pyridin-2-yl)methyl]-L-cysteine (three-letter code: NO6) (formula: $C_9H_{12}N_2O_2S$) (labeled as "Ligand of Interest" by depositor).
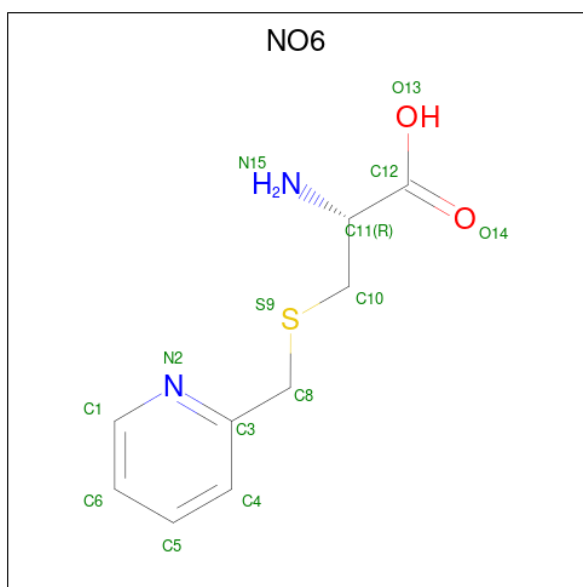
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			14	9	2	2	1		
2	B	1	Total	C	N	O	S	0	0
			14	9	2	2	1		
2	C	1	Total	C	N	O	S	0	0
			14	9	2	2	1		
2	D	1	Total	C	N	O	S	0	0
			14	9	2	2	1		
2	E	1	Total	C	N	O	S	0	0
			14	9	2	2	1		
2	F	1	Total	C	N	O	S	0	0
			14	9	2	2	1		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	109	Total	O	0	0
			109	109		
3	B	91	Total	O	0	0
			91	91		
3	C	74	Total	O	0	0
			74	74		
3	D	67	Total	O	0	0
			67	67		
3	E	82	Total	O	0	0
			82	82		
3	F	86	Total	O	0	0
			86	86		

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: N(G),N(G)-dimethylarginine dimethylaminohydrolase 1

Chain A:

- Molecule 1: N(G),N(G)-dimethylarginine dimethylaminohydrolase 1

Chain B:

- Molecule 1: N(G),N(G)-dimethylarginine dimethylaminohydrolase 1

Chain C:

MET GLY SER SER HIS HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET ALA SER MET ALA GLY LEU GLY HIS PRO ALA A9 F10 T14 H15 A16 R19 S24 L25 G26 Q27 H28 A29 L30 R31 S32 ALA LYS G35 E36 R45 Q48 V51 G52

V53 K57 L58 G59 L60 Q61 V62 L71 C74 V77 E78 D79 V80 R92 P93 P96 R99 K100 E101 V102 D103 M104 M105 K111 L114 K120 D121 E122 N123 A124 T125 L126 V131 G135 F138 F139 V140 N147 Q148 R149 G150 A151 E152 D156

V163 P167 L185 S191 E192 Q195 D210 P215 D216 D217 I218 I223 Y224 L225 K230 V233 L234 L235 H236 R237 T238 P239 E240 E244 L252 L257 M262 E266 L271 C274 V277 L278 I279 K282 VAL ASP SER

• Molecule 1: N(G),N(G)-dimethylarginine dimethylaminohydrolase 1

Chain D:

MET GLY SER SER HIS HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET ALA SER MET ALA GLY LEU GLY HIS PRO ALA A9 F10 H15 L21 P22 E23 S32 ALA LYS G35 E36 D39 R42 A43 E44 H47 V53 L54 G55 S56 K57
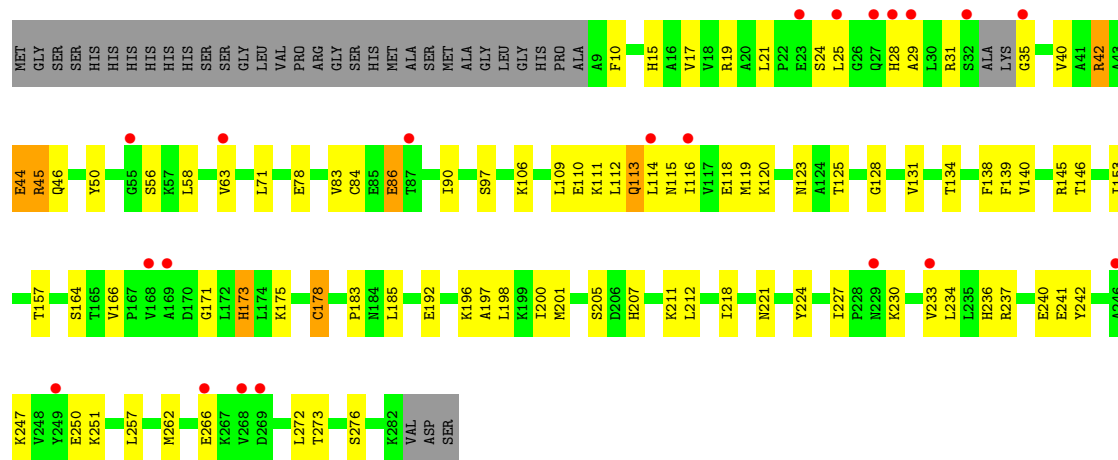
Q61 F76 V77 E78 D79 V80 V83 C84 R92 P93 G94 K100 E101 V102 D103 M104 L109 E110 K111 L112 Q113 L114 N115 I116 N123 A124 T125 G128 L132 F139 T146 N147 Q148 R149 I153 L154 F158 K159 D160 S164 F177 C178 S179 M180 N184

L185 I186 A187 S191 Q203 M204 H207 R208 Y209 D210 K211 L212 D217 A220 N221 C222 I223 Y224 L225 N226 I227 P228 N229 K230 G231 H232 L235 H236 R237 T238 P239 E240 E241 Y242 E250 M256 L257 I258 P259 M262 S263 E264 L265 E266 G270 T273 C274

N280 K281 K282 VAL ASP SER

• Molecule 1: N(G),N(G)-dimethylarginine dimethylaminohydrolase 1

Chain E:

MET GLY SER SER HIS HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET ALA SER MET ALA GLY LEU GLY HIS PRO ALA A9 F10 G11 R12 V17 V18 R19 A20 L21 L30 R31 S32 ALA LYS G35 E36 R42 A43 E44 L58 V63 C74

E78 D79 V80 A88 L89 I90 T91 R92 P93 S97 R98 R99 K100 E101 V102 D103 M104 M105 K106 E107 A108 L109 E110 K111 L112 Q113 I116 V117 D121 E122 N123 A124 T125 G128 V131 L132 F138 F139 V140 G141 L142 R145 T146 N147 G150 I153 T157 V163

A169 D170 G171 L172 K175 C178 N184 K196 A197 L198 K199 I200 Q203 M204 S205 D206 H207 R208 K211 L212 T213 V214 I218 N221 L225 L234 R237 T238 P239 E240 E241 S245 A246 K247 V248 K251 L252 K253 L257 M262 S263 E264 L265 E266

G270 L271 L272 T273 C274 V277 N280 K281 K282 VAL ASP SER

• Molecule 1: N(G),N(G)-dimethylarginine dimethylaminohydrolase 1

Chain F:

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	46.40Å 220.99Å 73.64Å 90.00° 91.08° 90.00°	Depositor
Resolution (Å)	73.63 – 2.37 73.63 – 2.37	Depositor EDS
% Data completeness (in resolution range)	99.0 (73.63-2.37) 94.1 (73.63-2.37)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.51 (at 2.37Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.237 , 0.269 0.240 , 0.274	Depositor DCC
R_{free} test set	2926 reflections (4.91%)	wwPDB-VP
Wilson B-factor (Å^2)	37.3	Xtriage
Anisotropy	0.940	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 28.0	EDS
L-test for twinning[2]	$< |L| > = 0.42, < L^2 > = 0.24$	Xtriage
Estimated twinning fraction	0.116 for h,-k,-l	Xtriage
Reported twinning fraction	0.180 for h,-k,-l	Depositor
Outliers	0 of 59548 reflections	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	13115	wwPDB-VP
Average B, all atoms (Å^2)	45.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.27% 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: NO6

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	0.26	0/2118	0.50	0/2861
1	B	0.28	0/2118	0.52	0/2861
1	C	0.27	0/2118	0.52	1/2861 (0.0%)
1	D	0.27	0/2118	0.52	0/2861
1	E	0.26	0/2118	0.51	0/2861
1	F	0.28	0/2118	0.51	0/2861
All	All	0.27	0/12708	0.51	1/17166 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	60	LEU	CB-CG-CD2	5.48	120.32	111.00

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	2087	0	2110	59	0
1	B	2087	0	2110	61	0
1	C	2087	0	2110	51	1
1	D	2087	0	2110	58	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	2087	0	2110	71	0
1	F	2087	0	2110	71	1
2	A	14	0	0	1	0
2	B	14	0	0	0	0
2	C	14	0	0	1	0
2	D	14	0	0	0	0
2	E	14	0	0	0	0
2	F	14	0	0	3	0
3	A	109	0	0	24	0
3	B	91	0	0	22	0
3	C	74	0	0	16	2
3	D	67	0	0	18	0
3	E	82	0	0	19	0
3	F	86	0	0	26	2
All	All	13115	0	12660	368	4

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 15.

All (368) 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:269:ASP:OD2	3:A:401:HOH:O	1.86	0.93
1:D:179:SER:OG	3:D:401:HOH:O	1.88	0.91
1:C:19:ARG:NH1	3:C:401:HOH:O	2.03	0.90
1:F:237:ARG:HD3	1:F:272:LEU:HD11	1.53	0.90
1:F:83:VAL:O	3:F:401:HOH:O	1.89	0.89
1:F:119:MET:SD	3:F:463:HOH:O	2.30	0.88
1:C:45:ARG:HH12	1:F:35:GLY:HA2	1.40	0.87
1:E:74:CYS:SG	3:E:401:HOH:O	2.34	0.86
1:D:23:GLU:O	3:D:402:HOH:O	1.94	0.85
1:A:198:LEU:HD21	1:A:211:LYS:HD2	1.59	0.84
1:C:121:ASP:N	3:C:406:HOH:O	2.05	0.82
1:B:48:GLN:NE2	3:B:404:HOH:O	2.14	0.80
1:F:134:THR:O	3:F:402:HOH:O	1.99	0.80
1:E:153:ILE:O	1:E:157:THR:OG1	2.00	0.79
1:F:97:SER:OG	3:F:403:HOH:O	2.00	0.79
1:A:69:GLU:HG3	1:C:195:GLN:HG3	1.64	0.78
1:B:69:GLU:OE1	3:B:401:HOH:O	2.01	0.78
1:D:47:HIS:ND1	3:D:409:HOH:O	2.17	0.77
1:F:15:HIS:NE2	3:F:406:HOH:O	2.12	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:301:NO6:O14	3:C:403:HOH:O	2.04	0.76
1:D:84:CYS:SG	3:D:467:HOH:O	2.43	0.75
1:C:48:GLN:O	3:C:402:HOH:O	2.04	0.75
1:A:156:ASP:OD1	3:A:404:HOH:O	2.04	0.74
1:F:106:LYS:O	3:F:404:HOH:O	2.06	0.74
1:C:252:LEU:O	3:C:404:HOH:O	2.04	0.74
1:E:20:ALA:O	3:E:401:HOH:O	2.04	0.74
1:A:207:HIS:ND1	3:A:406:HOH:O	2.21	0.73
1:D:160:ASP:O	3:D:405:HOH:O	2.06	0.73
1:C:152:GLU:OE2	3:C:405:HOH:O	2.05	0.73
1:F:198:LEU:HD21	1:F:211:LYS:HD2	1.70	0.72
1:A:129:GLY:O	3:A:405:HOH:O	2.07	0.72
1:D:101:GLU:O	3:D:404:HOH:O	2.06	0.72
1:D:232:HIS:ND1	3:D:403:HOH:O	2.00	0.72
1:B:113:GLN:O	3:B:402:HOH:O	2.09	0.70
1:D:57:LYS:NZ	3:D:411:HOH:O	2.23	0.70
1:D:238:THR:OG1	3:D:406:HOH:O	2.08	0.70
1:F:240:GLU:OE2	3:F:405:HOH:O	2.10	0.69
1:F:58:LEU:HD11	1:F:233:VAL:HG11	1.75	0.69
1:E:157:THR:HG22	3:E:440:HOH:O	1.93	0.68
1:D:149:ARG:HE	1:D:153:ILE:HD11	1.58	0.68
1:A:184:ASN:OD1	3:A:406:HOH:O	2.10	0.68
1:B:172:LEU:O	3:B:403:HOH:O	2.12	0.68
1:F:31:ARG:NH1	3:F:415:HOH:O	2.26	0.68
1:A:57:LYS:NZ	3:A:420:HOH:O	2.28	0.67
1:F:119:MET:HG3	1:F:153:ILE:HG21	1.74	0.67
1:A:211:LYS:NZ	3:A:421:HOH:O	2.28	0.67
1:F:19:ARG:NH2	3:F:414:HOH:O	2.26	0.67
1:F:115:ASN:ND2	3:F:421:HOH:O	2.28	0.67
1:F:118:GLU:HB2	1:F:120:LYS:HE3	1.77	0.66
1:B:138:PHE:HB2	1:B:163:VAL:HG12	1.77	0.66
1:F:86:GLU:OE1	3:F:407:HOH:O	2.13	0.65
1:A:44:GLU:OE1	3:A:407:HOH:O	2.15	0.65
1:E:221:ASN:ND2	3:E:419:HOH:O	2.28	0.65
2:F:301:NO6:N15	3:F:413:HOH:O	2.28	0.65
1:E:205:SER:O	3:E:402:HOH:O	2.14	0.65
1:E:17:VAL:HG22	1:E:63:VAL:HB	1.79	0.65
1:D:220:ALA:HA	3:D:416:HOH:O	1.97	0.64
1:B:106:LYS:O	1:B:110:GLU:HG3	1.97	0.64
1:B:139:PHE:HZ	1:B:205:SER:HB2	1.62	0.64
1:A:191:SER:OG	3:A:402:HOH:O	1.99	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:21:LEU:HD21	1:E:44:GLU:HA	1.79	0.64
1:E:108:ALA:HA	1:E:111:LYS:HE3	1.80	0.64
1:B:230:LYS:NZ	3:B:417:HOH:O	2.30	0.63
1:E:240:GLU:OE1	3:E:404:HOH:O	2.15	0.63
1:E:266:GLU:OE1	3:E:405:HOH:O	2.16	0.63
1:F:84:CYS:O	1:F:86:GLU:N	2.31	0.63
1:E:105:MET:HE1	1:E:277:VAL:HG21	1.80	0.63
1:C:131:VAL:HG22	1:C:140:VAL:HG22	1.81	0.63
1:A:192:GLU:OE2	3:A:408:HOH:O	2.16	0.63
1:E:12:ARG:NH2	3:E:422:HOH:O	2.30	0.63
1:E:18:VAL:HB	3:E:446:HOH:O	1.98	0.63
1:E:93:PRO:O	1:E:99:ARG:NE	2.29	0.63
1:F:90:ILE:HD11	1:F:116:ILE:HD12	1.81	0.63
1:C:24:SER:O	1:C:28:HIS:HB2	1.99	0.62
1:A:218:ILE:HD12	1:A:271:LEU:HD21	1.81	0.62
1:D:21:LEU:HD21	1:D:44:GLU:HA	1.80	0.62
1:E:109:LEU:HB2	1:E:116:ILE:HD11	1.82	0.62
1:D:79:ASP:HA	1:D:128:GLY:H	1.64	0.62
1:E:203:GLN:NE2	3:E:415:HOH:O	2.27	0.62
1:F:178:CYS:N	3:F:426:HOH:O	2.33	0.62
1:F:71:LEU:HD12	3:F:444:HOH:O	1.99	0.62
1:F:84:CYS:HB2	1:F:138:PHE:HZ	1.65	0.62
1:E:138:PHE:HB2	1:E:163:VAL:HG22	1.80	0.61
1:E:103:ASP:OD1	3:E:406:HOH:O	2.16	0.61
1:F:115:ASN:OD1	3:F:407:HOH:O	2.16	0.61
1:F:236:HIS:NE2	3:F:420:HOH:O	2.28	0.61
1:D:266:GLU:O	3:D:407:HOH:O	2.16	0.61
1:C:123:ASN:HB3	1:C:149:ARG:HG2	1.83	0.61
1:E:145:ARG:HG2	3:E:457:HOH:O	1.99	0.61
1:F:21:LEU:HG	1:F:44:GLU:HG2	1.83	0.60
1:D:123:ASN:HB2	1:D:149:ARG:HG2	1.83	0.60
1:A:110:GLU:O	1:A:113:GLN:N	2.33	0.60
1:B:136:ARG:NH2	1:B:184:ASN:OD1	2.34	0.60
1:F:211:LYS:NZ	3:F:422:HOH:O	2.28	0.60
1:B:61:GLN:NE2	3:B:426:HOH:O	2.34	0.60
1:B:37:GLU:O	3:B:405:HOH:O	2.16	0.59
1:B:276:SER:O	3:B:406:HOH:O	2.17	0.59
1:E:184:ASN:ND2	3:E:427:HOH:O	2.34	0.59
1:C:96:PRO:HA	1:C:99:ARG:HG3	1.85	0.59
1:A:153:ILE:HD12	3:A:431:HOH:O	2.02	0.59
1:D:203:GLN:OE1	3:D:408:HOH:O	2.16	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:131:VAL:O	1:F:175:LYS:NZ	2.33	0.59
1:E:214:VAL:HG13	1:E:245:SER:HB3	1.85	0.58
1:C:80:VAL:HB	1:C:102:VAL:HG12	1.85	0.58
1:E:42:ARG:HE	1:E:264:GLU:HG2	1.68	0.58
1:A:189:GLY:O	1:A:195:GLN:NE2	2.36	0.58
1:F:276:SER:OG	3:F:408:HOH:O	2.17	0.58
1:B:145:ARG:NH1	3:B:423:HOH:O	2.33	0.57
1:B:136:ARG:HD2	3:B:437:HOH:O	2.03	0.57
1:B:155:ALA:HB2	1:B:163:VAL:HG21	1.85	0.57
1:E:78:GLU:HB3	1:E:274:CYS:HA	1.85	0.57
1:B:35:GLY:N	3:B:430:HOH:O	2.37	0.57
1:E:80:VAL:HB	1:E:102:VAL:HG12	1.85	0.57
1:E:12:ARG:HB3	1:E:280:ASN:HD21	1.68	0.57
1:F:58:LEU:HB3	1:F:227:ILE:HD12	1.85	0.57
1:D:240:GLU:N	3:D:406:HOH:O	2.31	0.57
1:E:99:ARG:NH1	3:E:431:HOH:O	2.38	0.57
1:A:60:LEU:HD11	1:A:225:LEU:HD21	1.86	0.57
1:A:158:PHE:O	3:A:409:HOH:O	2.18	0.57
1:C:53:VAL:HA	1:C:57:LYS:HB3	1.86	0.57
1:D:224:TYR:CE1	1:D:232:HIS:HB3	2.40	0.57
1:E:21:LEU:H	1:E:21:LEU:HD23	1.68	0.56
1:A:79:ASP:HA	1:A:128:GLY:H	1.68	0.56
1:B:120:LYS:NZ	3:B:431:HOH:O	2.38	0.56
1:C:14:THR:HG21	3:C:447:HOH:O	2.05	0.56
1:F:157:THR:O	3:F:409:HOH:O	2.18	0.56
1:D:242:TYR:OH	1:D:266:GLU:OE2	2.22	0.56
1:A:223:ILE:HB	1:A:235:LEU:HB2	1.86	0.56
1:A:53:VAL:O	1:A:57:LYS:HB3	2.06	0.56
1:F:25:LEU:HD22	1:F:29:ALA:HB2	1.88	0.56
1:A:68:ASP:OD1	1:A:70:SER:OG	2.22	0.56
1:C:14:THR:N	1:C:279:ILE:O	2.37	0.55
1:B:242:TYR:OH	1:B:266:GLU:OE2	2.24	0.55
1:E:218:ILE:HD12	1:E:271:LEU:HD11	1.89	0.55
1:B:208:ARG:HD3	1:B:209:TYR:H	1.71	0.55
2:F:301:NO6:N15	3:F:427:HOH:O	2.33	0.55
1:C:223:ILE:HB	1:C:235:LEU:HB2	1.87	0.55
1:A:94:GLY:HA2	1:A:125:THR:HB	1.89	0.55
1:B:132:LEU:HD11	1:B:180:MET:HG2	1.87	0.55
1:B:191:SER:OG	1:B:217:ASP:OD2	2.22	0.54
1:E:12:ARG:HH12	1:E:282:LYS:HG2	1.72	0.54
1:E:110:GLU:HG3	1:E:116:ILE:HG13	1.89	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:167:PRO:O	3:C:408:HOH:O	2.18	0.54
1:A:24:SER:OG	1:A:69:GLU:OE1	2.24	0.54
1:A:188:ILE:HG12	1:A:198:LEU:HD22	1.89	0.54
1:E:89:LEU:HD13	1:E:157:THR:HG21	1.89	0.54
1:C:192:GLU:HA	1:C:195:GLN:HB2	1.90	0.54
1:E:124:ALA:HB2	1:E:153:ILE:HD13	1.89	0.54
1:D:187:ALA:HA	1:D:212:LEU:HB3	1.89	0.54
1:E:35:GLY:N	3:E:435:HOH:O	2.41	0.54
1:F:192:GLU:O	1:F:196:LYS:HG3	2.08	0.54
1:D:94:GLY:HA2	1:D:125:THR:HB	1.91	0.53
1:D:237:ARG:NH2	1:D:266:GLU:OE1	2.42	0.53
1:D:80:VAL:HB	1:D:102:VAL:HG12	1.90	0.53
1:A:237:ARG:NH2	3:A:417:HOH:O	2.42	0.53
1:E:147:ASN:N	3:E:428:HOH:O	2.42	0.53
1:C:120:LYS:N	3:C:406:HOH:O	2.42	0.52
1:F:241:GLU:OE2	1:F:262:MET:N	2.39	0.52
1:D:42:ARG:HA	1:E:30:LEU:HD11	1.92	0.52
1:F:110:GLU:N	3:F:404:HOH:O	2.42	0.52
1:F:197:ALA:O	1:F:201:MET:HG3	2.09	0.52
1:B:58:LEU:HB3	1:B:227:ILE:HD12	1.90	0.52
1:E:241:GLU:OE2	1:E:262:MET:N	2.38	0.52
1:B:80:VAL:HB	1:B:102:VAL:HG12	1.91	0.52
1:E:79:ASP:HA	1:E:128:GLY:H	1.75	0.51
1:F:42:ARG:O	1:F:46:GLN:HG3	2.09	0.51
1:A:123:ASN:HA	3:A:413:HOH:O	2.09	0.51
1:C:240:GLU:OE2	1:F:28:HIS:ND1	2.42	0.51
1:A:138:PHE:HB2	1:A:163:VAL:HG22	1.92	0.51
1:B:207:HIS:CG	1:B:208:ARG:H	2.26	0.51
1:D:39:ASP:OD2	1:E:97:SER:OG	2.21	0.51
1:D:223:ILE:HB	1:D:235:LEU:HB2	1.92	0.51
1:A:213:THR:O	3:A:410:HOH:O	2.18	0.51
1:B:205:SER:O	3:B:408:HOH:O	2.19	0.51
1:B:215:PRO:HD2	1:B:245:SER:HA	1.93	0.51
1:B:254:ASP:O	3:B:407:HOH:O	2.18	0.51
1:A:227:ILE:HB	1:A:230:LYS:HB3	1.93	0.51
1:D:53:VAL:O	1:D:57:LYS:HB3	2.11	0.51
1:F:71:LEU:HB2	3:F:444:HOH:O	2.11	0.51
1:C:225:LEU:HD21	1:C:278:LEU:HD13	1.93	0.50
1:D:76:PHE:CE1	1:D:270:GLY:HA3	2.47	0.50
1:B:92:ARG:NH1	3:B:434:HOH:O	2.40	0.50
1:B:269:ASP:HB3	3:B:456:HOH:O	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:106:LYS:NZ	3:E:432:HOH:O	2.39	0.50
1:A:39:ASP:OD2	3:A:411:HOH:O	2.20	0.50
1:E:131:VAL:O	1:E:175:LYS:NZ	2.33	0.50
1:F:247:LYS:HA	1:F:250:GLU:HB2	1.93	0.50
3:A:419:HOH:O	1:F:120:LYS:NZ	2.45	0.50
1:C:45:ARG:NH1	1:F:35:GLY:HA2	2.20	0.50
1:A:145:ARG:HG3	1:A:173:HIS:CE1	2.47	0.50
1:A:87:THR:HA	1:A:115:ASN:HB3	1.93	0.49
1:D:110:GLU:HG3	1:D:116:ILE:HD13	1.94	0.49
1:C:78:GLU:HB3	1:C:274:CYS:HA	1.92	0.49
1:A:80:VAL:HB	1:A:102:VAL:HG12	1.93	0.49
1:C:282:LYS:HB2	3:C:447:HOH:O	2.13	0.49
1:E:198:LEU:HD21	1:E:211:LYS:HD2	1.95	0.49
1:A:42:ARG:HB3	1:A:264:GLU:HG3	1.94	0.49
1:B:79:ASP:HA	1:B:128:GLY:H	1.78	0.49
1:C:51:VAL:HG13	1:C:62:VAL:HG11	1.93	0.49
1:E:12:ARG:HH12	1:E:282:LYS:CG	2.26	0.49
1:D:227:ILE:HB	1:D:230:LYS:HB2	1.94	0.49
1:B:237:ARG:NE	1:B:241:GLU:OE1	2.32	0.48
1:E:117:VAL:HG11	1:E:157:THR:HG23	1.96	0.48
1:F:139:PHE:HD2	1:F:164:SER:HB2	1.78	0.48
1:C:58:LEU:HD11	1:C:233:VAL:HG11	1.95	0.48
1:A:174:LEU:HB3	3:A:405:HOH:O	2.12	0.48
1:E:221:ASN:ND2	1:E:273:THR:OG1	2.25	0.48
1:E:239:PRO:HG3	1:E:246:ALA:HB1	1.94	0.48
1:C:71:LEU:HG	1:C:101:GLU:HG2	1.95	0.48
1:C:138:PHE:HB2	1:C:163:VAL:HG22	1.95	0.48
1:E:97:SER:OG	3:E:408:HOH:O	2.20	0.48
1:A:147:ASN:ND2	3:A:436:HOH:O	2.47	0.47
1:C:124:ALA:HB1	1:C:150:GLY:HA2	1.96	0.47
1:E:124:ALA:HB1	1:E:150:GLY:HA2	1.95	0.47
1:D:191:SER:HB3	1:D:217:ASP:OD2	2.13	0.47
1:C:93:PRO:O	1:C:99:ARG:NE	2.47	0.47
1:F:109:LEU:HB2	3:F:404:HOH:O	2.14	0.47
1:A:78:GLU:HB3	1:A:274:CYS:HA	1.96	0.47
1:B:32:SER:O	3:B:410:HOH:O	2.20	0.47
1:B:69:GLU:HB3	3:B:401:HOH:O	2.13	0.47
1:D:221:ASN:ND2	1:D:273:THR:OG1	2.39	0.47
1:F:84:CYS:C	1:F:86:GLU:H	2.17	0.47
1:E:98:ARG:NH2	1:E:101:GLU:OE1	2.42	0.47
1:F:196:LYS:O	1:F:200:ILE:HG13	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:242:TYR:OH	1:F:266:GLU:OE2	2.32	0.47
1:B:11:GLY:O	3:B:409:HOH:O	2.20	0.47
1:D:132:LEU:HD11	1:D:180:MET:HG2	1.96	0.47
1:D:232:HIS:HB2	1:D:255:HIS:ND1	2.30	0.47
1:C:124:ALA:HA	1:C:147:ASN:HD21	1.80	0.46
1:B:207:HIS:CG	1:B:208:ARG:N	2.83	0.46
1:D:123:ASN:O	1:D:147:ASN:ND2	2.26	0.46
1:A:194:ALA:N	3:A:402:HOH:O	2.19	0.46
1:D:15:HIS:CD2	1:D:61:GLN:HB2	2.51	0.46
1:A:79:ASP:OD1	1:A:98:ARG:NH1	2.40	0.46
1:F:139:PHE:CD2	1:F:164:SER:HB2	2.50	0.46
1:C:185:LEU:HD12	1:C:210:ASP:HB3	1.98	0.46
1:E:248:VAL:HA	1:E:251:LYS:HE3	1.97	0.46
1:A:124:ALA:HB2	3:A:431:HOH:O	2.15	0.46
1:F:247:LYS:O	1:F:251:LYS:HG3	2.16	0.46
1:A:90:ILE:HB	1:A:118:GLU:HA	1.97	0.46
1:A:12:ARG:HE	1:A:12:ARG:HB3	1.68	0.46
1:F:221:ASN:O	1:F:272:LEU:HD13	2.15	0.46
1:E:121:ASP:OD1	1:E:123:ASN:ND2	2.39	0.46
1:D:79:ASP:HA	1:D:128:GLY:N	2.31	0.45
1:E:234:LEU:HB3	1:E:257:LEU:HD23	1.98	0.45
1:B:153:ILE:O	1:B:157:THR:OG1	2.28	0.45
1:D:42:ARG:HD3	1:D:264:GLU:HG2	1.98	0.45
1:D:232:HIS:CE1	3:D:403:HOH:O	2.53	0.45
1:E:132:LEU:HD22	1:E:178:CYS:SG	2.55	0.45
1:B:98:ARG:NH2	1:B:101:GLU:OE1	2.48	0.45
1:C:9:ALA:N	3:C:433:HOH:O	2.48	0.45
1:D:224:TYR:HE1	1:D:232:HIS:HB3	1.79	0.45
1:E:58:LEU:HD12	1:E:225:LEU:HD12	1.99	0.45
1:A:145:ARG:NH1	2:A:301:NO6:O13	2.42	0.45
1:B:246:ALA:O	1:B:250:GLU:HG3	2.16	0.45
1:E:109:LEU:HB2	1:E:116:ILE:CD1	2.47	0.45
1:A:125:THR:O	1:A:146:THR:HA	2.17	0.45
1:A:153:ILE:O	1:A:157:THR:OG1	2.23	0.45
1:C:103:ASP:OD2	1:C:103:ASP:N	2.49	0.45
1:F:234:LEU:HD23	1:F:234:LEU:HA	1.77	0.45
1:E:121:ASP:C	1:E:123:ASN:H	2.21	0.45
3:D:414:HOH:O	1:E:92:ARG:NH2	2.48	0.44
1:E:102:VAL:HA	1:E:105:MET:HB3	1.99	0.44
1:B:177:PHE:HA	1:B:217:ASP:O	2.17	0.44
1:D:21:LEU:HD23	1:D:21:LEU:H	1.82	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:145:ARG:HG3	1:F:173:HIS:CE1	2.53	0.44
1:E:184:ASN:OD1	1:E:207:HIS:NE2	2.50	0.44
1:B:93:PRO:O	1:B:99:ARG:NE	2.38	0.44
1:C:114:LEU:HD11	1:C:279:ILE:HD13	1.98	0.44
1:E:90:ILE:HD13	1:E:90:ILE:HA	1.89	0.44
1:A:159:LYS:N	3:A:439:HOH:O	2.50	0.44
1:B:54:LEU:HG	1:B:60:LEU:HD12	2.00	0.44
1:D:184:ASN:ND2	1:D:209:TYR:HA	2.32	0.44
1:D:238:THR:HG22	1:D:259:PRO:HB2	2.00	0.44
1:A:83:VAL:HG11	1:A:279:ILE:HG12	2.00	0.43
1:C:215:PRO:HB2	3:C:438:HOH:O	2.17	0.43
1:F:145:ARG:HH11	1:F:173:HIS:HE1	1.65	0.43
1:B:143:SER:HA	3:B:457:HOH:O	2.18	0.43
1:D:125:THR:O	1:D:146:THR:HA	2.19	0.43
1:C:10:PHE:N	3:C:433:HOH:O	2.51	0.43
1:F:257:LEU:HB3	3:F:420:HOH:O	2.19	0.43
1:D:78:GLU:HB3	1:D:274:CYS:HA	2.00	0.43
1:D:159:LYS:O	3:D:410:HOH:O	2.21	0.43
1:B:76:PHE:CE1	1:B:270:GLY:HA3	2.54	0.43
1:C:29:ALA:O	1:C:31:ARG:NH2	2.50	0.43
1:F:17:VAL:HG22	1:F:63:VAL:HG12	2.01	0.43
1:F:185:LEU:HD11	1:F:212:LEU:HB2	2.00	0.43
1:B:98:ARG:HG2	3:B:467:HOH:O	2.18	0.43
1:C:77:VAL:HG23	1:C:277:VAL:HG23	2.00	0.43
1:E:196:LYS:O	1:E:200:ILE:HG13	2.18	0.43
1:A:55:GLY:HA2	1:A:60:LEU:O	2.18	0.42
1:A:106:LYS:HE3	1:A:110:GLU:OE2	2.19	0.42
1:B:214:VAL:HG12	1:B:248:VAL:HG11	2.00	0.42
1:F:90:ILE:HB	1:F:118:GLU:HA	2.01	0.42
1:D:92:ARG:O	1:D:125:THR:HA	2.19	0.42
1:F:218:ILE:HG21	1:F:266:GLU:CD	2.39	0.42
1:F:221:ASN:OD1	1:F:273:THR:HG23	2.20	0.42
1:A:58:LEU:HD11	1:A:233:VAL:HG11	2.00	0.42
1:A:235:LEU:HD23	1:A:260:VAL:HG21	2.02	0.42
1:B:12:ARG:NH2	1:B:228:PRO:HG3	2.34	0.42
1:C:262:MET:O	1:C:266:GLU:HB2	2.20	0.42
1:D:224:TYR:O	1:D:225:LEU:HD23	2.20	0.42
1:A:224:TYR:HE1	1:A:232:HIS:HB3	1.84	0.42
1:B:160:ASP:OD1	1:B:160:ASP:N	2.35	0.42
1:F:78:GLU:O	1:F:128:GLY:HA3	2.20	0.42
1:F:131:VAL:HG22	1:F:140:VAL:HG22	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:195:GLN:NE2	3:C:435:HOH:O	2.52	0.42
1:D:101:GLU:HG3	3:D:441:HOH:O	2.19	0.42
1:D:112:LEU:HD23	1:D:112:LEU:HA	1.89	0.42
1:D:185:LEU:HD12	1:D:210:ASP:HB3	2.00	0.42
1:B:110:GLU:HG2	1:B:116:ILE:HG13	2.01	0.42
1:C:244:GLU:HB2	3:C:438:HOH:O	2.19	0.42
1:D:102:VAL:HG22	3:D:423:HOH:O	2.18	0.42
1:B:184:ASN:ND2	1:B:209:TYR:HA	2.34	0.42
1:E:88:ALA:HB1	1:E:109:LEU:HD13	2.01	0.42
1:F:183:PRO:HD3	1:F:224:TYR:CZ	2.55	0.42
1:B:225:LEU:HD21	1:B:278:LEU:HD13	2.02	0.42
1:E:237:ARG:NH1	1:E:271:LEU:HD12	2.35	0.42
1:C:19:ARG:HD2	1:C:74:CYS:O	2.20	0.41
1:C:60:LEU:HA	3:C:444:HOH:O	2.19	0.41
1:C:92:ARG:CZ	1:C:122:GLU:HA	2.50	0.41
1:D:280:ASN:OD1	1:D:281:LYS:N	2.53	0.41
1:F:50:TYR:OH	1:F:272:LEU:O	2.28	0.41
1:F:205:SER:OG	1:F:207:HIS:O	2.28	0.41
1:A:36:GLU:O	3:A:412:HOH:O	2.22	0.41
1:B:92:ARG:NH1	1:B:122:GLU:O	2.53	0.41
1:C:218:ILE:HG23	1:C:271:LEU:HD22	2.03	0.41
1:D:250:GLU:HA	1:D:257:LEU:HD13	2.02	0.41
1:C:191:SER:OG	1:C:217:ASP:OD2	2.34	0.41
1:D:149:ARG:O	1:D:153:ILE:HD12	2.19	0.41
1:F:40:VAL:HG12	3:F:439:HOH:O	2.20	0.41
1:A:42:ARG:HD3	1:A:264:GLU:HG2	2.02	0.41
1:B:79:ASP:HA	1:B:128:GLY:N	2.35	0.41
1:F:272:LEU:HD12	1:F:272:LEU:H	1.85	0.41
1:A:122:GLU:O	3:A:413:HOH:O	2.22	0.41
1:B:73:ASP:HB2	3:B:467:HOH:O	2.20	0.41
1:B:88:ALA:HB1	1:B:109:LEU:HD13	2.03	0.41
1:E:93:PRO:HD2	1:E:99:ARG:HD3	2.03	0.41
1:A:131:VAL:HG22	1:A:140:VAL:HG22	2.02	0.41
1:B:254:ASP:OD1	1:B:254:ASP:N	2.40	0.41
1:C:237:ARG:CZ	1:C:262:MET:HB3	2.50	0.41
1:C:238:THR:HG21	1:F:28:HIS:CE1	2.56	0.41
1:E:212:LEU:HD11	1:E:248:VAL:HG13	2.03	0.41
1:F:125:THR:O	1:F:146:THR:HA	2.21	0.41
1:A:90:ILE:HD12	1:A:118:GLU:HG2	2.03	0.41
1:C:252:LEU:HB2	1:C:257:LEU:HD21	2.03	0.41
1:D:100:LYS:HE2	1:D:100:LYS:HB2	1.88	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:153:ILE:HD12	1:D:153:ILE:H	1.85	0.41
1:F:118:GLU:HB2	1:F:120:LYS:CE	2.48	0.41
1:E:125:THR:O	1:E:146:THR:HA	2.21	0.41
1:E:131:VAL:HG22	1:E:140:VAL:HG22	2.02	0.41
1:B:223:ILE:HB	1:B:235:LEU:HB2	2.02	0.41
1:F:114:LEU:HD12	1:F:114:LEU:HA	1.86	0.41
1:F:196:LYS:NZ	1:F:196:LYS:HB3	2.36	0.41
1:E:172:LEU:N	3:E:416:HOH:O	2.40	0.41
1:E:218:ILE:HG23	1:E:271:LEU:CD1	2.51	0.41
1:B:218:ILE:HG23	1:B:271:LEU:HD22	2.02	0.40
1:E:112:LEU:HB3	1:E:281:LYS:HD2	2.04	0.40
1:A:76:PHE:CE1	1:A:270:GLY:HA3	2.56	0.40
1:C:237:ARG:HA	1:C:237:ARG:HD2	1.87	0.40
1:D:238:THR:HG22	1:D:259:PRO:C	2.41	0.40
1:B:118:GLU:OE2	1:B:120:LYS:HE3	2.22	0.40
1:B:222:CYS:HB2	1:B:235:LEU:O	2.22	0.40
1:E:79:ASP:HA	1:E:128:GLY:N	2.37	0.40
1:F:111:LYS:C	1:F:113:GLN:H	2.25	0.40
2:F:301:NO6:S9	3:F:442:HOH:O	2.62	0.40
1:B:121:ASP:HB3	1:B:124:ALA:HB3	2.04	0.40
1:B:123:ASN:O	1:B:147:ASN:ND2	2.49	0.40

All (4) 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)
3:C:471:HOH:O	3:F:485:HOH:O[1_454]	2.02	0.18
1:C:27:GLN:O	1:F:45:ARG:NH1[1_455]	2.07	0.13
1:D:57:LYS:NZ	1:D:123:ASN:OD1[1_655]	2.10	0.10
3:C:474:HOH:O	3:F:485:HOH:O[1_454]	2.13	0.07

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	268/308 (87%)	251 (94%)	15 (6%)	2 (1%)	22	30
1	B	268/308 (87%)	250 (93%)	15 (6%)	3 (1%)	14	18
1	C	268/308 (87%)	249 (93%)	16 (6%)	3 (1%)	14	18
1	D	268/308 (87%)	253 (94%)	13 (5%)	2 (1%)	22	30
1	E	268/308 (87%)	252 (94%)	13 (5%)	3 (1%)	14	18
1	F	268/308 (87%)	245 (91%)	19 (7%)	4 (2%)	10	12
All	All	1608/1848 (87%)	1500 (93%)	91 (6%)	17 (1%)	14	18

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	86	GLU
1	A	10	PHE
1	A	36	GLU
1	B	10	PHE
1	B	36	GLU
1	C	10	PHE
1	C	36	GLU
1	D	10	PHE
1	D	36	GLU
1	E	10	PHE
1	E	36	GLU
1	E	122	GLU
1	F	113	GLN
1	F	10	PHE
1	B	113	GLN
1	C	28	HIS
1	F	171	GLY

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	230/258 (89%)	223 (97%)	7 (3%)	41	59
1	B	230/258 (89%)	216 (94%)	14 (6%)	18	27
1	C	230/258 (89%)	222 (96%)	8 (4%)	36	52
1	D	230/258 (89%)	219 (95%)	11 (5%)	25	39
1	E	230/258 (89%)	223 (97%)	7 (3%)	41	59
1	F	230/258 (89%)	219 (95%)	11 (5%)	25	39
All	All	1380/1548 (89%)	1322 (96%)	58 (4%)	30	44

All (58) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	25	LEU
1	A	45	ARG
1	A	91	THR
1	A	136	ARG
1	A	178	CYS
1	A	193	SER
1	A	206	ASP
1	B	23	GLU
1	B	77	VAL
1	B	91	THR
1	B	144	LYS
1	B	145	ARG
1	B	148	GLN
1	B	160	ASP
1	B	164	SER
1	B	168	VAL
1	B	178	CYS
1	B	179	SER
1	B	208	ARG
1	B	253	LYS
1	B	274	CYS
1	C	103	ASP
1	C	105	MET
1	C	126	LEU
1	C	148	GLN
1	C	192	GLU
1	C	210	ASP
1	C	230	LYS
1	C	274	CYS
1	D	56	SER

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Mol	Chain	Res	Type
1	D	104	MET
1	D	114	LEU
1	D	164	SER
1	D	177	PHE
1	D	191	SER
1	D	204	MET
1	D	207	HIS
1	D	208	ARG
1	D	217	ASP
1	D	262	MET
1	E	91	THR
1	E	107	GLU
1	E	113	GLN
1	E	122	GLU
1	E	208	ARG
1	E	253	LYS
1	E	274	CYS
1	F	24	SER
1	F	42	ARG
1	F	44	GLU
1	F	45	ARG
1	F	56	SER
1	F	112	LEU
1	F	123	ASN
1	F	166	VAL
1	F	173	HIS
1	F	178	CYS
1	F	230	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	28	HIS
1	C	173	HIS
1	C	202	GLN
1	D	61	GLN
1	D	203	GLN
1	F	173	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

6 ligands are modelled in this entry.

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	$\#|Z| > 2$
2	NO6	F	301	1	13,14,14	1.16	1 (7%)	15,17,17	1.57	2 (13%)
2	NO6	C	301	1	13,14,14	1.21	1 (7%)	15,17,17	1.58	2 (13%)
2	NO6	D	301	1	13,14,14	1.15	1 (7%)	15,17,17	1.73	4 (26%)
2	NO6	A	301	1	13,14,14	1.12	1 (7%)	15,17,17	1.66	3 (20%)
2	NO6	E	301	1	13,14,14	1.16	1 (7%)	15,17,17	1.69	3 (20%)
2	NO6	B	301	1	13,14,14	1.15	1 (7%)	15,17,17	1.76	4 (26%)

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
2	NO6	F	301	1	-	2/10/10/10	0/1/1/1
2	NO6	C	301	1	-	6/10/10/10	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NO6	D	301	1	-	2/10/10/10	0/1/1/1
2	NO6	A	301	1	-	1/10/10/10	0/1/1/1
2	NO6	E	301	1	-	3/10/10/10	0/1/1/1
2	NO6	B	301	1	-	1/10/10/10	0/1/1/1

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	301	NO6	C8-S9	-3.59	1.76	1.82
2	E	301	NO6	C8-S9	-3.42	1.76	1.82
2	B	301	NO6	C8-S9	-3.37	1.76	1.82
2	F	301	NO6	C8-S9	-3.31	1.76	1.82
2	D	301	NO6	C8-S9	-3.30	1.76	1.82
2	A	301	NO6	C8-S9	-3.19	1.76	1.82

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	301	NO6	C10-S9-C8	4.18	110.11	101.25
2	B	301	NO6	C10-S9-C8	4.12	109.99	101.25
2	C	301	NO6	C10-S9-C8	4.03	109.80	101.25
2	E	301	NO6	C10-S9-C8	4.03	109.80	101.25
2	F	301	NO6	C10-S9-C8	3.90	109.52	101.25
2	A	301	NO6	C10-S9-C8	3.85	109.43	101.25
2	F	301	NO6	C1-N2-C3	3.12	121.69	117.42
2	C	301	NO6	C1-N2-C3	2.95	121.46	117.42
2	D	301	NO6	C1-N2-C3	2.76	121.20	117.42
2	B	301	NO6	C1-N2-C3	2.72	121.15	117.42
2	A	301	NO6	C1-N2-C3	2.70	121.11	117.42
2	E	301	NO6	C1-N2-C3	2.66	121.07	117.42
2	B	301	NO6	C3-C8-S9	-2.63	108.71	113.78
2	D	301	NO6	C3-C8-S9	-2.34	109.27	113.78
2	A	301	NO6	C3-C8-S9	-2.34	109.27	113.78
2	E	301	NO6	C3-C8-S9	-2.20	109.53	113.78
2	B	301	NO6	C8-C3-N2	2.12	119.92	116.68
2	D	301	NO6	C8-C3-N2	2.06	119.84	116.68

There are no chirality outliers.

All (15) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	301	NO6	S9-C10-C11-N15
2	C	301	NO6	C3-C8-S9-C10
2	D	301	NO6	C3-C8-S9-C10
2	C	301	NO6	N2-C3-C8-S9
2	C	301	NO6	C4-C3-C8-S9
2	E	301	NO6	C4-C3-C8-S9
2	A	301	NO6	C3-C8-S9-C10
2	E	301	NO6	N2-C3-C8-S9
2	F	301	NO6	N2-C3-C8-S9
2	F	301	NO6	C4-C3-C8-S9
2	C	301	NO6	S9-C10-C11-C12
2	B	301	NO6	C3-C8-S9-C10
2	E	301	NO6	C3-C8-S9-C10
2	C	301	NO6	N15-C11-C12-O14
2	D	301	NO6	N15-C11-C12-O13

There are no ring outliers.

3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	301	NO6	3	0
2	C	301	NO6	1	0
2	A	301	NO6	1	0

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

Ligand NO6 F 301

Bond lengths

Bond angles

Torsions

Rings

Ligand NO6 C 301

Bond lengths

Bond angles

Torsions

Rings

Ligand NO6 D 301

Bond lengths

Bond angles

Torsions

Rings

Ligand NO6 A 301

Bond lengths

Bond angles

Torsions

Rings

Ligand NO6 E 301

Bond lengths

Bond angles

Torsions

Rings

Ligand NO6 B 301

Bond lengths

Bond angles

Torsions

Rings
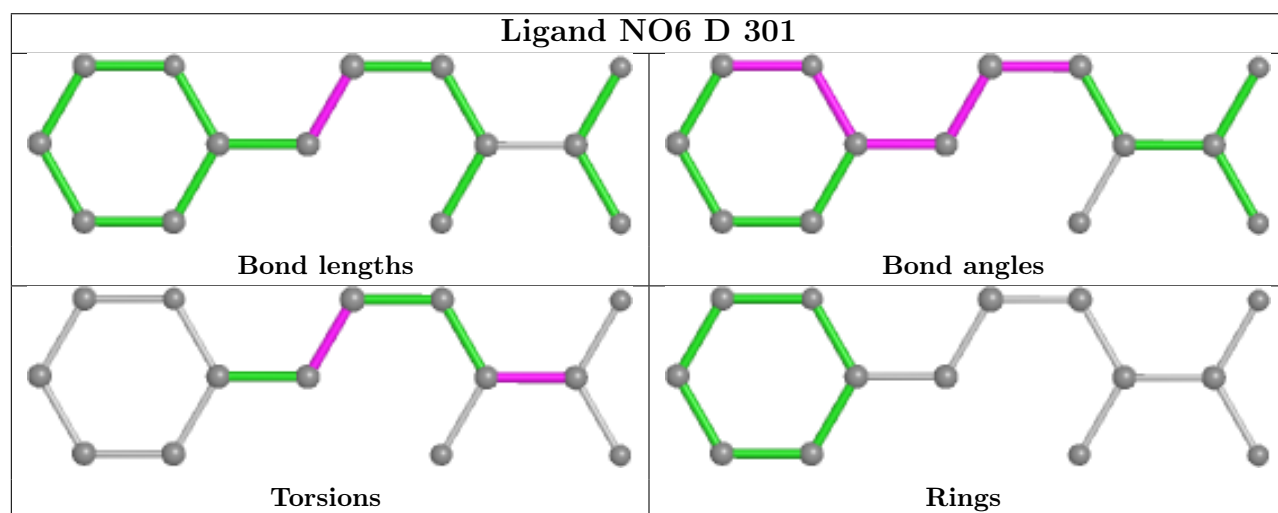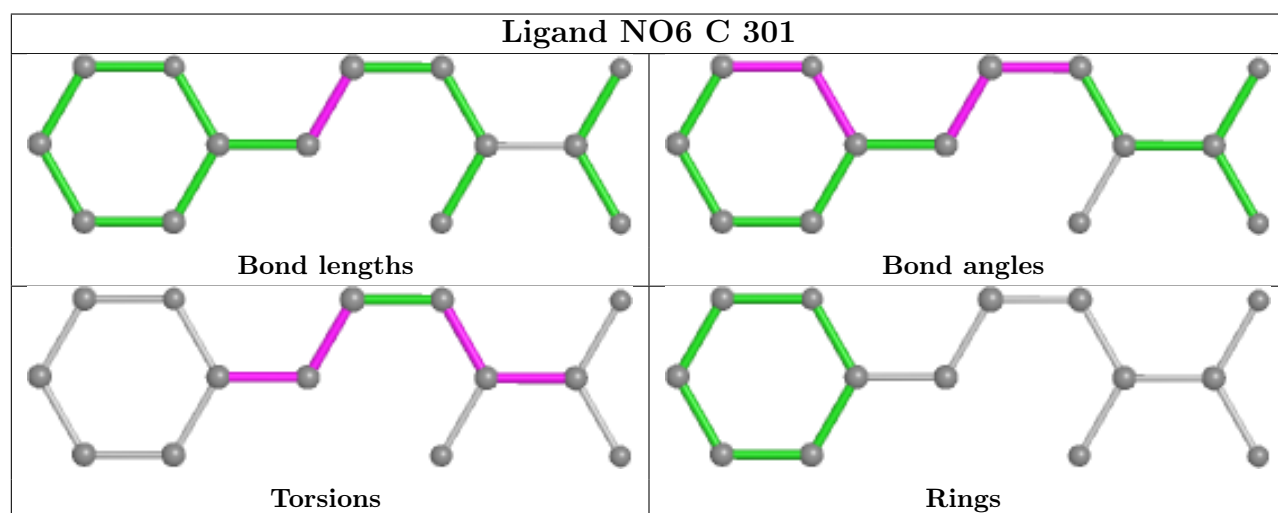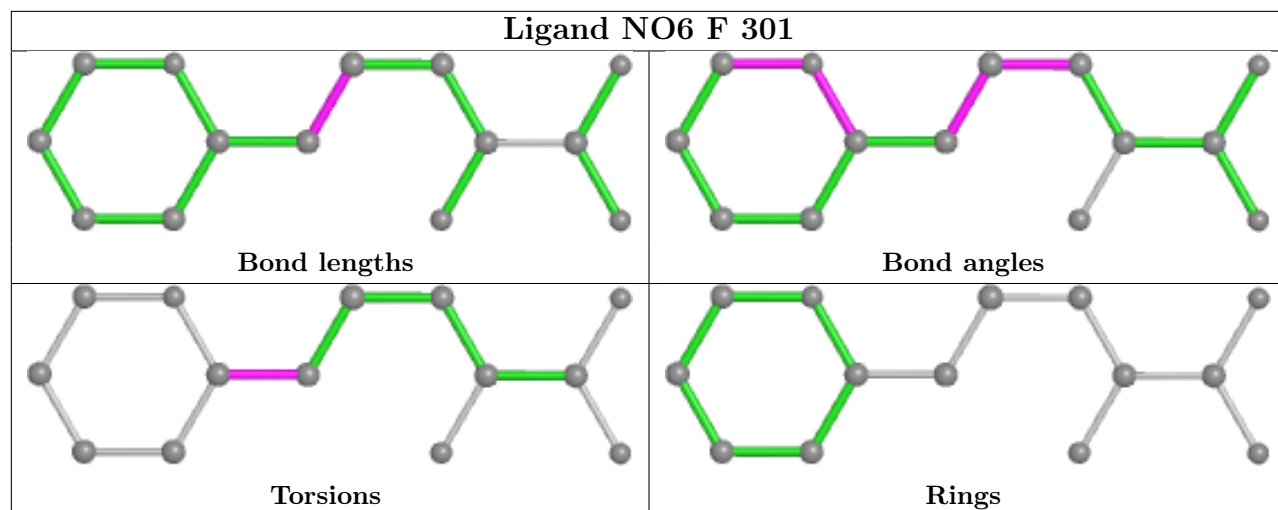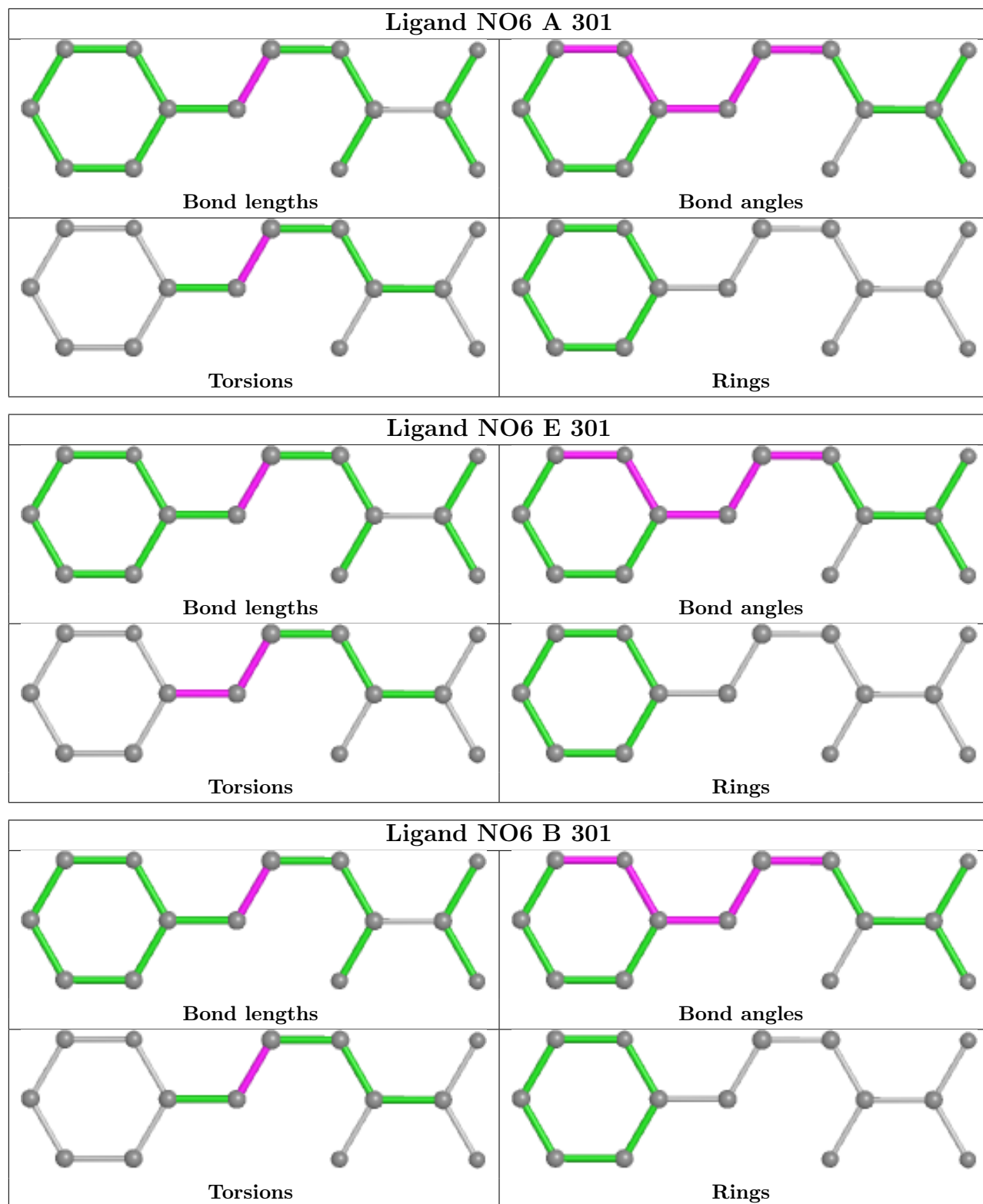
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	272/308 (88%)	0.27	3 (1%)	80	81	30, 38, 52, 63	0
1	B	272/308 (88%)	0.34	9 (3%)	46	49	27, 38, 54, 71	0
1	C	272/308 (88%)	0.47	12 (4%)	34	37	34, 47, 59, 70	0
1	D	272/308 (88%)	0.49	10 (3%)	41	45	29, 46, 58, 73	0
1	E	272/308 (88%)	0.54	12 (4%)	34	37	35, 48, 64, 77	0
1	F	272/308 (88%)	0.65	21 (7%)	13	14	34, 49, 66, 78	0
All	All	1632/1848 (88%)	0.46	67 (4%)	37	40	27, 45, 60, 78	0

All (67) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	29	ALA	6.9
1	E	124	ALA	5.4
1	F	266	GLU	4.9
1	D	124	ALA	4.9
1	E	169	ALA	4.7
1	C	28	HIS	4.6
1	C	27	GLN	4.3
1	E	35	GLY	4.2
1	F	246	ALA	4.1
1	B	9	ALA	3.6
1	F	169	ALA	3.6
1	F	269	ASP	3.5
1	F	233	VAL	3.5
1	D	229	ASN	3.5
1	F	25	LEU	3.5
1	F	116	ILE	3.3
1	E	142	LEU	3.3
1	B	227	ILE	3.3
1	E	9	ALA	3.3

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Mol	Chain	Res	Type	RSRZ
1	F	55	GLY	3.2
1	F	28	HIS	3.2
1	F	114	LEU	3.2
1	B	109	LEU	3.1
1	F	35	GLY	3.1
1	D	139	PHE	3.0
1	C	26	GLY	3.0
1	C	16	ALA	2.9
1	E	246	ALA	2.9
1	F	23	GLU	2.9
1	E	170	ASP	2.8
1	C	25	LEU	2.8
1	F	87	THR	2.8
1	E	11	GLY	2.7
1	F	168	VAL	2.7
1	E	252	LEU	2.7
1	F	32	SER	2.7
1	C	111	LYS	2.7
1	C	185	LEU	2.7
1	D	158	PHE	2.6
1	F	229	ASN	2.6
1	E	113	GLN	2.5
1	D	55	GLY	2.5
1	A	9	ALA	2.5
1	B	208	ARG	2.5
1	D	159	LYS	2.5
1	B	124	ALA	2.4
1	F	63	VAL	2.4
1	F	249	TYR	2.4
1	B	229	ASN	2.4
1	A	230	LYS	2.4
1	D	114	LEU	2.3
1	B	170	ASP	2.3
1	E	270	GLY	2.3
1	B	282	LYS	2.3
1	D	154	LEU	2.3
1	F	27	GLN	2.3
1	C	156	ASP	2.3
1	B	169	ALA	2.2
1	D	83	VAL	2.2
1	C	29	ALA	2.2
1	E	212	LEU	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	223	ILE	2.1
1	C	71	LEU	2.1
1	F	268	VAL	2.1
1	C	135	GLY	2.0
1	A	35	GLY	2.0
1	D	109	LEU	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
2	NO6	F	301	14/14	0.63	0.26	55,61,66,68	0
2	NO6	E	301	14/14	0.69	0.35	55,66,75,76	0
2	NO6	C	301	14/14	0.86	0.23	43,50,61,62	0
2	NO6	A	301	14/14	0.89	0.16	33,35,42,47	0
2	NO6	B	301	14/14	0.92	0.12	32,34,39,41	0
2	NO6	D	301	14/14	0.92	0.14	37,42,45,48	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 NO6 F 301:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
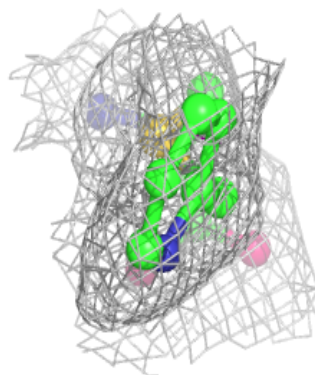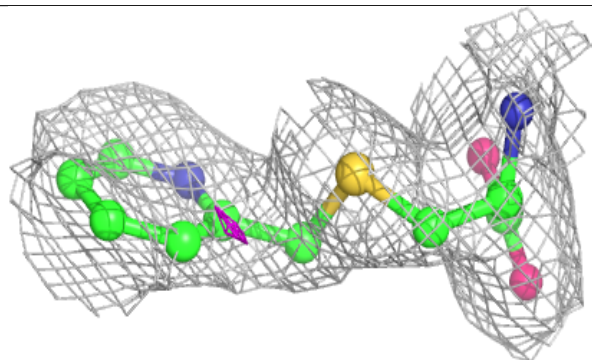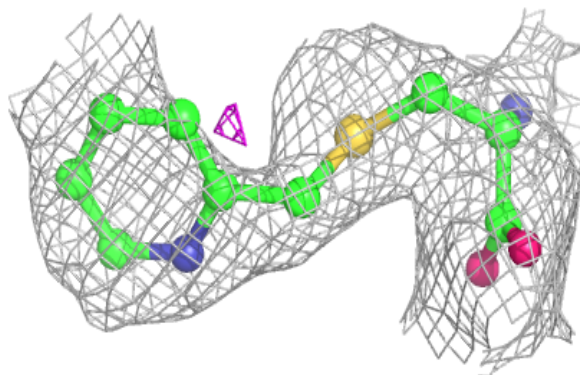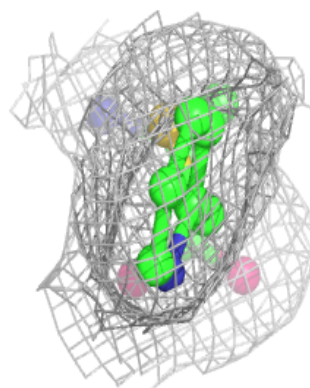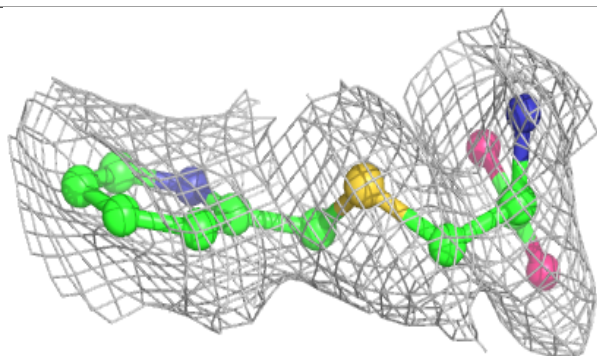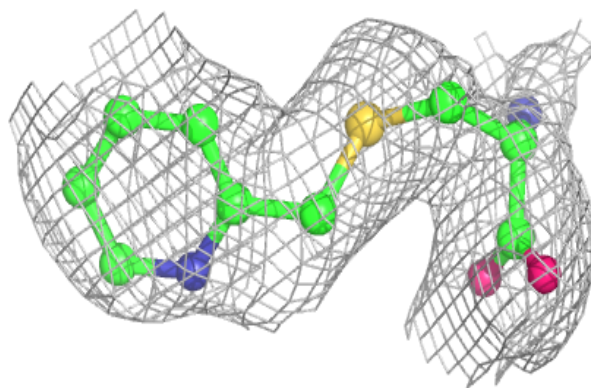mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
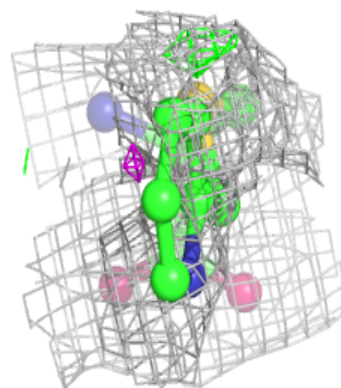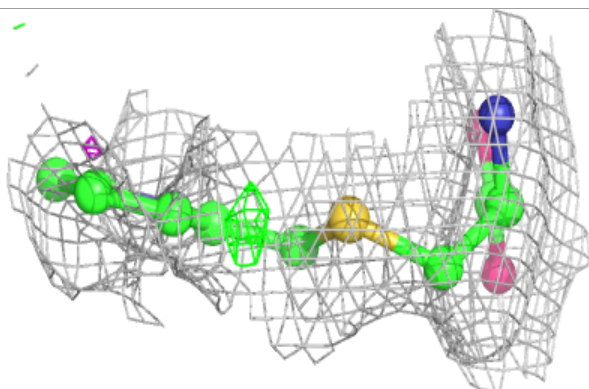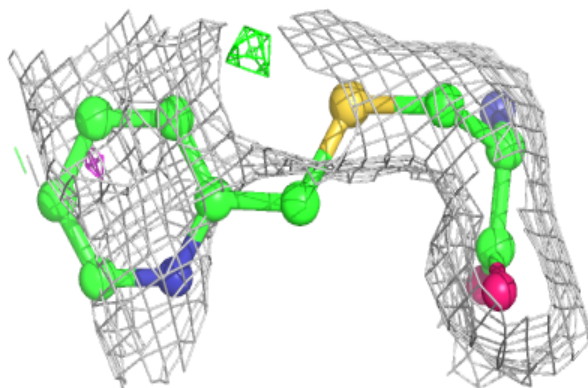
Electron density around NO6 E 301:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
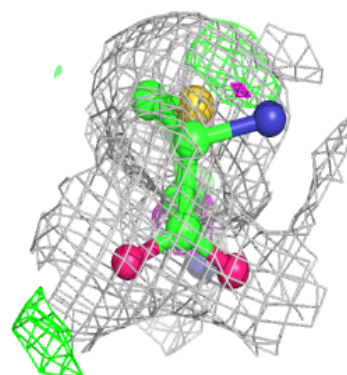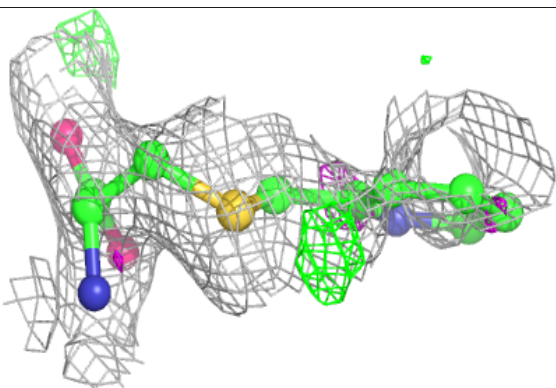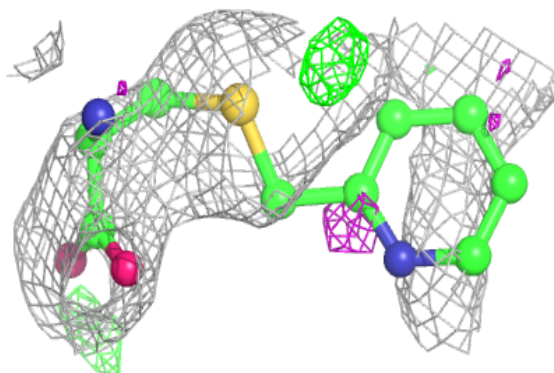
Electron density around NO6 C 301:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
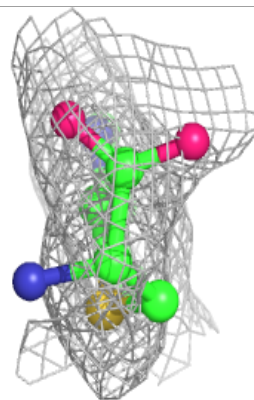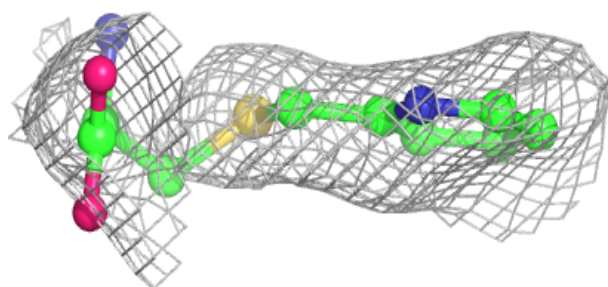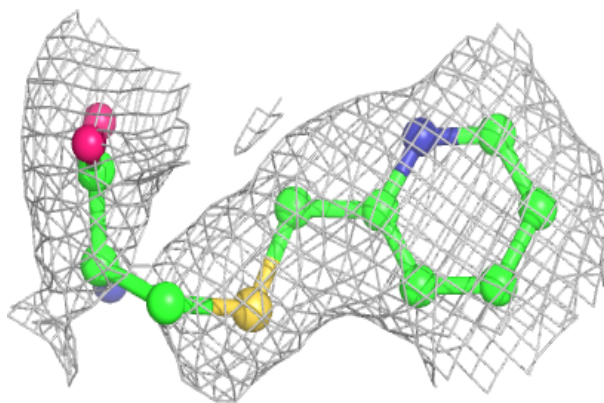
Electron density around NO6 A 301:

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

Electron density around NO6 B 301:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

Electron density around NO6 D 301:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
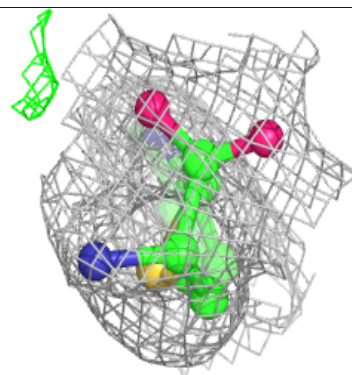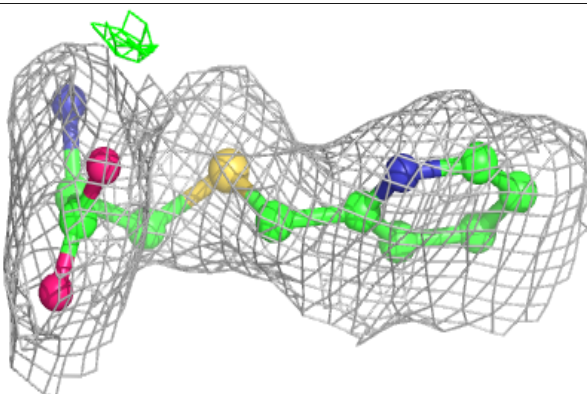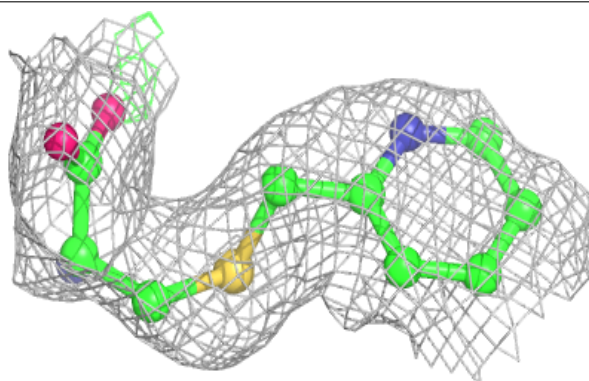
6.5 Other polymers (i)

There are no such residues in this entry.