Full wwPDB X-ray Structure Validation Report (i)

Jul 31, 2023 – 11:11 PM EDT

PDB ID	:	2DUB
Title	:	ENOYL-COA HYDRATASE COMPLEXED WITH OCTANOYL-COA
Authors	:	Engel, C.K.; Wierenga, R.K.
Deposited on	:	1997-04-28
Resolution	:	2.40 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	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.34
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.34

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 2.40 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.
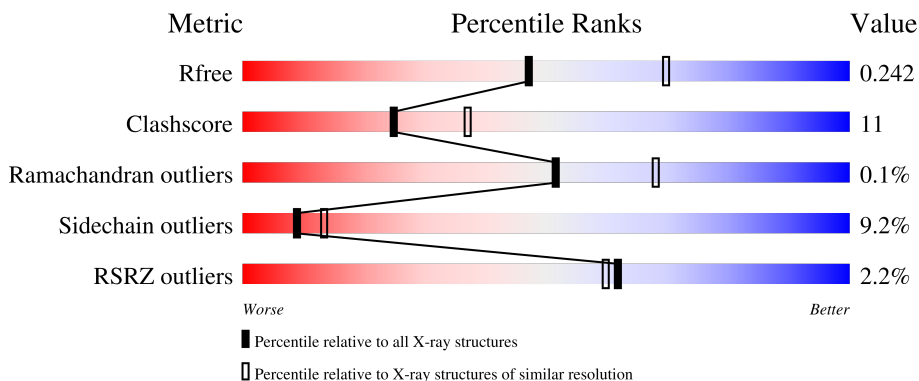
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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	261	3% · 74% · 21% · ·
1	B	261	2% · 74% · 20% · ·
1	C	261	4% · 72% · 23% · ·
1	D	261	2% · 76% · 19% · ·
1	E	261	% · 72% · 23% · ·

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Mol	Chain	Length	Quality of chain
1	F	261	

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

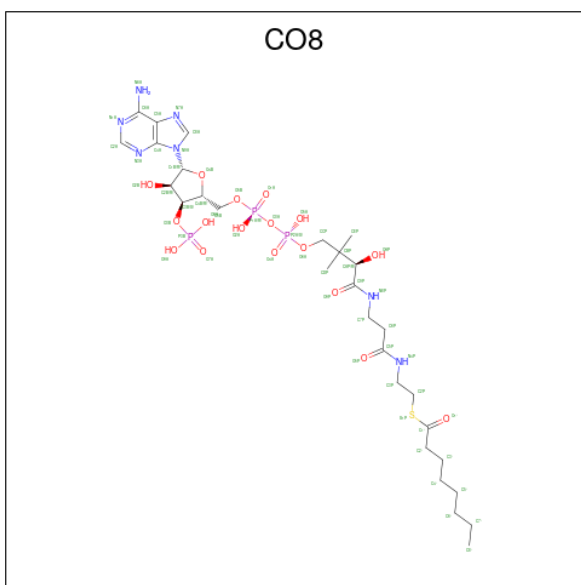| Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	CO8	B	300	-	-	-	X

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 12205 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 2-ENOYL-COA HYDRATASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	254	Total	C	N	O	S	0	0	0
			1921	1206	330	372	13			
1	B	254	Total	C	N	O	S	0	0	0
			1918	1205	329	371	13			
1	C	254	Total	C	N	O	S	0	0	0
			1918	1205	329	371	13			
1	D	257	Total	C	N	O	S	0	0	0
			1935	1214	333	375	13			
1	E	255	Total	C	N	O	S	0	0	0
			1923	1208	330	372	13			
1	F	255	Total	C	N	O	S	0	0	0
			1926	1209	331	373	13			

- Molecule 2 is OCTANOYL-COENZYME A (three-letter code: CO8) (formula: $C_{29}H_{50}N_7O_{17}P_3S$).

CO8

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total 57	C 29	N 7	O 17	P 3	S 1	0	0
2	B	1	Total 57	C 29	N 7	O 17	P 3	S 1	0	0
2	E	1	Total 57	C 29	N 7	O 17	P 3	S 1	0	0
2	F	1	Total 57	C 29	N 7	O 17	P 3	S 1	0	0

- Molecule 3 is water.

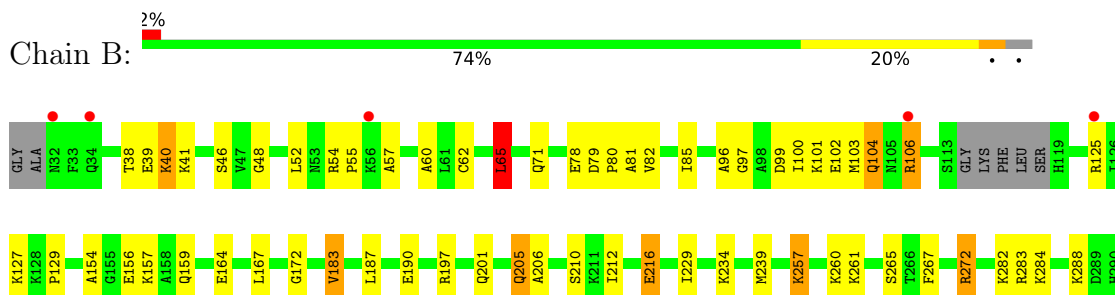| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	76	Total 76	O 76	0	0
3	B	73	Total 73	O 73	0	0
3	C	59	Total 59	O 59	0	0
3	D	73	Total 73	O 73	0	0
3	E	82	Total 82	O 82	0	0
3	F	73	Total 73	O 73	0	0

3 Residue-property plots ⓘ

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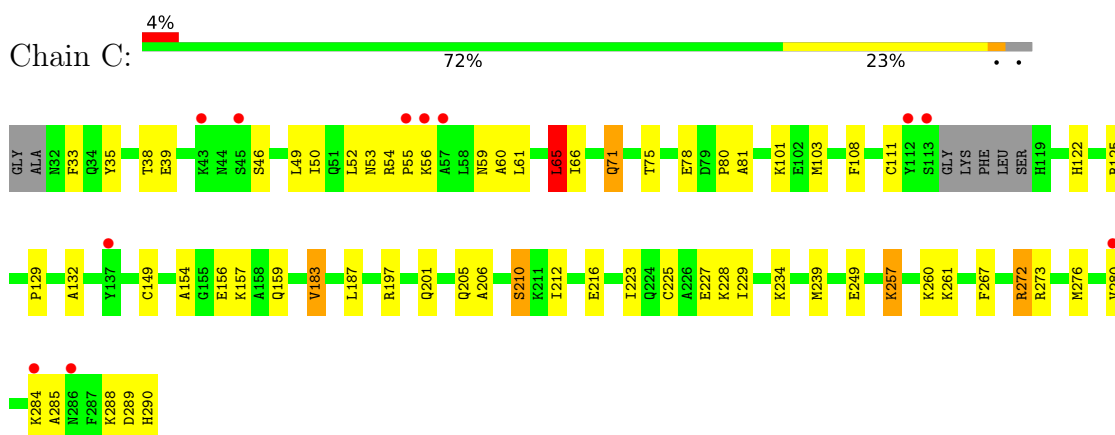
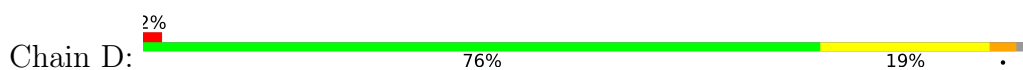- Molecule 1: 2-ENOYL-COA HYDRATASE
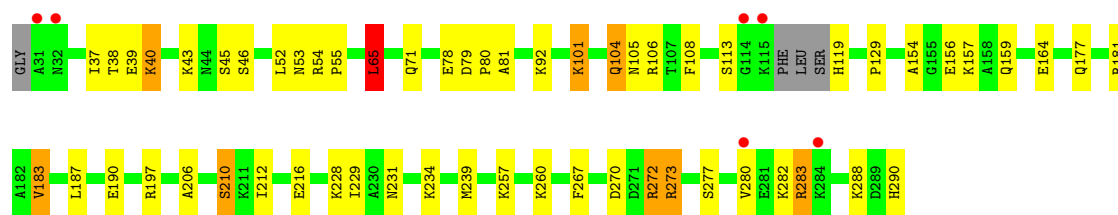
Chain A:

- Molecule 1: 2-ENOYL-COA HYDRATASE

Chain B:

- Molecule 1: 2-ENOYL-COA HYDRATASE

Chain C:

- Molecule 1: 2-ENOYL-COA HYDRATASE

Chain D:

GLY A31 N32 I37 T38 E39 K40 K43 N44 S45 S46 L52 N53 R54 P55 L65 Q71 E78 D79 P80 A81 K92 K101 Q104 N105 R106 T107 F108 S113 G114 K115 PHE LEU SER H119 P129 A154 G155 E156 K157 A158 Q159 E164 Q177 R181

A182 V183 L187 E190 R197 A206 S210 K211 I212 E216 K228 I229 A230 N231 K234 M239 K257 K260 F267 D270 D271 R272 R273 S277 V280 E281 K282 R283 K284 K288 D289 H290

• Molecule 1: 2-ENOYL-COA HYDRATASE

%

Chain E: 72% 23% • •

GLY A31 Q34 Y35 I36 I37 T38 E39 K40 K41 G42 K43 N44 S45 S46 L52 N53 R54 P55 L58 N59 A60 L61 L65 I66 Q71 E77 E78 D79 P80 A81 A96 G97 A98 D99 I100 K101 R106 T107 F108 C111 Y112 S113 GLY LYS PHE LEU SER H119 H122

I123 T124 R125 K128 P129 E156 K157 A158 Q159 G172 V183 L187 R197 I198 S199 A200 Q201 Q205 A206 S210 E227 K228 I229 M239 K257 K260 K261 S265 T266 F267 R272 R273 F279 V280 E281 K282 R283 K284 A285 N286 F287 K288 D289 H290

• Molecule 1: 2-ENOYL-COA HYDRATASE

%

Chain F: 76% 20% • •

GLY A31 N32 T38 E39 K40 K41 S45 S46 V47 G48 L52 N53 R54 P55 K56 A57 L65 Q71 D79 P80 A81 I85 K92 A98 K101 E102 M103 Q104 N105 R106 S113 GLY LYS PHE LEU SER H119 H122 R125 P129 A138 C143

A154 G155 E156 K157 A158 Q159 V183 L187 E190 R197 Q201 A206 S210 K211 I212 I229 M239 E242 K257 K260 K261 S265 T266 R272 R273 M276 K282 R283 K288 D289 H290

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	76.24Å 93.93Å 246.98Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.40 19.99 – 2.40	Depositor EDS
% Data completeness (in resolution range)	99.6 (20.00-2.40) 99.6 (19.99-2.40)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.07	Depositor
$< I/\sigma(I) >$ [1]	4.37 (at 2.41Å)	Xtriage
Refinement program	REFMAC, X-PLOR	Depositor
R, R_{free}	0.204 , 0.260 0.199 , 0.242	Depositor DCC
R_{free} test set	3525 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å^2)	28.1	Xtriage
Anisotropy	0.501	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.39 , 66.9	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	12205	wwPDB-VP
Average B, all atoms (Å^2)	32.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.68% 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: CO8

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	0.37	0/1943	0.58	1/2608 (0.0%)
1	B	0.37	0/1940	0.58	1/2604 (0.0%)
1	C	0.38	0/1940	0.58	1/2604 (0.0%)
1	D	0.37	0/1957	0.59	1/2627 (0.0%)
1	E	0.38	0/1945	0.58	1/2611 (0.0%)
1	F	0.36	0/1948	0.59	1/2615 (0.0%)
All	All	0.37	0/11673	0.58	6/15669 (0.0%)

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	F	65	LEU	CA-CB-CG	5.60	128.18	115.30
1	A	65	LEU	CA-CB-CG	5.31	127.51	115.30
1	E	65	LEU	CA-CB-CG	5.25	127.39	115.30
1	D	65	LEU	CA-CB-CG	5.20	127.27	115.30
1	B	65	LEU	CA-CB-CG	5.10	127.03	115.30
1	C	65	LEU	CA-CB-CG	5.01	126.82	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2   Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1921	0	1942	46	0
1	B	1918	0	1938	49	0
1	C	1918	0	1938	44	0
1	D	1935	0	1952	42	0
1	E	1923	0	1943	54	0
1	F	1926	0	1947	43	0
2	A	57	0	46	6	0
2	B	57	0	46	7	0
2	E	57	0	46	6	0
2	F	57	0	46	1	0
3	A	76	0	0	2	0
3	B	73	0	0	3	0
3	C	59	0	0	3	0
3	D	73	0	0	2	0
3	E	82	0	0	3	0
3	F	73	0	0	2	0
All	All	12205	0	11844	253	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 11.

All (253) 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:B:104:GLN:HG3	1:C:280:VAL:HG21	1.42	1.01
1:F:201:GLN:H	1:F:201:GLN:NE2	1.66	0.94
1:A:267:PHE:HA	1:A:272:ARG:HD3	1.51	0.94
1:B:172:GLY:H	2:B:300:CO8:H3'1	1.34	0.90
1:D:101:LYS:H	1:D:101:LYS:HD2	1.41	0.86
1:C:108:PHE:HZ	1:D:239:MET:HE1	1.39	0.85
1:A:172:GLY:H	2:A:300:CO8:H3'1	1.41	0.84
1:E:172:GLY:H	2:E:300:CO8:H3'1	1.46	0.81
1:E:183:VAL:HG22	1:E:206:ALA:HB1	1.64	0.80
1:B:183:VAL:HG22	1:B:206:ALA:HB1	1.65	0.78
1:C:183:VAL:HG22	1:C:206:ALA:HB1	1.68	0.76
1:D:183:VAL:HG22	1:D:206:ALA:HB1	1.69	0.74
1:A:201:GLN:NE2	1:A:201:GLN:H	1.86	0.73
1:F:183:VAL:HG22	1:F:206:ALA:HB1	1.71	0.73
1:F:52:LEU:HD22	1:F:65:LEU:HD11	1.71	0.72
1:B:100:ILE:HG23	1:C:276:MET:HG2	1.70	0.71
1:C:52:LEU:HD22	1:C:65:LEU:HD11	1.71	0.71
1:A:183:VAL:HG22	1:A:206:ALA:HB1	1.72	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:273:ARG:HH22	1:F:105:ASN:ND2	1.92	0.68
1:E:100:ILE:HG23	1:F:276:MET:HG2	1.76	0.67
1:B:201:GLN:H	1:B:201:GLN:NE2	1.93	0.67
1:D:280:VAL:HG21	1:F:104:GLN:NE2	2.09	0.66
1:B:183:VAL:HG13	1:B:187:LEU:HB3	1.78	0.66
1:B:239:MET:HE1	1:B:265:SER:HB3	1.77	0.66
3:C:303:HOH:O	1:E:257:LYS:HB3	1.95	0.66
1:B:129:PRO:HG2	1:B:229:ILE:HG21	1.77	0.65
1:D:78:GLU:O	1:D:80:PRO:HD3	1.95	0.65
1:C:267:PHE:HA	1:C:272:ARG:HD3	1.79	0.65
1:A:52:LEU:HD22	1:A:65:LEU:HD11	1.78	0.65
1:E:267:PHE:HA	1:E:272:ARG:HD2	1.78	0.64
1:D:183:VAL:CG1	1:D:187:LEU:HB3	2.27	0.64
1:F:183:VAL:HG13	1:F:187:LEU:HB3	1.78	0.64
1:E:183:VAL:HG13	1:E:187:LEU:HB3	1.80	0.64
1:C:201:GLN:H	1:C:201:GLN:NE2	1.96	0.63
1:A:183:VAL:HG13	1:A:187:LEU:HB3	1.80	0.63
1:D:183:VAL:HG13	1:D:187:LEU:HB3	1.79	0.63
1:E:43:LYS:HB2	1:E:227:GLU:OE2	1.98	0.63
1:C:183:VAL:HG13	1:C:187:LEU:HB3	1.82	0.62
1:A:199:SER:HB2	1:A:201:GLN:NE2	2.14	0.62
1:E:201:GLN:H	1:E:201:GLN:NE2	1.98	0.62
1:A:124:THR:HG22	3:A:360:HOH:O	1.99	0.62
1:C:78:GLU:O	1:C:80:PRO:HD3	2.00	0.62
1:E:183:VAL:CG1	1:E:187:LEU:HB3	2.30	0.61
1:A:228:LYS:O	1:A:231:ASN:HB2	2.01	0.61
1:D:283:ARG:HG3	1:D:283:ARG:HH11	1.65	0.61
1:F:239:MET:HE1	1:F:265:SER:HB3	1.82	0.61
1:A:183:VAL:CG1	1:A:187:LEU:HB3	2.30	0.61
1:E:272:ARG:HD3	3:E:361:HOH:O	2.02	0.60
1:F:129:PRO:HG2	1:F:229:ILE:HG21	1.83	0.60
1:A:129:PRO:HG2	1:A:229:ILE:HG21	1.83	0.60
1:C:183:VAL:CG1	1:C:187:LEU:HB3	2.32	0.60
1:E:122:HIS:HA	1:E:125:ARG:HD3	1.84	0.60
1:A:289:ASP:O	1:A:290:HIS:HB3	2.02	0.59
1:C:65:LEU:HD12	1:C:65:LEU:C	2.23	0.59
1:B:183:VAL:CG1	1:B:187:LEU:HB3	2.33	0.58
1:C:65:LEU:HD12	1:C:65:LEU:O	2.03	0.58
1:D:129:PRO:HG2	1:D:229:ILE:HG21	1.85	0.58
1:C:216:GLU:CD	1:C:216:GLU:H	2.06	0.58
1:B:183:VAL:HG22	1:B:206:ALA:CB	2.33	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:65:LEU:C	1:D:65:LEU:HD12	2.25	0.57
1:B:65:LEU:C	1:B:65:LEU:HD12	2.24	0.57
1:B:99:ASP:HA	2:B:300:CO8:N1A	2.20	0.57
1:D:52:LEU:HD22	1:D:65:LEU:HD11	1.86	0.57
1:E:183:VAL:HG22	1:E:206:ALA:CB	2.34	0.57
1:A:65:LEU:HD12	1:A:65:LEU:C	2.25	0.57
1:F:183:VAL:CG1	1:F:187:LEU:HB3	2.35	0.56
1:B:54:ARG:HH12	1:B:62:CYS:HB3	1.69	0.56
1:C:183:VAL:HG22	1:C:206:ALA:CB	2.34	0.56
1:D:183:VAL:HG22	1:D:206:ALA:CB	2.36	0.56
1:E:65:LEU:HD12	1:E:65:LEU:C	2.26	0.56
1:E:284:LYS:HE2	1:E:285:ALA:O	2.04	0.56
1:E:54:ARG:N	1:E:55:PRO:CD	2.68	0.56
1:B:283:ARG:HD2	3:B:305:HOH:O	2.04	0.56
1:D:105:ASN:HA	1:E:273:ARG:HH12	1.71	0.55
1:E:108:PHE:O	1:E:111:CYS:HB2	2.06	0.55
1:E:46:SER:HA	1:E:81:ALA:O	2.06	0.55
1:F:183:VAL:HG22	1:F:206:ALA:CB	2.36	0.55
1:A:201:GLN:H	1:A:201:GLN:CD	2.09	0.55
1:A:61:LEU:HB3	1:A:66:ILE:HD11	1.88	0.55
1:F:122:HIS:HA	1:F:125:ARG:NH1	2.20	0.55
1:F:65:LEU:HD12	1:F:65:LEU:C	2.28	0.54
1:D:210:SER:HB2	1:F:190:GLU:OE1	2.08	0.54
1:B:190:GLU:OE1	1:C:210:SER:HB2	2.07	0.54
1:A:43:LYS:HG3	1:A:44:ASN:ND2	2.23	0.54
1:E:100:ILE:CG2	1:F:276:MET:HG2	2.37	0.54
1:C:129:PRO:HG2	1:C:229:ILE:HG21	1.90	0.53
1:A:40:LYS:HE2	1:A:45:SER:HB3	1.91	0.53
1:A:199:SER:HB2	1:A:201:GLN:HE22	1.74	0.53
1:B:52:LEU:HD22	1:B:65:LEU:HD11	1.90	0.53
1:D:280:VAL:HG11	1:F:104:GLN:HE22	1.74	0.53
1:D:119:HIS:N	3:D:338:HOH:O	2.41	0.52
1:C:108:PHE:HZ	1:D:239:MET:CE	2.16	0.52
1:C:49:LEU:HD12	1:C:50:ILE:N	2.25	0.52
1:A:183:VAL:HG22	1:A:206:ALA:CB	2.39	0.52
1:E:52:LEU:HD22	1:E:65:LEU:HD11	1.92	0.52
1:B:96:ALA:O	2:B:300:CO8:H62	2.10	0.52
1:C:35:TYR:O	1:C:53:ASN:N	2.40	0.52
1:D:283:ARG:HH11	1:D:283:ARG:CG	2.23	0.51
1:B:54:ARG:NH1	1:B:62:CYS:HB3	2.25	0.51
1:C:75:THR:HB	3:C:326:HOH:O	2.10	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:54:ARG:HH12	1:E:60:ALA:HB3	1.75	0.51
1:E:61:LEU:HB3	1:E:66:ILE:HD11	1.90	0.51
1:D:65:LEU:HD12	1:D:65:LEU:O	2.10	0.51
1:A:65:LEU:HD12	1:A:65:LEU:O	2.10	0.51
1:F:40:LYS:HE2	1:F:79:ASP:OD2	2.09	0.51
1:A:172:GLY:N	2:A:300:CO8:H3'1	2.20	0.51
1:F:201:GLN:H	1:F:201:GLN:HE21	1.54	0.51
1:C:225:CYS:HA	1:C:228:LYS:HE3	1.93	0.50
1:F:159:GLN:NE2	1:F:197:ARG:HD2	2.25	0.50
1:B:164:GLU:HG2	2:B:300:CO8:H2'2	1.92	0.50
1:A:159:GLN:NE2	1:A:197:ARG:HD2	2.27	0.50
1:A:279:PHE:O	1:A:282:LYS:HE2	2.12	0.50
1:B:40:LYS:HE2	1:B:79:ASP:OD2	2.12	0.50
1:B:172:GLY:N	2:B:300:CO8:H3'1	2.15	0.49
1:C:54:ARG:NH1	1:C:60:ALA:HB3	2.27	0.49
1:D:280:VAL:HG21	1:F:104:GLN:HE21	1.77	0.49
1:E:267:PHE:HA	1:E:272:ARG:CD	2.42	0.49
1:B:104:GLN:CG	1:C:280:VAL:HG21	2.29	0.49
1:A:51:GLN:HG3	1:A:88:THR:HG23	1.95	0.49
1:E:239:MET:HE1	1:E:265:SER:HB3	1.94	0.49
1:E:129:PRO:HG2	1:E:229:ILE:HG21	1.95	0.49
1:B:54:ARG:N	1:B:55:PRO:CD	2.76	0.48
1:C:108:PHE:CZ	1:D:239:MET:HE1	2.31	0.48
1:D:104:GLN:O	1:E:272:ARG:NH2	2.41	0.48
1:B:201:GLN:H	1:B:201:GLN:CD	2.16	0.48
1:E:54:ARG:NH1	1:E:60:ALA:HB3	2.28	0.48
1:E:65:LEU:HD12	1:E:65:LEU:O	2.12	0.48
1:B:46:SER:HA	1:B:81:ALA:O	2.13	0.48
1:C:234:LYS:NZ	3:C:343:HOH:O	2.30	0.48
1:D:177:GLN:O	1:D:181:ARG:HG3	2.13	0.48
1:E:159:GLN:NE2	1:E:197:ARG:HD2	2.29	0.48
1:B:65:LEU:HD12	1:B:65:LEU:O	2.13	0.48
1:C:33:PHE:HE1	1:C:71:GLN:OE1	1.95	0.48
1:D:267:PHE:CD2	1:D:272:ARG:HD2	2.49	0.48
1:B:104:GLN:HE21	1:B:104:GLN:C	2.17	0.48
1:E:199:SER:HB2	1:E:201:GLN:NE2	2.29	0.48
1:D:40:LYS:CE	1:D:79:ASP:OD2	2.62	0.47
1:A:54:ARG:NH1	1:A:60:ALA:HB3	2.29	0.47
1:C:239:MET:HE1	1:D:108:PHE:HZ	1.79	0.47
1:E:40:LYS:NZ	1:E:79:ASP:OD2	2.37	0.47
1:F:201:GLN:NE2	1:F:201:GLN:N	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:99:ASP:OD2	1:B:102:GLU:HG3	2.14	0.47
1:D:272:ARG:HD3	3:D:291:HOH:O	2.15	0.47
1:D:280:VAL:HG11	1:F:104:GLN:NE2	2.30	0.47
1:A:100:ILE:HD11	2:A:300:CO8:H22	1.97	0.47
1:C:289:ASP:O	1:C:290:HIS:HB3	2.15	0.47
1:D:46:SER:HA	1:D:81:ALA:O	2.14	0.47
1:F:38:THR:O	1:F:39:GLU:HB3	2.15	0.47
1:F:98:ALA:O	2:F:300:CO8:N6A	2.48	0.47
1:F:283:ARG:HD2	3:F:361:HOH:O	2.14	0.47
1:B:60:ALA:HA	1:B:97:GLY:O	2.15	0.46
1:C:46:SER:HA	1:C:81:ALA:O	2.15	0.46
1:E:96:ALA:O	2:E:300:CO8:H62	2.15	0.46
1:F:101:LYS:H	1:F:101:LYS:HG2	1.46	0.46
1:B:159:GLN:NE2	1:B:197:ARG:HD2	2.30	0.46
1:E:100:ILE:HG12	2:E:300:CO8:N1A	2.31	0.46
1:E:289:ASP:OD1	3:E:307:HOH:O	2.21	0.46
1:F:46:SER:HA	1:F:81:ALA:O	2.15	0.46
1:B:284:LYS:HD2	3:B:351:HOH:O	2.15	0.45
1:E:257:LYS:O	1:E:261:LYS:HG2	2.15	0.45
1:D:190:GLU:OE1	1:E:210:SER:HB2	2.16	0.45
1:F:65:LEU:HD12	1:F:65:LEU:O	2.16	0.45
1:F:40:LYS:CE	1:F:79:ASP:OD2	2.64	0.45
1:C:54:ARG:N	1:C:55:PRO:CD	2.80	0.45
1:C:284:LYS:HG3	1:C:285:ALA:N	2.31	0.45
1:E:98:ALA:O	2:E:300:CO8:N6A	2.49	0.45
1:F:54:ARG:N	1:F:55:PRO:CD	2.78	0.45
1:A:35:TYR:O	1:A:53:ASN:N	2.44	0.45
1:A:105:ASN:HB2	3:A:330:HOH:O	2.17	0.45
1:D:228:LYS:O	1:D:231:ASN:HB2	2.16	0.45
1:F:138:ALA:O	1:F:143:CYS:HB2	2.17	0.45
1:A:138:ALA:O	1:A:143:CYS:HB2	2.17	0.44
1:F:266:THR:O	1:F:272:ARG:HB2	2.18	0.44
1:F:48:GLY:O	1:F:85:ILE:HG23	2.17	0.44
1:A:106:ARG:HA	1:A:106:ARG:NE	2.32	0.44
1:B:257:LYS:O	1:B:261:LYS:HG2	2.18	0.44
1:D:283:ARG:CG	1:D:283:ARG:NH1	2.81	0.44
1:A:96:ALA:O	2:A:300:CO8:H62	2.18	0.44
1:B:106:ARG:HA	1:B:106:ARG:HD3	1.74	0.44
1:A:257:LYS:O	1:A:261:LYS:HG2	2.17	0.44
1:B:267:PHE:HA	1:B:272:ARG:HD2	1.99	0.43
1:E:124:THR:HG22	3:E:351:HOH:O	2.17	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:122:HIS:HA	1:F:125:ARG:HH11	1.83	0.43
1:E:41:LYS:O	1:E:45:SER:HA	2.18	0.43
1:B:48:GLY:O	1:B:85:ILE:HG23	2.18	0.43
1:B:54:ARG:NH1	1:B:62:CYS:SG	2.92	0.43
1:B:154:ALA:O	1:B:212:ILE:HA	2.18	0.43
1:C:61:LEU:HB3	1:C:66:ILE:HD11	2.00	0.43
1:D:104:GLN:OE1	1:E:280:VAL:HG21	2.18	0.43
1:D:54:ARG:N	1:D:55:PRO:CD	2.81	0.43
1:F:54:ARG:HG2	1:F:57:ALA:HB3	2.00	0.43
1:F:79:ASP:HA	1:F:80:PRO:HD2	1.83	0.43
1:B:205:GLN:HA	1:B:205:GLN:HE21	1.83	0.43
1:B:216:GLU:CD	1:B:216:GLU:H	2.22	0.43
1:C:159:GLN:NE2	1:C:197:ARG:HD2	2.34	0.43
1:E:37:ILE:HD11	1:E:53:ASN:ND2	2.34	0.42
1:C:38:THR:O	1:C:39:GLU:HB3	2.19	0.42
1:E:201:GLN:H	1:E:201:GLN:CD	2.21	0.42
1:F:257:LYS:O	1:F:261:LYS:HG2	2.19	0.42
1:A:38:THR:O	1:A:39:GLU:HB3	2.18	0.42
1:B:57:ALA:HA	2:B:300:CO8:O4B	2.18	0.42
1:C:132:ALA:HB2	1:C:149:CYS:SG	2.59	0.42
1:E:43:LYS:N	1:E:227:GLU:OE2	2.31	0.42
1:A:54:ARG:HH12	1:A:60:ALA:HB3	1.85	0.42
1:B:172:GLY:H	2:B:300:CO8:C3'	2.19	0.42
1:D:37:ILE:HD11	1:D:53:ASN:ND2	2.34	0.42
1:D:270:ASP:OD2	1:D:290:HIS:ND1	2.50	0.42
1:B:65:LEU:C	1:B:65:LEU:CD1	2.86	0.42
1:B:100:ILE:HD12	1:B:167:LEU:HD13	2.02	0.42
3:B:329:HOH:O	1:F:257:LYS:HB3	2.20	0.42
1:C:257:LYS:O	1:C:261:LYS:HG2	2.20	0.42
1:D:159:GLN:NE2	1:D:197:ARG:HD2	2.34	0.42
1:E:286:ASN:ND2	1:E:288:LYS:HE3	2.34	0.42
1:A:54:ARG:N	1:A:55:PRO:CD	2.82	0.42
1:C:154:ALA:O	1:C:212:ILE:HA	2.20	0.42
1:A:264:TYR:CD1	1:C:111:CYS:HB3	2.55	0.42
1:C:54:ARG:H	1:C:59:ASN:ND2	2.17	0.42
1:C:65:LEU:C	1:C:65:LEU:CD1	2.89	0.42
1:B:99:ASP:HB3	1:B:102:GLU:HG3	2.02	0.41
1:D:38:THR:O	1:D:39:GLU:HB3	2.19	0.41
1:E:59:ASN:O	1:E:60:ALA:C	2.58	0.41
1:A:32:ASN:HD22	1:A:32:ASN:HA	1.51	0.41
1:A:154:ALA:O	1:A:212:ILE:HA	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:49:LEU:HD22	1:C:223:ILE:HD11	2.01	0.41
1:D:154:ALA:O	1:D:212:ILE:HA	2.21	0.41
1:E:239:MET:CE	1:E:265:SER:HB3	2.50	0.41
1:F:154:ALA:O	1:F:212:ILE:HA	2.21	0.41
1:A:152:ILE:HG21	1:A:209:VAL:HG12	2.03	0.41
1:A:205:GLN:HE21	1:B:205:GLN:NE2	2.18	0.41
1:A:54:ARG:NH1	1:A:60:ALA:O	2.53	0.41
1:B:78:GLU:O	1:B:80:PRO:HD3	2.21	0.41
1:F:40:LYS:HB3	1:F:45:SER:HB3	2.01	0.41
1:A:264:TYR:CG	1:C:111:CYS:HB3	2.56	0.41
1:D:65:LEU:C	1:D:65:LEU:CD1	2.88	0.41
1:F:56:LYS:HB2	3:F:344:HOH:O	2.20	0.41
1:F:201:GLN:H	1:F:201:GLN:CD	2.19	0.41
1:B:261:LYS:NZ	1:F:242:GLU:OE2	2.50	0.41
1:A:98:ALA:O	2:A:300:CO8:N6A	2.53	0.41
1:B:38:THR:O	1:B:39:GLU:HB3	2.21	0.41
1:B:82:VAL:O	1:B:234:LYS:HE2	2.21	0.41
1:C:122:HIS:HA	1:C:125:ARG:HD3	2.02	0.41
1:E:77:GLU:OE1	1:E:128:LYS:HG3	2.20	0.41
1:A:252:LEU:HB3	1:C:249:GLU:OE2	2.21	0.41
1:E:99:ASP:HA	2:E:300:CO8:N1A	2.36	0.41
1:E:35:TYR:CD1	1:E:54:ARG:HD2	2.55	0.40
1:E:38:THR:O	1:E:39:GLU:HB3	2.21	0.40
1:E:172:GLY:N	2:E:300:CO8:H3'1	2.25	0.40
1:E:58:LEU:HD23	1:E:58:LEU:HA	1.90	0.40
1:A:267:PHE:HA	1:A:272:ARG:CD	2.37	0.40
1:D:164:GLU:OE1	1:D:164:GLU:N	2.43	0.40
1:E:279:PHE:O	1:E:282:LYS:HD2	2.21	0.40
1:A:100:ILE:HG12	2:A:300:CO8:N1A	2.37	0.40
1:E:65:LEU:C	1:E:65:LEU:CD1	2.90	0.40

There are no symmetry-related clashes.

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	250/261 (96%)	240 (96%)	10 (4%)	0	100	100
1	B	250/261 (96%)	241 (96%)	9 (4%)	0	100	100
1	C	250/261 (96%)	239 (96%)	11 (4%)	0	100	100
1	D	253/261 (97%)	245 (97%)	7 (3%)	1 (0%)	34	48
1	E	251/261 (96%)	246 (98%)	5 (2%)	0	100	100
1	F	251/261 (96%)	246 (98%)	5 (2%)	0	100	100
All	All	1505/1566 (96%)	1457 (97%)	47 (3%)	1 (0%)	51	68

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	113	SER

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	199/205 (97%)	184 (92%)	15 (8%)	13	21
1	B	198/205 (97%)	177 (89%)	21 (11%)	6	9
1	C	198/205 (97%)	182 (92%)	16 (8%)	11	18
1	D	199/205 (97%)	176 (88%)	23 (12%)	5	7
1	E	198/205 (97%)	182 (92%)	16 (8%)	11	18
1	F	199/205 (97%)	181 (91%)	18 (9%)	9	14
All	All	1191/1230 (97%)	1082 (91%)	109 (9%)	9	13

All (109) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	32	ASN

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Mol	Chain	Res	Type
1	A	51	GLN
1	A	65	LEU
1	A	71	GLN
1	A	103	MET
1	A	125	ARG
1	A	156	GLU
1	A	157	LYS
1	A	183	VAL
1	A	210	SER
1	A	216	GLU
1	A	257	LYS
1	A	260	LYS
1	A	272	ARG
1	A	273	ARG
1	B	40	LYS
1	B	41	LYS
1	B	65	LEU
1	B	71	GLN
1	B	101	LYS
1	B	103	MET
1	B	104	GLN
1	B	106	ARG
1	B	125	ARG
1	B	127	LYS
1	B	156	GLU
1	B	157	LYS
1	B	183	VAL
1	B	205	GLN
1	B	210	SER
1	B	216	GLU
1	B	257	LYS
1	B	260	LYS
1	B	272	ARG
1	B	282	LYS
1	B	288	LYS
1	C	56	LYS
1	C	65	LEU
1	C	71	GLN
1	C	101	LYS
1	C	103	MET
1	C	156	GLU
1	C	157	LYS

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Mol	Chain	Res	Type
1	C	183	VAL
1	C	205	GLN
1	C	210	SER
1	C	227	GLU
1	C	257	LYS
1	C	260	LYS
1	C	272	ARG
1	C	273	ARG
1	C	288	LYS
1	D	40	LYS
1	D	43	LYS
1	D	45	SER
1	D	65	LEU
1	D	71	GLN
1	D	92	LYS
1	D	101	LYS
1	D	104	GLN
1	D	106	ARG
1	D	156	GLU
1	D	157	LYS
1	D	183	VAL
1	D	210	SER
1	D	216	GLU
1	D	234	LYS
1	D	257	LYS
1	D	260	LYS
1	D	272	ARG
1	D	273	ARG
1	D	277	SER
1	D	282	LYS
1	D	283	ARG
1	D	288	LYS
1	E	34	GLN
1	E	43	LYS
1	E	65	LEU
1	E	71	GLN
1	E	101	LYS
1	E	106	ARG
1	E	156	GLU
1	E	157	LYS
1	E	183	VAL
1	E	205	GLN

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Mol	Chain	Res	Type
1	E	210	SER
1	E	257	LYS
1	E	260	LYS
1	E	272	ARG
1	E	273	ARG
1	E	284	LYS
1	F	32	ASN
1	F	41	LYS
1	F	65	LEU
1	F	71	GLN
1	F	92	LYS
1	F	101	LYS
1	F	103	MET
1	F	106	ARG
1	F	156	GLU
1	F	157	LYS
1	F	183	VAL
1	F	201	GLN
1	F	210	SER
1	F	257	LYS
1	F	260	LYS
1	F	273	ARG
1	F	282	LYS
1	F	288	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (37) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	32	ASN
1	A	34	GLN
1	A	44	ASN
1	A	104	GLN
1	A	159	GLN
1	A	162	GLN
1	A	201	GLN
1	A	205	GLN
1	A	224	GLN
1	B	104	GLN
1	B	159	GLN
1	B	162	GLN
1	B	201	GLN
1	B	205	GLN

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Mol	Chain	Res	Type
1	B	224	GLN
1	C	59	ASN
1	C	159	GLN
1	C	162	GLN
1	C	201	GLN
1	C	205	GLN
1	D	159	GLN
1	D	162	GLN
1	D	205	GLN
1	D	224	GLN
1	E	122	HIS
1	E	159	GLN
1	E	162	GLN
1	E	201	GLN
1	E	224	GLN
1	F	32	ASN
1	F	104	GLN
1	F	105	ASN
1	F	159	GLN
1	F	162	GLN
1	F	201	GLN
1	F	205	GLN
1	F	224	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

4 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	CO8	B	300	1	51,59,59	1.37	5 (9%)	62,85,85	1.71	12 (19%)
2	CO8	E	300	-	51,59,59	1.37	5 (9%)	62,85,85	1.71	12 (19%)
2	CO8	A	300	-	51,59,59	1.37	5 (9%)	62,85,85	1.71	12 (19%)
2	CO8	F	300	-	51,59,59	1.34	5 (9%)	62,85,85	1.72	11 (17%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	CO8	B	300	1	-	7/54/74/74	0/3/3/3
2	CO8	E	300	-	-	7/54/74/74	0/3/3/3
2	CO8	A	300	-	-	7/54/74/74	0/3/3/3
2	CO8	F	300	-	-	6/54/74/74	0/3/3/3

All (20) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	300	CO8	C5P-N4P	4.53	1.43	1.33
2	E	300	CO8	C5P-N4P	4.52	1.43	1.33
2	B	300	CO8	C5P-N4P	4.51	1.43	1.33
2	F	300	CO8	C9P-N8P	4.12	1.42	1.33
2	F	300	CO8	C5P-N4P	4.10	1.42	1.33
2	E	300	CO8	C9P-N8P	4.10	1.42	1.33
2	A	300	CO8	C9P-N8P	4.09	1.42	1.33
2	F	300	CO8	C4A-N3A	4.08	1.41	1.35
2	B	300	CO8	C9P-N8P	4.07	1.42	1.33
2	B	300	CO8	C4A-N3A	3.69	1.40	1.35
2	E	300	CO8	C4A-N3A	3.67	1.40	1.35
2	A	300	CO8	C4A-N3A	3.65	1.40	1.35
2	B	300	CO8	O4B-C1B	2.75	1.44	1.41
2	E	300	CO8	O4B-C1B	2.74	1.44	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	300	CO8	O4B-C1B	2.70	1.44	1.41
2	F	300	CO8	O4B-C1B	2.67	1.44	1.41
2	A	300	CO8	P3B-O3B	-2.41	1.54	1.59
2	E	300	CO8	P3B-O3B	-2.40	1.54	1.59
2	B	300	CO8	P3B-O3B	-2.39	1.54	1.59
2	F	300	CO8	P3B-O3B	-2.16	1.55	1.59

All (47) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	300	CO8	C2'-C1'-S1P	7.77	122.50	113.46
2	E	300	CO8	C2'-C1'-S1P	7.76	122.50	113.46
2	A	300	CO8	C2'-C1'-S1P	7.75	122.48	113.46
2	F	300	CO8	C2'-C1'-S1P	7.59	122.30	113.46
2	F	300	CO8	C3'-C2'-C1'	4.61	122.55	112.33
2	E	300	CO8	C3'-C2'-C1'	4.51	122.34	112.33
2	B	300	CO8	C3'-C2'-C1'	4.51	122.33	112.33
2	A	300	CO8	C3'-C2'-C1'	4.49	122.30	112.33
2	F	300	CO8	O1'-C1'-S1P	-4.46	116.82	122.61
2	A	300	CO8	O1'-C1'-S1P	-4.29	117.05	122.61
2	B	300	CO8	O1'-C1'-S1P	-4.28	117.05	122.61
2	E	300	CO8	O1'-C1'-S1P	-4.26	117.08	122.61
2	E	300	CO8	O1'-C1'-C2'	-3.71	119.61	123.99
2	B	300	CO8	O1'-C1'-C2'	-3.71	119.61	123.99
2	A	300	CO8	O1'-C1'-C2'	-3.67	119.66	123.99
2	F	300	CO8	O1'-C1'-C2'	-3.37	120.02	123.99
2	B	300	CO8	C4'-C3'-C2'	3.05	124.14	113.19
2	A	300	CO8	C4'-C3'-C2'	3.04	124.13	113.19
2	E	300	CO8	C4'-C3'-C2'	3.04	124.12	113.19
2	F	300	CO8	C4'-C3'-C2'	2.95	123.81	113.19
2	F	300	CO8	O4B-C1B-C2B	-2.93	102.64	106.93
2	B	300	CO8	O4B-C1B-C2B	-2.65	103.06	106.93
2	E	300	CO8	O4B-C1B-C2B	-2.64	103.07	106.93
2	A	300	CO8	O4B-C1B-C2B	-2.63	103.08	106.93
2	F	300	CO8	C6P-C5P-N4P	-2.56	112.11	116.42
2	F	300	CO8	O6A-CCP-CBP	2.48	114.54	110.55
2	A	300	CO8	C6P-C5P-N4P	-2.37	112.44	116.42
2	B	300	CO8	C6P-C5P-N4P	-2.34	112.48	116.42
2	E	300	CO8	C6P-C5P-N4P	-2.34	112.49	116.42
2	E	300	CO8	O6A-CCP-CBP	2.28	114.21	110.55
2	A	300	CO8	C2B-C3B-C4B	-2.27	99.20	103.22
2	A	300	CO8	O6A-CCP-CBP	2.27	114.19	110.55

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	300	CO8	O6A-CCP-CBP	2.27	114.19	110.55
2	B	300	CO8	C2B-C3B-C4B	-2.26	99.22	103.22
2	E	300	CO8	C2B-C3B-C4B	-2.26	99.22	103.22
2	F	300	CO8	C2B-C3B-C4B	-2.19	99.35	103.22
2	F	300	CO8	C4A-C5A-N7A	2.09	111.58	109.40
2	A	300	CO8	C5'-C4'-C3'	2.08	125.00	114.42
2	E	300	CO8	C5'-C4'-C3'	2.08	124.98	114.42
2	B	300	CO8	C5'-C4'-C3'	2.08	124.98	114.42
2	F	300	CO8	C5'-C4'-C3'	2.07	124.93	114.42
2	A	300	CO8	C4A-C5A-N7A	2.06	111.54	109.40
2	E	300	CO8	O4B-C4B-C3B	2.04	109.24	104.87
2	E	300	CO8	C4A-C5A-N7A	2.04	111.52	109.40
2	A	300	CO8	O4B-C4B-C3B	2.04	109.23	104.87
2	B	300	CO8	C4A-C5A-N7A	2.04	111.52	109.40
2	B	300	CO8	O4B-C4B-C3B	2.03	109.22	104.87

There are no chirality outliers.

All (27) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	F	300	CO8	C3'-C4'-C5'-C6'
2	F	300	CO8	C4'-C5'-C6'-C7'
2	F	300	CO8	C3P-C2P-S1P-C1'
2	A	300	CO8	O1'-C1'-S1P-C2P
2	B	300	CO8	O1'-C1'-S1P-C2P
2	E	300	CO8	O1'-C1'-S1P-C2P
2	F	300	CO8	O1'-C1'-S1P-C2P
2	E	300	CO8	C5'-C6'-C7'-C8'
2	A	300	CO8	C5'-C6'-C7'-C8'
2	B	300	CO8	C5'-C6'-C7'-C8'
2	A	300	CO8	C3B-O3B-P3B-O7A
2	B	300	CO8	C3B-O3B-P3B-O7A
2	E	300	CO8	C3B-O3B-P3B-O7A
2	A	300	CO8	C3B-O3B-P3B-O8A
2	A	300	CO8	C3B-O3B-P3B-O9A
2	A	300	CO8	C5B-O5B-P1A-O3A
2	B	300	CO8	C3B-O3B-P3B-O8A
2	B	300	CO8	C3B-O3B-P3B-O9A
2	B	300	CO8	C5B-O5B-P1A-O3A
2	E	300	CO8	C3B-O3B-P3B-O8A
2	E	300	CO8	C3B-O3B-P3B-O9A
2	E	300	CO8	C5B-O5B-P1A-O3A

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Mol	Chain	Res	Type	Atoms
2	A	300	CO8	C5B-O5B-P1A-O2A
2	B	300	CO8	C5B-O5B-P1A-O2A
2	E	300	CO8	C5B-O5B-P1A-O2A
2	F	300	CO8	C5'-C6'-C7'-C8'
2	F	300	CO8	S1P-C2P-C3P-N4P

There are no ring outliers.

4 monomers are involved in 20 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	300	CO8	7	0
2	E	300	CO8	6	0
2	A	300	CO8	6	0
2	F	300	CO8	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 CO8 B 300

Bond lengths　　　　　　Bond angles

Torsions　　　　　　Rings

Ligand CO8 E 300

Bond lengths

Bond angles

Torsions

Rings

Ligand CO8 A 300

Bond lengths

Bond angles

Torsions

Rings

Ligand CO8 F 300

Bond lengths

Bond angles

Torsions

Rings
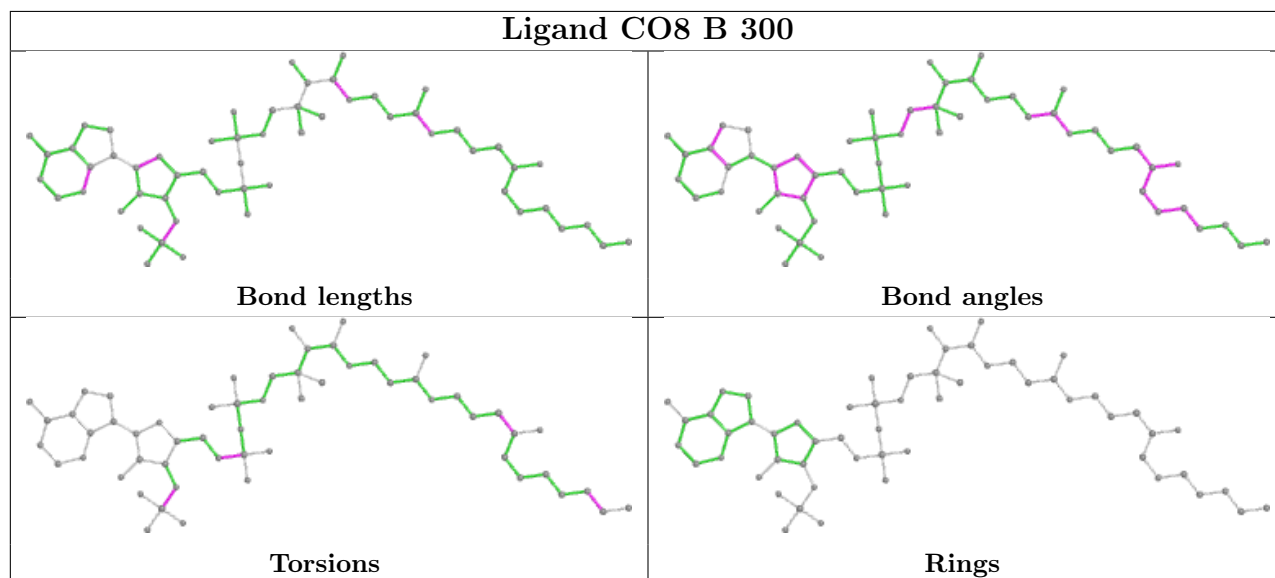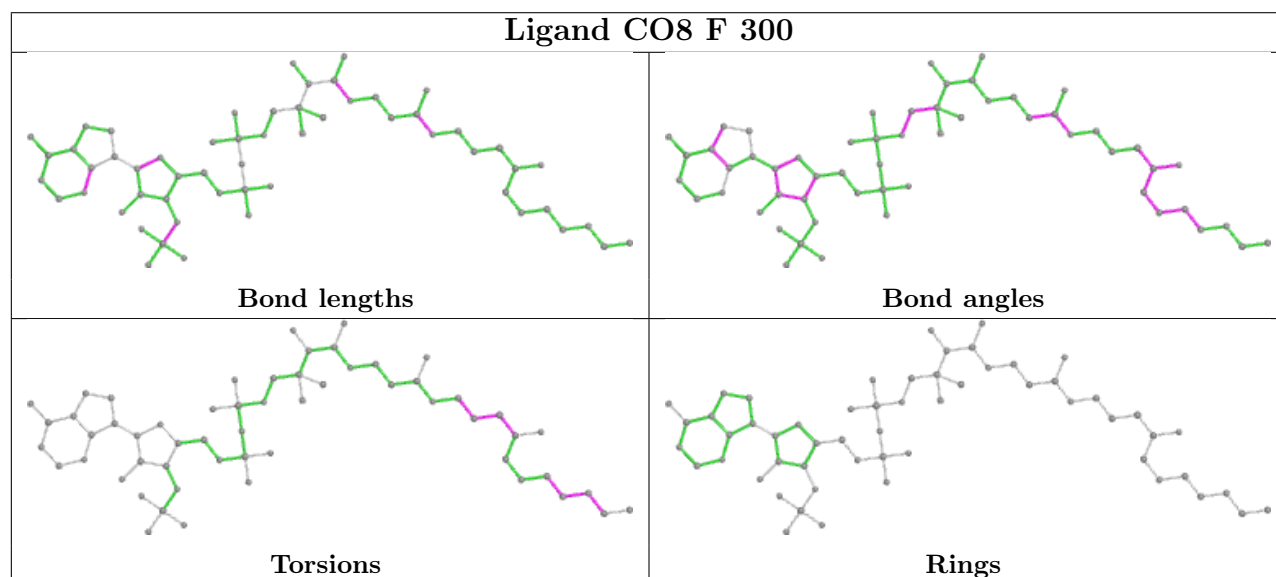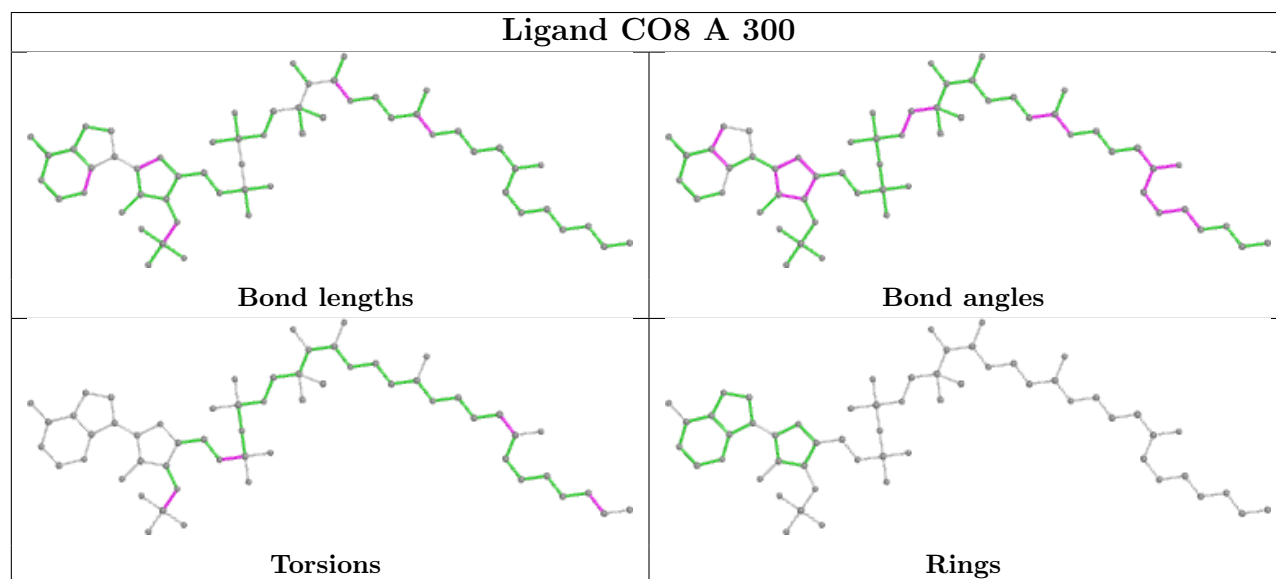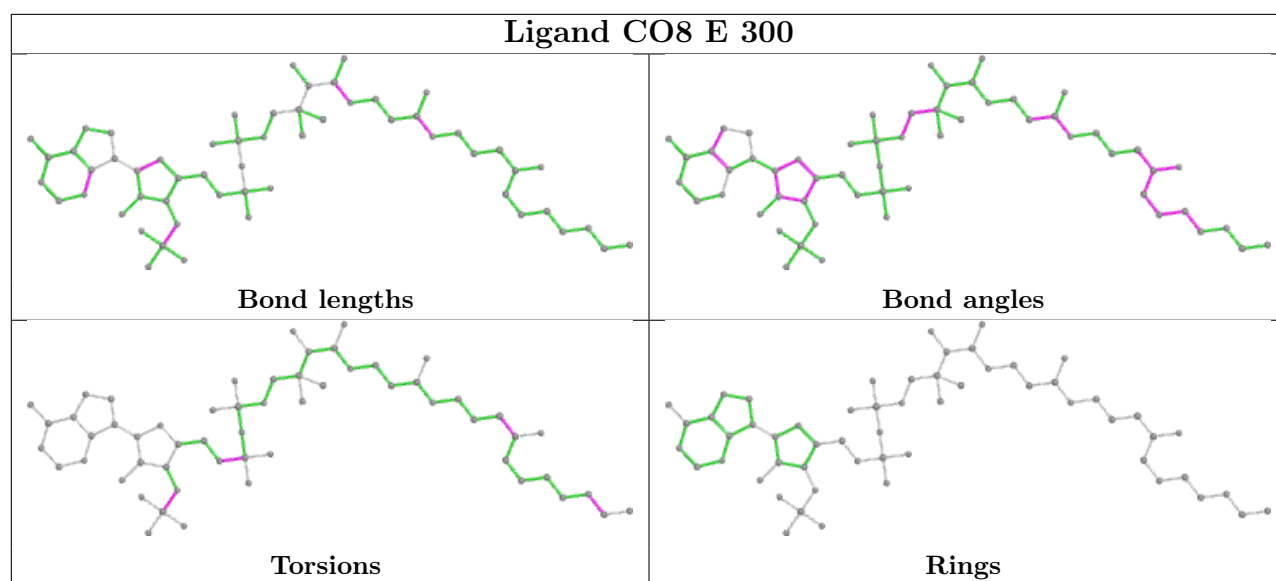
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	254/261 (97%)	-0.19	7 (2%)	53	51	12, 29, 52, 71	0
1	B	254/261 (97%)	-0.22	5 (1%)	65	63	12, 28, 52, 62	0
1	C	254/261 (97%)	-0.10	11 (4%)	35	33	12, 32, 54, 64	0
1	D	257/261 (98%)	-0.27	6 (2%)	60	58	10, 29, 53, 84	0
1	E	255/261 (97%)	-0.28	3 (1%)	79	77	11, 28, 53, 76	0
1	F	255/261 (97%)	-0.28	2 (0%)	86	84	13, 27, 53, 74	0
All	All	1529/1566 (97%)	-0.22	34 (2%)	62	60	10, 29, 53, 84	0

All (34) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	31	ALA	5.9
1	D	31	ALA	5.3
1	D	115	LYS	4.6
1	F	31	ALA	4.4
1	A	43	LYS	4.3
1	B	56	LYS	3.7
1	D	114	GLY	3.1
1	C	43	LYS	3.1
1	A	44	ASN	2.9
1	D	32	ASN	2.8
1	C	113	SER	2.8
1	A	280	VAL	2.8
1	C	45	SER	2.8
1	C	280	VAL	2.7
1	B	125	ARG	2.7
1	E	43	LYS	2.7
1	A	282	LYS	2.6
1	A	32	ASN	2.6
1	B	106	ARG	2.5

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Mol	Chain	Res	Type	RSRZ
1	B	34	GLN	2.4
1	B	32	ASN	2.4
1	C	112	TYR	2.4
1	C	57	ALA	2.4
1	C	55	PRO	2.3
1	C	56	LYS	2.3
1	D	284	LYS	2.3
1	E	44	ASN	2.3
1	C	284	LYS	2.2
1	D	280	VAL	2.2
1	F	32	ASN	2.1
1	A	285	ALA	2.1
1	A	132	ALA	2.0
1	C	286	ASN	2.0
1	C	137	TYR	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	CO8	F	300	57/57	0.50	0.40	45,65,89,92	0
2	CO8	B	300	57/57	0.52	0.55	40,60,76,79	0
2	CO8	A	300	57/57	0.87	0.21	40,60,76,79	0
2	CO8	E	300	57/57	0.89	0.18	40,60,76,79	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
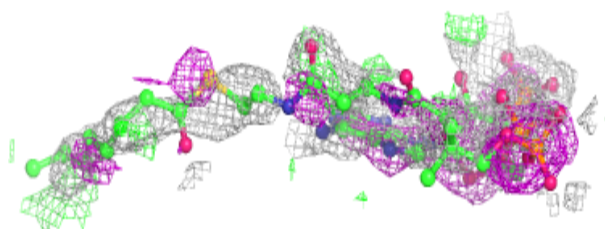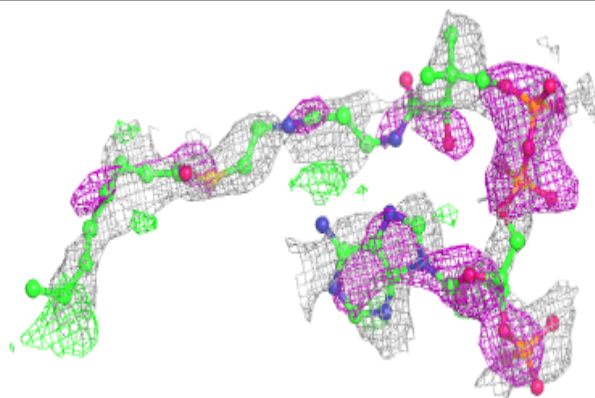
orientation to approximate a three-dimensional view.

Electron density around CO8 F 300:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
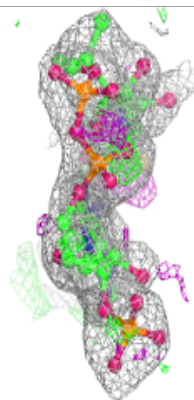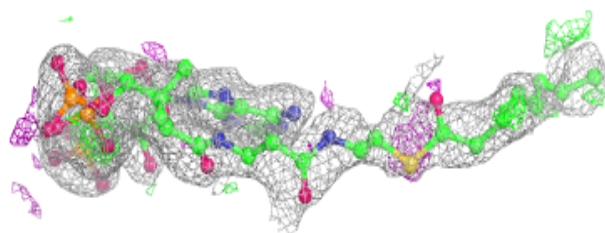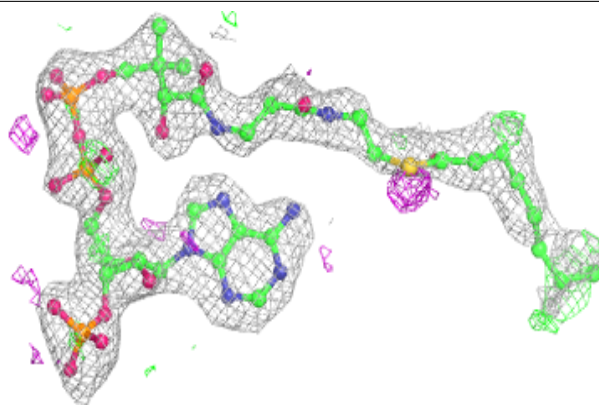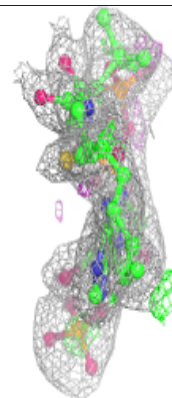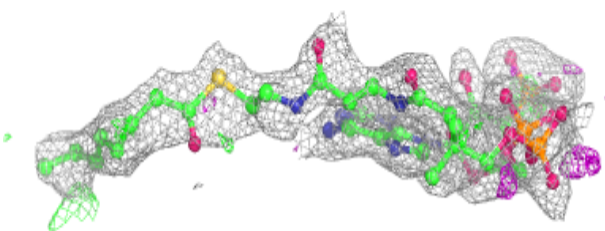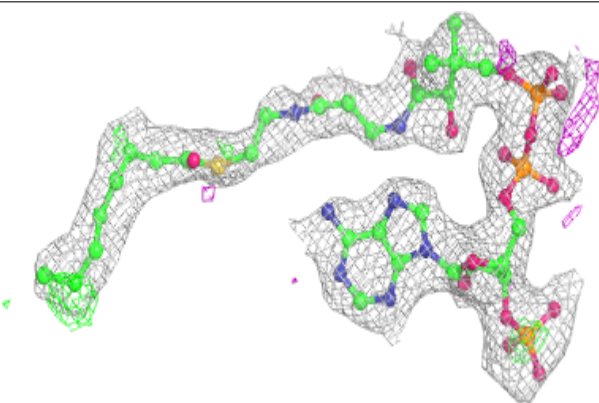mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
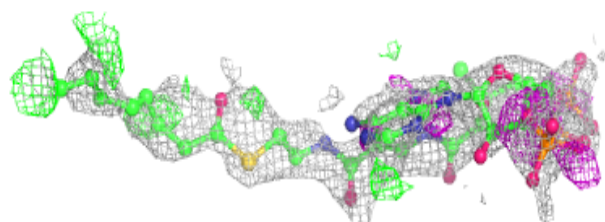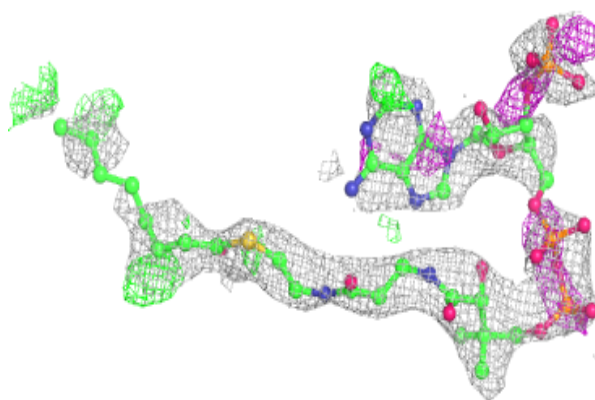
Electron density around CO8 B 300:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
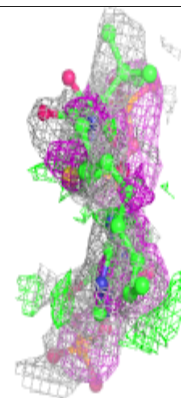
Electron density around CO8 A 300:

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

Electron density around CO8 E 300:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.