W O R L D W I D E
wwPDB
PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report (i)

Nov 21, 2023 – 02:22 PM JST

PDB ID	:	7VJU
Title	:	Crystal Structure of terephthalate dioxygenase from Comamonas testosteroni KF1
Authors	:	Mahto, J.K.; Kumar, P.
Deposited on	:	2021-09-28
Resolution	:	2.27 Å(reported)

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

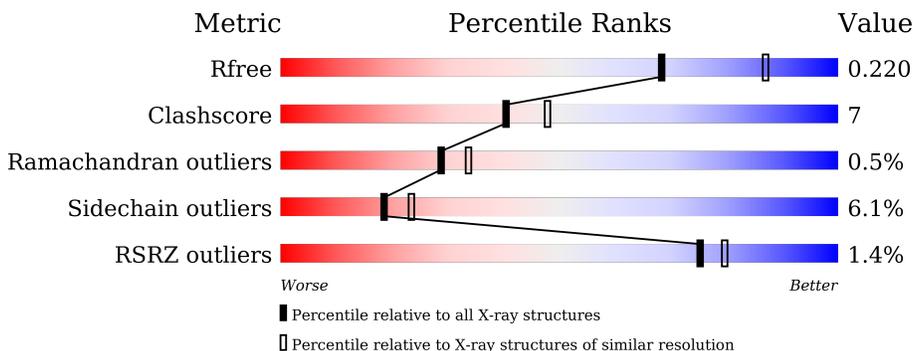|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh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

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.27 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		0.220
Clashscore		7
Ramachandran outliers		0.5%
Sidechain outliers		6.1%
RSRZ outliers		1.4%

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	6980 (2.30-2.26)
Clashscore	141614	7711 (2.30-2.26)
Ramachandran outliers	138981	7597 (2.30-2.26)
Sidechain outliers	138945	7598 (2.30-2.26)
RSRZ outliers	127900	6849 (2.30-2.26)

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

Mol	Chain	Length	Quality of chain
1	A	413	3% 77% 12% • 8%
1	C	413	% 78% 15% • 5%
1	E	413	% 75% 15% • 8%
2	B	154	78% 19% • •
2	D	154	74% 24% •
2	F	154	% 75% 19% 5% •

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
5	PEG	E	504	-	-	X	-

2 Entry composition ⓘ

There are 9 unique types of molecules in this entry. The entry contains 13744 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 Rieske (2Fe-2S) domain protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	378	Total 2973	C 1880	N 517	O 563	S 13	0	0	0
1	C	393	Total 3106	C 1959	N 543	O 590	S 14	0	1	0
1	E	378	Total 2979	C 1882	N 520	O 564	S 13	0	1	0

- Molecule 2 is a protein called Aromatic-ring-hydroxylating dioxygenase beta subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	153	Total 1206	C 756	N 210	O 234	S 6	0	0	0
2	D	154	Total 1214	C 761	N 211	O 235	S 7	0	0	0
2	F	153	Total 1206	C 756	N 210	O 234	S 6	0	0	0

- Molecule 3 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2) (labeled as "Ligand of Interest" by depositor).
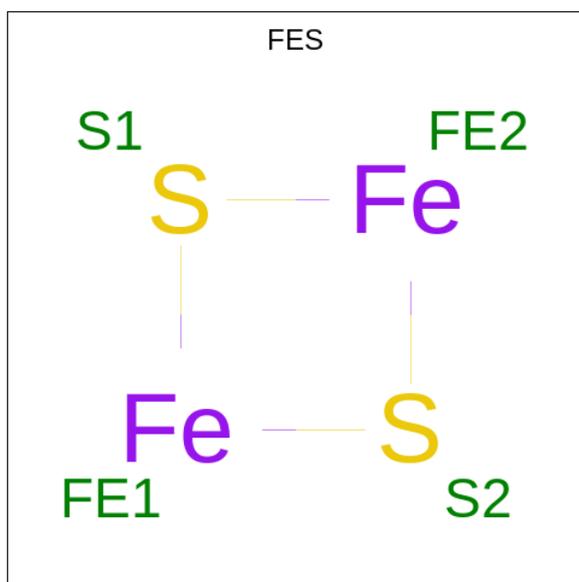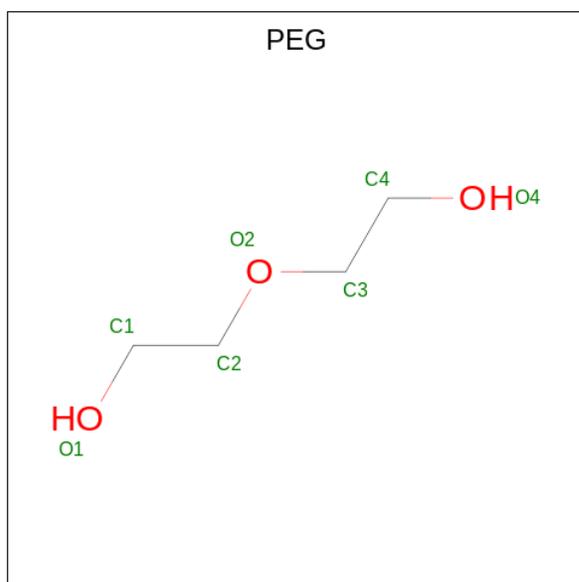
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 4	Fe 2	S 2	0	0
3	C	1	Total 4	Fe 2	S 2	0	0
3	E	1	Total 4	Fe 2	S 2	0	0

- Molecule 4 is FE (II) ION (three-letter code: FE2) (formula: Fe) (labeled as "Ligand of Interest" by depositor).

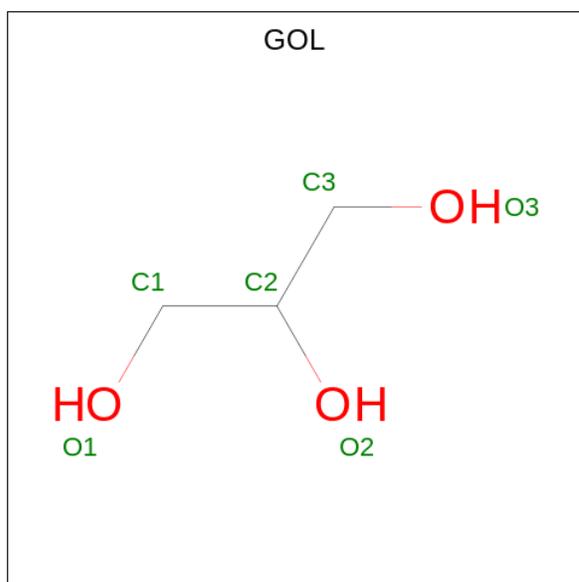| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total 1	Fe 1	0	0
4	C	1	Total 1	Fe 1	0	0
4	E	1	Total 1	Fe 1	0	0

- Molecule 5 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula: $C_4H_{10}O_3$).

PEG

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total 7	C 4	O 3	0	0
5	A	1	Total 7	C 4	O 3	0	0
5	C	1	Total 7	C 4	O 3	0	0
5	C	1	Total 7	C 4	O 3	0	0
5	E	1	Total 7	C 4	O 3	0	0
5	E	1	Total 7	C 4	O 3	0	0
5	F	1	Total 7	C 4	O 3	0	0

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).

GOL

C3

OH O3

C1   C2

HO

O1

OH

O2

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total 6	C 3	O 3	0	0
6	D	1	Total 6	C 3	O 3	0	0
6	E	1	Total 6	C 3	O 3	0	0

- Molecule 7 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).

PO4

O3

O^-

O2 O^- — P = O O1

P

O^-

O4
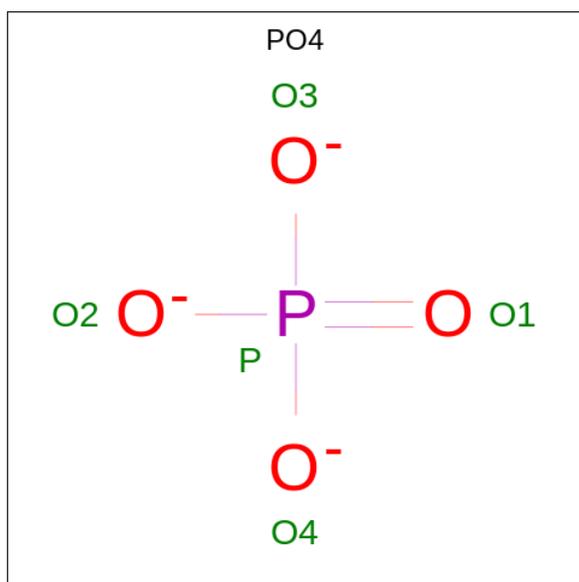
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total 5	O 4	P 1	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	B	1	Total 5	O 4	P 1	0	0
7	C	1	Total 5	O 4	P 1	0	0
7	C	1	Total 5	O 4	P 1	0	0
7	C	1	Total 5	O 4	P 1	0	0
7	D	1	Total 5	O 4	P 1	0	0
7	D	1	Total 5	O 4	P 1	0	0
7	E	1	Total 5	O 4	P 1	0	0
7	E	1	Total 5	O 4	P 1	0	0
7	F	1	Total 5	O 4	P 1	0	0

- Molecule 8 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: $C_8H_{18}O_5$).
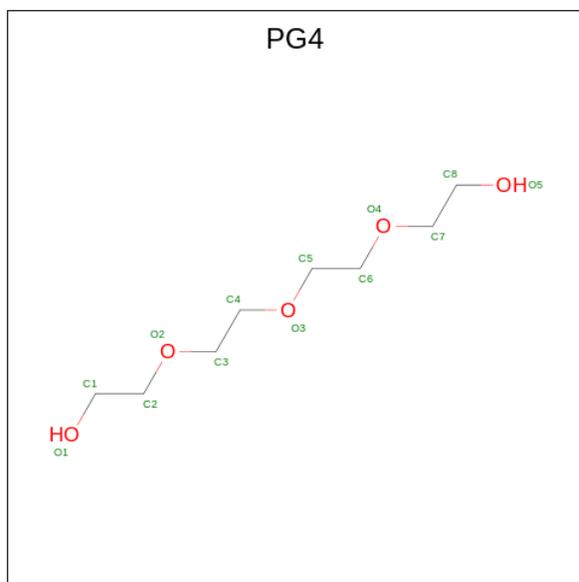
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	A	1	Total 13	C 8	O 5	0	0

- Molecule 9 is water.

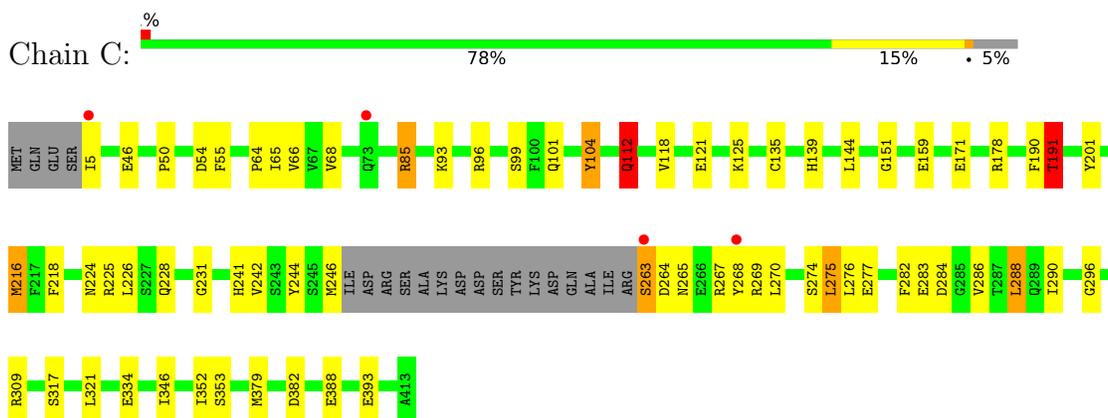| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	218	Total 218	O 218	0	0
9	B	79	Total 79	O 79	0	0
9	C	252	Total 252	O 252	0	0
9	D	84	Total 84	O 84	0	0
9	E	214	Total 214	O 214	0	0
9	F	68	Total 68	O 68	0	0

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.
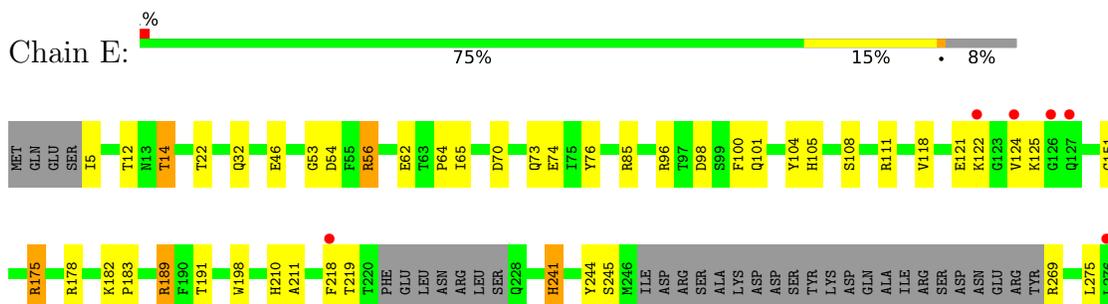
- Molecule 1: Rieske (2Fe-2S) domain protein

Chain A:

- Molecule 1: Rieske (2Fe-2S) domain protein
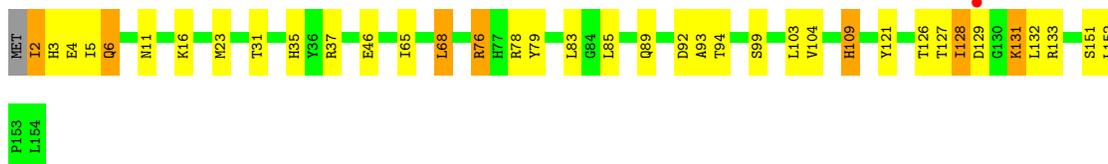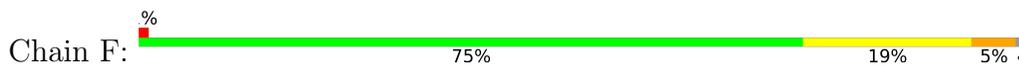
Chain C:

- Molecule 1: Rieske (2Fe-2S) domain protein

Chain E:

E281 V286 T287 L288 S292 V298 L299 Q300 Q303 R309 L312 P313 D330 R339 L340 K341 N344 L345 I346 S353 R365 L373 I377 R390 A391 K405 M411 GLN ALA

• Molecule 2: Aromatic-ring-hydroxylating dioxygenase beta subunit

Chain B:

78% 19%

MET I2 I5 F10 N11 M23 D59 I65 L68 N72 R76 H77 R78 Y79 L83 I88 A91 D92 A93 T94 Q95 S99 L103 H109 V115 Y121 K124 G130 K131 L132 E136 R137 V138 T148 L149 M150 S151 L152 P153 L154

• Molecule 2: Aromatic-ring-hydroxylating dioxygenase beta subunit

Chain D:

74% 24%

M1 I2 H3 E4 I5 Q6 N11 S20 D21 V22 W26 P27 C34 H35 Y36 R37 I52 V53 R76 Y79 R80 L83 G84 L85 P86 S90 A91 D92 S99 L103 V104 L105 R106 I107 M108 H109 T113 E114 Y121 K131 L132 R133 L134 Q135 E136

L149 L152 P153 L154

• Molecule 2: Aromatic-ring-hydroxylating dioxygenase beta subunit

Chain F:

%

75% 19% 5%

MET I2 H3 E4 I5 Q6 N11 K16 M23 T31 H35 Y36 R37 E46 I65 L68 R76 H77 R78 Y79 L83 G84 L85 Q89 D92 A93 T94 S99 L103 V104 H109 Y121 T126 T127 I128 D129 G130 K131 L132 R133 S151 L152

P153 L154

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	91.56Å 134.21Å 145.01Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	67.15 – 2.27 67.06 – 2.27	Depositor EDS
% Data completeness (in resolution range)	96.5 (67.15-2.27) 96.5 (67.06-2.27)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.43 (at 2.27Å)	Xtriage
Refinement program	REFMAC 5.8.0267	Depositor
R, R_{free}	0.157 , 0.221 0.157 , 0.220	Depositor DCC
R_{free} test set	3959 reflections (4.96%)	wwPDB-VP
Wilson B-factor (Å^2)	44.6	Xtriage
Anisotropy	0.024	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 52.2	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	13744	wwPDB-VP
Average B, all atoms (Å^2)	51.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.61% 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: PG4, FES, FE2, PEG, PO4, GOL

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$|Z|$ >5	RMSZ	#$|Z|$ >5
1	A	0.62	1/3041 (0.0%)	1.03	9/4106 (0.2%)
1	C	0.64	0/3179	1.01	6/4292 (0.1%)
1	E	0.61	1/3049 (0.0%)	1.02	10/4116 (0.2%)
2	B	0.58	1/1231 (0.1%)	0.97	1/1674 (0.1%)
2	D	0.61	2/1239 (0.2%)	1.05	5/1684 (0.3%)
2	F	0.54	0/1231	1.00	2/1674 (0.1%)
All	All	0.61	5/12970 (0.0%)	1.02	33/17546 (0.2%)

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	62	GLU	CD-OE2	8.68	1.35	1.25
1	A	185	GLU	CD-OE1	5.66	1.31	1.25
2	D	114	GLU	CD-OE1	5.49	1.31	1.25
2	D	114	GLU	CD-OE2	5.39	1.31	1.25
2	B	151	SER	CA-CB	-5.18	1.45	1.52

The worst 5 of 33 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	189	ARG	NE-CZ-NH1	12.67	126.63	120.30
1	A	189	ARG	NE-CZ-NH2	-12.24	114.18	120.30
1	E	309	ARG	CB-CG-CD	9.62	136.62	111.60
2	D	133	ARG	CG-CD-NE	-9.45	91.96	111.80
1	C	85	ARG	NE-CZ-NH1	-8.99	115.80	120.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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	2973	0	2855	32	0
1	C	3106	0	2985	42	0
1	E	2979	0	2868	35	0
2	B	1206	0	1163	19	0
2	D	1214	0	1175	26	0
2	F	1206	0	1163	31	0
3	A	4	0	0	1	0
3	C	4	0	0	0	0
3	E	4	0	0	1	0
4	A	1	0	0	0	0
4	C	1	0	0	0	0
4	E	1	0	0	0	0
5	A	14	0	20	1	0
5	C	14	0	20	0	0
5	E	14	0	20	7	0
5	F	7	0	10	1	0
6	A	6	0	8	0	0
6	D	6	0	8	0	0
6	E	6	0	8	1	0
7	A	5	0	0	0	0
7	B	5	0	0	0	0
7	C	15	0	0	0	0
7	D	10	0	0	1	0
7	E	10	0	0	1	0
7	F	5	0	0	0	0
8	A	13	0	18	0	0
9	A	218	0	0	4	0
9	B	79	0	0	1	0
9	C	252	0	0	5	0
9	D	84	0	0	0	0
9	E	214	0	0	3	0
9	F	68	0	0	1	0
All	All	13744	0	12321	180	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 7.

The worst 5 of 180 close contacts within the same asymmetric unit are listed below, sorted by

their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:131:LYS:HG2	2:D:132:LEU:H	1.19	1.03
1:E:101:GLN:H	5:E:504:PEG:H21	1.30	0.96
1:C:139:HIS:HD2	9:C:666:HOH:O	1.54	0.89
1:C:216:MET:HA	1:C:216:MET:CE	2.05	0.86
2:F:68:LEU:HD11	2:F:151:SER:HB2	1.57	0.84

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	372/413 (90%)	351 (94%)	20 (5%)	1 (0%)	41	49
1	C	390/413 (94%)	364 (93%)	23 (6%)	3 (1%)	19	22
1	E	373/413 (90%)	348 (93%)	23 (6%)	2 (0%)	29	34
2	B	151/154 (98%)	146 (97%)	4 (3%)	1 (1%)	22	25
2	D	152/154 (99%)	146 (96%)	6 (4%)	0	100	100
2	F	151/154 (98%)	141 (93%)	9 (6%)	1 (1%)	22	25
All	All	1589/1701 (93%)	1496 (94%)	85 (5%)	8 (0%)	29	34

5 of 8 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	219	THR
1	C	269	ARG
1	C	275	LEU
2	F	129	ASP
1	E	391	ALA

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	312/344 (91%)	293 (94%)	19 (6%)	18	23
1	C	327/344 (95%)	304 (93%)	23 (7%)	15	18
1	E	313/344 (91%)	296 (95%)	17 (5%)	22	28
2	B	128/131 (98%)	119 (93%)	9 (7%)	15	18
2	D	129/131 (98%)	123 (95%)	6 (5%)	26	34
2	F	128/131 (98%)	119 (93%)	9 (7%)	15	18
All	All	1337/1425 (94%)	1254 (94%)	83 (6%)	18	23

5 of 83 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	14	THR
1	E	373	LEU
1	E	73	GLN
1	E	218	PHE
2	F	3	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 9 such sidechains are listed below:

Mol	Chain	Res	Type
2	F	3	HIS
2	F	6	GLN
2	B	25	GLN
2	B	95	GLN
1	C	41	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 27 ligands modelled in this entry, 3 are monoatomic - leaving 24 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
3	FES	E	501	1	0,4,4	-	-	-		
5	PEG	C	504	-	6,6,6	0.38	0	5,5,5	0.71	0
5	PEG	A	504	-	6,6,6	0.73	0	5,5,5	0.59	0
7	PO4	E	507	-	4,4,4	0.52	0	6,6,6	0.49	0
5	PEG	F	201	-	6,6,6	0.19	0	5,5,5	0.22	0
7	PO4	A	506	-	4,4,4	0.80	0	6,6,6	0.41	0
5	PEG	E	504	-	6,6,6	0.30	0	5,5,5	0.49	0
7	PO4	C	505	-	4,4,4	0.78	0	6,6,6	0.49	0
3	FES	C	502	1	0,4,4	-	-	-		
5	PEG	E	503	-	6,6,6	0.37	0	5,5,5	0.76	0
7	PO4	B	201	-	4,4,4	0.57	0	6,6,6	0.55	0
6	GOL	D	201	-	5,5,5	0.34	0	5,5,5	0.90	0
5	PEG	C	501	-	6,6,6	0.20	0	5,5,5	0.21	0
6	GOL	E	505	-	5,5,5	0.05	0	5,5,5	0.30	0
7	PO4	F	202	-	4,4,4	0.77	0	6,6,6	0.43	0
7	PO4	E	506	-	4,4,4	0.57	0	6,6,6	0.51	0
5	PEG	A	503	-	6,6,6	0.41	0	5,5,5	0.66	0
7	PO4	D	202	-	4,4,4	0.47	0	6,6,6	0.53	0
3	FES	A	501	1	0,4,4	-	-	-		
6	GOL	A	505	-	5,5,5	0.26	0	5,5,5	1.18	0
7	PO4	C	507	-	4,4,4	0.71	0	6,6,6	0.46	0
7	PO4	D	203	-	4,4,4	0.81	0	6,6,6	0.55	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
8	PG4	A	507	-	12,12,12	0.23	0	11,11,11	0.10	0
7	PO4	C	506	-	4,4,4	0.41	0	6,6,6	0.68	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	PEG	F	201	-	-	1/4/4/4	-
6	GOL	A	505	-	-	3/4/4/4	-
5	PEG	E	503	-	-	2/4/4/4	-
3	FES	C	502	1	-	-	0/1/1/1
3	FES	E	501	1	-	-	0/1/1/1
5	PEG	C	504	-	-	3/4/4/4	-
5	PEG	A	504	-	-	4/4/4/4	-
6	GOL	D	201	-	-	2/4/4/4	-
5	PEG	C	501	-	-	3/4/4/4	-
6	GOL	E	505	-	-	2/4/4/4	-
5	PEG	E	504	-	-	2/4/4/4	-
8	PG4	A	507	-	-	4/10/10/10	-
5	PEG	A	503	-	-	3/4/4/4	-
3	FES	A	501	1	-	-	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 29 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	505	GOL	C1-C2-C3-O3
6	D	201	GOL	O1-C1-C2-O2
6	D	201	GOL	O1-C1-C2-C3
6	E	505	GOL	O1-C1-C2-C3
5	A	503	PEG	C1-C2-O2-C3

There are no ring outliers.

8 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	501	FES	1	0
7	E	507	PO4	1	0
5	F	201	PEG	1	0
5	E	504	PEG	7	0
6	E	505	GOL	1	0
5	A	503	PEG	1	0
3	A	501	FES	1	0
7	D	203	PO4	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 FES E 501

Bond lengths

Bond angles

Torsions

Rings

Ligand FES C 502

Bond lengths

Bond angles

Torsions

Rings

Ligand FES A 501

Bond lengths

Bond angles

Torsions

Rings
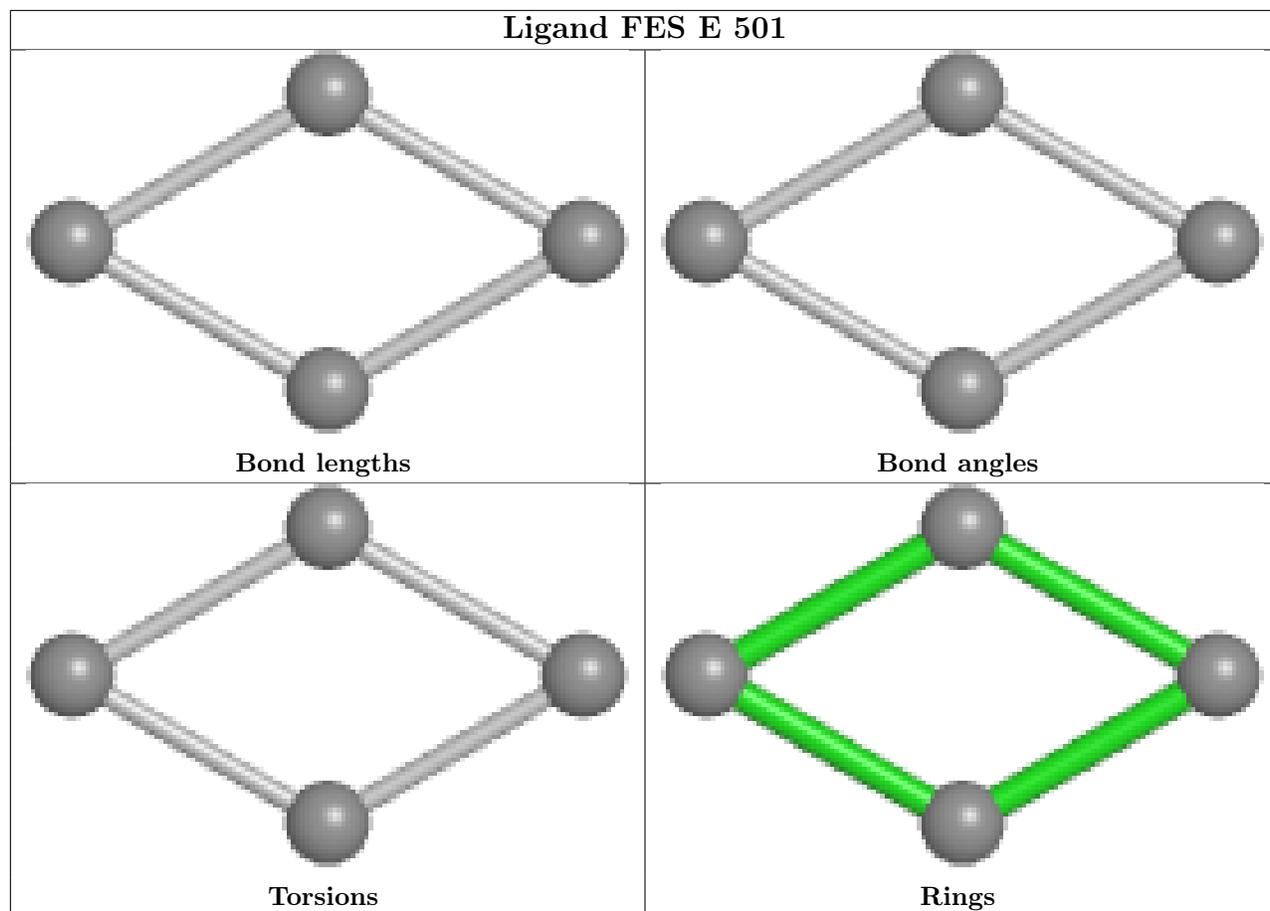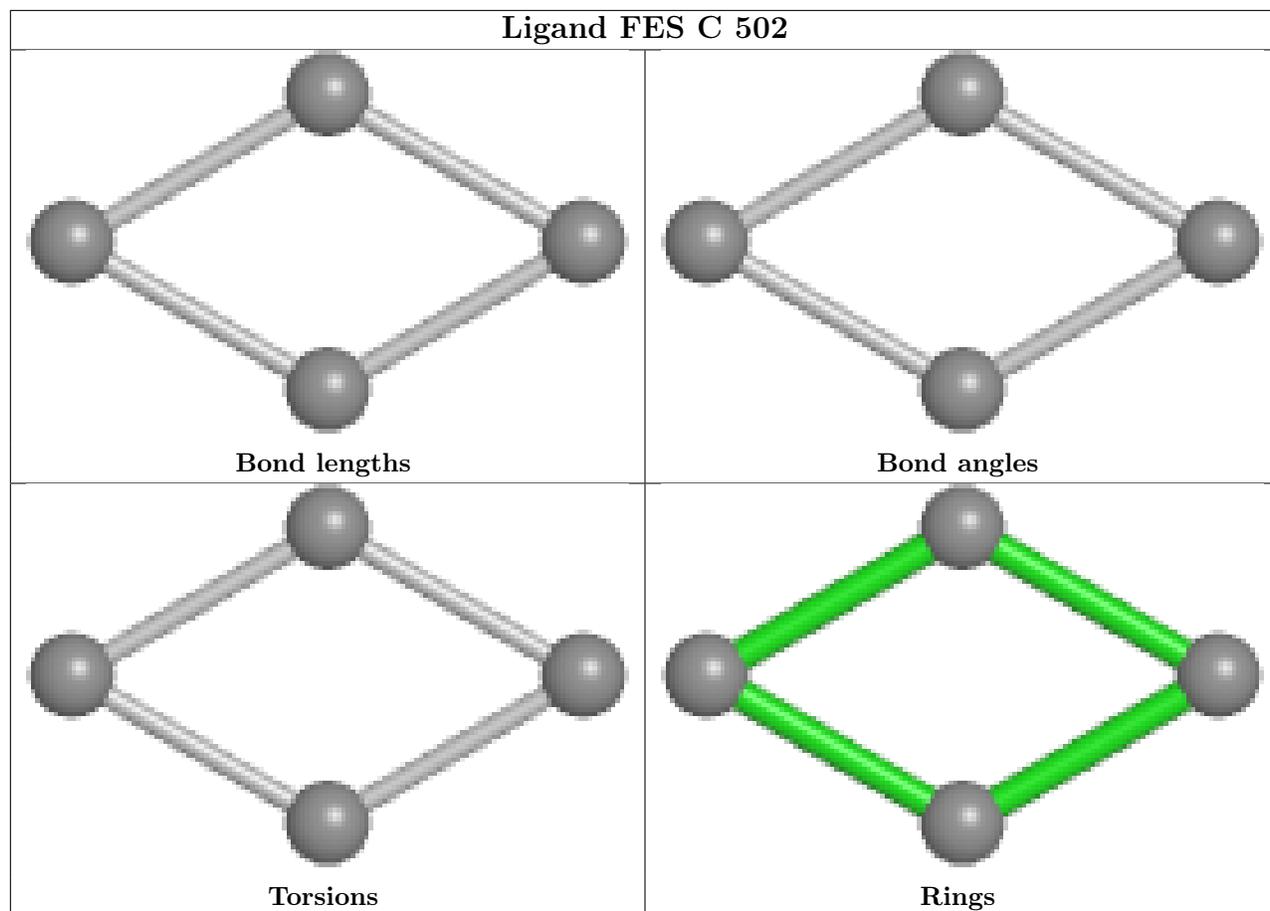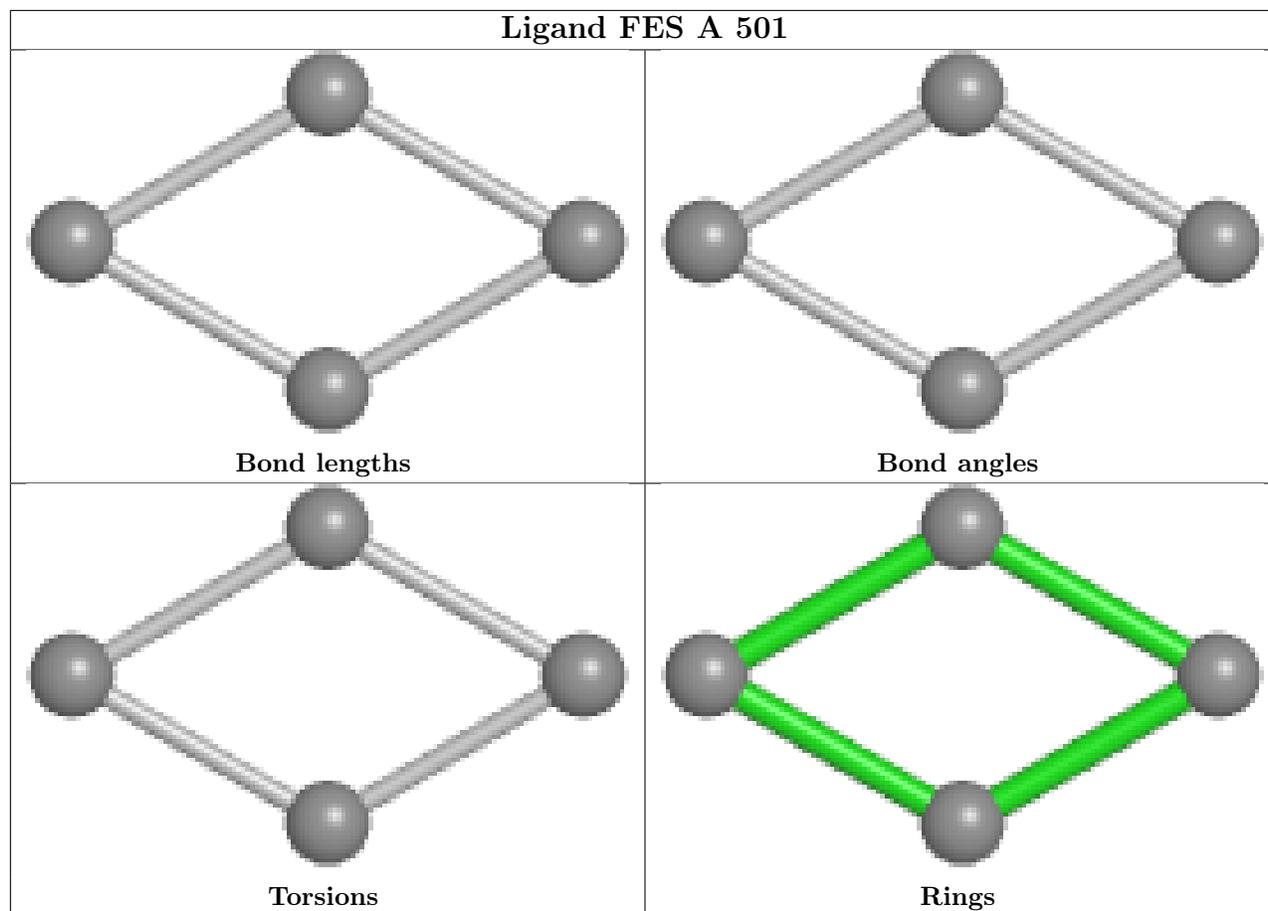
5.7 Other polymers ⓘ

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	378/413 (91%)	-0.03	12 (3%)	47	53	28, 45, 75, 105	0
1	C	393/413 (95%)	-0.19	4 (1%)	82	86	26, 43, 87, 125	0
1	E	378/413 (91%)	-0.10	6 (1%)	72	77	27, 47, 80, 135	0
2	B	153/154 (99%)	-0.07	0	100	100	32, 50, 78, 87	0
2	D	154/154 (100%)	-0.16	0	100	100	33, 48, 85, 96	0
2	F	153/154 (99%)	0.00	1 (0%)	87	90	34, 56, 90, 116	0
All	All	1609/1701 (94%)	-0.10	23 (1%)	75	79	26, 47, 82, 135	0

The worst 5 of 23 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	218	PHE	5.3
1	C	263	SER	4.0
1	E	124	VAL	3.9
1	A	244	TYR	3.5
1	C	5	ILE	3.4

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 (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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
6	GOL	D	201	6/6	0.78	0.27	44,63,67,74	0
5	PEG	F	201	7/7	0.85	0.13	77,79,85,87	0
8	PG4	A	507	13/13	0.85	0.20	67,89,105,109	0
7	PO4	B	201	5/5	0.86	0.17	80,88,98,110	0
5	PEG	A	504	7/7	0.91	0.21	48,54,62,66	0
5	PEG	E	503	7/7	0.91	0.22	37,49,54,55	0
7	PO4	F	202	5/5	0.92	0.21	82,102,106,115	0
5	PEG	C	504	7/7	0.93	0.20	43,48,53,56	0
5	PEG	A	503	7/7	0.94	0.25	42,49,52,56	0
7	PO4	C	507	5/5	0.94	0.15	91,91,97,98	0
7	PO4	D	202	5/5	0.94	0.10	68,70,79,81	0
5	PEG	E	504	7/7	0.94	0.14	45,50,62,63	0
7	PO4	A	506	5/5	0.94	0.14	76,82,88,93	0
6	GOL	E	505	6/6	0.95	0.14	47,60,65,69	0
7	PO4	C	505	5/5	0.95	0.16	70,84,91,95	0
6	GOL	A	505	6/6	0.95	0.14	42,46,55,59	0
5	PEG	C	501	7/7	0.96	0.12	62,65,67,68	0
7	PO4	E	507	5/5	0.97	0.10	76,82,84,87	0
7	PO4	C	506	5/5	0.98	0.14	55,59,65,66	0
7	PO4	D	203	5/5	0.98	0.15	52,54,57,65	0
7	PO4	E	506	5/5	0.98	0.13	55,59,63,66	0
4	FE2	E	502	1/1	0.99	0.13	42,42,42,42	0
3	FES	C	502	4/4	0.99	0.12	33,33,34,34	0
4	FE2	A	502	1/1	1.00	0.13	42,42,42,42	0
4	FE2	C	503	1/1	1.00	0.14	38,38,38,38	0
3	FES	A	501	4/4	1.00	0.12	31,32,32,33	0
3	FES	E	501	4/4	1.00	0.10	36,37,38,39	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.
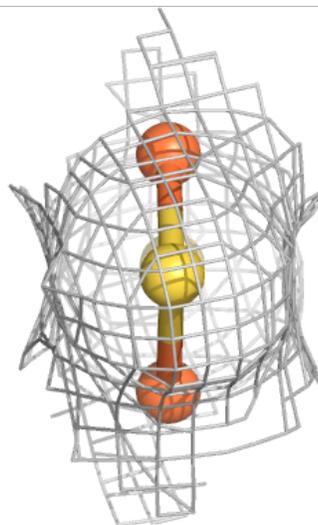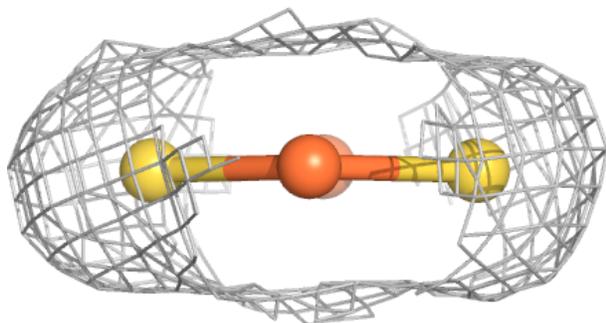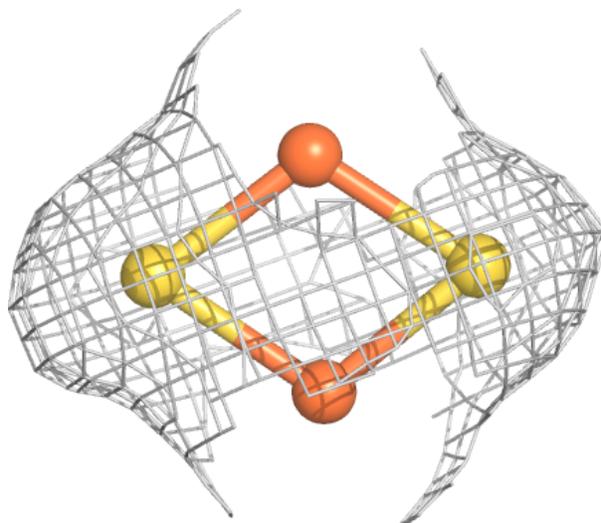
Electron density around FE2 E 502:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
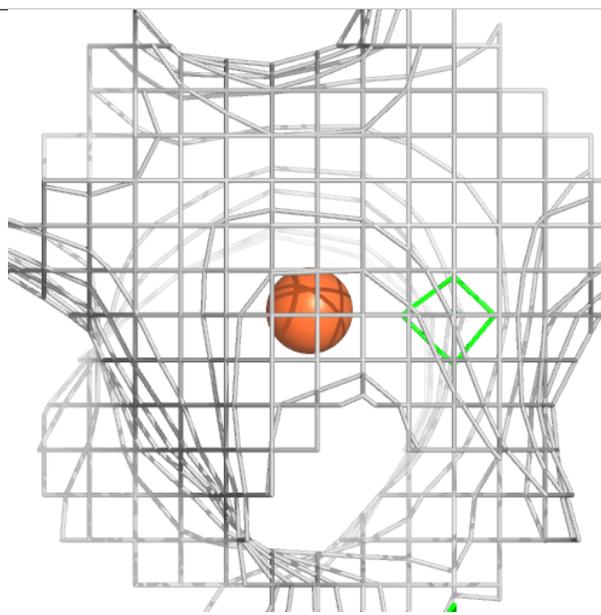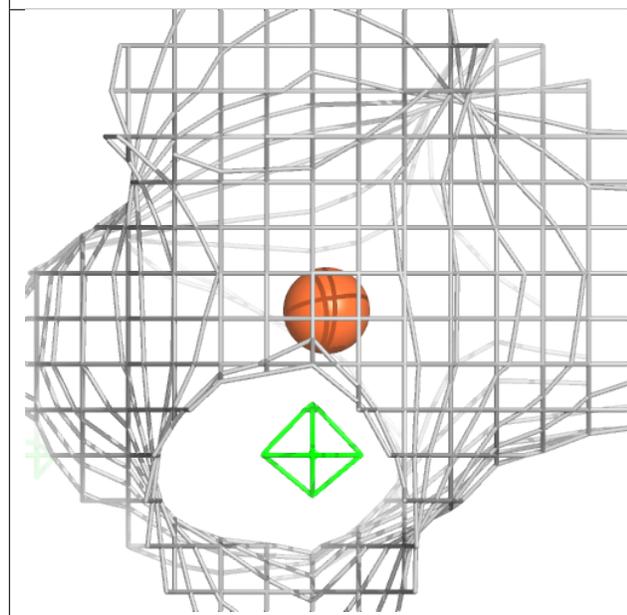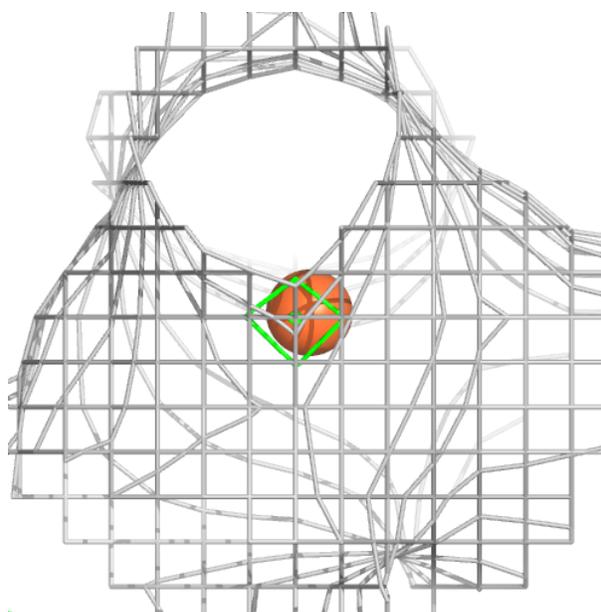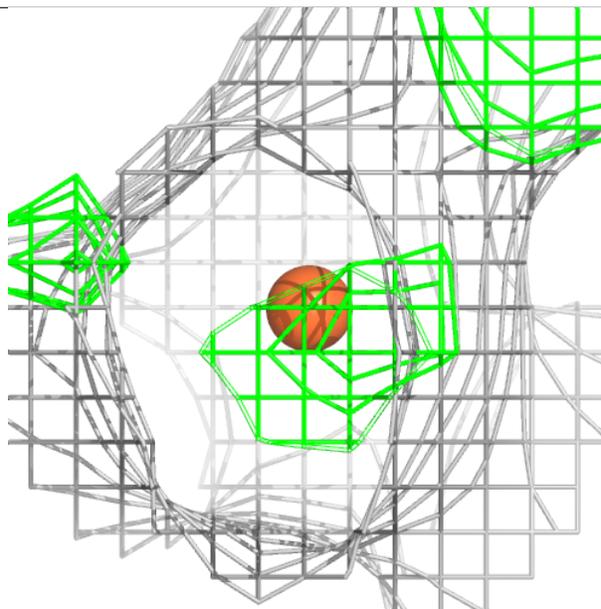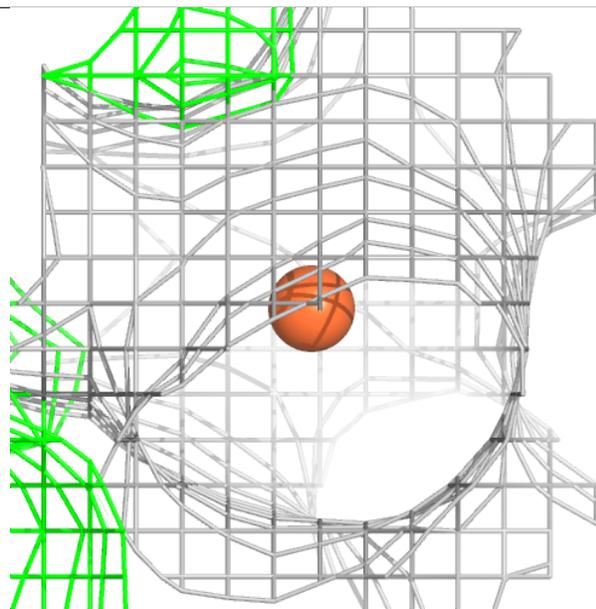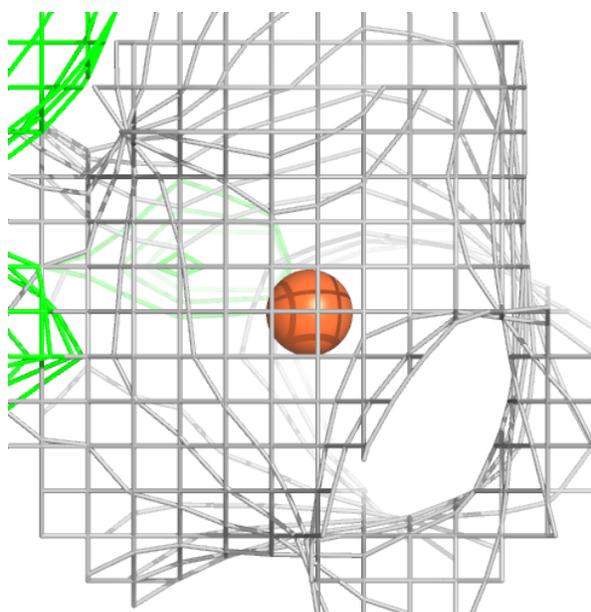and green (positive)
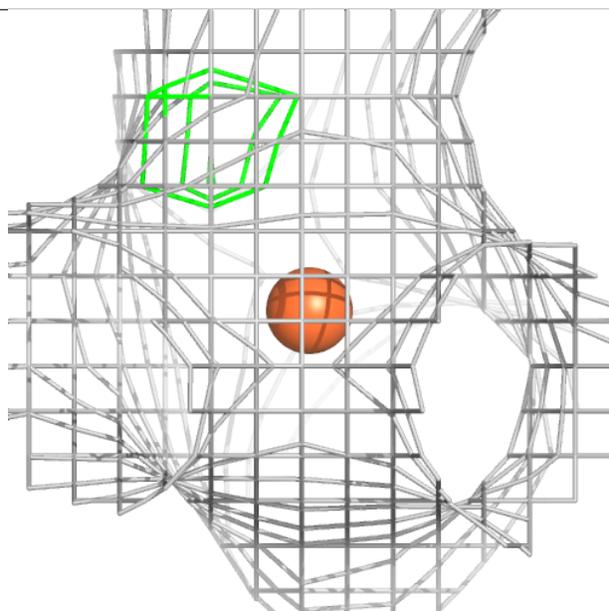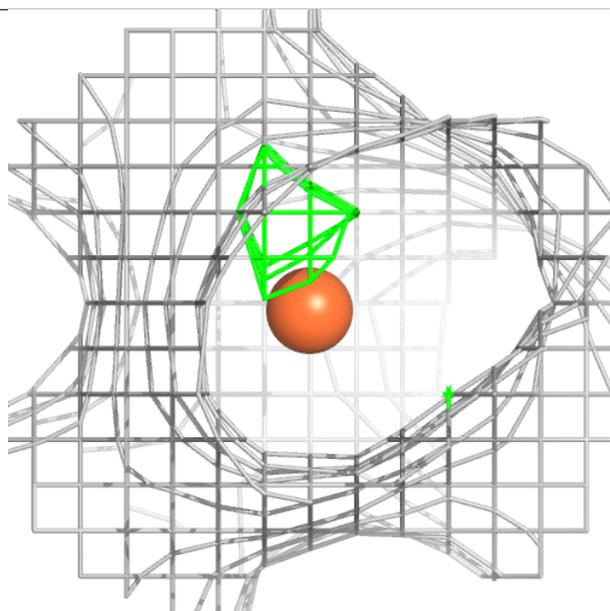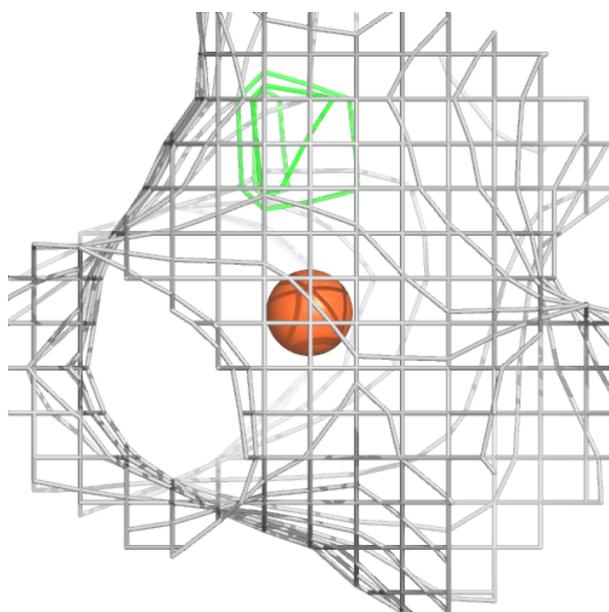
Electron density around FES C 502:

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

Electron density around FE2 A 502:

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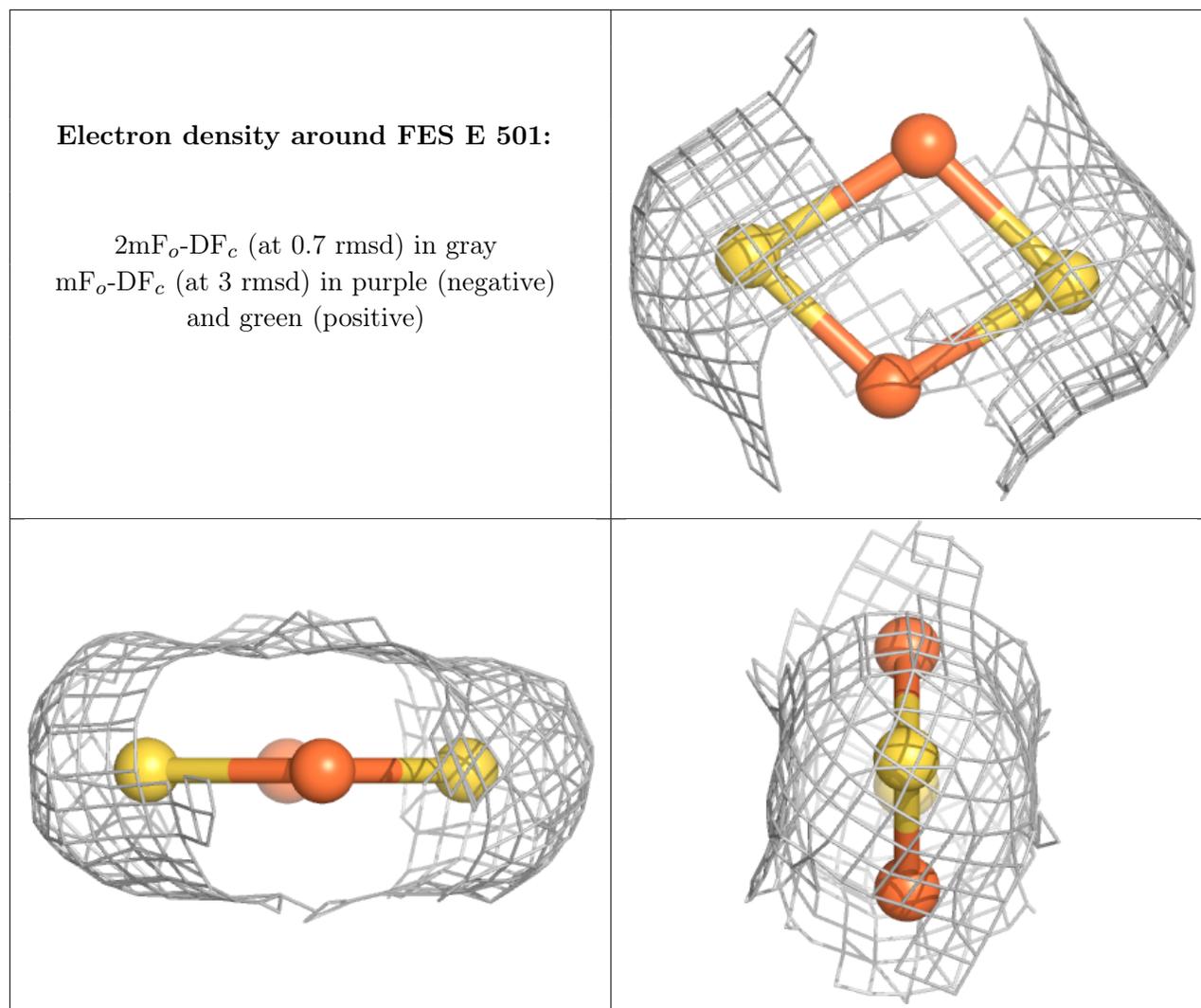and green (positive)

Electron density around FE2 C 503:

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

Electron density around FES A 501:

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

Electron density around FES E 501:

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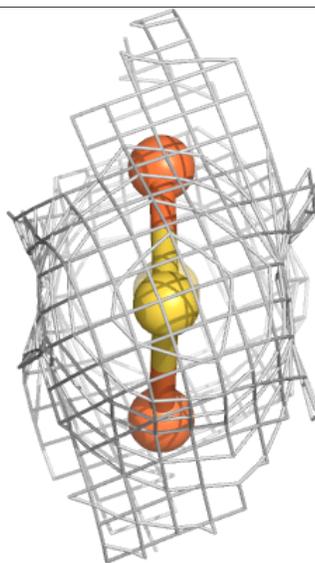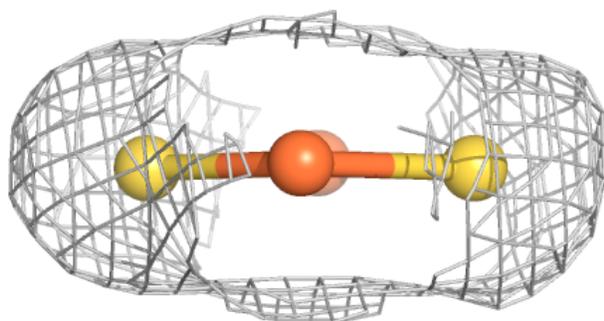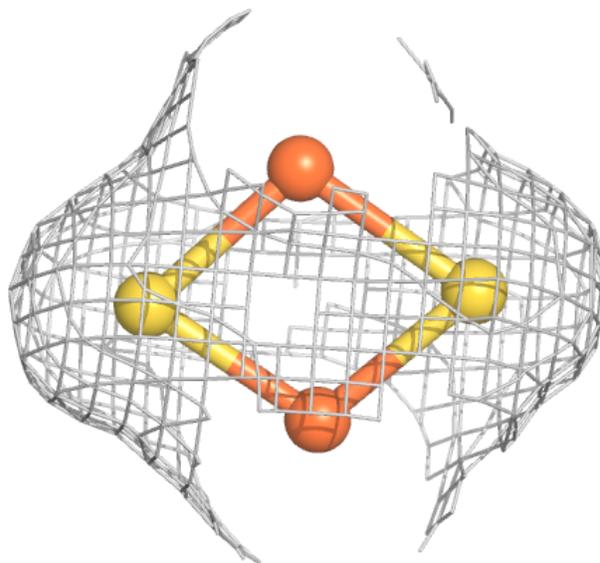
6.5 Other polymers (i)

There are no such residues in this entry.