Full wwPDB X-ray Structure Validation Report (i)

Dec 16, 2025 – 10:05 PM EST

PDB ID	:	2E74 / pdb_00002e74
Title	:	Crystal Structure of the Cytochrome b6f Complex from M.laminosus
Authors	:	Cramer, W.A.; Yamashita, E.; Zhang, H.
Deposited on	:	2007-01-05
Resolution	:	3.00 Å(reported)

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

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

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

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

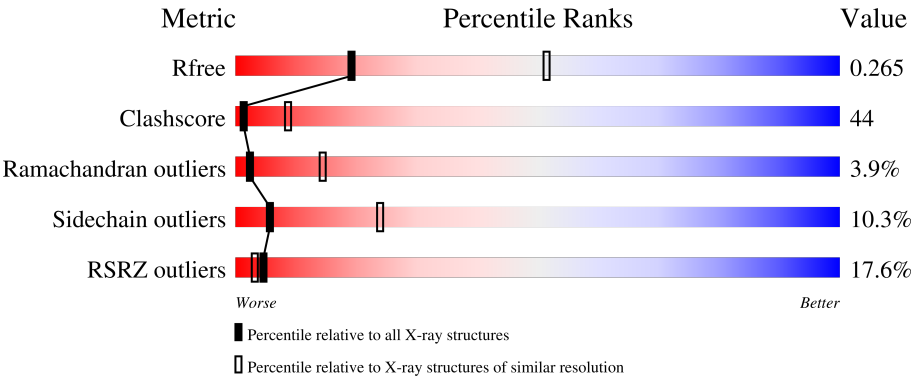
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.47

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 3.00 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	2511 (3.00-3.00)
Clashscore	180529	2866 (3.00-3.00)
Ramachandran outliers	177936	2778 (3.00-3.00)
Sidechain outliers	177891	2781 (3.00-3.00)
RSRZ outliers	164620	2523 (3.00-3.00)

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	215	56% 34% 9%
2	B	160	40% 48% 11%
3	C	289	25% 42% 47% 11%
4	D	179	45% 37% 49% 6% 7%
5	E	32	3% 38% 53% 9%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
6	F	35	14% 31% 46% 14% 9%
7	G	37	11% 30% 49% 19%
8	H	29	7% 38% 48% 10%

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
12	UMQ	A	1101	X	-	-	-
12	UMQ	A	1102	X	-	-	-
12	UMQ	A	1103	X	-	-	-
12	UMQ	A	1104	X	-	-	-
13	CLA	B	201	X	-	-	-
14	OPC	H	1002	-	-	X	-
15	FES	D	200	-	-	X	-
16	SQD	D	201	X	-	-	-

2 Entry composition (i)

There are 18 unique types of molecules in this entry. The entry contains 8025 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 Cytochrome b6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	215	Total	C	N	O	S	0	0	0
			1711	1140	272	288	11			

- Molecule 2 is a protein called Cytochrome b6-f complex subunit 4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	160	Total	C	N	O	S	0	0	0
			1249	841	193	209	6			

- Molecule 3 is a protein called Apocytochrome f.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	288	Total	C	N	O	S	0	0	0
			2216	1415	369	424	8			

- Molecule 4 is a protein called Cytochrome b6-f complex iron-sulfur subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	166	Total	C	N	O	S	0	0	0
			1260	805	218	230	7			

- Molecule 5 is a protein called Cytochrome b6-f complex subunit 6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	E	32	Total	C	N	O	S	0	0	0
			248	179	34	34	1			

- Molecule 6 is a protein called Cytochrome b6-f complex subunit 7.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	F	32	Total	C	N	O	S	0	0	0
			242	165	35	40	2			

- Molecule 7 is a protein called Cytochrome b6-f complex subunit 5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	G	37	Total	C	N	O	S	0	0	0
			283	188	44	50	1			

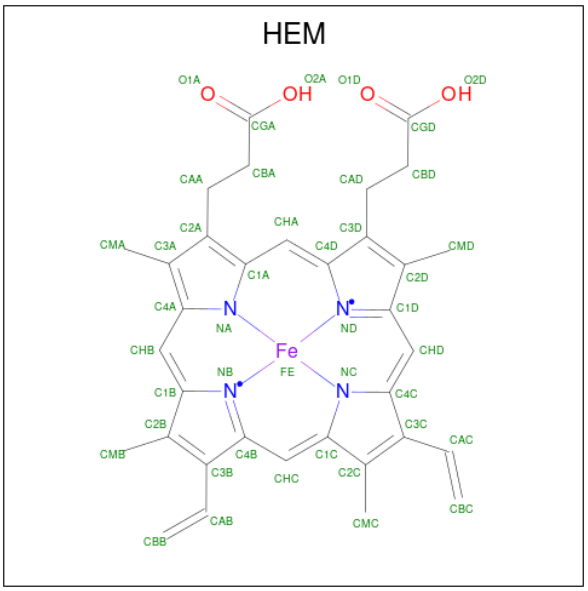
- Molecule 8 is a protein called Cytochrome b6-f complex subunit 8.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	H	29	Total	C	N	O	S	0	0	0
			230	156	36	36	2			

- Molecule 9 is CADMIUM ION (CCD ID: CD) (formula: Cd).

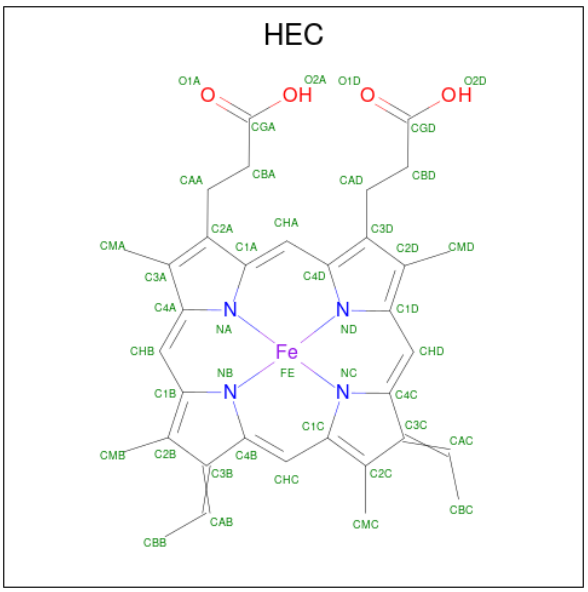
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	1	Total	Cd	0	0
			1	1		
9	B	1	Total	Cd	0	0
			1	1		

- Molecule 10 is PROTOPORPHYRIN IX CONTAINING FE (CCD ID: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).



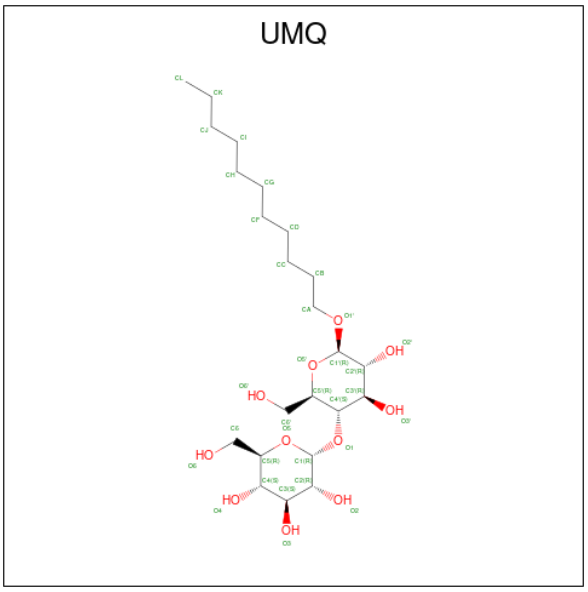
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
10	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
10	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 11 is HEME C (CCD ID: HEC) (formula: $C_{34}H_{34}FeN_4O_4$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
11	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
11	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 12 is UNDECYL-MALTOSIDE (CCD ID: UMQ) (formula: $C_{23}H_{44}O_{11}$).



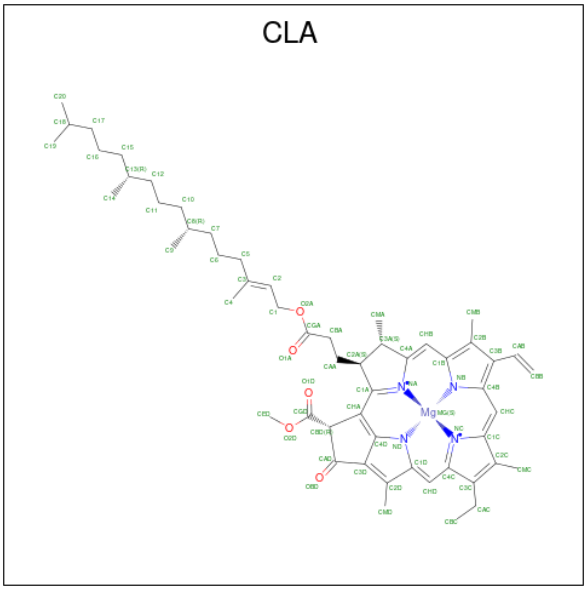
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
12	A	1	Total	C	O	0	0
			34	23	11		

Continued on next page...

Continued from previous page...

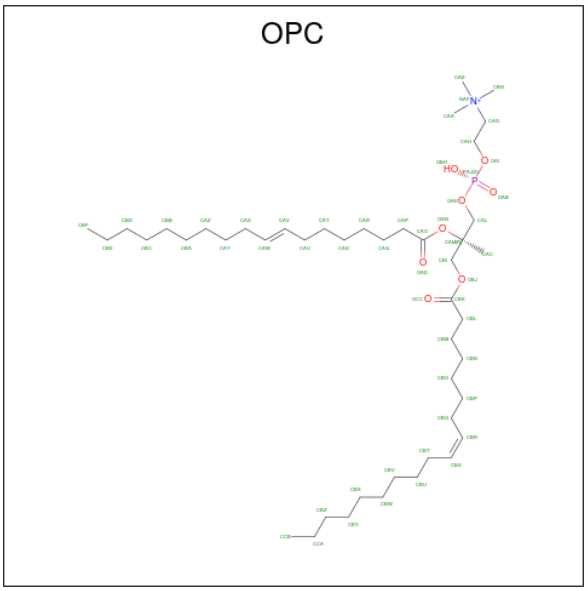
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	A	1	Total C O 34 23 11	0	0
12	A	1	Total C O 34 23 11	0	0
12	A	1	Total C O 34 23 11	0	0

- Molecule 13 is CHLOROPHYLL A (CCD ID: CLA) (formula: $C_{55}H_{72}MgN_4O_5$).



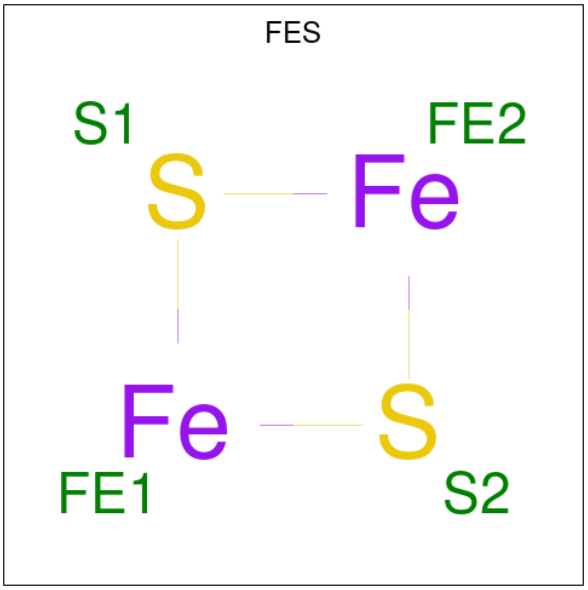
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
13	B	1	Total C Mg N O 65 55 1 4 5	0	0

- Molecule 14 is (7R,17E)-4-HYDROXY-N,N,N,7-TETRAMETHYL-7-[(8E)-OCTADEC-8-ENOYLOXY]-10-OXO-3,5,9-TRIOXA-4-PHOSPHAHEPTACOS-17-EN-1-AMINIUM 4-OXIDE (CCD ID: OPC) (formula: $C_{45}H_{87}NO_8P$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
14	B	1	Total	C	N	O	P	0	0
			54	44	1	8	1		
14	H	1	Total	C	N	O	P	0	0
			54	44	1	8	1		

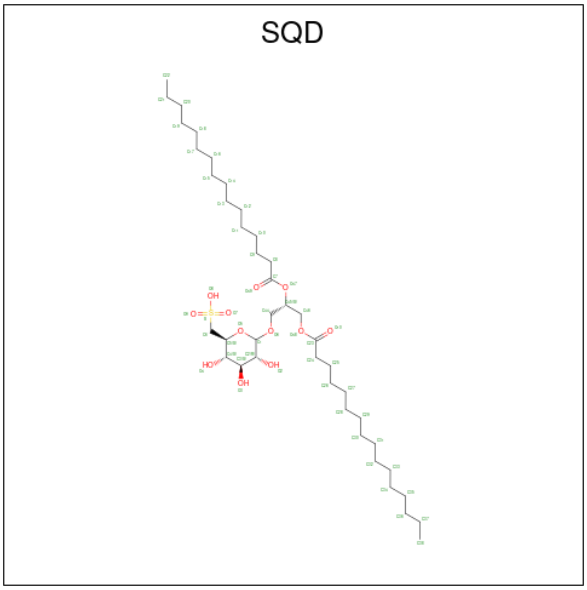
- Molecule 15 is FE2/S2 (INORGANIC) CLUSTER (CCD ID: FES) (formula: Fe_2S_2).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
15	D	1	Total	Fe	S	0	0
			4	2	2		

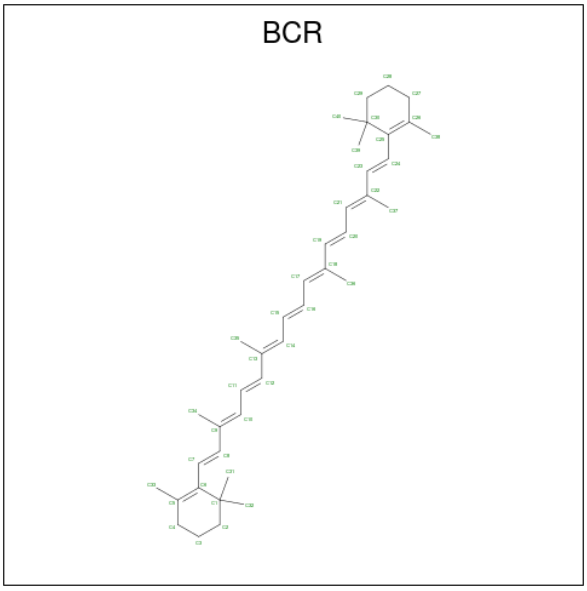
- Molecule 16 is 1,2-DI-O-ACYL-3-O-[6-DEOXY-6-SULFO-ALPHA-D-GLUCOPYRANOSY

L]-SN-GLYCEROL (CCD ID: SQD) (formula: $C_{41}H_{78}O_{12}S$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
16	D	1	Total	C	O	S	0	0
			54	41	12	1		

- Molecule 17 is BETA-CAROTENE (CCD ID: BCR) (formula: $C_{40}H_{56}$).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
17	G	1	Total	C	0	0
			40	40		

- Molecule 18 is water.

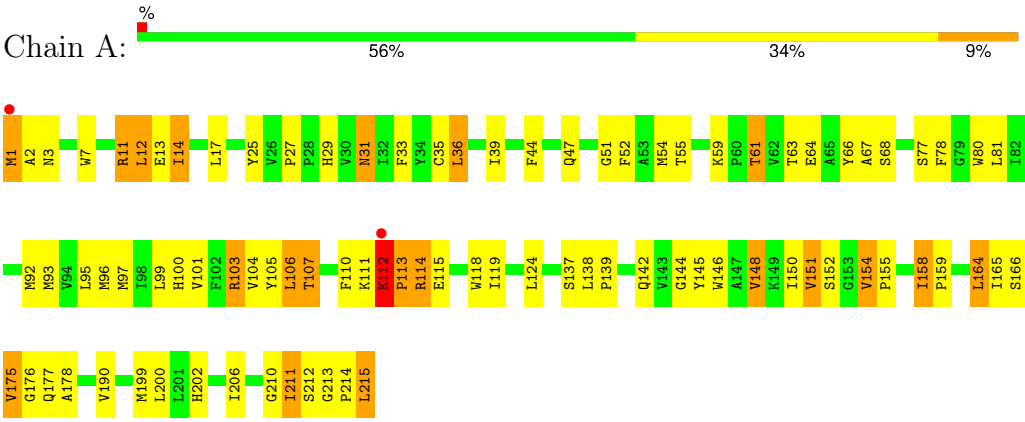
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
18	A	2	Total O 2 2	0	0
18	B	2	Total O 2 2	0	0
18	C	1	Total O 1 1	0	0

3 Residue-property plots (i)

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

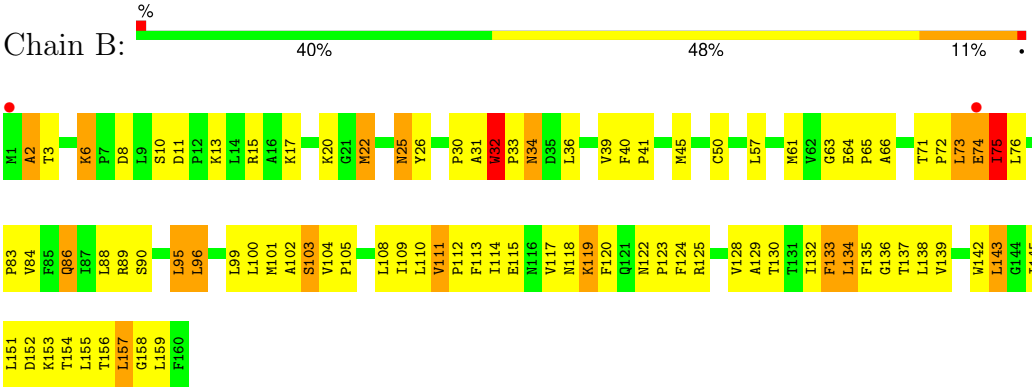
• Molecule 1: Cytochrome b6

Chain A:



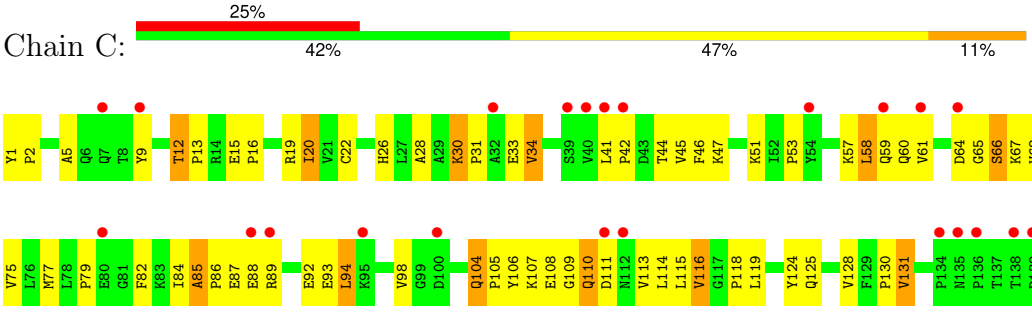
• Molecule 2: Cytochrome b6-f complex subunit 4

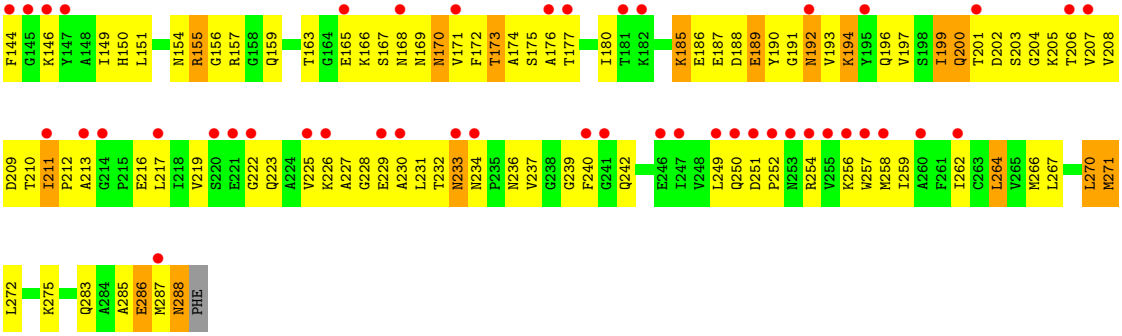
Chain B:



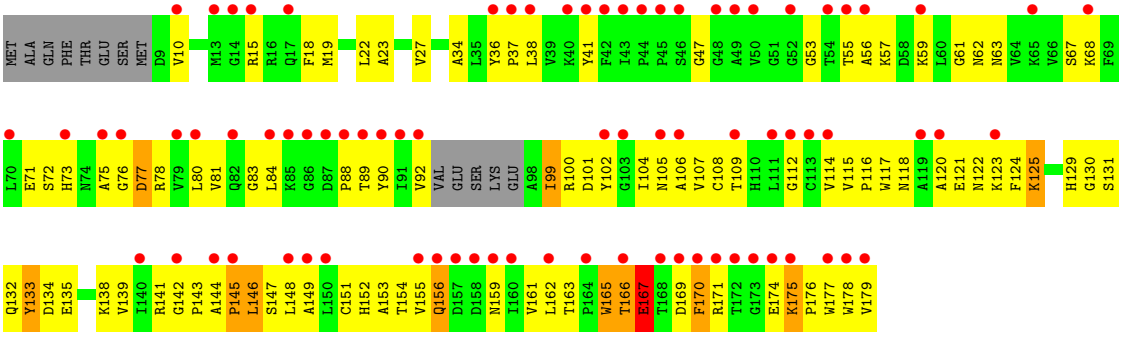
• Molecule 3: Apocytochrome f

Chain C:

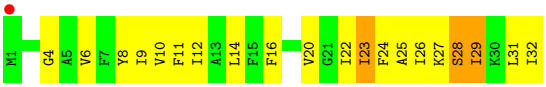




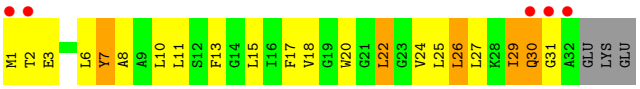
• Molecule 4: Cytochrome b6-f complex iron-sulfur subunit



• Molecule 5: Cytochrome b6-f complex subunit 6

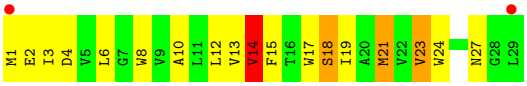


• Molecule 6: Cytochrome b6-f complex subunit 7



• Molecule 7: Cytochrome b6-f complex subunit 5

• Molecule 8: Cytochrome b6-f complex subunit 8


M1
E2
I3
D4
V5
L6
G7
W8
V9
A10
L11
L12
V13
V14
F15
T16
W17
S18
I19
A20
M21
V22
V23
W24
N27
G28
L29

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 61 2 2	Depositor
Cell constants a, b, c, α, β, γ	158.34Å 158.34Å 361.09Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	39.30 – 3.00 39.30 – 3.00	Depositor EDS
% Data completeness (in resolution range)	99.7 (39.30-3.00) 99.6 (39.30-3.00)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.71 (at 3.01Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.222 , 0.268 0.219 , 0.265	Depositor DCC
R_{free} test set	2740 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å^2)	89.0	Xtriage
Anisotropy	0.204	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 81.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	8025	wwPDB-VP
Average B, all atoms (Å^2)	66.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.80% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: BCR, CLA, HEC, HEM, FES, SQD, UMQ, OPC, CD

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	1.01	3/1763 (0.2%)	1.21	11/2405 (0.5%)
2	B	0.90	0/1288	1.19	4/1765 (0.2%)
3	C	0.71	0/2264	1.05	12/3082 (0.4%)
4	D	0.60	0/1292	0.83	0/1760
5	E	0.73	0/253	1.15	2/340 (0.6%)
6	F	0.79	0/246	1.08	0/331
7	G	0.83	0/289	1.14	2/391 (0.5%)
8	H	0.98	0/236	1.11	1/323 (0.3%)
All	All	0.82	3/7631 (0.0%)	1.09	32/10397 (0.3%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	1
8	H	0	1
All	All	0	2

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	175	VAL	CA-CB	-6.17	1.48	1.54
1	A	67	ALA	CA-CB	-5.67	1.44	1.53
1	A	113	PRO	CB-CG	5.15	1.75	1.49

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	111	VAL	CA-C-N	-7.82	111.74	119.64
2	B	111	VAL	C-N-CA	-7.82	111.74	119.64
1	A	158	ILE	CA-C-N	7.81	129.60	119.84
1	A	158	ILE	C-N-CA	7.81	129.60	119.84
7	G	3	GLU	CA-C-N	7.20	126.73	119.24
7	G	3	GLU	C-N-CA	7.20	126.73	119.24
1	A	190	VAL	N-CA-C	6.82	117.33	110.23
3	C	30	LYS	CA-C-N	6.59	126.51	119.85
3	C	30	LYS	C-N-CA	6.59	126.51	119.85
3	C	9	TYR	CA-C-N	6.54	127.12	120.38
3	C	9	TYR	C-N-CA	6.54	127.12	120.38
5	E	23	ILE	CB-CA-C	-6.45	103.75	111.81
1	A	148	VAL	N-CA-C	-6.31	104.34	110.72
1	A	114	ARG	N-CA-C	6.22	120.14	111.56
8	H	14	VAL	CB-CA-C	-5.98	104.06	112.14
1	A	106	LEU	N-CA-C	-5.97	106.64	112.97
1	A	112	LYS	CA-C-N	-5.91	113.54	119.56
1	A	112	LYS	C-N-CA	-5.91	113.54	119.56
3	C	104	GLN	CA-C-N	5.77	125.53	119.76
3	C	104	GLN	C-N-CA	5.77	125.53	119.76
3	C	34	VAL	CB-CA-C	-5.76	102.10	110.63
3	C	12	THR	CA-C-N	5.65	126.72	120.45
3	C	12	THR	C-N-CA	5.65	126.72	120.45
1	A	213	GLY	CA-C-N	5.62	126.10	120.14
1	A	213	GLY	C-N-CA	5.62	126.10	120.14
3	C	85	ALA	CA-C-N	5.40	126.59	119.84
3	C	85	ALA	C-N-CA	5.40	126.59	119.84
1	A	154	VAL	CB-CA-C	-5.32	108.64	113.70
3	C	259	ILE	CB-CA-C	-5.30	105.08	112.02
2	B	75	ILE	N-CA-C	5.24	113.92	106.53
2	B	157	LEU	N-CA-C	-5.23	106.85	113.23
5	E	23	ILE	N-CA-CB	5.22	116.31	110.62

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	32	TRP	Peptide
8	H	27	ASN	Peptide

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	1711	0	1736	145	1
2	B	1249	0	1308	143	0
3	C	2216	0	2232	203	2
4	D	1260	0	1243	125	0
5	E	248	0	284	30	0
6	F	242	0	260	27	0
7	G	283	0	289	45	1
8	H	230	0	239	21	0
9	A	1	0	0	0	0
9	B	1	0	0	0	0
10	A	86	0	60	19	0
11	A	43	0	31	6	0
11	C	43	0	31	6	0
12	A	136	0	164	13	0
13	B	65	0	72	4	0
14	B	54	0	83	2	0
14	H	54	0	83	23	0
15	D	4	0	0	2	0
16	D	54	0	57	11	0
17	G	40	0	52	11	0
18	A	2	0	0	0	0
18	B	2	0	0	0	0
18	C	1	0	0	0	0
All	All	8025	0	8224	717	2

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 44.

All (717) 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)
16:D:201:SQD:C4	16:D:201:SQD:C3	1.85	1.54
1:A:113:PRO:CG	1:A:113:PRO:CB	1.75	1.41
16:D:201:SQD:C4	16:D:201:SQD:C2	2.11	1.27
2:B:151:LEU:O	2:B:154:THR:HG22	1.25	1.25

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:151:LEU:O	2:B:154:THR:CG2	1.86	1.23
2:B:139:VAL:O	2:B:143:LEU:HD12	1.43	1.19
1:A:1:MET:N	1:A:1:MET:HE2	1.59	1.18
7:G:30:LYS:O	7:G:32:PRO:HD3	1.43	1.17
3:C:65:GLY:O	3:C:66:SER:O	1.64	1.14
3:C:70:LEU:N	3:C:70:LEU:HD23	1.63	1.13
3:C:107:LYS:CE	3:C:110:GLN:NE2	2.12	1.12
1:A:1:MET:HE2	1:A:1:MET:H1	0.97	1.12
4:D:78:ARG:HG2	4:D:92:VAL:HG22	1.26	1.12
4:D:166:THR:O	4:D:167:GLU:O	1.63	1.12
2:B:128:VAL:O	2:B:132:ILE:HD12	1.48	1.12
16:D:201:SQD:C4	16:D:201:SQD:H2	1.75	1.08
3:C:70:LEU:HD23	3:C:70:LEU:H	1.07	1.07
1:A:211:ILE:HD12	1:A:212:SER:H	1.19	1.07
4:D:131:SER:CB	4:D:142:GLY:HA3	1.84	1.07
4:D:109:THR:HG21	4:D:146:LEU:HB3	1.38	1.05
2:B:88:LEU:HD12	2:B:101:MET:SD	1.95	1.05
3:C:107:LYS:HE2	3:C:110:GLN:NE2	1.70	1.04
3:C:107:LYS:HE2	3:C:110:GLN:HE22	1.23	1.03
4:D:131:SER:HB3	4:D:142:GLY:HA3	1.39	1.02
2:B:158:GLY:O	2:B:159:LEU:HD23	1.57	1.02
1:A:111:LYS:O	1:A:113:PRO:HD2	1.59	1.02
2:B:128:VAL:O	2:B:132:ILE:CD1	2.09	1.01
10:A:301:HEM:HBB2	10:A:301:HEM:HMB2	1.39	0.98
4:D:133:TYR:CD2	4:D:139:VAL:HG12	1.98	0.98
16:D:201:SQD:H82	16:D:201:SQD:H241	1.45	0.98
3:C:107:LYS:HE3	3:C:110:GLN:NE2	1.78	0.98
7:G:30:LYS:C	7:G:32:PRO:HD3	1.88	0.97
1:A:112:LYS:HB3	1:A:113:PRO:HD3	1.46	0.97
3:C:232:THR:O	3:C:233:ASN:HB3	1.64	0.96
17:G:101:BCR:H333	14:H:1002:OPC:HBZ1	1.47	0.96
4:D:155:VAL:C	4:D:156:GLN:HE21	1.73	0.95
2:B:73:LEU:O	2:B:74:GLU:HB3	1.66	0.94
3:C:107:LYS:HE3	3:C:110:GLN:HE21	1.31	0.94
4:D:129:HIS:HB2	15:D:200:FES:S1	2.07	0.94
2:B:139:VAL:O	2:B:143:LEU:CD1	2.14	0.94
4:D:133:TYR:CE2	4:D:139:VAL:HG12	2.03	0.94
3:C:175:SER:HB2	3:C:209:ASP:OD1	1.67	0.93
1:A:7:TRP:CE2	1:A:11:ARG:NH2	2.35	0.93
3:C:188:ASP:O	3:C:190:TYR:N	2.00	0.93
4:D:131:SER:HA	4:D:142:GLY:HA3	1.49	0.93

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:131:SER:CA	4:D:142:GLY:HA3	1.98	0.93
2:B:32:TRP:CD1	2:B:33:PRO:HD3	2.04	0.92
4:D:15:ARG:HB3	5:E:31:LEU:HD23	1.51	0.92
1:A:92:MET:HE3	14:H:1002:OPC:HCB3	1.51	0.91
3:C:206:THR:HG22	3:C:206:THR:O	1.69	0.91
16:D:201:SQD:H2	16:D:201:SQD:H4	1.49	0.91
3:C:262:ILE:HG23	8:H:14:VAL:HG13	1.52	0.91
3:C:199:ILE:HG22	3:C:200:GLN:H	1.36	0.90
3:C:199:ILE:O	3:C:200:GLN:HG3	1.72	0.90
2:B:22:MET:HG2	2:B:22:MET:O	1.72	0.90
5:E:8:TYR:CZ	5:E:12:ILE:HD11	2.07	0.90
2:B:123:PRO:HD2	7:G:25:ALA:HB1	1.54	0.90
16:D:201:SQD:H241	16:D:201:SQD:C8	2.01	0.90
4:D:67:SER:O	4:D:71:GLU:HG3	1.73	0.89
4:D:133:TYR:CE2	4:D:139:VAL:CG1	2.56	0.89
2:B:118:ASN:HD22	2:B:120:PHE:H	1.20	0.89
1:A:47:GLN:NE2	1:A:89:SER:HB3	1.86	0.89
4:D:77:ASP:O	4:D:92:VAL:HA	1.70	0.88
3:C:174:ALA:HB2	3:C:231:LEU:HD23	1.54	0.88
3:C:70:LEU:N	3:C:70:LEU:CD2	2.37	0.87
3:C:231:LEU:HD12	3:C:231:LEU:O	1.73	0.87
3:C:155:ARG:H	3:C:155:ARG:HD2	1.39	0.87
1:A:211:ILE:HD12	1:A:212:SER:N	1.90	0.86
1:A:112:LYS:HB3	1:A:113:PRO:CD	2.06	0.86
3:C:94:LEU:O	3:C:94:LEU:HD23	1.76	0.86
12:A:1101:UMQ:HL3	4:D:37:PRO:HG2	1.58	0.85
1:A:92:MET:CE	14:H:1002:OPC:HBY1	2.05	0.85
1:A:103:ARG:NH1	1:A:104:VAL:HA	1.92	0.85
2:B:73:LEU:O	2:B:74:GLU:CB	2.24	0.85
2:B:109:ILE:O	2:B:112:PRO:HD2	1.77	0.84
16:D:201:SQD:C3	16:D:201:SQD:C5	2.55	0.84
10:A:301:HEM:HBB2	10:A:301:HEM:CMB	2.06	0.84
1:A:211:ILE:CD1	1:A:212:SER:H	1.91	0.83
7:G:2:VAL:CG1	7:G:3:GLU:N	2.42	0.83
4:D:156:GLN:HE21	4:D:156:GLN:N	1.76	0.82
5:E:16:PHE:CD2	6:F:22:LEU:HD21	2.14	0.82
5:E:4:GLY:HA3	14:H:1002:OPC:HAS1	1.60	0.82
4:D:133:TYR:CD2	4:D:139:VAL:CG1	2.63	0.82
1:A:215:LEU:H	1:A:215:LEU:HD23	1.45	0.82
4:D:131:SER:HB3	4:D:143:PRO:HD2	1.62	0.81
1:A:36:LEU:HD23	1:A:99:LEU:C	2.05	0.81

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:188:ASP:C	3:C:190:TYR:H	1.87	0.81
3:C:225:VAL:CG1	3:C:229:GLU:HG2	2.10	0.81
7:G:5:LEU:HD11	14:H:1002:OPC:HBN1	1.62	0.81
4:D:135:GLU:N	4:D:135:GLU:OE2	2.14	0.81
7:G:2:VAL:HG12	7:G:3:GLU:N	1.93	0.81
7:G:28:GLN:O	7:G:32:PRO:HB3	1.81	0.80
10:A:302:HEM:CMB	10:A:302:HEM:HBB2	2.12	0.80
3:C:180:ILE:CG2	3:C:222:GLY:H	1.94	0.80
1:A:111:LYS:O	1:A:113:PRO:CD	2.28	0.80
6:F:20:TRP:CZ3	17:G:101:BCR:H19C	2.17	0.80
1:A:112:LYS:O	1:A:115:GLU:OE1	1.99	0.80
3:C:30:LYS:HB3	3:C:31:PRO:HD2	1.64	0.80
10:A:302:HEM:HBB2	10:A:302:HEM:HMB1	1.64	0.79
2:B:84:VAL:HG13	2:B:101:MET:HG2	1.61	0.79
7:G:2:VAL:CG1	7:G:3:GLU:H	1.95	0.79
1:A:215:LEU:HD23	1:A:215:LEU:N	1.98	0.79
1:A:137:SER:HB2	1:A:148:VAL:HG21	1.64	0.79
7:G:30:LYS:O	7:G:32:PRO:CD	2.29	0.79
3:C:34:VAL:HG22	3:C:151:LEU:HD22	1.65	0.79
3:C:216:GLU:O	3:C:217:LEU:HD23	1.82	0.79
16:D:201:SQD:C4	16:D:201:SQD:O3	2.30	0.79
3:C:201:THR:HG22	3:C:202:ASP:N	1.97	0.78
2:B:143:LEU:HD12	2:B:143:LEU:H	1.48	0.78
3:C:199:ILE:O	3:C:200:GLN:CG	2.30	0.78
2:B:32:TRP:HB3	2:B:33:PRO:CD	2.13	0.78
1:A:11:ARG:HB2	1:A:12:LEU:HD22	1.66	0.78
1:A:1:MET:N	1:A:1:MET:CE	2.43	0.78
2:B:99:LEU:O	2:B:103:SER:OG	2.01	0.78
7:G:5:LEU:HD11	14:H:1002:OPC:CBN	2.13	0.78
6:F:20:TRP:HZ3	17:G:101:BCR:H19C	1.48	0.77
3:C:232:THR:O	3:C:233:ASN:CB	2.30	0.77
1:A:29:HIS:CD2	1:A:214:PRO:HA	2.20	0.76
4:D:131:SER:HA	4:D:142:GLY:CA	2.14	0.76
3:C:22:CYS:SG	3:C:240:PHE:CD1	2.76	0.76
3:C:155:ARG:HD2	3:C:155:ARG:N	1.97	0.76
3:C:177:THR:HG23	3:C:226:LYS:HG2	1.68	0.76
2:B:45:MET:HE3	4:D:27:VAL:HG13	1.67	0.76
4:D:155:VAL:C	4:D:156:GLN:NE2	2.43	0.76
1:A:83:ARG:NH2	2:B:61:MET:O	2.16	0.75
2:B:118:ASN:ND2	2:B:120:PHE:H	1.84	0.75
1:A:92:MET:CE	14:H:1002:OPC:CBY	2.64	0.75

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:94:LEU:HD23	3:C:94:LEU:C	2.12	0.75
3:C:196:GLN:NE2	3:C:210:THR:OG1	2.18	0.75
6:F:25:LEU:O	6:F:29:ILE:HG22	1.87	0.75
3:C:211:ILE:HD12	3:C:212:PRO:O	1.87	0.74
4:D:138:LYS:HA	4:D:147:SER:OG	1.86	0.74
2:B:31:ALA:O	2:B:32:TRP:O	2.04	0.74
4:D:67:SER:O	4:D:71:GLU:CG	2.36	0.74
1:A:7:TRP:NE1	1:A:11:ARG:NH2	2.36	0.74
2:B:82:TYR:HB2	2:B:83:PRO:HD3	1.70	0.74
1:A:61:THR:HG22	1:A:64:GLU:H	1.51	0.73
6:F:13:PHE:CE2	6:F:17:PHE:HE1	2.06	0.73
4:D:108:CYS:HB2	4:D:133:TYR:OH	1.88	0.73
1:A:202:HIS:O	1:A:206:ILE:HG13	1.88	0.73
3:C:19:ARG:O	3:C:20:ILE:HB	1.89	0.73
1:A:47:GLN:HE22	1:A:89:SER:HB3	1.51	0.72
1:A:103:ARG:HH11	1:A:104:VAL:HA	1.51	0.72
2:B:34:ASN:HD21	3:C:283:GLN:HE22	1.35	0.72
7:G:29:TYR:O	7:G:29:TYR:CD2	2.43	0.72
3:C:68:VAL:HG22	3:C:69:GLY:H	1.53	0.72
2:B:119:LYS:CG	2:B:119:LYS:O	2.37	0.72
3:C:199:ILE:O	3:C:200:GLN:CB	2.37	0.72
3:C:206:THR:O	3:C:206:THR:CG2	2.37	0.72
1:A:54:MET:CE	10:A:301:HEM:HBD1	2.20	0.71
3:C:98:VAL:HG21	3:C:130:PRO:HG3	1.73	0.71
3:C:185:LYS:O	3:C:185:LYS:HD3	1.90	0.71
3:C:176:ALA:HA	3:C:227:ALA:HB2	1.73	0.70
17:G:101:BCR:C32	8:H:19:ILE:HG12	2.21	0.70
2:B:32:TRP:CG	2:B:33:PRO:HD3	2.26	0.70
2:B:135:PHE:O	2:B:139:VAL:HG23	1.91	0.70
2:B:154:THR:HG23	2:B:155:LEU:H	1.56	0.70
3:C:286:GLU:N	3:C:286:GLU:OE1	2.24	0.70
4:D:92:VAL:HB	4:D:100:ARG:HD2	1.73	0.70
1:A:92:MET:HE2	14:H:1002:OPC:CBY	2.21	0.70
2:B:32:TRP:CB	2:B:33:PRO:CD	2.69	0.70
3:C:177:THR:HG23	3:C:226:LYS:HA	1.74	0.70
1:A:92:MET:HE1	14:H:1002:OPC:HBY1	1.74	0.70
7:G:34:GLU:O	7:G:35:LEU:HB2	1.88	0.70
3:C:58:LEU:HD13	3:C:59:GLN:N	2.07	0.70
3:C:94:LEU:CD2	3:C:98:VAL:HG23	2.22	0.69
2:B:118:ASN:ND2	2:B:120:PHE:CD1	2.60	0.69
3:C:94:LEU:HD23	3:C:98:VAL:HG23	1.74	0.69

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:92:MET:CE	14:H:1002:OPC:HCB3	2.22	0.69
3:C:141:ASN:C	3:C:141:ASN:HD22	2.00	0.69
5:E:22:ILE:O	5:E:26:ILE:HB	1.92	0.69
1:A:104:VAL:O	1:A:107:THR:HG22	1.92	0.69
3:C:28:ALA:HB3	3:C:239:GLY:HA2	1.72	0.69
6:F:13:PHE:CE2	6:F:17:PHE:CE1	2.80	0.69
3:C:5:ALA:HB2	11:C:301:HEC:HBB2	1.75	0.69
4:D:131:SER:HB3	4:D:142:GLY:CA	2.20	0.68
3:C:94:LEU:C	3:C:94:LEU:CD2	2.66	0.68
1:A:80:TRP:HE1	12:A:1101:UMQ:H6'1	1.57	0.68
11:A:303:HEC:HBD1	11:A:303:HEC:HHA	1.75	0.68
7:G:2:VAL:HG13	7:G:3:GLU:H	1.59	0.68
3:C:163:THR:OG1	3:C:165:GLU:HG2	1.94	0.68
4:D:109:THR:HG21	4:D:146:LEU:CB	2.21	0.68
3:C:13:PRO:O	3:C:20:ILE:HA	1.93	0.68
4:D:15:ARG:HB3	5:E:31:LEU:CD2	2.23	0.68
3:C:189:GLU:N	3:C:189:GLU:OE1	2.26	0.68
3:C:288:ASN:HD22	3:C:288:ASN:H	1.40	0.68
6:F:7:TYR:O	6:F:11:LEU:HD12	1.94	0.68
1:A:111:LYS:C	1:A:113:PRO:HD2	2.19	0.67
3:C:286:GLU:OE1	3:C:286:GLU:CA	2.41	0.67
3:C:79:PRO:HG2	3:C:82:PHE:CD1	2.29	0.67
3:C:176:ALA:C	3:C:227:ALA:HB2	2.19	0.67
2:B:32:TRP:HB3	2:B:33:PRO:HD3	1.76	0.67
1:A:114:ARG:NH1	1:A:210:GLY:O	2.27	0.67
3:C:46:PHE:CE2	3:C:131:VAL:HG22	2.30	0.67
4:D:57:LYS:HB3	4:D:61:GLY:HA2	1.76	0.67
1:A:155:PRO:HB2	1:A:166:SER:OG	1.94	0.67
3:C:219:VAL:HG21	3:C:231:LEU:HB2	1.77	0.66
4:D:118:ASN:C	4:D:118:ASN:HD22	2.03	0.66
3:C:180:ILE:HG23	3:C:222:GLY:H	1.61	0.66
4:D:99:ILE:HG13	4:D:100:ARG:H	1.60	0.66
4:D:99:ILE:HG23	4:D:100:ARG:N	2.09	0.66
3:C:60:GLN:HE22	3:C:156:GLY:HA2	1.60	0.66
3:C:194:LYS:HB2	3:C:194:LYS:NZ	2.11	0.66
3:C:270:LEU:HA	8:H:21:MET:HE2	1.77	0.66
3:C:167:SER:OG	3:C:168:ASN:N	2.27	0.66
3:C:177:THR:N	3:C:227:ALA:HB2	2.10	0.66
5:E:6:VAL:O	5:E:10:VAL:HG23	1.95	0.66
5:E:23:ILE:O	5:E:27:LYS:N	2.29	0.66
1:A:92:MET:HE2	14:H:1002:OPC:HBY2	1.78	0.66

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:137:SER:HB2	1:A:148:VAL:CG2	2.26	0.65
4:D:122:ASN:HB3	4:D:135:GLU:OE1	1.95	0.65
6:F:18:VAL:O	6:F:22:LEU:HB2	1.96	0.65
1:A:54:MET:HE3	10:A:301:HEM:HBD1	1.76	0.65
3:C:201:THR:CG2	3:C:202:ASP:H	2.09	0.65
3:C:177:THR:CG2	3:C:226:LYS:HG2	2.26	0.65
4:D:63:ASN:HB3	4:D:159:ASN:HD21	1.61	0.65
4:D:63:ASN:HB3	4:D:159:ASN:ND2	2.11	0.65
4:D:109:THR:HG22	4:D:109:THR:O	1.95	0.65
3:C:201:THR:CG2	3:C:202:ASP:N	2.59	0.65
4:D:107:VAL:HG12	4:D:112:GLY:HA2	1.77	0.65
1:A:36:LEU:HB3	1:A:100:HIS:HB2	1.78	0.65
3:C:59:GLN:OE1	3:C:67:LYS:O	2.15	0.65
1:A:83:ARG:HD2	10:A:301:HEM:O1D	1.97	0.65
5:E:16:PHE:HD2	6:F:22:LEU:HD21	1.61	0.65
2:B:142:TRP:CZ2	2:B:155:LEU:O	2.50	0.64
3:C:201:THR:HG22	3:C:202:ASP:H	1.59	0.64
3:C:211:ILE:HD12	3:C:211:ILE:C	2.23	0.64
1:A:7:TRP:NE1	1:A:11:ARG:HH21	1.93	0.64
3:C:229:GLU:HA	3:C:229:GLU:OE1	1.97	0.64
7:G:20:GLY:N	17:G:101:BCR:H363	2.13	0.64
1:A:31:ASN:C	1:A:31:ASN:HD22	2.05	0.64
3:C:251:ASP:HB3	3:C:254:ARG:HD3	1.79	0.64
2:B:45:MET:CE	4:D:27:VAL:HG13	2.27	0.64
2:B:151:LEU:O	2:B:154:THR:HG21	1.96	0.64
1:A:92:MET:HE3	14:H:1002:OPC:CCB	2.24	0.63
2:B:22:MET:O	2:B:22:MET:CG	2.41	0.63
3:C:64:ASP:HB2	3:C:192:ASN:HD22	1.62	0.63
3:C:94:LEU:CD2	3:C:98:VAL:CG2	2.75	0.63
13:B:201:CLA:HAC1	14:B:202:OPC:HBW1	1.80	0.63
2:B:8:ASP:OD1	2:B:10:SER:HB3	1.98	0.63
2:B:119:LYS:O	2:B:119:LYS:HG3	1.97	0.63
3:C:68:VAL:HG22	3:C:69:GLY:N	2.13	0.63
3:C:194:LYS:HB2	3:C:194:LYS:HZ2	1.64	0.63
4:D:116:PRO:HD2	4:D:125:LYS:O	1.98	0.63
1:A:170:ARG:HG3	1:A:172:GLY:O	1.99	0.63
1:A:110:PHE:HD1	2:B:112:PRO:HB3	1.63	0.62
4:D:169:ASP:OD1	4:D:176:PRO:HB3	1.98	0.62
4:D:130:GLY:O	4:D:141:ARG:NH2	2.31	0.62
12:A:1104:UMQ:HC1	2:B:32:TRP:CZ2	2.34	0.62
1:A:36:LEU:HD23	1:A:100:HIS:N	2.14	0.61

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:142:TRP:HZ2	2:B:155:LEU:O	1.84	0.61
3:C:275:LYS:HD3	4:D:19:MET:HB3	1.82	0.61
4:D:156:GLN:HE21	4:D:156:GLN:CA	2.13	0.61
1:A:63:THR:HG22	1:A:64:GLU:HG3	1.82	0.61
3:C:119:LEU:HD22	3:C:124:TYR:CE1	2.36	0.61
1:A:142:GLN:HG3	2:B:72:PRO:HG3	1.82	0.61
3:C:65:GLY:C	3:C:66:SER:O	2.44	0.61
3:C:175:SER:HB2	3:C:209:ASP:CG	2.25	0.61
1:A:93:MET:SD	10:A:301:HEM:HBB1	2.41	0.61
3:C:171:VAL:HG12	3:C:233:ASN:O	2.01	0.61
3:C:176:ALA:HA	3:C:227:ALA:CB	2.30	0.61
1:A:1:MET:HE2	1:A:1:MET:H3	1.63	0.61
2:B:75:ILE:O	2:B:75:ILE:HG12	2.00	0.61
2:B:88:LEU:CD1	2:B:101:MET:SD	2.83	0.61
4:D:131:SER:HB3	4:D:143:PRO:CD	2.31	0.61
1:A:100:HIS:HE1	10:A:302:HEM:C1A	2.19	0.61
2:B:32:TRP:CB	2:B:33:PRO:HD3	2.31	0.60
2:B:156:THR:O	2:B:157:LEU:HB2	2.01	0.60
2:B:3:THR:HG23	3:C:287:MET:HE1	1.82	0.60
2:B:114:ILE:O	2:B:117:VAL:HG23	2.01	0.60
1:A:103:ARG:HH12	1:A:104:VAL:HG22	1.66	0.60
10:A:302:HEM:HMB1	10:A:302:HEM:CBB	2.30	0.60
2:B:45:MET:HE1	4:D:27:VAL:HG22	1.82	0.60
4:D:156:GLN:N	4:D:156:GLN:NE2	2.49	0.60
3:C:71:ASN:N	11:C:301:HEC:O2A	2.16	0.60
3:C:15:GLU:HB3	3:C:16:PRO:CD	2.31	0.60
3:C:57:LYS:HE2	3:C:57:LYS:HA	1.82	0.60
5:E:26:ILE:HG22	5:E:32:ILE:HD12	1.83	0.60
4:D:89:THR:HG23	4:D:104:ILE:C	2.27	0.60
7:G:33:ASN:O	7:G:34:GLU:O	2.20	0.60
1:A:137:SER:CB	1:A:148:VAL:HG21	2.30	0.60
2:B:57:LEU:HD13	8:H:8:TRP:HA	1.83	0.60
12:A:1104:UMQ:H21	12:A:1104:UMQ:H62	1.83	0.59
4:D:78:ARG:CG	4:D:92:VAL:HG22	2.15	0.59
2:B:118:ASN:ND2	2:B:120:PHE:HD1	2.00	0.59
4:D:145:PRO:O	4:D:146:LEU:HB2	2.02	0.59
16:D:201:SQD:H241	16:D:201:SQD:H81	1.83	0.59
1:A:154:VAL:HB	1:A:155:PRO:HD3	1.85	0.59
2:B:110:LEU:O	2:B:111:VAL:C	2.43	0.59
7:G:5:LEU:CD1	14:H:1002:OPC:HBN1	2.31	0.59
5:E:29:ILE:HG22	5:E:29:ILE:O	2.01	0.59

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:152:ASP:OD2	2:B:153:LYS:HG2	2.03	0.59
1:A:111:LYS:NZ	2:B:120:PHE:O	2.35	0.59
1:A:114:ARG:NH2	1:A:212:SER:HA	2.17	0.59
2:B:79:TRP:CG	2:B:80:TYR:N	2.70	0.59
2:B:139:VAL:HG12	2:B:143:LEU:HD11	1.83	0.59
5:E:25:ALA:O	5:E:29:ILE:HG13	2.02	0.59
1:A:137:SER:CB	1:A:148:VAL:CG2	2.80	0.59
2:B:123:PRO:CD	7:G:25:ALA:HB1	2.31	0.59
3:C:176:ALA:CA	3:C:227:ALA:HB2	2.32	0.59
2:B:2:ALA:O	2:B:3:THR:OG1	2.16	0.59
3:C:199:ILE:O	3:C:200:GLN:HB2	2.03	0.59
4:D:121:GLU:O	4:D:122:ASN:HB2	2.02	0.59
3:C:64:ASP:HB2	3:C:192:ASN:ND2	2.17	0.59
1:A:1:MET:H1	1:A:1:MET:CE	1.92	0.58
1:A:158:ILE:HG23	1:A:159:PRO:HD2	1.83	0.58
4:D:108:CYS:HB3	4:D:115:VAL:CG2	2.34	0.58
4:D:166:THR:C	4:D:167:GLU:O	2.45	0.58
12:A:1101:UMQ:HD2	3:C:257:TRP:HB2	1.85	0.58
2:B:95:LEU:HD22	2:B:99:LEU:CD1	2.33	0.58
4:D:118:ASN:ND2	4:D:120:ALA:H	2.02	0.58
4:D:176:PRO:HD2	4:D:179:VAL:HG22	1.86	0.58
3:C:204:GLY:O	3:C:205:LYS:HB2	2.03	0.58
4:D:105:ASN:HB2	4:D:149:ALA:HB3	1.86	0.58
7:G:31:ARG:O	7:G:31:ARG:HG2	2.02	0.58
4:D:36:TYR:HB3	4:D:37:PRO:HD3	1.86	0.57
1:A:103:ARG:O	1:A:107:THR:HB	2.03	0.57
4:D:133:TYR:CD1	4:D:133:TYR:N	2.71	0.57
1:A:103:ARG:HH11	1:A:104:VAL:CA	2.17	0.57
3:C:285:ALA:C	3:C:286:GLU:OE1	2.47	0.57
11:A:303:HEC:HBD1	11:A:303:HEC:CHA	2.33	0.57
3:C:42:PRO:HG3	3:C:144:PHE:HE2	1.68	0.57
3:C:5:ALA:HB2	11:C:301:HEC:CBB	2.34	0.57
3:C:199:ILE:C	3:C:200:GLN:HG3	2.29	0.57
3:C:71:ASN:N	3:C:71:ASN:HD22	2.03	0.57
5:E:8:TYR:OH	6:F:15:LEU:HD22	2.03	0.57
7:G:3:GLU:C	7:G:3:GLU:OE1	2.47	0.57
1:A:12:LEU:O	1:A:13:GLU:HB2	2.03	0.57
2:B:151:LEU:O	2:B:154:THR:CB	2.53	0.57
6:F:11:LEU:HD21	14:H:1002:OPC:HAV	1.86	0.57
1:A:115:GLU:O	1:A:119:ILE:HG13	2.04	0.56
2:B:84:VAL:HG13	2:B:101:MET:CG	2.32	0.56

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:103:ARG:O	1:A:103:ARG:HD2	2.06	0.56
2:B:82:TYR:HB2	2:B:83:PRO:CD	2.35	0.56
5:E:28:SER:O	5:E:29:ILE:HG12	2.05	0.56
12:A:1104:UMQ:H21	12:A:1104:UMQ:C6	2.35	0.56
14:H:1002:OPC:HAY1	14:H:1002:OPC:HBC1	1.86	0.56
1:A:39:ILE:HD11	17:G:101:BCR:H312	1.87	0.56
1:A:61:THR:HG22	1:A:64:GLU:N	2.21	0.56
1:A:106:LEU:HD12	7:G:21:LEU:HD23	1.86	0.56
4:D:118:ASN:HD22	4:D:120:ALA:H	1.52	0.56
1:A:29:HIS:CD2	1:A:214:PRO:CA	2.89	0.56
3:C:71:ASN:N	3:C:71:ASN:ND2	2.53	0.56
1:A:115:GLU:OE1	1:A:115:GLU:N	2.39	0.56
6:F:25:LEU:O	6:F:29:ILE:CG2	2.52	0.56
2:B:134:LEU:HD11	7:G:22:PHE:CZ	2.40	0.56
3:C:187:GLU:HG3	3:C:187:GLU:O	2.06	0.56
4:D:133:TYR:CD2	4:D:148:LEU:HG	2.41	0.56
3:C:199:ILE:HG22	3:C:200:GLN:N	2.13	0.55
4:D:138:LYS:HA	4:D:147:SER:CB	2.36	0.55
1:A:103:ARG:HD2	1:A:103:ARG:C	2.30	0.55
2:B:71:THR:HG22	2:B:72:PRO:O	2.06	0.55
1:A:44:PHE:HB2	1:A:93:MET:HE3	1.88	0.55
2:B:128:VAL:O	2:B:132:ILE:HD13	2.02	0.55
3:C:216:GLU:HG3	3:C:217:LEU:H	1.71	0.55
1:A:47:GLN:NE2	1:A:89:SER:CB	2.65	0.55
2:B:32:TRP:O	2:B:33:PRO:C	2.49	0.55
1:A:1:MET:O	1:A:2:ALA:HB3	2.06	0.55
2:B:11:ASP:OD1	2:B:13:LYS:HB2	2.07	0.55
2:B:57:LEU:CD1	8:H:8:TRP:HA	2.36	0.54
6:F:13:PHE:CD2	6:F:17:PHE:HE1	2.25	0.54
3:C:79:PRO:HG2	3:C:82:PHE:CE1	2.41	0.54
3:C:41:LEU:HD22	3:C:252:PRO:HG3	1.88	0.54
3:C:286:GLU:OE1	3:C:286:GLU:HA	2.06	0.54
3:C:173:THR:HB	3:C:228:GLY:HA2	1.88	0.54
3:C:266:MET:HE1	5:E:11:PHE:CE2	2.43	0.54
5:E:24:PHE:O	5:E:25:ALA:C	2.50	0.54
1:A:100:HIS:CE1	10:A:302:HEM:C1A	2.95	0.54
3:C:174:ALA:CB	3:C:231:LEU:HD23	2.34	0.54
3:C:258:MET:O	3:C:262:ILE:HD13	2.07	0.54
4:D:56:ALA:HB1	4:D:81:VAL:HG11	1.90	0.54
5:E:10:VAL:O	5:E:14:LEU:HB2	2.08	0.54
6:F:29:ILE:HD12	6:F:29:ILE:O	2.08	0.54

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:169:ASN:O	3:C:236:ASN:HB2	2.08	0.53
3:C:15:GLU:HB3	3:C:16:PRO:HD2	1.90	0.53
4:D:109:THR:O	4:D:109:THR:CG2	2.55	0.53
4:D:55:THR:HG22	4:D:56:ALA:N	2.22	0.53
3:C:197:VAL:O	3:C:208:VAL:HG13	2.08	0.53
3:C:288:ASN:H	3:C:288:ASN:ND2	2.06	0.53
1:A:170:ARG:CG	1:A:172:GLY:O	2.57	0.53
2:B:6:LYS:HB2	2:B:6:LYS:NZ	2.24	0.53
6:F:3:GLU:O	6:F:7:TYR:HB2	2.09	0.53
7:G:29:TYR:O	7:G:29:TYR:CG	2.61	0.53
3:C:172:PHE:O	3:C:232:THR:OG1	2.27	0.53
2:B:34:ASN:N	2:B:34:ASN:HD22	2.07	0.53
3:C:34:VAL:CG2	3:C:151:LEU:HD22	2.35	0.53
16:D:201:SQD:C8	16:D:201:SQD:C24	2.83	0.53
3:C:172:PHE:H	3:C:232:THR:CB	2.20	0.53
3:C:262:ILE:HG23	8:H:14:VAL:CG1	2.34	0.53
2:B:32:TRP:CG	2:B:33:PRO:CD	2.90	0.53
1:A:138:LEU:N	1:A:139:PRO:CD	2.71	0.52
2:B:124:PHE:CE1	7:G:26:TYR:HB2	2.45	0.52
8:H:15:PHE:CG	14:H:1002:OPC:HBT1	2.44	0.52
1:A:144:GLY:O	1:A:148:VAL:HG23	2.10	0.52
3:C:262:ILE:HG22	3:C:266:MET:HE2	1.92	0.52
3:C:22:CYS:HB2	11:C:301:HEC:CAB	2.40	0.52
6:F:20:TRP:CD1	6:F:20:TRP:C	2.87	0.52
11:A:303:HEC:CMB	11:A:303:HEC:HBB2	2.40	0.52
3:C:172:PHE:N	3:C:232:THR:OG1	2.39	0.52
1:A:215:LEU:HB2	2:B:122:ASN:HB2	1.90	0.52
2:B:17:LYS:HE3	2:B:26:TYR:OH	2.10	0.52
2:B:32:TRP:HD1	2:B:33:PRO:HD3	1.70	0.52
3:C:107:LYS:CE	3:C:110:GLN:HE22	1.93	0.52
7:G:34:GLU:O	7:G:35:LEU:CB	2.59	0.51
2:B:86:GLN:HG2	2:B:143:LEU:HB3	1.93	0.51
4:D:75:ALA:O	4:D:76:GLY:C	2.53	0.51
7:G:11:LEU:O	7:G:12:GLY:C	2.50	0.51
2:B:129:ALA:O	2:B:130:THR:C	2.52	0.51
3:C:194:LYS:NZ	3:C:194:LYS:CB	2.74	0.51
4:D:115:VAL:HG13	4:D:125:LYS:C	2.35	0.51
1:A:110:PHE:H	1:A:110:PHE:HD2	1.57	0.51
3:C:94:LEU:HD21	3:C:98:VAL:CG2	2.40	0.51
4:D:169:ASP:C	4:D:171:ARG:H	2.19	0.51
1:A:150:ILE:HG22	1:A:151:VAL:N	2.26	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:33:GLU:HB3	3:C:51:LYS:HB2	1.93	0.51
3:C:191:GLY:O	3:C:192:ASN:O	2.29	0.51
4:D:77:ASP:OD2	4:D:77:ASP:N	2.44	0.51
4:D:105:ASN:CB	4:D:149:ALA:HB3	2.40	0.51
8:H:23:VAL:O	8:H:24:TRP:C	2.50	0.51
1:A:35:CYS:SG	11:A:303:HEC:HMB3	2.51	0.51
1:A:215:LEU:N	1:A:215:LEU:CD2	2.73	0.51
3:C:84:ILE:HG12	3:C:114:LEU:HD11	1.93	0.50
4:D:90:TYR:CD1	4:D:106:ALA:HB2	2.46	0.50
1:A:111:LYS:HE2	2:B:115:GLU:O	2.10	0.50
2:B:152:ASP:C	2:B:154:THR:H	2.17	0.50
3:C:271:MET:HB3	4:D:23:ALA:HA	1.93	0.50
4:D:141:ARG:HE	4:D:142:GLY:H	1.59	0.50
2:B:82:TYR:CB	2:B:83:PRO:HD3	2.41	0.50
3:C:231:LEU:O	3:C:231:LEU:CD1	2.53	0.50
12:A:1104:UMQ:C6	12:A:1104:UMQ:C2	2.88	0.50
16:D:201:SQD:H81	16:D:201:SQD:C24	2.41	0.50
10:A:301:HEM:HMB2	10:A:301:HEM:CBB	2.29	0.50
2:B:118:ASN:HD22	2:B:120:PHE:N	1.98	0.50
3:C:225:VAL:HG11	3:C:229:GLU:HG2	1.93	0.50
1:A:211:ILE:CD1	1:A:212:SER:N	2.63	0.50
2:B:74:GLU:O	2:B:74:GLU:HG3	2.11	0.50
3:C:60:GLN:CD	3:C:70:LEU:HB3	2.37	0.50
3:C:211:ILE:HD12	3:C:211:ILE:O	2.11	0.50
3:C:193:VAL:O	3:C:213:ALA:HB2	2.12	0.49
3:C:109:GLY:O	3:C:111:ASP:N	2.44	0.49
3:C:30:LYS:HB3	3:C:31:PRO:CD	2.39	0.49
1:A:170:ARG:HD2	1:A:172:GLY:O	2.12	0.49
3:C:13:PRO:HB3	3:C:106:TYR:CE1	2.47	0.49
4:D:133:TYR:CD2	4:D:139:VAL:HG13	2.48	0.49
2:B:11:ASP:O	2:B:15:ARG:HG3	2.13	0.49
2:B:132:ILE:HD12	2:B:132:ILE:H	1.76	0.49
17:G:101:BCR:H323	8:H:19:ILE:CG1	2.43	0.49
8:H:8:TRP:CE3	14:H:1002:OPC:HBL1	2.47	0.49
7:G:17:THR:O	7:G:18:LEU:C	2.55	0.49
2:B:79:TRP:CD1	2:B:79:TRP:C	2.89	0.49
4:D:38:LEU:O	4:D:41:TYR:HB3	2.12	0.49
4:D:56:ALA:HB1	4:D:81:VAL:CG1	2.43	0.49
8:H:15:PHE:CD1	14:H:1002:OPC:HBW1	2.48	0.49
1:A:47:GLN:NE2	1:A:47:GLN:HA	2.27	0.49
3:C:157:ARG:HE	11:C:301:HEC:CGD	2.25	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:203:SER:O	3:C:205:LYS:HG3	2.13	0.48
4:D:55:THR:CG2	4:D:56:ALA:N	2.76	0.48
2:B:50:CYS:HB3	14:H:1002:OPC:HBX1	1.94	0.48
3:C:288:ASN:HD22	3:C:288:ASN:N	2.02	0.48
4:D:81:VAL:O	4:D:88:PRO:HA	2.14	0.48
2:B:61:MET:HG3	3:C:146:LYS:HB3	1.94	0.48
4:D:77:ASP:OD1	4:D:92:VAL:O	2.30	0.48
4:D:156:GLN:HB2	4:D:161:VAL:CG2	2.43	0.48
4:D:174:GLU:O	4:D:175:LYS:C	2.57	0.48
1:A:105:TYR:C	1:A:107:THR:H	2.21	0.48
1:A:106:LEU:HD21	2:B:133:PHE:CE1	2.48	0.48
1:A:114:ARG:CZ	1:A:212:SER:HA	2.43	0.48
2:B:45:MET:HE1	4:D:27:VAL:HA	1.96	0.48
2:B:104:VAL:HB	2:B:105:PRO:HD3	1.94	0.48
5:E:16:PHE:HZ	6:F:25:LEU:HD22	1.78	0.48
6:F:25:LEU:HD23	6:F:29:ILE:HG22	1.94	0.48
5:E:24:PHE:O	5:E:28:SER:N	2.44	0.48
5:E:27:LYS:C	5:E:29:ILE:H	2.22	0.48
3:C:225:VAL:CG1	3:C:229:GLU:CG	2.87	0.48
5:E:16:PHE:HE1	5:E:20:VAL:HG21	1.79	0.48
2:B:128:VAL:HG12	2:B:132:ILE:CD1	2.44	0.48
1:A:27:PRO:HB2	1:A:29:HIS:ND1	2.29	0.48
1:A:52:PHE:N	10:A:301:HEM:CBC	2.76	0.48
3:C:19:ARG:O	3:C:20:ILE:CB	2.53	0.48
3:C:28:ALA:HB2	3:C:236:ASN:ND2	2.28	0.48
1:A:39:ILE:HG22	1:A:96:MET:HG3	1.94	0.48
3:C:75:VAL:HG13	3:C:75:VAL:O	2.14	0.48
8:H:10:ALA:O	8:H:14:VAL:HG22	2.13	0.48
2:B:95:LEU:O	2:B:95:LEU:HD23	2.14	0.47
3:C:270:LEU:HA	8:H:21:MET:CE	2.41	0.47
1:A:150:ILE:O	1:A:151:VAL:C	2.55	0.47
3:C:77:MET:HB2	3:C:150:HIS:HB2	1.95	0.47
3:C:92:GLU:O	3:C:93:GLU:C	2.57	0.47
8:H:17:TRP:O	8:H:21:MET:HB2	2.14	0.47
2:B:82:TYR:CB	2:B:83:PRO:CD	2.91	0.47
5:E:16:PHE:CD1	5:E:16:PHE:C	2.93	0.47
6:F:8:ALA:HB2	7:G:5:LEU:HD12	1.96	0.47
2:B:32:TRP:CG	2:B:33:PRO:N	2.82	0.47
3:C:116:VAL:HG12	3:C:116:VAL:O	2.15	0.47
6:F:6:LEU:O	6:F:10:LEU:HD23	2.14	0.47
2:B:134:LEU:HD11	7:G:22:PHE:HZ	1.77	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:60:GLN:NE2	3:C:70:LEU:HB3	2.29	0.47
1:A:77:SER:O	1:A:78:PHE:HB2	2.15	0.47
2:B:138:LEU:O	2:B:139:VAL:C	2.58	0.47
3:C:1:TYR:CD2	3:C:118:PRO:HG3	2.49	0.47
3:C:104:GLN:HA	3:C:105:PRO:HD3	1.71	0.47
7:G:28:GLN:C	7:G:30:LYS:H	2.22	0.47
1:A:112:LYS:CB	1:A:113:PRO:CD	2.82	0.47
1:A:158:ILE:HA	1:A:159:PRO:HD3	1.63	0.47
3:C:171:VAL:HG13	3:C:234:ASN:HD22	1.79	0.47
3:C:231:LEU:HD12	3:C:231:LEU:C	2.40	0.47
4:D:118:ASN:HD21	4:D:120:ALA:HB3	1.79	0.47
4:D:131:SER:CB	4:D:143:PRO:HD2	2.39	0.47
6:F:30:GLN:HG3	6:F:31:GLY:N	2.28	0.47
17:G:101:BCR:H323	8:H:19:ILE:HG12	1.95	0.47
1:A:105:TYR:CD1	13:B:201:CLA:HMB1	2.50	0.47
3:C:42:PRO:HG3	3:C:144:PHE:CE2	2.50	0.47
1:A:17:LEU:C	1:A:17:LEU:HD13	2.39	0.47
2:B:11:ASP:OD1	2:B:13:LYS:N	2.46	0.47
2:B:137:THR:HG21	7:G:18:LEU:HD11	1.96	0.47
2:B:154:THR:HG23	2:B:155:LEU:N	2.27	0.47
3:C:199:ILE:CG2	3:C:200:GLN:H	2.12	0.47
4:D:57:LYS:HG3	4:D:62:ASN:O	2.15	0.47
4:D:165:TRP:CH2	4:D:170:PHE:HD1	2.33	0.47
1:A:1:MET:CE	1:A:1:MET:H3	2.22	0.46
2:B:34:ASN:HD22	2:B:34:ASN:H	1.62	0.46
2:B:119:LYS:O	2:B:119:LYS:HG2	2.14	0.46
3:C:199:ILE:HD12	3:C:207:VAL:HG23	1.97	0.46
5:E:24:PHE:CZ	6:F:29:ILE:HD11	2.50	0.46
3:C:1:TYR:HD2	3:C:118:PRO:HG3	1.81	0.46
1:A:97:MET:O	1:A:100:HIS:HB3	2.15	0.46
2:B:32:TRP:CD1	2:B:33:PRO:CD	2.89	0.46
3:C:45:VAL:HG21	3:C:89:ARG:O	2.16	0.46
6:F:26:LEU:HD13	6:F:26:LEU:HA	1.77	0.46
10:A:302:HEM:HHA	10:A:302:HEM:HBA1	1.98	0.46
2:B:122:ASN:HA	2:B:123:PRO:HD3	1.88	0.46
3:C:68:VAL:CG2	3:C:69:GLY:H	2.26	0.46
1:A:17:LEU:HD13	1:A:17:LEU:O	2.15	0.46
1:A:106:LEU:HD21	2:B:133:PHE:CD1	2.51	0.46
4:D:152:HIS:O	4:D:162:LEU:HA	2.16	0.46
4:D:141:ARG:CG	4:D:142:GLY:H	2.28	0.46
1:A:11:ARG:H	1:A:11:ARG:HG2	1.45	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:29:HIS:CB	7:G:28:GLN:HE22	2.29	0.46
1:A:112:LYS:O	1:A:113:PRO:C	2.57	0.46
6:F:24:VAL:O	6:F:27:LEU:N	2.49	0.46
1:A:112:LYS:O	1:A:115:GLU:CD	2.59	0.46
1:A:211:ILE:HG23	1:A:212:SER:O	2.16	0.46
2:B:89:ARG:HG3	2:B:90:SER:N	2.31	0.46
3:C:53:PRO:HA	3:C:125:GLN:OE1	2.15	0.46
3:C:47:LYS:HG3	3:C:128:VAL:HG13	1.98	0.46
5:E:8:TYR:CZ	5:E:12:ILE:CD1	2.91	0.46
1:A:66:TYR:OH	2:B:63:GLY:O	2.28	0.45
2:B:95:LEU:HD22	2:B:99:LEU:HD11	1.96	0.45
7:G:26:TYR:O	7:G:28:GLN:N	2.48	0.45
14:H:1002:OPC:HBP1	14:H:1002:OPC:HBM1	1.61	0.45
1:A:93:MET:SD	10:A:301:HEM:CBB	3.04	0.45
4:D:139:VAL:HG13	4:D:147:SER:HA	1.98	0.45
4:D:169:ASP:OD1	4:D:176:PRO:CB	2.63	0.45
5:E:8:TYR:CE2	5:E:12:ILE:HD11	2.50	0.45
3:C:22:CYS:SG	3:C:240:PHE:CE1	3.08	0.45
3:C:34:VAL:CG2	3:C:151:LEU:CB	2.95	0.45
1:A:211:ILE:CD1	10:A:302:HEM:O2D	2.65	0.45
4:D:101:ASP:O	4:D:153:ALA:N	2.49	0.45
2:B:6:LYS:HG2	7:G:35:LEU:HD22	1.97	0.45
5:E:8:TYR:CE2	5:E:12:ILE:CD1	2.99	0.45
11:A:303:HEC:HBB2	11:A:303:HEC:HMB3	1.99	0.45
3:C:60:GLN:HE22	3:C:156:GLY:CA	2.28	0.45
1:A:92:MET:HB3	14:H:1002:OPC:CCB	2.47	0.45
1:A:199:MET:HE2	10:A:302:HEM:HBB2	1.98	0.45
4:D:118:ASN:C	4:D:118:ASN:ND2	2.73	0.45
7:G:26:TYR:C	7:G:28:GLN:N	2.75	0.45
2:B:6:LYS:HB2	2:B:6:LYS:HZ3	1.81	0.45
3:C:34:VAL:HG21	3:C:151:LEU:HB2	1.99	0.45
4:D:102:TYR:HA	4:D:151:CYS:O	2.16	0.45
2:B:96:LEU:O	2:B:100:LEU:HD12	2.16	0.45
2:B:124:PHE:HE1	7:G:26:TYR:HB2	1.82	0.44
1:A:80:TRP:CZ2	3:C:254:ARG:HG2	2.52	0.44
2:B:128:VAL:HG12	2:B:132:ILE:HD13	1.98	0.44
3:C:171:VAL:HG12	3:C:233:ASN:C	2.41	0.44
4:D:124:PHE:CE1	4:D:134:ASP:O	2.70	0.44
3:C:119:LEU:HD22	3:C:124:TYR:CD1	2.53	0.44
7:G:13:LEU:HD23	7:G:13:LEU:HA	1.89	0.44
3:C:2:PRO:HD3	11:C:301:HEC:CHB	2.48	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:285:ALA:HB2	4:D:10:VAL:HG21	1.98	0.44
2:B:109:ILE:O	2:B:112:PRO:CD	2.59	0.44
3:C:141:ASN:C	3:C:141:ASN:ND2	2.72	0.44
1:A:111:LYS:O	1:A:113:PRO:N	2.50	0.44
12:A:1102:UMQ:O3'	12:A:1102:UMQ:H11	2.13	0.44
3:C:79:PRO:HD3	3:C:149:ILE:HG12	1.98	0.44
6:F:20:TRP:HZ3	17:G:101:BCR:C19	2.22	0.44
1:A:110:PHE:HB3	1:A:118:TRP:CE3	2.53	0.44
1:A:177:GLN:O	1:A:178:ALA:C	2.59	0.44
2:B:32:TRP:O	2:B:34:ASN:N	2.51	0.44
1:A:151:VAL:CG2	1:A:152:SER:N	2.81	0.44
2:B:110:LEU:O	2:B:113:PHE:N	2.51	0.44
4:D:152:HIS:CE1	4:D:165:TRP:CD1	3.06	0.44
1:A:112:LYS:C	1:A:115:GLU:OE1	2.60	0.43
4:D:152:HIS:CE1	4:D:165:TRP:NE1	2.86	0.43
7:G:26:TYR:O	7:G:27:GLN:C	2.61	0.43
2:B:31:ALA:C	2:B:32:TRP:O	2.61	0.43
3:C:65:GLY:O	3:C:66:SER:C	2.47	0.43
4:D:80:LEU:HD23	4:D:80:LEU:HA	1.84	0.43
1:A:101:VAL:CG2	10:A:302:HEM:HMC3	2.47	0.43
2:B:36:LEU:HD23	2:B:36:LEU:HA	1.70	0.43
2:B:65:PRO:O	2:B:66:ALA:C	2.60	0.43
2:B:81:LEU:HD23	2:B:81:LEU:HA	1.80	0.43
3:C:144:PHE:CZ	3:C:251:ASP:HB2	2.52	0.43
3:C:225:VAL:HG11	3:C:229:GLU:CG	2.49	0.43
5:E:20:VAL:HA	5:E:23:ILE:HG13	2.00	0.43
3:C:26:HIS:CE1	3:C:154:ASN:OD1	2.72	0.43
5:E:14:LEU:C	5:E:14:LEU:HD23	2.44	0.43
4:D:129:HIS:CB	15:D:200:FES:S1	2.94	0.43
4:D:178:TRP:O	4:D:179:VAL:C	2.62	0.43
7:G:9:LEU:HD22	14:H:1002:OPC:HBV1	2.01	0.43
2:B:154:THR:O	2:B:157:LEU:HD12	2.18	0.43
3:C:34:VAL:CG2	3:C:151:LEU:HB2	2.49	0.43
4:D:117:TRP:CZ3	4:D:122:ASN:O	2.72	0.43
1:A:164:LEU:O	1:A:165:ILE:C	2.60	0.43
3:C:42:PRO:HD3	3:C:250:GLN:O	2.19	0.43
6:F:24:VAL:O	6:F:27:LEU:HB2	2.18	0.43
2:B:156:THR:O	2:B:157:LEU:CB	2.64	0.42
3:C:225:VAL:HG12	3:C:229:GLU:HG2	1.98	0.42
4:D:57:LYS:HB3	4:D:61:GLY:CA	2.48	0.42
4:D:177:TRP:CE2	4:D:178:TRP:HE3	2.37	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:F:22:LEU:O	6:F:26:LEU:HD22	2.19	0.42
1:A:145:TYR:CD1	1:A:145:TYR:C	2.97	0.42
12:A:1102:UMQ:H11	12:A:1102:UMQ:H3'1	1.72	0.42
4:D:90:TYR:OH	4:D:116:PRO:HA	2.19	0.42
1:A:137:SER:HB3	1:A:148:VAL:CG2	2.50	0.42
4:D:101:ASP:O	4:D:153:ALA:HB3	2.19	0.42
1:A:14:ILE:HG23	12:A:1103:UMQ:HD1	2.01	0.42
2:B:102:ALA:O	2:B:105:PRO:HD2	2.20	0.42
7:G:22:PHE:O	7:G:23:TYR:C	2.60	0.42
17:G:101:BCR:H361	17:G:101:BCR:H20C	1.61	0.42
3:C:19:ARG:O	3:C:242:GLN:OE1	2.38	0.42
3:C:44:THR:HG21	8:H:1:MET:SD	2.59	0.42
4:D:53:GLY:HA3	4:D:163:THR:HA	2.02	0.42
4:D:123:LYS:HE2	4:D:132:GLN:NE2	2.35	0.42
2:B:133:PHE:O	2:B:136:GLY:N	2.53	0.42
3:C:157:ARG:H	3:C:157:ARG:HG2	1.58	0.42
4:D:174:GLU:O	4:D:175:LYS:O	2.37	0.42
8:H:14:VAL:O	8:H:18:SER:HB2	2.19	0.42
1:A:139:PRO:HG3	10:A:301:HEM:O2A	2.19	0.42
3:C:266:MET:SD	8:H:13:VAL:HG12	2.60	0.42
2:B:41:PRO:HB2	3:C:272:LEU:HD13	2.02	0.42
2:B:71:THR:O	2:B:72:PRO:C	2.60	0.42
4:D:83:GLY:O	4:D:84:LEU:C	2.62	0.42
4:D:124:PHE:CD1	4:D:134:ASP:O	2.73	0.42
7:G:16:ALA:O	17:G:101:BCR:H16C	2.19	0.42
1:A:51:GLY:O	1:A:55:THR:HG23	2.20	0.42
1:A:215:LEU:HB2	2:B:122:ASN:H	1.85	0.42
3:C:159:GLN:HB3	3:C:170:ASN:HD22	1.85	0.42
1:A:35:CYS:O	1:A:36:LEU:C	2.63	0.42
2:B:25:ASN:HD22	2:B:25:ASN:C	2.27	0.42
2:B:101:MET:O	2:B:104:VAL:HG23	2.19	0.42
2:B:158:GLY:O	2:B:159:LEU:CD2	2.48	0.42
3:C:144:PHE:CE2	3:C:251:ASP:HB2	2.55	0.42
4:D:144:ALA:HA	4:D:145:PRO:HD3	1.93	0.42
1:A:25:TYR:CD2	2:B:30:PRO:HA	2.54	0.41
1:A:31:ASN:HD22	1:A:33:PHE:H	1.68	0.41
1:A:146:TRP:CD1	2:B:72:PRO:CD	3.03	0.41
2:B:89:ARG:NH2	2:B:146:GLY:O	2.53	0.41
4:D:78:ARG:HD2	4:D:117:TRP:CE2	2.55	0.41
4:D:141:ARG:HG2	4:D:142:GLY:H	1.85	0.41
1:A:103:ARG:NH1	1:A:104:VAL:HG22	2.33	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:146:TRP:CG	2:B:72:PRO:HD2	2.55	0.41
12:A:1101:UMQ:HK1	4:D:34:ALA:HA	2.02	0.41
2:B:61:MET:HE2	2:B:61:MET:HB3	1.89	0.41
13:B:201:CLA:HHD	14:B:202:OPC:HBW2	2.02	0.41
3:C:58:LEU:CD1	3:C:237:VAL:HG21	2.50	0.41
4:D:34:ALA:O	4:D:37:PRO:HD2	2.20	0.41
1:A:59:LYS:HG3	1:A:68:SER:HB3	2.02	0.41
2:B:124:PHE:HE1	7:G:26:TYR:CA	2.33	0.41
8:H:3:ILE:HG23	8:H:4:ASP:N	2.34	0.41
8:H:12:LEU:H	8:H:12:LEU:HG	1.64	0.41
1:A:31:ASN:HD21	1:A:33:PHE:HB2	1.84	0.41
12:A:1101:UMQ:HB1	3:C:254:ARG:HA	2.01	0.41
2:B:75:ILE:C	2:B:76:LEU:HD12	2.46	0.41
3:C:180:ILE:HG23	3:C:180:ILE:O	2.20	0.41
2:B:86:GLN:NE2	2:B:86:GLN:HA	2.35	0.41
3:C:28:ALA:HB3	3:C:239:GLY:CA	2.44	0.41
3:C:264:LEU:HA	3:C:264:LEU:HD23	1.86	0.41
4:D:106:ALA:O	4:D:114:VAL:HA	2.19	0.41
4:D:115:VAL:HG11	4:D:124:PHE:HB3	2.02	0.41
1:A:78:PHE:HE2	12:A:1101:UMQ:HC2	1.86	0.41
3:C:211:ILE:HA	3:C:212:PRO:HD3	1.94	0.41
3:C:257:TRP:O	3:C:258:MET:C	2.62	0.41
1:A:7:TRP:CD1	1:A:11:ARG:NH2	2.89	0.41
1:A:124:LEU:HD23	1:A:124:LEU:HA	1.87	0.41
4:D:18:PHE:CZ	4:D:22:LEU:HD21	2.55	0.41
7:G:18:LEU:HD23	7:G:18:LEU:HA	1.81	0.41
1:A:36:LEU:N	1:A:36:LEU:CD1	2.84	0.41
2:B:17:LYS:HB3	2:B:22:MET:O	2.21	0.41
4:D:165:TRP:HZ3	4:D:169:ASP:HA	1.86	0.41
2:B:57:LEU:HD13	8:H:8:TRP:CD2	2.56	0.41
3:C:75:VAL:HG23	3:C:115:LEU:HD23	2.02	0.41
3:C:114:LEU:HA	3:C:114:LEU:HD23	1.73	0.41
4:D:156:GLN:NE2	4:D:156:GLN:CA	2.83	0.41
7:G:21:LEU:HD12	7:G:21:LEU:HA	1.84	0.41
1:A:175:VAL:CG1	1:A:176:GLY:N	2.84	0.41
3:C:77:MET:HG2	3:C:113:VAL:HG13	2.03	0.41
3:C:172:PHE:O	3:C:173:THR:O	2.39	0.41
3:C:266:MET:HE1	5:E:11:PHE:HE2	1.83	0.41
4:D:105:ASN:O	4:D:148:LEU:HD22	2.21	0.41
4:D:177:TRP:NE1	4:D:178:TRP:CE3	2.89	0.41
4:D:56:ALA:C	4:D:57:LYS:HD2	2.46	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:H:1002:OPC:HBC1	14:H:1002:OPC:CAY	2.51	0.40
11:A:303:HEC:NB	2:B:40:PHE:CZ	2.90	0.40
4:D:68:LYS:HE3	4:D:68:LYS:HB2	1.77	0.40
1:A:31:ASN:ND2	1:A:33:PHE:HD2	2.20	0.40
3:C:271:MET:HG3	4:D:22:LEU:HB3	2.03	0.40
7:G:26:TYR:C	7:G:28:GLN:H	2.29	0.40
2:B:32:TRP:HB3	2:B:33:PRO:HD2	2.01	0.40
2:B:123:PRO:HD2	7:G:25:ALA:CB	2.37	0.40
2:B:145:ILE:HG22	2:B:149:PHE:HE1	1.86	0.40
13:B:201:CLA:C4	13:B:201:CLA:O2A	2.69	0.40
3:C:85:ALA:HA	3:C:86:PRO:HD2	1.91	0.40
3:C:180:ILE:HD11	3:C:197:VAL:HG13	2.04	0.40
1:A:112:LYS:O	1:A:114:ARG:N	2.55	0.40
3:C:12:THR:OG1	3:C:13:PRO:HD2	2.22	0.40
3:C:180:ILE:HG22	3:C:223:GLN:H	1.87	0.40
5:E:22:ILE:O	5:E:26:ILE:CB	2.64	0.40

All (2) 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:108:GLU:OE1	7:G:33:ASN:CB[8_565]	1.89	0.31
1:A:112:LYS:CE	3:C:87:GLU:OE1[8_665]	2.14	0.06

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	213/215 (99%)	185 (87%)	26 (12%)	2 (1%)	14 49
2	B	158/160 (99%)	126 (80%)	25 (16%)	7 (4%)	2 12
3	C	286/289 (99%)	244 (85%)	31 (11%)	11 (4%)	2 15

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
4	D	162/179 (90%)	124 (76%)	28 (17%)	10 (6%)	1 7
5	E	30/32 (94%)	23 (77%)	6 (20%)	1 (3%)	3 18
6	F	30/35 (86%)	25 (83%)	5 (17%)	0	100 100
7	G	35/37 (95%)	16 (46%)	14 (40%)	5 (14%)	0 1
8	H	27/29 (93%)	24 (89%)	2 (7%)	1 (4%)	2 15
All	All	941/976 (96%)	767 (82%)	137 (15%)	37 (4%)	2 14

All (37) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	112	LYS
2	B	32	TRP
2	B	74	GLU
2	B	125	ARG
3	C	66	SER
3	C	173	THR
3	C	189	GLU
3	C	192	ASN
3	C	200	GLN
3	C	230	ALA
4	D	77	ASP
4	D	167	GLU
7	G	34	GLU
1	A	3	ASN
2	B	22	MET
3	C	110	GLN
4	D	47	GLY
4	D	73	HIS
7	G	31	ARG
3	C	186	GLU
7	G	27	GLN
2	B	133	PHE
3	C	20	ILE
3	C	233	ASN
4	D	146	LEU
7	G	35	LEU
2	B	86	GLN
4	D	166	THR
4	D	170	PHE
4	D	175	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
5	E	28	SER
2	B	2	ALA
7	G	32	PRO
8	H	23	VAL
3	C	199	ILE
4	D	99	ILE
4	D	145	PRO

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	184/184 (100%)	167 (91%)	17 (9%)	7 29
2	B	137/137 (100%)	121 (88%)	16 (12%)	4 19
3	C	242/243 (100%)	219 (90%)	23 (10%)	7 28
4	D	134/146 (92%)	126 (94%)	8 (6%)	16 47
5	E	25/25 (100%)	23 (92%)	2 (8%)	10 35
6	F	24/27 (89%)	17 (71%)	7 (29%)	0 1
7	G	28/28 (100%)	24 (86%)	4 (14%)	2 13
8	H	24/24 (100%)	19 (79%)	5 (21%)	1 5
All	All	798/814 (98%)	716 (90%)	82 (10%)	6 24

All (82) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	11	ARG
1	A	12	LEU
1	A	14	ILE
1	A	31	ASN
1	A	36	LEU
1	A	61	THR
1	A	81	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	87	ARG
1	A	95	LEU
1	A	103	ARG
1	A	107	THR
1	A	151	VAL
1	A	164	LEU
1	A	200	LEU
1	A	211	ILE
1	A	215	LEU
2	B	6	LYS
2	B	20	LYS
2	B	25	ASN
2	B	34	ASN
2	B	39	VAL
2	B	64	GLU
2	B	73	LEU
2	B	75	ILE
2	B	79	TRP
2	B	95	LEU
2	B	96	LEU
2	B	103	SER
2	B	108	LEU
2	B	119	LYS
2	B	134	LEU
2	B	143	LEU
3	C	58	LEU
3	C	61	VAL
3	C	70	LEU
3	C	71	ASN
3	C	88	GLU
3	C	94	LEU
3	C	116	VAL
3	C	131	VAL
3	C	141	ASN
3	C	155	ARG
3	C	166	LYS
3	C	170	ASN
3	C	185	LYS
3	C	194	LYS
3	C	211	ILE
3	C	249	LEU
3	C	256	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
3	C	264	LEU
3	C	267	LEU
3	C	270	LEU
3	C	271	MET
3	C	286	GLU
3	C	288	ASN
4	D	59	LYS
4	D	72	SER
4	D	125	LYS
4	D	133	TYR
4	D	154	THR
4	D	156	GLN
4	D	165	TRP
4	D	167	GLU
5	E	9	ILE
5	E	29	ILE
6	F	1	MET
6	F	2	THR
6	F	7	TYR
6	F	22	LEU
6	F	26	LEU
6	F	29	ILE
6	F	30	GLN
7	G	3	GLU
7	G	6	LEU
7	G	17	THR
7	G	21	LEU
8	H	2	GLU
8	H	6	LEU
8	H	14	VAL
8	H	18	SER
8	H	21	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	31	ASN
1	A	47	GLN
2	B	25	ASN
2	B	34	ASN
2	B	118	ASN
3	C	6	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
3	C	59	GLN
3	C	60	GLN
3	C	71	ASN
3	C	110	GLN
3	C	123	GLN
3	C	141	ASN
3	C	196	GLN
3	C	234	ASN
3	C	242	GLN
3	C	250	GLN
3	C	288	ASN
4	D	82	GLN
4	D	118	ASN
4	D	132	GLN
4	D	156	GLN
4	D	159	ASN
7	G	27	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 oligosaccharides in this entry.

5.6 Ligand geometry

Of 16 ligands modelled in this entry, 2 are monoatomic - leaving 14 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	$\#\|Z\|>2$
12	UMQ	A	1102	-	35,35,35	1.61	4 (11%)	46,46,46	2.25	11 (23%)
10	HEM	A	301	1	42,50,50	1.83	6 (14%)	46,82,82	1.97	16 (34%)
14	OPC	H	1002	-	53,53,54	2.14	14 (26%)	59,61,64	2.30	16 (27%)
11	HEC	C	301	3	32,50,50	2.44	6 (18%)	30,82,82	1.96	10 (33%)
12	UMQ	A	1103	-	35,35,35	1.50	4 (11%)	46,46,46	2.11	8 (17%)
16	SQD	D	201	-	52,54,54	3.24	23 (44%)	62,65,65	4.54	23 (37%)
13	CLA	B	201	-	63,73,73	1.95	15 (23%)	74,113,113	2.44	23 (31%)
12	UMQ	A	1104	-	35,35,35	1.40	3 (8%)	46,46,46	2.08	8 (17%)
14	OPC	B	202	-	53,53,54	2.07	14 (26%)	59,61,64	2.43	13 (22%)
17	BCR	G	101	-	41,41,41	2.81	12 (29%)	56,56,56	7.05	17 (30%)
10	HEM	A	302	1	42,50,50	1.98	7 (16%)	46,82,82	1.53	9 (19%)
11	HEC	A	303	1	32,50,50	2.54	7 (21%)	30,82,82	1.95	5 (16%)
15	FES	D	200	4	0,4,4	-	-	-		
12	UMQ	A	1101	-	35,35,35	1.46	4 (11%)	46,46,46	2.16	9 (19%)

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
12	UMQ	A	1102	-	2/2/10/10	11/20/60/60	0/2/2/2
10	HEM	A	301	1	-	3/12/54/54	-
14	OPC	H	1002	-	-	26/57/57/60	-
11	HEC	C	301	3	-	4/10/54/54	-
12	UMQ	A	1103	-	2/2/10/10	5/20/60/60	0/2/2/2
16	SQD	D	201	-	1/1/9/9	28/49/69/69	0/1/1/1
13	CLA	B	201	-	2/2/15/20	14/37/115/115	-
12	UMQ	A	1104	-	2/2/10/10	11/20/60/60	0/2/2/2
11	HEC	A	303	1	-	6/10/54/54	-
14	OPC	B	202	-	-	22/57/57/60	-
17	BCR	G	101	-	-	9/29/63/63	0/2/2/2
10	HEM	A	302	1	-	2/12/54/54	-
15	FES	D	200	4	-	-	0/1/1/1
12	UMQ	A	1101	-	2/2/10/10	12/20/60/60	0/2/2/2

All (119) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	D	201	SQD	C4-C3	12.70	1.85	1.52
17	G	101	BCR	C8-C9	-8.96	1.26	1.46
17	G	101	BCR	C23-C22	-8.54	1.27	1.46
11	A	303	HEC	C2B-C3B	-7.20	1.32	1.40
10	A	301	HEM	C3D-C2D	7.19	1.52	1.36
11	C	301	HEC	C2B-C3B	-7.14	1.32	1.40
10	A	302	HEM	C3D-C2D	6.92	1.51	1.36
11	A	303	HEC	C3C-C2C	-6.66	1.33	1.40
12	A	1102	UMQ	C1'-C2'	-6.57	1.33	1.52
16	D	201	SQD	C17-C16	-6.23	1.20	1.51
12	A	1103	UMQ	C1'-C2'	-6.11	1.34	1.52
12	A	1104	UMQ	C1'-C2'	-6.07	1.34	1.52
16	D	201	SQD	C12-C11	-6.03	1.21	1.51
10	A	302	HEM	C3C-C2C	-6.00	1.32	1.40
12	A	1101	UMQ	C1'-C2'	-5.98	1.35	1.52
14	B	202	OPC	CAG-CAH	-5.78	1.33	1.51
14	H	1002	OPC	CAG-CAH	-5.77	1.33	1.51
11	C	301	HEC	C3C-C2C	-5.68	1.34	1.40
11	C	301	HEC	C3D-C2D	5.44	1.53	1.37
11	A	303	HEC	C3D-C2D	5.17	1.53	1.37
13	B	201	CLA	CHC-C1C	5.15	1.47	1.34
17	G	101	BCR	C24-C25	-5.13	1.27	1.45
14	B	202	OPC	OBJ-CBK	5.12	1.48	1.33
16	D	201	SQD	C18-C17	-5.05	1.26	1.51
17	G	101	BCR	C7-C6	-5.04	1.27	1.45
14	H	1002	OPC	CAQ-CAP	-4.97	1.34	1.52
16	D	201	SQD	C16-C15	-4.95	1.27	1.51
14	B	202	OPC	CAQ-CAP	-4.93	1.34	1.52
16	D	201	SQD	C11-C10	-4.91	1.27	1.51
16	D	201	SQD	C13-C12	-4.86	1.27	1.51
14	H	1002	OPC	OBJ-CBK	4.85	1.47	1.33
11	A	303	HEC	CBC-CAC	-4.83	1.31	1.49
16	D	201	SQD	O48-C23	4.78	1.47	1.33
13	B	201	CLA	C3C-C2C	4.73	1.47	1.36
14	H	1002	OPC	OAN-CAO	4.63	1.47	1.34
13	B	201	CLA	C3B-C2B	4.60	1.46	1.40
17	G	101	BCR	C12-C13	-4.59	1.36	1.46
17	G	101	BCR	C8-C7	-4.53	1.19	1.33
14	H	1002	OPC	CBP-CBQ	-4.52	1.33	1.52
17	G	101	BCR	C24-C23	-4.50	1.19	1.33
17	G	101	BCR	C19-C18	-4.50	1.36	1.46
11	A	303	HEC	CBB-CAB	-4.47	1.32	1.49
12	A	1102	UMQ	O1'-C1'	4.46	1.47	1.40

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	D	201	SQD	O47-C7	4.42	1.46	1.34
11	C	301	HEC	CBB-CAB	-4.32	1.33	1.49
13	B	201	CLA	O2D-CGD	4.29	1.43	1.33
13	B	201	CLA	O2A-CGA	4.22	1.45	1.33
12	A	1103	UMQ	O1'-C1'	4.19	1.47	1.40
13	B	201	CLA	OBD-CAD	4.14	1.29	1.22
12	A	1101	UMQ	O2'-C2'	-4.09	1.32	1.43
13	B	201	CLA	C3D-C4D	-4.09	1.35	1.44
14	B	202	OPC	CBP-CBQ	-4.07	1.35	1.52
16	D	201	SQD	C21-C20	-4.06	1.26	1.51
13	B	201	CLA	CHD-C1D	4.05	1.46	1.38
14	B	202	OPC	OAN-CAO	4.02	1.45	1.34
14	H	1002	OPC	CBP-CBO	-3.97	1.32	1.51
11	C	301	HEC	CBC-CAC	-3.91	1.35	1.49
14	B	202	OPC	CAV-CAW	3.90	1.53	1.31
13	B	201	CLA	CHD-C4C	3.83	1.47	1.39
12	A	1102	UMQ	O2'-C2'	-3.79	1.33	1.43
14	H	1002	OPC	CAV-CAW	3.75	1.53	1.31
14	H	1002	OPC	CAQ-CAR	-3.73	1.33	1.51
14	H	1002	OPC	CAR-CAS	-3.72	1.33	1.51
12	A	1103	UMQ	O2'-C2'	-3.64	1.33	1.43
12	A	1104	UMQ	O2'-C2'	-3.63	1.34	1.43
16	D	201	SQD	C36-C35	-3.59	1.33	1.51
16	D	201	SQD	C19-C18	-3.57	1.34	1.51
16	D	201	SQD	C34-C33	-3.53	1.34	1.51
14	B	202	OPC	CBB-CBC	-3.53	1.34	1.51
10	A	301	HEM	CMB-C2B	3.53	1.58	1.50
16	D	201	SQD	C20-C19	-3.52	1.34	1.51
16	D	201	SQD	C32-C31	-3.52	1.34	1.51
14	H	1002	OPC	CBC-CBD	-3.52	1.34	1.51
14	B	202	OPC	CBC-CBD	-3.52	1.34	1.51
10	A	301	HEM	C3C-C2C	-3.50	1.35	1.40
14	B	202	OPC	CAQ-CAR	-3.50	1.34	1.51
16	D	201	SQD	C33-C32	-3.47	1.34	1.51
16	D	201	SQD	C35-C34	-3.46	1.34	1.51
14	H	1002	OPC	CBB-CBC	-3.41	1.34	1.51
16	D	201	SQD	C15-C14	-3.41	1.34	1.51
12	A	1101	UMQ	O1'-C1'	3.40	1.45	1.40
14	B	202	OPC	CBP-CBO	-3.38	1.35	1.51
12	A	1104	UMQ	O1'-C1'	3.36	1.45	1.40
16	D	201	SQD	C22-C21	-3.35	1.26	1.50
14	B	202	OPC	CAR-CAS	-3.34	1.35	1.51

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	D	201	SQD	C14-C13	-3.34	1.35	1.51
14	H	1002	OPC	CBQ-CBR	-3.32	1.31	1.50
10	A	302	HEM	C3C-CAC	3.31	1.55	1.47
13	B	201	CLA	C3D-C2D	3.17	1.47	1.39
11	C	301	HEC	C4B-C3B	3.09	1.48	1.43
14	H	1002	OPC	CBT-CBS	-3.03	1.33	1.50
16	D	201	SQD	C37-C36	-2.88	1.33	1.51
14	H	1002	OPC	CAG-NAF	-2.87	1.42	1.51
14	B	202	OPC	CBQ-CBR	-2.83	1.34	1.50
10	A	301	HEM	FE-ND	2.80	2.13	1.98
14	B	202	OPC	CBT-CBS	-2.72	1.35	1.50
13	B	201	CLA	C1D-C2D	2.72	1.50	1.45
17	G	101	BCR	C11-C10	-2.69	1.34	1.43
14	B	202	OPC	CAG-NAF	-2.60	1.43	1.51
10	A	302	HEM	C3C-C4C	2.56	1.45	1.41
16	D	201	SQD	C38-C37	-2.49	1.32	1.50
17	G	101	BCR	C15-C14	-2.44	1.35	1.43
10	A	301	HEM	C3C-CAC	2.44	1.53	1.47
16	D	201	SQD	O6-C1	2.37	1.44	1.40
10	A	302	HEM	CAB-C3B	2.36	1.53	1.47
10	A	301	HEM	CAB-C3B	2.35	1.53	1.47
17	G	101	BCR	C16-C17	-2.31	1.36	1.43
13	B	201	CLA	C4B-CHC	2.22	1.47	1.41
13	B	201	CLA	C1C-C2C	2.22	1.49	1.44
10	A	302	HEM	C3B-C2B	-2.21	1.32	1.37
13	B	201	CLA	C4C-C3C	2.18	1.48	1.45
13	B	201	CLA	C1B-CHB	2.14	1.46	1.41
12	A	1102	UMQ	O5'-C1'	2.08	1.47	1.41
11	A	303	HEC	O1D-CGD	2.06	1.28	1.22
12	A	1101	UMQ	O5'-C1'	2.05	1.47	1.41
17	G	101	BCR	C20-C21	-2.05	1.36	1.43
12	A	1103	UMQ	O5'-C1'	2.05	1.47	1.41
11	A	303	HEC	C1D-ND	2.04	1.40	1.36
10	A	302	HEM	CMD-C2D	2.01	1.54	1.50

All (168) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
17	G	101	BCR	C24-C23-C22	33.77	176.20	126.23
17	G	101	BCR	C7-C8-C9	29.62	170.05	126.23
16	D	201	SQD	C4-C3-C2	-19.42	76.74	110.83
17	G	101	BCR	C23-C24-C25	17.93	174.90	127.00

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
17	G	101	BCR	C8-C7-C6	17.39	173.47	127.00
16	D	201	SQD	C18-C17-C16	11.30	171.49	114.37
16	D	201	SQD	C12-C11-C10	10.96	169.79	114.37
16	D	201	SQD	C17-C16-C15	10.73	168.62	114.37
16	D	201	SQD	C13-C12-C11	10.66	168.26	114.37
16	D	201	SQD	O3-C3-C4	-9.56	87.85	110.38
16	D	201	SQD	C22-C21-C20	9.47	177.30	113.36
14	B	202	OPC	CAA-NAF-CBG	-8.89	85.62	108.98
14	B	202	OPC	CAA-NAF-CAE	-8.49	86.67	108.98
14	H	1002	OPC	CAA-NAF-CAE	-8.46	86.75	108.98
14	H	1002	OPC	CAA-NAF-CBG	-8.24	87.33	108.98
12	A	1103	UMQ	O1'-C1'-C2'	7.70	119.96	108.27
12	A	1101	UMQ	O1'-C1'-C2'	7.55	119.74	108.27
13	B	201	CLA	CMD-C2D-C1D	7.17	137.35	124.73
12	A	1102	UMQ	O1'-C1'-C2'	7.16	119.14	108.27
12	A	1104	UMQ	O1'-C1'-C2'	7.12	119.08	108.27
12	A	1104	UMQ	O5'-C1'-C2'	6.36	123.44	110.37
16	D	201	SQD	C3-C4-C5	-6.33	98.76	110.23
13	B	201	CLA	C2C-C1C-NC	6.04	116.33	109.98
13	B	201	CLA	O2D-CGD-CBD	5.94	121.61	111.23
14	B	202	OPC	CAA-NAF-CAG	-5.68	87.35	109.91
11	A	303	HEC	CBA-CAA-C2A	-5.66	103.23	112.55
14	H	1002	OPC	CAA-NAF-CAG	-5.63	87.55	109.91
12	A	1104	UMQ	C1'-C2'-C3'	5.52	121.63	110.01
12	A	1102	UMQ	O5'-C1'-O1'	5.27	122.49	110.04
14	B	202	OPC	OAN-CAO-CAP	5.20	122.72	111.48
12	A	1101	UMQ	O5'-C1'-C2'	5.14	120.93	110.37
12	A	1101	UMQ	O2'-C2'-C1'	5.05	122.12	110.08
12	A	1101	UMQ	C1'-C2'-C3'	4.93	120.39	110.01
12	A	1103	UMQ	O5'-C1'-C2'	4.93	120.49	110.37
12	A	1103	UMQ	C1'-C2'-C3'	4.89	120.30	110.01
12	A	1102	UMQ	CA-O1'-C1'	4.88	122.01	113.68
12	A	1104	UMQ	CA-O1'-C1'	4.87	121.99	113.68
12	A	1102	UMQ	C1'-C2'-C3'	4.84	120.19	110.01
16	D	201	SQD	O5-C5-C4	4.84	118.41	109.70
16	D	201	SQD	O7-S-C6	4.81	113.94	106.76
10	A	301	HEM	CMA-C3A-C4A	-4.74	121.51	128.46
12	A	1103	UMQ	O2'-C2'-C1'	4.71	121.30	110.08
12	A	1103	UMQ	CA-O1'-C1'	4.68	121.67	113.68
11	A	303	HEC	CBC-CAC-C3C	-4.66	116.60	127.49
13	B	201	CLA	O2D-CGD-O1D	-4.60	114.89	123.85
14	B	202	OPC	CAR-CAQ-CAP	4.58	129.97	113.13

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
17	G	101	BCR	C8-C9-C10	4.53	126.13	119.01
13	B	201	CLA	C3D-C2D-C1D	-4.52	99.66	105.83
16	D	201	SQD	O47-C7-C8	4.51	121.24	111.48
13	B	201	CLA	CHD-C4C-C3C	-4.49	118.22	124.77
13	B	201	CLA	O2A-CGA-CBA	4.48	125.50	111.83
14	H	1002	OPC	CBG-NAF-CAE	4.41	120.57	108.98
11	A	303	HEC	CBB-CAB-C3B	-4.41	117.18	127.49
12	A	1104	UMQ	O2'-C2'-C1'	4.37	120.49	110.08
10	A	301	HEM	C4D-ND-C1D	4.35	110.36	105.21
16	D	201	SQD	O9-S-C6	4.34	113.24	106.76
12	A	1102	UMQ	O2'-C2'-C1'	4.33	120.40	110.08
14	B	202	OPC	CBG-NAF-CAE	4.32	120.32	108.98
11	C	301	HEC	CBB-CAB-C3B	-4.28	117.47	127.49
13	B	201	CLA	C3C-C4C-NC	4.22	115.83	110.43
13	B	201	CLA	C1C-C2C-C3C	-4.12	102.65	106.98
11	C	301	HEC	CBD-CAD-C3D	-4.05	105.74	112.54
12	A	1103	UMQ	O5'-C1'-O1'	4.02	119.54	110.04
17	G	101	BCR	C38-C26-C25	-3.96	120.17	124.48
12	A	1101	UMQ	O5'-C1'-O1'	3.92	119.31	110.04
12	A	1102	UMQ	O5'-C1'-C2'	3.89	118.37	110.37
14	B	202	OPC	OAN-CAO-OAD	-3.88	114.62	123.70
12	A	1101	UMQ	CA-O1'-C1'	3.86	120.28	113.68
11	C	301	HEC	C1D-C2D-C3D	-3.85	104.32	107.00
10	A	301	HEM	CBA-CAA-C2A	-3.84	106.08	112.54
12	A	1102	UMQ	O2'-C2'-C3'	3.83	119.40	110.38
11	C	301	HEC	CBA-CAA-C2A	-3.82	106.25	112.55
13	B	201	CLA	C1D-ND-C4D	-3.75	103.68	106.31
10	A	301	HEM	C4A-C3A-C2A	3.74	109.60	107.00
13	B	201	CLA	CHD-C1D-ND	-3.70	119.60	124.80
13	B	201	CLA	C3B-C4B-NB	3.67	113.95	109.21
16	D	201	SQD	O6-C1-C2	3.63	113.79	108.27
17	G	101	BCR	C34-C9-C10	-3.61	116.97	122.82
17	G	101	BCR	C3-C4-C5	-3.57	107.69	114.06
13	B	201	CLA	C4-C3-C5	3.56	121.41	115.23
13	B	201	CLA	C3D-C4D-ND	3.52	115.72	109.99
10	A	302	HEM	C1D-C2D-C3D	-3.52	103.28	106.98
13	B	201	CLA	O2A-CGA-O1A	-3.42	115.08	123.63
12	A	1103	UMQ	O2'-C2'-C3'	3.40	118.40	110.38
17	G	101	BCR	C32-C1-C6	-3.39	104.92	110.24
10	A	302	HEM	C4C-CHD-C1D	3.39	127.03	122.56
14	H	1002	OPC	OAN-CAO-CAP	3.32	118.67	111.48
13	B	201	CLA	C2D-C1D-ND	3.32	113.41	110.13

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
10	A	301	HEM	C2C-C3C-C4C	3.30	109.20	106.90
13	B	201	CLA	CAA-CBA-CGA	-3.23	104.03	113.21
12	A	1104	UMQ	O2'-C2'-C3'	3.18	117.88	110.38
10	A	301	HEM	C4C-CHD-C1D	3.17	126.74	122.56
10	A	302	HEM	C4D-ND-C1D	3.15	108.94	105.21
12	A	1104	UMQ	O5'-C1'-O1'	3.15	117.48	110.04
16	D	201	SQD	C15-C14-C13	3.08	129.96	114.37
12	A	1101	UMQ	O2'-C2'-C3'	3.02	117.50	110.38
14	H	1002	OPC	OBJ-CBK-CBL	2.95	120.84	111.83
10	A	301	HEM	CAD-CBD-CGD	-2.89	106.01	113.67
11	C	301	HEC	CMD-C2D-C3D	2.88	130.37	124.94
17	G	101	BCR	C33-C5-C6	-2.85	121.38	124.48
14	B	202	OPC	OBJ-CBK-CBL	2.84	120.50	111.83
13	B	201	CLA	CHB-C4A-NA	2.84	128.50	124.40
13	B	201	CLA	C4C-C3C-C2C	-2.83	102.77	106.89
12	A	1102	UMQ	O1-C1-C2	2.78	114.92	108.09
16	D	201	SQD	C14-C13-C12	2.77	128.38	114.37
14	B	202	OPC	CBG-NAF-CAG	2.77	120.90	109.91
14	B	202	OPC	CBU-CBT-CBS	2.74	127.95	112.60
16	D	201	SQD	O4-C4-C3	-2.72	103.98	110.38
12	A	1102	UMQ	C3-C4-C5	2.67	115.06	110.23
16	D	201	SQD	C45-O47-C7	-2.61	111.54	117.80
10	A	301	HEM	C3B-C2B-C1B	-2.61	104.45	106.41
16	D	201	SQD	O9-S-O7	-2.58	105.44	113.82
11	C	301	HEC	CBC-CAC-C3C	-2.57	121.47	127.49
14	H	1002	OPC	CAR-CAS-CAT	2.57	127.36	114.37
14	H	1002	OPC	OAI-CAH-CAG	2.57	122.01	109.65
14	H	1002	OPC	CBO-CBP-CBQ	2.56	126.18	113.86
16	D	201	SQD	O48-C23-C24	2.56	119.64	111.83
16	D	201	SQD	C16-C15-C14	2.56	127.30	114.37
10	A	301	HEM	CAD-C3D-C4D	2.53	129.11	124.70
10	A	301	HEM	C4D-C3D-C2D	-2.53	103.20	106.89
12	A	1101	UMQ	C1-O1-C4'	-2.52	111.99	117.98
12	A	1101	UMQ	C1'-O5'-C5'	-2.49	108.86	113.72
10	A	302	HEM	CHC-C4B-NB	2.49	127.11	124.44
17	G	101	BCR	C2-C1-C6	2.48	114.04	110.44
14	H	1002	OPC	CAE-NAF-CAG	2.47	119.71	109.91
16	D	201	SQD	O3-C3-C2	-2.42	104.67	110.38
14	B	202	OPC	CAR-CAS-CAT	2.41	126.55	114.37
17	G	101	BCR	C1-C6-C5	-2.41	119.35	122.64
10	A	301	HEM	C4B-C3B-C2B	2.39	109.48	107.28
14	H	1002	OPC	CBV-CBU-CBT	-2.38	102.42	113.86

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
10	A	302	HEM	CBA-CAA-C2A	-2.36	108.56	112.54
10	A	302	HEM	CAA-CBA-CGA	2.36	120.19	113.83
14	H	1002	OPC	CAQ-CAP-CAO	2.33	122.23	113.69
10	A	301	HEM	C4B-CHC-C1C	2.33	125.63	122.56
17	G	101	BCR	C11-C10-C9	2.31	130.52	127.28
10	A	301	HEM	CBB-CAB-C3B	-2.31	116.00	127.53
14	H	1002	OPC	CAQ-CAR-CAS	2.30	126.01	114.37
14	H	1002	OPC	CBG-NAF-CAG	2.29	119.01	109.91
11	C	301	HEC	CMB-C2B-C1B	-2.29	125.11	128.46
17	G	101	BCR	C24-C25-C26	-2.28	116.29	121.56
14	B	202	OPC	CAM-OAN-CAO	-2.26	112.38	117.80
13	B	201	CLA	CHC-C1C-C2C	-2.26	120.53	126.94
16	D	201	SQD	O47-C7-O49	-2.25	118.44	123.70
10	A	302	HEM	C3B-C2B-C1B	2.24	108.09	106.41
10	A	302	HEM	CAD-CBD-CGD	-2.23	107.74	113.67
14	H	1002	OPC	CBP-CBQ-CBR	2.23	125.07	112.60
12	A	1103	UMQ	C1-O1-C4'	-2.20	112.75	117.98
11	A	303	HEC	C3C-C4C-NC	-2.20	106.79	110.94
11	A	303	HEC	C4C-C3C-C2C	2.20	108.73	106.35
13	B	201	CLA	CMC-C2C-C1C	2.18	128.44	125.03
13	B	201	CLA	CAA-C2A-C3A	-2.18	107.12	113.00
10	A	301	HEM	CHC-C4B-NB	2.17	126.77	124.44
17	G	101	BCR	C38-C26-C27	2.17	118.21	113.60
17	G	101	BCR	C10-C11-C12	-2.15	116.97	123.20
11	C	301	HEC	CMD-C2D-C1D	-2.15	125.31	128.46
16	D	201	SQD	C1-C2-C3	2.15	114.52	110.01
14	H	1002	OPC	CBW-CBV-CBU	-2.12	103.63	114.37
11	C	301	HEC	O1D-CGD-CBD	-2.12	116.36	123.09
10	A	301	HEM	CAA-CBA-CGA	-2.11	108.14	113.83
11	C	301	HEC	CMC-C2C-C1C	-2.11	125.36	128.46
17	G	101	BCR	C20-C19-C18	-2.11	120.58	126.36
10	A	301	HEM	CMA-C3A-C2A	2.09	128.89	124.94
10	A	302	HEM	O2A-CGA-CBA	2.08	120.58	114.00
14	B	202	OPC	CBP-CBO-CBN	2.05	124.75	114.37
13	B	201	CLA	CMD-C2D-C3D	-2.05	122.99	127.69
12	A	1102	UMQ	C3'-C4'-C5'	2.04	115.44	110.93
12	A	1102	UMQ	O3'-C3'-C2'	-2.03	105.59	110.38
12	A	1104	UMQ	C1-O1-C4'	-2.01	113.22	117.98

All (11) chirality outliers are listed below:

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atom
12	A	1101	UMQ	C1'
12	A	1101	UMQ	C2'
12	A	1102	UMQ	C1'
12	A	1102	UMQ	C2'
12	A	1103	UMQ	C1'
12	A	1103	UMQ	C2'
12	A	1104	UMQ	C1'
12	A	1104	UMQ	C2'
13	B	201	CLA	ND
13	B	201	CLA	C8
16	D	201	SQD	C5

All (153) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
11	A	303	HEC	C2D-C3D-CAD-CBD
11	A	303	HEC	C4D-C3D-CAD-CBD
12	A	1102	UMQ	C3'-C4'-O1-C1
12	A	1103	UMQ	CB-CA-O1'-C1'
12	A	1104	UMQ	O5'-C1'-O1'-CA
13	B	201	CLA	O2A-C1-C2-C3
14	B	202	OPC	NAF-CAG-CAH-OAI
14	B	202	OPC	CBO-CBP-CBQ-CBR
14	H	1002	OPC	CAL-OAK-PAJ-OBH
14	H	1002	OPC	CAL-OAK-PAJ-OAB
14	H	1002	OPC	CAL-OAK-PAJ-OAI
14	H	1002	OPC	NAF-CAG-CAH-OAI
14	H	1002	OPC	CBO-CBP-CBQ-CBR
16	D	201	SQD	C2-C1-O6-C44
16	D	201	SQD	O5-C1-O6-C44
16	D	201	SQD	O47-C45-C46-O48
16	D	201	SQD	O5-C5-C6-S
16	D	201	SQD	C5-C6-S-O7
16	D	201	SQD	C5-C6-S-O8
16	D	201	SQD	C5-C6-S-O9
17	G	101	BCR	C6-C7-C8-C9
17	G	101	BCR	C22-C23-C24-C25
13	B	201	CLA	CBD-CGD-O2D-CED
16	D	201	SQD	C31-C32-C33-C34
16	D	201	SQD	C33-C34-C35-C36
14	H	1002	OPC	CAQ-CAR-CAS-CAT

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
16	D	201	SQD	C12-C13-C14-C15
16	D	201	SQD	C13-C14-C15-C16
12	A	1101	UMQ	O5-C5-C6-O6
12	A	1102	UMQ	O5'-C5'-C6'-O6'
12	A	1101	UMQ	O5'-C5'-C6'-O6'
12	A	1102	UMQ	C4-C5-C6-O6
12	A	1103	UMQ	O5'-C1'-O1'-CA
12	A	1104	UMQ	O5-C5-C6-O6
16	D	201	SQD	C10-C11-C12-C13
16	D	201	SQD	C16-C17-C18-C19
16	D	201	SQD	C9-C10-C11-C12
12	A	1102	UMQ	C2'-C1'-O1'-CA
12	A	1104	UMQ	C4-C5-C6-O6
17	G	101	BCR	C7-C8-C9-C34
12	A	1102	UMQ	O5-C5-C6-O6
17	G	101	BCR	C7-C8-C9-C10
12	A	1101	UMQ	C4-C5-C6-O6
16	D	201	SQD	C8-C7-O47-C45
14	H	1002	OPC	OAN-CAM-CBI-OBJ
12	A	1101	UMQ	C4'-C5'-C6'-O6'
13	B	201	CLA	C6-C7-C8-C10
14	B	202	OPC	CAP-CAO-OAN-CAM
13	B	201	CLA	C15-C16-C17-C18
12	A	1102	UMQ	O1'-CA-CB-CC
13	B	201	CLA	O1D-CGD-O2D-CED
14	B	202	OPC	CBL-CBK-OBJ-CBI
12	A	1102	UMQ	C4'-C5'-C6'-O6'
13	B	201	CLA	C8-C10-C11-C12
14	B	202	OPC	OAD-CAO-OAN-CAM
16	D	201	SQD	O49-C7-O47-C45
14	B	202	OPC	CAH-CAG-NAF-CBG
12	A	1101	UMQ	C2'-C1'-O1'-CA
13	B	201	CLA	C10-C11-C12-C13
14	B	202	OPC	CBK-CBL-CBM-CBN
16	D	201	SQD	C23-C24-C25-C26
14	B	202	OPC	OCC-CBK-OBJ-CBI
14	B	202	OPC	OAK-CAL-CAM-OAN
14	H	1002	OPC	CAH-CAG-NAF-CBG
12	A	1101	UMQ	CB-CC-CD-CF
14	B	202	OPC	CBM-CBN-CBO-CBP
14	B	202	OPC	CAZ-CBA-CBB-CBC
12	A	1104	UMQ	CB-CC-CD-CF

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
12	A	1101	UMQ	CA-CB-CC-CD
13	B	201	CLA	C3A-C2A-CAA-CBA
14	H	1002	OPC	CBW-CBX-CBY-CBZ
14	B	202	OPC	CAY-CAZ-CBA-CBB
14	H	1002	OPC	CBX-CBY-CBZ-CCA
16	D	201	SQD	C26-C27-C28-C29
12	A	1104	UMQ	CD-CF-CG-CH
14	H	1002	OPC	CBM-CBN-CBO-CBP
12	A	1102	UMQ	CH-CI-CJ-CK
14	B	202	OPC	CAS-CAT-CAU-CAV
17	G	101	BCR	C37-C22-C23-C24
17	G	101	BCR	C21-C22-C23-C24
13	B	201	CLA	C4-C3-C5-C6
14	B	202	OPC	CAH-CAG-NAF-CAA
12	A	1101	UMQ	CH-CI-CJ-CK
14	H	1002	OPC	CBL-CBM-CBN-CBO
14	H	1002	OPC	CBS-CBT-CBU-CBV
13	B	201	CLA	C2-C3-C5-C6
13	B	201	CLA	C1A-C2A-CAA-CBA
14	H	1002	OPC	CAS-CAT-CAU-CAV
16	D	201	SQD	C25-C26-C27-C28
14	H	1002	OPC	CAL-CAM-CBI-OBJ
16	D	201	SQD	C28-C29-C30-C31
14	B	202	OPC	CBT-CBU-CBV-CBW
12	A	1104	UMQ	CF-CG-CH-CI
14	H	1002	OPC	CAX-CAY-CAZ-CBA
12	A	1104	UMQ	O5'-C5'-C6'-O6'
14	H	1002	OPC	CAW-CAX-CAY-CAZ
16	D	201	SQD	C24-C23-O48-C46
12	A	1104	UMQ	CH-CI-CJ-CK
13	B	201	CLA	C3-C5-C6-C7
16	D	201	SQD	C24-C25-C26-C27
10	A	301	HEM	C3D-CAD-CBD-CGD
14	B	202	OPC	CBC-CBD-CBE-CBF
14	B	202	OPC	OAK-CAL-CAM-CBI
14	B	202	OPC	CAR-CAS-CAT-CAU
16	D	201	SQD	C44-C45-C46-O48
12	A	1104	UMQ	O1'-CA-CB-CC
17	G	101	BCR	C23-C24-C25-C26
14	H	1002	OPC	CBU-CBV-CBW-CBX
16	D	201	SQD	O6-C44-C45-O47
16	D	201	SQD	O10-C23-O48-C46

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
12	A	1103	UMQ	CF-CG-CH-CI
12	A	1103	UMQ	CA-CB-CC-CD
14	H	1002	OPC	OAK-CAL-CAM-OAN
14	H	1002	OPC	CBV-CBW-CBX-CBY
14	B	202	OPC	CBL-CBM-CBN-CBO
12	A	1101	UMQ	CF-CG-CH-CI
14	B	202	OPC	CBP-CBQ-CBR-CBS
14	H	1002	OPC	CAM-CAL-OAK-PAJ
12	A	1104	UMQ	CC-CD-CF-CG
14	B	202	OPC	CAL-CAM-CBI-OBJ
14	H	1002	OPC	CBP-CBQ-CBR-CBS
13	B	201	CLA	C6-C7-C8-C9
16	D	201	SQD	C15-C16-C17-C18
14	H	1002	OPC	CBC-CBD-CBE-CBF
16	D	201	SQD	O6-C44-C45-C46
16	D	201	SQD	C45-C44-O6-C1
12	A	1101	UMQ	CB-CA-O1'-C1'
12	A	1102	UMQ	CB-CA-O1'-C1'
14	H	1002	OPC	OAK-CAL-CAM-CBI
17	G	101	BCR	C11-C10-C9-C34
17	G	101	BCR	C11-C10-C9-C8
11	C	301	HEC	CAA-CBA-CGA-O2A
11	C	301	HEC	CAD-CBD-CGD-O2D
11	C	301	HEC	CAA-CBA-CGA-O1A
13	B	201	CLA	C11-C12-C13-C15
11	C	301	HEC	CAD-CBD-CGD-O1D
12	A	1102	UMQ	CC-CD-CF-CG
10	A	301	HEM	CAA-CBA-CGA-O2A
11	A	303	HEC	CAA-CBA-CGA-O2A
12	A	1104	UMQ	CG-CH-CI-CJ
10	A	301	HEM	CAA-CBA-CGA-O1A
11	A	303	HEC	CAA-CBA-CGA-O1A
12	A	1102	UMQ	C5'-C4'-O1-C1
10	A	302	HEM	C1A-C2A-CAA-CBA
12	A	1103	UMQ	CG-CH-CI-CJ
10	A	302	HEM	C2A-CAA-CBA-CGA
12	A	1101	UMQ	CC-CD-CF-CG
11	A	303	HEC	C3D-CAD-CBD-CGD
11	A	303	HEC	CAD-CBD-CGD-O2D
14	B	202	OPC	CBR-CBS-CBT-CBU
12	A	1101	UMQ	CI-CJ-CK-CL
14	H	1002	OPC	CBY-CBZ-CCA-CCB

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
14	H	1002	OPC	CBR-CBS-CBT-CBU

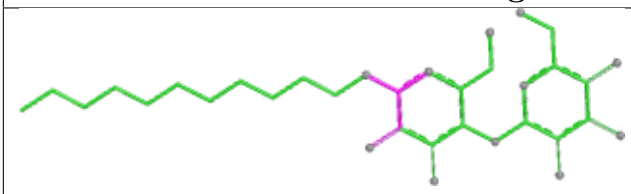
There are no ring outliers.

14 monomers are involved in 94 short contacts:

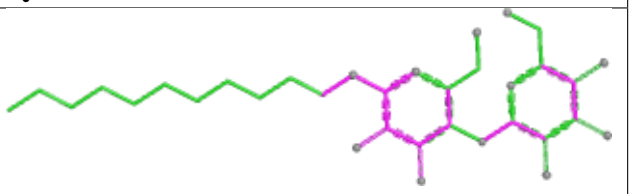
Mol	Chain	Res	Type	Clashes	Symm-Clashes
12	A	1102	UMQ	2	0
10	A	301	HEM	10	0
14	H	1002	OPC	23	0
11	C	301	HEC	6	0
12	A	1103	UMQ	1	0
16	D	201	SQD	11	0
13	B	201	CLA	4	0
12	A	1104	UMQ	4	0
14	B	202	OPC	2	0
17	G	101	BCR	11	0
10	A	302	HEM	9	0
11	A	303	HEC	6	0
15	D	200	FES	2	0
12	A	1101	UMQ	6	0

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.

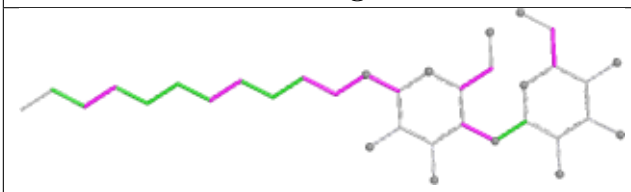
Ligand UMQ A 1102



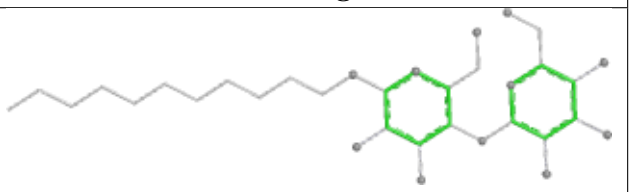
Bond lengths



Bond angles

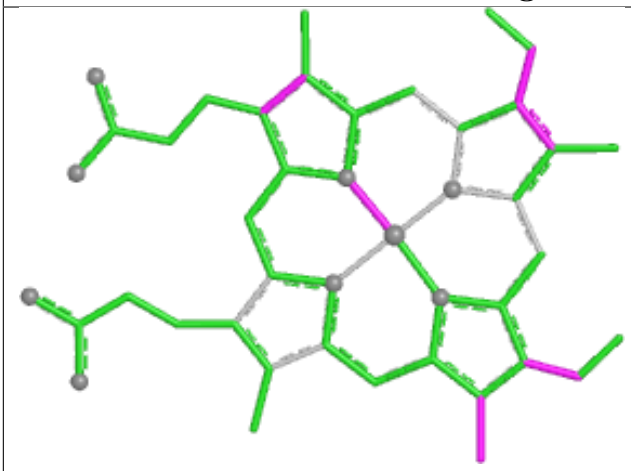


Torsions

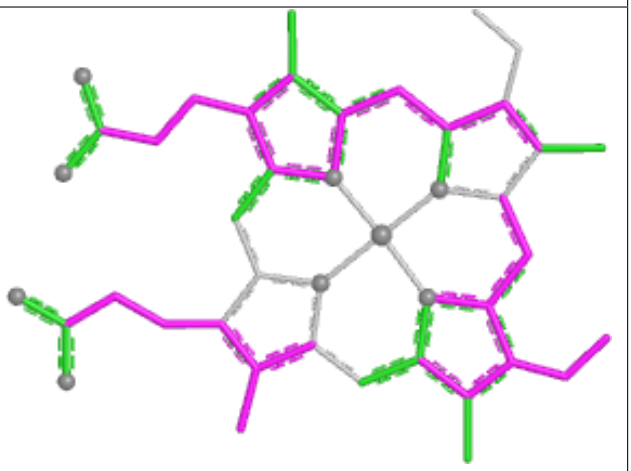


Rings

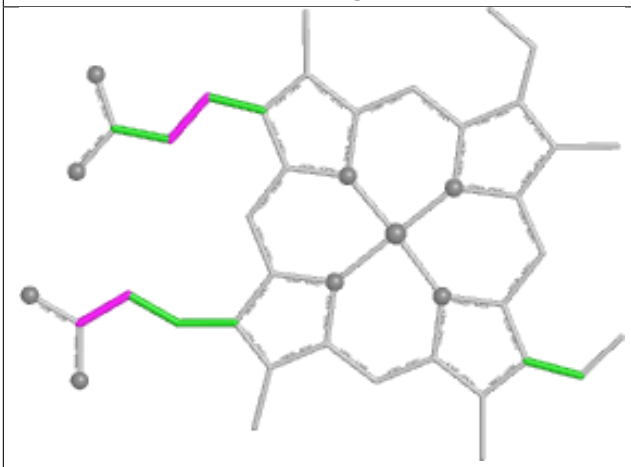
Ligand HEM A 301



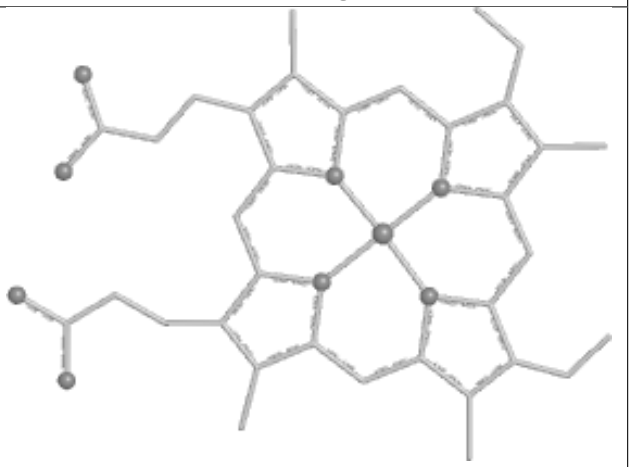
Bond lengths



Bond angles

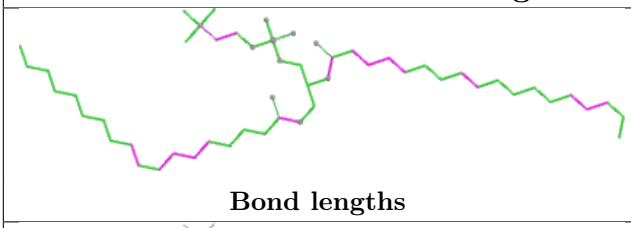


Torsions

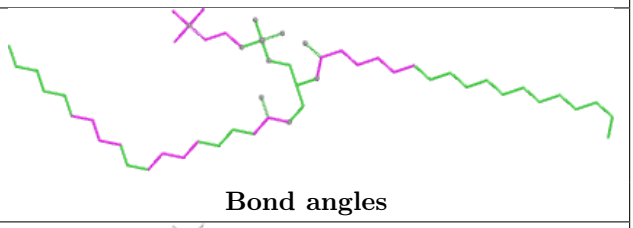


Rings

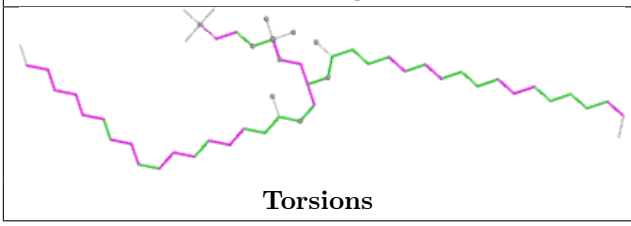
Ligand OPC H 1002



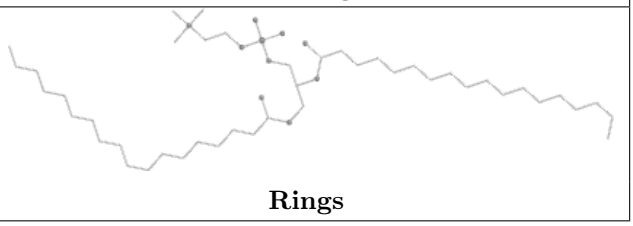
Bond lengths



Bond angles

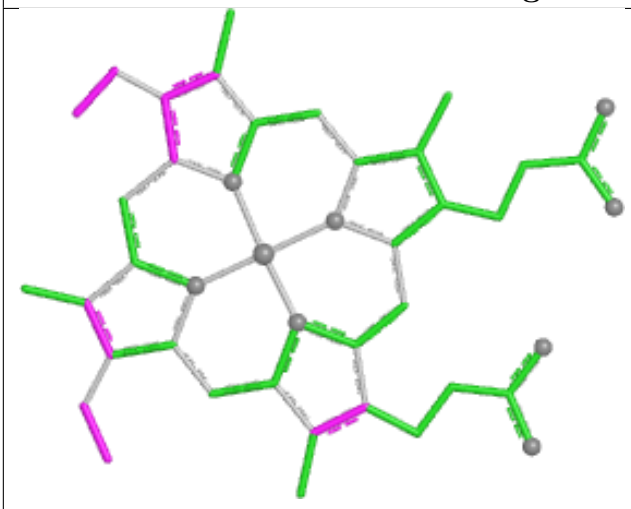


Torsions

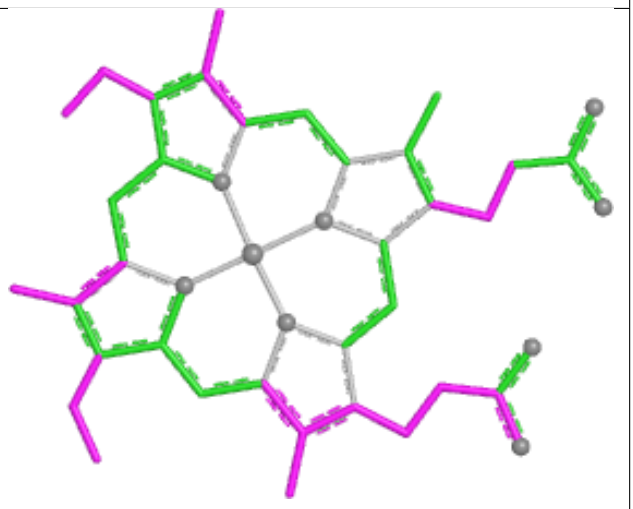


Rings

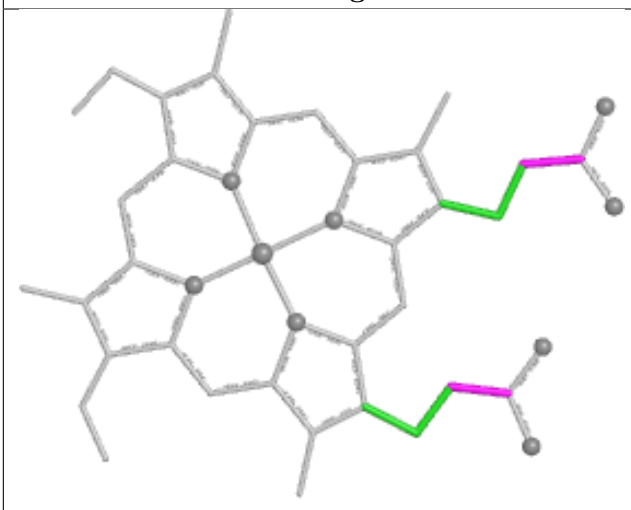
Ligand HEC C 301



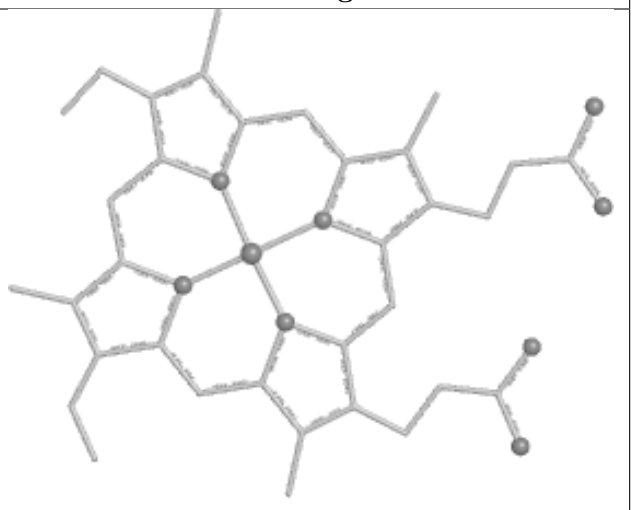
Bond lengths



Bond angles

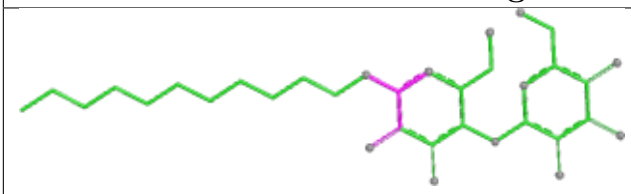


Torsions

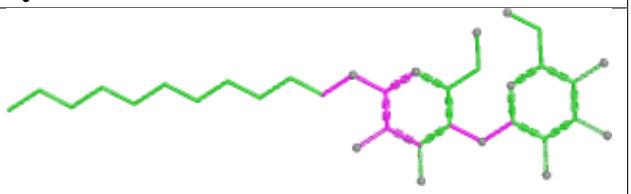


Rings

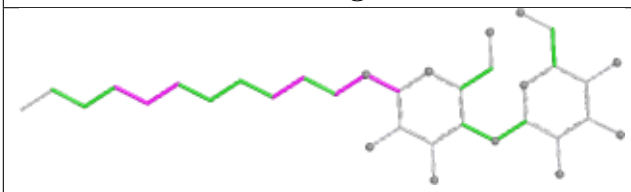
Ligand UMQ A 1103



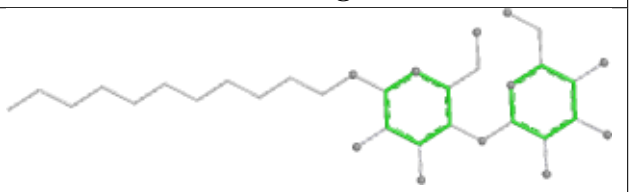
Bond lengths



Bond angles

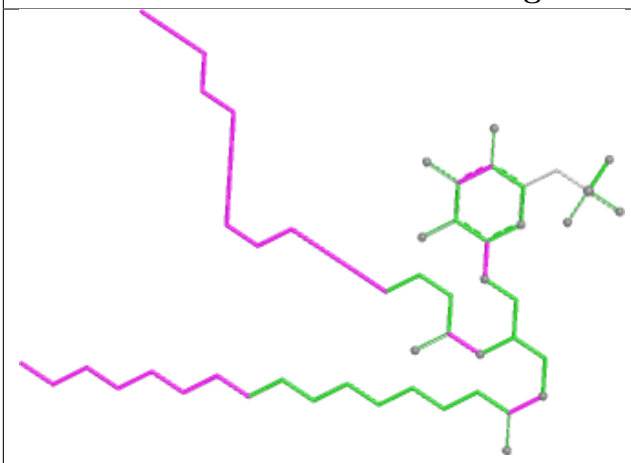


Torsions

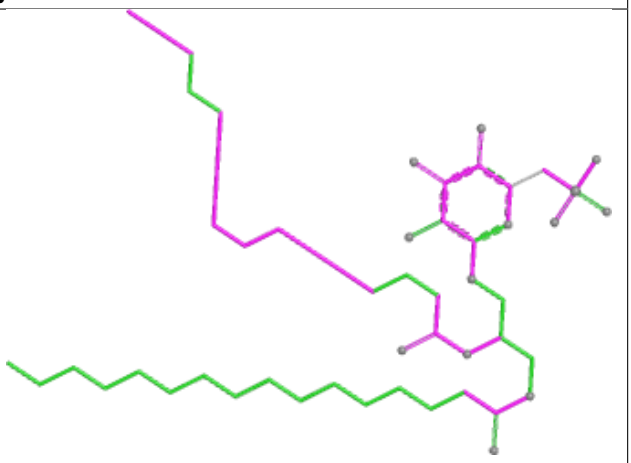


Rings

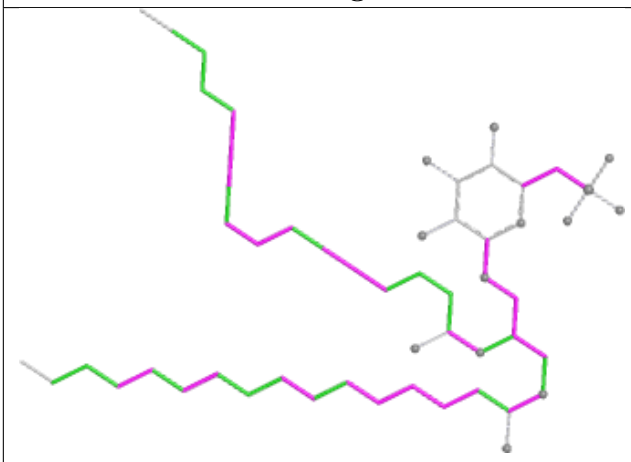
Ligand SQD D 201



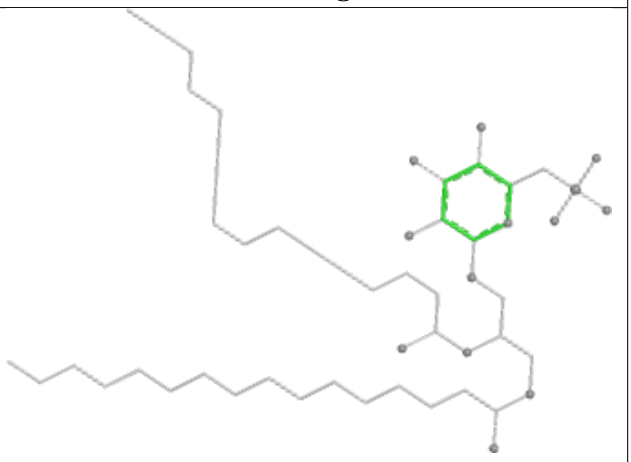
Bond lengths



Bond angles

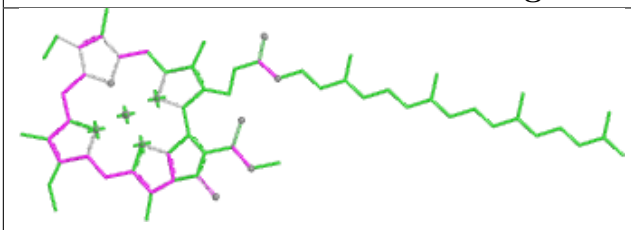


Torsions

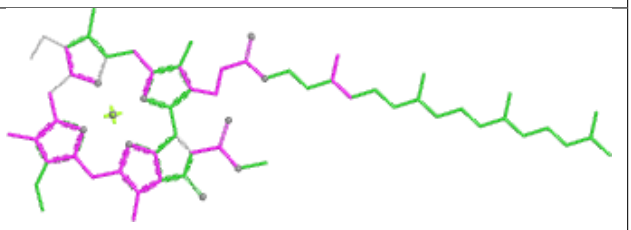


Rings

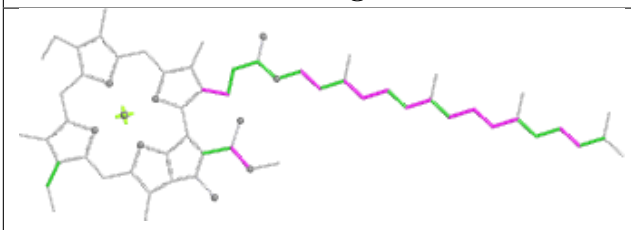
Ligand CLA B 201



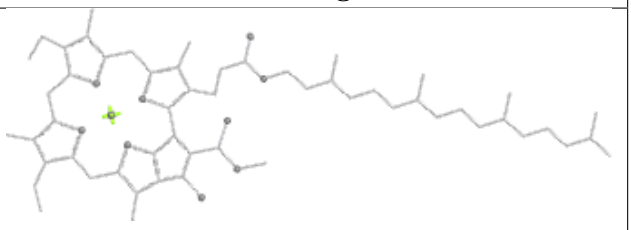
Bond lengths



Bond angles

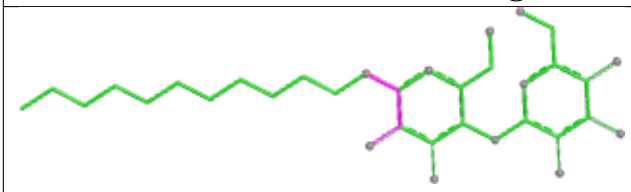


Torsions

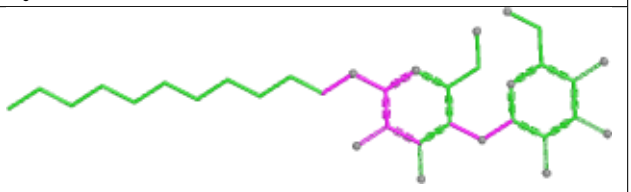


Rings

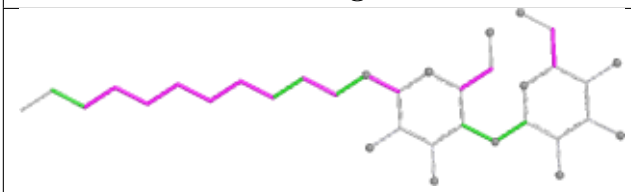
Ligand UMQ A 1104



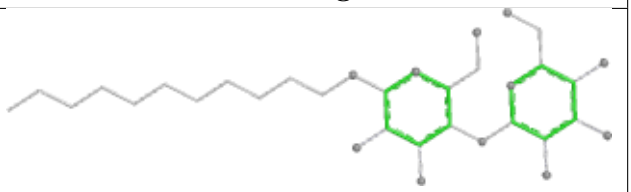
Bond lengths



Bond angles

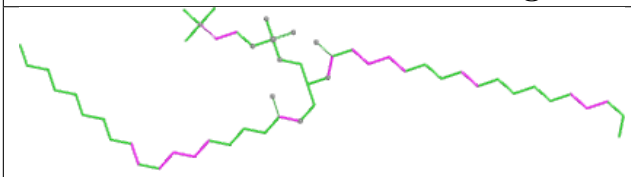


Torsions

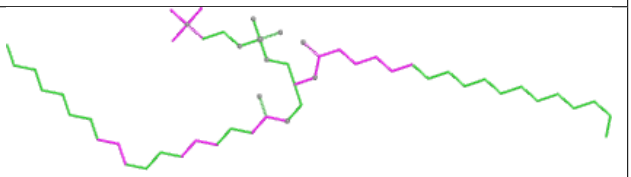


Rings

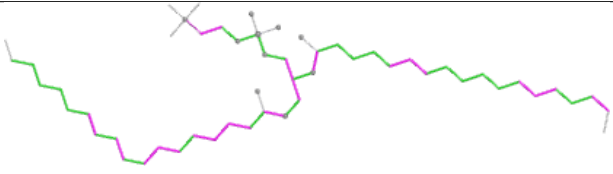
Ligand OPC B 202



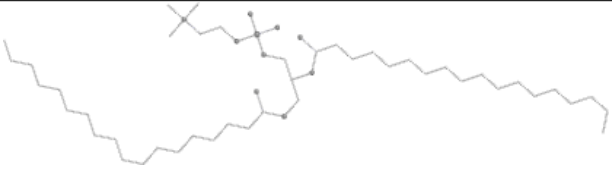
Bond lengths



Bond angles

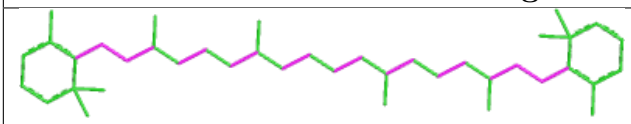


Torsions

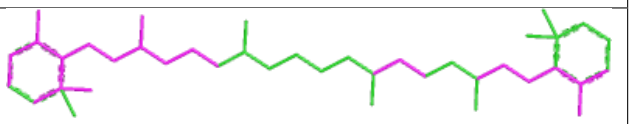


Rings

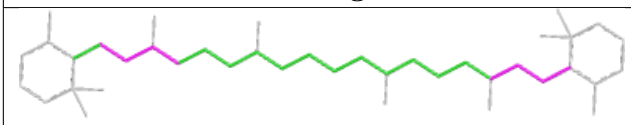
Ligand BCR G 101



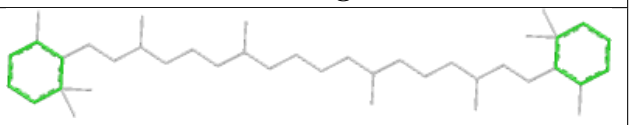
Bond lengths



Bond angles

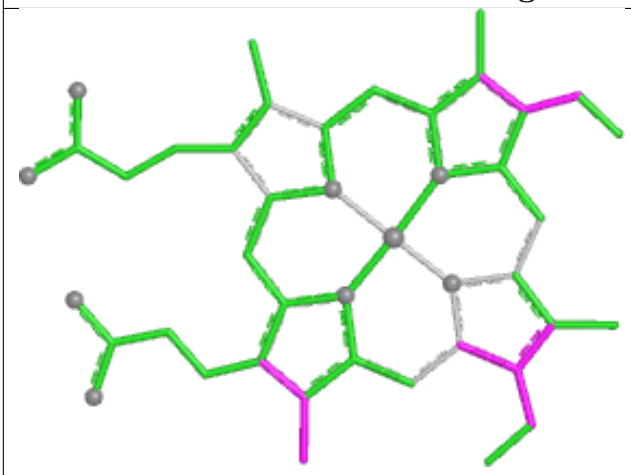


Torsions

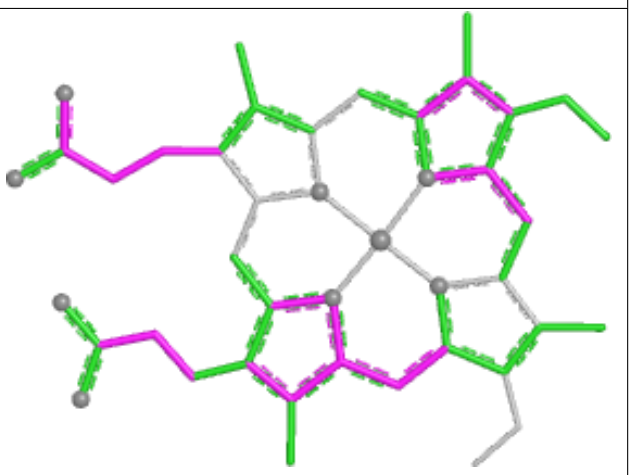


Rings

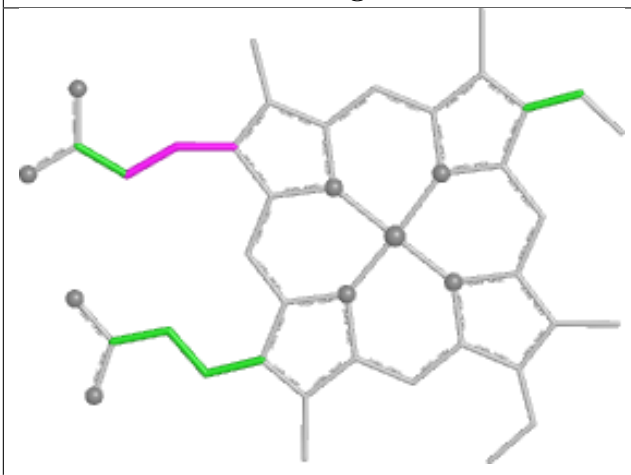
Ligand HEM A 302



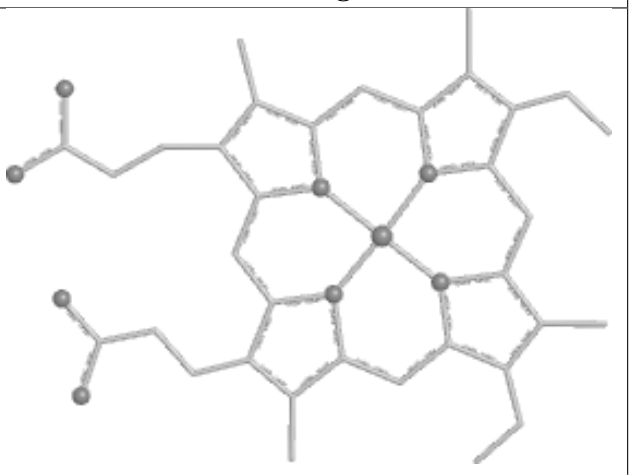
Bond lengths



Bond angles

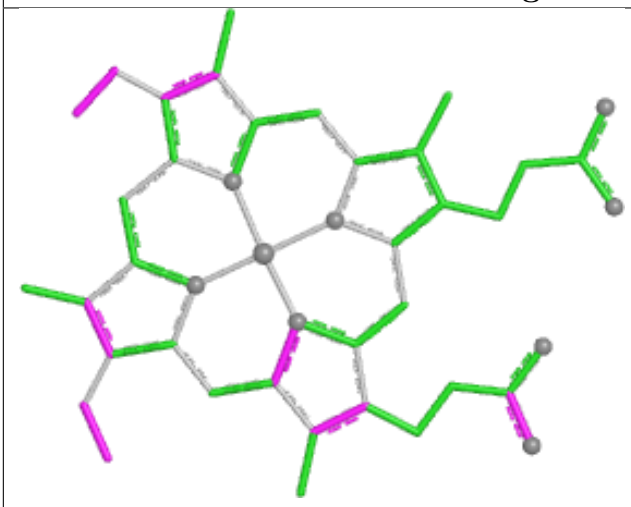


Torsions

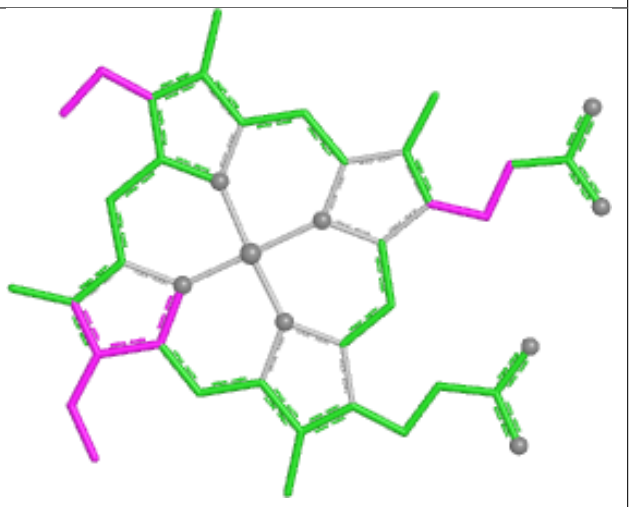


Rings

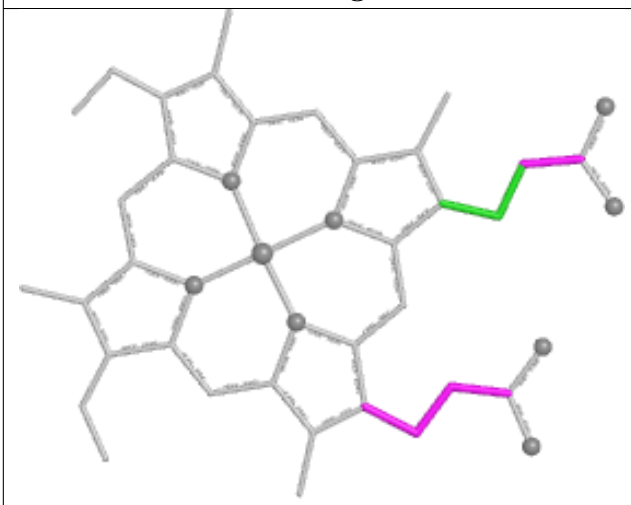
Ligand HEC A 303



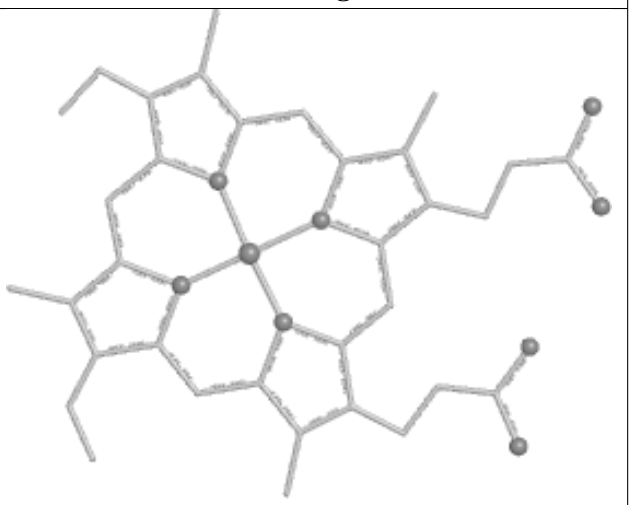
Bond lengths



Bond angles

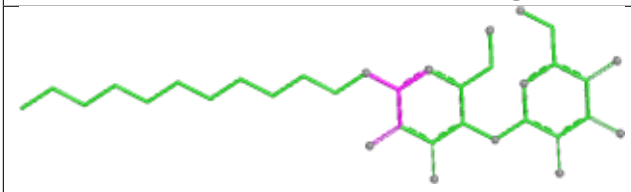


Torsions

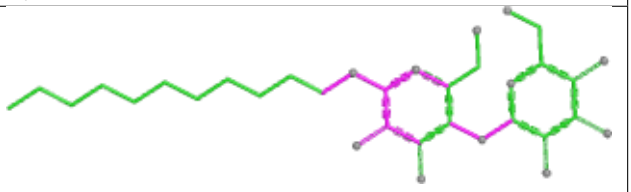


Rings

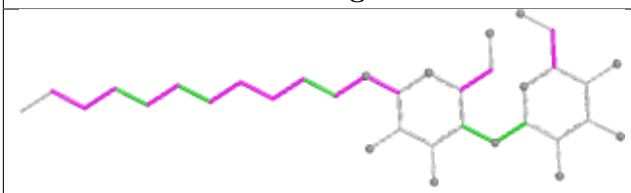
Ligand UMQ A 1101



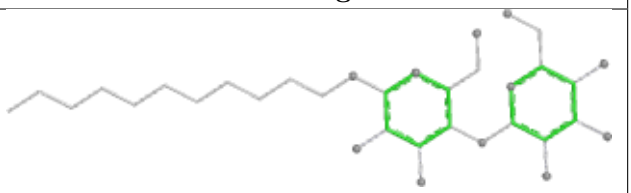
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	215/215 (100%)	-0.53	2 (0%) 81 63	21, 41, 72, 160	0
2	B	160/160 (100%)	-0.05	2 (1%) 74 54	32, 57, 103, 135	0
3	C	288/289 (99%)	1.49	73 (25%) 2 2	10, 54, 114, 130	1 (0%)
4	D	166/179 (92%)	2.05	80 (48%) 0 0	38, 91, 125, 171	0
5	E	32/32 (100%)	0.32	1 (3%) 51 30	60, 75, 106, 122	0
6	F	32/35 (91%)	0.36	5 (15%) 6 4	47, 69, 124, 139	0
7	G	37/37 (100%)	0.11	4 (10%) 12 7	42, 57, 123, 131	0
8	H	29/29 (100%)	-0.03	2 (6%) 24 14	40, 52, 76, 118	0
All	All	959/976 (98%)	0.70	169 (17%) 4 3	10, 57, 115, 171	1 (0%)

All (169) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	C	40	VAL	10.5
4	D	149	ALA	8.4
4	D	173	GLY	7.4
4	D	50	VAL	5.9
6	F	1	MET	5.7
3	C	254	ARG	5.3
4	D	17	GLN	5.3
3	C	181	THR	5.2
3	C	88	GLU	5.1
4	D	105	ASN	5.1
4	D	172	THR	4.9
3	C	256	LYS	4.8
3	C	230	ALA	4.6
4	D	49	ALA	4.6
3	C	145	GLY	4.5
3	C	140	LYS	4.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
4	D	80	LEU	4.4
4	D	175	LYS	4.2
4	D	160	ILE	4.2
4	D	75	ALA	4.2
3	C	249	LEU	4.1
4	D	85	LYS	4.1
4	D	87	ASP	4.0
3	C	250	GLN	4.0
3	C	241	GLY	3.9
3	C	136	PRO	3.9
4	D	41	TYR	3.8
3	C	226	LYS	3.8
3	C	251	ASP	3.7
4	D	91	ILE	3.7
4	D	171	ARG	3.6
4	D	166	THR	3.6
4	D	84	LEU	3.6
4	D	46	SER	3.5
4	D	86	GLY	3.5
3	C	142	ILE	3.5
4	D	164	PRO	3.5
3	C	41	LEU	3.5
3	C	147	TYR	3.5
4	D	111	LEU	3.5
4	D	42	PHE	3.5
4	D	170	PHE	3.5
4	D	177	TRP	3.4
3	C	207	VAL	3.4
4	D	54	THR	3.4
4	D	178	TRP	3.4
3	C	252	PRO	3.4
4	D	43	ILE	3.4
3	C	39	SER	3.4
3	C	234	ASN	3.3
7	G	1	MET	3.3
4	D	82	GLN	3.3
3	C	206	THR	3.3
3	C	7	GLN	3.3
4	D	45	PRO	3.2
3	C	225	VAL	3.2
1	A	112	LYS	3.2
3	C	192	ASN	3.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	C	165	GLU	3.2
4	D	148	LEU	3.1
8	H	1	MET	3.1
4	D	106	ALA	3.1
4	D	159	ASN	3.1
3	C	258	MET	3.1
3	C	220	SER	3.1
6	F	2	THR	3.1
4	D	92	VAL	3.1
3	C	222	GLY	3.0
3	C	171	VAL	3.0
1	A	1	MET	3.0
3	C	221	GLU	3.0
3	C	168	ASN	3.0
3	C	141	ASN	3.0
3	C	135	ASN	2.9
4	D	88	PRO	2.9
4	D	168	THR	2.9
3	C	100	ASP	2.9
3	C	111	ASP	2.9
4	D	44	PRO	2.9
3	C	80	GLU	2.8
4	D	174	GLU	2.8
4	D	90	TYR	2.8
3	C	217	LEU	2.8
4	D	40	LYS	2.8
4	D	155	VAL	2.8
4	D	55	THR	2.8
4	D	103	GLY	2.8
3	C	214	GLY	2.8
3	C	144	PHE	2.8
3	C	143	HIS	2.7
3	C	139	ASP	2.7
4	D	114	VAL	2.7
4	D	59	LYS	2.7
3	C	253	ASN	2.7
4	D	14	GLY	2.7
4	D	73	HIS	2.7
4	D	179	VAL	2.6
4	D	10	VAL	2.6
8	H	29	LEU	2.6
4	D	13	MET	2.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	C	182	LYS	2.6
3	C	247	ILE	2.6
4	D	120	ALA	2.6
3	C	213	ALA	2.5
4	D	156	GLN	2.5
4	D	150	LEU	2.5
6	F	31	GLY	2.5
3	C	146	LYS	2.5
3	C	177	THR	2.5
3	C	257	TRP	2.5
4	D	70	LEU	2.5
4	D	119	ALA	2.5
4	D	109	THR	2.5
4	D	142	GLY	2.5
7	G	37	GLY	2.5
6	F	32	ALA	2.5
3	C	240	PHE	2.5
4	D	102	TYR	2.5
3	C	287	MET	2.5
4	D	157	ASP	2.4
3	C	61	VAL	2.4
5	E	1	MET	2.4
7	G	27	GLN	2.4
4	D	145	PRO	2.4
4	D	89	THR	2.4
3	C	211	ILE	2.3
2	B	74	GLU	2.3
2	B	1	MET	2.3
4	D	123	LYS	2.3
3	C	262	ILE	2.3
3	C	9	TYR	2.3
3	C	255	VAL	2.3
3	C	176	ALA	2.3
3	C	59	GLN	2.3
3	C	64	ASP	2.2
3	C	134	PRO	2.2
4	D	15	ARG	2.2
4	D	38	LEU	2.2
4	D	52	GLY	2.2
4	D	76	GLY	2.2
3	C	246	GLU	2.2
3	C	95	LYS	2.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	C	32	ALA	2.2
4	D	112	GLY	2.2
3	C	201	THR	2.2
4	D	144	ALA	2.2
4	D	37	PRO	2.2
4	D	36	TYR	2.2
4	D	56	ALA	2.2
3	C	229	GLU	2.2
4	D	113	CYS	2.1
4	D	68	LYS	2.1
3	C	54	TYR	2.1
3	C	138	THR	2.1
3	C	89	ARG	2.1
7	G	32	PRO	2.1
4	D	79	VAL	2.1
3	C	233	ASN	2.1
4	D	65	LYS	2.1
3	C	260	ALA	2.1
3	C	195	TYR	2.1
4	D	48	GLY	2.1
6	F	30	GLN	2.1
4	D	158	ASP	2.1
4	D	140	ILE	2.0
4	D	162	LEU	2.0
4	D	169	ASP	2.0
3	C	42	PRO	2.0
3	C	112	ASN	2.0

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

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

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum,

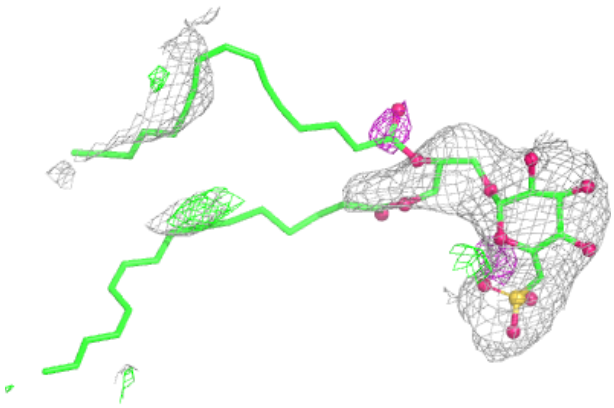
median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

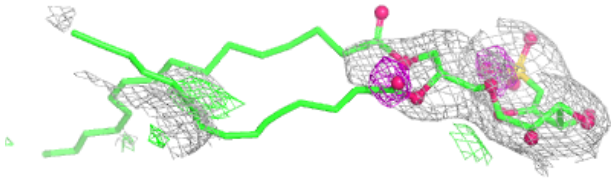
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
16	SQD	D	201	54/54	0.76	0.31	67,164,194,196	0
12	UMQ	A	1101	34/34	0.77	0.22	35,109,146,149	0
12	UMQ	A	1104	34/34	0.80	0.21	86,134,171,175	0
17	BCR	G	101	40/40	0.83	0.24	33,70,131,136	0
12	UMQ	A	1102	34/34	0.84	0.18	62,119,148,149	0
14	OPC	H	1002	54/55	0.85	0.23	41,93,187,196	0
14	OPC	B	202	54/55	0.88	0.20	48,82,157,162	0
12	UMQ	A	1103	34/34	0.88	0.17	76,112,134,135	0
13	CLA	B	201	65/65	0.95	0.11	41,60,91,99	0
15	FES	D	200	4/4	0.95	0.10	96,101,102,113	0
9	CD	B	161	1/1	0.96	0.06	166,166,166,166	0
10	HEM	A	302	43/43	0.97	0.09	9,34,57,74	0
11	HEC	C	301	43/43	0.97	0.10	29,54,89,97	0
11	HEC	A	303	43/43	0.98	0.07	26,59,68,76	0
10	HEM	A	301	43/43	0.98	0.08	9,32,51,75	0
9	CD	A	1001	1/1	0.99	0.04	65,65,65,65	0

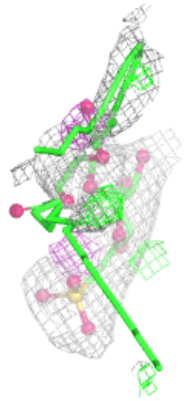
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around SQD D 201:

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

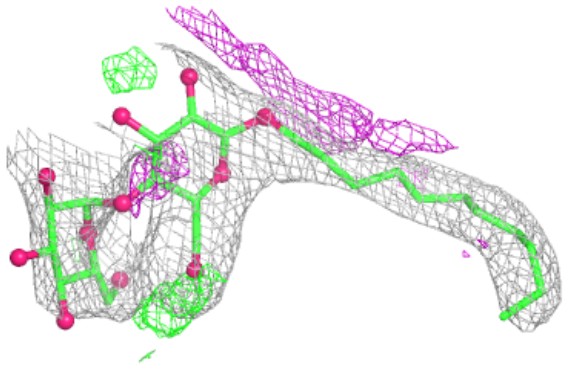


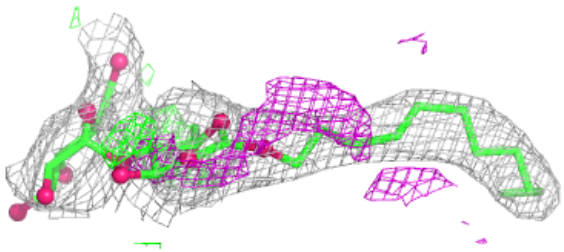


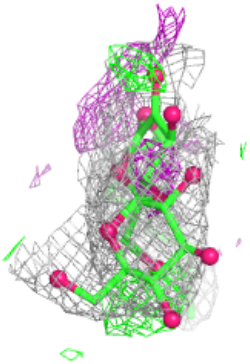


Electron density around UMQ A 1101:

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

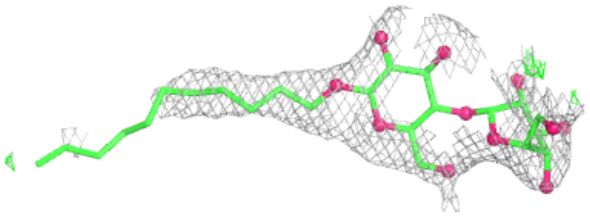


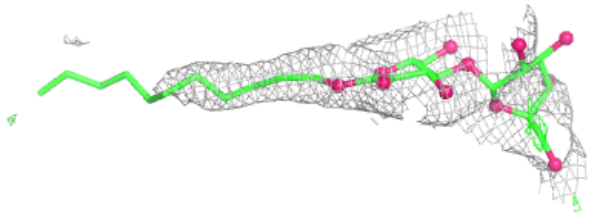


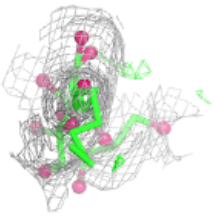


Electron density around UMQ A 1104:

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

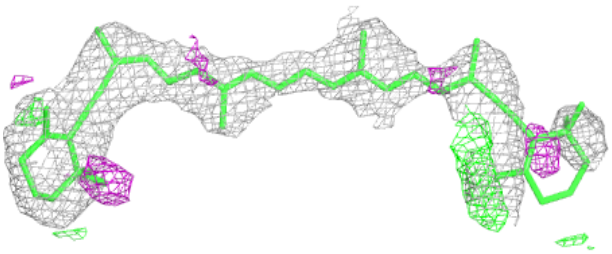


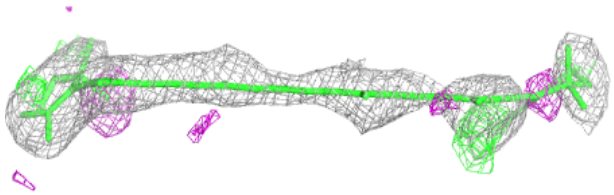


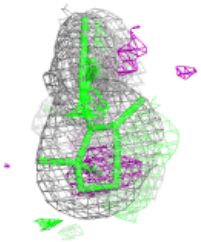


Electron density around BCR G 101:

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

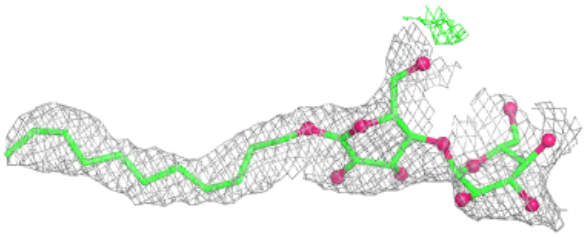


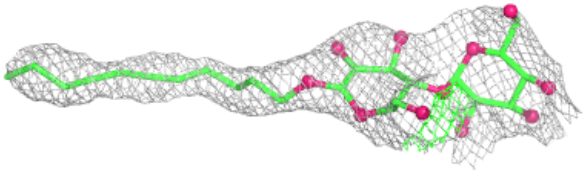


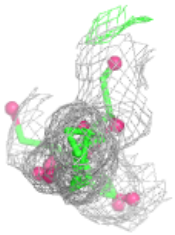


Electron density around UMQ A 1102:

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

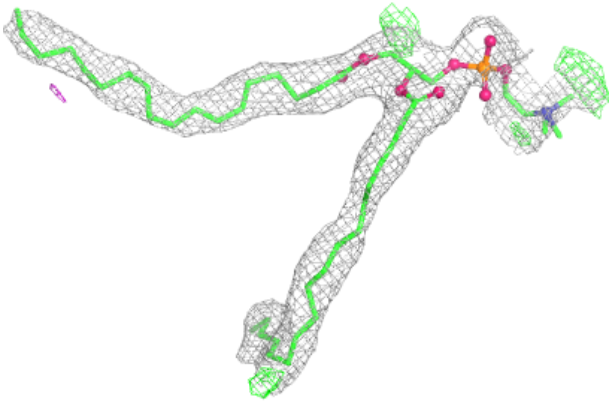


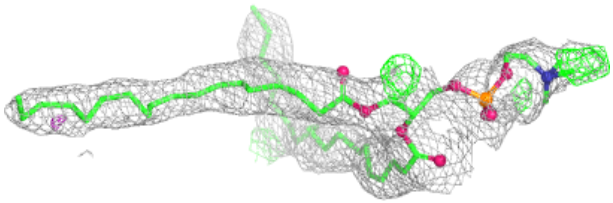


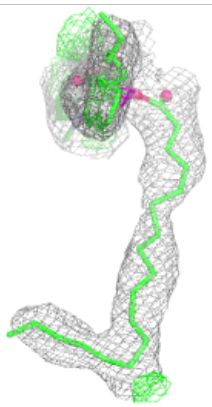


Electron density around OPC H 1002:

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

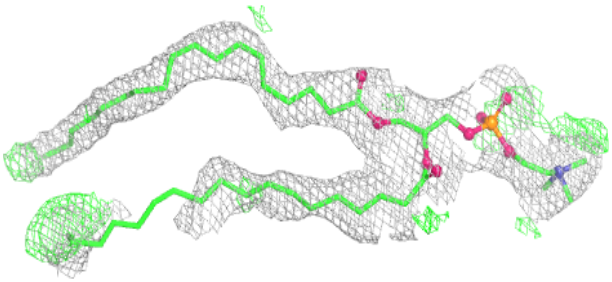


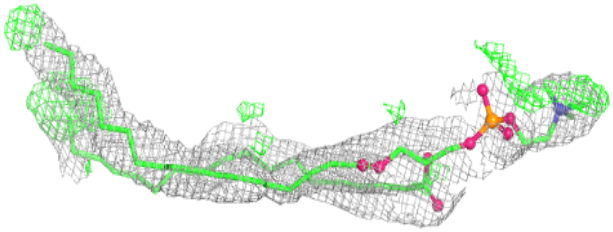


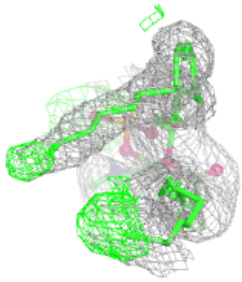


Electron density around OPC B 202:

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

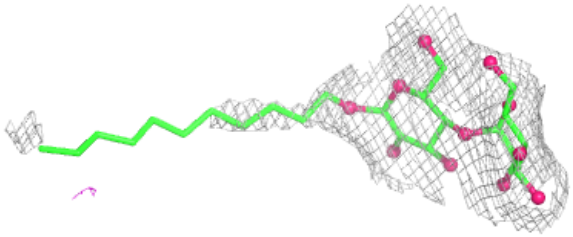


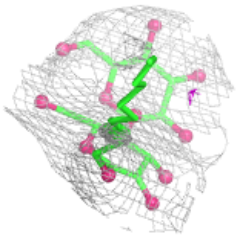




Electron density around UMQ A 1103:

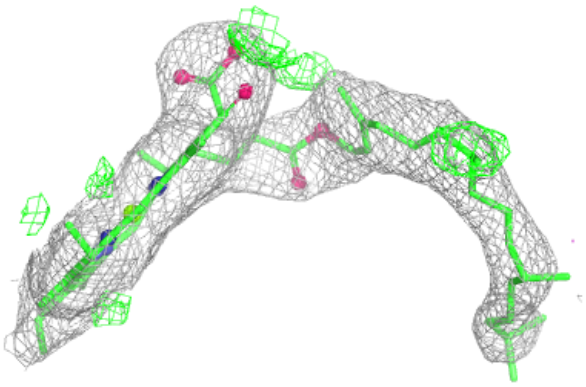
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

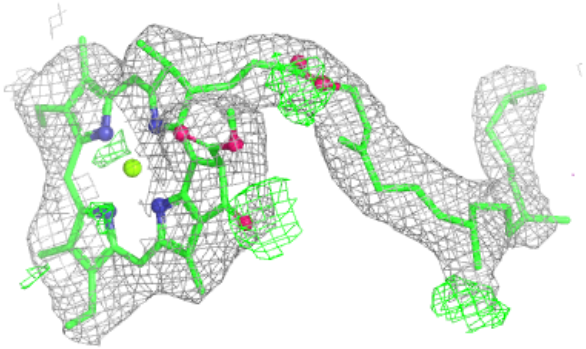


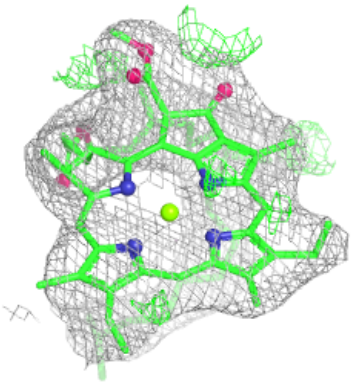


Electron density around CLA B 201:

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

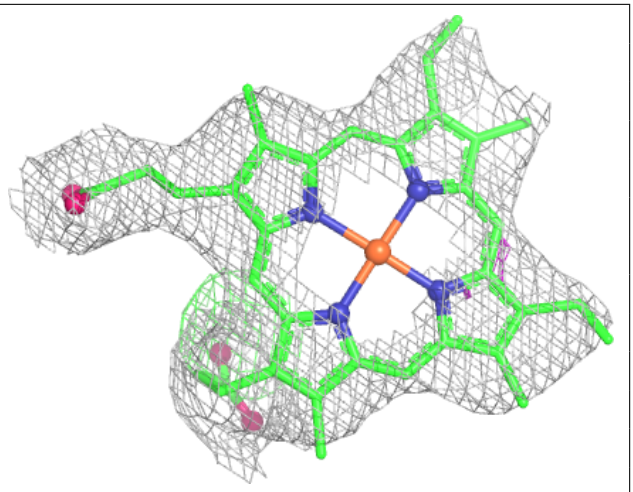


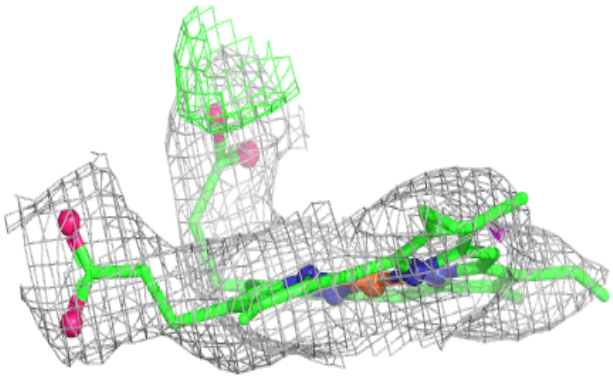


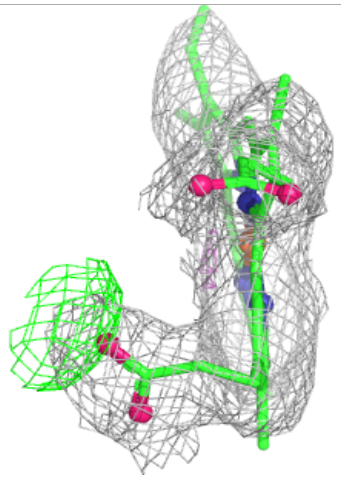


Electron density around HEM A 302:

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

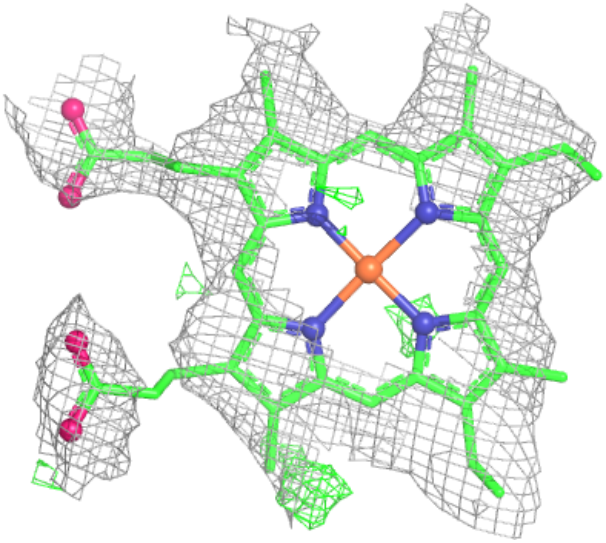


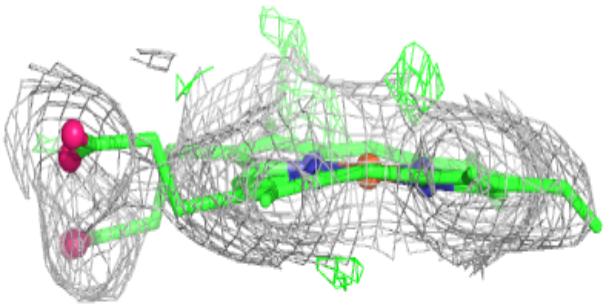


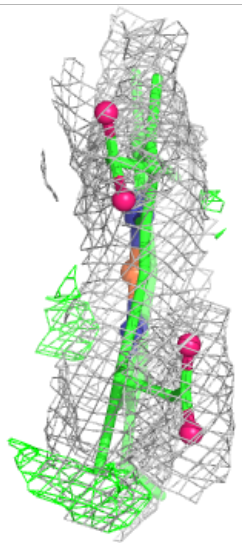


Electron density around HEC C 301:

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

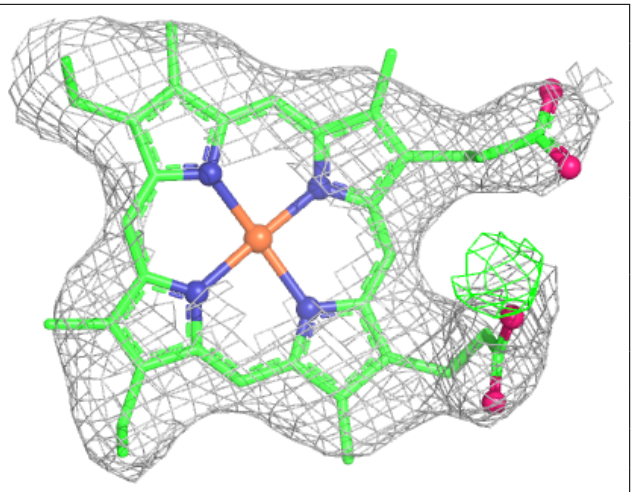


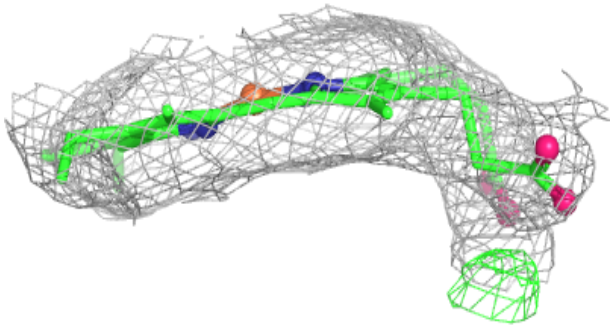


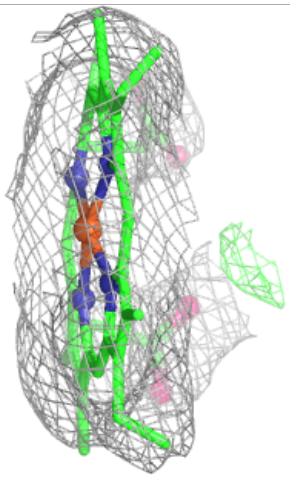


Electron density around HEC A 303:

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

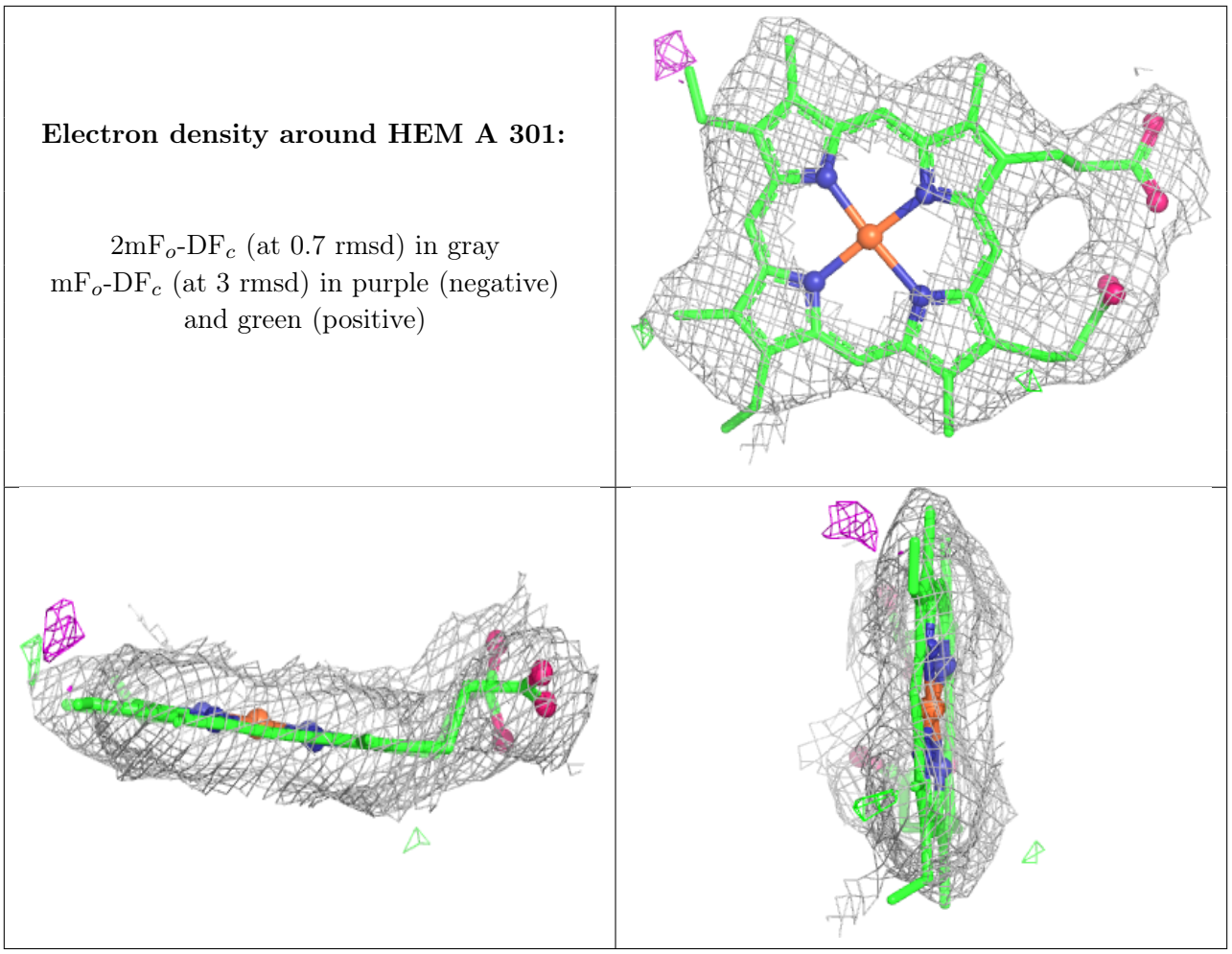






Electron density around HEM A 301:

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



6.5 Other polymers

There are no such residues in this entry.