



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 9, 2018 – 01:25 pm GMT

PDB ID : 1PPJ
Title : Bovine cytochrome bc1 complex with stigmatellin and antimycin
Authors : Huang, L.S.; Cobessi, D.; Tung, E.Y.; Berry, E.A.
Deposited on : 2003-06-16
Resolution : 2.10 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7.3 (157068), CSD as539be (2018)
Xtriage (Phenix) : 1.13
EDS : trunk30967
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)
Refmac : 5.8.0158
CCP4 : 7.0 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk30967

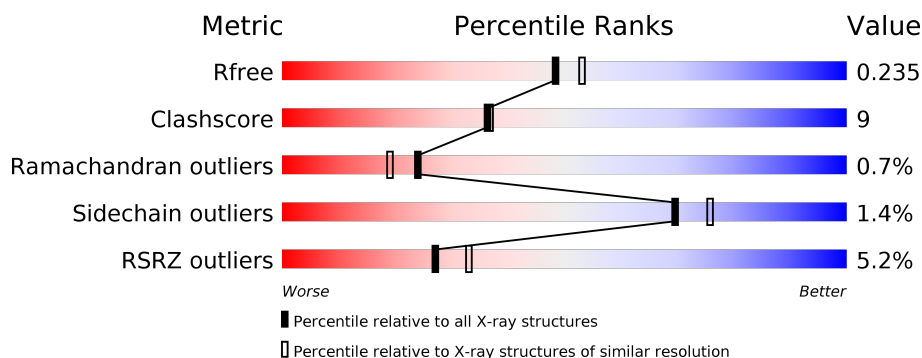
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 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}	111664	4608 (2.10-2.10)
Clashscore	122126	5109 (2.10-2.10)
Ramachandran outliers	120053	5059 (2.10-2.10)
Sidechain outliers	120020	5060 (2.10-2.10)
RSRZ outliers	108989	4497 (2.10-2.10)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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 $\leq 5\%$. 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	446	<div> <div>2%</div> <div> <div></div> <div>82%</div> <div>16%</div> <div>..</div> </div> </div>
1	N	446	<div> <div>5%</div> <div> <div></div> <div>80%</div> <div>18%</div> <div>..</div> </div> </div>
2	B	439	<div> <div>2%</div> <div> <div></div> <div>80%</div> <div>16%</div> <div>.</div> </div> </div>
2	O	439	<div> <div>3%</div> <div> <div></div> <div>84%</div> <div>13%</div> <div>.</div> </div> </div>
3	C	379	<div> <div>%</div> <div> <div></div> <div>84%</div> <div>11%</div> <div>..</div> </div> </div>
3	P	379	<div> <div>%</div> <div> <div></div> <div>82%</div> <div>13%</div> <div>..</div> </div> </div>

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Mol	Chain	Length	Quality of chain
4	D	241	
4	Q	241	
5	E	196	
5	R	196	
6	F	110	
6	S	110	
7	G	81	
7	T	81	
8	H	78	
8	U	78	
9	I	78	
9	V	78	
10	J	62	
10	W	62	

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
11	JZR	C	4002	-	-	-	X
11	JZR	D	4003	-	-	-	X
11	JZR	F	3011	-	-	-	X
11	JZR	F	4001	-	-	-	X
11	JZR	S	2011	-	-	-	X
13	AZI	A	4011	-	-	-	X
13	AZI	O	4010	-	-	-	X
14	GOL	B	2009	-	-	-	X
14	GOL	C	4006	-	-	-	X
14	GOL	O	3009	-	-	-	X
18	ANY	P	3002	X	-	-	-

2 Entry composition

There are 22 unique types of molecules in this entry. The entry contains 33549 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 Ubiquinol-cytochrome C reductase complex core protein I, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	442	Total	C	N	O	S	0	0	1
			3396	2117	601	658	20			
1	N	442	Total	C	N	O	S	10	0	1
			3396	2117	601	658	20			

- Molecule 2 is a protein called Ubiquinol-cytochrome C reductase complex core protein 2, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	424	Total	C	N	O	S	0	0	1
			3178	1997	562	612	7			
2	O	424	Total	C	N	O	S	0	0	1
			3156	1984	558	607	7			

- Molecule 3 is a protein called Cytochrome b.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	365	Total	C	N	O	S	0	0	0
			2892	1940	450	485	17			
3	P	365	Total	C	N	O	S	0	0	0
			2891	1940	449	485	17			

- Molecule 4 is a protein called Cytochrome c1, heme protein, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	241	Total	C	N	O	S	0	0	0
			1919	1225	330	349	15			
4	Q	241	Total	C	N	O	S	0	0	0
			1919	1225	330	349	15			

- Molecule 5 is a protein called Ubiquinol-cytochrome C reductase iron-sulfur subunit, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	E	196	Total	C	N	O	S	0	0	0
			1510	954	263	285	8			
5	R	196	Total	C	N	O	S	0	0	0
			1517	956	263	290	8			

- Molecule 6 is a protein called Ubiquinol-cytochrome C reductase complex 14 kDa protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	F	99	Total	C	N	O	S	0	0	0
			861	545	155	159	2			
6	S	99	Total	C	N	O	S	0	0	0
			861	545	155	159	2			

- Molecule 7 is a protein called Ubiquinol-cytochrome C reductase complex ubiquinone-binding protein QP-C.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	G	75	Total	C	N	O	S	0	0	2
			621	406	117	97	1			
7	T	76	Total	C	N	O	S	0	0	2
			626	409	118	98	1			

- Molecule 8 is a protein called Ubiquinol-cytochrome C reductase complex 11 kDa protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	H	66	Total	C	N	O	S	0	0	0
			539	327	98	109	5			
8	U	66	Total	C	N	O	S	0	0	0
			539	327	98	109	5			

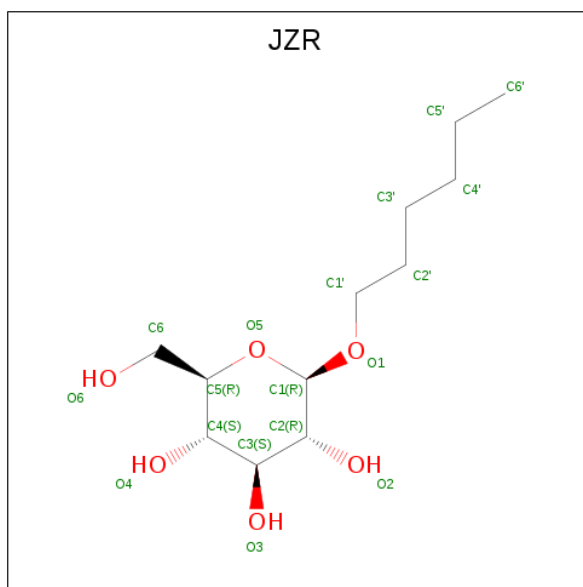
- Molecule 9 is a protein called Ubiquinol-cytochrome C reductase iron-sulfur subunit, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
9	I	43	Total	C	N	O	S	0	0	0
			285	175	53	56	1			
9	V	43	Total	C	N	O	S	0	0	0
			285	175	53	56	1			

- Molecule 10 is a protein called Ubiquinol-cytochrome C reductase complex 7.2 kDa protein.

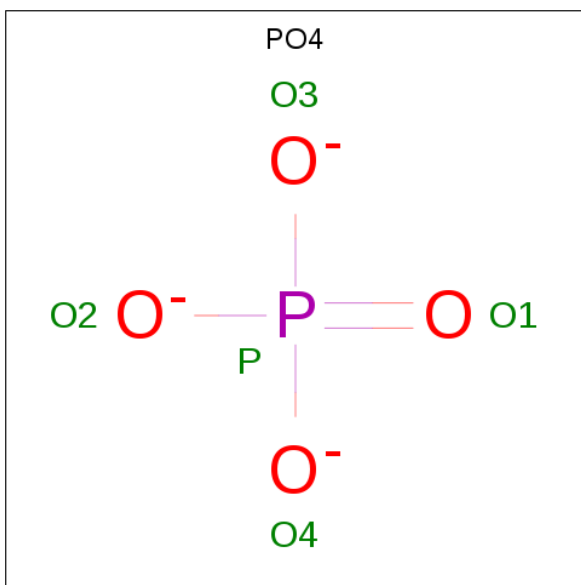
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
10	J	33	Total	C	N	O	0	0	1
			284	185	50	49			
10	W	62	Total	C	N	O	0	0	1
			506	332	88	86			

- Molecule 11 is hexyl beta-D-glucopyranoside (three-letter code: JZR) (formula: C₁₂H₂₄O₆).



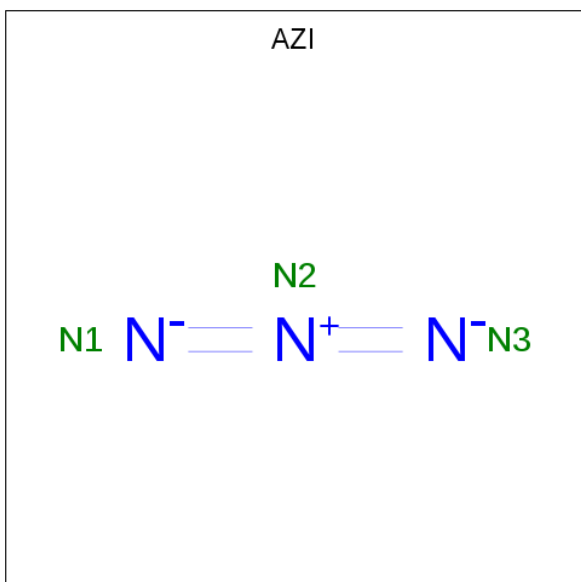
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
11	A	1	Total	C	O	0	0
			18	12	6		
11	C	1	Total	C	O	0	0
			18	12	6		
11	C	1	Total	C	O	0	0
			18	12	6		
11	D	1	Total	C	O	0	0
			18	12	6		
11	F	1	Total	C	O	0	0
			18	12	6		
11	F	1	Total	C	O	0	0
			18	12	6		
11	P	1	Total	C	O	0	0
			18	12	6		
11	R	1	Total	C	O	0	0
			18	12	6		
11	S	1	Total	C	O	0	0
			18	12	6		

- Molecule 12 is PHOSPHATE ION (three-letter code: PO4) (formula: O₄P).



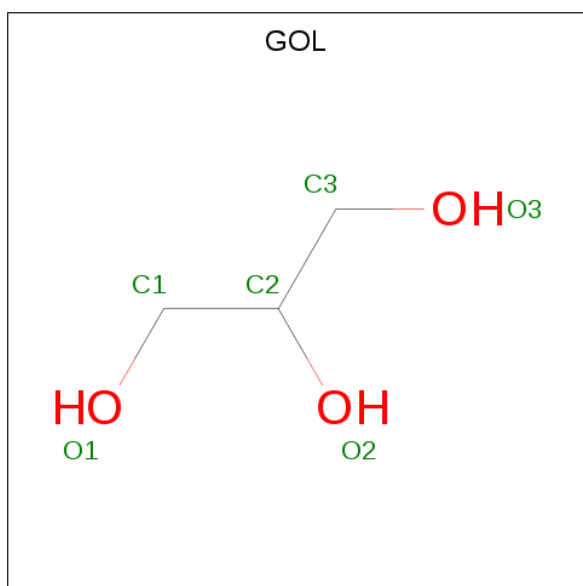
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
12	A	1	Total	O	P	0	0
			5	4	1		
12	C	1	Total	O	P	0	0
			5	4	1		
12	F	1	Total	O	P	0	0
			5	4	1		
12	P	1	Total	O	P	0	0
			5	4	1		
12	S	1	Total	O	P	0	0
			5	4	1		

- Molecule 13 is AZIDE ION (three-letter code: AZI) (formula: N₃).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
13	A	1	Total N 3 3	0	0
13	C	1	Total N 3 3	0	0
13	G	1	Total N 3 3	0	0
13	O	1	Total N 3 3	0	0
13	P	1	Total N 3 3	0	0

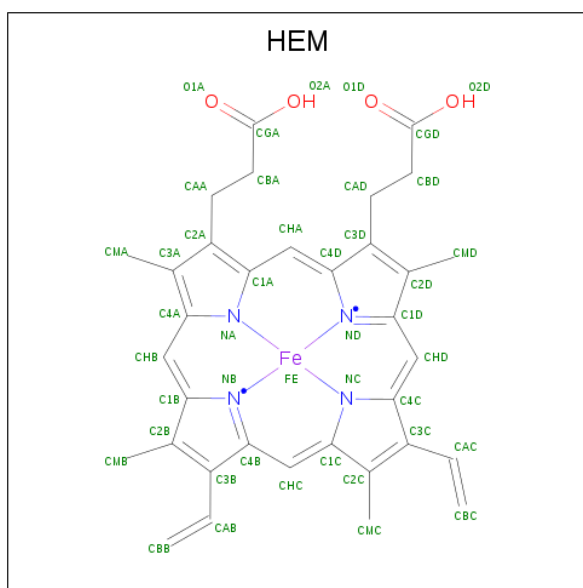
- Molecule 14 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
14	B	1	Total C O 6 3 3	0	0
14	C	1	Total C O 6 3 3	0	0
14	C	1	Total C O 6 3 3	0	0
14	O	1	Total C O 6 3 3	0	0
14	P	1	Total C O 6 3 3	0	0
14	R	1	Total C O 6 3 3	0	0

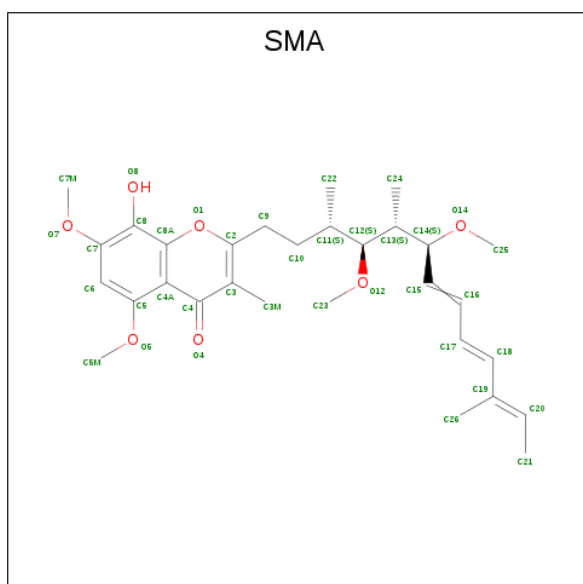
- Molecule 15 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (for-

mula: C₃₄H₃₂FeN₄O₄).



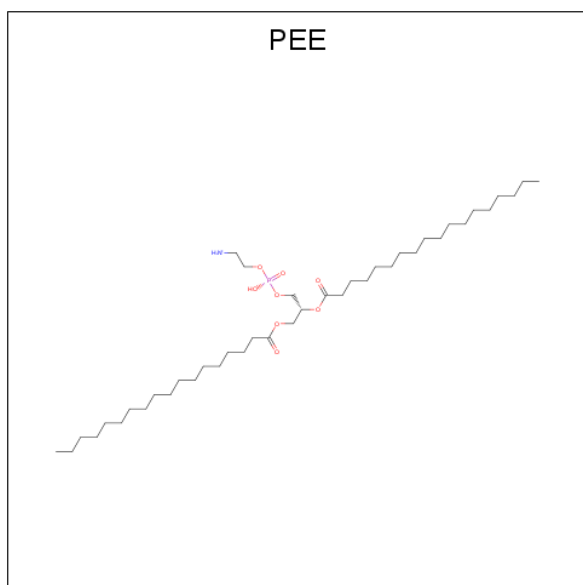
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
15	C	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
15	C	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
15	P	1	Total 43	C 34	Fe 1	N 4	O 4	0	0
15	P	1	Total 43	C 34	Fe 1	N 4	O 4	0	0

- Molecule 16 is STIGMATELLIN A (three-letter code: SMA) (formula: $\text{C}_{30}\text{H}_{42}\text{O}_7$).



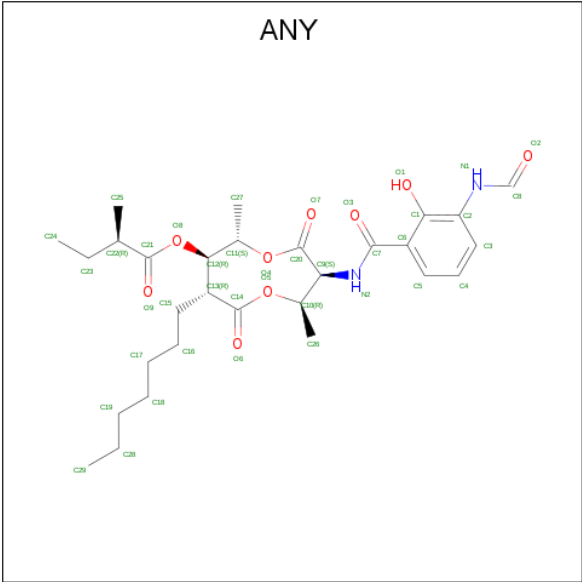
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
16	C	1	Total	C	O	0	0
			37	30	7		
16	P	1	Total	C	O	0	0
			37	30	7		

- Molecule 17 is 1,2-Dioleoyl-sn-glycero-3-phosphoethanolamine (three-letter code: PEE) (formula: C₄₁H₈₃NO₈P).



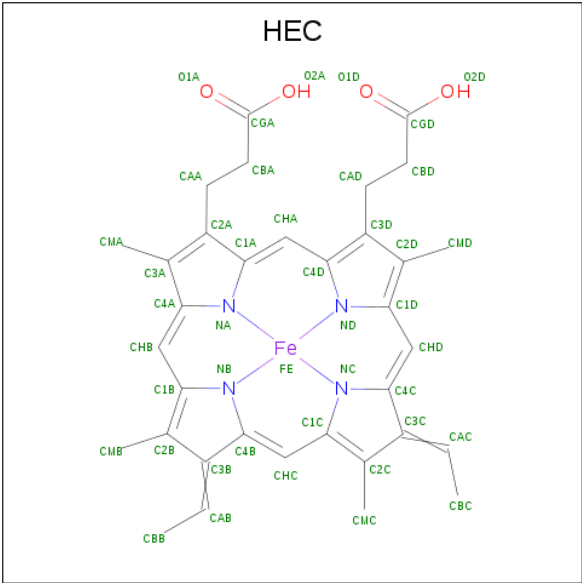
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
17	C	1	Total	C	N	O	P	0	0
			49	39	1	8	1		
17	D	1	Total	C	N	O	P	0	0
			26	16	1	8	1		
17	P	1	Total	C	N	O	P	0	0
			49	39	1	8	1		
17	Q	1	Total	C	N	O	P	0	0
			51	41	1	8	1		

- Molecule 18 is 2-METHYL-BUTYRIC ACID 3-(3-FORMYLAMINO-2-HYDROXY-BENZ OYLAMINO)-8-HEPTYL-2,6-DIMETHYL-4,9-DIOXO-[1,5]DIOXONAN-7-YL ESTER (three-letter code: ANY) (formula: C₂₉H₄₂N₂O₉).



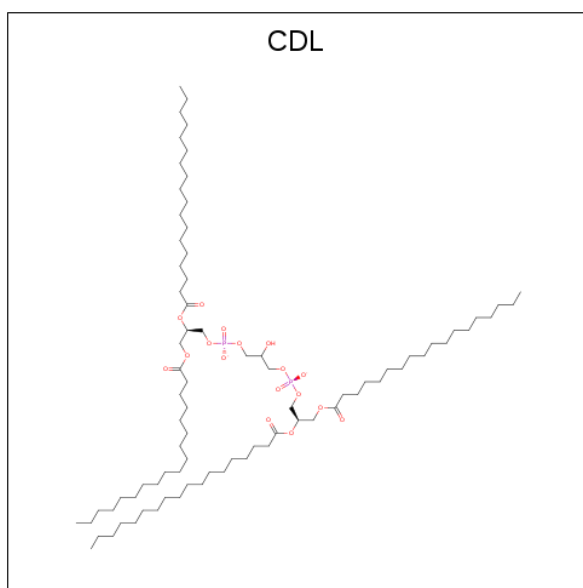
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
18	C	1	Total	C	N	O	0	0
			37	26	2	9		
18	P	1	Total	C	N	O	0	0
			37	26	2	9		

- Molecule 19 is HEME C (three-letter code: HEC) (formula: $C_{34}H_{34}FeN_4O_4$).



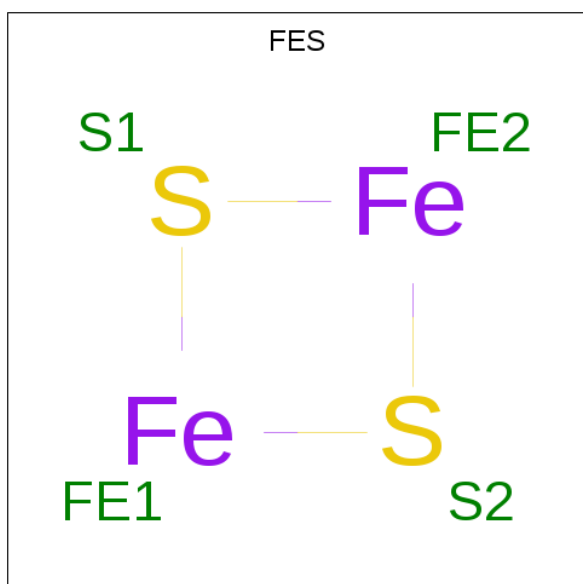
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
19	D	1	Total	C	Fe	N	O	0
			43	34	1	4	4	
19	Q	1	Total	C	Fe	N	O	0
			43	34	1	4	4	

- Molecule 20 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
20	D	1	Total	C	O	P	0	0
			39	24	13	2		
20	G	1	Total	C	O	P	0	0
			44	25	17	2		
20	P	1	Total	C	O	P	0	0
			39	24	13	2		
20	T	1	Total	C	O	P	0	0
			49	30	17	2		

- Molecule 21 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
21	E	1	Total 4	Fe 2	S 2	0	0
21	R	1	Total 4	Fe 2	S 2	0	0

- Molecule 22 is water.

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
22	A	219	Total 219	O 219		0	0
22	B	167	Total 167	O 167		0	0
22	C	123	Total 123	O 123		0	0
22	D	96	Total 96	O 96		0	0
22	E	50	Total 50	O 50		0	0
22	F	63	Total 63	O 63		0	0
22	G	17	Total 17	O 17		0	0
22	H	17	Total 17	O 17		0	0
22	I	16	Total 16	O 16		0	0
22	J	4	Total 4	O 4		0	0
22	N	98	Total 98	O 98		0	0
22	O	127	Total 127	O 127		0	0
22	P	115	Total 115	O 115		0	0
22	Q	89	Total 89	O 89		0	0
22	R	63	Total 63	O 63		0	0
22	S	63	Total 63	O 63		0	0
22	T	20	Total 20	O 20		0	0
22	U	6	Total 6	O 6		0	0

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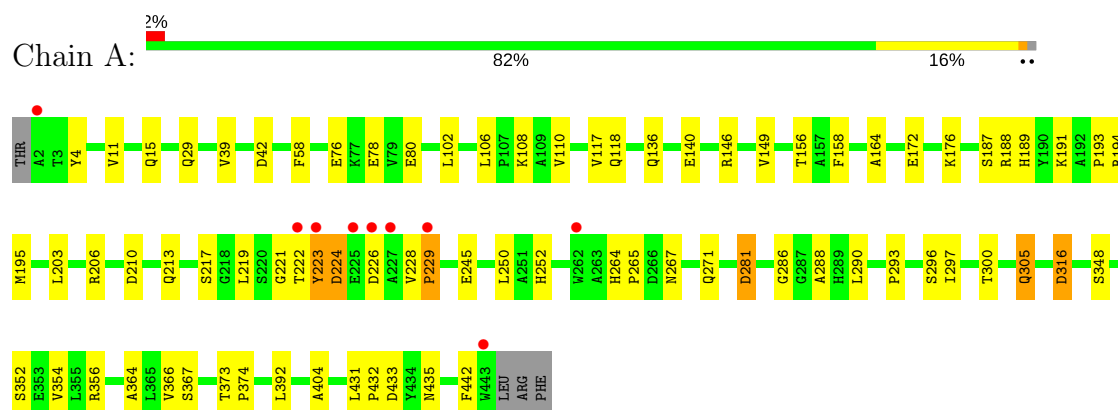
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
22	V	8	Total	O	0	0
			8	8		
22	W	9	Total	O	0	0
			9	9		

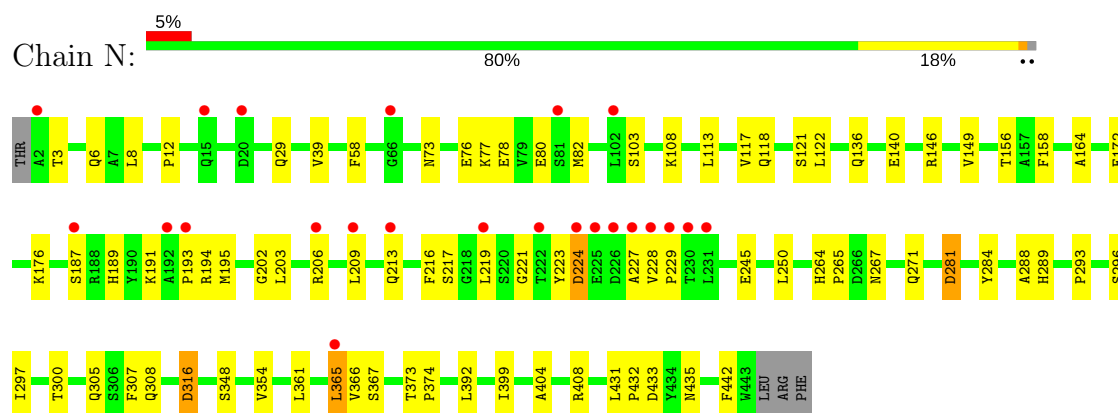
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA 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.

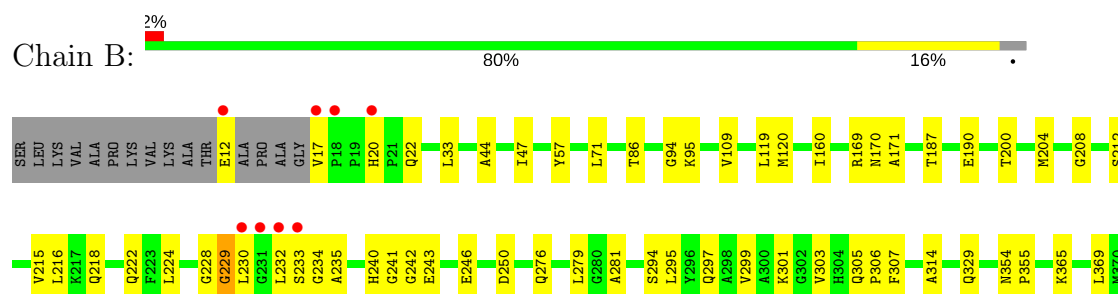
- Molecule 1: Ubiquinol-cytochrome C reductase complex core protein I, mitochondrial

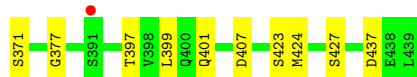


- Molecule 1: Ubiquinol-cytochrome C reductase complex core protein I, mitochondrial

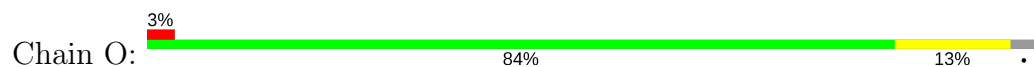


- Molecule 2: Ubiquinol-cytochrome C reductase complex core protein 2, mitochondrial

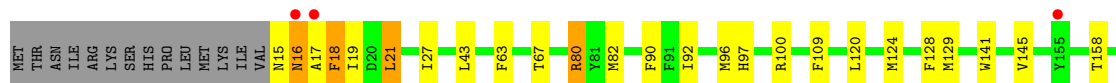
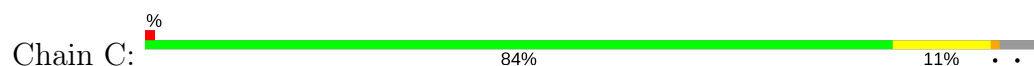




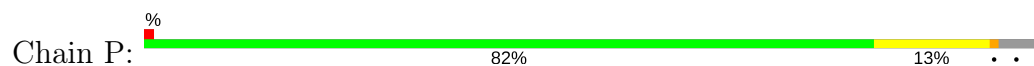
- Molecule 2: Ubiquinol-cytochrome C reductase complex core protein 2, mitochondrial



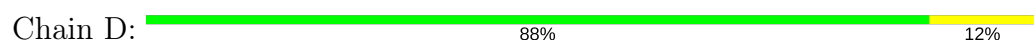
- Molecule 3: Cytochrome b



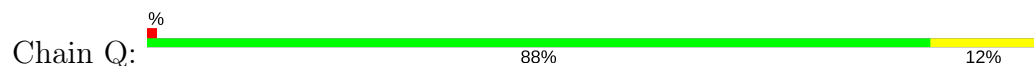
- Molecule 3: Cytochrome b

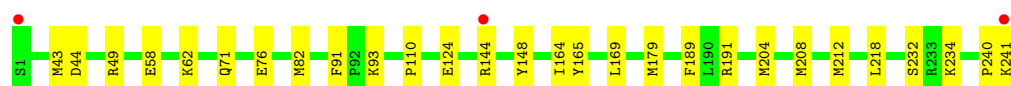


- Molecule 4: Cytochrome c1, heme protein, mitochondrial

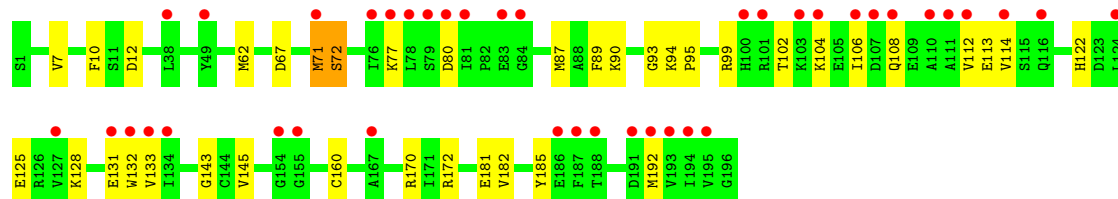
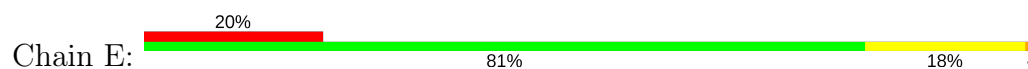


- Molecule 4: Cytochrome c1, heme protein, mitochondrial

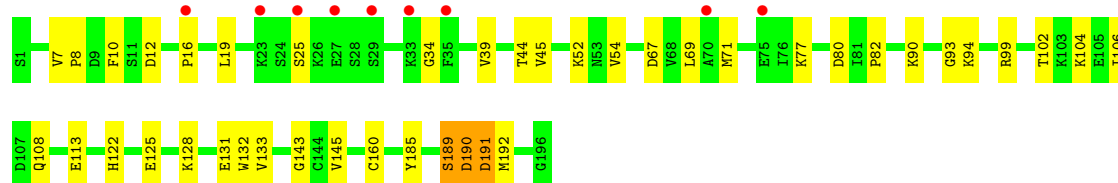
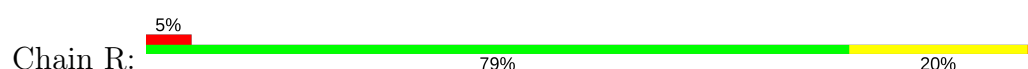




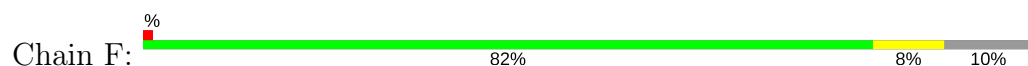
- Molecule 5: Ubiquinol-cytochrome C reductase iron-sulfur subunit, mitochondrial



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- Molecule 6: Ubiquinol-cytochrome C reductase complex 14 kDa protein



- Molecule 6: Ubiquinol-cytochrome C reductase complex 14 kDa protein



- Molecule 7: Ubiquinol-cytochrome C reductase complex ubiquinone-binding protein QP-C

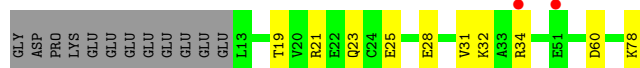
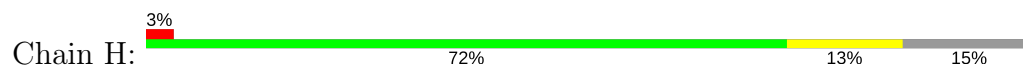


- Molecule 7: Ubiquinol-cytochrome C reductase complex ubiquinone-binding protein QP-C

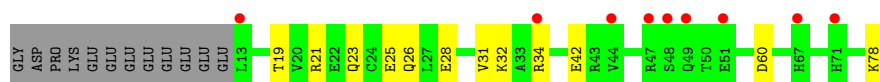




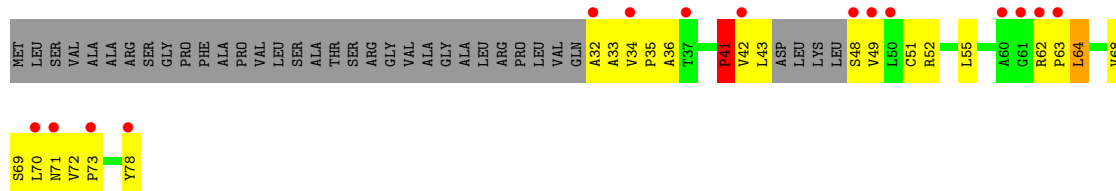
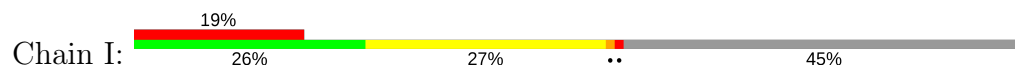
- Molecule 8: Ubiquinol-cytochrome C reductase complex 11 kDa protein



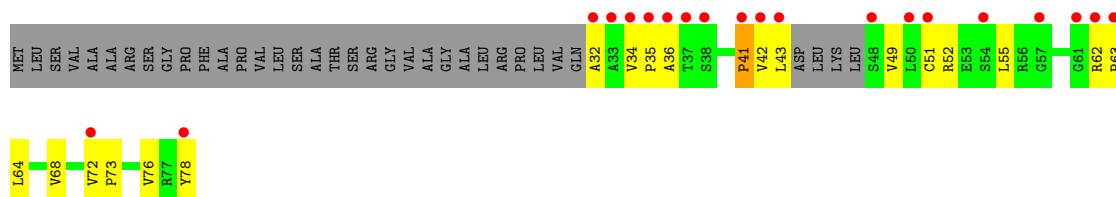
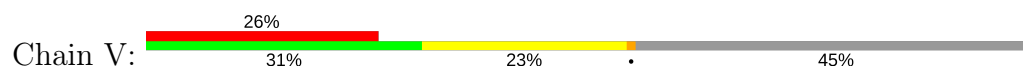
- Molecule 8: Ubiquinol-cytochrome C reductase complex 11 kDa protein



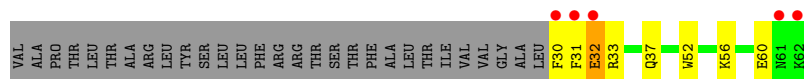
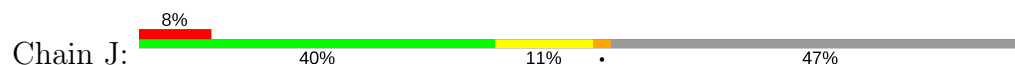
- Molecule 9: Ubiquinol-cytochrome C reductase iron-sulfur subunit, mitochondrial



- Molecule 9: Ubiquinol-cytochrome C reductase iron-sulfur subunit, mitochondrial

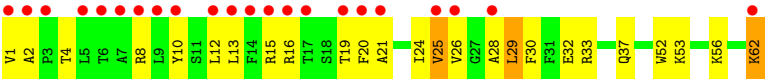


- Molecule 10: Ubiquinol-cytochrome C reductase complex 7.2 kDa protein



- Molecule 10: Ubiquinol-cytochrome C reductase complex 7.2 kDa protein





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	128.53Å 168.75Å 231.53Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	93.53 – 2.10 93.53 – 2.10	Depositor EDS
% Data completeness (in resolution range)	97.7 (93.53-2.10) 97.8 (93.53-2.10)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.03 (at 2.10Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.224 , 0.260 0.219 , 0.235	Depositor DCC
R_{free} test set	14181 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å ²)	41.8	Xtriage
Anisotropy	0.314	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 65.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	33549	wwPDB-VP
Average B, all atoms (Å ²)	50.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.97% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: AZI, GOL, CDL, PO4, JZR, FES, HEC, HEM, PEE, ANY, SMA

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# $ Z > 5$	RMSZ	# $ Z > 5$
1	A	0.33	0/3465	0.64	0/4704
1	N	0.30	0/3465	0.63	1/4704 (0.0%)
2	B	0.32	0/3236	0.63	0/4388
2	O	0.31	0/3213	0.62	0/4354
3	C	0.34	0/2986	0.64	1/4089 (0.0%)
3	P	0.33	0/2985	0.64	1/4087 (0.0%)
4	D	0.30	0/1978	0.61	0/2684
4	Q	0.29	0/1978	0.59	0/2684
5	E	0.29	0/1544	0.64	1/2087 (0.0%)
5	R	0.30	0/1551	0.66	1/2097 (0.0%)
6	F	0.32	0/878	0.63	0/1175
6	S	0.30	0/878	0.61	0/1175
7	G	0.31	0/642	0.61	0/869
7	T	0.31	0/647	0.61	0/876
8	H	0.30	0/544	0.56	0/729
8	U	0.27	0/544	0.55	0/729
9	I	0.35	0/286	0.87	2/387 (0.5%)
9	V	0.34	0/286	0.84	1/387 (0.3%)
10	J	0.33	0/292	0.53	0/386
10	W	0.31	0/518	0.55	0/696
All	All	0.31	0/31916	0.63	8/43287 (0.0%)

There are no bond length outliers.

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	I	35	PRO	N-CA-CB	5.84	110.31	103.30
9	I	64	LEU	CA-CB-CG	5.72	128.47	115.30
5	R	143	GLY	N-CA-C	5.70	127.35	113.10
1	N	365	LEU	CA-CB-CG	5.68	128.36	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	143	GLY	N-CA-C	5.58	127.06	113.10

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3396	0	3292	65	0
1	N	3396	0	3292	57	0
2	B	3178	0	3153	72	0
2	O	3156	0	3123	44	0
3	C	2892	0	2938	36	0
3	P	2891	0	2937	43	0
4	D	1919	0	1868	27	0
4	Q	1919	0	1868	28	0
5	E	1510	0	1495	30	0
5	R	1517	0	1499	33	0
6	F	861	0	854	12	0
6	S	861	0	854	19	0
7	G	621	0	626	15	0
7	T	626	0	631	15	0
8	H	539	0	524	11	0
8	U	539	0	524	10	0
9	I	285	0	280	50	0
9	V	285	0	280	24	0
10	J	284	0	264	5	0
10	W	506	0	512	30	0
11	A	18	0	24	0	0
11	C	36	0	48	2	0
11	D	18	0	24	3	0
11	F	36	0	48	3	0
11	P	18	0	24	0	0
11	R	18	0	24	1	0
11	S	18	0	24	3	0
12	A	5	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
12	C	5	0	0	0	0
12	F	5	0	0	0	0
12	P	5	0	0	0	0
12	S	5	0	0	0	0
13	A	3	0	0	0	0
13	C	3	0	0	0	0
13	G	3	0	0	0	0
13	O	3	0	0	0	0
13	P	3	0	0	0	0
14	B	6	0	8	0	0
14	C	12	0	16	1	0
14	O	6	0	8	0	0
14	P	6	0	8	0	0
14	R	6	0	8	1	0
15	C	86	0	60	3	0
15	P	86	0	60	2	0
16	C	37	0	42	2	0
16	P	37	0	42	2	0
17	C	49	0	72	0	0
17	D	26	0	26	3	0
17	P	49	0	72	1	0
17	Q	51	0	82	3	0
18	C	37	0	28	1	0
18	P	37	0	29	2	0
19	D	43	0	30	3	0
19	Q	43	0	30	1	0
20	D	39	0	39	0	0
20	G	44	0	32	0	0
20	P	39	0	39	2	0
20	T	49	0	42	2	0
21	E	4	0	0	0	0
21	R	4	0	0	0	0
22	A	219	0	0	7	0
22	B	167	0	0	5	0
22	C	123	0	0	1	0
22	D	96	0	0	0	0
22	E	50	0	0	0	0
22	F	63	0	0	0	0
22	G	17	0	0	0	0
22	H	17	0	0	0	0
22	I	16	0	0	2	0
22	J	4	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
22	N	98	0	0	1	0
22	O	127	0	0	2	0
22	P	115	0	0	5	0
22	Q	89	0	0	0	0
22	R	63	0	0	5	0
22	S	63	0	0	1	0
22	T	20	0	0	0	0
22	U	6	0	0	0	0
22	V	8	0	0	1	0
22	W	9	0	0	0	0
All	All	33549	0	31803	551	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 9.

The worst 5 of 551 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:95:LYS:HE2	9:I:32:ALA:HB3	1.47	0.94
10:W:16:ARG:HB2	10:W:19:THR:HG22	1.48	0.94
2:O:95:LYS:HE2	9:V:32:ALA:N	1.82	0.94
1:A:136:GLN:HE21	9:I:51:CYS:HB3	1.30	0.93
1:A:146:ARG:HA	22:A:4191:HOH:O	1.69	0.92

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	440/446 (99%)	425 (97%)	11 (2%)	4 (1%)	19	13
1	N	440/446 (99%)	425 (97%)	11 (2%)	4 (1%)	19	13

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	B	418/439 (95%)	405 (97%)	10 (2%)	3 (1%)	24	19
2	O	419/439 (95%)	404 (96%)	13 (3%)	2 (0%)	31	27
3	C	363/379 (96%)	352 (97%)	9 (2%)	2 (1%)	27	23
3	P	363/379 (96%)	352 (97%)	10 (3%)	1 (0%)	43	43
4	D	239/241 (99%)	233 (98%)	6 (2%)	0	100	100
4	Q	239/241 (99%)	232 (97%)	7 (3%)	0	100	100
5	E	194/196 (99%)	181 (93%)	10 (5%)	3 (2%)	11	6
5	R	194/196 (99%)	183 (94%)	8 (4%)	3 (2%)	11	6
6	F	97/110 (88%)	96 (99%)	1 (1%)	0	100	100
6	S	97/110 (88%)	94 (97%)	1 (1%)	2 (2%)	8	3
7	G	73/81 (90%)	70 (96%)	3 (4%)	0	100	100
7	T	74/81 (91%)	69 (93%)	5 (7%)	0	100	100
8	H	64/78 (82%)	63 (98%)	1 (2%)	0	100	100
8	U	64/78 (82%)	64 (100%)	0	0	100	100
9	I	39/78 (50%)	37 (95%)	1 (3%)	1 (3%)	6	2
9	V	39/78 (50%)	36 (92%)	2 (5%)	1 (3%)	6	2
10	J	30/62 (48%)	28 (93%)	2 (7%)	0	100	100
10	W	59/62 (95%)	54 (92%)	4 (7%)	1 (2%)	10	5
All	All	3945/4220 (94%)	3803 (96%)	115 (3%)	27 (1%)	24	19

5 of 27 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	224	ASP
3	C	19	ILE
5	E	71	MET
5	E	72	SER
9	I	41	PRO

5.3.2 Protein sidechains ⓘ

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

The Analysed column shows the number of residues for which the sidechain conformation was

analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	363/370 (98%)	355 (98%)	8 (2%)	55	60
1	N	363/370 (98%)	357 (98%)	6 (2%)	63	70
2	B	332/343 (97%)	332 (100%)	0	100	100
2	O	328/343 (96%)	328 (100%)	0	100	100
3	C	312/327 (95%)	304 (97%)	8 (3%)	49	53
3	P	311/327 (95%)	303 (97%)	8 (3%)	49	53
4	D	206/206 (100%)	206 (100%)	0	100	100
4	Q	206/206 (100%)	204 (99%)	2 (1%)	78	83
5	E	165/168 (98%)	164 (99%)	1 (1%)	87	91
5	R	167/168 (99%)	164 (98%)	3 (2%)	62	67
6	F	90/98 (92%)	90 (100%)	0	100	100
6	S	90/98 (92%)	87 (97%)	3 (3%)	41	43
7	G	66/71 (93%)	66 (100%)	0	100	100
7	T	66/71 (93%)	66 (100%)	0	100	100
8	H	63/74 (85%)	63 (100%)	0	100	100
8	U	63/74 (85%)	61 (97%)	2 (3%)	42	44
9	I	27/60 (45%)	26 (96%)	1 (4%)	37	38
9	V	27/60 (45%)	26 (96%)	1 (4%)	37	38
10	J	27/52 (52%)	25 (93%)	2 (7%)	15	11
10	W	51/52 (98%)	49 (96%)	2 (4%)	35	35
All	All	3323/3538 (94%)	3276 (99%)	47 (1%)	69	76

5 of 47 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	N	203	LEU
3	P	16	ASN
8	U	78	LYS
1	N	281	ASP
3	P	21	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 37 such sidechains are listed below:

Mol	Chain	Res	Type
5	E	57	GLN
1	N	165	GLN
6	S	79	GLN
6	F	79	GLN
9	I	71	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

45 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
12	PO4	A	2013	-	4,4,4	1.37	1 (25%)	6,6,6	0.75	0
11	JZR	A	4004	-	18,18,18	1.56	3 (16%)	23,23,23	0.61	0
13	AZI	A	4011	-	0,2,2	0.00	-	0,1,1	0.00	-
14	GOL	B	2009	-	5,5,5	1.17	0	5,5,5	0.56	0
16	SMA	C	2001	-	36,38,38	1.99	8 (22%)	44,52,52	1.55	4 (9%)
18	ANY	C	2002	-	38,38,41	1.86	11 (28%)	34,52,55	1.69	7 (20%)
13	AZI	C	2005	-	0,2,2	0.00	-	0,1,1	0.00	-
17	PEE	C	2007	-	48,48,50	1.18	5 (10%)	51,53,55	0.82	4 (7%)
14	GOL	C	2008	-	5,5,5	1.41	0	5,5,5	0.75	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
11	JZR	C	2010	-	18,18,18	1.78	4 (22%)	23,23,23	0.67	0
11	JZR	C	4002	-	18,18,18	1.84	4 (22%)	23,23,23	0.74	1 (4%)
14	GOL	C	4006	-	5,5,5	1.28	0	5,5,5	0.61	0
12	PO4	C	4008	-	4,4,4	1.42	1 (25%)	6,6,6	0.74	0
15	HEM	C	501	3	27,50,50	1.86	5 (18%)	17,82,82	1.18	1 (5%)
15	HEM	C	502	3	27,50,50	1.89	8 (29%)	17,82,82	1.35	2 (11%)
20	CDL	D	2003	-	38,38,99	1.05	1 (2%)	43,47,111	1.06	3 (6%)
17	PEE	D	2006	-	25,25,50	1.50	6 (24%)	28,30,55	0.79	1 (3%)
11	JZR	D	4003	-	18,18,18	1.81	4 (22%)	23,23,23	0.70	0
19	HEC	D	501	4	26,50,50	1.81	5 (19%)	18,82,82	0.98	1 (5%)
21	FES	E	501	5	0,4,4	0.00	-	0,4,4	0.00	-
12	PO4	F	2012	-	4,4,4	1.30	1 (25%)	6,6,6	0.75	0
11	JZR	F	3011	-	18,18,18	1.77	5 (27%)	23,23,23	0.65	0
11	JZR	F	4001	-	18,18,18	1.81	5 (27%)	23,23,23	0.69	0
20	CDL	G	2004	-	43,43,99	1.11	3 (6%)	49,55,111	1.23	5 (10%)
13	AZI	G	4009	-	0,2,2	0.00	-	0,1,1	0.00	-
14	GOL	O	3009	-	5,5,5	1.11	0	5,5,5	0.50	0
13	AZI	O	4010	-	0,2,2	0.00	-	0,1,1	0.00	-
16	SMA	P	3001	-	36,38,38	1.96	10 (27%)	44,52,52	1.62	4 (9%)
18	ANY	P	3002	-	38,38,41	1.85	11 (28%)	34,52,55	1.57	7 (20%)
20	CDL	P	3003	-	38,38,99	1.02	1 (2%)	43,47,111	1.05	3 (6%)
13	AZI	P	3005	-	0,2,2	0.00	-	0,1,1	0.00	-
17	PEE	P	3007	-	48,48,50	1.19	5 (10%)	51,53,55	0.82	4 (7%)
14	GOL	P	3008	-	5,5,5	1.24	0	5,5,5	0.56	0
11	JZR	P	3010	-	18,18,18	1.79	6 (33%)	23,23,23	0.68	0
12	PO4	P	3013	-	4,4,4	1.36	1 (25%)	6,6,6	0.73	0
15	HEM	P	501	3	27,50,50	1.93	7 (25%)	17,82,82	1.30	3 (17%)
15	HEM	P	502	3	27,50,50	2.03	7 (25%)	17,82,82	1.32	4 (23%)
17	PEE	Q	3006	-	50,50,50	1.23	6 (12%)	53,55,55	0.82	4 (7%)
19	HEC	Q	501	4	26,50,50	1.94	3 (11%)	18,82,82	0.90	0
14	GOL	R	4005	-	5,5,5	1.26	0	5,5,5	0.57	0
11	JZR	R	4007	-	18,18,18	1.82	4 (22%)	23,23,23	0.69	0
21	FES	R	501	5	0,4,4	0.00	-	0,4,4	0.00	-
11	JZR	S	2011	-	18,18,18	1.76	3 (16%)	23,23,23	0.71	0
12	PO4	S	3012	-	4,4,4	1.36	1 (25%)	6,6,6	0.74	0
20	CDL	T	3004	-	48,48,99	1.13	4 (8%)	54,60,111	1.16	4 (7%)

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	PO4	A	2013	-	-	0/0/0/0	0/0/0/0
11	JZR	A	4004	-	-	0/9/29/29	0/1/1/1
13	AZI	A	4011	-	-	0/0/0/0	0/0/0/0
14	GOL	B	2009	-	-	0/4/4/4	0/0/0/0
16	SMA	C	2001	-	-	0/33/34/34	0/2/2/2
18	ANY	C	2002	-	-	0/37/52/56	0/1/2/2
13	AZI	C	2005	-	-	0/0/0/0	0/0/0/0
17	PEE	C	2007	-	-	0/52/52/54	0/0/0/0
14	GOL	C	2008	-	-	0/4/4/4	0/0/0/0
11	JZR	C	2010	-	-	0/9/29/29	0/1/1/1
11	JZR	C	4002	-	-	0/9/29/29	0/1/1/1
14	GOL	C	4006	-	-	0/4/4/4	0/0/0/0
12	PO4	C	4008	-	-	0/0/0/0	0/0/0/0
15	HEM	C	501	3	-	0/6/54/54	0/0/8/8
15	HEM	C	502	3	-	0/6/54/54	0/0/8/8
20	CDL	D	2003	-	-	0/43/43/110	0/0/0/0
17	PEE	D	2006	-	-	0/29/29/54	0/0/0/0
11	JZR	D	4003	-	-	0/9/29/29	0/1/1/1
19	HEC	D	501	4	-	0/6/54/54	0/0/8/8
21	FES	E	501	5	-	0/0/4/4	0/1/1/1
12	PO4	F	2012	-	-	0/0/0/0	0/0/0/0
11	JZR	F	3011	-	-	0/9/29/29	0/1/1/1
11	JZR	F	4001	-	-	0/9/29/29	0/1/1/1
20	CDL	G	2004	-	-	0/52/52/110	0/0/0/0
13	AZI	G	4009	-	-	0/0/0/0	0/0/0/0
14	GOL	O	3009	-	-	0/4/4/4	0/0/0/0
13	AZI	O	4010	-	-	0/0/0/0	0/0/0/0
16	SMA	P	3001	-	-	0/33/34/34	0/2/2/2
18	ANY	P	3002	-	1/1/10/13	0/37/52/56	0/1/2/2
20	CDL	P	3003	-	-	0/43/43/110	0/0/0/0
13	AZI	P	3005	-	-	0/0/0/0	0/0/0/0
17	PEE	P	3007	-	-	0/52/52/54	0/0/0/0
14	GOL	P	3008	-	-	0/4/4/4	0/0/0/0
11	JZR	P	3010	-	-	0/9/29/29	0/1/1/1
12	PO4	P	3013	-	-	0/0/0/0	0/0/0/0
15	HEM	P	501	3	-	0/6/54/54	0/0/8/8
15	HEM	P	502	3	-	0/6/54/54	0/0/8/8
17	PEE	Q	3006	-	-	0/54/54/54	0/0/0/0
19	HEC	Q	501	4	-	0/6/54/54	0/0/8/8

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
14	GOL	R	4005	-	-	0/4/4/4	0/0/0/0
11	JZR	R	4007	-	-	0/9/29/29	0/1/1/1
21	FES	R	501	5	-	0/0/4/4	0/1/1/1
11	JZR	S	2011	-	-	0/9/29/29	0/1/1/1
12	PO4	S	3012	-	-	0/0/0/0	0/0/0/0
20	CDL	T	3004	-	-	0/57/57/110	0/0/0/0

The worst 5 of 149 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
19	Q	501	HEC	C3C-C2C	-6.41	1.33	1.40
19	Q	501	HEC	C3B-C2B	-5.56	1.34	1.40
19	D	501	HEC	C3C-C2C	-4.83	1.35	1.40
15	P	502	HEM	C3B-CAB	-4.82	1.38	1.47
19	D	501	HEC	C3B-C2B	-4.76	1.35	1.40

The worst 5 of 62 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
16	C	2001	SMA	C3-C4-C4A	-4.87	114.79	121.25
16	P	3001	SMA	C3-C4-C4A	-4.52	115.25	121.25
16	P	3001	SMA	C9-C10-C11	-4.50	108.65	114.72
20	T	3004	CDL	CB4-OB6-CB5	-4.28	109.82	117.91
16	C	2001	SMA	C9-C10-C11	-4.07	109.23	114.72

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
18	P	3002	ANY	C22

There are no torsion outliers.

There are no ring outliers.

23 monomers are involved in 40 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
16	C	2001	SMA	2	0
18	C	2002	ANY	1	0
14	C	2008	GOL	1	0
11	C	4002	JZR	2	0
15	C	501	HEM	1	0
15	C	502	HEM	2	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
17	D	2006	PEE	3	0
11	D	4003	JZR	3	0
19	D	501	HEC	3	0
11	F	3011	JZR	2	0
11	F	4001	JZR	1	0
16	P	3001	SMA	2	0
18	P	3002	ANY	2	0
20	P	3003	CDL	2	0
17	P	3007	PEE	1	0
15	P	501	HEM	1	0
15	P	502	HEM	1	0
17	Q	3006	PEE	3	0
19	Q	501	HEC	1	0
14	R	4005	GOL	1	0
11	R	4007	JZR	1	0
11	S	2011	JZR	3	0
20	T	3004	CDL	2	0

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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	442/446 (99%)	0.28	9 (2%) 65 69	25, 39, 60, 115	0
1	N	441/446 (98%)	0.41	23 (5%) 27 33	33, 52, 76, 139	1 (0%)
2	B	424/439 (96%)	0.20	9 (2%) 63 68	29, 42, 66, 94	0
2	O	424/439 (96%)	0.26	13 (3%) 49 56	30, 47, 70, 124	0
3	C	365/379 (96%)	0.00	3 (0%) 86 88	23, 36, 53, 108	0
3	P	365/379 (96%)	0.02	4 (1%) 80 84	29, 39, 53, 106	0
4	D	241/241 (100%)	0.02	1 (0%) 92 93	31, 44, 64, 82	0
4	Q	241/241 (100%)	0.11	3 (1%) 79 82	35, 48, 67, 89	0
5	E	196/196 (100%)	1.04	40 (20%) 1 1	35, 62, 106, 111	0
5	R	196/196 (100%)	0.37	9 (4%) 32 38	34, 51, 77, 95	0
6	F	99/110 (90%)	0.04	1 (1%) 82 85	27, 40, 69, 79	0
6	S	99/110 (90%)	0.24	4 (4%) 38 45	33, 42, 80, 102	0
7	G	75/81 (92%)	0.54	5 (6%) 18 22	29, 53, 76, 89	0
7	T	76/81 (93%)	0.80	12 (15%) 2 2	37, 63, 93, 95	0
8	H	66/78 (84%)	0.32	2 (3%) 50 57	43, 59, 77, 81	0
8	U	66/78 (84%)	0.95	9 (13%) 3 4	50, 66, 89, 104	0
9	I	43/78 (55%)	1.60	15 (34%) 0 0	34, 65, 84, 89	0
9	V	43/78 (55%)	2.22	20 (46%) 0 0	38, 72, 86, 91	0
10	J	33/62 (53%)	1.03	5 (15%) 2 3	37, 54, 115, 130	0
10	W	62/62 (100%)	1.70	22 (35%) 0 0	44, 74, 129, 144	0
All	All	3997/4220 (94%)	0.33	209 (5%) 27 33	23, 45, 81, 144	1 (0%)

The worst 5 of 209 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	N	227	ALA	18.5
7	G	75	ALA	11.6
10	J	62	LYS	10.2
10	W	2	ALA	9.8
10	W	1	VAL	9.4

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 carbohydrates in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
11	JZR	F	4001	18/18	0.14	0.72	146,154,157,158	0
13	AZI	A	4011	3/3	0.20	0.46	61,61,66,69	0
11	JZR	D	4003	18/18	0.28	0.70	160,169,171,171	0
14	GOL	B	2009	6/6	0.36	0.59	84,85,86,86	0
11	JZR	S	2011	18/18	0.42	0.46	61,89,94,98	0
11	JZR	C	4002	18/18	0.55	0.51	114,122,125,125	0
14	GOL	O	3009	6/6	0.56	0.65	82,84,85,85	0
11	JZR	F	3011	18/18	0.58	0.42	108,113,116,116	0
13	AZI	O	4010	3/3	0.60	0.65	102,102,104,104	0
14	GOL	C	4006	6/6	0.62	0.52	96,98,99,100	0
11	JZR	P	3010	18/18	0.63	0.37	103,107,112,112	0
11	JZR	C	2010	18/18	0.63	0.38	94,103,108,108	0
11	JZR	R	4007	18/18	0.65	0.34	85,95,98,99	0
17	PEE	D	2006	26/51	0.67	0.30	85,98,108,109	0
13	AZI	C	2005	3/3	0.67	0.20	54,54,56,58	0
13	AZI	G	4009	3/3	0.69	0.22	66,66,67,68	0
12	PO4	A	2013	5/5	0.71	0.16	119,120,121,122	0
12	PO4	C	4008	5/5	0.76	0.17	153,153,153,153	0
13	AZI	P	3005	3/3	0.78	0.12	51,51,54,56	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
20	CDL	D	2003	39/100	0.79	0.18	53,78,93,94	0
14	GOL	R	4005	6/6	0.81	0.20	81,83,84,85	0
14	GOL	P	3008	6/6	0.82	0.15	67,69,71,71	0
20	CDL	P	3003	39/100	0.84	0.19	61,89,111,111	0
17	PEE	Q	3006	51/51	0.86	0.29	65,75,98,100	0
20	CDL	G	2004	44/100	0.88	0.21	73,87,99,102	0
14	GOL	C	2008	6/6	0.89	0.31	61,65,68,75	0
12	PO4	P	3013	5/5	0.91	0.10	104,105,106,106	0
20	CDL	T	3004	49/100	0.91	0.23	74,89,107,107	0
12	PO4	S	3012	5/5	0.93	0.15	97,97,99,100	0
17	PEE	P	3007	49/51	0.94	0.20	41,57,81,81	0
12	PO4	F	2012	5/5	0.95	0.12	81,82,83,84	0
18	ANY	C	2002	37/40	0.95	0.14	31,39,65,70	0
16	SMA	P	3001	37/37	0.95	0.13	27,40,44,46	0
18	ANY	P	3002	37/40	0.95	0.16	33,39,67,71	0
17	PEE	C	2007	49/51	0.95	0.18	35,55,81,83	0
16	SMA	C	2001	37/37	0.96	0.13	31,39,44,48	0
11	JZR	A	4004	18/18	0.96	0.13	28,34,40,42	0
21	FES	E	501	4/4	0.97	0.10	41,41,43,43	0
15	HEM	P	502	43/43	0.97	0.13	27,31,36,40	0
15	HEM	C	501	43/43	0.97	0.12	20,31,38,47	0
19	HEC	Q	501	43/43	0.97	0.12	38,45,48,51	0
15	HEM	C	502	43/43	0.98	0.13	22,28,34,37	0
21	FES	R	501	4/4	0.98	0.14	35,35,37,37	0
15	HEM	P	501	43/43	0.98	0.12	30,34,42,46	0
19	HEC	D	501	43/43	0.98	0.12	35,41,44,45	0

6.5 Other polymers [i](#)

There are no such residues in this entry.