Full wwPDB NMR Structure Validation Report (i)

Jun 24, 2024 – 06:02 PM EDT

PDB ID	:	6WQE
BMRB ID	:	27284
Title	:	Solution Structure of the IWP-051-bound H-NOX from Shewanella woodyi in the Fe(II)CO ligation state
Authors	:	Chen, C.Y.; Lee, W.; Montfort, W.R.
Deposited on	:	2020-04-28

This is a Full wwPDB NMR 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/NMRValidationReportHelp
with specific help available everywhere you see the (i) symbol.

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

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

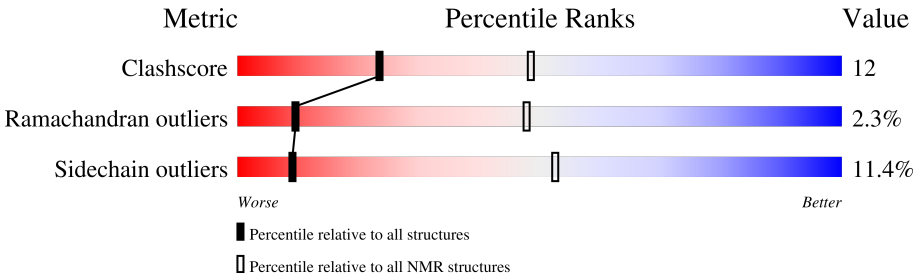
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
SOLUTION NMR

The overall completeness of chemical shifts assignment is 72%.

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)	NMR archive (#Entries)
Clashscore	158937	12864
Ramachandran outliers	154571	11451
Sidechain outliers	154315	11428

The table below summarises the geometric issues observed across the polymeric chains and their fit to the experimental data. The red, orange, yellow and green segments indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria. A cyan segment indicates the fraction of residues that are not part of the well-defined cores, and 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%

Mol	Chain	Length	Quality of chain
1	A	190	69% 22% • • 5%

2 Ensemble composition and analysis (i)

This entry contains 20 models. Model 1 is the overall representative, medoid model (most similar to other models).

The following residues are included in the computation of the global validation metrics.

Well-defined (core) protein residues			
Well-defined core	**Residue range (total)**	**Backbone RMSD (Å)**	**Medoid model**
1	A:2-A:181 (180)	0.17	1

Ill-defined regions of proteins are excluded from the global statistics.

Ligands and non-protein polymers are included in the analysis.

The models can be grouped into 3 clusters and 7 single-model clusters were found.

Cluster number	Models
1	1, 2, 3, 11, 12, 15, 16
2	6, 13, 18
3	5, 14, 20
Single-model clusters	4; 7; 8; 9; 10; 17; 19

3 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 3128 atoms, of which 1527 are hydrogens and 0 are deuteriums.

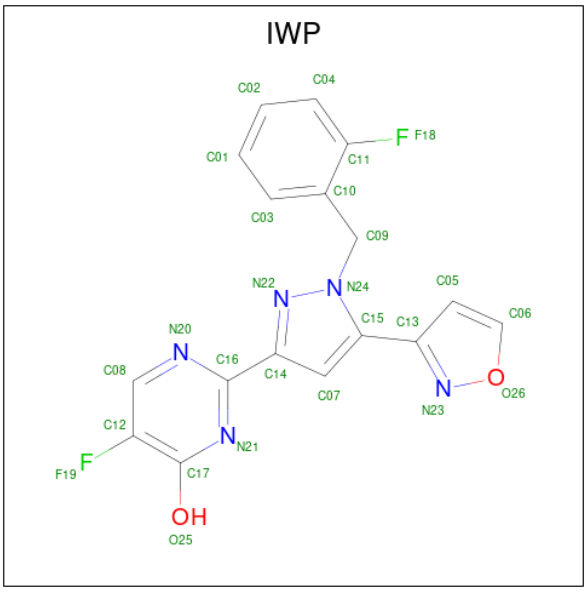
- Molecule 1 is a protein called Heme NO binding domain protein.

Mol	Chain	Residues	Atoms						Trace
1	A	190	Total	C	H	N	O	S	0
			3016	978	1486	239	305	8	

There are 8 discrepancies between the modelled and reference sequences:

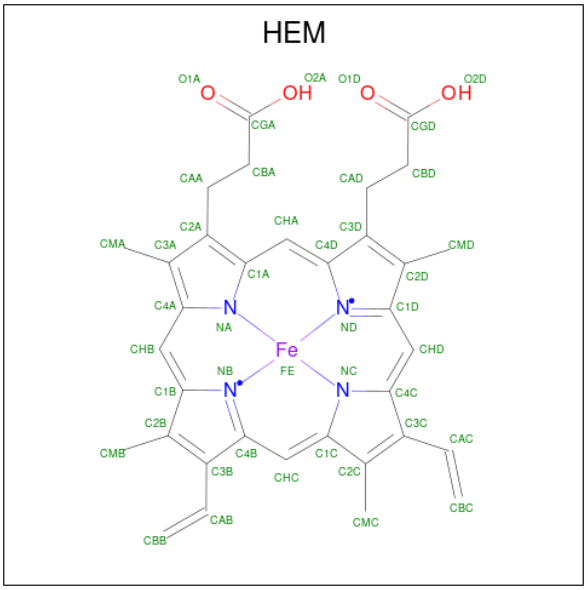
Chain	Residue	Modelled	Actual	Comment	Reference
A	183	GLY	-	expression tag	UNP B1KIH6
A	184	ALA	-	expression tag	UNP B1KIH6
A	185	GLU	-	expression tag	UNP B1KIH6
A	186	ASN	-	expression tag	UNP B1KIH6
A	187	LEU	-	expression tag	UNP B1KIH6
A	188	TYR	-	expression tag	UNP B1KIH6
A	189	PHE	-	expression tag	UNP B1KIH6
A	190	GLN	-	expression tag	UNP B1KIH6

- Molecule 2 is 5-fluoro-2-{1-[(2-fluorophenyl)methyl]-5-(1,2-oxazol-3-yl)-1H-pyrazol-3-yl }pyrimidin-4-ol (three-letter code: IWP) (formula: $C_{17}H_{11}F_2N_5O_2$) (labeled as "Ligand of Interest" by depositor).



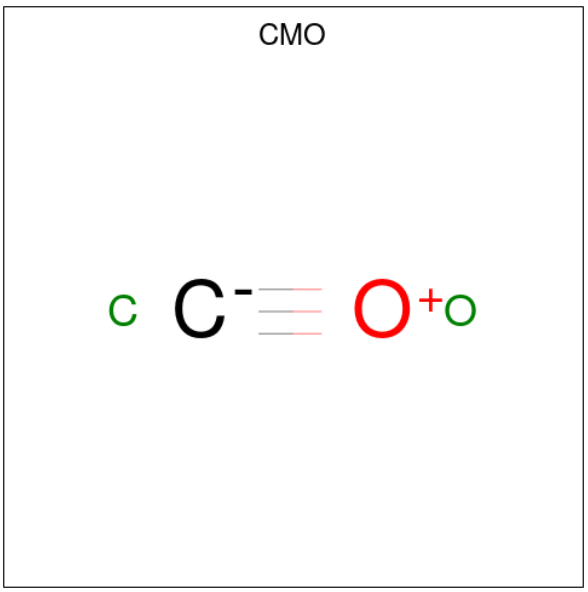
Mol	Chain	Residues	Atoms					
			Total	C	F	H	N	O
2	A	1	37	17	2	11	5	2

- Molecule 3 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).



Mol	Chain	Residues	Atoms					
			Total	C	Fe	H	N	O
3	A	1	73	34	1	30	4	4

- Molecule 4 is CARBON MONOXIDE (three-letter code: CMO) (formula: CO).



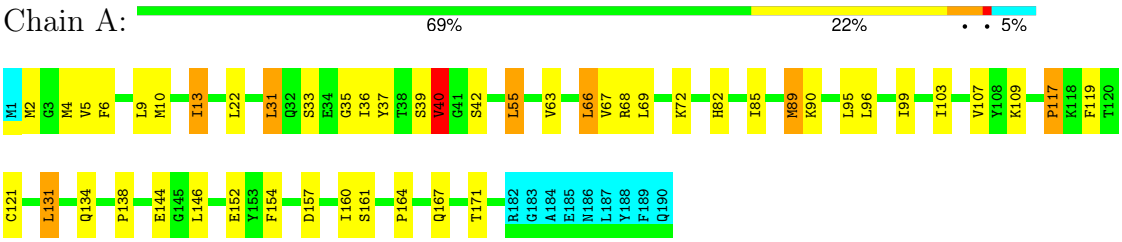
Mol	Chain	Residues	Atoms		
4	A	1	Total	C	O
			2	1	1

4 Residue-property plots

4.1 Average score per residue in the NMR ensemble

These plots are provided for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic is the same as shown in the summary in section 1 of this report. The second graphic shows the sequence where residues are colour-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. Stretches of 2 or more consecutive residues without any outliers are shown as green connectors. Residues which are classified as ill-defined in the NMR ensemble, are shown in cyan with an underline colour-coded according to the previous scheme. Residues which were present in the experimental sample, but not modelled in the final structure are shown in grey.

• Molecule 1: Heme NO binding domain protein

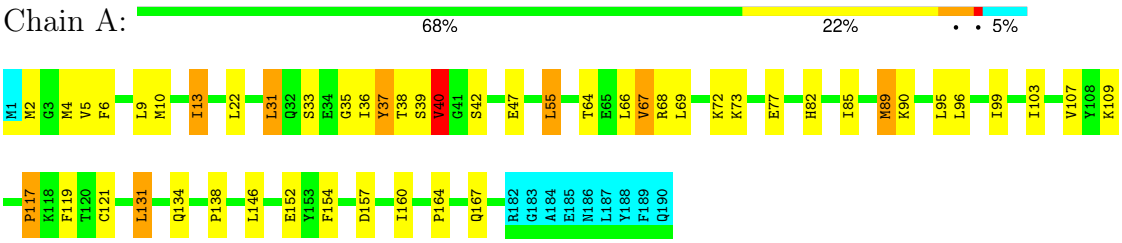


4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

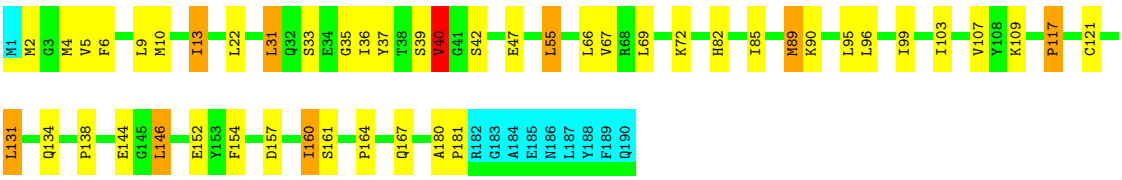
4.2.1 Score per residue for model 1 (medoid)

• Molecule 1: Heme NO binding domain protein



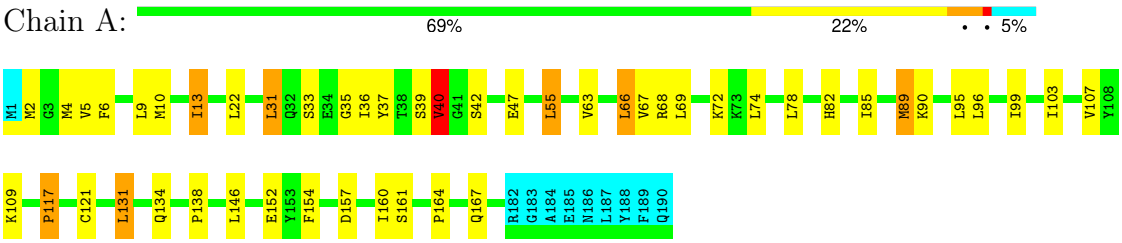
4.2.2 Score per residue for model 2

• Molecule 1: Heme NO binding domain protein



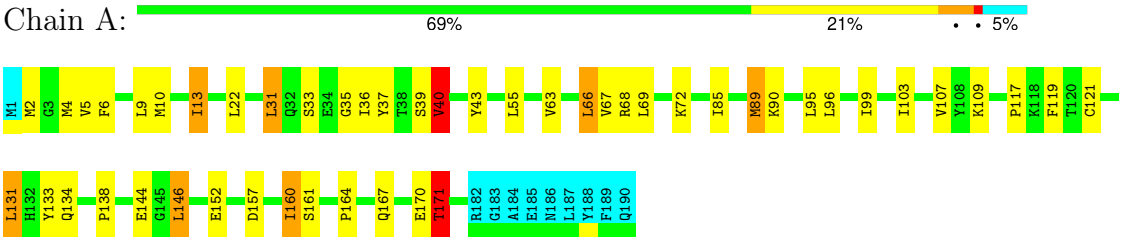
4.2.3 Score per residue for model 3

• Molecule 1: Heme NO binding domain protein



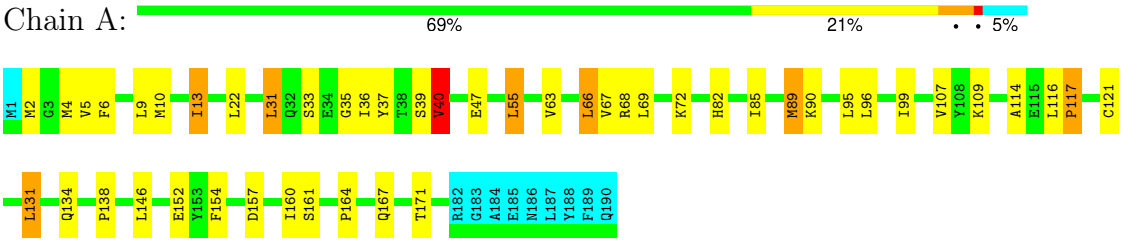
4.2.4 Score per residue for model 4

• Molecule 1: Heme NO binding domain protein



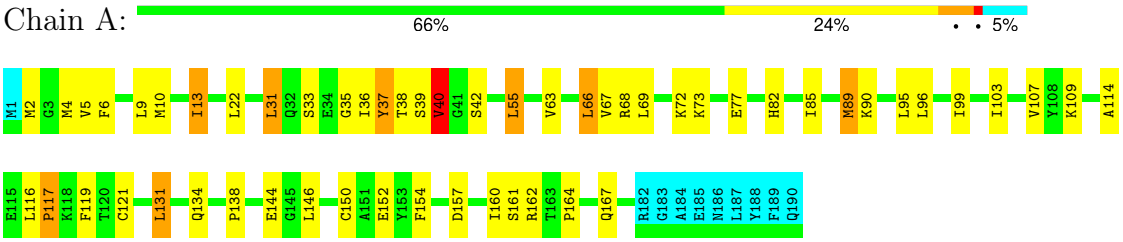
4.2.5 Score per residue for model 5

• Molecule 1: Heme NO binding domain protein



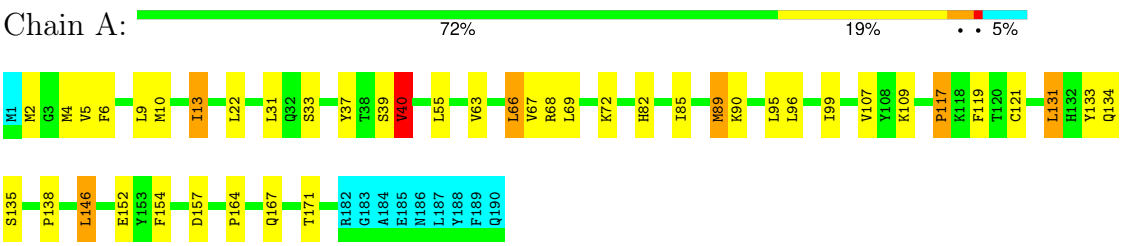
4.2.6 Score per residue for model 6

• Molecule 1: Heme NO binding domain protein



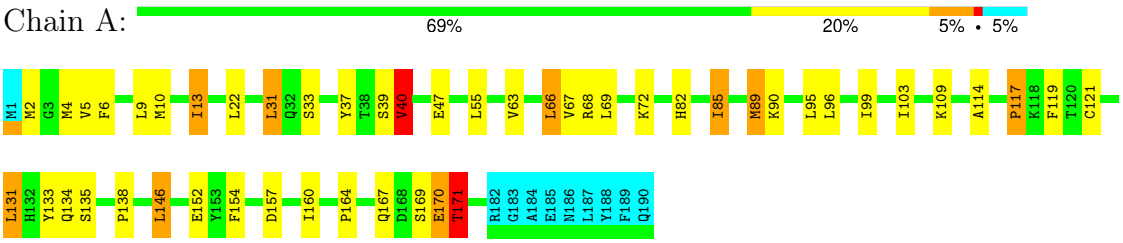
4.2.7 Score per residue for model 7

• Molecule 1: Heme NO binding domain protein



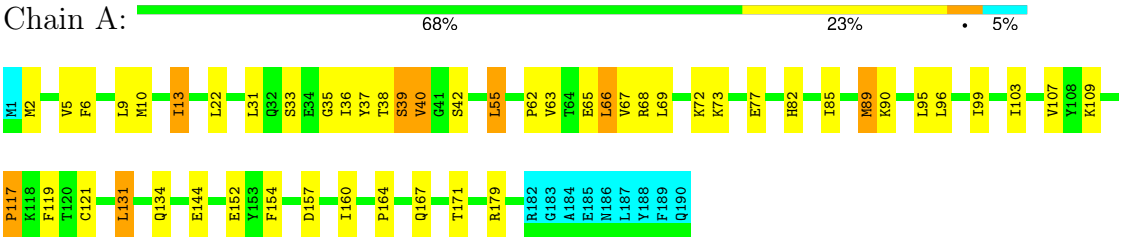
4.2.8 Score per residue for model 8

• Molecule 1: Heme NO binding domain protein



4.2.9 Score per residue for model 9

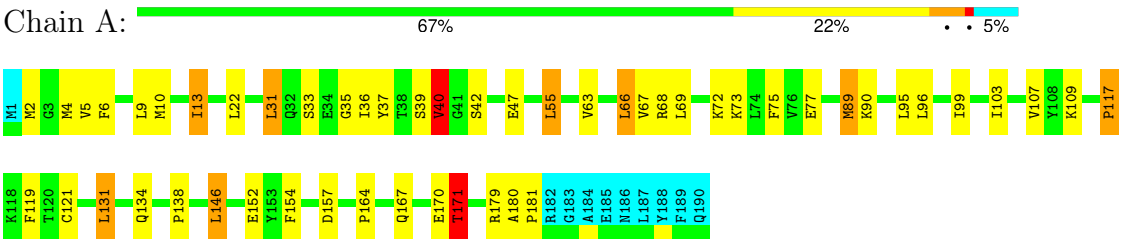
• Molecule 1: Heme NO binding domain protein



4.2.10 Score per residue for model 10

• Molecule 1: Heme NO binding domain protein

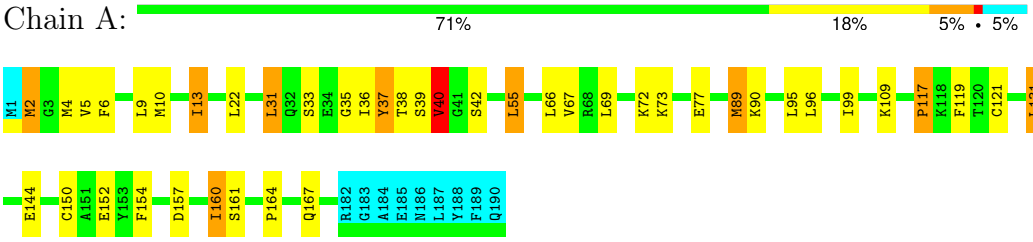
Chain A:



4.2.11 Score per residue for model 11

• Molecule 1: Heme NO binding domain protein

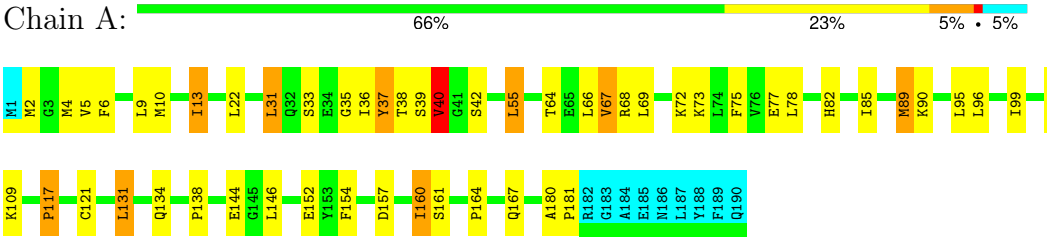
Chain A:



4.2.12 Score per residue for model 12

• Molecule 1: Heme NO binding domain protein

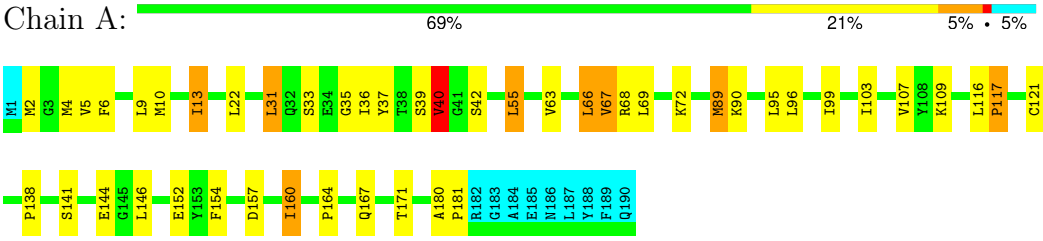
Chain A:



4.2.13 Score per residue for model 13

• Molecule 1: Heme NO binding domain protein

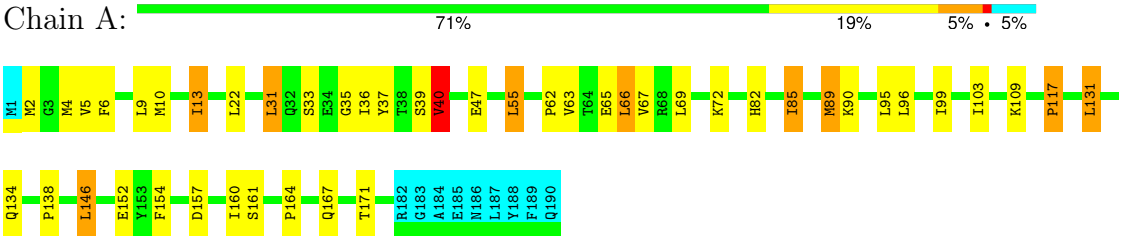
Chain A:



4.2.14 Score per residue for model 14

• Molecule 1: Heme NO binding domain protein

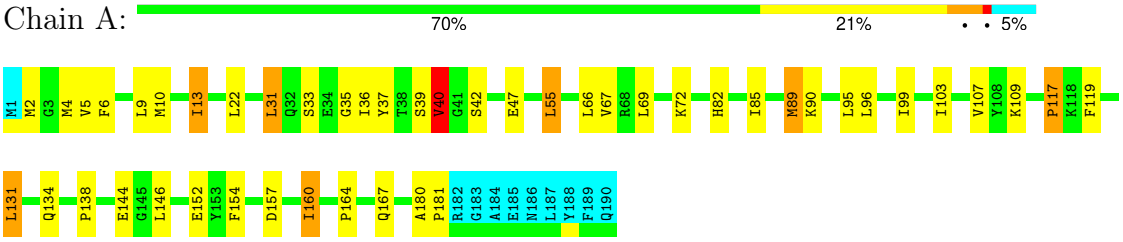
Chain A:



4.2.15 Score per residue for model 15

• Molecule 1: Heme NO binding domain protein

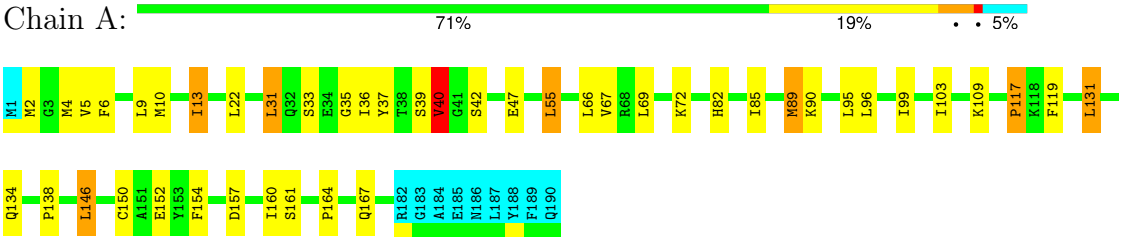
Chain A:



4.2.16 Score per residue for model 16

• Molecule 1: Heme NO binding domain protein

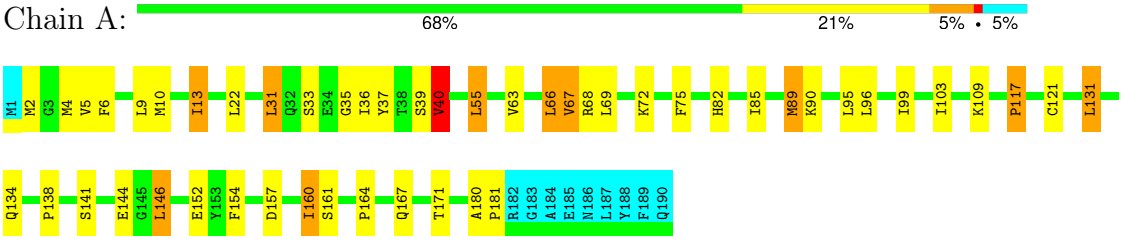
Chain A:



4.2.17 Score per residue for model 17

• Molecule 1: Heme NO binding domain protein

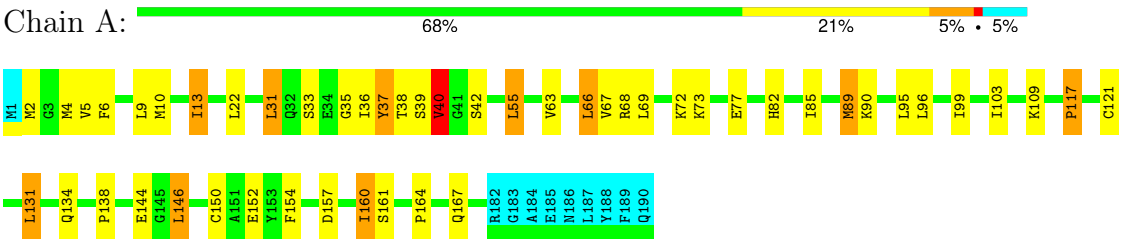
Chain A:



4.2.18 Score per residue for model 18

• Molecule 1: Heme NO binding domain protein

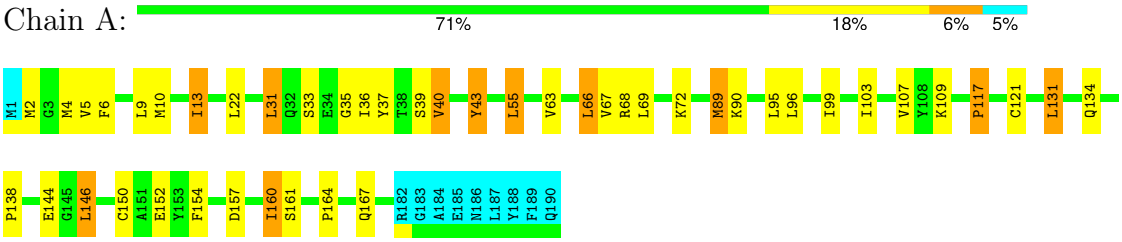
Chain A:



4.2.19 Score per residue for model 19

• Molecule 1: Heme NO binding domain protein

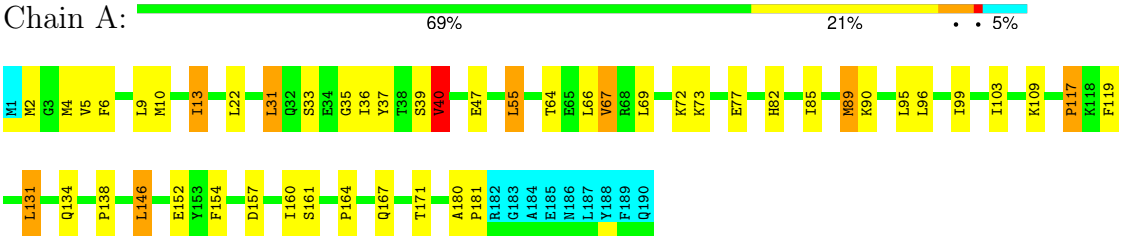
Chain A:



4.2.20 Score per residue for model 20

• Molecule 1: Heme NO binding domain protein

Chain A:



5 Refinement protocol and experimental data overview

The models were refined using the following method: *simulated annealing*.

Of the 200 calculated structures, 20 were deposited, based on the following criterion: *structures with acceptable covalent geometry*.

The following table shows the software used for structure solution, optimisation and refinement.

Software name	Classification	Version
X-PLOR NIH	refinement	
X-PLOR NIH	structure calculation	

The following table shows chemical shift validation statistics as aggregates over all chemical shift files. Detailed validation can be found in section 7 of this report.

Chemical shift file(s)	working_cs.cif
Number of chemical shift lists	1
Total number of shifts	2280
Number of shifts mapped to atoms	1865
Number of unparsed shifts	0
Number of shifts with mapping errors	415
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	72%

6 Model quality

6.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: HEM, CMO, IWP

There are no covalent bond-length or bond-angle outliers.

There are no bond-length outliers.

There are no bond-angle outliers.

There are no chirality outliers.

There are no planarity outliers.

6.2 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 each 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 averaged over the ensemble.

Mol	Chain	Non-H	H(model)	H(added)	Clashes
1	A	1444	1405	1405	28±4
2	A	26	11	0	2±0
3	A	43	30	30	10±3
4	A	2	0	0	1±1
All	All	30300	28920	28700	721

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 12.

All unique clashes are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
3:A:502:HEM:O1D	3:A:502:HEM:C4D	1.42	1.70	9	14
3:A:502:HEM:O1D	3:A:502:HEM:C3D	1.19	1.92	13	10
1:A:114:ALA:HB1	3:A:502:HEM:CBD	1.08	1.77	6	2
3:A:502:HEM:O1D	3:A:502:HEM:CHA	1.07	2.03	9	7
1:A:114:ALA:HB1	3:A:502:HEM:HBD2	1.06	1.27	6	2
1:A:69:LEU:HD13	2:A:501:IWP:C02	1.00	1.86	8	20
3:A:502:HEM:HHA	3:A:502:HEM:CGD	0.95	1.92	9	15
3:A:502:HEM:CHA	3:A:502:HEM:CGD	0.95	2.44	9	5
3:A:502:HEM:O1D	3:A:502:HEM:HHA	0.93	1.63	5	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
3:A:502:HEM:HBD2	3:A:502:HEM:CHA	0.90	1.96	11	10
3:A:502:HEM:HBD2	3:A:502:HEM:HHA	0.88	1.43	11	3
3:A:502:HEM:C4D	3:A:502:HEM:CGD	0.87	2.55	9	3
3:A:502:HEM:HHA	3:A:502:HEM:CBD	0.86	2.00	14	14
3:A:502:HEM:HHA	3:A:502:HEM:HBD2	0.86	1.47	12	8
1:A:4:MET:HG3	1:A:39:SER:HB2	0.85	1.48	6	19
3:A:502:HEM:HHA	3:A:502:HEM:O1D	0.83	1.74	3	11
3:A:502:HEM:HMB1	3:A:502:HEM:HBB2	0.82	1.51	6	1
1:A:116:LEU:HD21	3:A:502:HEM:HAD2	0.81	1.51	6	3
1:A:133:TYR:OH	3:A:502:HEM:CBA	0.78	2.31	4	1
3:A:502:HEM:HBD1	3:A:502:HEM:HHA	0.78	1.55	10	2
1:A:69:LEU:HD13	2:A:501:IWP:C01	0.77	2.09	8	19
3:A:502:HEM:CHA	3:A:502:HEM:O1D	0.76	2.34	3	9
1:A:107:VAL:HG11	3:A:502:HEM:HMD1	0.75	1.56	6	1
3:A:502:HEM:CHA	3:A:502:HEM:CBD	0.75	2.61	3	6
1:A:6:PHE:O	1:A:10:MET:HG2	0.74	1.83	10	20
1:A:114:ALA:CB	3:A:502:HEM:CBD	0.73	2.65	6	1
3:A:502:HEM:HHA	3:A:502:HEM:HBD1	0.72	1.60	8	1
3:A:502:HEM:HBD1	3:A:502:HEM:CHA	0.72	2.13	8	2
1:A:107:VAL:HG11	3:A:502:HEM:HMD3	0.72	1.62	5	4
1:A:63:VAL:HA	1:A:66:LEU:HD23	0.72	1.60	4	10
3:A:502:HEM:CBD	3:A:502:HEM:CHA	0.71	2.62	15	4
3:A:502:HEM:HBB2	3:A:502:HEM:CMB	0.68	2.18	6	1
3:A:502:HEM:CGD	3:A:502:HEM:HHA	0.68	2.19	13	1
1:A:31:LEU:HG	1:A:35:GLY:HA2	0.68	1.65	13	16
1:A:99:ILE:HD13	1:A:103:ILE:HD12	0.67	1.66	9	17
1:A:146:LEU:HD21	4:A:503:CMO:O	0.67	1.90	17	11
1:A:133:TYR:OH	3:A:502:HEM:CGA	0.66	2.43	4	1
1:A:114:ALA:HB1	3:A:502:HEM:HBD1	0.66	1.63	6	1
3:A:502:HEM:CMA	3:A:502:HEM:HBA1	0.66	2.19	7	1
1:A:180:ALA:HB1	1:A:181:PRO:HD2	0.66	1.68	15	7
1:A:114:ALA:HB1	3:A:502:HEM:O2D	0.65	1.90	8	1
3:A:502:HEM:CGD	3:A:502:HEM:CHA	0.65	2.72	16	5
3:A:502:HEM:CHA	3:A:502:HEM:HBD2	0.64	2.23	16	1
1:A:72:LYS:HE3	1:A:152:GLU:HG2	0.62	1.70	7	20
3:A:502:HEM:HBA1	3:A:502:HEM:CMA	0.62	2.24	3	5
1:A:13:ILE:CD1	1:A:55:LEU:HD11	0.62	2.24	8	20
1:A:31:LEU:HG	1:A:35:GLY:CA	0.62	2.24	1	17
1:A:63:VAL:HA	1:A:66:LEU:CD2	0.62	2.24	19	13
1:A:107:VAL:HG11	3:A:502:HEM:CMD	0.61	2.25	6	13
1:A:114:ALA:CB	3:A:502:HEM:HBD1	0.61	2.22	6	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:133:TYR:OH	3:A:502:HEM:HBA2	0.61	1.94	4	1
1:A:75:PHE:CE1	3:A:502:HEM:CBB	0.61	2.83	10	3
1:A:164:PRO:HA	1:A:167:GLN:HB2	0.60	1.71	9	20
1:A:95:LEU:O	1:A:99:ILE:HG12	0.58	1.98	20	20
1:A:36:ILE:O	1:A:36:ILE:HG23	0.58	1.99	2	18
1:A:170:GLU:O	1:A:171:THR:HG23	0.57	2.00	10	3
1:A:146:LEU:CD2	4:A:503:CMO:O	0.57	2.52	17	6
1:A:99:ILE:HD13	1:A:103:ILE:CD1	0.55	2.32	9	11
1:A:89:MET:SD	1:A:154:PHE:HZ	0.54	2.25	11	19
1:A:131:LEU:O	1:A:131:LEU:HG	0.54	2.01	9	15
3:A:502:HEM:CMB	3:A:502:HEM:HBB2	0.54	2.32	15	7
3:A:502:HEM:HBB2	3:A:502:HEM:HMB2	0.54	1.80	15	1
3:A:502:HEM:HMB1	3:A:502:HEM:CBB	0.53	2.32	6	1
3:A:502:HEM:HBA1	3:A:502:HEM:HMA3	0.53	1.81	7	4
1:A:40:VAL:O	1:A:40:VAL:HG12	0.52	2.04	9	1
1:A:2:MET:O	1:A:5:VAL:HG22	0.52	2.04	8	20
1:A:13:ILE:HD11	1:A:55:LEU:HD11	0.52	1.80	7	1
1:A:38:THR:HG23	1:A:39:SER:H	0.52	1.65	9	1
1:A:13:ILE:HD12	1:A:55:LEU:HD11	0.51	1.83	9	9
1:A:119:PHE:CE1	1:A:131:LEU:HD13	0.51	2.40	4	7
1:A:66:LEU:O	1:A:66:LEU:HG	0.51	2.03	10	4
1:A:89:MET:HG2	1:A:90:LYS:N	0.51	2.20	8	20
1:A:107:VAL:HG11	3:A:502:HEM:HMD2	0.50	1.83	19	2
1:A:117:PRO:HB2	1:A:134:GLN:O	0.49	2.07	5	20
1:A:144:GLU:HG3	1:A:160:ILE:HD13	0.49	1.84	19	11
1:A:119:PHE:HE1	1:A:131:LEU:HD13	0.48	1.69	1	7
1:A:38:THR:HG23	1:A:39:SER:N	0.48	2.24	9	1
1:A:82:HIS:HB3	1:A:85:ILE:HB	0.48	1.86	15	15
1:A:78:LEU:HD13	3:A:502:HEM:HMC1	0.47	1.84	12	1
1:A:73:LYS:O	1:A:77:GLU:HG2	0.47	2.09	10	8
1:A:133:TYR:HH	3:A:502:HEM:CGA	0.46	2.23	4	1
3:A:502:HEM:HMB2	3:A:502:HEM:CBB	0.46	2.39	15	1
1:A:62:PRO:HG2	1:A:65:GLU:CB	0.46	2.40	14	2
1:A:95:LEU:HD22	1:A:150:CYS:SG	0.46	2.50	11	5
1:A:9:LEU:O	1:A:13:ILE:HG12	0.45	2.10	20	20
1:A:40:VAL:O	1:A:40:VAL:HG13	0.45	2.11	13	16
1:A:133:TYR:CE2	1:A:135:SER:HB2	0.45	2.47	8	2
1:A:31:LEU:CD2	1:A:35:GLY:HA3	0.45	2.42	9	1
1:A:40:VAL:O	1:A:40:VAL:CG1	0.45	2.65	9	1
1:A:31:LEU:HG	1:A:35:GLY:HA3	0.44	1.89	11	1
3:A:502:HEM:CMB	3:A:502:HEM:CBB	0.44	2.89	6	6

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:116:LEU:CD2	3:A:502:HEM:HAD2	0.43	2.35	6	1
1:A:64:THR:O	1:A:67:VAL:HG12	0.43	2.14	12	3
1:A:40:VAL:HG13	1:A:40:VAL:O	0.43	2.13	17	2
1:A:36:ILE:O	1:A:36:ILE:CG2	0.42	2.67	2	7
1:A:37:TYR:HB3	1:A:38:THR:H	0.42	1.44	6	5
1:A:31:LEU:HD13	1:A:31:LEU:HA	0.42	1.70	8	3
1:A:67:VAL:HG11	1:A:141:SER:HB3	0.41	1.92	17	2
1:A:74:LEU:HD22	1:A:74:LEU:O	0.41	2.15	3	1
1:A:78:LEU:HD13	3:A:502:HEM:HMC3	0.41	1.92	3	1
3:A:502:HEM:CMA	3:A:502:HEM:CBA	0.41	2.94	7	1
1:A:2:MET:HG2	1:A:43:TYR:HB2	0.41	1.93	19	1

6.3 Torsion angles (i)

6.3.1 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 PDB entries followed by that with respect to all NMR entries. 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	180/190 (95%)	166±1 (92±0%)	10±1 (5±1%)	4±1 (2±0%)	9	48
All	All	3600/3800 (95%)	3327 (92%)	191 (5%)	82 (2%)	9	48

All 7 unique Ramachandran outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type	Models (Total)
1	A	40	VAL	20
1	A	117	PRO	19
1	A	138	PRO	19
1	A	42	SER	12
1	A	171	THR	10
1	A	170	GLU	1
1	A	39	SER	1

6.3.2 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 PDB entries followed by that with respect to all NMR entries. 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	164/172 (95%)	145±1 (89±1%)	19±1 (11±1%)	9 52
All	All	3280/3440 (95%)	2905 (89%)	375 (11%)	9 52

All 27 unique residues with a non-rotameric sidechain are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type	Models (Total)
1	A	13	ILE	20
1	A	22	LEU	20
1	A	33	SER	20
1	A	37	TYR	20
1	A	66	LEU	20
1	A	67	VAL	20
1	A	89	MET	20
1	A	96	LEU	20
1	A	109	LYS	20
1	A	131	LEU	20
1	A	157	ASP	20
1	A	31	LEU	19
1	A	40	VAL	19
1	A	146	LEU	18
1	A	55	LEU	17
1	A	121	CYS	16
1	A	160	ILE	16
1	A	68	ARG	14
1	A	161	SER	13
1	A	47	GLU	10
1	A	85	ILE	3
1	A	171	THR	3
1	A	43	TYR	2
1	A	179	ARG	2
1	A	162	ARG	1
1	A	169	SER	1
1	A	2	MET	1

6.3.3 RNA

There are no RNA molecules in this entry.

6.4 Non-standard residues in protein, DNA, RNA chains

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

6.5 Carbohydrates

There are no monosaccharides in this entry.

6.6 Ligand geometry

3 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds for which Mogul statistics could be retrieved, the number of bonds that are observed in the model and the number of bonds 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 is the number of standard deviations the observed value is removed from the expected value. A bond length with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the average root-mean-square of all Z scores of the bond lengths.

Mol	Type	Chain	Res	Link	Bond lengths		
					Counts	RMSZ	#Z>2
2	IWP	A	501	-	25,29,29	1.07±0.01	3±0 (12±0%)
3	HEM	A	502	1	42,50,50	2.09±0.01	17±0 (40±0%)
4	CMO	A	503	-	0,1,1	0.00±0.00	-

In the following table, the Counts columns list the number of angles for which Mogul statistics could be retrieved, the number of angles that are observed in the model and the number of 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 angle is the number of standard deviations the observed value is removed from the expected value. A bond angle with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the average root-mean-square of all Z scores of the bond angles.

Mol	Type	Chain	Res	Link	Bond angles		
					Counts	RMSZ	#Z>2
2	IWP	A	501	-	29,41,41	2.38±0.01	6±0 (20±0%)
3	HEM	A	502	1	46,82,82	1.09±0.02	1±0 (2±0%)
4	CMO	A	503	-	-	-	-

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
3	HEM	A	502	1	-	0±0,12,54,54	-
2	IWP	A	501	-	-	0±0,4,12,12	0±0,4,4,4

All unique bond outliers are listed below. They are sorted according to the Z-score of the worst occurrence in the ensemble.

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)	Models	
								Worst	Total
3	A	502	HEM	C4D-C3D	5.00	1.36	1.45	6	20
3	A	502	HEM	C3B-C4B	4.35	1.36	1.44	11	20
3	A	502	HEM	C1B-C2B	3.84	1.36	1.44	9	20
3	A	502	HEM	C1D-C2D	3.77	1.36	1.44	20	20
3	A	502	HEM	CMA-C3A	3.13	1.45	1.51	12	20
3	A	502	HEM	C3C-C4C	3.07	1.36	1.41	5	20
3	A	502	HEM	C3C-C2C	2.94	1.36	1.40	6	20
2	A	501	IWP	C15-C13	2.83	1.43	1.48	4	20
3	A	502	HEM	O2D-CGD	2.75	1.21	1.30	8	20
3	A	502	HEM	CMD-C2D	2.73	1.45	1.50	6	20
3	A	502	HEM	CAA-C2A	2.68	1.45	1.52	12	20
3	A	502	HEM	CMB-C2B	2.64	1.45	1.50	13	20
3	A	502	HEM	O2A-CGA	2.60	1.22	1.30	8	20
3	A	502	HEM	C2C-C1C	2.55	1.36	1.42	10	20
3	A	502	HEM	CMC-C2C	2.50	1.45	1.51	20	20
2	A	501	IWP	C07-C14	2.36	1.44	1.40	4	20
3	A	502	HEM	CAD-C3D	2.34	1.45	1.51	9	20
3	A	502	HEM	CBD-CGD	2.29	1.45	1.50	1	20
2	A	501	IWP	C14-N22	2.26	1.38	1.34	18	20
3	A	502	HEM	CBA-CGA	2.19	1.45	1.50	19	20
3	A	502	HEM	C4A-CHB	2.02	1.35	1.41	6	1

All unique angle outliers are listed below. They are sorted according to the Z-score of the worst occurrence in the ensemble.

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})	Models	
								Worst	Total
2	A	501	IWP	C16-C14-N22	9.42	129.52	124.16	1	20
2	A	501	IWP	C05-C13-C15	5.66	121.98	128.77	2	20
2	A	501	IWP	C05-C13-N23	3.18	114.11	110.30	15	20
3	A	502	HEM	C3B-C4B-NB	3.02	111.64	109.47	17	20

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})	Models	
								Worst	Total
2	A	501	IWP	C15-N24-N22	2.68	114.01	111.93	4	20
2	A	501	IWP	O25-C17-C12	2.46	120.35	125.41	5	20
3	A	502	HEM	C4D-ND-C1D	2.36	102.41	105.21	6	5
2	A	501	IWP	C04-C11-C10	2.12	119.84	123.60	14	20
3	A	502	HEM	C2C-C3C-C4C	2.03	105.48	106.90	8	1

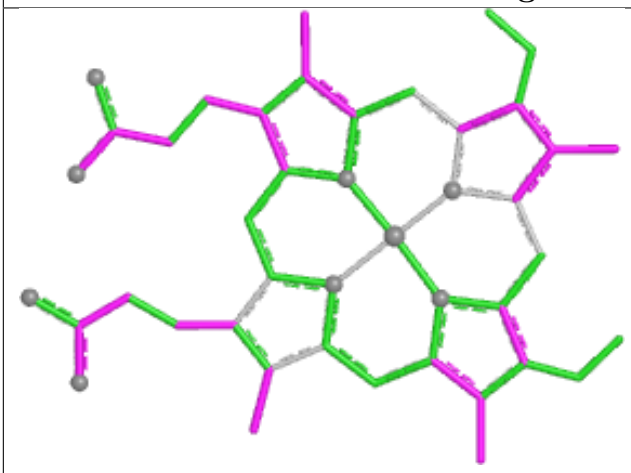
There are no chirality outliers.

There are no torsion outliers.

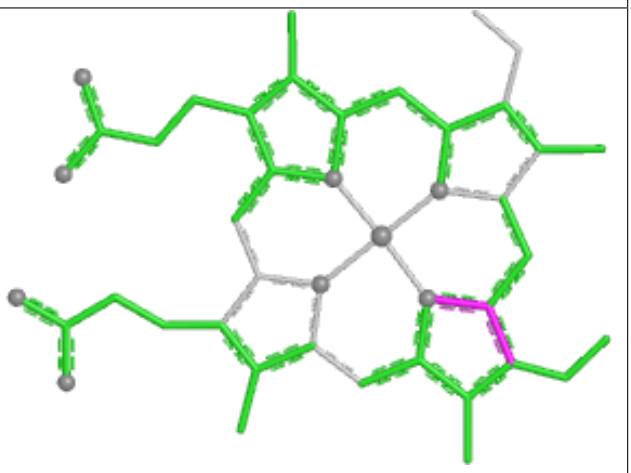
There are no ring outliers.

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.

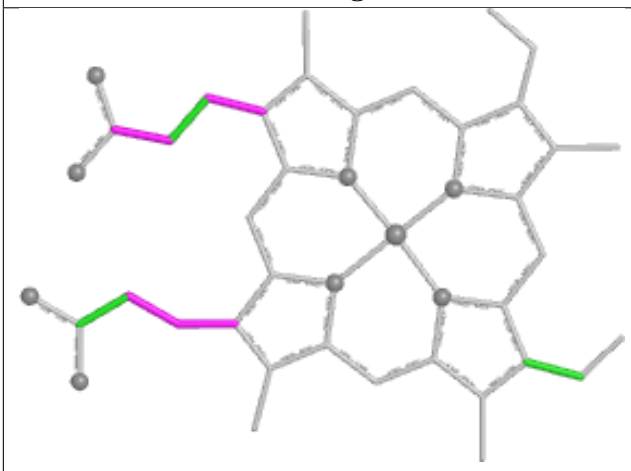
Ligand HEM A 502



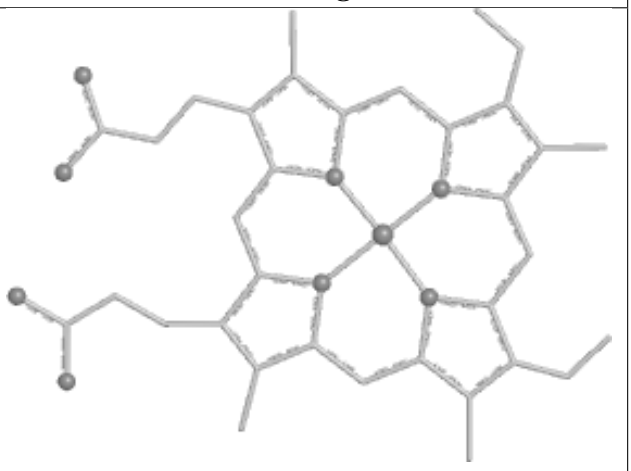
Bond lengths



Bond angles

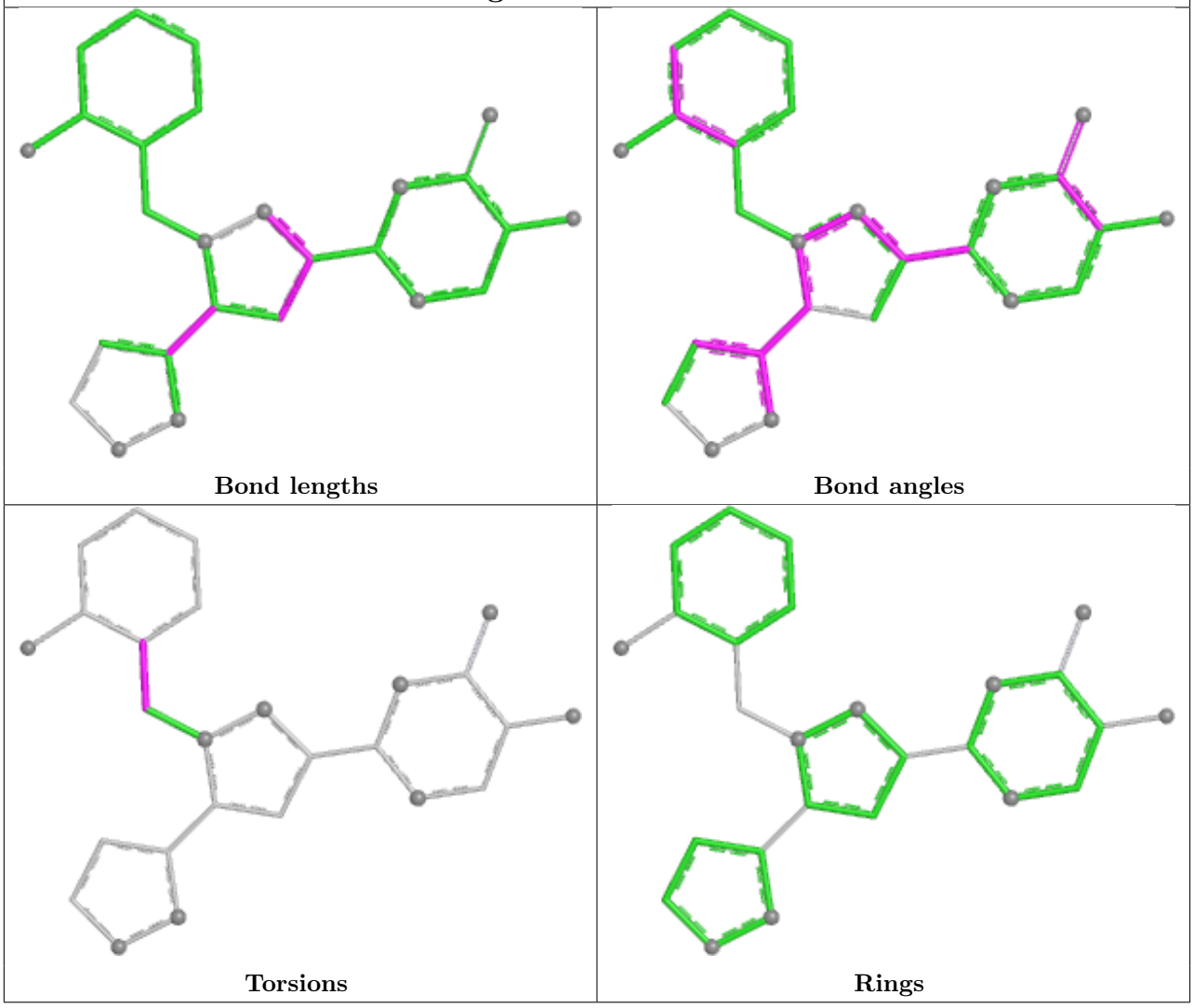


Torsions



Rings

Ligand IWP A 501



6.7 Other polymers (i)

There are no such molecules in this entry.

6.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

7 Chemical shift validation

The completeness of assignment taking into account all chemical shift lists is 72% for the well-defined parts and 71% for the entire structure.

7.1 Chemical shift list 1

File name: working_cs.cif

Chemical shift list name: *SwHNOX_IWP051_chemical_shift*

7.1.1 Bookkeeping

The following table shows the results of parsing the chemical shift list and reports the number of nuclei with statistically unusual chemical shifts.

Total number of shifts	2280
Number of shifts mapped to atoms	1865
Number of unparsed shifts	0
Number of shifts with mapping errors	415
Number of shifts with mapping warnings	0
Number of shift outliers (ShiftChecker)	27

The following assigned chemical shifts were not mapped to the molecules present in the coordinate file.

- No matching atom found in the structure. All 415 occurrences are reported below.

List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	2	MET	HB1	1.737	0.00	0
1	A	2	MET	HG1	2.521	0.02	0
1	A	3	GLY	HN	8.982	0.00	0
1	A	3	GLY	HA1	4.92	0.02	0
1	A	4	MET	HN	9.054	0.00	0
1	A	4	MET	HB1	2.268	0.01	0
1	A	4	MET	HG1	2.277	0.01	0
1	A	5	VAL	HN	7.916	0.00	0
1	A	6	PHE	HN	6.786	0.00	0
1	A	6	PHE	HB1	1.616	0.01	0
1	A	7	THR	HN	8.854	0.00	0
1	A	8	GLY	HN	7.581	0.00	0
1	A	8	GLY	HA1	3.433	0.01	0
1	A	9	LEU	HN	7.761	0.00	0

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	9	LEU	HB1	0.248	0.02	0
1	A	10	MET	HN	8.349	0.00	0
1	A	10	MET	HB1	2.044	0.01	0
1	A	10	MET	HG1	2.368	0.01	0
1	A	11	GLU	HN	8.021	0.00	0
1	A	11	GLU	HB1	1.979	0.02	0
1	A	11	GLU	HG1	2.135	0.01	0
1	A	12	LEU	HN	7.497	0.00	0
1	A	12	LEU	HB1	2.078	0.01	0
1	A	13	ILE	HN	8.554	0.00	0
1	A	13	ILE	HG11	0.675	0.01	0
1	A	14	GLU	HN	8.202	0.00	0
1	A	14	GLU	HB1	2.02	0.01	0
1	A	14	GLU	HG1	2.168	0.00	0
1	A	15	ASP	HN	8.314	0.00	0
1	A	15	ASP	HB1	2.586	0.01	0
1	A	16	GLU	HN	8.518	0.04	0
1	A	16	GLU	HB1	1.23	0.03	0
1	A	16	GLU	HG1	1.622	0.01	0
1	A	17	PHE	HN	8.426	0.00	0
1	A	17	PHE	HB1	2.924	0.01	0
1	A	18	GLY	HN	7.846	0.01	0
1	A	18	GLY	HA1	4.067	0.01	0
1	A	19	TYR	HN	8.735	0.00	0
1	A	19	TYR	HB1	2.966	0.01	0
1	A	20	GLU	HN	8.879	0.00	0
1	A	20	GLU	HB1	1.92	0.01	0
1	A	20	GLU	HG1	2.219	0.01	0
1	A	21	THR	HN	7.581	0.00	0
1	A	22	LEU	HN	7.154	0.00	0
1	A	22	LEU	HB1	1.079	0.01	0
1	A	23	ASP	HN	8.355	0.00	0
1	A	23	ASP	HB1	2.515	0.02	0
1	A	24	THR	HN	7.848	0.00	0
1	A	25	LEU	HN	8.154	0.00	0
1	A	25	LEU	HB1	1.739	0.01	0
1	A	26	LEU	HN	8.342	0.00	0
1	A	26	LEU	HB1	1.388	0.01	0
1	A	27	GLU	HN	7.787	0.00	0
1	A	27	GLU	HB1	1.852	0.00	0
1	A	27	GLU	HG1	2.248	0.01	0

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	28	SER	HN	7.749	0.00	0
1	A	28	SER	HB1	3.92	0.01	0
1	A	29	CYS	HN	7.514	0.01	0
1	A	29	CYS	HB1	2.626	0.01	0
1	A	30	GLU	HN	8.52	0.00	0
1	A	30	GLU	HB1	1.896	0.02	0
1	A	30	GLU	HG1	2.276	0.00	0
1	A	31	LEU	HN	8.408	0.00	0
1	A	31	LEU	HB1	1.401	0.01	0
1	A	32	GLN	HN	9.287	0.00	0
1	A	32	GLN	HB1	2.463	0.01	0
1	A	32	GLN	HG1	2.182	0.01	0
1	A	33	SER	HN	8.784	0.00	0
1	A	33	SER	HB1	3.787	0.01	0
1	A	34	GLU	HN	7.848	0.00	0
1	A	35	GLY	HN	8.151	0.00	0
1	A	35	GLY	HA1	3.123	0.01	0
1	A	36	ILE	HN	6.619	0.00	0
1	A	36	ILE	HG11	0.859	0.01	0
1	A	37	TYR	HN	8.08	0.00	0
1	A	37	TYR	HB1	2.358	0.01	0
1	A	38	THR	HN	8.713	0.00	0
1	A	39	SER	HN	9.027	0.00	0
1	A	39	SER	HB1	3.993	0.01	0
1	A	40	VAL	HN	7.473	0.00	0
1	A	41	GLY	HN	7.857	0.00	0
1	A	41	GLY	HA1	3.646	0.01	0
1	A	42	SER	HN	7.826	0.00	0
1	A	42	SER	HB1	3.586	0.01	0
1	A	43	TYR	HN	9.329	0.00	0
1	A	43	TYR	HB1	2.64	0.01	0
1	A	44	ASP	HN	9.089	0.00	0
1	A	44	ASP	HB1	2.833	0.01	0
1	A	45	HIS	HN	9.942	0.00	0
1	A	46	GLN	HN	8.711	0.00	0
1	A	46	GLN	HB1	2.012	0.00	0
1	A	46	GLN	HG1	2.13	0.01	0
1	A	47	GLU	HN	8.217	0.00	0
1	A	47	GLU	HB1	2.428	0.01	0
1	A	47	GLU	HG1	2.347	0.01	0
1	A	48	LEU	HN	7.085	0.00	0

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	48	LEU	HB1	1.09	0.01	0
1	A	49	LEU	HN	7.32	0.00	0
1	A	49	LEU	HB1	1.528	0.01	0
1	A	50	GLN	HN	8.145	0.00	0
1	A	50	GLN	HB1	2.128	0.01	0
1	A	50	GLN	HG1	2.318	0.01	0
1	A	51	LEU	HN	7.629	0.00	0
1	A	51	LEU	HB1	1.034	0.01	0
1	A	52	VAL	HN	7.886	0.00	0
1	A	53	VAL	HN	8.727	0.00	0
1	A	54	LYS	HN	7.913	0.00	0
1	A	54	LYS	HB1	1.749	0.01	0
1	A	54	LYS	HD1	1.419	0.02	0
1	A	54	LYS	HE1	2.741	0.01	0
1	A	54	LYS	HG1	0.669	0.01	0
1	A	55	LEU	HN	8.379	0.00	0
1	A	55	LEU	HB1	1.265	0.00	0
1	A	56	SER	HN	8.646	0.00	0
1	A	56	SER	HB1	3.869	0.01	0
1	A	57	GLU	HN	7.768	0.00	0
1	A	57	GLU	HB1	2.132	0.01	0
1	A	57	GLU	HG1	2.434	0.01	0
1	A	58	VAL	HN	7.831	0.00	0
1	A	59	SER	HN	8.243	0.00	0
1	A	59	SER	HB1	3.3	0.01	0
1	A	60	SER	HN	8.042	0.00	0
1	A	60	SER	HB1	4.196	0.01	0
1	A	61	VAL	HN	7.81	0.00	0
1	A	62	PRO	HB1	1.747	0.01	0
1	A	62	PRO	HD1	3.603	0.00	0
1	A	62	PRO	HG1	2.103	0.01	0
1	A	63	VAL	HN	8.626	0.00	0
1	A	64	THR	HN	8.138	0.00	0
1	A	65	GLU	HN	6.68	0.00	0
1	A	65	GLU	HB1	1.601	0.00	0
1	A	65	GLU	HG1	2.157	0.00	0
1	A	66	LEU	HN	7.824	0.00	0
1	A	66	LEU	HB1	1.022	0.02	0
1	A	67	VAL	HN	8.305	0.00	0
1	A	68	ARG	HN	7.374	0.00	0
1	A	68	ARG	HB1	2.018	0.01	0

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	68	ARG	HG1	1.879	0.00	0
1	A	69	LEU	HN	8.076	0.00	0
1	A	69	LEU	HB1	1.851	0.01	0
1	A	70	PHE	HN	8.096	0.00	0
1	A	70	PHE	HB1	3.002	0.01	0
1	A	71	GLY	HN	8.272	0.00	0
1	A	71	GLY	HA1	2.289	0.01	0
1	A	72	LYS	HN	7.401	0.00	0
1	A	72	LYS	HB1	1.58	0.00	0
1	A	72	LYS	HG1	1.217	0.01	0
1	A	73	LYS	HN	7.241	0.00	0
1	A	73	LYS	HB1	1.856	0.01	0
1	A	73	LYS	HD1	1.455	0.01	0
1	A	73	LYS	HE1	2.907	0.01	0
1	A	73	LYS	HG1	1.241	0.00	0
1	A	74	LEU	HN	7.826	0.00	0
1	A	74	LEU	HB1	0.21	0.01	0
1	A	75	PHE	HN	6.947	0.00	0
1	A	75	PHE	HB1	2.503	0.02	0
1	A	76	VAL	HN	7.345	0.00	0
1	A	77	GLU	HN	6.602	0.00	0
1	A	77	GLU	HB1	1.769	0.01	0
1	A	77	GLU	HG1	2.044	0.00	0
1	A	78	LEU	HN	7.649	0.00	0
1	A	78	LEU	HB1	0.82	0.01	0
1	A	79	ILE	HN	7.569	0.00	0
1	A	79	ILE	HG11	0.716	0.01	0
1	A	80	GLU	HN	8.223	0.00	0
1	A	80	GLU	HB1	1.899	0.02	0
1	A	80	GLU	HG1	2.158	0.01	0
1	A	81	GLY	HN	7.538	0.00	0
1	A	81	GLY	HA1	3.651	0.01	0
1	A	82	HIS	HN	7.213	0.00	0
1	A	82	HIS	HB1	3.225	0.01	0
1	A	83	PRO	HB1	2.39	0.01	0
1	A	83	PRO	HD1	3.699	0.00	0
1	A	84	GLU	HN	9.293	0.00	0
1	A	84	GLU	HB1	2.237	0.00	0
1	A	85	ILE	HN	7.568	0.00	0
1	A	85	ILE	HG11	1.602	0.01	0
1	A	86	ALA	HN	8.185	0.00	0

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	87	ASN	HN	8.555	0.00	0
1	A	87	ASN	HB1	2.865	0.01	0
1	A	88	GLU	HN	7.536	0.00	0
1	A	88	GLU	HB1	1.853	0.01	0
1	A	88	GLU	HG1	2.087	0.00	0
1	A	89	MET	HN	7.613	0.00	0
1	A	89	MET	HB1	1.84	0.01	0
1	A	89	MET	HG1	2.779	0.02	0
1	A	90	LYS	HN	9.578	0.00	0
1	A	90	LYS	HB1	1.647	0.01	0
1	A	90	LYS	HD1	1.614	0.01	0
1	A	90	LYS	HG1	1.371	0.01	0
1	A	91	ASP	HN	7.506	0.00	0
1	A	91	ASP	HB1	2.798	0.01	0
1	A	92	SER	HN	9.139	0.00	0
1	A	92	SER	HB1	3.47	0.01	0
1	A	93	PHE	HN	7.526	0.00	0
1	A	93	PHE	HB1	2.775	0.01	0
1	A	94	ASP	HN	8.407	0.00	0
1	A	94	ASP	HB1	2.735	0.02	0
1	A	95	LEU	HN	7.774	0.00	0
1	A	95	LEU	HB1	1.795	0.01	0
1	A	96	LEU	HN	8.424	0.00	0
1	A	96	LEU	HB1	1.144	0.00	0
1	A	97	SER	HN	7.961	0.00	0
1	A	97	SER	HB1	3.906	0.02	0
1	A	98	LYS	HN	7.784	0.00	0
1	A	98	LYS	HB1	2.144	0.01	0
1	A	98	LYS	HD1	1.559	0.01	0
1	A	98	LYS	HE1	2.608	0.00	0
1	A	99	ILE	HN	7.318	0.00	0
1	A	99	ILE	HG11	1.895	0.01	0
1	A	100	ASP	HN	7.77	0.00	0
1	A	100	ASP	HB1	2.448	0.01	0
1	A	101	SER	HN	7.856	0.00	0
1	A	101	SER	HB1	3.94	0.00	0
1	A	102	PHE	HN	7.543	0.00	0
1	A	102	PHE	HB1	3.125	0.01	0
1	A	103	ILE	HN	8.405	0.00	0
1	A	103	ILE	HG11	1.6	0.01	0
1	A	104	HIS	HN	8.036	0.00	0

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	104	HIS	HB1	1.791	0.01	0
1	A	105	VAL	HN	5.716	0.00	0
1	A	106	GLU	HN	7.926	0.00	0
1	A	106	GLU	HB1	1.457	0.02	0
1	A	106	GLU	HG1	1.741	0.01	0
1	A	107	VAL	HN	7.805	0.00	0
1	A	108	TYR	HN	7.311	0.00	0
1	A	108	TYR	HB1	2.924	0.00	0
1	A	109	LYS	HN	7.236	0.00	0
1	A	109	LYS	HB1	1.536	0.01	0
1	A	109	LYS	HD1	1.441	0.00	0
1	A	109	LYS	HE1	2.655	0.00	0
1	A	109	LYS	HG1	1.252	0.01	0
1	A	110	LEU	HN	7.045	0.00	0
1	A	110	LEU	HB1	0.526	0.01	0
1	A	111	TYR	HN	8.305	0.00	0
1	A	111	TYR	HB1	3.314	0.01	0
1	A	112	PRO	HB1	2.098	0.02	0
1	A	112	PRO	HD1	3.788	0.00	0
1	A	112	PRO	HG1	1.897	0.01	0
1	A	113	GLN	HN	9.739	0.00	0
1	A	113	GLN	HB1	2.12	0.01	0
1	A	113	GLN	HG1	2.48	0.01	0
1	A	114	ALA	HN	8.763	0.00	0
1	A	115	GLU	HN	10.849	0.00	0
1	A	115	GLU	HG1	2.168	0.01	0
1	A	116	LEU	HN	7.767	0.00	0
1	A	116	LEU	HB1	0.886	0.01	0
1	A	117	PRO	HD1	3.527	0.01	0
1	A	118	LYS	HN	8.253	0.00	0
1	A	118	LYS	HB1	1.536	0.01	0
1	A	118	LYS	HE1	2.606	0.01	0
1	A	118	LYS	HG1	0.848	0.00	0
1	A	119	PHE	HN	7.888	0.00	0
1	A	119	PHE	HB1	2.419	0.01	0
1	A	120	THR	HN	8.284	0.00	0
1	A	121	CYS	HN	4.085	0.00	0
1	A	121	CYS	HB1	2.471	0.01	0
1	A	122	ASP	HN	9.139	0.00	0
1	A	122	ASP	HB1	2.488	0.01	0
1	A	123	ARG	HN	9.048	0.00	0

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	123	ARG	HB1	1.576	0.02	0
1	A	123	ARG	HD1	3.263	0.00	0
1	A	123	ARG	HG1	1.574	0.00	0
1	A	124	LEU	HN	8.001	0.00	0
1	A	124	LEU	HB1	1.347	0.01	0
1	A	125	GLY	HN	8.135	0.00	0
1	A	125	GLY	HA1	4.245	0.01	0
1	A	126	ASP	HN	8.283	0.00	0
1	A	126	ASP	HB1	2.461	0.02	0
1	A	127	ASN	HN	9.163	0.00	0
1	A	127	ASN	HB1	2.526	0.02	0
1	A	128	ASP	HN	6.99	0.00	0
1	A	128	ASP	HB1	2.281	0.01	0
1	A	129	ILE	HN	9.319	0.00	0
1	A	129	ILE	HG11	0.638	0.02	0
1	A	130	ARG	HN	8.768	0.00	0
1	A	130	ARG	HB1	1.753	0.01	0
1	A	130	ARG	HG1	1.511	0.01	0
1	A	131	LEU	HN	9.509	0.00	0
1	A	131	LEU	HB1	1.562	0.01	0
1	A	132	HIS	HN	9.492	0.00	0
1	A	132	HIS	HB1	3.469	0.01	0
1	A	133	TYR	HN	9.859	0.00	0
1	A	133	TYR	HB1	3.014	0.01	0
1	A	134	GLN	HN	8.007	0.00	0
1	A	134	GLN	HB1	1.556	0.01	0
1	A	134	GLN	HG1	1.307	0.02	0
1	A	135	SER	HN	8.734	0.00	0
1	A	135	SER	HB1	4.329	0.00	0
1	A	136	LYS	HN	7.669	0.00	0
1	A	136	LYS	HB1	1.646	0.01	0
1	A	136	LYS	HD1	1.425	0.00	0
1	A	136	LYS	HE1	3.848	0.00	0
1	A	136	LYS	HG1	1.251	0.01	0
1	A	137	ARG	HN	8.973	0.00	0
1	A	137	ARG	HB1	1.659	0.00	0
1	A	137	ARG	HG1	1.422	0.00	0
1	A	138	PRO	HG1	1.48	0.01	0
1	A	139	PHE	HN	8.782	0.00	0
1	A	139	PHE	HB1	3.619	0.01	0
1	A	140	ALA	HN	9.072	0.00	0

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	141	SER	HN	9.358	0.00	0
1	A	141	SER	HB1	3.943	0.01	0
1	A	142	PHE	HN	7.236	0.00	0
1	A	142	PHE	HB1	2.833	0.01	0
1	A	143	ALA	HN	8.187	0.00	0
1	A	144	GLU	HN	8.145	0.00	0
1	A	144	GLU	HB1	1.834	0.01	0
1	A	144	GLU	HG1	2.004	0.01	0
1	A	145	GLY	HN	7.575	0.00	0
1	A	145	GLY	HA1	3.731	0.02	0
1	A	146	LEU	HN	7.699	0.00	0
1	A	146	LEU	HB1	1.249	0.01	0
1	A	147	LEU	HN	8.028	0.00	0
1	A	147	LEU	HB1	2.266	0.01	0
1	A	148	ASP	HN	7.741	0.00	0
1	A	148	ASP	HB1	2.421	0.02	0
1	A	149	GLY	HN	8.614	0.00	0
1	A	149	GLY	HA1	3.395	0.01	0
1	A	150	CYS	HN	8.095	0.00	0
1	A	150	CYS	HB1	3.28	0.01	0
1	A	151	ALA	HN	7.652	0.02	0
1	A	152	GLU	HN	7.508	0.00	0
1	A	152	GLU	HB1	2.191	0.00	0
1	A	153	TYR	HN	8.335	0.00	0
1	A	153	TYR	HB1	2.479	0.00	0
1	A	154	PHE	HN	7.844	0.00	0
1	A	154	PHE	HB1	2.632	0.01	0
1	A	155	LYS	HN	7.938	0.00	0
1	A	155	LYS	HB1	1.789	0.01	0
1	A	155	LYS	HD1	1.55	0.00	0
1	A	155	LYS	HE1	2.642	0.01	0
1	A	155	LYS	HG1	1.26	0.00	0
1	A	156	GLU	HN	8.533	0.00	0
1	A	156	GLU	HB1	1.618	0.02	0
1	A	156	GLU	HG1	2.046	0.01	0
1	A	157	ASP	HN	8.671	0.00	0
1	A	157	ASP	HB1	2.416	0.01	0
1	A	158	PHE	HN	8.904	0.00	0
1	A	158	PHE	HB1	2.92	0.01	0
1	A	159	THR	HN	9.115	0.00	0
1	A	160	ILE	HN	9.109	0.00	0

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	160	ILE	HG11	0.689	0.00	0
1	A	161	SER	HN	9.057	0.00	0
1	A	162	ARG	HN	8.975	0.00	0
1	A	162	ARG	HB1	1.951	0.00	0
1	A	162	ARG	HD1	2.997	0.00	0
1	A	163	THR	HN	8.37	0.00	0
1	A	164	PRO	HB1	1.893	0.01	0
1	A	164	PRO	HD1	3.819	0.00	0
1	A	164	PRO	HG1	2.059	0.00	0
1	A	165	GLU	HN	8.939	0.00	0
1	A	165	GLU	HB1	2.174	0.00	0
1	A	165	GLU	HG1	2.292	0.00	0
1	A	166	THR	HN	7.858	0.00	0
1	A	167	GLN	HN	7.16	0.00	0
1	A	167	GLN	HB1	1.965	0.01	0
1	A	167	GLN	HG1	2.355	0.00	0
1	A	168	ASP	HN	8.292	0.00	0
1	A	168	ASP	HB1	2.559	0.02	0
1	A	169	SER	HN	7.422	0.00	0
1	A	170	GLU	HN	8.61	0.00	0
1	A	170	GLU	HB1	1.687	0.00	0
1	A	170	GLU	HG1	2.393	0.02	0
1	A	171	THR	HN	8.465	0.00	0
1	A	172	ASP	HN	7.821	0.00	0
1	A	172	ASP	HB1	2.361	0.01	0
1	A	173	VAL	HN	8.933	0.00	0
1	A	174	ILE	HN	7.898	0.00	0
1	A	174	ILE	HG11	1.042	0.01	0
1	A	175	PHE	HN	9.285	0.00	0
1	A	175	PHE	HB1	2.799	0.01	0
1	A	176	ASN	HN	9.429	0.00	0
1	A	176	ASN	HB1	2.662	0.01	0
1	A	177	ILE	HN	9.01	0.00	0
1	A	177	ILE	HG11	0.857	0.01	0
1	A	178	THR	HN	8.45	0.00	0
1	A	179	ARG	HN	8.649	0.00	0
1	A	179	ARG	HB1	1.421	0.01	0
1	A	180	ALA	HN	8.385	0.00	0
1	A	181	PRO	HB1	1.85	0.01	0
1	A	181	PRO	HD1	3.59	0.00	0
1	A	181	PRO	HG1	2.019	0.01	0

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	182	ARG	HN	8.452	0.00	0
1	A	182	ARG	HB1	1.734	0.00	0
1	A	182	ARG	HD1	2.974	0.00	0
1	A	182	ARG	HG1	1.572	0.01	0
1	A	183	GLY	HN	8.587	0.00	0
1	A	183	GLY	HA1	3.866	0.03	0
1	A	184	ALA	HN	8.222	0.00	0
1	A	185	GLU	HN	8.589	0.00	0
1	A	185	GLU	HB1	1.864	0.01	0
1	A	185	GLU	HG1	2.175	0.01	0
1	A	186	ASN	HN	8.332	0.00	0
1	A	186	ASN	HB1	2.631	0.02	0
1	A	187	LEU	HN	8.066	0.00	0
1	A	187	LEU	HB1	1.42	0.02	0
1	A	188	TYR	HN	7.569	0.01	0
1	A	188	TYR	HB1	2.801	0.01	0
1	A	189	PHE	HN	8.217	0.00	0
1	B	1	HEM	HHA	9.486	0.01	0
1	B	1	HEM	HAB	8.14	0.01	0
1	B	1	HEM	HAC	7.759	0.01	0
1	B	1	HEM	HHB	9.847	0.01	0
1	B	1	HEM	HBBA	5.465	0.01	0
1	B	1	HEM	HBB	5.415	0.00	0
1	B	1	HEM	HBCA	5.62	0.01	0
1	B	1	HEM	HBC	5.201	0.01	0
1	B	1	HEM	HHC	9.423	0.01	0
1	B	1	HEM	HHD	9.623	0.01	0
1	B	1	HEM	HMA	4.065	0.01	0
1	B	1	HEM	HMB	3.275	0.01	0
1	B	1	HEM	HMC	3.077	0.01	0
1	B	1	HEM	HMD	3.18	0.01	0
1	A	501	IWP	H09	5.814	0.01	0

7.1.2 Chemical shift referencing (i)

The following table shows the suggested chemical shift referencing corrections.

Nucleus	# values	Correction ± precision, *ppm*	Suggested action
$^{13}C_{\alpha}$	187	-0.25 ± 0.12	None needed (< 0.5 ppm)
$^{13}C_{\beta}$	174	0.21 ± 0.07	None needed (< 0.5 ppm)
$^{13}C'$	185	0.05 ± 0.12	None needed (< 0.5 ppm)

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Nucleus	# values	Correction ± precision, *ppm*	Suggested action
^{15}N	179	0.11 ± 0.23	None needed (< 0.5 ppm)

7.1.3 Completeness of resonance assignments

The following table shows the completeness of the chemical shift assignments for the well-defined regions of the structure. The overall completeness is 72%, i.e. 1781 atoms were assigned a chemical shift out of a possible 2461. 0 out of 34 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	708/896 (79%)	179/363 (49%)	358/360 (99%)	171/173 (99%)
Sidechain	960/1354 (71%)	602/880 (68%)	357/438 (82%)	1/36 (3%)
Aromatic	113/211 (54%)	85/104 (82%)	27/103 (26%)	1/4 (25%)
Overall	1781/2461 (72%)	866/1347 (64%)	742/901 (82%)	173/213 (81%)

The following table shows the completeness of the chemical shift assignments for the full structure. The overall completeness is 71%, i.e. 1853 atoms were assigned a chemical shift out of a possible 2606. 0 out of 35 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	737/947 (78%)	186/384 (48%)	372/380 (98%)	179/183 (98%)
Sidechain	995/1429 (70%)	624/928 (67%)	370/460 (80%)	1/41 (2%)
Aromatic	121/230 (53%)	89/113 (79%)	31/113 (27%)	1/4 (25%)
Overall	1853/2606 (71%)	899/1425 (63%)	773/953 (81%)	181/228 (79%)

7.1.4 Statistically unusual chemical shifts

The following table lists the statistically unusual chemical shifts. These are statistical measures, and large deviations from the mean do not necessarily imply incorrect assignments. Molecules containing paramagnetic centres or hemes are expected to give rise to anomalous chemical shifts.

List Id	Chain	Res	Type	Atom	Shift, *ppm*	Expected range, *ppm*	Z-score
1	A	146	LEU	HD11	-3.10	-0.61 – 2.12	-14.1
1	A	146	LEU	HD12	-3.10	-0.61 – 2.12	-14.1
1	A	146	LEU	HD13	-3.10	-0.61 – 2.12	-14.1
1	A	188	TYR	CE2	133.43	111.68 – 124.17	12.4
1	A	188	TYR	CE1	133.43	111.24 – 124.66	11.5
1	A	78	LEU	HD11	-2.38	-0.61 – 2.12	-11.5
1	A	78	LEU	HD12	-2.38	-0.61 – 2.12	-11.5
1	A	78	LEU	HD13	-2.38	-0.61 – 2.12	-11.5
1	A	70	PHE	CD2	117.83	125.53 – 137.61	-11.4

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List Id	Chain	Res	Type	Atom	Shift, *ppm*	Expected range, *ppm*	Z-score
1	A	70	PHE	CD1	117.83	125.33 – 137.83	-11.0
1	A	179	ARG	HD2	0.92	1.97 – 4.26	-9.6
1	A	132	HIS	CE1	117.97	126.08 – 149.12	-8.5
1	A	146	LEU	HD21	-1.62	-0.65 – 2.13	-8.5
1	A	146	LEU	HD22	-1.62	-0.65 – 2.13	-8.5
1	A	146	LEU	HD23	-1.62	-0.65 – 2.13	-8.5
1	A	99	ILE	HG21	-1.32	-0.56 – 2.11	-7.9
1	A	99	ILE	HG22	-1.32	-0.56 – 2.11	-7.9
1	A	99	ILE	HG23	-1.32	-0.56 – 2.11	-7.9
1	A	116	LEU	HD11	-1.18	-0.61 – 2.12	-7.1
1	A	116	LEU	HD12	-1.18	-0.61 – 2.12	-7.1
1	A	116	LEU	HD13	-1.18	-0.61 – 2.12	-7.1
1	A	142	PHE	HE1	5.04	5.56 – 8.62	-6.7
1	A	142	PHE	HE2	5.04	5.54 – 8.63	-6.6
1	A	146	LEU	HG	-0.63	-0.13 – 3.16	-6.5
1	A	136	LYS	CE	47.10	37.57 – 46.21	6.0
1	A	74	LEU	HG	-0.42	-0.13 – 3.16	-5.9
1	A	116	LEU	HB2	-0.17	-0.07 – 3.30	-5.3

7.1.5 Random Coil Index (RCI) plots

The image below reports *random coil index* values for the protein chains in the structure. The height of each bar gives a probability of a given residue to be disordered, as predicted from the available chemical shifts and the amino acid sequence. A value above 0.2 is an indication of significant predicted disorder. The colour of the bar shows whether the residue is in the well-defined core (black) or in the ill-defined residue ranges (cyan), as described in section 2 on ensemble composition.If well-defined core and ill-defined regions are not identified then it is shown as gray bars.

Random coil index (RCI) for chain A: