



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 10, 2021 – 08:16 PM EDT

PDB ID : 3DDR  
Title : Structure of the *Serratia marcescens* hemophore receptor HasR-Ile671Gly mutant in complex with its hemophore HasA and heme  
Authors : Krieg, S.; Diederichs, K.  
Deposited on : 2008-06-06  
Resolution : 2.80 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](mailto: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 : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.23.2  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.23.2

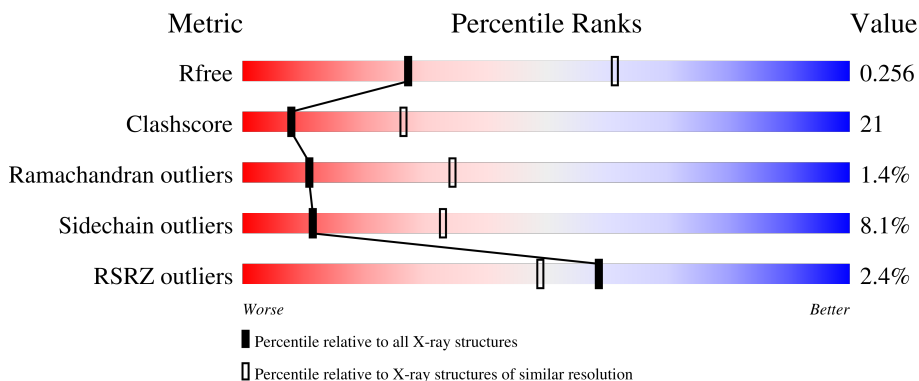
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.80 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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  $\geq 3$ , 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  $\leq 5\%$ . 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	865	 53% 30% 13% 2%
1	B	865	 52% 32% 13% 2%
2	C	206	 57% 20% 21% 4%
2	D	206	 56% 20% 21% 2%

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
3	NA	A	866	-	-	-	X
3	NA	B	866	-	-	-	X
4	GOL	B	871	-	-	X	X

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 14259 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 HasR protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	753	5885	3670	1043	1159	13	0	0	0
1	B	753	5885	3670	1043	1159	13	0	0	0

There are 30 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	ALA	-	expression tag	UNP Q79AD2
A	2	GLN	-	expression tag	UNP Q79AD2
A	3	ALA	-	expression tag	UNP Q79AD2
A	4	GLU	-	expression tag	UNP Q79AD2
A	5	ALA	-	expression tag	UNP Q79AD2
A	6	SER	-	expression tag	UNP Q79AD2
A	7	SER	-	expression tag	UNP Q79AD2
A	8	ALA	-	expression tag	UNP Q79AD2
A	9	GLN	-	expression tag	UNP Q79AD2
A	10	ALA	-	expression tag	UNP Q79AD2
A	11	ALA	-	expression tag	UNP Q79AD2
A	12	GLN	-	expression tag	UNP Q79AD2
A	13	GLN	-	expression tag	UNP Q79AD2
A	645	ALA	GLY	SEE REMARK 999	UNP Q79AD2
A	671	GLY	ILE	engineered mutation	UNP Q79AD2
B	1	ALA	-	expression tag	UNP Q79AD2
B	2	GLN	-	expression tag	UNP Q79AD2
B	3	ALA	-	expression tag	UNP Q79AD2
B	4	GLU	-	expression tag	UNP Q79AD2
B	5	ALA	-	expression tag	UNP Q79AD2
B	6	SER	-	expression tag	UNP Q79AD2
B	7	SER	-	expression tag	UNP Q79AD2
B	8	ALA	-	expression tag	UNP Q79AD2
B	9	GLN	-	expression tag	UNP Q79AD2
B	10	ALA	-	expression tag	UNP Q79AD2

*Continued on next page...*

*Continued from previous page...*

Chain	Residue	Modelled	Actual	Comment	Reference
B	11	ALA	-	expression tag	UNP Q79AD2
B	12	GLN	-	expression tag	UNP Q79AD2
B	13	GLN	-	expression tag	UNP Q79AD2
B	645	ALA	GLY	SEE REMARK 999	UNP Q79AD2
B	671	GLY	ILE	engineered mutation	UNP Q79AD2

- Molecule 2 is a protein called Hemophore HasA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	162	1176	739	188	248	1	0	0	0
2	D	162	Total	C	N	O	S			
			1176	739	188	248	1	0	0	0

There are 38 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-17	MET	-	expression tag	UNP Q54450
C	-16	ARG	-	expression tag	UNP Q54450
C	-15	GLY	-	expression tag	UNP Q54450
C	-14	SER	-	expression tag	UNP Q54450
C	-13	HIS	-	expression tag	UNP Q54450
C	-12	HIS	-	expression tag	UNP Q54450
C	-11	HIS	-	expression tag	UNP Q54450
C	-10	HIS	-	expression tag	UNP Q54450
C	-9	HIS	-	expression tag	UNP Q54450
C	-8	HIS	-	expression tag	UNP Q54450
C	-7	GLY	-	expression tag	UNP Q54450
C	-6	ILE	-	expression tag	UNP Q54450
C	-5	ARG	-	expression tag	UNP Q54450
C	-4	MET	-	expression tag	UNP Q54450
C	-3	ARG	-	expression tag	UNP Q54450
C	-2	ALA	-	expression tag	UNP Q54450
C	-1	ARG	-	expression tag	UNP Q54450
C	0	TYR	-	expression tag	UNP Q54450
C	1	PRO	-	expression tag	UNP Q54450
D	-17	MET	-	expression tag	UNP Q54450
D	-16	ARG	-	expression tag	UNP Q54450
D	-15	GLY	-	expression tag	UNP Q54450
D	-14	SER	-	expression tag	UNP Q54450
D	-13	HIS	-	expression tag	UNP Q54450
D	-12	HIS	-	expression tag	UNP Q54450

*Continued on next page...*

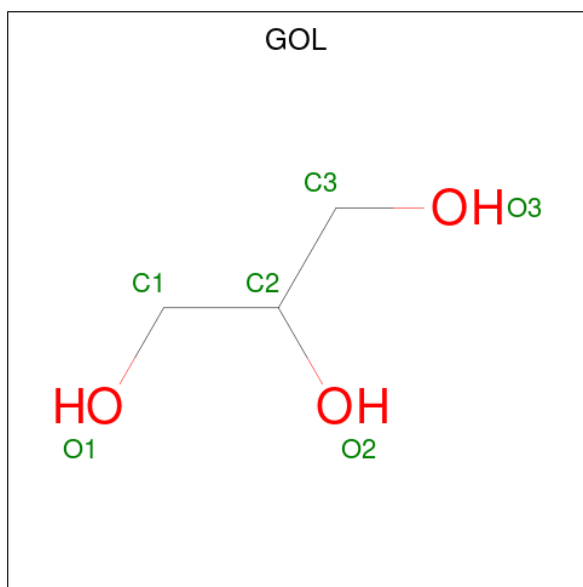
Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
D	-11	HIS	-	expression tag	UNP Q54450
D	-10	HIS	-	expression tag	UNP Q54450
D	-9	HIS	-	expression tag	UNP Q54450
D	-8	HIS	-	expression tag	UNP Q54450
D	-7	GLY	-	expression tag	UNP Q54450
D	-6	ILE	-	expression tag	UNP Q54450
D	-5	ARG	-	expression tag	UNP Q54450
D	-4	MET	-	expression tag	UNP Q54450
D	-3	ARG	-	expression tag	UNP Q54450
D	-2	ALA	-	expression tag	UNP Q54450
D	-1	ARG	-	expression tag	UNP Q54450
D	0	TYR	-	expression tag	UNP Q54450
D	1	PRO	-	expression tag	UNP Q54450

- Molecule 3 is SODIUM ION (three-letter code: NA) (formula: Na).

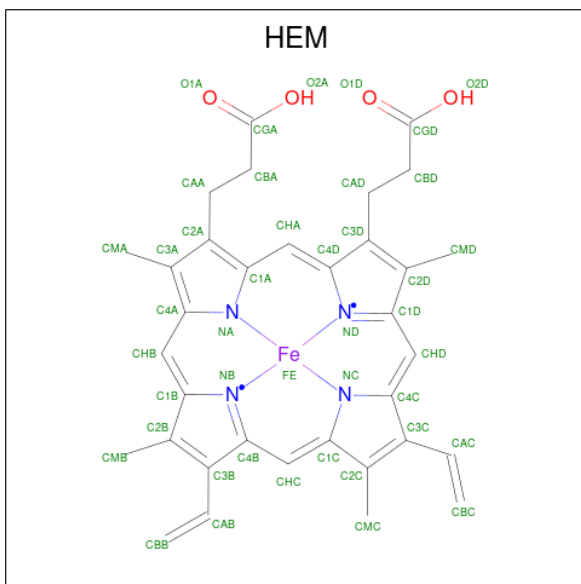
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Na 1 1	0	0
3	B	1	Total Na 1 1	0	0

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 6 3 3	0	0
4	B	1	Total C O 6 3 3	0	0
4	B	1	Total C O 6 3 3	0	0
4	B	1	Total C O 6 3 3	0	0
4	B	1	Total C O 6 3 3	0	0
4	B	1	Total C O 6 3 3	0	0

- Molecule 5 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula:  $C_{34}H_{32}FeN_4O_4$ ).



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

- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	6	Total O 6 6	0	0

*Continued on next page...*

*Continued from previous page...*

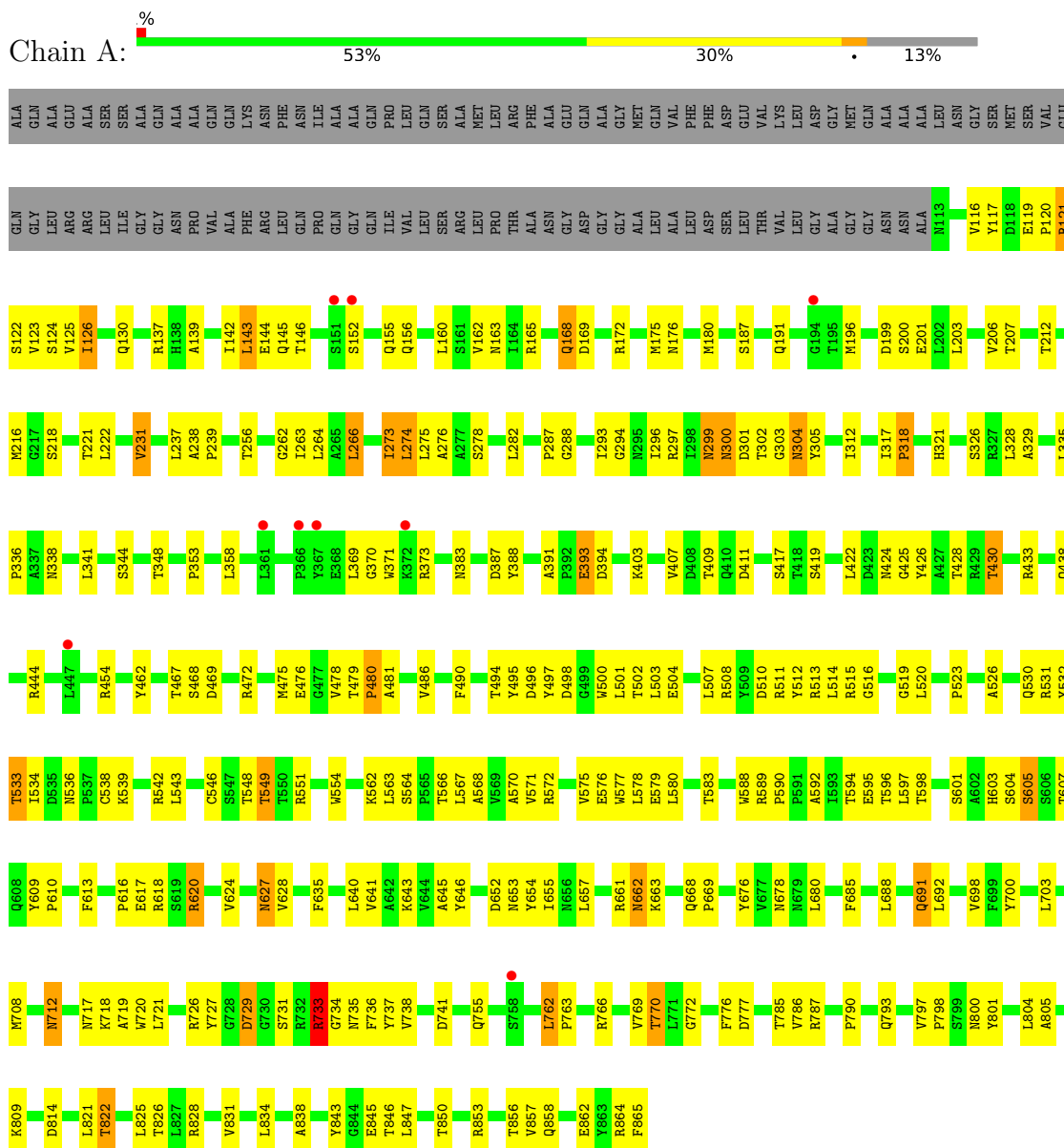
<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>	<b>ZeroOcc</b>	<b>AltConf</b>
6	B	6	Total O 6 6	0	0
6	D	1	Total O 1 1	0	0



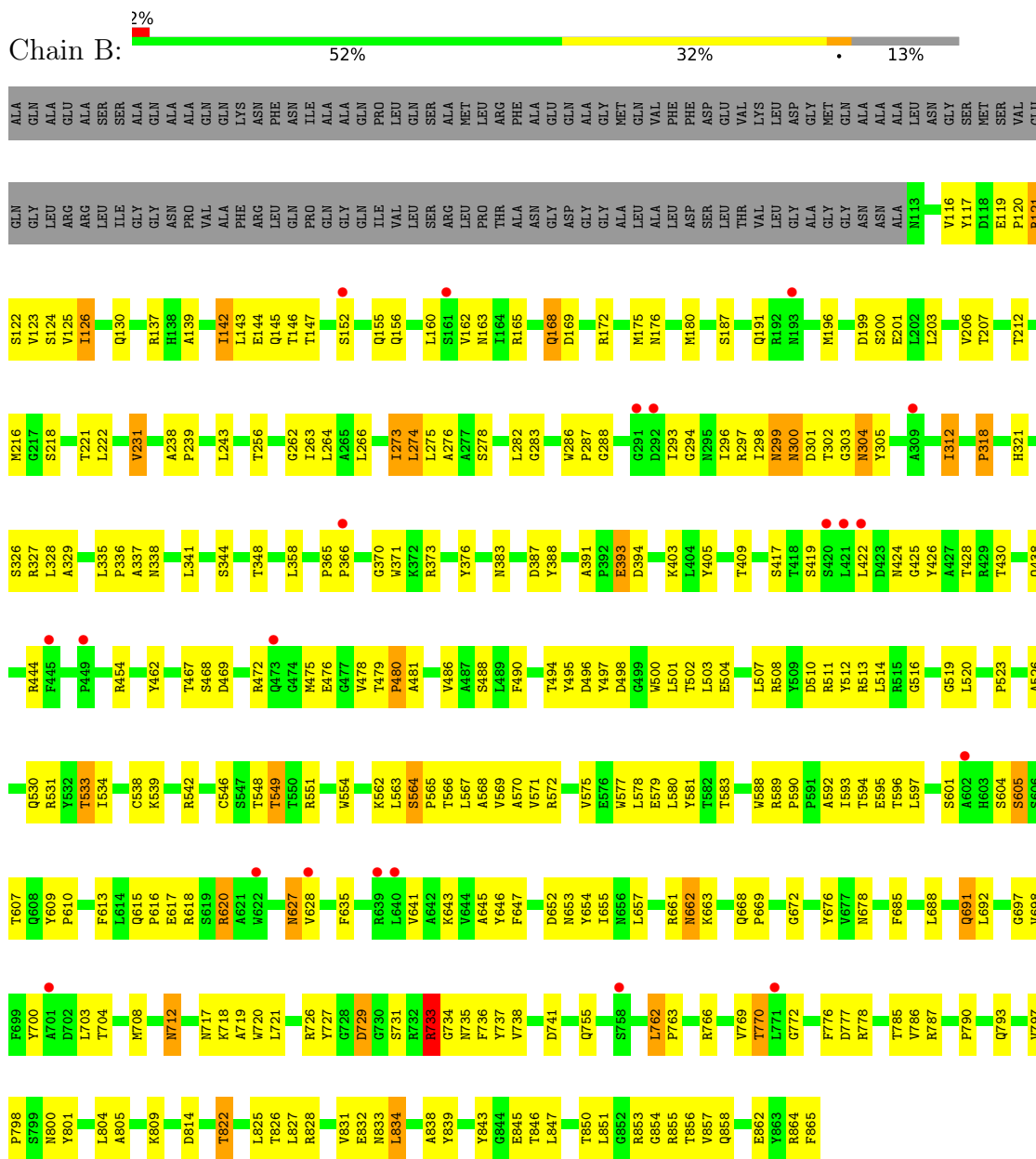
### 3 Residue-property plots i

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.

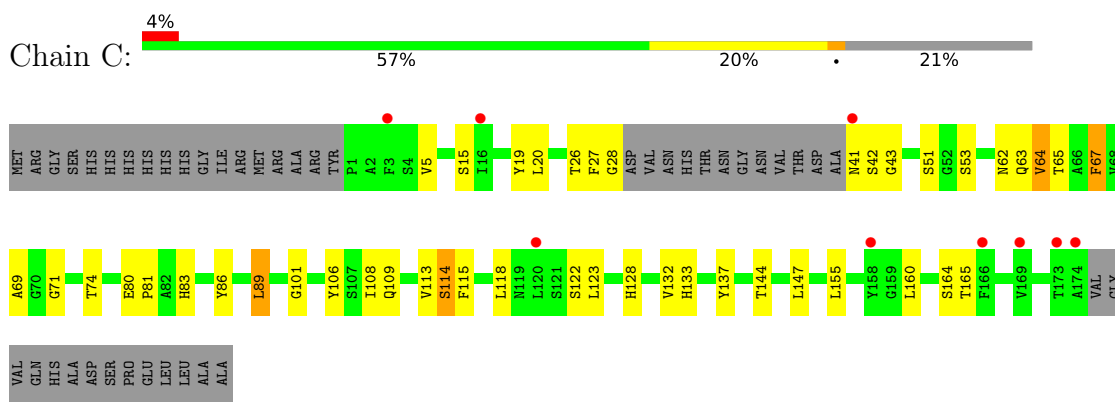
- Molecule 1: HasR protein



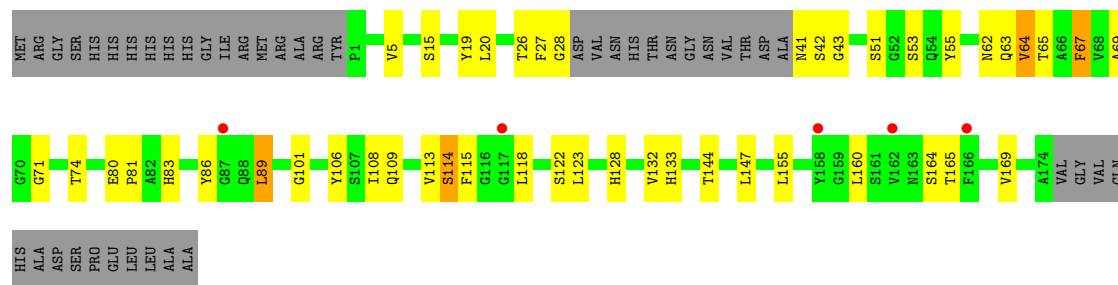
- Molecule 1: HasR protein



• Molecule 2: Hemophore HasA



• Molecule 2: Hemophore HasA



## 4 Data and refinement statistics i

Property	Value	Source
Space group	F 2 2 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	157.41Å 162.72Å 597.01Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	39.25 – 2.80 39.25 – 2.80	Depositor EDS
% Data completeness (in resolution range)	98.1 (39.25-2.80) 98.1 (39.25-2.80)	Depositor EDS
$R_{merge}$	0.20	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.51 (at 2.81Å)	Xtrriage
Refinement program	PHENIX (phenix.refine)	Depositor
R, $R_{free}$	0.226 , 0.262 0.219 , 0.256	Depositor DCC
$R_{free}$ test set	4636 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	70.5	Xtrriage
Anisotropy	0.733	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.28 , 47.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.026 for -k,-h,-l	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	14259	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	104.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.06% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: HEM, NA, GOL

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.35	0/6023	0.57	0/8182
1	B	0.35	0/6023	0.57	0/8182
2	C	0.29	0/1203	0.46	0/1638
2	D	0.30	0/1203	0.47	0/1638
All	All	0.34	0/14452	0.56	0/19640

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5885	0	5589	250	0
1	B	5885	0	5589	264	0
2	C	1176	0	1073	36	0
2	D	1176	0	1073	32	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	6	0	8	1	0
4	B	30	0	40	13	0
5	C	43	0	30	16	0

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	D	43	0	30	13	0
6	A	6	0	0	0	0
6	B	6	0	0	0	0
6	D	1	0	0	0	0
All	All	14259	0	13432	593	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 21.

All (593) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:137:ARG:HD3	1:A:853:ARG:HD2	1.35	1.08
1:B:137:ARG:HD3	1:B:853:ARG:HD2	1.37	1.06
1:B:300:ASN:HB3	1:B:302:THR:HG23	1.41	1.01
1:A:300:ASN:HB3	1:A:302:THR:HG23	1.41	0.99
1:A:733:ARG:CG	1:A:734:GLY:H	1.72	0.99
1:B:575:VAL:HG22	1:B:577:TRP:H	1.26	0.99
5:C:200:HEM:HHD	5:C:200:HEM:HBC2	1.44	0.98
1:B:733:ARG:CG	1:B:734:GLY:H	1.75	0.97
5:D:200:HEM:HBC2	5:D:200:HEM:HHD	1.45	0.96
1:A:575:VAL:HG22	1:A:577:TRP:H	1.27	0.96
5:C:200:HEM:HBA2	5:C:200:HEM:HHA	1.48	0.93
1:B:318:PRO:HG2	1:B:371:TRP:HB2	1.50	0.93
1:A:218:SER:O	1:A:221:THR:HB	1.68	0.92
1:A:733:ARG:HG2	1:A:734:GLY:H	1.33	0.92
1:B:218:SER:O	1:B:221:THR:HB	1.70	0.92
1:A:318:PRO:HG2	1:A:371:TRP:HB2	1.52	0.89
1:A:592:ALA:HB3	1:A:595:GLU:HG2	1.54	0.89
1:B:539:LYS:HA	1:B:734:GLY:HA2	1.53	0.89
1:A:539:LYS:HA	1:A:734:GLY:HA2	1.54	0.88
1:B:733:ARG:HG2	1:B:734:GLY:H	1.35	0.88
1:B:589:ARG:NH2	1:B:595:GLU:OE2	2.08	0.85
2:D:51:SER:HB2	2:D:74:THR:HG22	1.58	0.84
2:C:51:SER:HB2	2:C:74:THR:HG22	1.60	0.83
1:A:191:GLN:HG2	1:A:845:GLU:HG3	1.60	0.83
1:A:538:CYS:O	1:A:539:LYS:HB2	1.77	0.83
5:C:200:HEM:HHC	5:C:200:HEM:HBB2	1.61	0.83
1:B:520:LEU:HD11	1:B:609:TYR:CD1	2.14	0.82
2:C:137:TYR:HB2	5:C:200:HEM:HBC1	1.60	0.82
1:B:191:GLN:HG2	1:B:845:GLU:HG3	1.62	0.81

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:592:ALA:HB3	1:B:595:GLU:HG2	1.61	0.81
2:C:41:ASN:HB2	2:C:42:SER:HA	1.63	0.81
1:A:301:ASP:HA	1:A:304:ASN:HA	1.63	0.80
1:A:480:PRO:HD3	1:A:594:THR:HA	1.63	0.79
1:A:216:MET:HE2	1:A:490:PHE:HE2	1.46	0.79
1:A:720:TRP:CE3	1:A:721:LEU:HG	2.17	0.79
1:B:301:ASP:HA	1:B:304:ASN:HA	1.64	0.79
1:A:520:LEU:HD11	1:A:609:TYR:CD1	2.18	0.78
1:A:341:LEU:HD23	1:A:388:TYR:HD1	1.48	0.78
1:B:341:LEU:HD23	1:B:388:TYR:HD1	1.46	0.78
1:B:538:CYS:O	1:B:539:LYS:HB2	1.82	0.78
1:A:733:ARG:CG	1:A:734:GLY:N	2.46	0.77
1:A:720:TRP:CZ3	1:A:721:LEU:HG	2.19	0.77
1:B:480:PRO:HD3	1:B:594:THR:HA	1.64	0.77
1:B:643:LYS:HB3	1:B:691:GLN:HG3	1.65	0.77
1:B:610:PRO:O	1:B:720:TRP:HZ3	1.67	0.77
2:D:41:ASN:HB2	2:D:42:SER:HA	1.65	0.77
1:A:568:ALA:HB2	1:A:583:THR:HG22	1.67	0.77
1:B:720:TRP:CE3	1:B:721:LEU:HG	2.20	0.77
1:B:216:MET:HE2	1:B:490:PHE:HE2	1.48	0.76
1:A:643:LYS:HB3	1:A:691:GLN:HG3	1.67	0.76
1:B:733:ARG:CG	1:B:734:GLY:N	2.49	0.76
1:A:216:MET:SD	1:A:438:GLN:HB2	2.25	0.76
1:B:720:TRP:CZ3	1:B:721:LEU:HG	2.21	0.76
1:A:562:LYS:HE2	1:A:618:ARG:CD	2.15	0.76
1:A:610:PRO:O	1:A:720:TRP:HZ3	1.68	0.75
1:B:297:ARG:HH22	1:B:847:LEU:HA	1.51	0.75
1:B:562:LYS:HE2	1:B:618:ARG:CD	2.16	0.75
1:B:376:TYR:CE1	4:B:871:GOL:H2	2.21	0.75
2:D:20:LEU:HB3	2:D:144:THR:HG21	1.69	0.75
1:B:520:LEU:CD1	1:B:609:TYR:HD1	2.00	0.74
1:A:462:TYR:CE1	1:A:486:VAL:HG13	2.23	0.73
1:B:376:TYR:HE1	4:B:871:GOL:H2	1.53	0.73
5:D:200:HEM:HBD2	5:D:200:HEM:HHA	1.70	0.73
1:A:297:ARG:HH22	1:A:847:LEU:HA	1.52	0.73
1:A:733:ARG:HG2	1:A:734:GLY:N	2.04	0.73
1:B:520:LEU:HD11	1:B:609:TYR:HD1	1.53	0.73
2:C:20:LEU:HB3	2:C:144:THR:HG21	1.71	0.73
5:D:200:HEM:HHC	5:D:200:HEM:HBB2	1.69	0.73
1:B:393:GLU:O	1:B:394:ASP:HB2	1.89	0.72
1:B:462:TYR:CE1	1:B:486:VAL:HG13	2.25	0.72

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:562:LYS:HE2	1:A:618:ARG:HD2	1.71	0.72
1:A:300:ASN:HB3	1:A:302:THR:CG2	2.19	0.72
1:A:520:LEU:CD1	1:A:609:TYR:HD1	2.02	0.72
1:B:216:MET:SD	1:B:438:GLN:HB2	2.30	0.71
1:B:562:LYS:HE2	1:B:618:ARG:HD2	1.72	0.71
1:B:300:ASN:HB3	1:B:302:THR:CG2	2.19	0.70
1:B:831:VAL:HG22	1:B:857:VAL:HG22	1.71	0.70
1:B:426:TYR:CE2	1:B:472:ARG:HD2	2.25	0.70
1:A:831:VAL:HG22	1:A:857:VAL:HG22	1.74	0.70
1:B:274:LEU:HD12	1:B:275:LEU:N	2.07	0.70
1:A:274:LEU:HD12	1:A:275:LEU:N	2.06	0.69
1:B:278:SER:OG	1:B:326:SER:HB2	1.93	0.69
1:A:733:ARG:HG3	1:A:734:GLY:H	1.58	0.69
1:B:175:MET:HE1	1:B:196:MET:HG2	1.73	0.69
5:C:200:HEM:HBA2	5:C:200:HEM:CHA	2.22	0.69
1:A:520:LEU:O	1:A:551:ARG:HD3	1.92	0.69
1:A:604:SER:O	1:A:605:SER:HB3	1.92	0.68
1:B:770:THR:HG22	1:B:785:THR:HG23	1.76	0.68
1:A:216:MET:HE2	1:A:490:PHE:CE2	2.29	0.68
1:A:657:LEU:O	1:A:755:GLN:O	2.11	0.67
1:A:568:ALA:CB	1:A:583:THR:HG22	2.24	0.67
1:A:163:ASN:ND2	1:A:168:GLN:HB3	2.10	0.67
1:A:393:GLU:O	1:A:394:ASP:HB2	1.92	0.67
1:A:770:THR:HG22	1:A:785:THR:HG23	1.75	0.67
1:A:480:PRO:HG2	1:A:597:LEU:HB2	1.77	0.67
1:A:661:ARG:HH11	1:A:718:LYS:HA	1.59	0.67
1:A:798:PRO:HB2	1:A:800:ASN:OD1	1.95	0.67
1:B:520:LEU:O	1:B:551:ARG:HD3	1.94	0.66
1:B:733:ARG:HG2	1:B:734:GLY:N	2.07	0.66
1:A:278:SER:OG	1:A:326:SER:HB2	1.95	0.66
1:B:604:SER:O	1:B:605:SER:HB3	1.94	0.66
1:B:798:PRO:HB2	1:B:800:ASN:OD1	1.96	0.66
2:C:122:SER:HB2	2:C:132:VAL:HG22	1.76	0.66
1:B:480:PRO:HG2	1:B:597:LEU:HB2	1.76	0.66
1:A:426:TYR:CE2	1:A:472:ARG:HD2	2.30	0.66
1:B:657:LEU:O	1:B:755:GLN:O	2.13	0.66
1:A:604:SER:O	1:A:605:SER:CB	2.43	0.66
1:B:163:ASN:ND2	1:B:168:GLN:HB3	2.11	0.66
1:A:798:PRO:HD2	1:A:801:TYR:CE2	2.29	0.66
2:C:41:ASN:CB	2:C:42:SER:HA	2.23	0.66
2:D:122:SER:HB2	2:D:132:VAL:HG22	1.77	0.66

*Continued on next page...*



*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:539:LYS:HD2	1:B:734:GLY:HA3	1.78	0.65
1:B:568:ALA:HB2	1:B:583:THR:HG22	1.78	0.65
1:A:175:MET:HE1	1:A:196:MET:HG2	1.76	0.65
1:A:237:LEU:O	4:A:867:GOL:H11	1.96	0.65
1:A:475:MET:HA	1:A:478:VAL:HG23	1.78	0.65
1:B:604:SER:O	1:B:605:SER:CB	2.44	0.65
1:B:733:ARG:HG3	1:B:734:GLY:H	1.61	0.65
1:A:603:HIS:HE1	5:C:200:HEM:HMA3	1.62	0.65
1:B:661:ARG:HH11	1:B:718:LYS:HA	1.62	0.64
1:B:231:VAL:HG12	1:B:274:LEU:HD21	1.79	0.64
1:A:610:PRO:O	1:A:720:TRP:CZ3	2.51	0.64
1:B:216:MET:HE2	1:B:490:PHE:CE2	2.30	0.64
1:B:373:ARG:HH12	4:B:871:GOL:H12	1.63	0.64
1:A:539:LYS:HD2	1:A:734:GLY:HA3	1.79	0.64
1:B:798:PRO:HD2	1:B:801:TYR:CE2	2.32	0.64
1:B:610:PRO:O	1:B:720:TRP:CZ3	2.50	0.64
1:A:231:VAL:HG12	1:A:274:LEU:HD21	1.79	0.64
1:A:566:THR:O	1:A:567:LEU:HD12	1.97	0.64
1:A:341:LEU:CD2	1:A:388:TYR:HD1	2.11	0.63
1:A:303:GLY:O	1:A:304:ASN:HB2	1.97	0.63
1:B:475:MET:HA	1:B:478:VAL:HG23	1.78	0.63
1:B:417:SER:HB2	1:B:424:ASN:OD1	1.99	0.63
1:B:697:GLY:HA3	1:B:778:ARG:HH21	1.62	0.63
1:B:301:ASP:HB3	1:B:304:ASN:OD1	1.98	0.63
1:B:822:THR:HG23	1:B:825:LEU:HB2	1.81	0.63
1:B:373:ARG:CZ	4:B:871:GOL:H11	2.28	0.63
1:B:508:ARG:O	1:B:563:LEU:HD12	1.98	0.63
1:B:504:GLU:HB3	1:B:568:ALA:HB3	1.81	0.63
1:A:822:THR:HG23	1:A:825:LEU:HB2	1.81	0.62
1:B:341:LEU:CD2	1:B:388:TYR:HD1	2.11	0.62
1:A:301:ASP:HB3	1:A:304:ASN:OD1	1.99	0.62
1:A:853:ARG:HH11	1:A:856:THR:HG21	1.64	0.62
1:B:373:ARG:HH12	4:B:871:GOL:C1	2.12	0.62
1:B:568:ALA:CB	1:B:583:THR:HG22	2.30	0.61
1:A:417:SER:HB2	1:A:424:ASN:OD1	2.00	0.61
1:B:566:THR:O	1:B:567:LEU:HD12	2.00	0.61
1:B:328:LEU:HD12	1:B:329:ALA:N	2.15	0.61
1:B:373:ARG:NH1	4:B:871:GOL:H11	2.15	0.61
2:C:15:SER:HA	2:C:165:THR:HA	1.82	0.61
1:A:508:ARG:O	1:A:563:LEU:HD12	2.01	0.61
1:B:508:ARG:HD2	1:B:510:ASP:OD1	2.00	0.61

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:162:VAL:HG23	1:A:175:MET:HE3	1.83	0.61
1:A:299:ASN:HA	1:A:305:TYR:HD2	1.65	0.61
1:A:341:LEU:CD2	1:A:388:TYR:CD1	2.84	0.61
1:B:341:LEU:CD2	1:B:388:TYR:CD1	2.83	0.61
1:B:341:LEU:HD23	1:B:388:TYR:CD1	2.34	0.61
2:C:137:TYR:HB2	5:C:200:HEM:CBC	2.31	0.61
1:B:609:TYR:CZ	1:B:663:LYS:HE2	2.36	0.60
1:B:299:ASN:HA	1:B:305:TYR:HD2	1.66	0.60
1:A:137:ARG:HD3	1:A:853:ARG:CD	2.23	0.60
1:B:605:SER:OG	5:D:200:HEM:C1D	2.55	0.60
1:B:137:ARG:HD3	1:B:853:ARG:CD	2.25	0.60
1:B:548:THR:HG22	1:B:549:THR:N	2.16	0.60
5:C:200:HEM:HBD2	5:C:200:HEM:CMD	2.32	0.60
1:B:562:LYS:HG3	1:B:563:LEU:N	2.16	0.60
1:B:303:GLY:O	1:B:304:ASN:HB2	2.02	0.59
1:B:328:LEU:HD12	1:B:329:ALA:H	1.67	0.59
1:B:534:ILE:HD12	1:B:737:TYR:CZ	2.37	0.59
1:A:162:VAL:HG23	1:A:175:MET:CE	2.33	0.59
1:A:609:TYR:CZ	1:A:663:LYS:HE2	2.37	0.59
1:A:419:SER:OG	1:A:422:LEU:HB2	2.02	0.59
2:D:15:SER:HA	2:D:165:THR:HA	1.85	0.59
1:B:165:ARG:HA	1:B:708:MET:CE	2.33	0.59
1:B:520:LEU:CD1	1:B:609:TYR:CD1	2.82	0.59
1:A:579:GLU:HB3	1:A:627:ASN:ND2	2.18	0.59
1:B:579:GLU:HB3	1:B:627:ASN:ND2	2.18	0.59
1:A:548:THR:HG22	1:A:549:THR:N	2.17	0.59
1:A:526:ALA:HB2	1:A:531:ARG:HA	1.85	0.58
1:A:562:LYS:HG3	1:A:563:LEU:N	2.17	0.58
1:B:620:ARG:HG2	1:B:620:ARG:O	2.02	0.58
1:A:700:TYR:CE2	1:A:772:GLY:HA3	2.39	0.58
1:B:299:ASN:HD22	1:B:300:ASN:N	2.00	0.58
1:B:419:SER:OG	1:B:422:LEU:HB2	2.03	0.58
1:B:526:ALA:HB2	1:B:531:ARG:HA	1.85	0.58
1:A:200:SER:HA	1:A:203:LEU:HD12	1.85	0.58
1:B:162:VAL:HG23	1:B:175:MET:CE	2.34	0.58
1:A:263:ILE:HG23	1:A:274:LEU:HD11	1.86	0.58
1:B:172:ARG:NH1	1:B:655:ILE:HG13	2.19	0.58
1:A:727:TYR:CD2	2:C:109:GLN:HG3	2.38	0.58
1:B:358:LEU:HD12	1:B:370:GLY:O	2.03	0.58
1:A:520:LEU:CD1	1:A:609:TYR:CD1	2.83	0.58
1:A:126:ILE:HG13	1:A:206:VAL:HB	1.86	0.58

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:328:LEU:HD12	1:A:329:ALA:N	2.19	0.58
1:B:497:TYR:HB3	1:B:501:LEU:HB3	1.84	0.58
1:B:500:TRP:O	1:B:571:VAL:HA	2.03	0.58
1:A:165:ARG:HA	1:A:708:MET:CE	2.34	0.57
1:A:655:ILE:HD12	1:A:655:ILE:O	2.03	0.57
1:B:126:ILE:HG13	1:B:206:VAL:HB	1.85	0.57
1:B:263:ILE:HG23	1:B:274:LEU:HD11	1.87	0.57
1:A:534:ILE:HD12	1:A:737:TYR:CZ	2.38	0.57
1:B:655:ILE:O	1:B:655:ILE:HD12	2.04	0.57
2:C:115:PHE:HB3	2:C:118:LEU:HD11	1.86	0.57
1:A:605:SER:OG	5:C:200:HEM:C4A	2.58	0.57
1:B:162:VAL:HG23	1:B:175:MET:HE3	1.87	0.57
1:A:720:TRP:O	1:A:721:LEU:HB2	2.03	0.57
1:A:191:GLN:HG2	1:A:845:GLU:CG	2.33	0.57
1:A:163:ASN:HD22	1:A:168:GLN:HB3	1.70	0.57
2:C:101:GLY:HA3	2:C:106:TYR:CE2	2.40	0.57
1:B:373:ARG:NH2	4:B:871:GOL:H11	2.18	0.56
1:B:539:LYS:HD2	1:B:734:GLY:CA	2.34	0.56
1:A:475:MET:SD	1:A:478:VAL:HG21	2.45	0.56
1:A:520:LEU:HD11	1:A:609:TYR:HD1	1.58	0.56
1:A:508:ARG:HD2	1:A:510:ASP:OD1	2.04	0.56
1:B:426:TYR:CD2	1:B:472:ARG:HD2	2.39	0.56
1:B:526:ALA:HB1	1:B:530:GLN:O	2.05	0.56
1:A:120:PRO:O	1:A:121:ARG:HB3	2.05	0.56
1:A:539:LYS:HD2	1:A:734:GLY:CA	2.36	0.56
1:B:511:ARG:HH22	1:B:513:ARG:HD2	1.71	0.56
2:D:115:PHE:HB3	2:D:118:LEU:HD11	1.88	0.56
1:B:191:GLN:HG2	1:B:845:GLU:CG	2.34	0.56
1:B:700:TYR:CE2	1:B:772:GLY:HA3	2.41	0.56
1:B:727:TYR:CD2	2:D:109:GLN:HG3	2.40	0.56
1:B:321:HIS:CE1	4:B:871:GOL:HO1	2.23	0.55
1:B:588:TRP:CH2	1:B:590:PRO:HG3	2.41	0.55
1:A:328:LEU:HD12	1:A:329:ALA:H	1.72	0.55
1:A:299:ASN:HD22	1:A:300:ASN:N	2.04	0.55
1:A:426:TYR:CD2	1:A:472:ARG:HD2	2.41	0.55
1:A:511:ARG:HH22	1:A:513:ARG:HD2	1.71	0.55
1:A:712:ASN:HD22	1:A:712:ASN:N	2.05	0.55
1:B:645:ALA:O	1:B:688:LEU:HD23	2.07	0.55
1:A:462:TYR:CE1	1:A:486:VAL:CG1	2.90	0.54
2:C:113:VAL:HG12	2:C:114:SER:N	2.22	0.54
1:A:526:ALA:CB	1:A:531:ARG:HA	2.38	0.54

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:358:LEU:HD12	1:A:370:GLY:O	2.08	0.54
1:B:853:ARG:HH11	1:B:856:THR:HG21	1.71	0.54
1:A:661:ARG:NH1	1:A:718:LYS:HA	2.23	0.54
1:B:373:ARG:NH1	4:B:871:GOL:C1	2.70	0.54
1:A:172:ARG:NH1	1:A:655:ILE:HG13	2.23	0.54
1:B:712:ASN:N	1:B:712:ASN:HD22	2.05	0.54
1:A:620:ARG:O	1:A:620:ARG:HG2	2.08	0.54
1:A:500:TRP:O	1:A:571:VAL:HA	2.07	0.53
1:A:601:SER:HB3	1:A:607:THR:HA	1.90	0.53
1:B:864:ARG:O	1:B:865:PHE:HB3	2.07	0.53
1:B:697:GLY:CA	1:B:778:ARG:HH21	2.22	0.53
1:A:273:ILE:HD11	1:A:275:LEU:HG	1.90	0.53
1:A:646:TYR:HB2	1:A:688:LEU:HD21	1.90	0.53
1:A:864:ARG:O	1:A:865:PHE:HB3	2.08	0.53
2:C:41:ASN:HB2	2:C:42:SER:CA	2.37	0.53
5:D:200:HEM:HHD	5:D:200:HEM:CBC	2.30	0.53
1:A:588:TRP:CH2	1:A:590:PRO:HG3	2.44	0.53
1:A:180:MET:HE1	1:A:383:ASN:HB3	1.91	0.53
1:A:726:ARG:HB2	1:A:741:ASP:HB2	1.89	0.53
1:A:729:ASP:OD1	1:A:729:ASP:N	2.40	0.53
1:B:137:ARG:HH11	1:B:155:GLN:HB3	1.73	0.53
1:B:163:ASN:HD22	1:B:168:GLN:HB3	1.73	0.53
1:B:200:SER:HA	1:B:203:LEU:HD12	1.91	0.53
1:B:729:ASP:OD1	1:B:729:ASP:N	2.41	0.53
1:B:769:VAL:HG12	1:B:786:VAL:HB	1.91	0.53
1:A:504:GLU:HB3	1:A:568:ALA:HB3	1.91	0.53
1:B:180:MET:HE1	1:B:383:ASN:HB3	1.91	0.53
1:A:645:ALA:O	1:A:688:LEU:HD23	2.08	0.53
1:B:526:ALA:CB	1:B:531:ARG:HA	2.39	0.53
2:C:86:TYR:HA	2:C:132:VAL:HG21	1.91	0.53
2:D:113:VAL:HG12	2:D:114:SER:N	2.23	0.53
1:B:601:SER:HB3	1:B:607:THR:HA	1.92	0.52
1:B:199:ASP:O	1:B:200:SER:HB3	2.10	0.52
1:A:144:GLU:HG2	1:A:766:ARG:NH1	2.25	0.52
1:B:790:PRO:O	1:B:809:LYS:HB3	2.09	0.52
1:B:519:GLY:HA3	1:B:551:ARG:NH1	2.25	0.52
5:C:200:HEM:HHD	5:C:200:HEM:CBC	2.28	0.52
1:A:790:PRO:O	1:A:809:LYS:HB3	2.10	0.52
1:B:273:ILE:HD12	1:B:274:LEU:N	2.25	0.52
1:A:577:TRP:HD1	1:A:578:LEU:HB2	1.74	0.52
2:D:101:GLY:HA3	2:D:106:TYR:CE2	2.44	0.52

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:274:LEU:HD12	1:B:274:LEU:C	2.30	0.52
1:B:720:TRP:O	1:B:721:LEU:HB2	2.08	0.52
2:D:86:TYR:HA	2:D:132:VAL:HG21	1.92	0.51
1:A:338:ASN:HB3	1:A:391:ALA:O	2.10	0.51
1:B:462:TYR:CE1	1:B:486:VAL:CG1	2.92	0.51
1:A:273:ILE:HD12	1:A:274:LEU:N	2.25	0.51
2:C:128:HIS:HA	2:C:133:HIS:CD2	2.45	0.51
2:D:128:HIS:HA	2:D:133:HIS:CD2	2.44	0.51
1:A:497:TYR:HB3	1:A:501:LEU:HB3	1.91	0.51
1:B:296:ILE:HG22	1:B:804:LEU:HD13	1.93	0.51
1:B:646:TYR:HB2	1:B:688:LEU:HD21	1.93	0.51
1:A:117:TYR:CG	1:A:641:VAL:HG22	2.46	0.51
1:A:301:ASP:HA	1:A:304:ASN:CA	2.36	0.51
1:A:462:TYR:CZ	1:A:486:VAL:CG1	2.94	0.51
1:A:479:THR:O	1:A:594:THR:HG23	2.11	0.51
1:B:120:PRO:O	1:B:121:ARG:HB3	2.09	0.51
1:B:165:ARG:HA	1:B:708:MET:HE3	1.93	0.51
1:B:655:ILE:HD12	1:B:655:ILE:C	2.32	0.50
2:C:67:PHE:CD1	2:C:67:PHE:C	2.84	0.50
1:B:338:ASN:HB3	1:B:391:ALA:O	2.12	0.50
1:A:282:LEU:O	1:A:321:HIS:HB2	2.11	0.50
1:B:828:ARG:NH1	1:B:862:GLU:OE1	2.42	0.50
2:D:67:PHE:CD1	2:D:67:PHE:C	2.85	0.50
1:A:137:ARG:HH11	1:A:155:GLN:HB3	1.75	0.50
1:A:828:ARG:NH1	1:A:862:GLU:OE1	2.42	0.50
2:D:55:TYR:CE1	5:D:200:HEM:CBB	2.94	0.50
1:A:169:ASP:O	1:A:172:ARG:HG3	2.10	0.50
1:B:273:ILE:HD11	1:B:275:LEU:HG	1.94	0.50
1:B:299:ASN:HD22	1:B:300:ASN:CG	2.15	0.50
1:B:373:ARG:HH22	4:B:871:GOL:C1	2.24	0.50
1:B:596:THR:HG22	1:B:597:LEU:HD23	1.93	0.50
1:A:628:VAL:O	1:A:641:VAL:HA	2.12	0.50
1:B:144:GLU:HG2	1:B:766:ARG:NH1	2.26	0.50
1:B:156:GLN:HG3	1:B:850:THR:HG21	1.94	0.50
1:B:588:TRP:CZ3	1:B:590:PRO:HG3	2.46	0.50
2:C:137:TYR:CZ	5:C:200:HEM:HMD3	2.47	0.50
1:A:199:ASP:O	1:A:200:SER:HB3	2.12	0.50
1:A:296:ILE:HG22	1:A:804:LEU:HD13	1.93	0.50
1:A:299:ASN:ND2	1:A:300:ASN:CG	2.64	0.50
1:A:526:ALA:HB1	1:A:530:GLN:O	2.12	0.50
1:A:635:PHE:CD1	1:A:635:PHE:N	2.76	0.50

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:853:ARG:NH1	1:A:856:THR:HG21	2.27	0.50
1:B:661:ARG:NH1	1:B:718:LYS:HA	2.25	0.50
5:D:200:HEM:HHC	5:D:200:HEM:CBB	2.41	0.50
1:A:199:ASP:O	1:A:199:ASP:OD1	2.29	0.50
1:A:116:VAL:HG23	1:A:123:VAL:HG13	1.94	0.49
1:B:299:ASN:ND2	1:B:300:ASN:CG	2.64	0.49
1:B:300:ASN:C	1:B:302:THR:H	2.16	0.49
1:B:301:ASP:HA	1:B:304:ASN:CA	2.37	0.49
1:B:577:TRP:HD1	1:B:578:LEU:HB2	1.77	0.49
1:A:562:LYS:HE2	1:A:618:ARG:NE	2.27	0.49
1:A:596:THR:HG22	1:A:597:LEU:HD23	1.95	0.49
1:B:570:ALA:HA	1:B:580:LEU:O	2.13	0.49
1:A:301:ASP:CA	1:A:304:ASN:HA	2.38	0.49
1:A:595:GLU:HA	1:A:676:TYR:CD1	2.47	0.49
1:A:655:ILE:HD12	1:A:655:ILE:C	2.32	0.49
1:B:662:ASN:OD1	1:B:718:LYS:HE3	2.13	0.49
1:B:462:TYR:CZ	1:B:486:VAL:CG1	2.95	0.49
5:D:200:HEM:HHA	5:D:200:HEM:CBD	2.41	0.49
5:C:200:HEM:HBD2	5:C:200:HEM:HMD2	1.93	0.49
1:B:734:GLY:O	1:B:736:PHE:N	2.45	0.49
1:A:130:GLN:OE1	1:A:145:GLN:HB2	2.12	0.49
1:A:299:ASN:HD22	1:A:300:ASN:CG	2.16	0.49
1:A:519:GLY:HA3	1:A:551:ARG:NH1	2.27	0.49
1:A:570:ALA:HA	1:A:580:LEU:O	2.13	0.49
1:A:139:ALA:HB1	1:A:160:LEU:HD22	1.95	0.49
1:A:507:LEU:HD12	1:A:507:LEU:O	2.13	0.49
1:A:692:LEU:C	1:A:692:LEU:HD23	2.32	0.49
1:B:726:ARG:HB2	1:B:741:ASP:HB2	1.94	0.49
1:A:797:VAL:HB	1:A:801:TYR:CD2	2.48	0.49
1:B:475:MET:SD	1:B:478:VAL:HG21	2.53	0.49
2:D:27:PHE:HB2	2:D:65:THR:HG21	1.95	0.49
1:B:628:VAL:O	1:B:641:VAL:HA	2.13	0.48
1:A:300:ASN:C	1:A:302:THR:H	2.15	0.48
1:B:231:VAL:CG1	1:B:274:LEU:HD21	2.42	0.48
1:A:165:ARG:HA	1:A:708:MET:HE3	1.95	0.48
1:A:734:GLY:O	1:A:736:PHE:N	2.45	0.48
1:B:117:TYR:CG	1:B:641:VAL:HG22	2.48	0.48
1:B:282:LEU:O	1:B:321:HIS:HB2	2.13	0.48
2:C:133:HIS:CE1	5:C:200:HEM:CBC	2.96	0.48
1:B:672:GLY:HA2	5:D:200:HEM:HBC1	1.96	0.48
2:C:62:ASN:O	2:C:64:VAL:HG12	2.13	0.48

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:769:VAL:HG12	1:A:786:VAL:HB	1.94	0.48
1:B:327:ARG:HB3	4:B:867:GOL:H31	1.95	0.48
1:B:169:ASP:O	1:B:172:ARG:HG3	2.13	0.48
1:B:539:LYS:CA	1:B:734:GLY:HA2	2.35	0.48
1:B:661:ARG:HD3	1:B:718:LYS:HA	1.96	0.48
1:B:692:LEU:HD23	1:B:692:LEU:C	2.33	0.48
1:A:165:ARG:HA	1:A:708:MET:HE1	1.95	0.48
1:A:231:VAL:CG1	1:A:274:LEU:HD21	2.42	0.48
1:B:797:VAL:HB	1:B:801:TYR:CD2	2.48	0.48
2:C:53:SER:HA	2:C:71:GLY:O	2.14	0.48
1:A:274:LEU:HD12	1:A:274:LEU:C	2.34	0.48
1:A:539:LYS:CA	1:A:734:GLY:HA2	2.35	0.48
1:A:577:TRP:CD1	1:A:578:LEU:HB2	2.48	0.48
2:D:62:ASN:O	2:D:64:VAL:HG12	2.14	0.48
1:B:130:GLN:OE1	1:B:145:GLN:HB2	2.13	0.48
1:B:635:PHE:CD1	1:B:635:PHE:N	2.79	0.47
2:C:113:VAL:CG1	2:C:114:SER:N	2.76	0.47
1:A:661:ARG:HD3	1:A:718:LYS:HA	1.95	0.47
1:B:165:ARG:HA	1:B:708:MET:HE1	1.95	0.47
1:B:731:SER:OG	1:B:733:ARG:NH2	2.47	0.47
1:A:523:PRO:HG3	1:A:668:GLN:OE1	2.14	0.47
1:A:685:PHE:N	1:A:685:PHE:CD2	2.82	0.47
1:B:301:ASP:CA	1:B:304:ASN:HA	2.38	0.47
1:B:793:GLN:HA	1:B:805:ALA:O	2.14	0.47
1:B:655:ILE:HG22	1:B:678:ASN:ND2	2.30	0.47
1:A:669:PRO:C	2:C:43:GLY:O	2.52	0.47
1:B:116:VAL:HG23	1:B:123:VAL:HG13	1.97	0.47
1:A:655:ILE:HG22	1:A:678:ASN:ND2	2.29	0.47
1:A:793:GLN:HA	1:A:805:ALA:O	2.14	0.47
1:B:238:ALA:HB1	1:B:239:PRO:HD2	1.97	0.47
1:B:262:GLY:O	1:B:276:ALA:HA	2.15	0.47
1:B:321:HIS:CE1	4:B:871:GOL:O1	2.67	0.47
1:B:554:TRP:CZ3	1:B:613:PHE:HZ	2.33	0.47
1:B:199:ASP:O	1:B:199:ASP:OD1	2.33	0.47
1:B:776:PHE:O	1:B:777:ASP:HB2	2.14	0.47
2:D:113:VAL:CG1	2:D:114:SER:N	2.78	0.47
1:A:116:VAL:CG2	1:A:123:VAL:HG13	2.45	0.47
2:C:62:ASN:O	2:C:63:GLN:HB2	2.15	0.47
1:A:513:ARG:HH12	1:A:515:ARG:NH1	2.13	0.47
1:B:119:GLU:HA	1:B:120:PRO:HD3	1.68	0.46
1:A:669:PRO:O	2:C:43:GLY:O	2.33	0.46

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:238:ALA:HB1	1:A:239:PRO:HD2	1.97	0.46
1:A:662:ASN:OD1	1:A:718:LYS:HE3	2.15	0.46
1:B:562:LYS:HE2	1:B:618:ARG:NE	2.30	0.46
1:B:685:PHE:N	1:B:685:PHE:CD2	2.84	0.46
1:A:296:ILE:HD13	1:A:296:ILE:N	2.31	0.46
1:A:579:GLU:HB3	1:A:627:ASN:HD21	1.80	0.46
1:B:387:ASP:OD1	1:B:403:LYS:HD3	2.15	0.46
5:D:200:HEM:HBB2	5:D:200:HEM:CHC	2.40	0.46
1:B:577:TRP:CD1	1:B:578:LEU:HB2	2.50	0.46
1:B:669:PRO:C	2:D:43:GLY:O	2.54	0.46
1:A:262:GLY:O	1:A:276:ALA:HA	2.15	0.46
1:B:199:ASP:C	1:B:201:GLU:H	2.19	0.46
1:B:712:ASN:N	1:B:712:ASN:ND2	2.63	0.46
2:D:55:TYR:CE1	5:D:200:HEM:HBB1	2.51	0.46
5:D:200:HEM:HBC2	5:D:200:HEM:CHD	2.24	0.46
1:B:501:LEU:HD12	1:B:502:THR:H	1.80	0.46
1:B:575:VAL:CG1	1:B:577:TRP:HB3	2.45	0.46
1:A:312:ILE:HD11	1:A:358:LEU:HD11	1.98	0.46
1:A:494:THR:HG22	1:A:495:TYR:N	2.31	0.46
1:B:468:SER:HB3	1:B:476:GLU:O	2.16	0.46
1:B:523:PRO:HG3	1:B:668:GLN:OE1	2.16	0.45
1:A:121:ARG:O	1:A:643:LYS:HE3	2.15	0.45
1:B:139:ALA:HB1	1:B:160:LEU:HD22	1.97	0.45
1:B:669:PRO:O	2:D:43:GLY:O	2.35	0.45
1:A:712:ASN:N	1:A:712:ASN:ND2	2.64	0.45
1:A:776:PHE:O	1:A:777:ASP:HB2	2.16	0.45
1:A:847:LEU:HA	1:A:847:LEU:HD12	1.73	0.45
1:B:216:MET:SD	1:B:438:GLN:CB	3.03	0.45
1:B:373:ARG:NH2	4:B:871:GOL:C1	2.79	0.45
1:B:498:ASP:HB2	1:B:500:TRP:CD1	2.51	0.45
1:B:609:TYR:OH	1:B:663:LYS:HE2	2.17	0.45
2:C:19:TYR:CD2	2:C:19:TYR:C	2.90	0.45
1:A:199:ASP:C	1:A:201:GLU:H	2.20	0.45
1:B:299:ASN:O	1:B:301:ASP:N	2.49	0.45
2:D:27:PHE:O	2:D:27:PHE:CD1	2.70	0.45
1:A:498:ASP:HB2	1:A:500:TRP:CD1	2.52	0.45
1:A:588:TRP:CZ3	1:A:590:PRO:HG3	2.52	0.45
1:B:533:THR:OG1	1:B:534:ILE:N	2.50	0.45
1:B:579:GLU:HB3	1:B:627:ASN:HD21	1.81	0.45
2:C:27:PHE:CD1	2:C:27:PHE:O	2.70	0.45
1:A:501:LEU:HD12	1:A:502:THR:H	1.79	0.45

*Continued on next page...*



*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:27:PHE:HB2	2:C:65:THR:HG21	1.98	0.45
2:C:74:THR:OG1	2:C:86:TYR:CE2	2.70	0.45
1:B:312:ILE:HD11	1:B:358:LEU:HD11	1.97	0.45
1:B:299:ASN:ND2	1:B:300:ASN:N	2.65	0.45
1:A:299:ASN:O	1:A:301:ASP:N	2.50	0.44
2:D:53:SER:HA	2:D:71:GLY:O	2.17	0.44
1:A:156:GLN:HG3	1:A:850:THR:HG21	1.98	0.44
1:A:595:GLU:OE2	1:A:655:ILE:HG12	2.16	0.44
1:B:256:THR:HG21	1:B:858:GLN:OE1	2.17	0.44
1:A:300:ASN:C	1:A:302:THR:N	2.71	0.44
1:B:286:TRP:HA	1:B:287:PRO:HD3	1.78	0.44
1:B:595:GLU:HA	1:B:676:TYR:CD1	2.53	0.44
1:B:847:LEU:HA	1:B:847:LEU:HD12	1.75	0.44
2:D:83:HIS:O	2:D:128:HIS:HE1	2.00	0.44
2:C:26:THR:C	2:C:28:GLY:H	2.21	0.44
2:D:26:THR:C	2:D:28:GLY:H	2.20	0.44
2:D:74:THR:OG1	2:D:86:TYR:CE2	2.70	0.44
1:A:119:GLU:HA	1:A:120:PRO:HD3	1.70	0.44
2:C:69:ALA:HB1	2:C:89:LEU:HD21	1.99	0.44
1:A:121:ARG:O	1:A:643:LYS:CE	2.65	0.44
1:B:479:THR:O	1:B:594:THR:HG23	2.18	0.44
1:B:853:ARG:NH1	1:B:856:THR:HG21	2.32	0.44
1:B:717:ASN:O	1:B:719:ALA:N	2.43	0.44
1:B:298:ILE:O	1:B:299:ASN:HB3	2.18	0.44
1:A:201:GLU:OE1	1:A:201:GLU:HA	2.17	0.44
1:A:288:GLY:HA3	1:A:838:ALA:HA	2.00	0.44
1:A:589:ARG:NH2	1:A:595:GLU:OE2	2.29	0.44
2:C:155:LEU:HB3	2:C:160:LEU:HB2	1.99	0.44
1:A:373:ARG:O	1:A:373:ARG:HG2	2.18	0.43
1:A:387:ASP:OD1	1:A:403:LYS:HD3	2.18	0.43
1:B:444:ARG:HG3	1:B:454:ARG:HG3	1.99	0.43
2:C:27:PHE:O	2:C:27:PHE:CG	2.71	0.43
2:D:62:ASN:O	2:D:63:GLN:HB2	2.18	0.43
1:B:123:VAL:HG22	1:B:124:SER:N	2.33	0.43
1:B:293:ILE:HG13	1:B:294:GLY:N	2.33	0.43
1:B:373:ARG:O	1:B:373:ARG:HG2	2.18	0.43
1:B:548:THR:HG22	1:B:549:THR:H	1.81	0.43
2:C:83:HIS:O	2:C:128:HIS:HE1	2.01	0.43
1:A:444:ARG:HG3	1:A:454:ARG:HG3	2.00	0.43
1:B:657:LEU:HB2	1:B:676:TYR:CE2	2.54	0.43
2:D:19:TYR:CD2	2:D:19:TYR:C	2.91	0.43

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:155:LEU:HB3	2:D:160:LEU:HB2	1.99	0.43
1:A:533:THR:OG1	1:A:534:ILE:N	2.51	0.43
1:A:609:TYR:OH	1:A:663:LYS:HE2	2.18	0.43
1:B:243:LEU:C	1:B:243:LEU:HD23	2.38	0.43
1:B:296:ILE:N	1:B:296:ILE:HD13	2.32	0.43
1:B:697:GLY:HA3	1:B:778:ARG:NH2	2.30	0.43
1:A:266:LEU:HD12	1:A:266:LEU:HA	1.80	0.43
1:B:762:LEU:HD12	1:B:762:LEU:HA	1.82	0.43
1:B:299:ASN:C	1:B:301:ASP:H	2.22	0.43
1:B:719:ALA:C	1:B:720:TRP:O	2.54	0.43
1:A:548:THR:HG22	1:A:549:THR:H	1.81	0.43
1:A:731:SER:OG	1:A:733:ARG:NH2	2.51	0.43
1:B:180:MET:HE2	1:B:405:TYR:HB2	2.00	0.43
1:B:494:THR:HG22	1:B:495:TYR:N	2.32	0.43
1:A:500:TRP:HA	1:A:572:ARG:HG3	2.01	0.43
1:A:554:TRP:CZ3	1:A:613:PHE:HZ	2.36	0.43
1:B:123:VAL:CG2	1:B:124:SER:N	2.81	0.43
1:B:165:ARG:HD3	1:B:647:PHE:CE2	2.54	0.43
1:B:787:ARG:NH1	1:B:814:ASP:OD2	2.50	0.43
2:C:83:HIS:CE1	5:C:200:HEM:C2A	3.06	0.43
1:A:652:ASP:O	1:A:653:ASN:HB2	2.19	0.42
1:B:116:VAL:CG2	1:B:123:VAL:HG13	2.49	0.42
1:B:139:ALA:O	1:B:142:ILE:HG23	2.19	0.42
1:B:201:GLU:OE1	1:B:201:GLU:HA	2.18	0.42
1:B:833:ASN:O	1:B:855:ARG:HA	2.20	0.42
1:B:590:PRO:HA	1:B:616:PRO:HB3	2.00	0.42
1:A:480:PRO:HB2	1:A:481:ALA:H	1.48	0.42
1:A:657:LEU:HB2	1:A:676:TYR:CE2	2.54	0.42
1:A:719:ALA:C	1:A:720:TRP:O	2.55	0.42
1:A:821:LEU:HA	1:A:821:LEU:HD12	1.76	0.42
1:B:121:ARG:O	1:B:643:LYS:CE	2.68	0.42
1:A:369:LEU:HD12	1:A:369:LEU:HA	1.92	0.42
1:A:680:LEU:HD11	1:A:717:ASN:OD1	2.19	0.42
1:A:763:PRO:HA	1:A:843:TYR:CD2	2.55	0.42
1:B:172:ARG:HH12	1:B:655:ILE:HG13	1.82	0.42
1:B:417:SER:HB3	1:B:425:GLY:N	2.34	0.42
1:B:798:PRO:C	1:B:800:ASN:H	2.23	0.42
5:C:200:HEM:HBC2	5:C:200:HEM:CHD	2.25	0.42
2:D:27:PHE:O	2:D:27:PHE:CG	2.72	0.42
1:A:299:ASN:ND2	1:A:300:ASN:N	2.67	0.42
1:A:575:VAL:CG1	1:A:577:TRP:HB3	2.50	0.42

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:717:ASN:C	1:A:719:ALA:H	2.21	0.42
1:B:763:PRO:HA	1:B:843:TYR:CD2	2.54	0.42
1:A:293:ILE:HG13	1:A:294:GLY:N	2.34	0.42
1:A:543:LEU:HD23	1:A:543:LEU:HA	1.89	0.42
1:A:572:ARG:HA	1:A:578:LEU:O	2.19	0.42
1:A:798:PRO:C	1:A:800:ASN:H	2.22	0.42
1:A:143:LEU:HD12	1:A:143:LEU:HA	1.91	0.42
1:A:168:GLN:HG3	1:A:169:ASP:OD1	2.19	0.42
1:A:256:THR:HG21	1:A:858:GLN:OE1	2.19	0.42
1:B:147:THR:HG23	1:B:704:THR:HB	2.02	0.42
1:B:507:LEU:O	1:B:507:LEU:HD12	2.19	0.42
1:A:468:SER:HB3	1:A:476:GLU:O	2.19	0.42
1:A:480:PRO:HG3	1:A:598:THR:HA	2.01	0.42
1:A:603:HIS:CE1	5:C:200:HEM:HMA3	2.49	0.42
1:B:300:ASN:C	1:B:302:THR:N	2.71	0.42
1:A:300:ASN:O	1:A:302:THR:N	2.52	0.42
1:A:717:ASN:O	1:A:719:ALA:N	2.44	0.42
1:B:299:ASN:HD22	1:B:300:ASN:CB	2.33	0.42
1:B:572:ARG:HA	1:B:578:LEU:O	2.20	0.42
2:D:80:GLU:HG2	2:D:81:PRO:HA	2.01	0.42
1:A:516:GLY:HA3	1:A:597:LEU:HD11	2.02	0.41
1:B:832:GLU:OE1	1:B:853:ARG:NH2	2.53	0.41
1:A:575:VAL:HG22	1:A:576:GLU:N	2.35	0.41
1:A:609:TYR:HA	1:A:610:PRO:HD3	1.85	0.41
1:B:834:LEU:HD23	1:B:834:LEU:HA	1.86	0.41
1:A:762:LEU:HD12	1:A:762:LEU:HA	1.81	0.41
1:B:137:ARG:HB2	1:B:282:LEU:HD13	2.02	0.41
1:B:516:GLY:HA3	1:B:597:LEU:HD11	2.03	0.41
1:B:564:SER:HA	1:B:565:PRO:HD3	1.73	0.41
1:A:216:MET:SD	1:A:438:GLN:CB	3.03	0.41
1:B:569:VAL:O	1:B:581:TYR:HA	2.20	0.41
1:A:137:ARG:HB2	1:A:282:LEU:HD13	2.03	0.41
1:A:562:LYS:HB3	1:A:588:TRP:CD2	2.55	0.41
1:A:640:LEU:HG	1:A:641:VAL:N	2.35	0.41
1:B:297:ARG:NH2	1:B:846:THR:O	2.53	0.41
1:B:652:ASP:O	1:B:653:ASN:HB2	2.21	0.41
2:C:122:SER:HB2	2:C:132:VAL:CG2	2.48	0.41
1:B:712:ASN:HD22	1:B:712:ASN:H	1.67	0.41
5:D:200:HEM:CBD	5:D:200:HEM:CHA	2.99	0.41
1:A:417:SER:HB3	1:A:425:GLY:N	2.35	0.41
1:A:543:LEU:HD21	1:A:736:PHE:CD1	2.55	0.41

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:566:THR:O	1:A:567:LEU:CD1	2.66	0.41
1:B:121:ARG:O	1:B:643:LYS:HE3	2.20	0.41
1:B:520:LEU:HA	1:B:520:LEU:HD12	1.78	0.41
1:B:593:ILE:HD12	1:B:593:ILE:H	1.85	0.41
1:A:123:VAL:HG22	1:A:124:SER:N	2.35	0.41
1:A:297:ARG:NH2	1:A:846:THR:O	2.54	0.41
1:B:854:GLY:O	1:B:855:ARG:C	2.59	0.41
2:D:122:SER:HB2	2:D:132:VAL:CG2	2.47	0.41
2:D:165:THR:O	2:D:169:VAL:HG23	2.21	0.41
1:A:532:TYR:HA	1:A:536:ASN:O	2.20	0.41
1:A:595:GLU:OE1	1:A:655:ILE:HD13	2.21	0.41
1:B:288:GLY:HA3	1:B:838:ALA:HA	2.03	0.41
1:B:480:PRO:HB2	1:B:481:ALA:H	1.38	0.41
1:B:609:TYR:HA	1:B:610:PRO:HD3	1.88	0.41
1:B:615:GLN:HA	1:B:616:PRO:HD3	1.95	0.41
2:C:80:GLU:HG2	2:C:81:PRO:HA	2.03	0.41
2:D:69:ALA:HB1	2:D:89:LEU:HD21	2.03	0.41
1:A:299:ASN:C	1:A:301:ASP:H	2.23	0.41
1:A:590:PRO:HA	1:A:616:PRO:HB3	2.02	0.41
1:A:787:ARG:NH1	1:A:814:ASP:OD2	2.51	0.41
1:B:365:PRO:HA	1:B:366:PRO:C	2.42	0.40
1:A:617:GLU:OE2	1:A:654:TYR:HA	2.21	0.40
1:B:839:TYR:O	1:B:851:LEU:HA	2.22	0.40
1:A:407:VAL:O	1:A:433:ARG:HA	2.21	0.40
1:B:283:GLY:HA2	1:B:321:HIS:CB	2.51	0.40
1:B:617:GLU:OE2	1:B:654:TYR:HA	2.22	0.40
1:A:287:PRO:HG3	1:A:317:ILE:HD11	2.03	0.40
1:A:321:HIS:CE1	1:A:353:PRO:HG2	2.56	0.40
1:A:411:ASP:HB3	1:A:430:THR:HG23	2.03	0.40
1:B:827:LEU:HD23	1:B:827:LEU:HA	1.83	0.40
1:A:123:VAL:CG2	1:A:124:SER:N	2.84	0.40

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	751/865 (87%)	664 (88%)	76 (10%)	11 (2%)	10	33
1	B	751/865 (87%)	666 (89%)	73 (10%)	12 (2%)	9	31
2	C	158/206 (77%)	141 (89%)	16 (10%)	1 (1%)	25	56
2	D	158/206 (77%)	142 (90%)	15 (10%)	1 (1%)	25	56
All	All	1818/2142 (85%)	1613 (89%)	180 (10%)	25 (1%)	11	34

All (25) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	480	PRO
1	B	480	PRO
2	C	5	VAL
2	D	5	VAL
1	A	299	ASN
1	A	300	ASN
1	A	304	ASN
1	A	605	SER
1	A	733	ARG
1	B	299	ASN
1	B	300	ASN
1	B	304	ASN
1	B	605	SER
1	B	733	ARG
1	A	121	ARG
1	B	318	PRO
1	B	735	ASN
1	A	318	PRO
1	A	735	ASN
1	B	121	ARG
1	B	337	ALA
1	A	336	PRO
1	B	336	PRO
1	A	231	VAL
1	B	231	VAL

### 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	615/694 (89%)	564 (92%)	51 (8%)	11	32
1	B	615/694 (89%)	563 (92%)	52 (8%)	10	31
2	C	123/158 (78%)	115 (94%)	8 (6%)	17	44
2	D	123/158 (78%)	115 (94%)	8 (6%)	17	44
All	All	1476/1704 (87%)	1357 (92%)	119 (8%)	11	33

All (119) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	122	SER
1	A	125	VAL
1	A	126	ILE
1	A	142	ILE
1	A	143	LEU
1	A	146	THR
1	A	152	SER
1	A	168	GLN
1	A	176	ASN
1	A	187	SER
1	A	207	THR
1	A	212	THR
1	A	222	LEU
1	A	264	LEU
1	A	266	LEU
1	A	273	ILE
1	A	274	LEU
1	A	335	LEU
1	A	344	SER
1	A	348	THR
1	A	393	GLU
1	A	409	THR
1	A	428	THR
1	A	430	THR

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	467	THR
1	A	469	ASP
1	A	496	ASP
1	A	503	LEU
1	A	512	TYR
1	A	514	LEU
1	A	533	THR
1	A	542	ARG
1	A	546	CYS
1	A	549	THR
1	A	564	SER
1	A	620	ARG
1	A	624	VAL
1	A	627	ASN
1	A	662	ASN
1	A	691	GLN
1	A	698	VAL
1	A	703	LEU
1	A	712	ASN
1	A	729	ASP
1	A	733	ARG
1	A	738	VAL
1	A	762	LEU
1	A	770	THR
1	A	822	THR
1	A	826	THR
1	A	834	LEU
1	B	122	SER
1	B	125	VAL
1	B	126	ILE
1	B	142	ILE
1	B	143	LEU
1	B	146	THR
1	B	152	SER
1	B	168	GLN
1	B	176	ASN
1	B	187	SER
1	B	207	THR
1	B	212	THR
1	B	222	LEU
1	B	264	LEU
1	B	266	LEU

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B	273	ILE
1	B	274	LEU
1	B	312	ILE
1	B	335	LEU
1	B	344	SER
1	B	348	THR
1	B	393	GLU
1	B	409	THR
1	B	428	THR
1	B	430	THR
1	B	467	THR
1	B	469	ASP
1	B	488	SER
1	B	496	ASP
1	B	503	LEU
1	B	512	TYR
1	B	514	LEU
1	B	533	THR
1	B	542	ARG
1	B	546	CYS
1	B	549	THR
1	B	564	SER
1	B	620	ARG
1	B	627	ASN
1	B	662	ASN
1	B	691	GLN
1	B	698	VAL
1	B	703	LEU
1	B	712	ASN
1	B	729	ASP
1	B	733	ARG
1	B	738	VAL
1	B	762	LEU
1	B	770	THR
1	B	822	THR
1	B	826	THR
1	B	834	LEU
2	C	64	VAL
2	C	67	PHE
2	C	89	LEU
2	C	108	ILE
2	C	114	SER

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Res	Type
2	C	123	LEU
2	C	147	LEU
2	C	164	SER
2	D	64	VAL
2	D	67	PHE
2	D	89	LEU
2	D	108	ILE
2	D	114	SER
2	D	123	LEU
2	D	147	LEU
2	D	164	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	299	ASN
1	A	441	ASN
1	A	603	HIS
1	B	299	ASN
1	B	441	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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 10 ligands modelled in this entry, 2 are monoatomic - leaving 8 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
4	GOL	B	871	-	5,5,5	0.32	0	5,5,5	0.58	0
5	HEM	C	200	2	27,50,50	2.27	6 (22%)	17,82,82	1.43	4 (23%)
4	GOL	B	867	-	5,5,5	0.44	0	5,5,5	0.25	0
5	HEM	D	200	2	27,50,50	2.21	5 (18%)	17,82,82	1.69	4 (23%)
4	GOL	B	869	-	5,5,5	0.38	0	5,5,5	0.27	0
4	GOL	A	867	-	5,5,5	0.40	0	5,5,5	0.21	0
4	GOL	B	870	-	5,5,5	0.47	0	5,5,5	0.42	0
4	GOL	B	868	-	5,5,5	0.39	0	5,5,5	0.30	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GOL	B	871	-	-	2/4/4/4	-
5	HEM	C	200	2	-	4/6/54/54	-
4	GOL	B	867	-	-	4/4/4/4	-
5	HEM	D	200	2	-	2/6/54/54	-
4	GOL	B	869	-	-	2/4/4/4	-
4	GOL	A	867	-	-	2/4/4/4	-
4	GOL	B	870	-	-	0/4/4/4	-
4	GOL	B	868	-	-	2/4/4/4	-

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	200	HEM	C3D-C2D	5.49	1.53	1.37
5	D	200	HEM	C3D-C2D	5.40	1.53	1.37
5	D	200	HEM	C3B-C2B	-5.06	1.33	1.40
5	C	200	HEM	C3B-C2B	-5.01	1.33	1.40
5	D	200	HEM	C3C-C2C	-4.86	1.33	1.40
5	C	200	HEM	C3C-C2C	-4.85	1.33	1.40
5	C	200	HEM	C3B-CAB	3.54	1.55	1.47

*Continued on next page...*

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	200	HEM	C3C-CAC	3.29	1.54	1.47
5	D	200	HEM	C3B-CAB	3.22	1.54	1.47
5	D	200	HEM	C3C-CAC	3.09	1.54	1.47
5	C	200	HEM	CAA-C2A	2.18	1.55	1.52

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	D	200	HEM	CBD-CAD-C3D	-4.00	105.10	112.48
5	D	200	HEM	CAA-CBA-CGA	-2.69	108.16	112.67
5	D	200	HEM	C1D-C2D-C3D	-2.62	105.17	107.00
5	D	200	HEM	C4C-C3C-C2C	2.37	108.55	106.90
5	C	200	HEM	C4A-C3A-C2A	2.25	108.56	107.00
5	C	200	HEM	C1D-C2D-C3D	-2.21	105.46	107.00
5	C	200	HEM	C4C-C3C-C2C	2.18	108.42	106.90
5	C	200	HEM	CMA-C3A-C4A	-2.04	125.33	128.46

There are no chirality outliers.

All (18) torsion outliers are listed below:

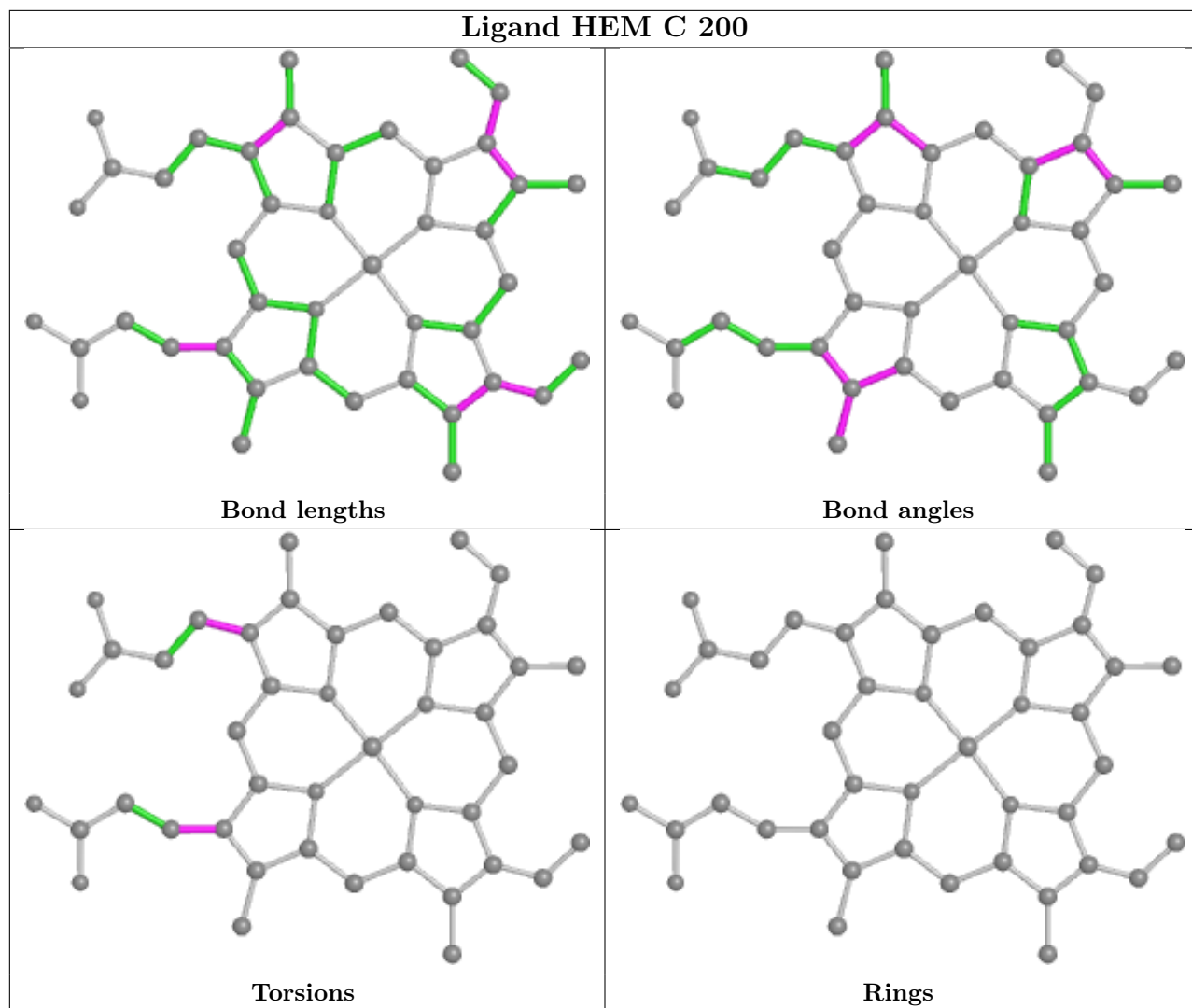
Mol	Chain	Res	Type	Atoms
4	B	867	GOL	O1-C1-C2-C3
4	B	867	GOL	C1-C2-C3-O3
4	B	868	GOL	O1-C1-C2-C3
4	B	869	GOL	O1-C1-C2-C3
4	B	871	GOL	O1-C1-C2-C3
5	C	200	HEM	C1A-C2A-CAA-CBA
5	C	200	HEM	C3A-C2A-CAA-CBA
5	C	200	HEM	C2D-C3D-CAD-CBD
5	C	200	HEM	C4D-C3D-CAD-CBD
5	D	200	HEM	C2D-C3D-CAD-CBD
5	D	200	HEM	C4D-C3D-CAD-CBD
4	B	867	GOL	O1-C1-C2-O2
4	A	867	GOL	O1-C1-C2-C3
4	B	867	GOL	O2-C2-C3-O3
4	B	868	GOL	O1-C1-C2-O2
4	B	871	GOL	O1-C1-C2-O2
4	A	867	GOL	O1-C1-C2-O2
4	B	869	GOL	O1-C1-C2-O2

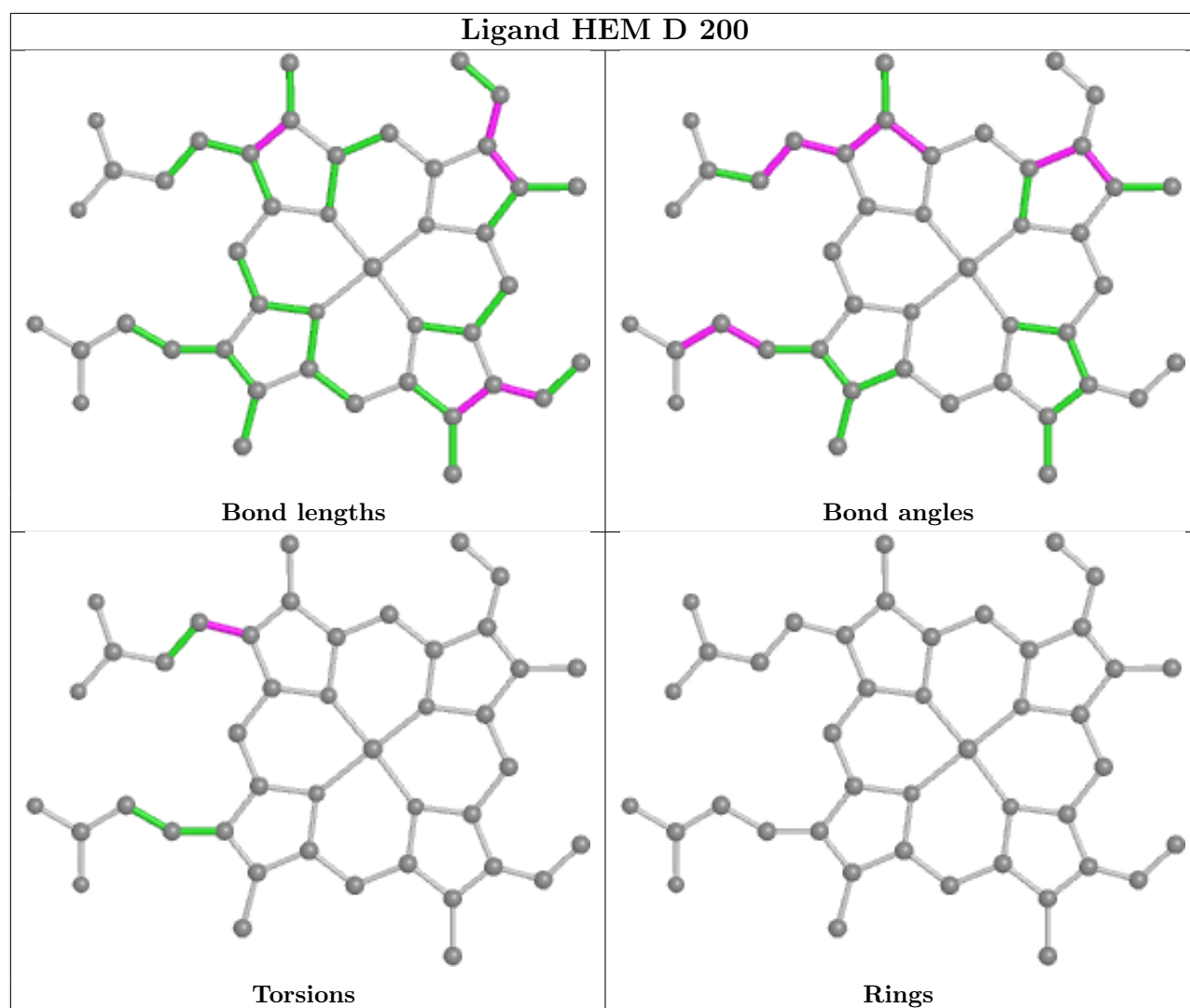
There are no ring outliers.

5 monomers are involved in 43 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	871	GOL	12	0
5	C	200	HEM	16	0
4	B	867	GOL	1	0
5	D	200	HEM	13	0
4	A	867	GOL	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 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.





## 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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	753/865 (87%)	-0.10	9 (1%) 79 73	65, 96, 140, 198	0
1	B	753/865 (87%)	-0.01	21 (2%) 53 43	66, 99, 142, 195	0
2	C	162/206 (78%)	0.11	9 (5%) 24 16	90, 118, 145, 161	5 (3%)
2	D	162/206 (78%)	-0.03	5 (3%) 49 39	98, 118, 144, 163	5 (3%)
All	All	1830/2142 (85%)	-0.04	44 (2%) 59 49	65, 101, 142, 198	10 (0%)

All (44) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	449	PRO	4.3
1	B	292	ASP	3.4
2	C	158	TYR	3.4
2	C	174	ALA	3.3
1	B	602	ALA	3.0
1	B	758	SER	2.9
1	A	367	TYR	2.9
1	A	366	PRO	2.9
1	B	291	GLY	2.8
2	D	158	TYR	2.8
1	B	309	ALA	2.8
2	C	41	ASN	2.7
2	D	166	PHE	2.6
1	B	421	LEU	2.6
1	B	161	SER	2.5
1	B	420	SER	2.4
1	B	771	LEU	2.4
2	C	166	PHE	2.4
1	B	701	ALA	2.4
2	D	117	GLY	2.3
1	B	422	LEU	2.3

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	RSRZ
2	C	3	PHE	2.3
2	C	173	THR	2.3
1	A	447	LEU	2.3
1	B	152	SER	2.3
2	C	120	LEU	2.3
1	A	194	GLY	2.3
2	D	162	VAL	2.3
1	B	445	PHE	2.2
1	A	152	SER	2.2
1	B	639	ARG	2.2
2	C	169	VAL	2.2
1	A	361	LEU	2.2
1	B	628	VAL	2.2
1	B	193	ASN	2.2
2	C	16	ILE	2.2
1	A	151	SER	2.1
1	A	372	LYS	2.1
1	B	622	TRP	2.0
2	D	87	GLY	2.0
1	A	758	SER	2.0
1	B	473	GLN	2.0
1	B	366	PRO	2.0
1	B	640	LEU	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 monosaccharides in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> 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.

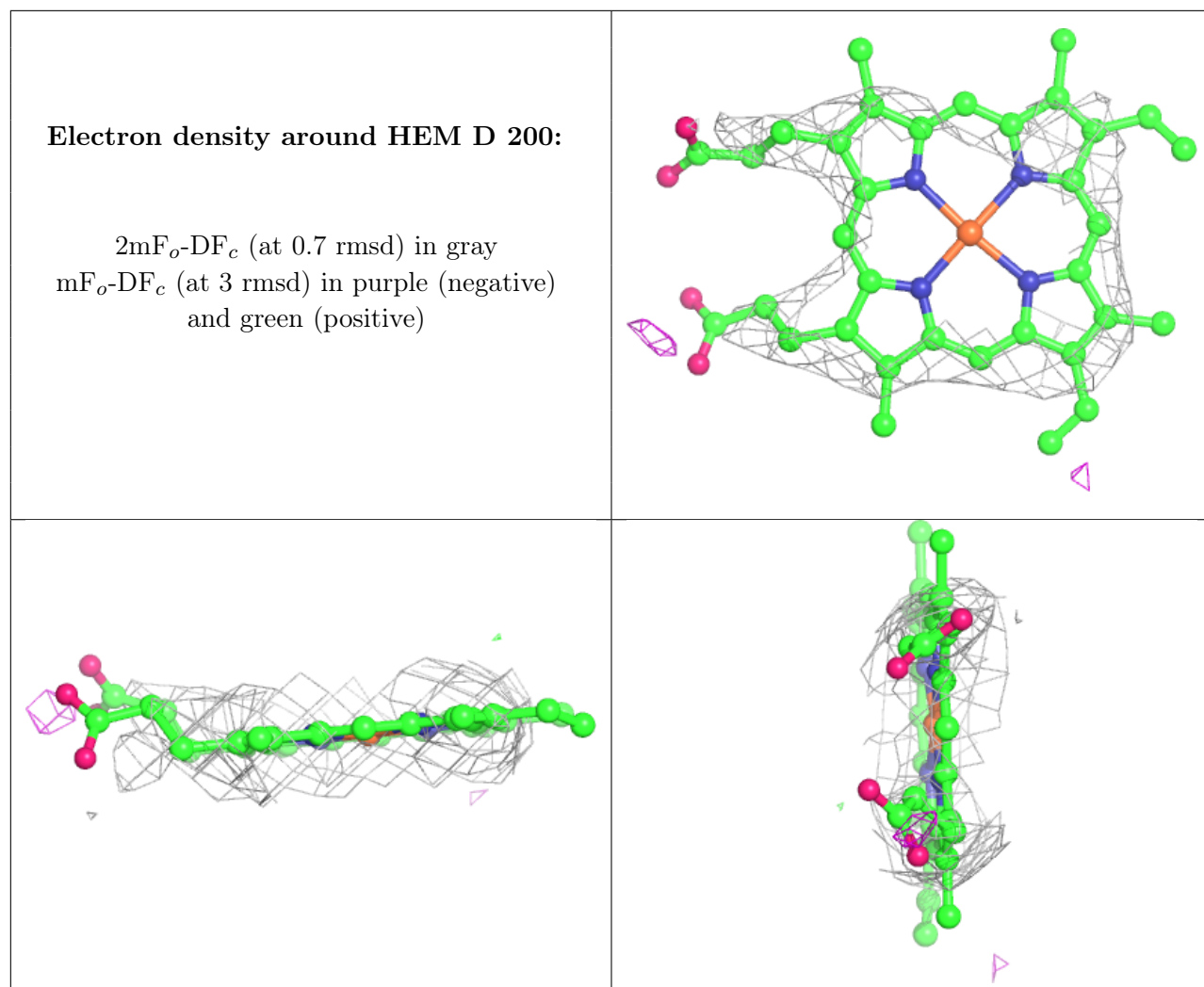
*Continued on next page...*

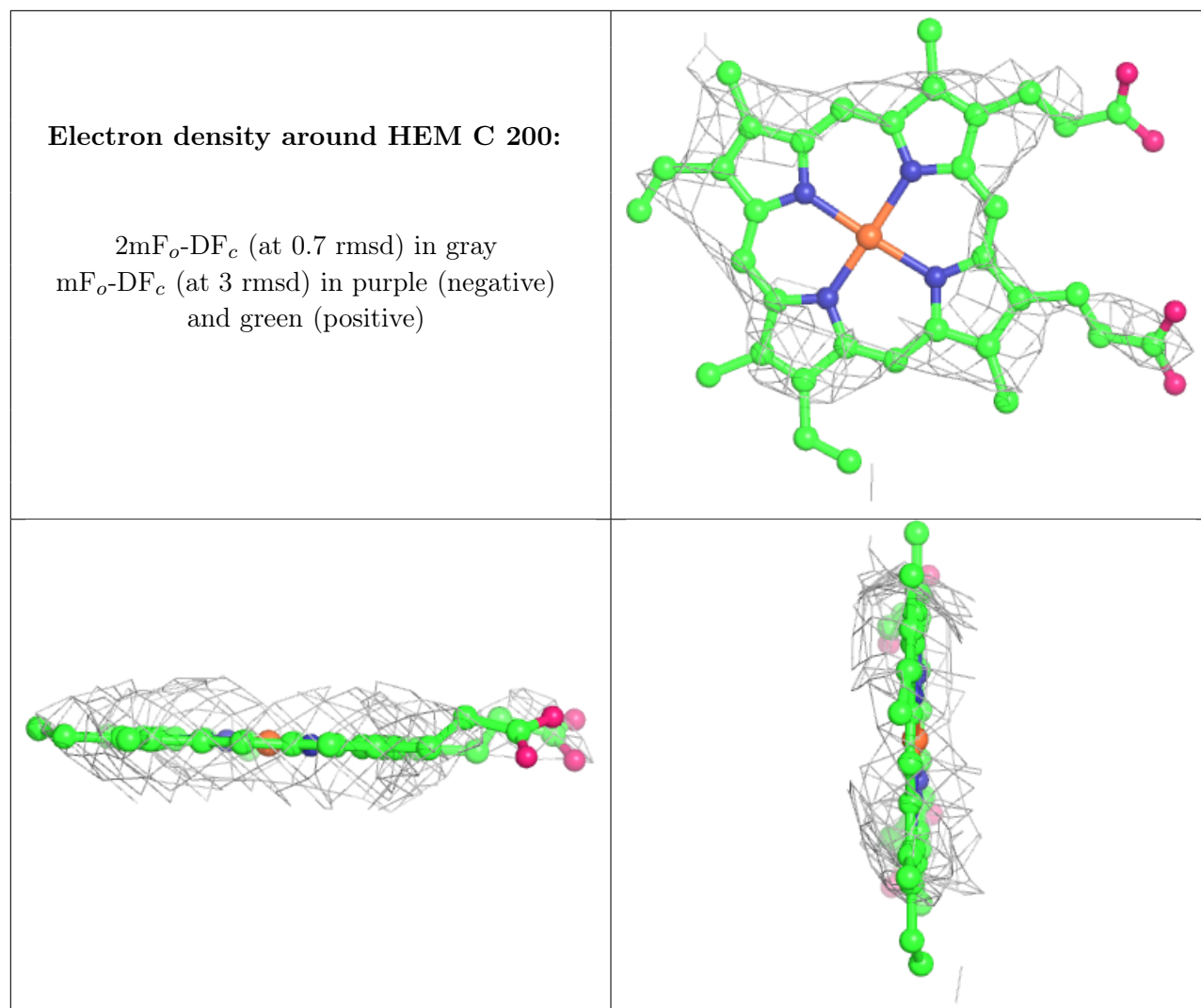


*Continued from previous page...*

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	GOL	B	871	6/6	0.40	1.01	101,168,171,176	0
3	NA	A	866	1/1	0.42	1.64	103,103,103,103	0
3	NA	B	866	1/1	0.52	3.73	131,131,131,131	0
4	GOL	B	867	6/6	0.80	0.20	72,94,110,114	0
4	GOL	B	868	6/6	0.82	0.13	82,102,134,135	0
4	GOL	A	867	6/6	0.82	0.33	98,121,134,139	0
4	GOL	B	870	6/6	0.90	0.22	51,71,96,107	0
4	GOL	B	869	6/6	0.91	0.11	105,129,146,149	0
5	HEM	D	200	43/43	0.94	0.28	92,118,162,199	0
5	HEM	C	200	43/43	0.95	0.23	72,117,151,157	43

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.





## 6.5 Other polymers [i](#)

There are no such residues in this entry.