W O R L D W I D E
wwPDB
P R O T E I N D A T A B A N K

Full wwPDB NMR Structure Validation Report ⓘ

May 11, 2024 – 02:10 PM EDT

PDB ID	:	2K78
Title	:	Solution Structure of the IsdC NEAT domain bound to Zinc Protoporphyrin
Authors	:	Villareal, V.A.; Pilpa, R.M.; Robson, S.A.; Fadeev, E.A.; Clubb, R.T.
Deposited on	:	2008-08-06

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 ⓘ 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 ⓘ) were used in the production of this report:

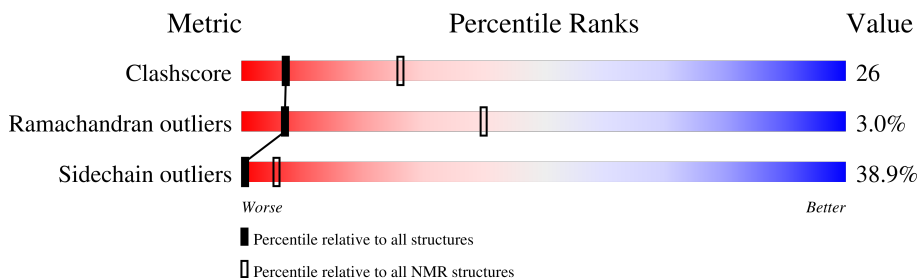|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

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 was not calculated.

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

Metric	Percentile Ranks	Value
Clashscore		26
Ramachandran outliers		3.0%
Sidechain outliers		38.9%

Worse — *Better*

▮ Percentile relative to all structures

◫ Percentile relative to all NMR structures

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	147	27% 41% 11% 7% 14%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA and RNA chains that are outliers for geometric criteria:

Mol	Chain	Compound	Res	Total models with violations	
				Chirality	Geometry
2	A	ZNH	151	30	-

2   Ensemble composition and analysis ⓘ

This entry contains 30 models. Model 4 is the overall representative, medoid model (most similar to other models). The authors have identified model 1 as representative, based on the following criterion: *lowest energy.*

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:30-A:145 (116)	0.66	4

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 5 clusters. No single-model clusters were found.

Cluster number	Models
1	1, 4, 5, 9, 11, 17, 25, 27, 28, 29, 30
2	2, 3, 6, 13, 14, 18, 20
3	7, 15, 16, 21, 22, 26
4	8, 12, 23, 24
5	10, 19

3 Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 2057 atoms, of which 1004 are hydrogens and 0 are deuteriums.
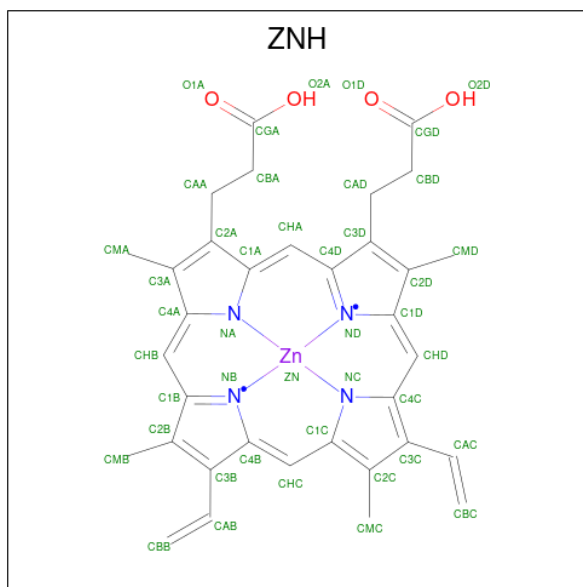
- Molecule 1 is a protein called Iron-regulated surface determinant protein C.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	126	1984	639	974	171	199	1	0

There are 21 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	4	MET	-	expression tag	UNP Q7A151
A	5	GLY	-	expression tag	UNP Q7A151
A	6	SER	-	expression tag	UNP Q7A151
A	7	SER	-	expression tag	UNP Q7A151
A	8	HIS	-	expression tag	UNP Q7A151
A	9	HIS	-	expression tag	UNP Q7A151
A	10	HIS	-	expression tag	UNP Q7A151
A	11	HIS	-	expression tag	UNP Q7A151
A	12	HIS	-	expression tag	UNP Q7A151
A	13	HIS	-	expression tag	UNP Q7A151
A	14	SER	-	expression tag	UNP Q7A151
A	15	SER	-	expression tag	UNP Q7A151
A	16	GLY	-	expression tag	UNP Q7A151
A	17	LEU	-	expression tag	UNP Q7A151
A	18	VAL	-	expression tag	UNP Q7A151
A	19	PRO	-	expression tag	UNP Q7A151
A	20	ARG	-	expression tag	UNP Q7A151
A	21	GLY	-	expression tag	UNP Q7A151
A	22	SER	-	expression tag	UNP Q7A151
A	23	HIS	-	expression tag	UNP Q7A151
A	24	MET	-	expression tag	UNP Q7A151

- Molecule 2 is PROTOPORPHYRIN IX CONTAINING ZN (three-letter code: ZNH) (formula: $C_{34}H_{32}N_4O_4Zn$).
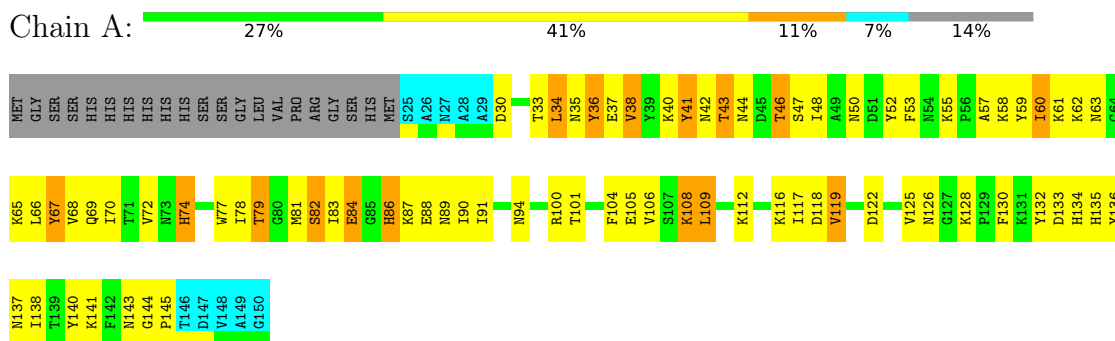
ZNH

Mol	Chain	Residues	Atoms					
			Total	C	H	N	O	Zn
2	A	1	73	34	30	4	4	1

WORLDWIDE
wwPDB
PROTEIN DATA BANK

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: Iron-regulated surface determinant protein C

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

• Molecule 1: Iron-regulated surface determinant protein C

4.2.2 Score per residue for model 2

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

29%   35%   13%   •   7%   14%

4.2.3 Score per residue for model 3

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

32%   31%   16%   7%   14%

4.2.4 Score per residue for model 4 (medoid)

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

27%   36%   16%   •   7%   14%

4.2.5 Score per residue for model 5

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

4.2.6 Score per residue for model 6

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

4.2.7 Score per residue for model 7

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

4.2.8 Score per residue for model 8

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

4.2.9   Score per residue for model 9

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

4.2.10   Score per residue for model 10

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

4.2.11   Score per residue for model 11

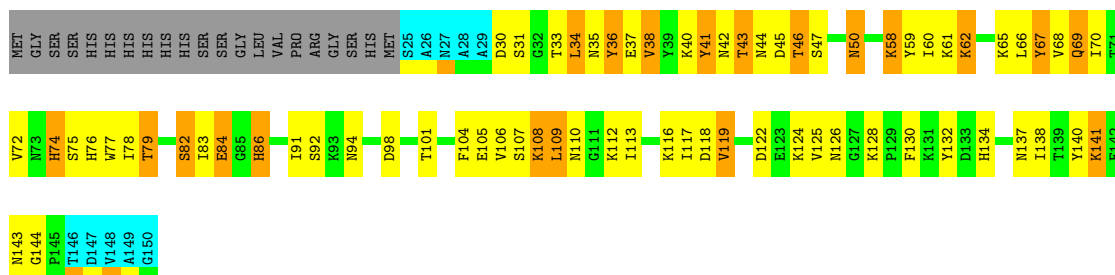• Molecule 1: Iron-regulated surface determinant protein C
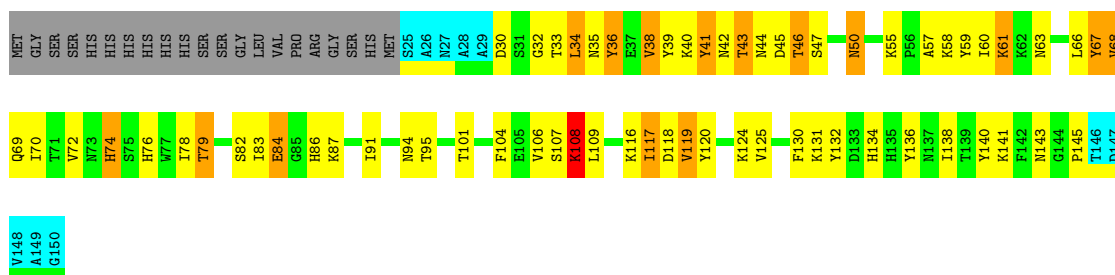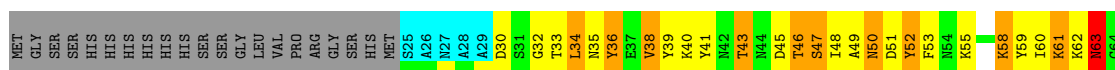
Chain A:

K65 L66 Y67 V68 Q69 I70 T71 V72 N73 H74 S75 H76 W77 I78 T79 G80 M81 S82 I83 E84 G85 H86 K87 I90 N94 D98 E103 F104 E105 V106 S107 K108 L109 N110 G111 K112 K116 I117 D118 V119 Y120 I121 D122 E123 K124 F130 K131 Y132 D133 H134 H135 Y136 N137 I138

T139 Y140 K141 F142 N143 G144 P145 T146 D147 V148 A149 G150

4.2.12 Score per residue for model 12

• Molecule 1: Iron-regulated surface determinant protein C

Chain A: 33%   32%   14%   7%   14%

MET GLY SER SER HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET S25 A26 N27 A28 A29 D30 S31 G32 T33 L34 N35 Y36 E37 V38 V39 K40 Y41 N42 T43 N44 D45 T46 S47 N50 F53 N54 K55 Y59 I60 K61 K62 N63 G64 K65 L66 Y67

V68 Q69 I70 T71 V72 N73 H74 W77 I78 T79 G80 M81 S82 I83 E84 G85 H86 K87 E88 N89 S92 K93 N94 T95 E103 F104 E105 V106 S107 K108 L109 K112 K116 I117 D118 V119 D122 V125 N126 G127 K128 P129 F130 K131 Y132 D133 H134 H135 I138 T139 Y140 K141

F142 N143 T146 D147 V148 A149 G150

4.2.13 Score per residue for model 13

• Molecule 1: Iron-regulated surface determinant protein C

Chain A: 31%   35%   12%   •   7%   14%

MET GLY SER SER HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET S25 A26 N27 A28 A29 D30 T33 L34 N35 Y36 E37 V38 Y39 K40 Y41 N42 T43 N44 D45 T46 S47 I48 A49 N50 D51 Y52 F53 N54 K55 P56 A57 K58 Y59 I60 K65 L66 Y67

V68 Q69 I70 T71 V72 N73 H74 W77 I78 T79 G80 M81 S82 I83 E84 G85 H86 K87 E88 N89 I90 I91 S92 K93 N94 T95 R100 F104 S107 K108 L109 K112 I113 K116 I117 D118 V119 D122 E123 N126 G127 K128 K131 Y132 D133 H134 H135 Y136 N137 I138
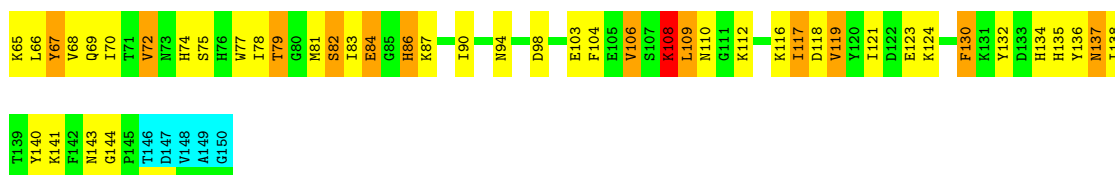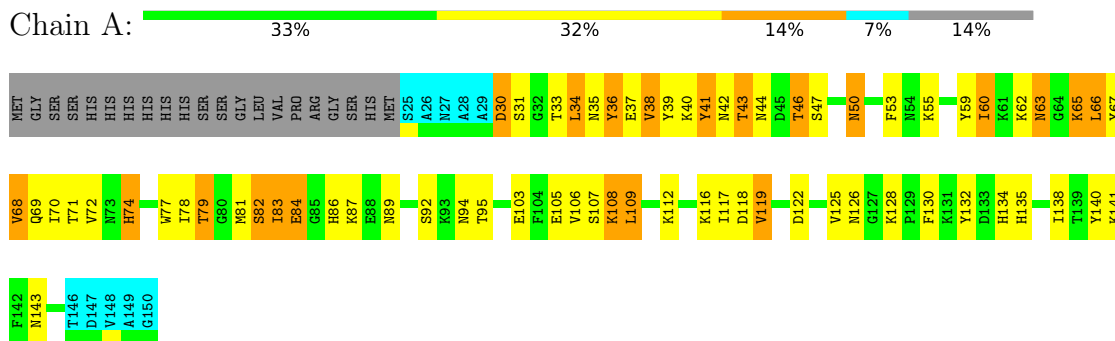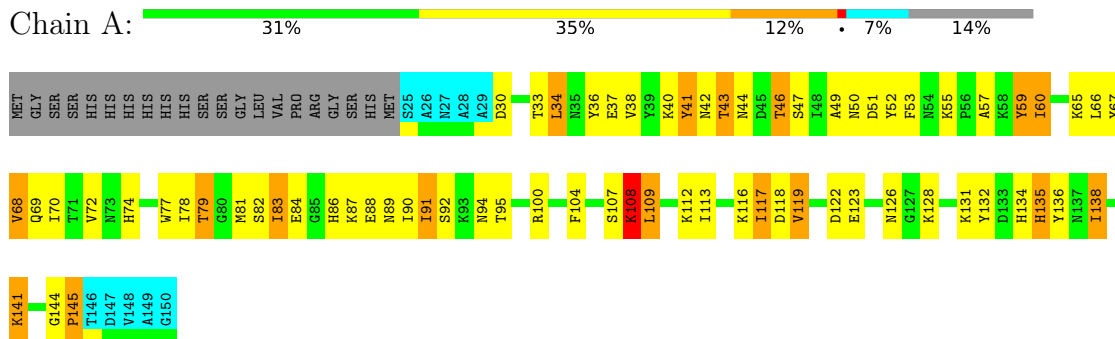
K141 G144 P145 T146 D147 V148 A149 G150

4.2.14 Score per residue for model 14

• Molecule 1: Iron-regulated surface determinant protein C

Chain A: 32%   32%   14%   •   7%   14%

MET GLY SER SER HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET S25 A26 N27 A28 A29 D30 T33 L34 N35 Y36 E37 V38 Y39 K40 Y41 N42 T43 N44 D45 T46 S47 N50 D51 Y52 F53 N54 A57 K58 Y59 I60 K61 K62 N63 L66 Y67

V68 Q69 I70 T71 V72 N73 H74 W77 I78 T79 G80 M81 S82 I83 E84 G85 H86 K87 E88 N89 N94 E99 R100 T101 F104 E105 V106 S107 K108 L109 N110 G111 K112 K116 I117 D118 V119 Y120 I121 D122 V125 N126 F130 K131 Y132 D133 H134 H135 Y136 N137 I138 T139 Y140

G144 P145 T146 D147 V148 A149 G150

4.2.15 Score per residue for model 15

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

| 26% | 36% | 17% | 7% | 14% |

MET GLY SER SER HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET S25 A26 N27 A28 A29 D30 S31 G32 T33 L34 N35 Y36 E37 V38 Y39 K40 Y41 N42 T43 N44 D45 T46 S47 N50 D51 Y52 F53 N54 K55 P56 A57 K58 Y59 I60 K61 K62 N63 G64

K65 L66 Y67 V68 Q69 I70 T71 V72 N73 H74 I78 T79 G80 M81 S82 I83 E84 G85 H86 K87 I90 I91 S92 K93 N94 T95 A96 K97 R100 V106 S107 K108 L109 N110 G111 K112 I113 K116 I117 D118 V119 Y120 I121 D122 E123 K124 V125 N126 G127 K128 P129 F130 K131 Y132 D133

H134 H135 Y136 N137 I138 T139 Y140 K141 F142 N143 G144 P145 T146 D147 V148 A149 G150

4.2.16 Score per residue for model 16

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

| 33% | 31% | 15% | • | 7% | 14% |

MET GLY SER SER HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET S25 A26 N27 A28 A29 D30 T33 L34 N35 Y36 E37 V38 Y39 K40 Y41 N42 T43 N44 D45 T46 S47 N50 D51 Y52 K55 P56 A57 K58 Y59 I60 K61 K62 N63 G64 K65 L66

Y67 V68 Q69 I70 T71 V72 N73 H74 S75 H76 W77 I78 T79 G80 M81 S82 I83 E84 G85 H86 K87 E88 N89 I90 I91 N94 T101 F104 E105 V106 S107 K108 L109 N110 G111 K112 K116 I117 D118 V119 N126 F130 K131 Y132 D133 H134 H135 Y136 N137 I138 T139 Y140 K141 F142

N143 G144 P145 T146 D147 V148 A149 G150

4.2.17 Score per residue for model 17

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

| 31% | 31% | 16% | • | 7% | 14% |

MET GLY SER SER HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET S25 A26 N27 A28 A29 T33 L34 N35 Y36 E37 V38 Y39 K40 Y41 N42 T43 N44 D45 T46 S47 I48 A49 N50 D51 Y52 F53 N54 K55 P56 A57 K58 Y59 I60 K61 K62 N63 G64 K65

L66 Y67 I70 T71 V72 N73 H74 S75 H76 W77 I78 T79 G80 M81 S82 I83 E84 G85 H86 K87 E88 N89 I90 I91 N94 T95 T101 E105 V106 S107 K108 L109 N110 G111 K112 K116 I117 D118 V119 Y120 I121 D122 V125 K128 P129 F130 K131 Y132 H135 Y136 N137 I138

T139 Y140 K141 F142 N143 T146 D147 V148 A149 G150

4.2.18 Score per residue for model 18

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

4.2.19 Score per residue for model 19

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:
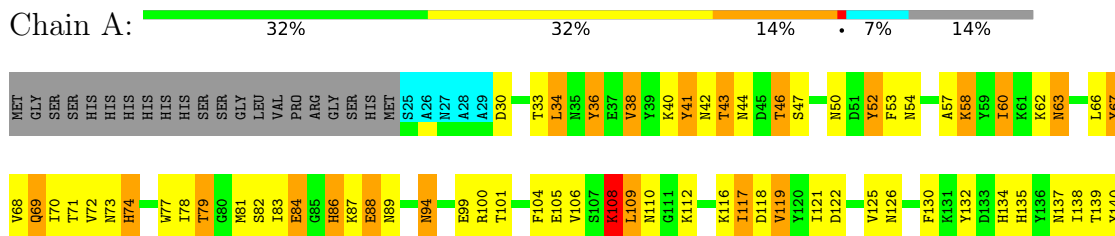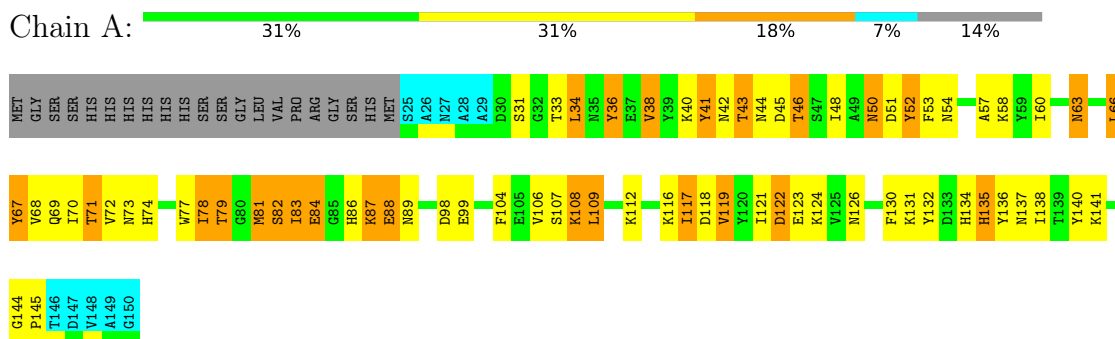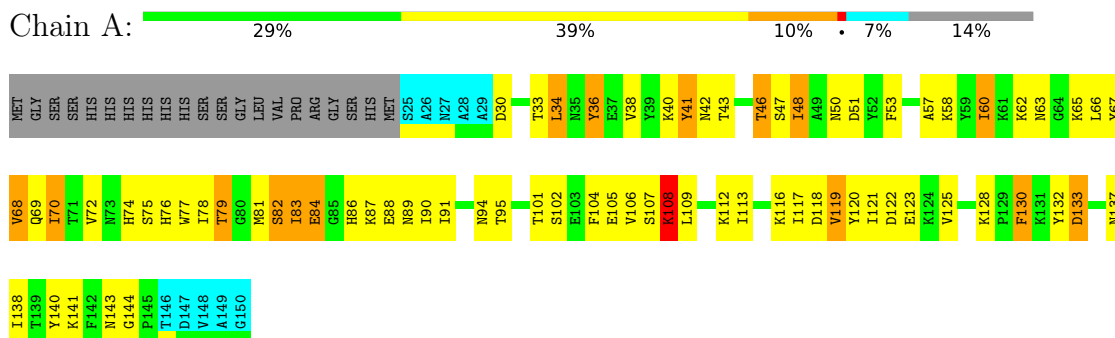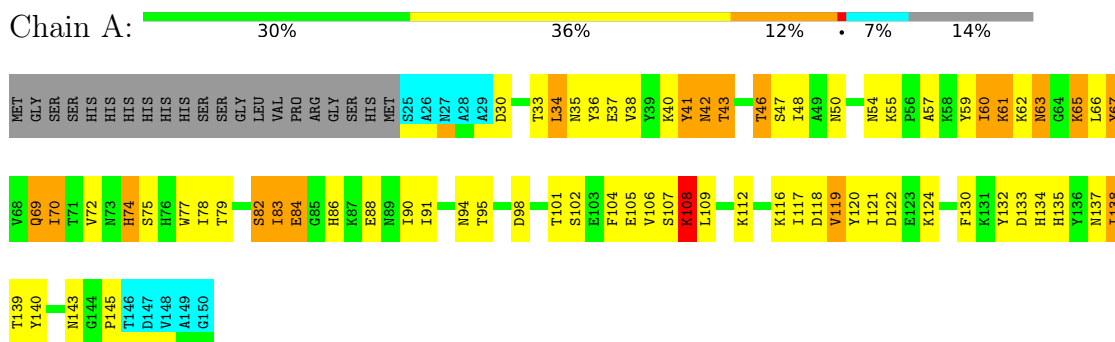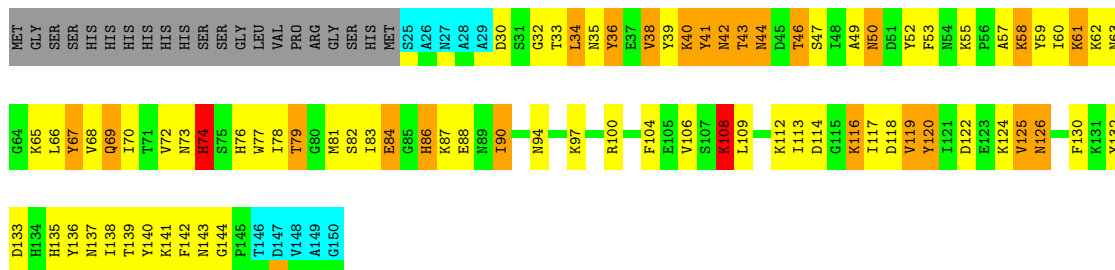

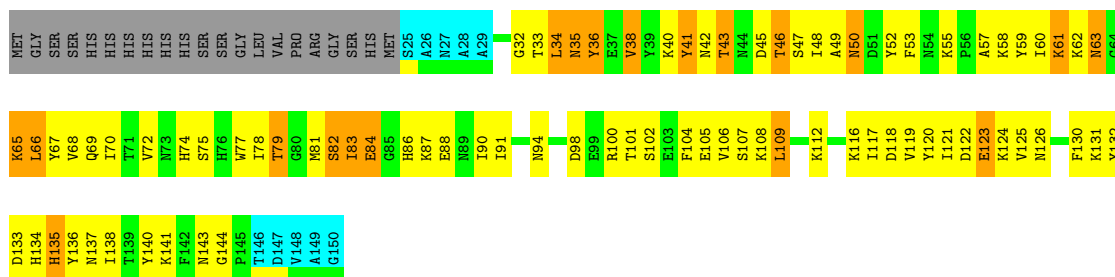### 4.2.20 Score per residue for model 20

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

4.2.21 Score per residue for model 21

• Molecule 1: Iron-regulated surface determinant protein C

Chain A: 31% 31% 18% 7% 14%

4.2.22 Score per residue for model 22

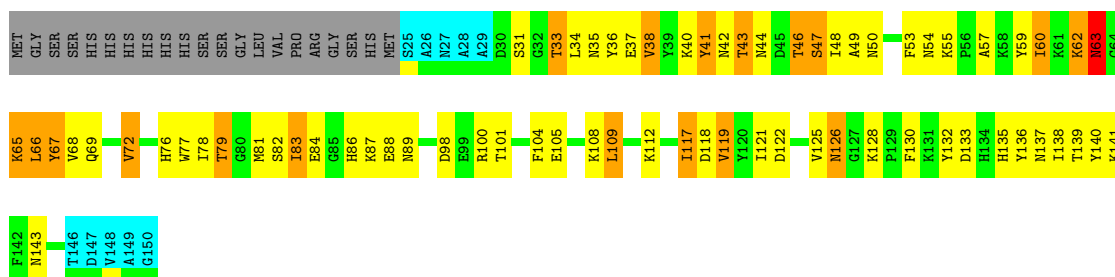• Molecule 1: Iron-regulated surface determinant protein C

Chain A: 29% 39% 10% 7% 14%

4.2.23 Score per residue for model 23

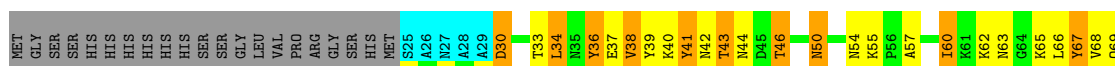• Molecule 1: Iron-regulated surface determinant protein C
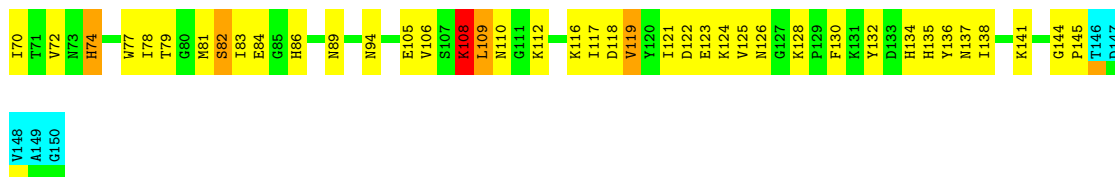
Chain A: 30% 36% 12% 7% 14%

4.2.24　Score per residue for model 24

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

4.2.25　Score per residue for model 25

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

4.2.26　Score per residue for model 26

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

4.2.27　Score per residue for model 27

• Molecule 1: Iron-regulated surface determinant protein C

Chain A:

4.2.28 Score per residue for model 28

• Molecule 1: Iron-regulated surface determinant protein C

4.2.29 Score per residue for model 29

• Molecule 1: Iron-regulated surface determinant protein C

4.2.30 Score per residue for model 30

• Molecule 1: Iron-regulated surface determinant protein C

5 Refinement protocol and experimental data overview (i)

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

Of the 200 calculated structures, 30 were deposited, based on the following criterion: *structures with the lowest energy.*

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

Software name	Classification	Version
X-PLOR NIH	refinement	

No chemical shift data was provided.

6 Model quality ⓘ

6.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: ZNH

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	951	920	920	51±6
2	A	43	30	30	3±1
All	All	29820	28500	28500	1531

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 26.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Total
1:A:34:LEU:HD13	1:A:109:LEU:HD22	0.92	1.39	15	9
1:A:125:VAL:HG23	1:A:130:PHE:CE1	0.86	2.06	3	5
1:A:83:ILE:HD11	1:A:140:TYR:CD2	0.82	2.10	17	9
1:A:36:TYR:CZ	1:A:57:ALA:HB2	0.82	2.10	14	15
1:A:36:TYR:CE1	1:A:57:ALA:HB2	0.81	2.10	10	20
1:A:83:ILE:HD12	1:A:104:PHE:CD2	0.81	2.11	6	8
1:A:34:LEU:HD23	1:A:59:TYR:HB3	0.81	1.51	29	1
1:A:74:HIS:O	1:A:78:ILE:HG22	0.80	1.77	10	13
1:A:66:LEU:HD11	1:A:108:LYS:HA	0.77	1.56	20	11
1:A:66:LEU:O	1:A:66:LEU:HD22	0.77	1.80	17	11
1:A:38:VAL:O	1:A:46:THR:HG22	0.76	1.80	20	5

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:34:LEU:HD11	1:A:144:GLY:HA3	0.76	1.57	26	17
1:A:83:ILE:HD11	1:A:140:TYR:CE2	0.75	2.16	3	8
1:A:66:LEU:HD13	1:A:66:LEU:N	0.74	1.97	7	6
1:A:78:ILE:HD11	1:A:81:MET:SD	0.74	2.23	5	8
1:A:72:VAL:HG22	1:A:81:MET:CE	0.74	2.12	16	2
1:A:130:PHE:CZ	2:A:151:ZNH:HMB2	0.73	2.18	11	19
1:A:38:VAL:HG13	1:A:139:THR:O	0.72	1.84	23	1
1:A:79:THR:HG22	1:A:118:ASP:O	0.71	1.85	23	29
1:A:34:LEU:HD11	1:A:109:LEU:HB2	0.71	1.62	17	1
1:A:34:LEU:HG	1:A:109:LEU:HD22	0.70	1.61	9	2
1:A:72:VAL:HG12	1:A:78:ILE:HG21	0.70	1.63	27	10
1:A:72:VAL:HG22	1:A:81:MET:HE1	0.69	1.62	16	2
1:A:67:TYR:O	1:A:68:VAL:HG23	0.69	1.87	27	2
1:A:65:LYS:C	1:A:66:LEU:HD13	0.68	2.09	12	6
1:A:66:LEU:HD22	1:A:66:LEU:C	0.68	2.09	5	5
1:A:38:VAL:O	1:A:46:THR:HG23	0.68	1.89	15	13
1:A:78:ILE:HD11	1:A:81:MET:CG	0.67	2.19	3	6
1:A:77:TRP:O	1:A:119:VAL:HG12	0.67	1.90	22	17
1:A:79:THR:HG22	1:A:118:ASP:C	0.67	2.09	23	28
1:A:130:PHE:CE2	2:A:151:ZNH:HMB2	0.67	2.23	21	4
1:A:34:LEU:HD11	1:A:109:LEU:CB	0.67	2.20	17	1
1:A:66:LEU:C	1:A:66:LEU:HD22	0.67	2.10	28	2
1:A:66:LEU:HD21	1:A:106:VAL:O	0.66	1.90	27	14
1:A:38:VAL:HG23	1:A:46:THR:OG1	0.66	1.91	13	1
1:A:38:VAL:HG12	1:A:139:THR:O	0.65	1.90	14	3
1:A:125:VAL:HG21	1:A:130:PHE:CD2	0.65	2.26	22	1
1:A:38:VAL:C	1:A:46:THR:HG23	0.65	2.11	29	11
1:A:36:TYR:CE2	1:A:57:ALA:HB2	0.65	2.26	20	2
1:A:66:LEU:HD22	1:A:66:LEU:O	0.65	1.90	21	2
1:A:34:LEU:HD23	1:A:59:TYR:CE1	0.64	2.27	26	2
1:A:66:LEU:HD21	1:A:108:LYS:H	0.64	1.53	14	6
1:A:34:LEU:HD23	1:A:59:TYR:CB	0.64	2.22	29	1
1:A:34:LEU:HD23	1:A:59:TYR:CD1	0.64	2.27	26	2
1:A:83:ILE:HD11	1:A:140:TYR:CE1	0.64	2.27	23	1
1:A:72:VAL:HG13	1:A:78:ILE:HD13	0.64	1.68	2	3
1:A:69:GLN:C	1:A:70:ILE:HD12	0.64	2.14	5	1
1:A:48:ILE:HG22	1:A:49:ALA:N	0.63	2.07	4	8
1:A:47:SER:HB3	1:A:48:ILE:HD12	0.63	1.71	19	3
1:A:83:ILE:HD12	1:A:104:PHE:CG	0.62	2.30	24	6
1:A:78:ILE:HD11	1:A:81:MET:HG3	0.61	1.70	29	5
1:A:121:ILE:HD13	2:A:151:ZNH:CBB	0.61	2.25	18	13

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:66:LEU:HD11	1:A:108:LYS:N	0.61	2.09	25	6
1:A:125:VAL:HG12	1:A:125:VAL:O	0.61	1.96	3	8
1:A:38:VAL:HG23	1:A:46:THR:HG21	0.60	1.73	3	2
1:A:66:LEU:HD11	1:A:106:VAL:O	0.60	1.96	26	1
1:A:70:ILE:HD12	1:A:70:ILE:N	0.60	2.11	5	1
1:A:66:LEU:HD23	1:A:66:LEU:N	0.60	2.12	20	11
1:A:77:TRP:O	1:A:119:VAL:HG13	0.60	1.97	4	3
1:A:59:TYR:CD2	1:A:109:LEU:HD21	0.59	2.32	9	4
1:A:113:ILE:HD12	1:A:142:PHE:CD2	0.59	2.32	27	2
1:A:34:LEU:HD12	1:A:144:GLY:HA3	0.59	1.75	20	4
1:A:67:TYR:CD1	1:A:67:TYR:N	0.58	2.71	10	30
1:A:52:TYR:CD1	1:A:78:ILE:HD13	0.58	2.33	21	1
1:A:78:ILE:O	1:A:78:ILE:HG23	0.57	1.99	14	29
1:A:66:LEU:CD1	1:A:66:LEU:N	0.57	2.67	17	7
1:A:117:ILE:HG21	1:A:138:ILE:HD11	0.57	1.76	13	2
1:A:137:ASN:O	1:A:138:ILE:HG23	0.57	1.99	29	19
1:A:83:ILE:HD12	1:A:104:PHE:CD1	0.57	2.35	11	2
1:A:124:LYS:O	1:A:125:VAL:HG23	0.57	1.98	27	2
1:A:77:TRP:CD2	2:A:151:ZNH:HBB2	0.57	2.35	1	4
1:A:125:VAL:HG23	1:A:130:PHE:CZ	0.57	2.34	3	1
1:A:72:VAL:CG1	1:A:78:ILE:HG21	0.57	2.29	1	8
1:A:38:VAL:HG12	1:A:140:TYR:HA	0.57	1.75	11	4
1:A:66:LEU:HD11	1:A:108:LYS:CA	0.56	2.30	11	12
1:A:34:LEU:HD11	1:A:144:GLY:CA	0.56	2.30	9	7
1:A:46:THR:HG21	1:A:50:ASN:CB	0.56	2.30	25	2
1:A:78:ILE:HD11	1:A:117:ILE:HG13	0.56	1.77	21	5
1:A:38:VAL:O	1:A:38:VAL:HG23	0.56	1.98	8	1
1:A:106:VAL:HG21	1:A:113:ILE:HD13	0.56	1.76	27	3
1:A:59:TYR:CA	1:A:68:VAL:HG13	0.56	2.30	13	2
1:A:34:LEU:C	1:A:34:LEU:HD12	0.56	2.21	29	1
1:A:78:ILE:HA	1:A:119:VAL:HG12	0.56	1.77	30	1
1:A:59:TYR:HA	1:A:68:VAL:HG13	0.56	1.76	13	2
1:A:34:LEU:HD11	1:A:145:PRO:HD2	0.56	1.76	15	3
1:A:48:ILE:HG21	2:A:151:ZNH:C1D	0.55	2.31	29	3
1:A:90:ILE:HD12	1:A:90:ILE:O	0.55	2.01	25	2
1:A:34:LEU:HD12	1:A:35:ASN:O	0.55	2.02	29	1
1:A:66:LEU:HD13	1:A:108:LYS:CE	0.55	2.31	20	2
1:A:91:ILE:HG22	1:A:101:THR:O	0.55	2.02	24	12
1:A:117:ILE:HG21	1:A:138:ILE:CD1	0.55	2.31	13	2
1:A:34:LEU:HD13	1:A:35:ASN:N	0.55	2.17	9	1
1:A:91:ILE:HG21	1:A:101:THR:HG22	0.54	1.79	24	9

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Total
1:A:53:PHE:CG	1:A:53:PHE:O	0.54	2.60	28	4
1:A:66:LEU:N	1:A:66:LEU:HD13	0.54	2.18	17	7
1:A:125:VAL:HG23	1:A:130:PHE:CD1	0.54	2.37	25	1
1:A:34:LEU:HD13	1:A:35:ASN:H	0.53	1.63	9	1
1:A:38:VAL:CG2	1:A:53:PHE:CE1	0.53	2.91	14	2
1:A:47:SER:C	1:A:48:ILE:HD12	0.53	2.23	17	2
1:A:91:ILE:HG22	1:A:101:THR:C	0.53	2.24	24	2
1:A:84:GLU:CB	1:A:86:HIS:CE1	0.53	2.92	2	10
1:A:66:LEU:HD13	1:A:108:LYS:HE2	0.53	1.80	9	1
1:A:34:LEU:HD13	1:A:59:TYR:CD2	0.53	2.39	8	1
1:A:88:GLU:CB	1:A:104:PHE:CE1	0.52	2.92	7	6
1:A:38:VAL:CG1	1:A:140:TYR:CD1	0.52	2.92	14	4
1:A:121:ILE:HD13	2:A:151:ZNH:HBB1	0.52	1.79	21	6
1:A:88:GLU:CB	1:A:104:PHE:CZ	0.52	2.92	2	3
1:A:74:HIS:CE1	1:A:77:TRP:CE2	0.52	2.97	30	1
1:A:67:TYR:C	1:A:68:VAL:HG12	0.52	2.23	24	3
1:A:34:LEU:HD22	1:A:109:LEU:HD22	0.52	1.80	14	3
1:A:66:LEU:N	1:A:66:LEU:CD1	0.52	2.69	7	6
1:A:53:PHE:CZ	1:A:81:MET:CE	0.52	2.92	17	1
1:A:34:LEU:CB	1:A:59:TYR:CD1	0.52	2.92	3	5
1:A:59:TYR:CD1	1:A:61:LYS:CE	0.52	2.92	17	1
1:A:72:VAL:HG22	1:A:100:ARG:O	0.51	2.05	6	2
1:A:41:TYR:CE2	1:A:137:ASN:ND2	0.51	2.78	9	5
1:A:41:TYR:CD2	1:A:137:ASN:ND2	0.51	2.78	20	4
1:A:49:ALA:HB2	1:A:138:ILE:HG21	0.51	1.83	8	1
1:A:36:TYR:CD2	1:A:37:GLU:N	0.51	2.79	7	1
1:A:132:TYR:OH	2:A:151:ZNH:NA	0.51	2.44	11	20
1:A:83:ILE:O	1:A:86:HIS:CD2	0.51	2.64	22	14
1:A:49:ALA:HB1	1:A:53:PHE:CE2	0.50	2.41	29	1
1:A:66:LEU:HD11	1:A:108:LYS:H	0.50	1.65	6	1
1:A:77:TRP:HA	1:A:121:ILE:HD11	0.50	1.82	11	5
1:A:86:HIS:CD2	1:A:86:HIS:N	0.50	2.79	12	3
1:A:71:THR:HG22	1:A:71:THR:O	0.50	2.06	26	2
1:A:53:PHE:O	1:A:53:PHE:CG	0.50	2.65	20	2
1:A:83:ILE:HD11	1:A:140:TYR:CZ	0.50	2.42	12	1
1:A:72:VAL:HG13	1:A:81:MET:HE3	0.50	1.83	30	1
1:A:60:ILE:HG23	1:A:67:TYR:HB2	0.50	1.82	7	1
1:A:36:TYR:CE1	1:A:57:ALA:CB	0.50	2.93	10	2
1:A:83:ILE:CD1	1:A:140:TYR:CD2	0.50	2.93	17	1
1:A:36:TYR:CE2	1:A:70:ILE:HD11	0.49	2.42	23	2
1:A:34:LEU:O	1:A:34:LEU:HD23	0.49	2.07	12	1

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:77:TRP:CE2	2:A:151:ZNH:HBB2	0.49	2.42	20	1
1:A:106:VAL:HG22	1:A:107:SER:N	0.49	2.22	21	1
1:A:41:TYR:O	1:A:42:ASN:CB	0.49	2.61	22	29
1:A:32:GLY:O	1:A:59:TYR:CD2	0.49	2.65	11	2
1:A:83:ILE:O	1:A:84:GLU:CB	0.49	2.61	27	16
1:A:117:ILE:O	1:A:117:ILE:HD13	0.49	2.08	15	2
1:A:83:ILE:HD11	1:A:140:TYR:CG	0.49	2.43	15	1
1:A:86:HIS:CD2	1:A:86:HIS:O	0.48	2.66	9	15
1:A:52:TYR:CD1	1:A:52:TYR:N	0.48	2.80	17	5
1:A:66:LEU:O	1:A:66:LEU:CD2	0.48	2.61	16	6
1:A:66:LEU:N	1:A:66:LEU:CD2	0.48	2.76	20	5
1:A:125:VAL:O	1:A:125:VAL:HG12	0.48	2.08	26	5
1:A:83:ILE:HD11	1:A:140:TYR:CD1	0.48	2.43	15	1
1:A:84:GLU:HB2	1:A:86:HIS:CE1	0.48	2.43	10	8
1:A:34:LEU:HD13	1:A:59:TYR:CG	0.48	2.43	8	1
1:A:36:TYR:CD1	1:A:36:TYR:O	0.48	2.67	22	14
1:A:84:GLU:CB	1:A:86:HIS:NE2	0.48	2.76	13	5
1:A:121:ILE:HD12	1:A:132:TYR:CB	0.48	2.39	30	1
1:A:38:VAL:O	1:A:39:TYR:CD1	0.48	2.66	11	8
1:A:34:LEU:HD23	1:A:34:LEU:C	0.48	2.29	12	1
1:A:49:ALA:O	1:A:53:PHE:CD2	0.48	2.67	13	4
1:A:88:GLU:HB3	1:A:104:PHE:CZ	0.48	2.44	2	3
1:A:53:PHE:O	1:A:53:PHE:CD2	0.48	2.66	21	4
1:A:41:TYR:O	1:A:43:THR:HG23	0.48	2.08	5	21
1:A:112:LYS:CG	1:A:139:THR:CG2	0.48	2.91	16	2
1:A:90:ILE:HG22	1:A:100:ARG:NH2	0.48	2.24	15	1
1:A:60:ILE:O	1:A:67:TYR:CD1	0.48	2.66	17	2
1:A:117:ILE:HG21	1:A:138:ILE:HD13	0.48	1.85	29	1
1:A:58:LYS:CB	1:A:69:GLN:CG	0.48	2.92	11	6
1:A:38:VAL:HG23	1:A:46:THR:CG2	0.48	2.39	3	1
1:A:36:TYR:CE1	1:A:57:ALA:N	0.48	2.81	19	1
1:A:34:LEU:HD21	1:A:143:ASN:C	0.48	2.28	8	4
1:A:84:GLU:HB3	1:A:86:HIS:CE1	0.48	2.43	29	5
1:A:123:GLU:O	1:A:130:PHE:CD1	0.48	2.67	3	2
1:A:100:ARG:CG	1:A:101:THR:N	0.47	2.77	1	5
1:A:78:ILE:HD12	2:A:151:ZNH:HBC2	0.47	1.85	16	2
1:A:77:TRP:O	1:A:121:ILE:HD11	0.47	2.09	17	1
1:A:34:LEU:HB2	1:A:59:TYR:CD1	0.47	2.45	10	8
1:A:46:THR:CG2	1:A:50:ASN:CB	0.47	2.92	25	8
1:A:70:ILE:N	1:A:70:ILE:CD1	0.47	2.77	5	1
1:A:41:TYR:CD2	1:A:137:ASN:OD1	0.47	2.68	19	2

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:32:GLY:O	1:A:59:TYR:CD1	0.47	2.67	2	5
1:A:66:LEU:HD23	1:A:66:LEU:O	0.47	2.09	6	3
1:A:135:HIS:O	1:A:136:TYR:CD1	0.47	2.67	2	4
1:A:135:HIS:O	1:A:136:TYR:CG	0.47	2.68	20	14
1:A:72:VAL:CG2	1:A:100:ARG:CB	0.47	2.93	7	2
1:A:86:HIS:CD2	1:A:86:HIS:C	0.47	2.88	5	18
1:A:66:LEU:CD1	1:A:108:LYS:CA	0.47	2.92	23	3
1:A:61:LYS:N	1:A:61:LYS:CD	0.47	2.78	10	1
1:A:135:HIS:CD2	1:A:135:HIS:O	0.47	2.68	21	2
1:A:106:VAL:HG21	1:A:113:ILE:CD1	0.47	2.40	27	3
1:A:55:LYS:CD	1:A:55:LYS:N	0.47	2.78	18	1
1:A:65:LYS:CD	1:A:65:LYS:N	0.47	2.78	17	4
1:A:34:LEU:C	1:A:34:LEU:HD23	0.46	2.31	24	3
1:A:59:TYR:CD1	1:A:61:LYS:HD2	0.46	2.45	11	4
1:A:119:VAL:HG11	1:A:132:TYR:CE2	0.46	2.44	18	1
1:A:38:VAL:CG1	1:A:140:TYR:CE1	0.46	2.98	27	2
1:A:54:ASN:HB3	1:A:71:THR:HG21	0.46	1.87	14	2
1:A:52:TYR:O	1:A:52:TYR:CD1	0.46	2.68	20	3
1:A:106:VAL:CG2	1:A:107:SER:N	0.46	2.79	21	2
1:A:59:TYR:CD2	1:A:109:LEU:CD2	0.46	2.98	12	5
1:A:130:PHE:CD1	1:A:130:PHE:N	0.46	2.83	3	1
1:A:72:VAL:HG12	1:A:81:MET:HE1	0.46	1.87	8	1
1:A:50:ASN:O	1:A:53:PHE:CE1	0.46	2.68	14	1
1:A:66:LEU:C	1:A:66:LEU:CD2	0.46	2.83	5	7
1:A:143:ASN:ND2	1:A:143:ASN:N	0.46	2.64	19	3
1:A:106:VAL:CG2	1:A:113:ILE:HD13	0.46	2.40	27	2
1:A:83:ILE:O	1:A:86:HIS:CE1	0.46	2.69	10	7
1:A:66:LEU:HD13	1:A:66:LEU:H	0.46	1.69	15	5
1:A:36:TYR:CE2	1:A:53:PHE:CE2	0.46	3.04	20	1
1:A:120:TYR:CZ	1:A:133:ASP:OD2	0.45	2.68	25	2
1:A:82:SER:N	1:A:116:LYS:O	0.45	2.50	11	26
1:A:125:VAL:O	1:A:126:ASN:CB	0.45	2.65	15	5
1:A:52:TYR:CE1	1:A:78:ILE:HD13	0.45	2.47	21	2
1:A:117:ILE:HD13	1:A:117:ILE:C	0.45	2.31	15	1
1:A:90:ILE:CG1	1:A:90:ILE:O	0.45	2.65	18	4
1:A:79:THR:CG2	1:A:118:ASP:CB	0.45	2.94	23	9
1:A:88:GLU:HB2	1:A:104:PHE:CZ	0.45	2.47	7	8
1:A:81:MET:HG3	1:A:117:ILE:HD12	0.45	1.89	5	1
1:A:68:VAL:CG2	1:A:70:ILE:HD12	0.45	2.42	22	1
1:A:61:LYS:HD3	1:A:109:LEU:HD21	0.45	1.87	4	2
1:A:74:HIS:CD2	1:A:77:TRP:CE2	0.45	3.05	7	1

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:130:PHE:N	1:A:130:PHE:CD1	0.45	2.85	14	2
1:A:135:HIS:O	1:A:136:TYR:CD2	0.45	2.70	17	1
1:A:119:VAL:HG11	1:A:132:TYR:HE2	0.45	1.72	18	2
1:A:74:HIS:CD2	1:A:77:TRP:CZ3	0.45	3.05	26	1
1:A:105:GLU:C	1:A:106:VAL:HG13	0.45	2.31	24	11
1:A:34:LEU:CD1	1:A:143:ASN:O	0.45	2.65	26	2
1:A:54:ASN:CB	1:A:71:THR:HG21	0.45	2.42	21	1
1:A:34:LEU:HB2	1:A:59:TYR:CD2	0.45	2.47	23	2
1:A:62:LYS:CB	1:A:65:LYS:CD	0.45	2.95	3	3
1:A:43:THR:OG1	1:A:44:ASN:N	0.45	2.50	21	20
1:A:74:HIS:CD2	1:A:77:TRP:CE3	0.44	3.04	26	1
1:A:72:VAL:HG13	1:A:81:MET:CE	0.44	2.42	30	1
1:A:53:PHE:CE1	1:A:81:MET:SD	0.44	3.10	8	1
1:A:53:PHE:N	1:A:53:PHE:CD1	0.44	2.83	12	1
1:A:78:ILE:O	1:A:78:ILE:CG2	0.44	2.66	22	20
1:A:113:ILE:HD12	1:A:142:PHE:CE2	0.44	2.47	8	1
1:A:53:PHE:CZ	1:A:81:MET:SD	0.44	3.11	29	5
1:A:59:TYR:HA	1:A:68:VAL:HG23	0.44	1.89	12	1
1:A:41:TYR:CG	1:A:137:ASN:OD1	0.44	2.71	17	2
1:A:30:ASP:O	1:A:60:ILE:HA	0.44	2.13	27	14
1:A:66:LEU:CD1	1:A:108:LYS:HA	0.44	2.42	23	7
1:A:46:THR:HG21	1:A:50:ASN:HB2	0.44	1.90	27	2
1:A:124:LYS:O	1:A:125:VAL:CG2	0.44	2.65	15	1
1:A:41:TYR:CE1	1:A:138:ILE:O	0.44	2.71	23	1
1:A:70:ILE:O	1:A:70:ILE:CG2	0.44	2.65	24	6
1:A:130:PHE:O	1:A:130:PHE:CG	0.44	2.70	25	1
1:A:38:VAL:O	1:A:46:THR:CG2	0.44	2.65	6	11
1:A:109:LEU:H	1:A:109:LEU:HD12	0.44	1.73	11	1
1:A:69:GLN:O	1:A:69:GLN:CG	0.44	2.66	18	12
1:A:35:ASN:O	1:A:143:ASN:N	0.44	2.51	11	10
1:A:60:ILE:O	1:A:66:LEU:HA	0.43	2.13	22	3
1:A:59:TYR:CD1	1:A:59:TYR:C	0.43	2.90	11	5
1:A:130:PHE:CD2	1:A:130:PHE:O	0.43	2.71	11	1
1:A:41:TYR:CD2	1:A:137:ASN:CG	0.43	2.91	17	1
1:A:58:LYS:HB2	1:A:69:GLN:CG	0.43	2.43	6	5
1:A:112:LYS:HG3	1:A:139:THR:CG2	0.43	2.43	3	3
1:A:68:VAL:HG12	1:A:68:VAL:O	0.43	2.13	11	4
1:A:41:TYR:CD1	1:A:138:ILE:C	0.43	2.92	6	2
1:A:36:TYR:CD1	1:A:36:TYR:C	0.43	2.91	14	1
1:A:33:THR:HG22	1:A:57:ALA:O	0.43	2.12	29	1
1:A:110:ASN:ND2	1:A:145:PRO:O	0.43	2.52	8	1

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:119:VAL:HB	1:A:132:TYR:CE2	0.43	2.49	11	2
1:A:126:ASN:ND2	1:A:126:ASN:N	0.43	2.64	2	3
1:A:66:LEU:C	1:A:67:TYR:CG	0.43	2.92	18	6
1:A:83:ILE:O	1:A:86:HIS:NE2	0.43	2.51	23	6
1:A:84:GLU:HB3	1:A:86:HIS:NE2	0.43	2.28	12	5
1:A:36:TYR:HE2	1:A:70:ILE:HD11	0.43	1.73	4	1
1:A:70:ILE:O	1:A:70:ILE:HG22	0.43	2.13	15	3
1:A:137:ASN:O	1:A:138:ILE:CG2	0.43	2.67	11	3
1:A:110:ASN:CB	1:A:145:PRO:O	0.43	2.67	26	1
1:A:121:ILE:HD12	1:A:132:TYR:HB3	0.43	1.90	30	1
1:A:51:ASP:C	1:A:52:TYR:CG	0.43	2.92	6	4
1:A:68:VAL:HG11	1:A:142:PHE:CE1	0.43	2.49	5	1
1:A:34:LEU:CD1	1:A:109:LEU:HD22	0.43	2.29	15	3
1:A:72:VAL:HG11	1:A:81:MET:CE	0.43	2.44	7	1
1:A:109:LEU:HD12	1:A:109:LEU:N	0.43	2.29	11	1
1:A:46:THR:OG1	1:A:50:ASN:CB	0.43	2.66	25	1
1:A:119:VAL:HG12	1:A:121:ILE:CD1	0.43	2.43	28	1
1:A:90:ILE:O	1:A:90:ILE:CG1	0.43	2.67	1	8
1:A:91:ILE:CG2	1:A:92:SER:N	0.43	2.82	3	5
1:A:63:ASN:ND2	1:A:63:ASN:N	0.43	2.64	11	1
1:A:82:SER:O	1:A:83:ILE:CG1	0.43	2.67	25	2
1:A:88:GLU:HB2	1:A:104:PHE:CE1	0.43	2.48	19	3
1:A:111:GLY:N	1:A:142:PHE:O	0.43	2.52	20	2
1:A:62:LYS:O	1:A:65:LYS:CG	0.42	2.67	2	7
1:A:102:SER:HB2	1:A:104:PHE:CZ	0.42	2.49	4	3
1:A:34:LEU:CD2	1:A:143:ASN:O	0.42	2.67	22	2
1:A:72:VAL:HG22	1:A:100:ARG:HB3	0.42	1.91	25	1
1:A:37:GLU:O	1:A:141:LYS:N	0.42	2.52	9	4
1:A:82:SER:HG	1:A:116:LYS:C	0.42	2.16	1	1
1:A:77:TRP:CG	2:A:151:ZNH:HBB2	0.42	2.49	5	1
1:A:109:LEU:O	1:A:109:LEU:CD1	0.42	2.67	14	5
1:A:123:GLU:HG2	1:A:130:PHE:CE1	0.42	2.48	25	1
1:A:112:LYS:CD	1:A:112:LYS:O	0.42	2.67	26	1
1:A:125:VAL:N	1:A:128:LYS:O	0.42	2.52	4	3
1:A:59:TYR:HB2	1:A:109:LEU:HD23	0.42	1.91	5	1
1:A:60:ILE:CG2	1:A:67:TYR:O	0.42	2.67	14	4
1:A:41:TYR:O	1:A:43:THR:CG2	0.42	2.68	17	3
1:A:90:ILE:O	1:A:90:ILE:CD1	0.42	2.68	25	1
1:A:62:LYS:HB2	1:A:65:LYS:CD	0.42	2.45	3	3
1:A:106:VAL:CG1	1:A:108:LYS:O	0.42	2.67	26	1
1:A:34:LEU:HD23	1:A:34:LEU:O	0.42	2.14	24	2

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:118:ASP:OD1	1:A:119:VAL:N	0.42	2.52	10	1
1:A:51:ASP:C	1:A:52:TYR:CD1	0.42	2.92	19	2
1:A:120:TYR:CE1	1:A:122:ASP:OD2	0.42	2.72	24	1
1:A:34:LEU:CD1	1:A:35:ASN:O	0.42	2.67	29	1
1:A:88:GLU:OE1	1:A:102:SER:CB	0.42	2.68	20	1
1:A:50:ASN:HA	1:A:53:PHE:CE1	0.42	2.50	22	2
1:A:125:VAL:O	1:A:125:VAL:CG1	0.42	2.68	6	2
1:A:119:VAL:HB	1:A:132:TYR:CD2	0.42	2.50	21	3
1:A:77:TRP:O	1:A:119:VAL:CG1	0.42	2.67	28	1
1:A:79:THR:CG2	1:A:80:GLY:N	0.42	2.81	4	2
1:A:102:SER:O	1:A:104:PHE:CE2	0.42	2.73	4	1
1:A:36:TYR:CD1	1:A:57:ALA:HB2	0.42	2.50	16	1
1:A:66:LEU:C	1:A:67:TYR:CD1	0.42	2.93	18	1
1:A:84:GLU:OE1	1:A:84:GLU:CA	0.42	2.67	19	1
1:A:34:LEU:HG	1:A:35:ASN:N	0.42	2.29	3	1
1:A:138:ILE:CD1	1:A:140:TYR:OH	0.42	2.68	7	1
1:A:32:GLY:O	1:A:59:TYR:N	0.42	2.52	11	2
1:A:40:LYS:CG	1:A:43:THR:OG1	0.42	2.68	11	1
1:A:69:GLN:NE2	1:A:101:THR:HG21	0.42	2.29	23	1
1:A:136:TYR:CD1	2:A:151:ZNH:HBD2	0.41	2.50	10	3
1:A:48:ILE:HG21	2:A:151:ZNH:CHD	0.41	2.44	21	1
1:A:50:ASN:OD1	1:A:51:ASP:N	0.41	2.53	21	1
1:A:136:TYR:HB3	2:A:151:ZNH:HMD2	0.41	1.92	30	1
1:A:46:THR:CG2	1:A:50:ASN:HB2	0.41	2.45	27	6
1:A:46:THR:CG2	1:A:50:ASN:HB3	0.41	2.45	3	1
1:A:38:VAL:O	1:A:38:VAL:CG2	0.41	2.67	8	1
1:A:110:ASN:O	1:A:110:ASN:ND2	0.41	2.53	11	1
1:A:124:LYS:C	1:A:125:VAL:HG23	0.41	2.36	15	1
1:A:73:ASN:O	1:A:74:HIS:CB	0.41	2.67	18	1
1:A:88:GLU:HB3	1:A:104:PHE:CE1	0.41	2.49	29	1
1:A:106:VAL:HG23	1:A:113:ILE:CD1	0.41	2.45	2	2
1:A:81:MET:CE	1:A:140:TYR:OH	0.41	2.68	3	1
1:A:137:ASN:C	1:A:138:ILE:HG23	0.41	2.35	11	1
1:A:72:VAL:O	1:A:72:VAL:CG2	0.41	2.66	20	2
1:A:100:ARG:HG3	1:A:101:THR:N	0.41	2.31	29	2
1:A:133:ASP:OD1	1:A:133:ASP:N	0.41	2.53	24	1
1:A:113:ILE:N	1:A:140:TYR:O	0.41	2.53	19	2
1:A:138:ILE:HG23	2:A:151:ZNH:HMD3	0.41	1.93	13	1
1:A:121:ILE:HD12	1:A:132:TYR:CD2	0.41	2.50	18	2
1:A:50:ASN:ND2	1:A:51:ASP:OD1	0.41	2.54	21	1
1:A:52:TYR:O	1:A:53:PHE:CD1	0.41	2.73	27	1

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Total
1:A:50:ASN:ND2	1:A:51:ASP:OD2	0.41	2.53	4	1
1:A:72:VAL:HG22	1:A:100:ARG:CB	0.41	2.45	7	1
1:A:62:LYS:HB3	1:A:65:LYS:CD	0.41	2.46	9	2
1:A:121:ILE:HG21	2:A:151:ZNH:CBB	0.41	2.46	22	1
1:A:61:LYS:CD	1:A:66:LEU:HB2	0.41	2.46	26	1
1:A:49:ALA:CB	1:A:138:ILE:HG21	0.41	2.46	8	1
1:A:79:THR:CG2	1:A:118:ASP:HB2	0.41	2.46	28	4
1:A:66:LEU:CD2	1:A:66:LEU:C	0.41	2.89	12	2
1:A:122:ASP:OD1	1:A:122:ASP:N	0.41	2.53	13	3
1:A:83:ILE:HG13	1:A:140:TYR:CE2	0.41	2.51	29	2
1:A:36:TYR:CZ	1:A:53:PHE:CE2	0.41	3.09	20	1
1:A:40:LYS:HG3	1:A:43:THR:CG2	0.41	2.46	21	1
1:A:52:TYR:CD1	2:A:151:ZNH:HBC1	0.41	2.51	28	1
1:A:51:ASP:O	1:A:52:TYR:CD1	0.41	2.73	2	1
1:A:94:ASN:N	1:A:99:GLU:O	0.41	2.53	14	2
1:A:135:HIS:O	1:A:135:HIS:CD2	0.41	2.74	2	1
1:A:106:VAL:HG23	1:A:108:LYS:O	0.41	2.16	4	1
1:A:59:TYR:CB	1:A:68:VAL:HG23	0.41	2.45	12	1
1:A:62:LYS:O	1:A:63:ASN:O	0.41	2.39	29	5
1:A:135:HIS:ND1	1:A:135:HIS:N	0.41	2.68	19	1
1:A:38:VAL:HG22	1:A:139:THR:O	0.41	2.16	23	1
1:A:38:VAL:O	1:A:46:THR:CB	0.41	2.68	25	1
1:A:72:VAL:HB	1:A:78:ILE:HD13	0.41	1.93	29	1
1:A:132:TYR:OH	1:A:136:TYR:CZ	0.41	2.67	30	1
1:A:35:ASN:O	1:A:143:ASN:ND2	0.41	2.51	25	1
1:A:55:LYS:CB	1:A:56:PRO:HA	0.40	2.46	5	1
1:A:51:ASP:HB2	1:A:52:TYR:CE1	0.40	2.51	6	1
1:A:34:LEU:HD11	1:A:145:PRO:CD	0.40	2.46	13	1
1:A:41:TYR:CE1	1:A:138:ILE:C	0.40	2.95	16	1
1:A:60:ILE:HG22	1:A:67:TYR:O	0.40	2.16	18	1
1:A:61:LYS:HE2	1:A:109:LEU:HD21	0.40	1.92	28	1
1:A:78:ILE:CD1	1:A:81:MET:SD	0.40	3.09	30	2
1:A:61:LYS:NZ	1:A:145:PRO:HG2	0.40	2.31	15	1
1:A:61:LYS:CG	1:A:66:LEU:HB2	0.40	2.46	17	1
1:A:133:ASP:O	1:A:134:HIS:CG	0.40	2.74	18	1
1:A:113:ILE:HD12	1:A:142:PHE:HD2	0.40	1.74	24	1
1:A:66:LEU:HD21	1:A:106:VAL:HG13	0.40	1.92	26	1
1:A:77:TRP:CD1	1:A:77:TRP:N	0.40	2.88	26	1
1:A:105:GLU:OE2	1:A:106:VAL:N	0.40	2.55	26	1
1:A:83:ILE:O	1:A:83:ILE:HG22	0.40	2.15	12	1
1:A:36:TYR:HA	1:A:143:ASN:ND2	0.40	2.31	29	1

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Total
1:A:90:ILE:O	1:A:90:ILE:HD12	0.40	2.16	1	1
1:A:68:VAL:O	1:A:68:VAL:HG12	0.40	2.15	7	1
1:A:118:ASP:OD1	1:A:135:HIS:ND1	0.40	2.54	8	1
1:A:79:THR:OG1	1:A:120:TYR:CB	0.40	2.70	10	1
1:A:33:THR:HG23	1:A:58:LYS:HD2	0.40	1.93	18	1
1:A:82:SER:O	1:A:116:LYS:N	0.40	2.53	24	1
1:A:112:LYS:O	1:A:112:LYS:CE	0.40	2.69	26	1
1:A:65:LYS:N	1:A:65:LYS:HD3	0.40	2.32	28	1
1:A:40:LYS:HE3	1:A:47:SER:CB	0.40	2.47	11	1
1:A:97:LYS:O	1:A:98:ASP:CB	0.40	2.69	26	1
1:A:40:LYS:HG2	1:A:43:THR:HG21	0.40	1.94	27	1

6.3 Torsion angles ⓘ

6.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	116/147 (79%)	95±2 (82±2%)	17±2 (15±2%)	4±1 (3±1%)	7	40
All	All	3480/4410 (79%)	2856 (82%)	519 (15%)	105 (3%)	7	40

All 10 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	63	ASN	26
1	A	74	HIS	25
1	A	108	LYS	21
1	A	145	PRO	12
1	A	133	ASP	8
1	A	48	ILE	8
1	A	125	VAL	2
1	A	106	VAL	1
1	A	87	LYS	1
1	A	123	GLU	1

6.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	105/128 (82%)	64±4 (61±3%)	41±4 (39±3%)	0	6
All	All	3150/3840 (82%)	1924 (61%)	1226 (39%)	0	6

All 90 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	33	THR	30
1	A	41	TYR	30
1	A	43	THR	30
1	A	108	LYS	30
1	A	109	LEU	30
1	A	117	ILE	30
1	A	46	THR	29
1	A	34	LEU	28
1	A	70	ILE	28
1	A	94	ASN	28
1	A	40	LYS	27
1	A	60	ILE	27
1	A	79	THR	27
1	A	112	LYS	27
1	A	47	SER	26
1	A	119	VAL	25
1	A	141	LYS	25
1	A	36	TYR	24
1	A	50	ASN	23
1	A	55	LYS	23
1	A	38	VAL	22
1	A	82	SER	22
1	A	84	GLU	22
1	A	122	ASP	22
1	A	87	LYS	21
1	A	65	LYS	20
1	A	126	ASN	20
1	A	58	LYS	18
1	A	89	ASN	18

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Models (Total)
1	A	134	HIS	17
1	A	67	TYR	16
1	A	68	VAL	16
1	A	86	HIS	15
1	A	72	VAL	15
1	A	95	THR	14
1	A	98	ASP	14
1	A	138	ILE	14
1	A	37	GLU	14
1	A	74	HIS	14
1	A	128	LYS	14
1	A	30	ASP	13
1	A	83	ILE	13
1	A	75	SER	13
1	A	135	HIS	13
1	A	66	LEU	13
1	A	107	SER	12
1	A	69	GLN	11
1	A	61	LYS	11
1	A	71	THR	10
1	A	120	TYR	10
1	A	100	ARG	10
1	A	131	LYS	10
1	A	62	LYS	10
1	A	76	HIS	9
1	A	81	MET	9
1	A	44	ASN	8
1	A	63	ASN	8
1	A	123	GLU	8
1	A	124	LYS	8
1	A	31	SER	7
1	A	103	GLU	7
1	A	90	ILE	7
1	A	97	LYS	7
1	A	133	ASP	6
1	A	42	ASN	6
1	A	92	SER	6
1	A	88	GLU	6
1	A	54	ASN	6
1	A	45	ASP	6
1	A	137	ASN	5
1	A	91	ILE	5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Models (Total)
1	A	105	GLU	5
1	A	35	ASN	5
1	A	102	SER	5
1	A	73	ASN	5
1	A	52	TYR	5
1	A	110	ASN	4
1	A	118	ASP	4
1	A	78	ILE	4
1	A	106	VAL	3
1	A	116	LYS	3
1	A	53	PHE	3
1	A	48	ILE	2
1	A	59	TYR	2
1	A	130	PHE	2
1	A	51	ASP	2
1	A	113	ILE	1
1	A	99	GLU	1
1	A	125	VAL	1
1	A	114	ASP	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 ⓘ

1 ligand is 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	ZNH	A	151	-	47,50,50	2.17±0.01	19±0 (41±0%)

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	ZNH	A	151	-	55,82,82	1.24±0.02	4±0 (7±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
2	ZNH	A	151	-	1±0,1,9,9	0±0,12,54,54	-

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
2	A	151	ZNH	C4C-NC	4.52	1.42	1.35	27	30
2	A	151	ZNH	C1A-C2A	4.42	1.37	1.45	27	30
2	A	151	ZNH	C1C-CHC	4.40	1.28	1.41	25	30
2	A	151	ZNH	ZN-NC	4.16	1.91	2.02	16	30
2	A	151	ZNH	C3C-C2C	4.04	1.34	1.40	26	30
2	A	151	ZNH	C4C-CHD	3.92	1.30	1.41	9	30
2	A	151	ZNH	C4A-C3A	3.80	1.37	1.45	1	30
2	A	151	ZNH	CHB-C4A	3.76	1.31	1.38	14	30
2	A	151	ZNH	C1B-C2B	3.45	1.37	1.44	6	30
2	A	151	ZNH	CHA-C1A	3.41	1.31	1.38	14	30
2	A	151	ZNH	C1C-NC	3.31	1.40	1.35	21	30
2	A	151	ZNH	CHA-C4D	2.75	1.32	1.39	13	30

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)	Models Worst	Total
2	A	151	ZNH	CHB-C1B	2.68	1.33	1.39	28	30
2	A	151	ZNH	C3D-C2D	2.52	1.31	1.36	12	30
2	A	151	ZNH	ZN-ND	2.29	1.91	1.99	15	30
2	A	151	ZNH	CHC-C4B	2.27	1.29	1.35	29	11
2	A	151	ZNH	C4A-NA	2.24	1.43	1.38	8	30
2	A	151	ZNH	C3B-C2B	2.24	1.32	1.37	11	30
2	A	151	ZNH	C1A-NA	2.12	1.42	1.38	19	30
2	A	151	ZNH	C2A-C3A	2.12	1.32	1.36	18	28

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(°)	Ideal(°)	Models Worst	Total
2	A	151	ZNH	C3B-C2B-C1B	2.85	108.60	106.49	14	30
2	A	151	ZNH	C4A-NA-C1A	2.80	102.19	106.52	4	30
2	A	151	ZNH	CMC-C2C-C1C	2.53	124.58	128.46	11	30
2	A	151	ZNH	CHD-C1D-ND	2.42	127.75	124.68	23	30
2	A	151	ZNH	CAA-CBA-CGA	2.02	109.25	113.60	9	1

All unique chiral outliers are listed below.

Mol	Chain	Res	Type	Atoms	Models (Total)
2	A	151	ZNH	NA	30

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 ZNH A 151

Bond lengths

Bond angles

Torsions

Rings

6.7 Other polymers ⓘ

There are no such molecules in this entry.

6.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

7 Chemical shift validation ⓘ

No chemical shift data were provided