Full wwPDB NMR Structure Validation Report ⓘ

Feb 20, 2022 – 01:01 AM EST

PDB ID	:	1SOU
Title	:	NMR structure of Aquifex aeolicus 5,10-methenyltetrahydrofolate synthetase: Northeast Structural Genomics Consortium Target QR46
Authors	:	Cort, J.R.; Chiang, Y.; Acton, T.; Wu, M.; Montelione, G.T.; Kennedy, M.A.; Northeast Structural Genomics Consortium (NESG)
Deposited on	:	2004-03-15

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

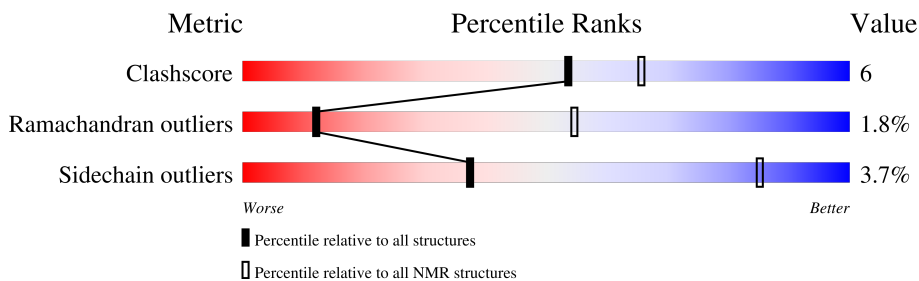|		
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
ShiftChecker	:	2.26
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.26

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		6
Ramachandran outliers		1.8%
Sidechain outliers		3.7%

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	194	83% 7% 10%

2 Ensemble composition and analysis ⓘ

This entry contains 20 models. Model 13 is the overall representative, medoid model (most similar to other models). The authors have identified model 1 as representative, based on the following criterion: *combination of factors*.

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

Well-defined (core) protein residues			
Well-defined core	Residue range (total)	Backbone RMSD (Å)	Medoid model
1	A:2-A:129, A:136-A:181 (174)	0.67	13

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

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

The models can be grouped into 3 clusters. No single-model clusters were found.

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

3 Entry composition ⓘ

There is only 1 type of molecule in this entry. The entry contains 3214 atoms, of which 1638 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called 5,10-methenyltetrahydrofolate synthetase.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	194	3214	1011	1638	284	277	4	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	187	LEU	-	cloning artifact	UNP O67621
A	188	GLU	-	cloning artifact	UNP O67621
A	189	HIS	-	expression tag	UNP O67621
A	190	HIS	-	expression tag	UNP O67621
A	191	HIS	-	expression tag	UNP O67621
A	192	HIS	-	expression tag	UNP O67621
A	193	HIS	-	expression tag	UNP O67621
A	194	HIS	-	expression tag	UNP O67621

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.

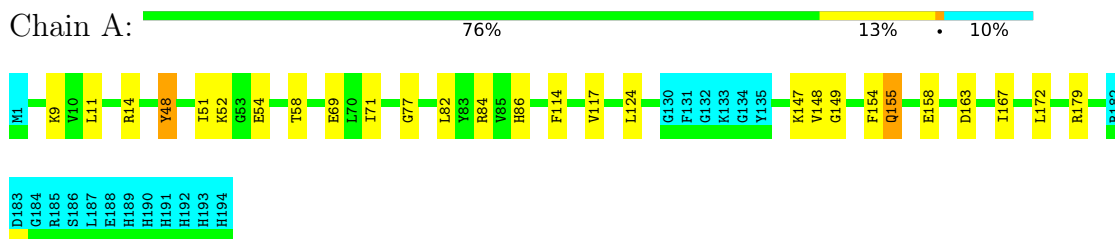- Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:
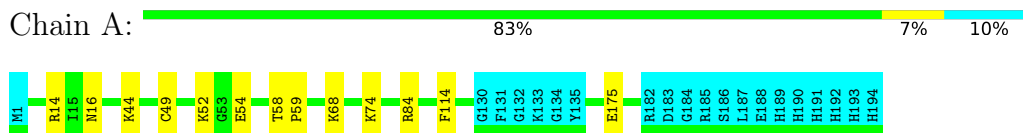
4.2 Scores per residue for each member of the ensemble

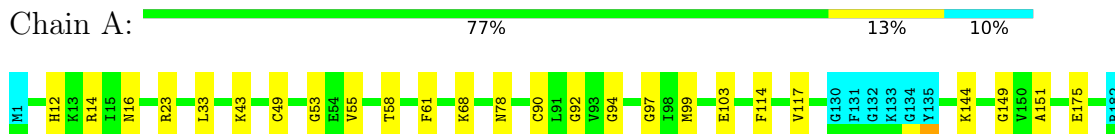Colouring as in section 4.1 above.
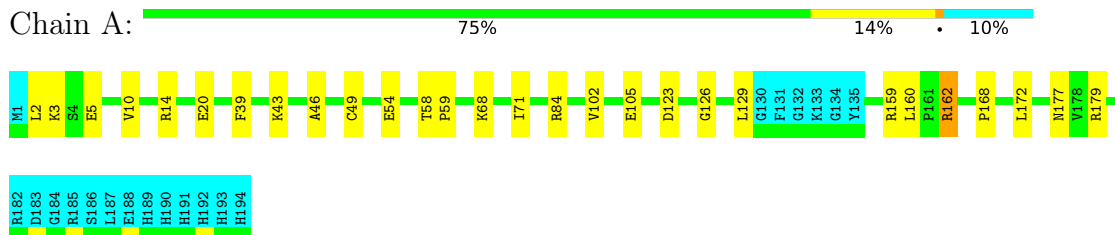
4.2.1 Score per residue for model 1

- Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:

4.2.2 Score per residue for model 2
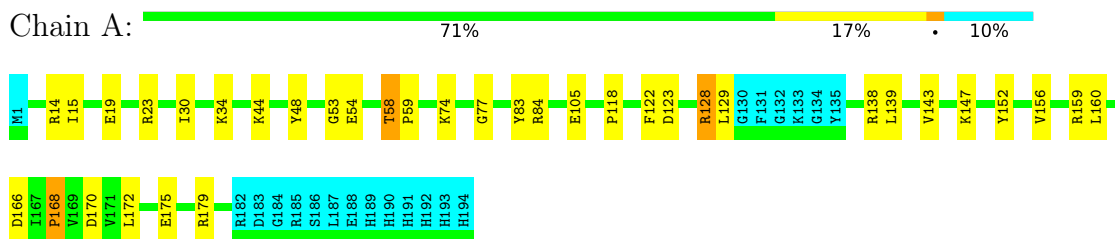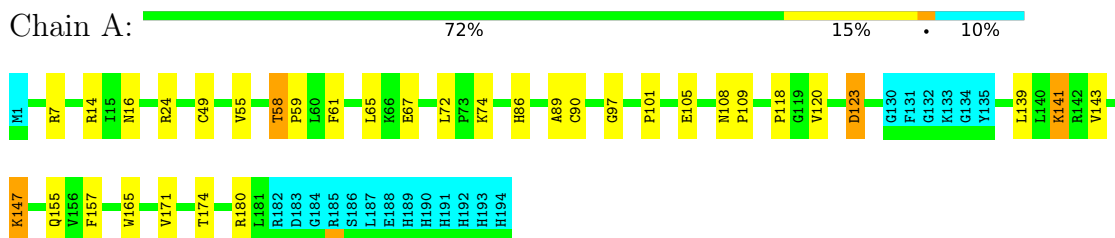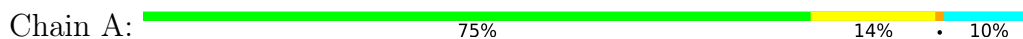
- Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:

D183 G184 R185 S186 L187 E188 H189 H190 H191 H192 H193 H194

4.2.3 Score per residue for model 3

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A: 75% 14% · 10%

M1 L2 K3 S4 E5 V10 R14 E20 F39 K43 A46 C49 E54 T58 P59 K68 I71 R84 V102 E105 D123 G126 L129 G130 F131 G132 K133 G134 Y135 R159 L160 P161 R162 P168 L172 N177 V178 R179

R182 D183 G184 R185 S186 L187 E188 H189 H190 H191 H192 H193 H194

4.2.4 Score per residue for model 4

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A: 71% 17% · 10%

M1 R14 I15 E19 R23 I30 K34 K44 Y48 G53 E54 T58 P59 K74 G77 Y83 R84 E105 P118 F122 D123 R128 L129 G130 F131 G132 K133 G134 Y135 R138 L139 V143 K147 Y152 V156 R159 L160

D166 I167 P168 V169 D170 V171 L172 E175 R179 R182 D183 G184 R185 S186 L187 E188 H189 H190 H191 H192 H193 H194

4.2.5 Score per residue for model 5

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A: 72% 15% · 10%

M1 R7 R14 I15 N16 R24 C49 V55 T58 P59 L60 F61 L65 K66 E67 L72 P73 K74 H86 A89 C90 G97 P101 E105 N108 P109 P118 G119 V120 D123 G130 F131 G132 K133 G134 Y135 L139 L140 K141 R142 V143

K147 Q155 V156 F157 W165 V171 T174 R180 L181 R182 D183 G184 R185 S186 L187 E188 H189 H190 H191 H192 H193 H194

4.2.6 Score per residue for model 6

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A: 75% 14% · 10%

M1 L2 V10 L11 R14 E20 R24 L36 C49 P50 I51 K52 G53 E54 T58 F61 P62 K74 E79 R84 G94 E100 P101 E105 F114 R128 L129 G130 F131 G132 K133 G134 Y135 V148 Q155 T174 E175 V178 R182

D183 G184 R185 S186 L187 E188 H189 H190 H191 H192 H193 H194
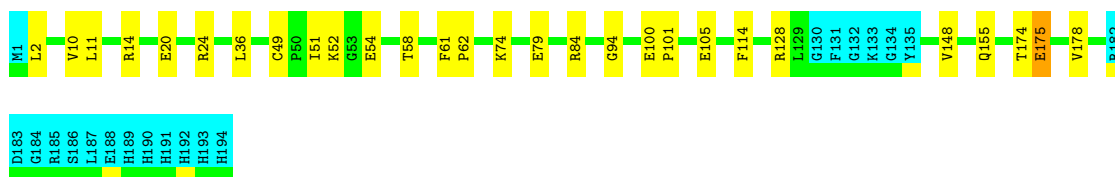
4.2.7 Score per residue for model 7

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A: 71% 19% · 10%

M1 L2 E5 R14 I15 R22 K28 E38 K44 V45 A46 L47 Y48 C49 P50 E54 L57 T58 P59 L60 F61 P62 I71 K74 V75 E76 S81 R84 V85 G97 P101 D111 V117 A121 L124 G130 F131 G132 K133 G134 Y135

Y136 D137 K144 E158 I167 P168 E175 R179 R182 D183 G184 R185 S186 L187 E188 H189 H190 H191 H192 H193 H194
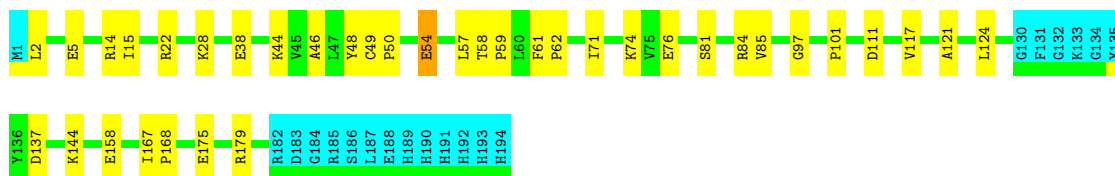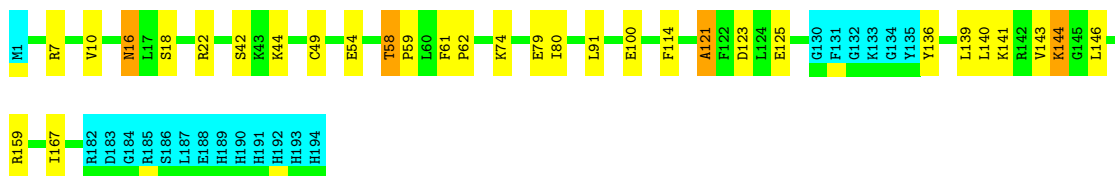
4.2.8 Score per residue for model 8

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A: 74% 14% · 10%

M1 R7 V10 N16 L17 S18 R22 S42 K43 K44 C49 E54 T58 P59 L60 F61 P62 K74 E79 I80 L91 E100 F114 A121 F122 D123 L124 E125 G130 F131 G132 K133 G134 Y135 Y136 L139 L140 K141 R142 V143 K144 G145 L146

R159 I167 R182 D183 G184 R185 S186 L187 E188 H189 H190 H191 H192 H193 H194
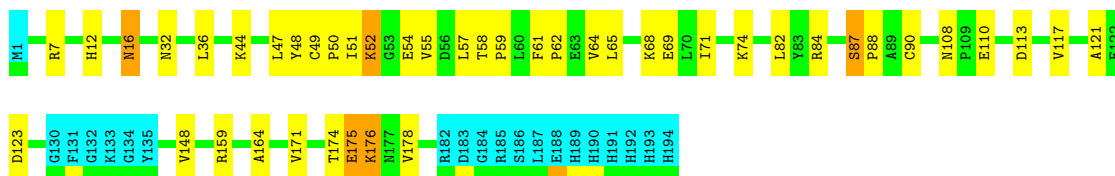
4.2.9 Score per residue for model 9

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A: 67% 20% · 10%

M1 R7 H12 N16 N32 L36 K44 L47 Y48 C49 P50 I51 K52 G53 E54 V55 D56 L57 T58 P59 L60 F61 P62 E63 V64 L65 K68 E69 L70 I71 K74 L82 Y83 R84 S87 P88 A89 C90 N108 P109 E110 D113 V117 A121 F122

D123 G130 F131 G132 K133 G134 Y135 V148 R159 A164 V171 T174 E175 K176 N177 V178 R182 D183 G184 R185 S186 L187 E188 H189 H190 H191 H192 H193 H194

4.2.10 Score per residue for model 10

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:
75%   14%   •   10%

M1 E5 K9 R14 I15 K43 Y48 K52 G53 E54 V55 T58 K68 E76 I80 R84 F114 V117 P118 A121 E125 R128 L129 G130 F131 G132 K133 G134 Y135 Y136 L139 V143 V148 R162 D170 T174 E175

L181 R182 D183 G184 R185 S186 L187 E188 H189 H190 H191 H192 H193 H194
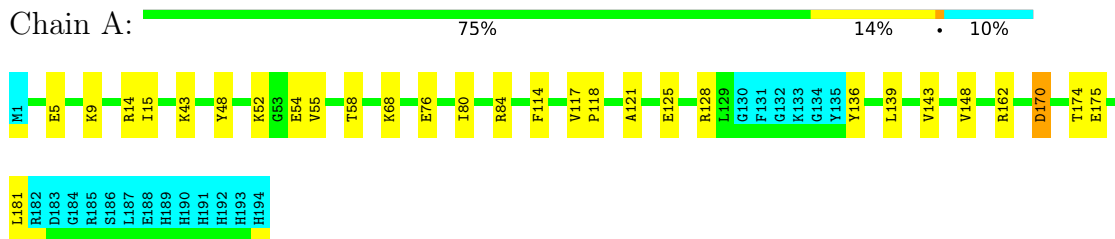
4.2.11 Score per residue for model 11

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:
71%   19%   10%

M1 L2 K3 H12 N16 K43 K44 P50 I51 K52 G53 E54 V55 T58 P59 K68 K74 V75 E76 G77 I80 R84 P88 E100 V107 E110 D111 V112 D113 F114 G119 F122 R128 L129 G130 F131 G132 K133 G134 Y135 Y136 K144

V148 R162 D163 A164 I167 P168 N177 R182 D183 G184 R185 S186 L187 E188 H189 H190 H191 H192 H193 H194
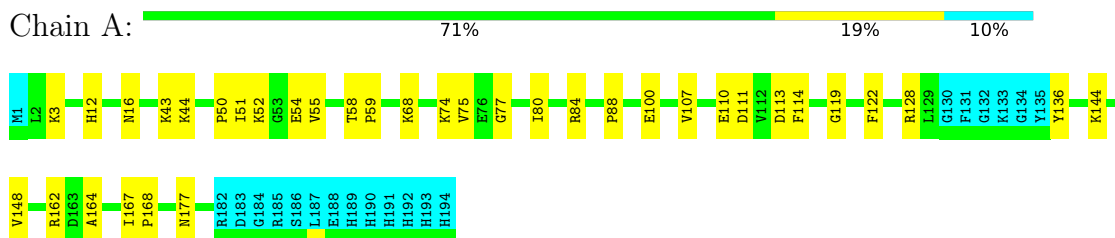
4.2.12 Score per residue for model 12

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:
71%   17%   •   10%

M1 H12 N16 R23 E27 K34 K43 K44 V45 A46 I51 K52 G53 E54 E63 E67 K68 I71 K74 E79 R84 V85 C90 G97 E100 F114 A121 L124 G130 F131 G132 K133 G134 Y135 Y136 D137 K141 V148

Y152 Q155 E158 D166 L172 V173 T174 E175 V178 L181 R182 D183 G184 R185 S186 L187 E188 H189 H190 H191 H192 H193 H194

4.2.13 Score per residue for model 13 (medoid)

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:
73%   16%   •   10%

M1 K8 S18 R22 L33 K34 S35 L36 F39 S42 C49 E54 V55 D56 L57 T58 P59 L60 F61 P62 I71 L82 E110 F114 A121 F122 D123 L124 G130 F131 G132 K133 G134 Y135 R142 V143 K144 V148 A151 E158 D163

A164 T174 N177 R182 D183 G184 R185 S186 L187 E188 H189 H190 H191 H192 H193 H194

4.2.14 Score per residue for model 14

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:

4.2.15 Score per residue for model 15

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:

4.2.16 Score per residue for model 16
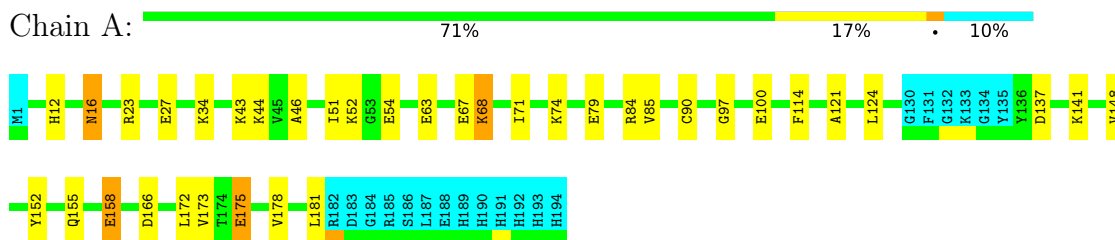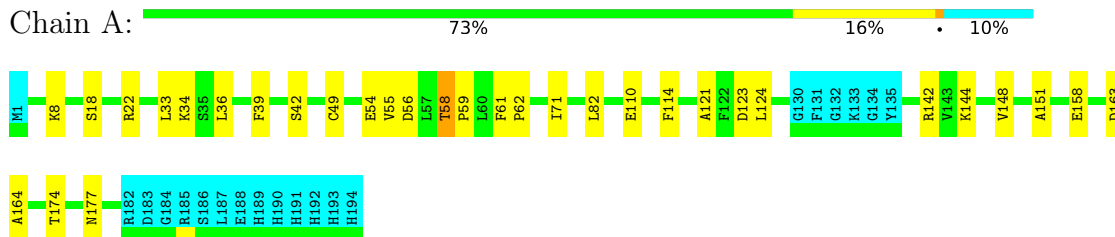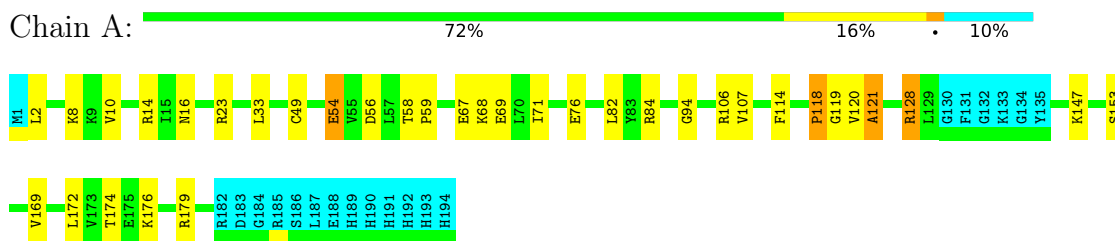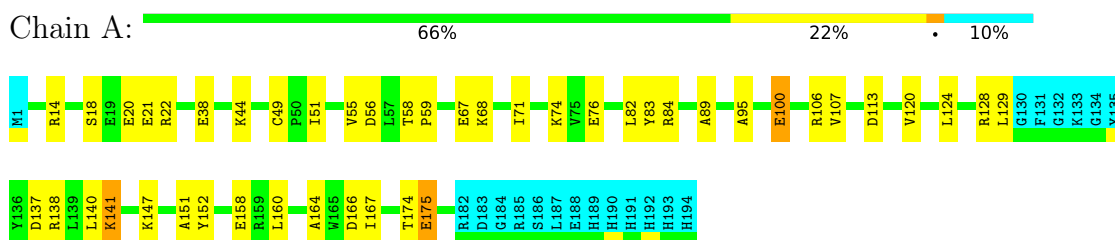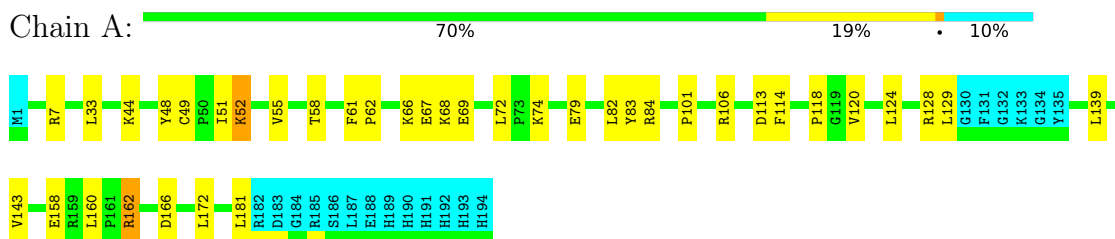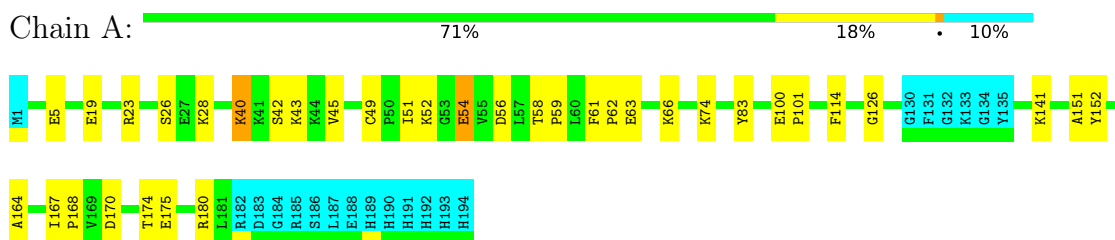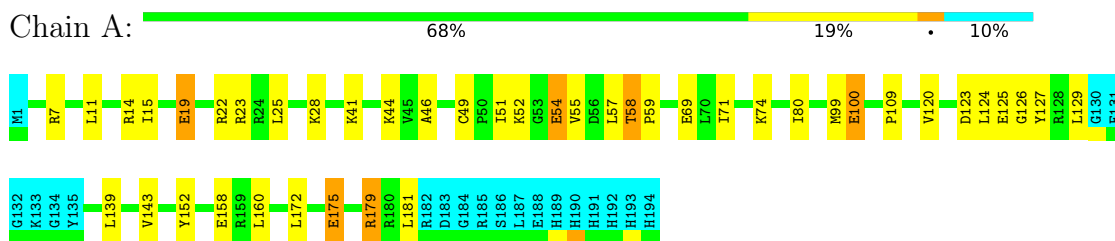
• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:

4.2.17 Score per residue for model 17

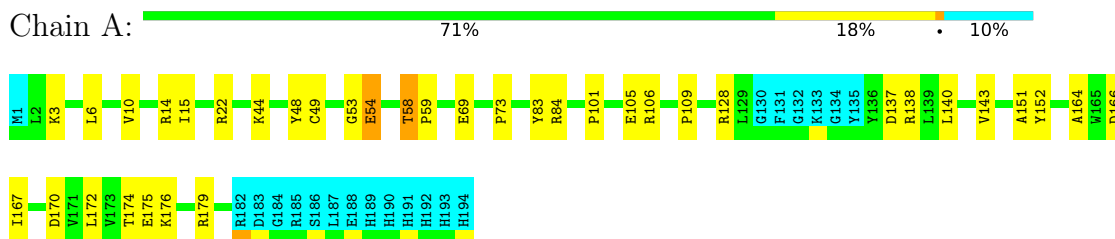• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:

4.2.18 Score per residue for model 18

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase
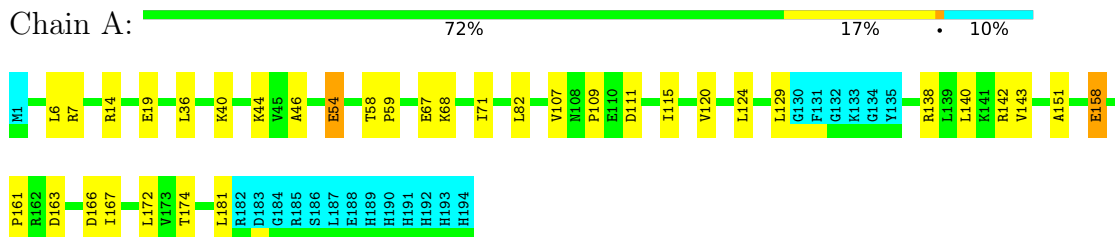
Chain A:

4.2.19 Score per residue for model 19

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:

4.2.20 Score per residue for model 20

• Molecule 1: 5,10-methenyltetrahydrofolate synthetase

Chain A:

5 Refinement protocol and experimental data overview ⓘ

The models were refined using the following method: *MOLECULAR DYNAMICS, SIMULATED ANNEALING.*

Of the 29 calculated structures, 20 were deposited, based on the following criterion: *structures with acceptable covalent geometry,structures with favorable non-bond energy,structures with the least restraint violations,structures with the lowest energy.*

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

Software name	Classification	Version
NIH-XPLOR	refinement	2.0.4
CNS	refinement	1.1

No chemical shift data was provided.

6 Model quality ⓘ

6.1 Standard geometry ⓘ

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	1406	1484	1482	16±4
All	All	28120	29680	29640	320

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 6.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Total
1:A:90:CYS:HB3	1:A:103:GLU:HB2	0.82	1.51	2	1
1:A:44:LYS:HB2	1:A:113:ASP:HB3	0.81	1.51	15	2
1:A:163:ASP:HB3	1:A:166:ASP:HB2	0.75	1.57	20	1
1:A:67:GLU:HG3	1:A:68:LYS:HD2	0.74	1.59	14	1
1:A:124:LEU:HG	1:A:158:GLU:HA	0.74	1.56	7	8
1:A:123:ASP:HB2	1:A:159:ARG:HA	0.68	1.64	9	2
1:A:72:LEU:HB2	1:A:101:PRO:HG3	0.67	1.67	16	2
1:A:74:LYS:HB2	1:A:81:SER:HB2	0.67	1.63	7	1
1:A:48:TYR:HB2	1:A:117:VAL:HG12	0.67	1.66	7	3
1:A:137:ASP:HA	1:A:140:LEU:HB2	0.67	1.66	15	1
1:A:67:GLU:HG3	1:A:68:LYS:HG3	0.66	1.68	16	2
1:A:172:LEU:HB3	1:A:179:ARG:HB2	0.66	1.67	3	4
1:A:50:PRO:HB3	1:A:54:GLU:HB2	0.66	1.68	11	1
1:A:147:LYS:HD3	1:A:167:ILE:HD11	0.66	1.68	15	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:175:GLU:HG3	1:A:176:LYS:HD2	0.66	1.67	19	1
1:A:14:ARG:HD3	1:A:54:GLU:HA	0.65	1.67	19	1
1:A:51:ILE:HG13	1:A:52:LYS:HD3	0.64	1.69	9	1
1:A:162:ARG:HD3	1:A:162:ARG:H	0.64	1.51	3	1
1:A:137:ASP:O	1:A:141:LYS:HG2	0.64	1.93	12	1
1:A:123:ASP:CB	1:A:159:ARG:HA	0.64	2.23	9	2
1:A:129:LEU:HB2	1:A:160:LEU:HD13	0.63	1.69	16	3
1:A:74:LYS:HG3	1:A:100:GLU:HB2	0.62	1.70	17	2
1:A:51:ILE:HG13	1:A:52:LYS:H	0.62	1.53	12	2
1:A:69:GLU:HG3	1:A:84:ARG:HB2	0.62	1.72	19	1
1:A:14:ARG:HD3	1:A:54:GLU:HG2	0.61	1.72	14	1
1:A:84:ARG:HB3	1:A:105:GLU:HG3	0.61	1.72	3	1
1:A:33:LEU:HD12	1:A:36:LEU:HD12	0.61	1.72	13	1
1:A:74:LYS:HD2	1:A:83:TYR:CE2	0.61	2.30	15	1
1:A:74:LYS:HD3	1:A:83:TYR:HE2	0.60	1.56	16	1
1:A:44:LYS:HA	1:A:69:GLU:HB2	0.59	1.74	18	1
1:A:167:ILE:HD12	1:A:168:PRO:HD2	0.59	1.73	11	3
1:A:140:LEU:HB2	1:A:167:ILE:HD13	0.58	1.74	20	2
1:A:15:ILE:HA	1:A:22:ARG:NH1	0.57	2.14	7	1
1:A:74:LYS:HD2	1:A:83:TYR:HE2	0.57	1.59	4	2
1:A:124:LEU:HA	1:A:179:ARG:HH22	0.57	1.57	7	1
1:A:129:LEU:HD13	1:A:160:LEU:HB3	0.57	1.76	3	2
1:A:172:LEU:HB3	1:A:179:ARG:HB3	0.57	1.76	14	2
1:A:58:THR:HB	1:A:59:PRO:HD3	0.57	1.76	9	3
1:A:50:PRO:HG3	1:A:57:LEU:HB2	0.56	1.75	9	1
1:A:45:VAL:HA	1:A:114:PHE:O	0.56	2.00	17	1
1:A:33:LEU:HD11	1:A:114:PHE:HZ	0.56	1.60	2	3
1:A:123:ASP:OD2	1:A:159:ARG:HA	0.56	1.98	3	1
1:A:174:THR:HB	1:A:175:GLU:OE1	0.55	2.01	6	1
1:A:36:LEU:HD21	1:A:178:VAL:HG21	0.55	1.76	9	2
1:A:42:SER:HB3	1:A:114:PHE:HB2	0.55	1.78	8	1
1:A:95:ALA:H	1:A:100:GLU:HG3	0.54	1.63	15	1
1:A:110:GLU:HG3	1:A:144:LYS:HD3	0.54	1.79	11	1
1:A:48:TYR:HB3	1:A:118:PRO:HD2	0.54	1.80	16	1
1:A:34:LYS:HE2	1:A:63:GLU:HG2	0.54	1.79	12	1
1:A:71:ILE:CG2	1:A:82:LEU:HB3	0.53	2.34	1	5
1:A:119:GLY:HA3	1:A:122:PHE:CE2	0.53	2.38	11	1
1:A:87:SER:HB2	1:A:90:CYS:SG	0.53	2.44	9	1
1:A:22:ARG:HH12	1:A:56:ASP:HB2	0.53	1.64	15	1
1:A:14:ARG:HD3	1:A:54:GLU:OE1	0.53	2.04	4	1
1:A:124:LEU:HA	1:A:179:ARG:NH2	0.53	2.19	7	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:147:LYS:HG2	1:A:170:ASP:OD2	0.52	2.04	4	1
1:A:122:PHE:CE2	1:A:128:ARG:HB3	0.52	2.39	4	1
1:A:109:PRO:HB3	1:A:143:VAL:HG22	0.52	1.80	19	1
1:A:110:GLU:HG3	1:A:144:LYS:HE3	0.52	1.81	13	1
1:A:125:GLU:O	1:A:181:LEU:HD11	0.52	2.05	10	2
1:A:46:ALA:HB2	1:A:71:ILE:HB	0.52	1.81	12	2
1:A:23:ARG:HH21	1:A:56:ASP:HB2	0.51	1.65	14	1
1:A:14:ARG:HD2	1:A:54:GLU:OE2	0.51	2.05	6	1
1:A:74:LYS:HD3	1:A:101:PRO:O	0.51	2.05	6	1
1:A:58:THR:HA	1:A:61:PHE:CD1	0.51	2.41	2	2
1:A:40:LYS:N	1:A:40:LYS:HD2	0.51	2.21	17	1
1:A:58:THR:N	1:A:59:PRO:HD2	0.51	2.20	19	8
1:A:42:SER:O	1:A:43:LYS:HD2	0.51	2.06	17	1
1:A:74:LYS:HG3	1:A:100:GLU:CB	0.51	2.36	18	1
1:A:75:VAL:HG12	1:A:77:GLY:H	0.51	1.66	11	1
1:A:74:LYS:HG2	1:A:100:GLU:HB2	0.51	1.83	12	1
1:A:151:ALA:O	1:A:174:THR:HA	0.51	2.06	17	5
1:A:7:ARG:HG2	1:A:120:VAL:HG11	0.51	1.83	16	1
1:A:11:LEU:HD12	1:A:14:ARG:HD3	0.50	1.84	1	1
1:A:43:LYS:HA	1:A:68:LYS:HD2	0.50	1.82	2	1
1:A:63:GLU:HA	1:A:66:LYS:NZ	0.50	2.21	17	1
1:A:171:VAL:HG22	1:A:180:ARG:HG2	0.50	1.83	5	1
1:A:82:LEU:HD11	1:A:139:LEU:HD11	0.50	1.82	16	1
1:A:18:SER:O	1:A:22:ARG:HG3	0.50	2.07	13	2
1:A:54:GLU:HG3	1:A:55:VAL:H	0.50	1.66	9	1
1:A:28:LYS:HD2	1:A:175:GLU:HB2	0.50	1.83	7	2
1:A:69:GLU:OE1	1:A:84:ARG:HD2	0.50	2.07	14	1
1:A:80:ILE:HD11	1:A:136:TYR:HD1	0.49	1.66	11	3
1:A:61:PHE:HB2	1:A:62:PRO:HD3	0.49	1.84	9	4
1:A:137:ASP:O	1:A:138:ARG:HB3	0.49	2.08	19	1
1:A:10:VAL:HG13	1:A:155:GLN:NE2	0.49	2.22	6	1
1:A:141:LYS:HG3	1:A:167:ILE:HB	0.49	1.84	17	1
1:A:47:LEU:HD23	1:A:57:LEU:HB3	0.49	1.82	9	1
1:A:74:LYS:HG3	1:A:100:GLU:OE1	0.49	2.08	15	1
1:A:137:ASP:O	1:A:141:LYS:HD3	0.49	2.07	15	1
1:A:94:GLY:HA3	1:A:100:GLU:OE2	0.49	2.08	6	1
1:A:54:GLU:OE1	1:A:54:GLU:HA	0.48	2.08	4	1
1:A:108:ASN:OD1	1:A:109:PRO:HD2	0.48	2.08	5	1
1:A:67:GLU:HB2	1:A:68:LYS:HD2	0.48	1.85	12	1
1:A:51:ILE:HG13	1:A:52:LYS:N	0.48	2.22	18	3
1:A:12:HIS:O	1:A:16:ASN:HB2	0.48	2.09	9	4

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:128:ARG:HB3	1:A:166:ASP:OD2	0.48	2.08	16	1
1:A:74:LYS:HG2	1:A:100:GLU:OE1	0.48	2.09	11	1
1:A:83:TYR:HB2	1:A:101:PRO:HG2	0.48	1.86	17	1
1:A:139:LEU:O	1:A:143:VAL:HG23	0.48	2.09	8	5
1:A:108:ASN:ND2	1:A:110:GLU:HB3	0.48	2.23	9	1
1:A:39:PHE:CZ	1:A:68:LYS:HE2	0.48	2.44	3	1
1:A:55:VAL:HG12	1:A:57:LEU:HG	0.48	1.85	18	1
1:A:69:GLU:OE2	1:A:84:ARG:HD2	0.47	2.10	16	1
1:A:14:ARG:HH11	1:A:120:VAL:HA	0.47	1.68	18	1
1:A:43:LYS:O	1:A:68:LYS:HB3	0.47	2.09	11	2
1:A:84:ARG:HB2	1:A:107:VAL:CG2	0.47	2.39	15	2
1:A:14:ARG:NH1	1:A:120:VAL:HA	0.47	2.24	18	2
1:A:175:GLU:O	1:A:176:LYS:HG2	0.47	2.09	9	1
1:A:18:SER:HB2	1:A:21:GLU:HB3	0.47	1.84	15	1
1:A:80:ILE:HG13	1:A:139:LEU:HD13	0.47	1.86	18	1
1:A:114:PHE:CZ	1:A:148:VAL:HG21	0.47	2.44	10	3
1:A:6:LEU:O	1:A:10:VAL:HG23	0.47	2.10	19	1
1:A:74:LYS:HD3	1:A:83:TYR:CE2	0.46	2.43	16	1
1:A:43:LYS:O	1:A:68:LYS:HB2	0.46	2.11	12	1
1:A:51:ILE:HG13	1:A:52:LYS:HG2	0.46	1.86	11	2
1:A:74:LYS:HE2	1:A:100:GLU:HB3	0.46	1.87	8	1
1:A:92:GLY:O	1:A:99:MET:HA	0.46	2.11	2	1
1:A:166:ASP:O	1:A:168:PRO:HD3	0.46	2.11	4	1
1:A:52:LYS:N	1:A:52:LYS:HD3	0.46	2.25	16	1
1:A:48:TYR:HA	1:A:73:PRO:HG3	0.46	1.88	19	1
1:A:48:TYR:HD2	1:A:118:PRO:HD2	0.46	1.70	10	1
1:A:18:SER:HB2	1:A:21:GLU:CB	0.46	2.41	15	1
1:A:14:ARG:NH2	1:A:151:ALA:HA	0.45	2.27	2	1
1:A:61:PHE:N	1:A:62:PRO:HD2	0.45	2.25	17	3
1:A:126:GLY:O	1:A:168:PRO:HA	0.45	2.11	3	2
1:A:25:LEU:HB3	1:A:152:TYR:CE1	0.45	2.46	18	1
1:A:14:ARG:HB3	1:A:54:GLU:HB3	0.45	1.88	6	1
1:A:16:ASN:C	1:A:16:ASN:HD22	0.45	2.15	8	1
1:A:173:VAL:HG22	1:A:178:VAL:HG12	0.45	1.88	12	1
1:A:14:ARG:HH21	1:A:54:GLU:HG3	0.45	1.72	1	1
1:A:69:GLU:HG2	1:A:84:ARG:HD2	0.45	1.88	1	1
1:A:65:LEU:HD21	1:A:88:PRO:HA	0.45	1.89	9	1
1:A:10:VAL:HB	1:A:120:VAL:HG13	0.45	1.89	14	1
1:A:19:GLU:O	1:A:23:ARG:HG2	0.44	2.12	4	2
1:A:89:ALA:O	1:A:90:CYS:SG	0.44	2.75	5	1
1:A:85:VAL:HG13	1:A:90:CYS:SG	0.44	2.52	12	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:19:GLU:O	1:A:23:ARG:HB2	0.44	2.12	18	1
1:A:109:PRO:HB3	1:A:143:VAL:HA	0.44	1.88	18	1
1:A:23:ARG:O	1:A:27:GLU:HB2	0.44	2.11	12	1
1:A:152:TYR:HD1	1:A:175:GLU:HB3	0.44	1.72	15	1
1:A:20:GLU:O	1:A:24:ARG:HG2	0.44	2.13	6	1
1:A:84:ARG:HG3	1:A:107:VAL:CG2	0.44	2.43	11	1
1:A:140:LEU:HB3	1:A:167:ILE:HG21	0.44	1.87	8	2
1:A:64:VAL:HA	1:A:68:LYS:HE2	0.44	1.90	9	1
1:A:121:ALA:HA	1:A:155:GLN:O	0.44	2.11	12	1
1:A:172:LEU:HB2	1:A:181:LEU:HD21	0.44	1.90	20	1
1:A:90:CYS:CB	1:A:103:GLU:HB2	0.44	2.36	2	1
1:A:50:PRO:HG3	1:A:57:LEU:H	0.44	1.71	7	1
1:A:6:LEU:HG	1:A:129:LEU:HD21	0.44	1.89	20	1
1:A:153:SER:OG	1:A:176:LYS:HG3	0.44	2.13	14	1
1:A:3:LYS:HD2	1:A:129:LEU:HG	0.43	1.88	3	1
1:A:84:ARG:HD3	1:A:105:GLU:OE1	0.43	2.13	6	1
1:A:58:THR:OG1	1:A:59:PRO:HD3	0.43	2.13	11	1
1:A:147:LYS:HE2	1:A:167:ILE:HD11	0.43	1.90	1	1
1:A:154:PHE:HB2	1:A:155:GLN:OE1	0.43	2.13	1	1
1:A:65:LEU:HD12	1:A:86:HIS:HA	0.43	1.90	5	1
1:A:44:LYS:HB2	1:A:113:ASP:H	0.43	1.73	16	2
1:A:11:LEU:O	1:A:15:ILE:HG12	0.43	2.14	18	1
1:A:179:ARG:HA	1:A:179:ARG:NE	0.43	2.28	1	1
1:A:69:GLU:OE2	1:A:84:ARG:HD3	0.43	2.14	9	1
1:A:51:ILE:HD12	1:A:51:ILE:O	0.43	2.12	15	1
1:A:74:LYS:HD2	1:A:101:PRO:O	0.43	2.13	5	1
1:A:84:ARG:HG3	1:A:84:ARG:O	0.43	2.13	7	1
1:A:44:LYS:HG3	1:A:111:ASP:O	0.43	2.13	20	2
1:A:22:ARG:HD2	1:A:54:GLU:HB2	0.43	1.90	18	1
1:A:128:ARG:HD3	1:A:166:ASP:OD1	0.43	2.13	15	1
1:A:84:ARG:HB3	1:A:105:GLU:HG2	0.43	1.90	4	1
1:A:15:ILE:CG2	1:A:52:LYS:HB3	0.43	2.44	10	1
1:A:138:ARG:O	1:A:142:ARG:HD3	0.43	2.13	20	1
1:A:179:ARG:HA	1:A:179:ARG:HE	0.43	1.74	1	1
1:A:141:LYS:HA	1:A:167:ILE:HG21	0.43	1.91	17	1
1:A:141:LYS:HD3	1:A:167:ILE:HG13	0.43	1.89	8	1
1:A:172:LEU:HB2	1:A:181:LEU:HD11	0.43	1.91	16	2
1:A:20:GLU:CD	1:A:20:GLU:H	0.43	2.16	3	1
1:A:34:LYS:HD3	1:A:39:PHE:HE2	0.43	1.74	13	1
1:A:44:LYS:HD3	1:A:111:ASP:O	0.43	2.13	7	1
1:A:54:GLU:HB2	1:A:152:TYR:CE2	0.43	2.49	17	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:54:GLU:HG3	1:A:118:PRO:HB2	0.42	1.90	4	1
1:A:129:LEU:HD13	1:A:160:LEU:HD13	0.42	1.90	4	1
1:A:152:TYR:O	1:A:156:VAL:HG23	0.42	2.15	4	1
1:A:14:ARG:HG3	1:A:54:GLU:OE2	0.42	2.14	20	1
1:A:14:ARG:CZ	1:A:120:VAL:HA	0.42	2.44	5	1
1:A:121:ALA:O	1:A:128:ARG:HA	0.42	2.14	14	1
1:A:26:SER:HB3	1:A:56:ASP:HB2	0.42	1.90	17	1
1:A:14:ARG:NH1	1:A:54:GLU:HG2	0.42	2.30	10	1
1:A:8:LYS:NZ	1:A:8:LYS:HB2	0.42	2.29	14	1
1:A:30:ILE:O	1:A:34:LYS:HB2	0.42	2.15	4	1
1:A:39:PHE:HA	1:A:42:SER:OG	0.42	2.14	13	1
1:A:82:LEU:O	1:A:106:ARG:HA	0.42	2.14	15	2
1:A:162:ARG:HD2	1:A:162:ARG:C	0.42	2.34	16	1
1:A:40:LYS:HA	1:A:68:LYS:NZ	0.42	2.29	20	1
1:A:14:ARG:HB2	1:A:155:GLN:OE1	0.42	2.15	5	1
1:A:10:VAL:HG11	1:A:121:ALA:HB2	0.42	1.90	8	1
1:A:22:ARG:HD2	1:A:54:GLU:O	0.42	2.14	18	1
1:A:152:TYR:HB3	1:A:175:GLU:OE2	0.42	2.14	19	1
1:A:46:ALA:O	1:A:115:ILE:HA	0.42	2.14	20	1
1:A:15:ILE:HG22	1:A:53:GLY:HA3	0.42	1.92	4	1
1:A:148:VAL:HA	1:A:171:VAL:O	0.42	2.15	9	1
1:A:123:ASP:HA	1:A:157:PHE:O	0.42	2.15	5	1
1:A:5:GLU:HG3	1:A:9:LYS:HE2	0.42	1.92	10	1
1:A:144:LYS:NZ	1:A:144:LYS:HB3	0.42	2.30	8	1
1:A:46:ALA:HA	1:A:71:ILE:O	0.41	2.15	12	3
1:A:123:ASP:HB2	1:A:127:TYR:HB2	0.41	1.91	18	1
1:A:152:TYR:HD1	1:A:175:GLU:HG3	0.41	1.75	12	1
1:A:15:ILE:HA	1:A:22:ARG:HH12	0.41	1.75	19	1
1:A:83:TYR:HB2	1:A:101:PRO:HB2	0.41	1.91	19	1
1:A:2:LEU:HB2	1:A:5:GLU:HB2	0.41	1.91	7	1
1:A:125:GLU:HB2	1:A:159:ARG:NH1	0.41	2.31	8	1
1:A:71:ILE:HA	1:A:83:TYR:O	0.41	2.16	15	1
1:A:28:LYS:HE2	1:A:175:GLU:HB2	0.41	1.91	18	1
1:A:39:PHE:O	1:A:68:LYS:HE3	0.41	2.16	3	1
1:A:142:ARG:HE	1:A:142:ARG:HA	0.41	1.76	13	1
1:A:147:LYS:O	1:A:169:VAL:HB	0.41	2.16	14	1
1:A:22:ARG:NH1	1:A:56:ASP:HB2	0.41	2.30	15	1
1:A:117:VAL:O	1:A:149:GLY:HA2	0.41	2.15	1	2
1:A:147:LYS:NZ	1:A:147:LYS:HB2	0.41	2.31	5	1
1:A:107:VAL:HG13	1:A:111:ASP:HB3	0.41	1.91	20	1
1:A:144:LYS:HD3	1:A:144:LYS:O	0.41	2.16	2	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Models Total
1:A:14:ARG:HD3	1:A:54:GLU:HB3	0.41	1.93	7	1
1:A:55:VAL:HG22	1:A:152:TYR:CZ	0.41	2.51	15	1
1:A:10:VAL:O	1:A:14:ARG:HG3	0.41	2.16	3	1
1:A:58:THR:N	1:A:59:PRO:CD	0.40	2.84	15	3
1:A:114:PHE:CE2	1:A:148:VAL:HG21	0.40	2.51	11	3
1:A:85:VAL:HG21	1:A:101:PRO:HB3	0.40	1.92	7	1
1:A:67:GLU:OE2	1:A:68:LYS:HG3	0.40	2.16	15	1
1:A:40:LYS:HA	1:A:68:LYS:HZ1	0.40	1.76	20	1
1:A:141:LYS:HE2	1:A:141:LYS:HA	0.40	1.92	5	1
1:A:118:PRO:HB2	1:A:119:GLY:H	0.40	1.59	14	1
1:A:53:GLY:O	1:A:54:GLU:HB2	0.40	2.17	4	1
1:A:51:ILE:HD12	1:A:52:LYS:N	0.40	2.32	6	1
1:A:109:PRO:CB	1:A:143:VAL:HA	0.40	2.46	20	1

6.3 Torsion angles (i)

6.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all NMR entries. The Analysed column shows the number of residues for which the backbone conformation was analysed and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	174/194 (90%)	154±3 (88±2%)	17±3 (10±2%)	3±1 (2±1%)	12	54
All	All	3480/3880 (90%)	3072 (88%)	345 (10%)	63 (2%)	12	54

All 21 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	49	CYS	14
1	A	55	VAL	6
1	A	121	ALA	6
1	A	164	ALA	6
1	A	54	GLU	5
1	A	97	GLY	4
1	A	48	TYR	2
1	A	77	GLY	2
1	A	163	ASP	2

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Mol	Chain	Res	Type	Models (Total)
1	A	53	GLY	2
1	A	94	GLY	2
1	A	2	LEU	2
1	A	118	PRO	2
1	A	102	VAL	1
1	A	91	LEU	1
1	A	176	LYS	1
1	A	88	PRO	1
1	A	56	ASP	1
1	A	89	ALA	1
1	A	126	GLY	1
1	A	161	PRO	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	157/173 (91%)	151±2 (96±1%)	6±2 (4±1%)	37	85
All	All	3140/3460 (91%)	3025 (96%)	115 (4%)	37	85

All 57 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	58	THR	10
1	A	175	GLU	8
1	A	128	ARG	6
1	A	16	ASN	5
1	A	54	GLU	5
1	A	162	ARG	4
1	A	44	LYS	4
1	A	174	THR	4
1	A	76	GLU	4
1	A	177	ASN	3
1	A	123	ASP	3
1	A	79	GLU	3
1	A	105	GLU	2

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Mol	Chain	Res	Type	Models (Total)
1	A	141	LYS	2
1	A	38	GLU	2
1	A	144	LYS	2
1	A	52	LYS	2
1	A	84	ARG	2
1	A	3	LYS	2
1	A	158	GLU	2
1	A	106	ARG	2
1	A	100	GLU	2
1	A	19	GLU	2
1	A	9	LYS	1
1	A	48	TYR	1
1	A	86	HIS	1
1	A	155	GLN	1
1	A	23	ARG	1
1	A	78	ASN	1
1	A	5	GLU	1
1	A	43	LYS	1
1	A	138	ARG	1
1	A	168	PRO	1
1	A	7	ARG	1
1	A	24	ARG	1
1	A	67	GLU	1
1	A	147	LYS	1
1	A	165	TRP	1
1	A	11	LEU	1
1	A	137	ASP	1
1	A	146	LEU	1
1	A	32	ASN	1
1	A	74	LYS	1
1	A	87	SER	1
1	A	170	ASP	1
1	A	68	LYS	1
1	A	166	ASP	1
1	A	8	LYS	1
1	A	20	GLU	1
1	A	51	ILE	1
1	A	66	LYS	1
1	A	40	LYS	1
1	A	180	ARG	1
1	A	41	LYS	1
1	A	99	MET	1

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Mol	Chain	Res	Type	Models (Total)
1	A	179	ARG	1
1	A	36	LEU	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 ⓘ

There are no ligands in this entry.

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