

wwPDB NMR Structure Validation Summary Report (i)

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Title : Hybrid structure of the SPP1 tail tube by solid-state NMR and cryo EM -

NMR Ensemble

Authors: Zinke, M.; Sachowsky, K.A.A.; Zinn-Justin, S.; Ravelli, R.; Schroder, G.F.;

Habeck, M.; Lange, A.

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

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

EMDB validation analysis : NOT EXECUTED

MolProbity : 4.02b-467

Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)

MapQ : NOT EXECUTED

Ideal geometry (proteins) : Engh & Huber (2001) Ideal geometry (DNA, RNA) : Parkinson et al. (1996)

Validation Pipeline (wwPDB-VP) : 2.33

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure: *ELECTRON MICROSCOPY, SOLID-STATE NMR*

The reported resolution of this entry is 4.00 Å.

The overall completeness of chemical shifts assignment was not calculated.

There are no overall percentile quality scores available for this entry.

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	172	100%
1	В	172	100%
1	С	172	100%
1	D	172	100%
1	Е	172	100%
1	F	172	100%
1	G	172	100%
1	Н	172	100%
1	I	172	100%
1	J	172	100%
1	K	172	100%
1	L	172	100%



2 Ensemble composition and analysis (i)

This entry contains 10 models. The atoms present in the NMR models are not consistent. Some calculations may have failed as a result. All residues are included in the validation scores.

Cyrange was unable to find well-defined residues.

Error message: Cyrange did not run

NmrClust was unable to cluster the ensemble.

Error message: NmrClust did not run



3 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 30672 atoms, of which 14916 are hydrogens and 0 are deuteriums.

In the tables below, 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 Tail tube protein gp17.1*.

Mol	Chain	Residues			Atom	.S			AltConf	Trace
1	A	172	Total	С	Н	N	О	S	0	
1	A	172	2556	821	1243	216	275	1	U	
1	D	170	Total	С	Н	N	О	S	0	
1	В	172	2556	821	1243	216	275	1	0	
1	С	172	Total	С	Н	N	О	S	0	
1		172	2556	821	1243	216	275	1	U	
1	D	172	Total	С	Н	N	О	S	0	
1	D	172	2556	821	1243	216	275	1	U	
1	Е	172	Total	С	Н	N	О	S	0	
1	12	172	2556	821	1243	216	275	1	U	
1	F	172	Total	С	Н	N	О	S	0	
1	I.	112	2556	821	1243	216	275	1	0	
1	G	172	Total	С	Н	N	О	S	0	
1	G	112	2556	821	1243	216	275	1	0	
1	Н	172	Total	С	Н	N	О	S	0	
1	11	112	2556	821	1243	216	275	1	0	
1	I	172	Total	С	Н	N	О	S	0	
1	1	112	2556	821	1243	216	275	1	0	
1	J	172	Total	С	Н	N	О	S	0	
1		112	2556	821	1243	216	275	1	U	
1	K	172	Total	С	Н	N	О	S	0	
1	IX	114	2556	821	1243	216	275	1	U	
1	L	172	Total	С	Н	N	О	S	0	
1	ъ	112	2556	821	1243	216	275	1	U	



4 Residue-property plots (i)

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: Tail tube protein gp17.1* Chain A: • Molecule 1: Tail tube protein gp17.1* Chain B: 100% • Molecule 1: Tail tube protein gp17.1* Chain C: 100%



A126 W126 E128 S130 S131 C132 C133 C134 C134 C134 C144 C144 C144 C144 C144 C144 C144 C146 C141 C146 C166 C166 C166 C166 C166 C166 C167 C167 C167 C167 C167 C168	
• Molecule 1: Tail tube protein gp17.1*	
Chain D: 100%	
P6	G63 E64
V66 166 166 168 177 173 174 175 175 176 177 177 177 178 189 189 189 189 189 189 189 18	E123
A 126 E 127 E 128 E 129 E 139 E 139 E 139 E 138 E 138 E 145 E 145	
• Molecule 1: Tail tube protein gp17.1*	
Chain E:	
16 16 17 18 18 19 19 19 19 19 19	G63 E64
V65 V68 V68 V68 V68 V68 V68 V77 V77 V77 V77 V77 V77 V77 V77 V77 V7	E123
A126 1128 1130 1130 1131 1138 1138 1138 1138 1138 1138 1138 1138 1145 1145 1145 1145 1145 1145 1145 1145 1145 1145 1145 1145 1145 1145 1146 1166 1166 1166 1167 1166 1167 1167 1167 1177	
• Molecule 1: Tail tube protein gp17.1*	
Chain F: 100%	
10 10 10 10 10 10 10 10	G63 E64
V65 V67 V68 K77 K77 K77 K77 K77 K77 K77 K	E123 G124
1128 1130 1130 1133 1133 1133 1133 1133 113	
• Molecule 1: Tail tube protein gp17.1*	
Chain G:	
P 5	G63 E64
V65 Y66 Y67 Y68 Y68 Y68 Y68 Y68 Y68 Y68 Y71 Y73 Y74 Y74 Y77 Y78 Y77 Y78 Y77 Y78 Y77 Y78 Y83 Y10 Y10 Y10 Y112 Y112 Y112 Y113 Y118 Y118 Y118 Y119 Y118 Y119 Y118 Y119 Y119	E123 G124



A126 E127 E127 E128 S129 E130 S131 L132 Q133 V134	E137 L138 K139 N140 G141 E142 I143 D144 T145 F146	E148 E148 I150 V151 N152 V153	K155 K155 G156 G157 Y158 D159	F160 Q161 Q162 Q162 P163 G164	U165 T166 T167 G168	A170 P171 G172	T173 V174 P175 A176			
• Molecule 1: T	Cail tube protein	n gp17.1*								
Chain H:			100%							
P5 16 16 68 69 010 V111 X112 Y13 Y13	410 817 118 119 420 722 623 824 824 826	F28 P29 A30 A31 Q32 T33	635 836 V37 838 639	E40 R41 E42 L43 F44	D45 E46 Q47 T48	N50 G51 R52	153 L54 G55 P56	G57 S58 V59	A60 D61	G63 E64
V65 T66 Y67 Y68 Q69 K70 R71 G72 D73 A74 A74	A 777 A 778 A 778 D 81 D 81 A 82 A 83 A 83 A 83 A 84 A 84 A 84 A 84 A 84 A 84 A 84 A 84	488 (488 (490 (492 (493 (494)	196 196 197 1898 1899	E100 N101 D102 K103 Y104	A106 Q107 F108	F110 A111 Y112	1113 E114 S115 R116	E117 Y118	D120 G121	V122 E123 G124
4126 1128 1128 1130 1130 1132 (1132 (1132 1135	0130 E137 M140 0141 1143 1145 1146	E148 E149 I150 V151 N152 V153 S154	K155 G156 G157 Y158 D159	F160 Q161 Q162 P163 G164	4165 T166 T167 G168	A170 P171 G172	T173 V174 P175 A176			
• Molecule 1: T	ail tube proteir	n gp17.1*								
Chain I:		1	.00%							
P5 16 16 17 19 10 10 11 114 114	410 817 118 118 720 623 623 623 824 A25 P26	F28 F29 F29 F29 F29 F29 F29 F29 F29	635 836 V37 838 639	E40 R41 E42 L43 F44	D45 E46 Q47 T48	N50 G51 R52	153 L54 G55 P56	G57 S58 V59	A60 D61	G63 E64
V65 T66 Y67 Y68 G69 G72 G72 A74 A74	477 478 179 179 1880 1881 1883 1885 1886 1886	(189 (189 (189 (199 (199 (199 (199 (199	196 196 197 199	E100 N101 D102 K103 Y104	A106 Q107 F108	F110 A111 Y112	E1113 E114 S115 R116	E117 Y118 S119	0120 G121 W133	V122 E123 G124
A125 V126 E127 I128 S129 S131 L132 Q133 V134	1138 1138 1140 1143 1143 1145 1145 1146	E148 E148 I150 V151 V153 V153	K155 G156 G157 Y158 D159	F160 Q161 Q162 P163 G164	4165 T166 T167 G168	A170 P171 G172	T173 V174 P175 A176			
• Molecule 1: T	`ail tube proteir	n gp17.1*						-		
Chain J:			100%						ı	
P5 16 16 16 10 10 10 11 11 11 11 11	21	F28 F29 A30 Q32 T33	635 836 838 838	E40 E41 E42 L43 F44	D45 E46 Q47 T48 K40	N50 G51 R52	153 L54 G55	S58 V59	A60 D61	G63 E64
V65 T66 Y67 Y68 G69 K70 R71 G72 D73 A74	477 478 179 179 188 188 188 186 688 887	189 (988 (900 (900 (900 (900 (900)	196 196 197 198 199	E100 N101 D102 K103	A106 Q107 F108	F110 A111 Y112	E1113 E114 S115 R116	E117 Y118	0120 G121	V122 E123 G124
A125 V126 E127 S129 S129 S131 L132 Q133 V134	6130 E137 K138 N140 G141 E142 D144 L145 L146	E148 E149 I150 V151 N152 V153	K155 G156 G157 Y158 D159	F160 Q161 Q162 P163 G164	U165 T166 T167 G168	A170 P171 G172	T173 V174 P175 A176			
• Molecule 1: T	`ail tube proteir	n gp17.1*						-		
Chain K:			100%							
P5 16 16 16 17 17 17 17 17 17 17 17 17 17 17 17 17	817 118 118 118 122 122 122 122 122 122 127 127 127 127	F28 F29 F29 F29 F29 F29 F29 F29 F29 F29 F29	635 836 838 838	E40 E42 L43 F44	D45 E46 Q47 T48	N50 G51 R52	153 L54 G55	S58 V59	A60 D61	G63 E64
V65 166 166 176 170 172 173 174 174	476 478 478 179 179 180 181 482 484 885 886	(188 (189 (189 (190 (190 (190 (190 (190 (190 (190 (19	D95 T96 V97 K98 N99	E100 N101 D102 K103	A106 Q107 F108	F110 A111 Y112	1113 E114 S115 R116	E117 Y118 S119	D120 G121 W123	V122 E123 G124



A126 E127 1128 S129 S130 S131 L132 V133 V134 L138 E137 E137 E137 E138 E142 E142 E143	1146 1146 1146 1150 1150 1150 1150 1150 1150 1150 115	
• Molecule 1: Tail tube pro	otein gp17.1*	
Chain L:	100%	
P6	A 25	
V65 Y67 Y68 Y68 G69 K70 K71 R71 R71 R77 R77 R77 R77 R77 R77 R77 R	086 086 088 088 088 088 088 088	
A 126 F127 F128 S129 F130 F133 Q133 Q133 G136 F135 F139 M139 M139 M139 M139 M140 M140 M140 M141	1146 1146 1146 1146 1150 1150 1151 1152 1153 1154 1156 1166 1167 1167 1167 1167 1167 1171 1171 1171 1172 1173 1174 1174 1177 1177 1177 1177 1177	
4.2 Residue scores the NMR ense	for the representative (author defined) models mble	l from
	s number 1. Colouring as in section 4.1 above.	
• Molecule 1: Tail tube pro	otein gp17.1*	
Chain A:	100%	
P6	A26 P26 P26 P27 P28	
V65 T66 Y67 Y68 C69 K70 K71 G72 D73 A74 A74 A78 A78 A82 A82 A83 A83	N85 C86 C86 C87 C87 C87 C89 C99 C99 C99 C99 C99 C99 C99	
A126 E127 1128 1128 1130 1131 1132 1135 1135 1135 1135 1135 1136 1138 1143 1143	1146 1146 1146 1150 1150 1150 1150 1150 1150 1150 1161 1167 1167 1167 1167 1167 1167 116	
• Molecule 1: Tail tube pro	otein gp17.1*	
Chain B:	100%	
P6 M7 M7 M7 M9 Q9 Q10 V11 V11 F16 P16 S17 D19 A21 T22 A21 T22 A21 S24 S24 S25 S25 S26 S26 S27 S27 S27 S27 S27 S28 S28 S28 S28 S28 S28 S28 S28 S28 S28	A25 P26 P27 P28 P28 P28 P28 P28 P28 P28 P28	
V65 Y67 Y68 Y68 G69 G72 G72 G75 G75 G76 G76 G76 G76 G76 G76 G77 G77	N86 086 086 086 086 088 092 092 093 093 094 095 095 096 096 097 097 099 099 099 099 099 099	
A 125 F1 128 F1 128 F1 128 F1 130 F1 132 F1 135 F1	146 146 146 147 148 149 1451 1451 1451 1453 1455 1455 1466 1466 1466 1467 1467 1468 1468 1468 1468 1468 1470 1471 1471 1472 1473 1474 1475 1477 1477 1477 1477 1477 1477	
• Molecule 1: Tail tube pro	otein gp17.1*	
Chain C:	100%	



P5 16 08 049 010 V11 X12 Y13	F15 Q16 S17 I18 D19 A20	T22 G23 S24 A25 P26 L27	A30 Y31 Q32 T33	D34 G35 S36 V37 S38	E40 E42 E42 L43	D45 D45 Q47 T48	K49 N50 G51	153 L54 G55 P56	G57 S58 V59	A60 D61 S62	E64
166 166 167 168 169 1770 1771 1771 1771 1771 1771 1771 177	476 476 478 179 E80 D81	A82 Y83 N85 G86 K87	189 K90 F91 W92 R93	V94 D95 T96 V97 K98	E100 N101 D102 K103	1104 D105 A106 Q107 F108	G109 F110 A111	1113 E114 S115 R116	E117 Y118 S119	D120 G121 V122	G124
A125 V126 E127 E127 E128 S129 I130 E133 Q133 V134	1135 6136 6137 1138 K139 N140 6141	E142 1143 D144 T145 L146 P147	E149 1150 V151 N152 V153	\$154 K155 G156 G157 Y158 D159	F160 Q161 Q162 P163	1166 1167 1167 1167	E169 A170 P171 G172	T173 V174 P175 A176			
• Molecule 1:	Tail tube	protein	gp17.1*								
Chain D:				100%							
P5 M7 M7 G8 Q9 D10 V11 K12 K13	F15 Q16 S17 I18 D19 A20 A21	122 G23 S24 A25 P26 L27	A30 Y31 Q32 T33	D34 G35 S36 V37 S38	E40 E42 L43 L43	D45 D45 E46 Q47 T48	K49 N50 G51 R52	153 L54 G55 P56	G57 S58 V59	A60 D61 S62	E64
V65 T66 Y67 Y68 G69 K70 K71 G72 D73	475 476 777 777 179 E80 D81	A82 Y83 Q84 M85 G86 K87	K90 K90 F91 W92 R93	V94 D95 T96 V97 K98 N99	E100 N101 D102 K103	1104 D105 A106 Q107 F108	G109 F110 A111 Y112	1113 E114 S115 R116	E117 Y118 S119	G121 V122	G124
A125 V126 E127 I128 S129 I130 S131 [132] U132 V134	1135 G136 E137 L138 K139 N140 G141	E142 1143 D144 T145 L146 F147	E149 1150 V151 N152 V153	\$154 K155 G156 G157 Y158 D159	F160 Q161 Q162 P163	1166 T167 T167 G168	E169 A170 P171 G172	T173 V174 P175 A176			
• Molecule 1:	Tail tube	protein	gp17.1*								
Chain E:				100%							
P5 16 08 09 010 V11 K12 Y13	F15 Q16 S17 I18 D19 A20 A21	T22 G23 S24 A25 P26 L27	A30 Y31 Q32 T33	034 035 836 V37 838	E40 R41 E42 L43	D45 D45 Q47 T48	K49 N50 G51 R52	153 L54 G55 P56	G57 S58 V59	A60 D61 S62	E64
V65 T66 Y67 Y68 G69 K70 R71 G72 D73	G75 Q76 Q76 K77 A78 I79 E80	482 483 084 085 G86 K87	K90 K90 F91 W92 R93	V94 D95 T96 V97 K98	E100 N101 D102 K103	1104 D105 A106 Q107 F108	G109 F110 A111 Y112	1113 E114 S115 R116	E117 Y118 S119	D120 G121 V122	G124
A125 V126 E127 I128 S129 I130 E132 Q133 Q133	1135 6136 E137 L138 K139 M140 G141	E142 1143 D144 T145 L146 F147	E149 1150 V151 N152 V153	\$154 K155 G156 G157 Y158 D159	F160 Q161 Q162 P163	Q165 Q165 T166 T167 G168	E169 A170 P171 G172	T173 V174 P175 A176			
• Molecule 1:	Tail tube	protein	gp17.1*								
Chain F:				100%							
P5 16 M7 G8 Q9 D10 V11 K12 Y13	F15 Q16 S17 118 D19 A20 A21	T22 G23 S24 A25 P26 L27	A30 Y31 Q32 T33	034 035 036 037 037	E40 E42 E42 L43	D45 D45 E46 Q47 T48	K49 N50 G51 R52	153 L54 G55 P56	G57 S58 V59	A60 D61 S62	E64
V65 T66 Y67 Y68 G69 K70 R71 G72 D73	475 476 877 877 179 E80 D81	A82 Y83 N85 G86 K87	189 K90 F91 W92 R93	V94 D95 T96 V97 K98	E100 N101 D102 K103	1104 D105 A106 Q107 F108	G109 F110 A111 V112	1113 E114 S115 R116	E117 Y118 S119	D120 G121 V122	G124
A125 V126 E127 E127 S129 S139 I130 L132 Q133	1135 G136 E137 L138 K139 M140 G141	E142 1143 D144 T145 L146 P147	E149 1150 V151 N152 V153	\$154 K155 G156 G157 Y158 D159	F160 Q161 Q162 P163	4164 4165 1166 1167 6168	E169 A170 P171 G172	T173 V174 P175 A176			
• Molecule 1:	Tail tube	protein	gp17.1*								
Chain G:				100%							



P5 16 M7 M7 Q8 Q9 D10 V11 K12 Y13 F15	9116 1118 1118 1118 1118 1118 1118 1118	S62 G63 E64
766 166 166 167 168 168 169 167 167 167 168 168 168 168 168 168 168 168 168 168	476 477 478 477 482 482 482 483 484 485 686 686 686 686 686 686 686 6	V122 E123 G124
A125 V126 E127 E127 E130 E130 E133 Q133 V134	0138 0140 0141 0141 0143 0144 0144 0144 0145 0148 0148 0150 0156 0156 0156 0157 0168 0168 0168 0168 0168 0168 0168 0168	
• Molecule 1: 7	Γail tube protein gp17.1*	
Chain H:	100%	
P5 16 M7 G8 G9 D10 V11 K12 Y13 F15	016 018 019	S62 G63 E64
V65 T66 Y67 Y68 G69 K70 R71 G72 D73 A74 G75	476 477 477 482 482 482 483 484 485 686 686 686 686 686 686 686 6	V122 E123 G124
A126 E127 E127 E128 E130 E130 E132 Q133 V134 I135	0136 0137 0138 0140 0141 0143 0144 0144 0144 0146 0146 0156 0156 0156 0161 0161 0161 0161 016	
• Molecule 1: 7	Tail tube protein gp17.1*	
Chain I:	100%	
P5 M7 M7 G8 Q9 D10 V11 K12 Y13 F15 F15	0118 118 118 118 118 118 118 122 123 123 123 123 123 123 123	S62 G63 E64
V65 T66 Y67 Y67 Y68 G69 K70 B71 B71 A74 A74	476 477 478 478 482 482 488 488 488	V122 E123 G124
A125 1128 1128 1130 1130 1132 0133 V134 1135	0136 0137 0138 0140 0141 0145 0145 0146 0161 0165 0165 0167 0165 0167 0167 0168 0168 0168 0168 0168 0168 0168 0168	
• Molecule 1: 7	Γail tube protein gp17.1*	
Chain J:	100%	
P5 16 M7 M7 G8 G8 Q9 D10 V11 K12 Y13 F15	016 018 019	S62 G63 E64
V65 T66 Y67 Y67 Y68 G69 K70 R71 G72 A74	A 778 A 778 A 778 A 778 A 778 A 778 A 82 A 83 A 92 A 93 A 93 A 94 A 94	V122 E123 G124
1130 1132 1132 1133 1133 1133 1133 1133	0138 0140 01410 01410 01410 01410 01410 01410 01410 01410 0148 0148	
• Molecule 1: 7	Γail tube protein gp17.1*	
Chain K:	100%	



P5	I6 M7	සු සු	D10	K12	L14	F15 Q16	S17	D19	A20	T22	G23	S24 A25	P26	L27 F28	P29	A30	Y31	T33	D34	836	V37	623	E40	R41 E42	L43	F44	E46	Q47 TA8	K49	NSO	G51 R52	153	1.54	G55 D56	G57	828	V59	D61	S62 G63	1 E E E
V65	T66 Y67	Y68 G69	K70	G72	A74	G75 Q76	K77	6/1	E80	A82	Y83	U84 N85	985	K87	189	K90	F91 W92	R93	V94	196 T	76X	66N	E100	N101 D102	K103	Y104	A106	Q107 F108	G109	F110	A111 Y112	1113	E114	8115	E117	Y118	S119 D120	G121	V122	70,00
A125	V126 E127	I128 S129	I130	L132	V134	I135 G136	E137	K139	N140	E142	1143	D144 T145	L146	P147 E148	E149	1150	V151 N152	V153	S154	G156	G157 V158	D159	F160	Q161 Q162	P163	G164 0165	T166	T167	E169	A170	F171 G172	T173	V174	P175	WILLO					
•	Μ	ole	ecu	le	1:	Ta	ail	tı	ıb	e j	pr	ot	ei	n ,	gp	o1	7.	1*	:																•					
С	ha		т																10	00%)																_			
	ma	ın	L:																10	,0 ,0																				
P5		es es	D10	. 01	L14	F15 Q16	S17 118	D19	A20	T22	G23	S24 A25	P26	L27 F28	P29	A30	Y31	T33	D34		V37	623	E40	R41	L43	F44	E46	Q47	K49	NSO	R52	153	L54	G55 D56	G57	S 58	V59	D61	\$62 G63	100 H
PS		88 00 00	D10 V11	K12		G75 F15 Q76 Q16			E80 A20				G86 P26							836	V37 S38			N101 R41 D102 E42		Y104 F44		Q107 Q47		10	12	3	₽ 1	S115 G55 R116 D56		18			V122 S62 E123 G63	0127



5 Refinement protocol and experimental data overview (i)



The models were refined using the following method: na.

Of the 500 calculated structures, 10 were deposited, based on the following criterion: target function.

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

Software name	Classification	Version
Inferential Structure Determination (ISD)	structure calculation	

No chemical shift data was provided. Note: This is a solid-state NMR structure, where hydrogen atoms are typically not assigned a chemical shift value, which may lead to lower completeness of assignment measure.



6 Model quality (i)

6.1 Standard geometry (i)

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 (i)

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	0	0	0	0±0
1	В	0	0	0	0±0
1	С	0	0	0	0±0
1	D	0	0	0	0±0
1	Е	0	0	0	0±0
1	F	0	0	0	0±0
1	G	0	0	0	0±0
1	Н	0	0	0	0±0
1	I	0	0	0	0±0
1	J	0	0	0	0±0
1	K	0	0	0	0±0
1	L	0	0	0	0±0
All	All	0	0	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 -.

There are no clashes.



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	0	-	-	-	-
1	В	0	-	-	-	-
1	С	0	-	-	-	-
1	D	0	-	-	-	-
1	Е	0	-	-	-	-
1	F	0	-	-	-	-
1	G	0	-	-	-	-
1	Н	0	-	-	-	-
1	I	0	-	-	-	-
1	J	0	-	-	-	-
1	K	0	-	-	-	-
1	L	0	-	-	-	-
All	All	0	-	-	-	-

There are no Ramachandran outliers.

6.3.2 Protein sidechains (i)

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	0	-	-	-
1	В	0	-	-	-
1	С	0	-	-	-
1	D	0	-	-	-
1	Е	0	-	-	-
1	F	0	-	-	-
1	G	0	-	-	-
1	Н	0	-	-	-
1	I	0	-	-	-
1	J	0	-	-	-

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	K	0	-	-	-
1	L	0	-	-	-
All	All	0	-	-	-

There are no protein residues with a non-rotameric sidechain to report.

6.3.3 RNA (i)

There are no RNA molecules in this entry.

6.4 Non-standard residues in protein, DNA, RNA chains (i)

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

6.5 Carbohydrates (i)

There are no monosaccharides in this entry.

6.6 Ligand geometry (i)

There are no ligands in this entry.

6.7 Other polymers (i)

There are no such molecules in this entry.

6.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

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7 NMR restraints analysis (i)

7.1 Conformationally restricting restraints (i)

The following table provides the summary of experimentally observed NMR restraints in different categories. Restraints are classified into different categories based on the sequence separation of the atoms involved.

Description	Value
Total distance restraints	1384
Intra-residue ($ i-j =0$)	24
Sequential ($ i-j =1$)	188
Medium range ($ i-j >1$ and $ i-j <5$)	144
Long range (i-j ≥5)	920
Inter-chain	0
Hydrogen bond restraints	108
Disulfide bond restraints	0
Total dihedral-angle restraints	2880
Number of unmapped restraints	0
Number of restraints per residue	2.1
Number of long range restraints per residue ¹	0.5

¹Long range hydrogen bonds and disulfide bonds are counted as long range restraints while calculating the number of long range restraints per residue

7.2 Residual restraint violations (i)

This section provides the overview of the restraint violations analysis. The violations are binned as small, medium and large violations based on its absolute value. Average number of violations per model is calculated by dividing the total number of violations in each bin by the size of the ensemble.

7.2.1 Average number of distance violations per model (i)

Distance violations less than 0.1 Å are not included in the calculation.

Bins (Å)	Average number of violations per model	Max (Å)
0.1-0.2 (Small)	27.8	0.2
0.2-0.5 (Medium)	39.4	0.5
>0.5 (Large)	675.1	70.55



7.2.2 Average number of dihedral-angle violations per model (i)

Dihedral-angle violations less than 1° are not included in the calculation.

$\mathbf{Bins}\;(^{\circ})$	Average number of violations per model	\mathbf{Max} (°)
1.0-10.0 (Small)	633.0	10.0
10.0-20.0 (Medium)	392.9	20.0
>20.0 (Large)	753.6	174.9



8 Distance violation analysis (i)

8.1 Summary of distance violations (i)

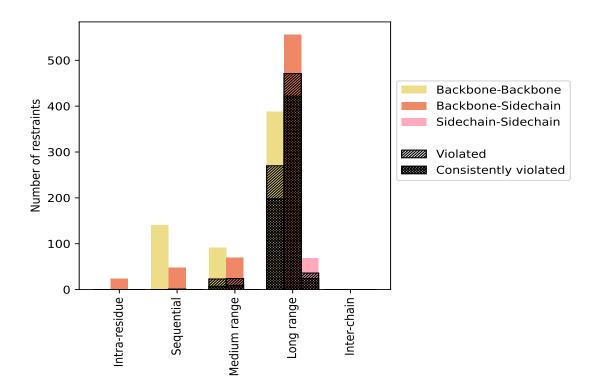
The following table shows the summary of distance violations in different restraint categories based on the sequence separation of the atoms involved. Each category is further sub-divided into three sub-categories based on the atoms involved. Violations less than 0.1 Å are not included in the statistics.

Doctroints type	Count	% 1	Vi	${f Violated^3}$			tently	$\mathbf{Violated}^4$
Restraints type	Count	70-	Count	$\%^2$	$\%^{1}$	Count	$\%^{2}$	$\%^1$
Intra-residue (i-j =0)	24	1.7	0	0.0	0.0	0	0.0	0.0
Backbone-Backbone	0	0.0	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	24	1.7	0	0.0	0.0	0	0.0	0.0
Sidechain-Sidechain	0	0.0	0	0.0	0.0	0	0.0	0.0
Sequential (i-j =1)	188	13.6	1	0.5	0.1	0	0.0	0.0
Backbone-Backbone	140	10.1	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	48	3.5	1	2.1	0.1	0	0.0	0.0
Sidechain-Sidechain	0	0.0	0	0.0	0.0	0	0.0	0.0
Medium range ($ i-j >1 \& i-j <5$)	144	10.4	39	27.1	2.8	15	10.4	1.1
Backbone-Backbone	75	5.4	15	20.0	1.1	6	8.0	0.4
Backbone-Sidechain	69	5.0	24	34.8	1.7	9	13.0	0.7
Sidechain-Sidechain	0	0.0	0	0.0	0.0	0	0.0	0.0
Long range ($ i-j \ge 5$)	920	66.5	714	77.6	51.6	630	68.5	45.5
Backbone-Backbone	296	21.4	207	69.9	15.0	184	62.2	13.3
Backbone-Sidechain	556	40.2	471	84.7	34.0	422	75.9	30.5
Sidechain-Sidechain	68	4.9	36	52.9	2.6	24	35.3	1.7
Inter-chain	0	0.0	0	0.0	0.0	0	0.0	0.0
Backbone-Backbone	0	0.0	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	0	0.0	0	0.0	0.0	0	0.0	0.0
Sidechain-Sidechain	0	0.0	0	0.0	0.0	0	0.0	0.0
Hydrogen bond	108	7.8	71	65.7	5.1	15	13.9	1.1
Disulfide bond	0	0.0	0	0.0	0.0	0	0.0	0.0
Total	1384	100.0	825	59.6	59.6	660	47.7	47.7
Backbone-Backbone	619	44.7	293	47.3	21.2	205	33.1	14.8
Backbone-Sidechain	697	50.4	496	71.2	35.8	431	61.8	31.1
Sidechain-Sidechain	68	4.9	36	52.9	2.6	24	35.3	1.7

 $^{^1}$ percentage calculated with respect to the total number of distance restraints, 2 percentage calculated with respect to the number of restraints in a particular restraint category, 3 violated in at least one model, 4 violated in all the models



8.1.1 Bar chart: Distribution of distance restraints and violations (i)



Violated and consistently violated restraints are shown using different hatch patterns in their respective categories. The hydrogen bonds and disulfied bonds are counted in their appropriate category on the x-axis

8.2 Distance violation statistics for each model (i)

The following table provides the distance violation statistics for each model in the ensemble. Violations less than 0.1 Å are not included in the statistics.

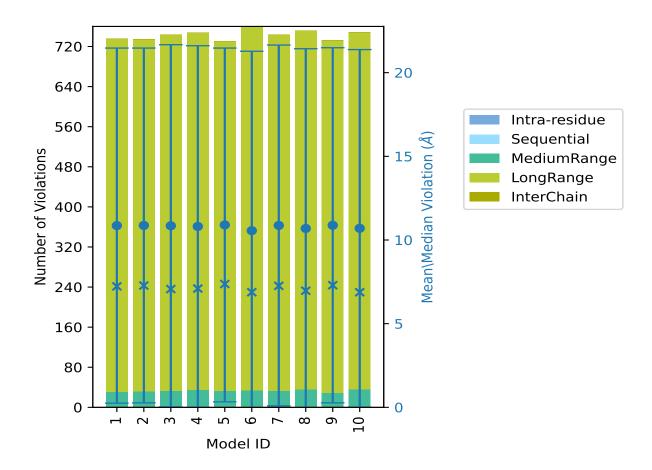
Model ID	Number of violations						Mean (Å)	Max (Å)	\mathbf{SD}^6 (Å)	Median (Å)
Wiodel 1D	IR^1	SQ^2	MR^3	LR^4	IC^5	Total	Mean (A)	Wax (A)	SD (A)	Median (A)
1	0	1	30	704	0	735	10.86	66.1	10.61	7.23
2	0	1	31	702	0	734	10.87	66.32	10.6	7.28
3	0	1	32	710	0	743	10.85	69.31	10.82	7.07
4	0	1	34	712	0	747	10.81	69.18	10.8	7.1
5	0	1	32	697	0	730	10.9	66.09	10.57	7.37
6	0	1	33	726	0	760	10.56	70.48	10.72	6.88
7	0	1	32	710	0	743	10.87	69.09	10.78	7.26
8	0	1	35	715	0	751	10.69	70.55	10.74	6.97
9	0	0	29	703	0	732	10.88	66.23	10.61	7.3
10	0	1	35	712	0	748	10.7	70.33	10.68	6.88

¹Intra-residue restraints, ²Sequential restraints, ³Medium range restraints, ⁴Long range restraints,



⁵Inter-chain restraints, ⁶Standard deviation

8.2.1 Bar graph: Distance Violation statistics for each model (i)



The mean(dot),median(x) and the standard deviation are shown in blue with respect to the y axis on the right

8.3 Distance violation statistics for the ensemble (i)

Violation analysis may find that some restraints are violated in few models and some are violated in most of models. The following table provides this information as number of violated restraints for a given fraction of the ensemble. In total, 522(IR:24, SQ:187, MR:105, LR:206, IC:0) restraints are not violated in the ensemble.

	Number of violated restraints						Fractio	n of the ensemble
I	\mathbb{R}^1	SQ^2	$ m MR^3$	LR^4	IC^5	Total	Count ⁶	%
	0	0	1	7	0	8	1	10.0
	0	0	3	4	0	7	2	20.0
	0	0	4	15	0	19	3	30.0
	0	0	1	13	0	14	4	40.0

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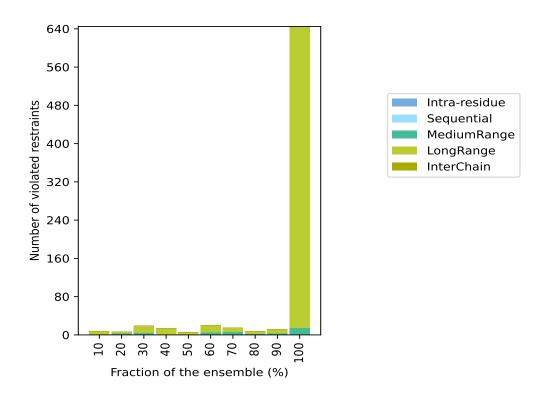


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Nu	Number of violated restraints						Fraction of the ensemble		
IR^1	SQ^2	MR^3	LR^4	IC^5	Total	Count ⁶	%		
0	0	0	6	0	6	5	50.0		
0	0	5	15	0	20	6	60.0		
0	0	6	9	0	15	7	70.0		
0	0	2	6	0	8	8	80.0		
0	1	2	9	0	12	9	90.0		
0	0	15	630	0	645	10	100.0		

 $^{^1{\}rm Intra-residue}$ restraints, $^2{\rm Sequential}$ restraints, $^3{\rm Medium}$ range restraints, $^4{\rm Long}$ range restraints, $^5{\rm Inter-chain}$ restraints, 6 Number of models with violations

8.3.1 Bar graph: Distance violation statistics for the ensemble (i)

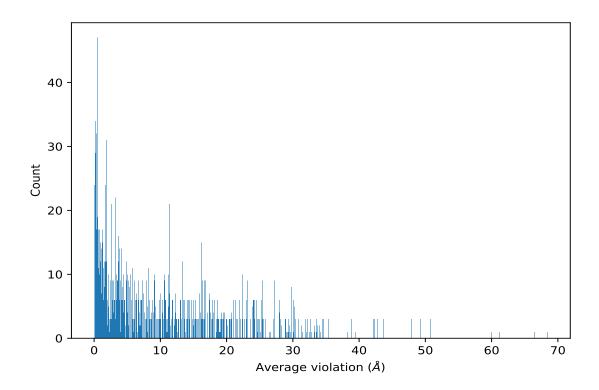


8.4 Most violated distance restraints in the ensemble (i)

8.4.1 Histogram: Distribution of mean distance violations (i)

The following histogram shows the distribution of the average value of the violation. The average is calculated for each restraint that is violated in more than one model over all the violated models in the ensemble





8.4.2 Table: Most violated distance restraints (i)

The following table provides the mean and the standard deviation of the violations for the 10 worst performing restraints, sorted by number of violated models and the mean violation value. The Key (restraint list ID, restraint ID) is the unique identifier for a given restraint. Rows with same key represent combinatorial or ambiguous restraints and are counted as a single restraint.

Key	Atom-1	Atom-2	\mathbf{Models}^1	Mean (Å)	\mathbf{SD}^1 (Å)	Median (Å)
(2,114)	1:A:161:GLN:H	1:A:48:THR:H	10	68.37	1.85	69.14
(2,116)	1:A:161:GLN:H	1:A:47:GLN:H	10	66.48	1.26	66.8
(2,429)	1:A:160:PHE:H	1:A:52:ARG:H	10	61.13	0.5	60.88
(2,112)	1:A:161:GLN:H	1:A:53:ILE:H	10	60.0	0.13	60.02
(2,1179)	1:A:165:GLN:H	1:A:53:ILE:HG21	10	50.7	0.87	50.26
(2,1179)	1:A:165:GLN:H	1:A:53:ILE:HG22	10	50.7	0.87	50.26
(2,1179)	1:A:165:GLN:H	1:A:53:ILE:HG23	10	50.7	0.87	50.26
(2,1126)	1:A:46:GLU:H	1:A:173:THR:HG21	10	49.28	0.95	49.18
(2,1126)	1:A:46:GLU:H	1:A:173:THR:HG22	10	49.28	0.95	49.18
(2,1126)	1:A:46:GLU:H	1:A:173:THR:HG23	10	49.28	0.95	49.18
(2,612)	1:A:161:GLN:H	1:A:53:ILE:HD11	10	47.96	1.1	48.52
(2,612)	1:A:161:GLN:H	1:A:53:ILE:HD12	10	47.96	1.1	48.52
(2,612)	1:A:161:GLN:H	1:A:53:ILE:HD13	10	47.96	1.1	48.52
(2,766)	1:A:169:GLU:H	1:A:53:ILE:HD11	10	43.71	0.79	44.02
(2,766)	1:A:169:GLU:H	1:A:53:ILE:HD12	10	43.71	0.79	44.02
(2,766)	1:A:169:GLU:H	1:A:53:ILE:HD13	10	43.71	0.79	44.02

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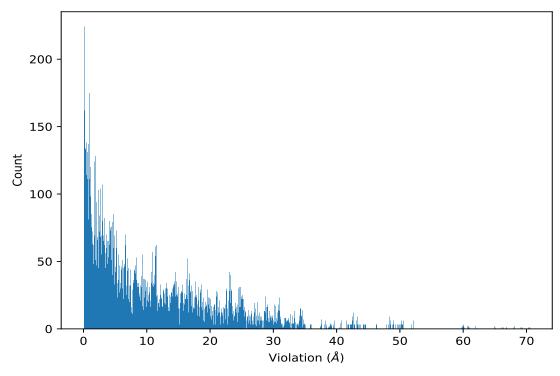
Key	Atom-1	Atom-2	\mathbf{Models}^1	Mean (Å)	\mathbf{SD}^1 (Å)	Median (Å)
(2,774)	1:A:172:GLY:H	1:A:53:ILE:HD11	10	42.73	0.47	42.54
(2,774)	1:A:172:GLY:H	1:A:53:ILE:HD12	10	42.73	0.47	42.54
(2,774)	1:A:172:GLY:H	1:A:53:ILE:HD13	10	42.73	0.47	42.54
(2,1146)	1:A:170:ALA:H	1:A:53:ILE:HG21	10	42.27	0.53	42.3

¹Number of violated models, ²Standard deviation

8.5 All violated distance restraints (i)

8.5.1 Histogram: Distribution of distance violations (i)

The following histogram shows the distribution of the absolute value of the violation for all violated restraints in the ensemble.



8.5.2 Table: All distance violations (i)

The following table provides the 10 worst performing restraints, sorted by the violation value. The Key (restraint list ID, restraint ID) is the unique identifier for a given restraint. Rows with same key represent combinatorial or ambiguous restraints and are counted as a single restraint.

Key	Atom-1	Atom-2	Model ID	Violation (Å)	
(2,114)	1:A:161:GLN:H	1:A:48:THR:H	8	70.55	

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(2,114)	1:A:161:GLN:H	1:A:48:THR:H	6	70.48
(2,114)	1:A:161:GLN:H	1:A:48:THR:H	10	70.33
(2,114)	1:A:161:GLN:H	1:A:48:THR:H	3	69.31
(2,114)	1:A:161:GLN:H	1:A:48:THR:H	4	69.18
(2,114)	1:A:161:GLN:H	1:A:48:THR:H	7	69.09
(2,116)	1:A:161:GLN:H	1:A:47:GLN:H	8	68.13
(2,116)	1:A:161:GLN:H	1:A:47:GLN:H	6	68.12
(2,116)	1:A:161:GLN:H	1:A:47:GLN:H	10	67.86
(2,116)	1:A:161:GLN:H	1:A:47:GLN:H	3	66.88



9 Dihedral-angle violation analysis (i)

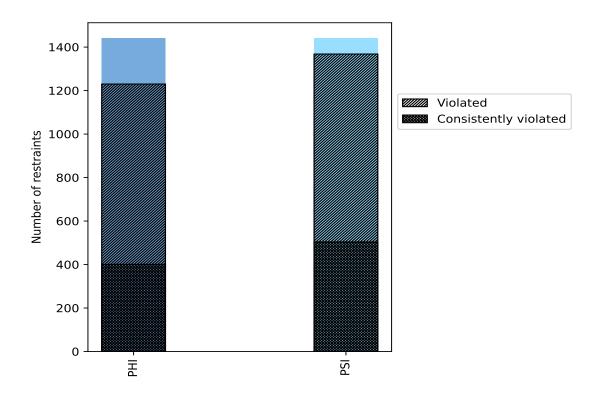
9.1 Summary of dihedral-angle violations (i)

The following table provides the summary of dihedral-angle violations in different dihedral-angle types. Violations less than 1° are not included in the calculation.

Angle tree	Count % ¹		${f Violated^3}$			Consistently Violated ⁴		
Angle type	Count	70	Count	$\%^2$	$\%^1$	Count	$\%^2$	$\%^1$
PHI	1440	50.0	1230	85.4	42.7	401	27.8	13.9
PSI	1440	50.0	1368	95.0	47.5	504	35.0	17.5
Total	2880	100.0	2598	90.2	90.2	905	31.4	31.4

 $^{^1}$ percentage calculated with respect to total number of dihedral-angle restraints, 2 percentage calculated with respect to number of restraints in a particular dihedral-angle type, 3 violated in at least one model, 4 violated in all the models

9.1.1 Bar chart: Distribution of dihedral-angles and violations (i)



Violated and consistently violated restraints are shown using different hatch patterns in their respective categories

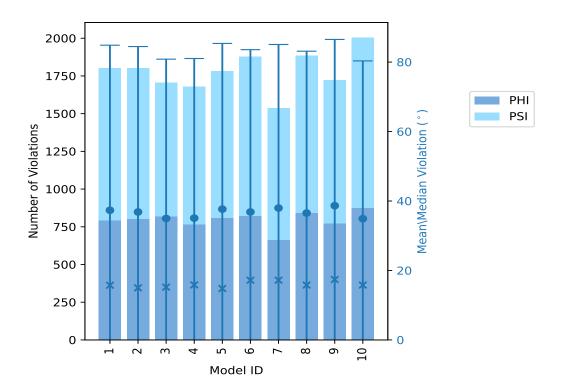


9.2 Dihedral-angle violation statistics for each model (i)

The following table provides the dihedral-angle violation statistics for each model in the ensemble. Violations less than 1° are not included in the statistics.

Model ID	Number of violations			Mean (°)	Mov (°)	SD (°)	Median (°)	
Model 1D	PHI	PSI	Total	Mean ()	$\mathbf{Max} \ (^{\circ})$	SD ()	Mediali ()	
1	792	1008	1800	37.33	170.8	47.53	15.75	
2	804	999	1803	36.84	172.7	47.63	15.0	
3	817	888	1705	34.98	169.4	45.86	15.2	
4	768	912	1680	35.07	168.5	45.96	15.85	
5	810	972	1782	37.66	174.9	47.71	14.8	
6	821	1056	1877	36.84	174.6	46.73	17.2	
7	664	875	1539	37.98	169.0	47.09	17.2	
8	840	1044	1884	36.53	173.8	46.6	15.8	
9	773	948	1721	38.65	174.9	47.87	17.4	
10	876	1128	2004	34.91	167.7	45.43	15.8	

9.2.1 Bar graph: Dihedral violation statistics for each model (i)



The mean(dot),median(x) and the standard deviation are shown in blue with respect to the y axis on the right



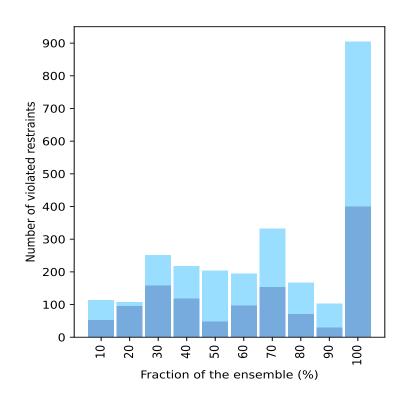
Dihedral-angle violation statistics for the ensemble (i) 9.3

Violation analysis may find that some restraints are violated in very few models and some are violated in most of models. The following table provides this information as number of violated restraints for a given fraction of ensemble.

Num	iber o	f violated restraints	Fraction of the ensemble			
PHI	PSI	Total	$Count^1$	%		
54	60	114	1	10.0		
95	12	107	2	20.0		
158	93	251	3	30.0		
119	99	218	4	40.0		
48	156	204	5	50.0		
98	97	195	6	60.0		
154	179	333	7	70.0		
72	96	168	8	80.0		
31	72	103	9	90.0		
401	504	905	10	100.0		

¹ Number of models with violations

9.3.1Bar graph: Dihedral-angle Violation statistics for the ensemble (i)



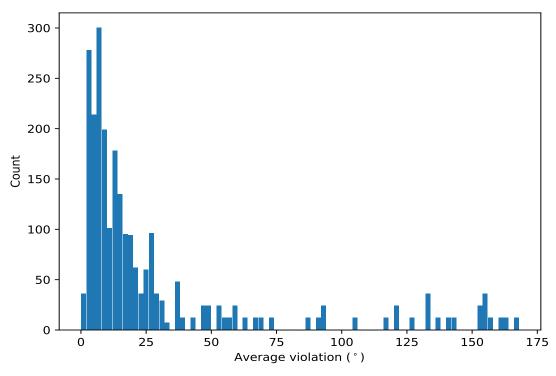




9.4 Most violated dihedral-angle restraints in the ensemble (i)

9.4.1 Histogram: Distribution of mean dihedral-angle violations (i)

The following histogram shows the distribution of the average value of the violation. The average is calculated for each restraint that is violated in more than one model over all the violated models in the ensemble



9.4.2 Table: Most violated dihedral-angle restraints (i)

The following table provides the mean and the standard deviation of the violations for the 10 worst performing restraints, sorted by number of violated models and the mean violation value. The Key (restraint list ID, restraint ID) is the unique identifier for a given restraint.

Key	Atom-1	Atom-2	Atom-3	Atom-4	${f Models}^1$	Mean	${f SD}^2$	Median
(1,2548)	1:L:151:VAL:C	1:L:152:ASN:N	1:L:152:ASN:CA	1:L:152:ASN:C	10	166.82	9.33	171.45
(1,2549)	1:E:151:VAL:C	1:E:152:ASN:N	1:E:152:ASN:CA	1:E:152:ASN:C	10	166.82	9.33	171.45
(1,2550)	1:J:151:VAL:C	1:J:152:ASN:N	1:J:152:ASN:CA	1:J:152:ASN:C	10	166.82	9.35	171.45
(1,2551)	1:H:151:VAL:C	1:H:152:ASN:N	1:H:152:ASN:CA	1:H:152:ASN:C	10	166.82	9.35	171.45
(1,2545)	1:D:151:VAL:C	1:D:152:ASN:N	1:D:152:ASN:CA	1:D:152:ASN:C	10	166.81	9.34	171.45
(1,2546)	1:A:151:VAL:C	1:A:152:ASN:N	1:A:152:ASN:CA	1:A:152:ASN:C	10	166.81	9.36	171.5
(1,2547)	1:K:151:VAL:C	1:K:152:ASN:N	1:K:152:ASN:CA	1:K:152:ASN:C	10	166.81	9.37	171.45
(1,2552)	1:F:151:VAL:C	1:F:152:ASN:N	1:F:152:ASN:CA	1:F:152:ASN:C	10	166.81	9.35	171.45
(1,2553)	1:G:151:VAL:C	1:G:152:ASN:N	1:G:152:ASN:CA	1:G:152:ASN:C	10	166.8	9.36	171.45
(1,2555)	1:B:151:VAL:C	1:B:152:ASN:N	1:B:152:ASN:CA	1:B:152:ASN:C	10	166.8	9.34	171.4

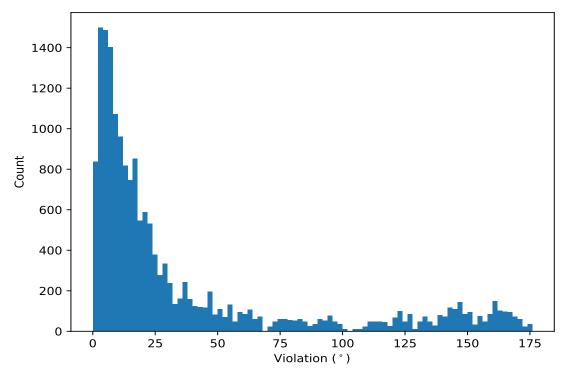
¹ Number of violated models, ²Standard deviation, All angle values are in degree (°)



9.5 All violated dihedral-angle restraints (i)

9.5.1 Histogram: Distribution of violations (i)

The following histogram shows the distribution of the absolute value of the violation for all violated restraints in the ensemble.



9.5.2 Table: All violated dihedral-angle restraints (i)

The following table provides the list of violations for the 10 worst performing restraints, sorted by the violation value. The Key (restraint list ID, restraint ID) is the unique identifier for a given restraint.

Key	Atom-1	Atom-2	Atom-3	Atom-4	Model ID	Violation (°)
(1,2555)	1:B:151:VAL:C	1:B:152:ASN:N	1:B:152:ASN:CA	1:B:152:ASN:C	5	174.9
(1,2553)	1:G:151:VAL:C	1:G:152:ASN:N	1:G:152:ASN:CA	1:G:152:ASN:C	5	174.9
(1,2551)	1:H:151:VAL:C	1:H:152:ASN:N	1:H:152:ASN:CA	1:H:152:ASN:C	5	174.9
(1,2550)	1:J:151:VAL:C	1:J:152:ASN:N	1:J:152:ASN:CA	1:J:152:ASN:C	5	174.9
(1,2549)	1:E:151:VAL:C	1:E:152:ASN:N	1:E:152:ASN:CA	1:E:152:ASN:C	5	174.9
(1,2547)	1:K:151:VAL:C	1:K:152:ASN:N	1:K:152:ASN:CA	1:K:152:ASN:C	9	174.9
(1,2545)	1:D:151:VAL:C	1:D:152:ASN:N	1:D:152:ASN:CA	1:D:152:ASN:C	5	174.9
(1,2556)	1:I:151:VAL:C	1:I:152:ASN:N	1:I:152:ASN:CA	1:I:152:ASN:C	5	174.8
(1,2556)	1:I:151:VAL:C	1:I:152:ASN:N	1:I:152:ASN:CA	1:I:152:ASN:C	9	174.8
(1,2555)	1:B:151:VAL:C	1:B:152:ASN:N	1:B:152:ASN:CA	1:B:152:ASN:C	9	174.8

