WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB NMR Structure Validation Report ⓘ

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PDB ID	:	9PQH / pdb_00009pqh
BMRB ID	:	51715
Title	:	NMR Structure of Ca2+/Calmodulin bound to the GluN1 C0 domain of the NMDA receptor
Authors	:	Bej, A.; Ames, J.B.
Deposited on	:	2025-07-22

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

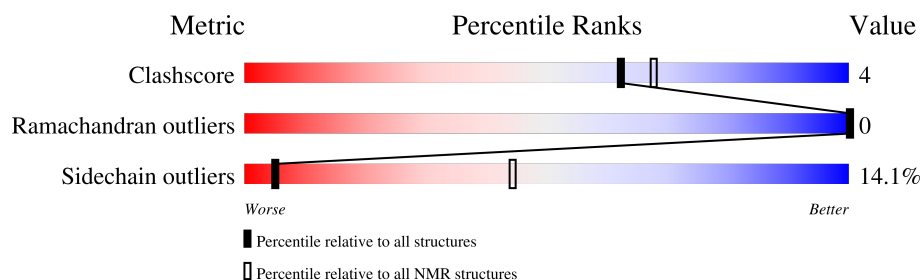|		
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
BMRB Restraints Analysis	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.47

1 Overall quality at a glance ⓘ

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

The overall completeness of chemical shifts assignment is 70%.

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		4
Ramachandran outliers		0
Sidechain outliers		14.1%

Worse   *Better*

▮ Percentile relative to all structures

▯ Percentile relative to all NMR structures

Metric	Whole archive (#Entries)	NMR archive (#Entries)
Clashscore	210492	14027
Ramachandran outliers	207382	12486
Sidechain outliers	206894	12463

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	149	81% 13% • • •
2	B	938	• 98%

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2 Ensemble composition and analysis ⓘ

This entry contains 10 models. Model 9 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:8-A:149, B:846-B:865 (162)	1.00	9

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 2 clusters and 1 single-model cluster was found.

Cluster number	Models
1	1, 2, 4, 6, 8, 9
2	3, 5, 10
Single-model clusters	7

3 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 2585 atoms, of which 1260 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Calmodulin-1.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	146	2237	707	1085	186	250	9	0

- Molecule 2 is a protein called Glutamate receptor ionotropic, NMDA 1.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
2	B	20	344	107	175	34	27	1	0

- Molecule 3 is CALCIUM ION (CCD ID: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).
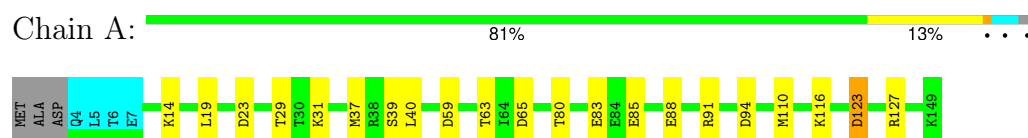
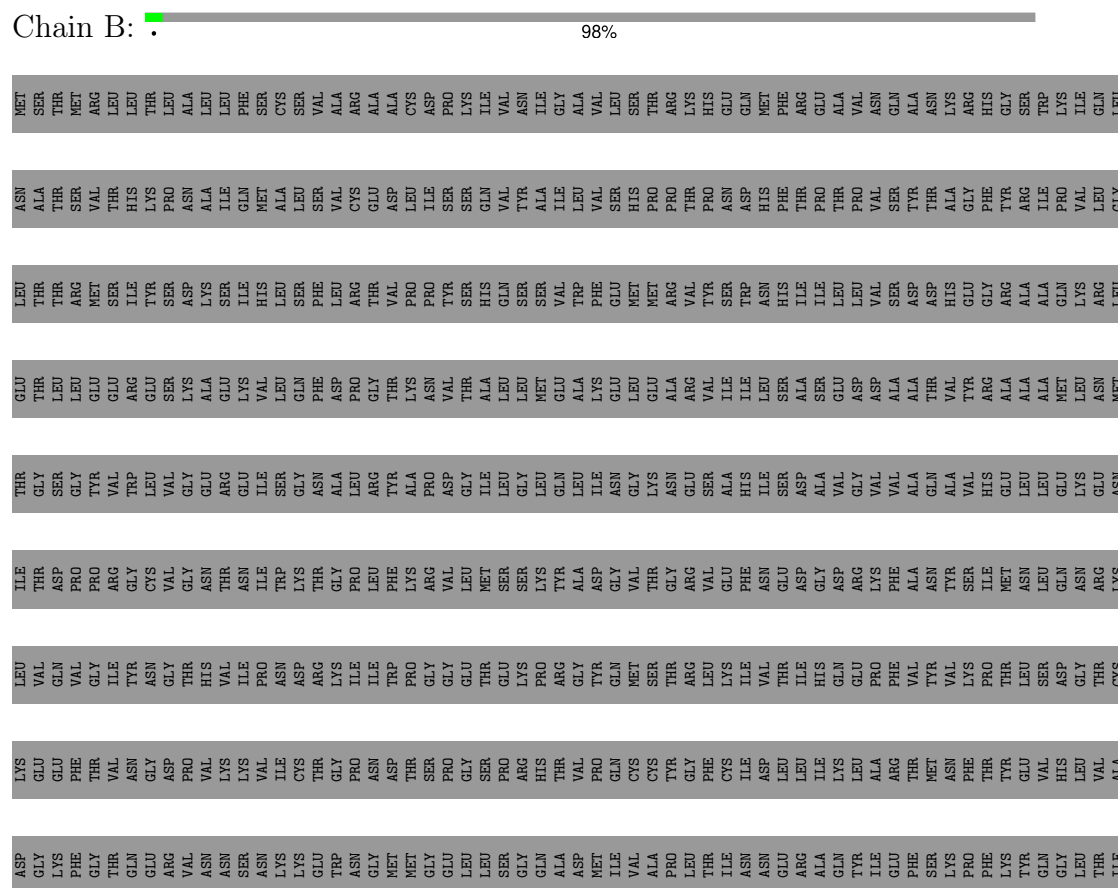| Mol	Chain	Residues	Atoms	
			Total	Ca
3	A	4	4	4

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: Calmodulin-1

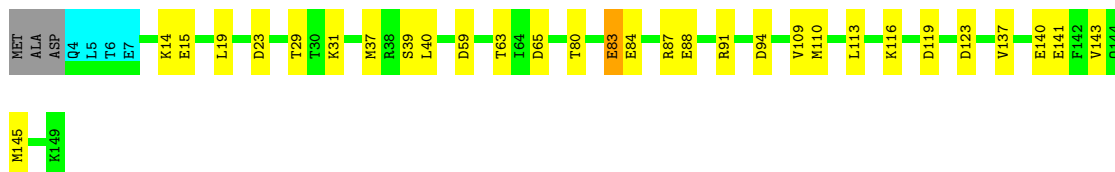Chain A:

• Molecule 2: Glutamate receptor ionotropic, NMDA 1

Chain B:

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: Calmodulin-1

Chain A:

• Molecule 2: Glutamate receptor ionotropic, NMDA 1

Chain B:

THR GLY SER GLY TYR VAL TRP LEU VAL GLY GLU ARG GLU ILE SER GLY ASN ALA LEU ARG TYR ALA PRO ASP GLY ILE LEU GLY LEU GLN ILE LEU ILE ASN GLY LYS ASN GLU SER ALA HIS ILE SER ASP ALA VAL GLY VAL VAL ALA GLN VAL HIS GLU LEU LEU LEU LYS GLU ASN

ILE THR ASP PRO ARG GLY CYS VAL GLY THR ASN THR ILE TRP LYS THR GLY PRO LEU PHE LYS ARG VAL LEU MET SER SER LYS TYR ALA ASP GLY VAL THR GLY ARG VAL GLU PHE ASN GLU ASP GLY ASP ARG LYS PHE ALA ASN TYR SER ILE MET ASN LEU GLN ASN ARG LYS

LEU VAL GLN VAL GLY ILE TYR ASN GLY THR HIS VAL ILE PRO ASN ASP ARG LYS ILE ILE TRP PRO GLY GLY GLU THR GLU LYS PRO ARG GLY TYR GLN MET SER THR ARG LEU LYS ILE VAL THR ILE HIS GLN GLU PRO PHE VAL TYR VAL LYS PRO THR LEU SER ASP GLY THR CYS

LYS GLU GLU PHE THR VAL ASN GLY ASP PRO VAL LYS LYS VAL ILE CYS THR GLY PRO ASN ASP THR SER PRO GLY SER PRO ARG HIS THR VAL PRO GLN CYS CYS TYR GLY PHE CYS ILE ASP LEU LEU ILE LYS LEU ALA ARG THR MET ASN PHE THR TYR GLU VAL HIS LEU VAL ALA

ASP GLY LYS PHE GLY THR GLN GLU ARG VAL ASN ASN SER ASN LYS LYS GLU TRP ASN GLY MET MET GLY GLU LEU LEU SER GLY GLN ALA ASP MET ILE VAL ALA PRO LEU THR ILE ASN ASN GLU ARG ALA GLN TYR ILE GLU PHE SER LYS PRO PHE LYS TYR GLN GLY LEU THR ILE

LEU VAL LYS LYS GLU ILE PRO ARG SER THR LEU ASP SER PHE MET GLN PRO PHE GLN SER THR LEU TRP LEU LEU VAL GLY LEU SER VAL HIS VAL VAL ALA VAL MET LEU TYR LEU LEU ASP ARG PHE SER PRO PHE GLY ARG PHE LYS VAL ASN SER GLU GLU GLU GLU GLU ASP ALA

LEU THR LEU SER SER ALA MET TRP PHE SER TRP GLY VAL LEU LEU ASN SER GLY ILE GLY GLU GLY ALA PRO ARG SER PHE SER ALA ARG ILE LEU GLY MET VAL TRP ALA GLY PHE ALA MET ILE ILE VAL ALA SER TYR THR ALA ASN LEU ALA ALA PHE LEU VAL LEU ASP ARG PRO

GLU GLU ARG ILE THR GLY ILE ASN ASP PRO ARG LEU ARG ASN PRO SER ASP LYS PHE ILE TYR ALA THR VAL LYS GLN SER SER VAL ASP ILE TYR PHE ARG ARG GLN VAL GLU LEU SER THR MET TYR ARG HIS MET GLU LYS HIS ASN TYR GLU SER ALA ALA GLU ALA ILE GLN ALA

VAL ARG ASP ASN LYS LEU HIS ALA PHE ILE TRP ASP SER ALA VAL LEU GLU PHE GLU ALA SER GLN LYS CYS ASP LEU VAL THR THR GLY GLU LEU PHE PHE ARG SER GLY PHE GLY ILE GLY MET ARG LYS ASP SER PRO TRP LYS GLN ASN VAL SER LEU SER ILE LEU LYS SER HIS

GLU ASN GLY PHE MET GLU ASP LEU ASP LYS THR TRP VAL ARG TYR GLN GLU CYS ASP SER ARG SER ASN ALA PRO ALA THR LEU THR PHE GLU ASN MET ALA GLY VAL PHE MET LEU VAL ALA GLY GLY ILE VAL ALA GLY ILE PHE LEU ILE PHE ILE GLU ILE ALA TYR LYS ARG HIS

LYS ASP ALA ARG ARG K846 W858 R865 LYS SER GLY ARG ALA GLU PRO ASP PRO LYS LYS LYS ALA THR PHE ARG ALA ILE THR SER THR LEU ALA SER SER PHE LYS ARG ARG ARG SER SER LYS ASP THR SER THR GLY GLY GLY ARG ALA LEU GLU GLN ASN GLN LYS ASP THR

VAL LEU PRO ARG ARG ALA ILE GLU GLU ARG GLU GLU GLN GLN LEU GLU LEU CYS SER ARG HIS ARG GLU SER

4.2.2 Score per residue for model 2

- Molecule 1: Calmodulin-1

Chain A: 72%   20%

MET ALA ASP Q4 L5 T6 E7 K14 E15 L19 D23 T27 I28 T29 T30 K31 L40 G41 Q42 L49 I53 N54 E55 D59 T63 I64 D65 T71 T80 D81 S82 E83 E84 E85 I86 R87 E88 R91 D94 L113 K116 D119 D123
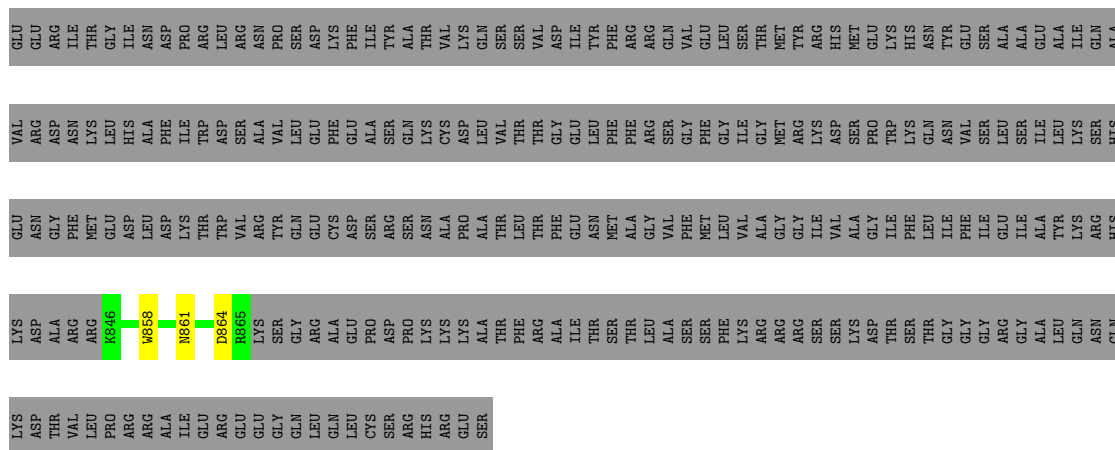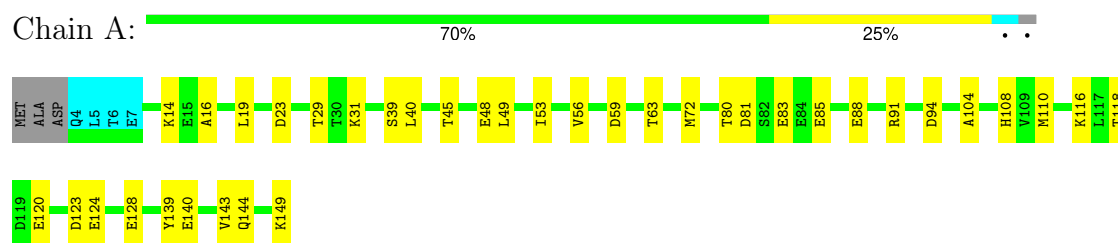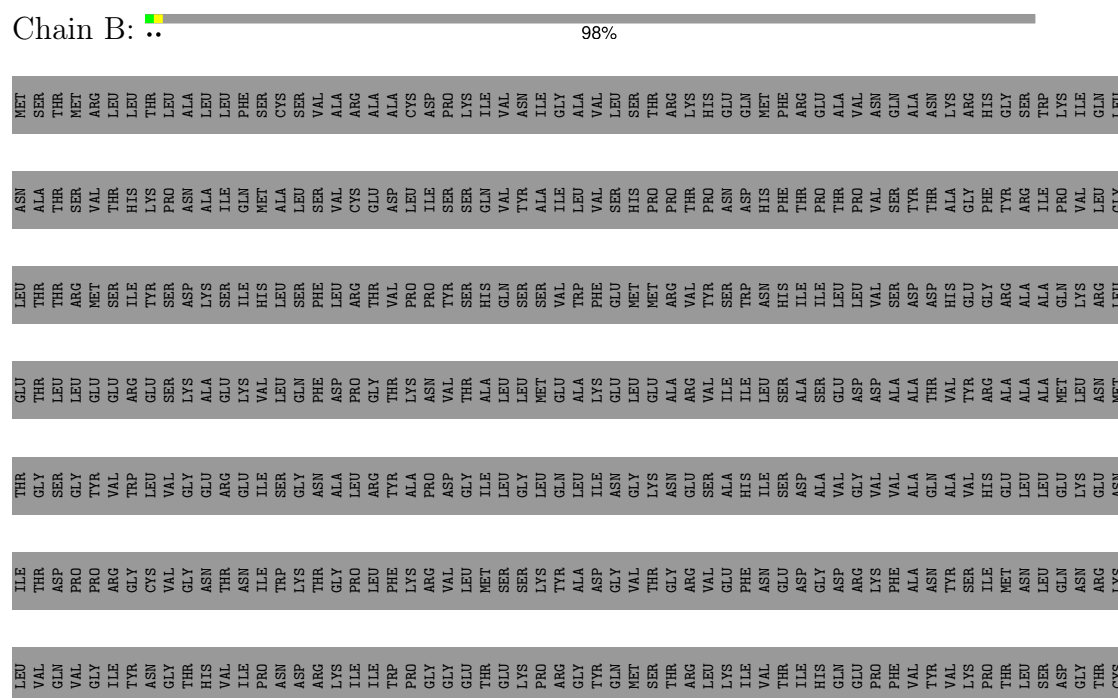
R127 I131 Y139 E140 V143 T147 A148 K149

- Molecule 2: Glutamate receptor ionotropic, NMDA 1

Chain B: 98%

4.2.3 Score per residue for model 3

• Molecule 1: Calmodulin-1

Chain A:
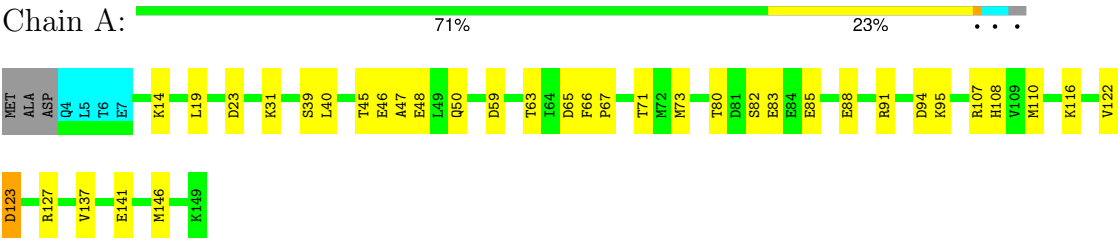
72% 21%

MET ALA ASP Q4 L5 T6 E7 K14 E15 S18 L19 F20 T27 I28 T29 T30 K31 V36 M37 R38 S39 L40 T45 E48 E55 D59 T63 I64 D65 F66 P67 T80 E83 E84 E85 I86 R87 D94 M110 T111 N112 L113 K116 D123

R127 E128 E141 M145 K149

• Molecule 2: Glutamate receptor ionotropic, NMDA 1

Chain B: ⎢ 98%

MET SER THR MET ARG LEU LEU THR LEU ALA LEU LEU PHE SER CYS SER VAL ALA ARG ALA ALA CYS ASP PRO LYS ILE VAL ASN ILE GLY ALA VAL LEU SER THR ARG LYS HIS GLU GLN MET PHE ARG GLU ALA VAL ASN GLN ALA ASN LYS ARG HIS GLY SER TRP LYS ILE GLN LEU

ASN ALA THR SER VAL THR HIS LYS PRO ASN ALA ILE GLN MET ALA LEU SER VAL CYS GLU ASP LEU ILE SER SER GLN VAL TYR ALA ILE LEU VAL SER HIS PRO PRO THR PRO ASP HIS PHE THR PRO THR PRO VAL SER TYR THR ALA GLY PHE TYR ARG ILE PRO VAL LEU GLY

LEU THR THR ARG MET SER ILE TYR SER ASP LYS SER ILE HIS LEU SER PHE LEU ARG THR VAL PRO PRO TYR SER HIS GLN SER SER VAL TRP PHE GLU MET MET ARG VAL TYR SER TRP ASN HIS ILE ILE LEU LEU VAL SER ASP ASP HIS GLU GLY ARG ALA ALA GLN LYS ARG LEU

GLU THR LEU LEU GLU GLU ARG GLU SER LYS ALA GLU LYS VAL LEU GLN PHE ASP PRO GLY THR LYS ASN VAL THR ALA LEU LEU MET GLU ALA LYS GLU LEU GLU ALA ARG VAL ILE ILE LEU SER ALA SER GLU ASP ASP ALA ALA THR VAL TYR ARG ALA ALA MET LEU ASN MET

THR GLY SER GLY TYR VAL TRP LEU VAL GLY GLU ARG GLU ILE SER GLY ASN ALA LEU ARG TYR ALA PRO ASP GLY ILE ILE GLY LEU GLN LEU ILE ASN GLY LYS ASN GLU SER ALA HIS ILE SER ASP ALA VAL GLY VAL VAL ALA GLN ALA VAL HIS GLU LEU LEU GLU LYS GLU ASN

ILE THR ASP PRO PRO ARG GLY CYS VAL GLY ASP THR ASN ILE TRP LYS THR GLY PRO LEU PHE LYS ARG VAL LEU MET SER SER LYS TYR ALA ASP GLY VAL THR GLY ARG VAL GLU PHE ASN GLU ASP GLY ASP ARG LYS PHE ALA ASN TYR SER ILE MET ASN LEU GLN ASN ARG LYS

LEU VAL GLN VAL GLY ILE TYR ASN GLY THR HIS VAL ILE PRO ASN ASP ARG LYS ILE ILE TRP PRO GLY GLY GLU THR GLU LYS PRO ARG GLY TYR GLN MET SER THR ARG LEU LYS ILE VAL THR ILE HIS GLN GLU PRO PHE VAL TYR VAL LYS PRO THR LEU SER ASP GLY THR CYS

LYS GLU GLU PHE THR VAL ASN GLY ASP PRO VAL LYS LYS VAL ILE CYS THR GLY PRO ASN ASP THR SER PRO GLY SER PRO ARG HIS THR VAL PRO GLN CYS CYS TYR GLY PHE CYS ILE ASP LEU LEU ILE LYS LEU ALA ARG THR MET ASN PHE THR TYR GLU VAL HIS LEU VAL ALA

ASP GLY LYS PHE GLY THR GLN GLU ARG VAL ASN ASN SER ASN LYS LYS GLU TRP ASN GLY MET MET GLY GLU LEU LEU SER GLY GLN ALA ASP MET ILE VAL ALA PRO LEU THR ILE ASN ASN GLU ARG ALA GLN TYR ILE GLU PHE SER LYS PRO PHE LYS TYR GLN GLY LEU THR ILE

LEU VAL LYS LYS GLU ILE PRO ARG SER THR LEU ASP SER PHE MET GLN PRO PHE GLN SER THR LEU TRP LEU LEU VAL GLY LEU SER VAL HIS VAL VAL ALA VAL MET LEU TYR LEU LEU ASP ARG PHE SER PRO PHE GLY ARG PHE LYS VAL ASN SER GLU GLU GLU GLU ASP ALA

LEU THR LEU SER SER ALA MET TRP PHE SER TRP GLY VAL LEU LEU ASN SER GLY ILE GLY GLU GLY ALA PRO ARG SER PHE SER ALA ARG ILE LEU GLY MET VAL TRP ALA GLY PHE ALA MET ILE ILE VAL ALA SER TYR THR ALA ASN LEU ALA ALA PHE LEU VAL LEU ASP ARG PRO

GLU GLU ARG ILE THR GLY ILE ASN ASP PRO ARG LEU ARG ASN PRO SER ASP LYS PHE ILE TYR ALA THR VAL LYS GLN SER SER VAL ASP ILE TYR PHE ARG ARG GLN VAL GLU LEU SER THR MET TYR ARG HIS MET GLU LYS HIS ASN TYR GLU SER ALA ALA GLU ALA ILE GLN ALA

VAL ARG ASP ASN LYS LEU HIS ALA PHE ILE TRP ASP SER ALA VAL LEU GLU PHE GLU ALA SER GLN LYS CYS ASP LEU VAL THR THR GLY GLU LEU PHE PHE ARG SER GLY PHE GLY ILE GLY MET ARG LYS ASP SER PRO TRP LYS GLN ASN VAL SER LEU SER ILE LEU LYS SER HIS

GLU ASN GLY PHE MET GLU ASP LEU ASP LYS THR TRP VAL ARG TYR GLN GLU CYS ASP SER ARG SER ASN ALA PRO ALA THR LEU THR PHE GLU ASN MET ALA GLY VAL PHE MET LEU VAL ALA GLY GLY ILE VAL ALA GLY ILE PHE LEU ILE PHE ILE GLU ILE ALA TYR LYS ARG HIS

LYS ASP ALA ARG ARG K946 L850 N856 V857 W858 R865 LYS SER GLY ARG ALA GLU GLY PRO ASP ARG SER PRO ALA VAL LEU THR PHE ARG ALA ILE LEU THR SER THR LEU ALA SER SER PHE LYS ARG ARG ARG SER SER LYS ASP THR SER THR VAL GLY GLY GLY ARG GLY ALA LEU GLN ASN

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GLN LYS ASP THR VAL LEU PRO ARG ALA ALA ILE GLU GLU GLU GLN LEU GLU GLN LEU LEU CYS SER ARG HIS GLU SER

4.2.4 Score per residue for model 4

• Molecule 1: Calmodulin-1

Chain A: 75% 19% • • •

MET ALA ASP Q4 L5 T6 E7 K14 E15 L119 D23 T29 T30 K31 M37 R38 S39 L40 D59 T63 I64 D65 T80 E83 E84 R87 E88 R91 D94 V109 M110 L113 K116 D119 D123 V137 E140 E141 F142 V143 Q144

M145 K149

• Molecule 2: Glutamate receptor ionotropic, NMDA 1

Chain B: • 98%

MET SER THR MET ARG LEU LEU THR LEU ALA LEU LEU PHE SER CYS SER VAL ALA ARG ALA ALA CYS ASP PRO LYS ILE VAL ASN ILE GLY ALA VAL LEU SER THR ARG LYS HIS GLU GLN MET PHE ARG GLU ALA VAL ASN GLN ALA ASN LYS ARG HIS GLY SER TRP LYS ILE GLN LEU

ASN ALA THR SER VAL THR HIS LYS PRO ASN ALA ILE GLN MET ALA LEU SER VAL CYS GLU ASP LEU ILE SER SER GLN VAL TYR ALA ILE LEU VAL SER HIS PRO PRO THR PRO ASN ASP HIS PHE THR PRO THR PRO VAL SER TYR THR ALA GLY PHE TYR ARG ILE PRO VAL LEU GLY

LEU THR THR ARG MET SER ILE TYR SER ASP LYS SER ILE HIS LEU SER PHE LEU ARG THR VAL PRO PRO TYR SER HIS GLN SER SER VAL TRP PHE GLU MET MET ARG VAL TYR SER TRP ASN HIS ILE ILE LEU LEU VAL SER ASP ASP HIS GLU GLY ARG ALA ALA GLN LYS ARG LEU

GLU THR LEU LEU GLU GLU ARG GLU SER LYS ALA GLU LYS VAL LEU GLN PHE ASP PRO GLY THR LYS ASN VAL THR ALA LEU LEU MET GLU ALA LYS GLU LEU GLU ALA ARG VAL ILE ILE LEU SER ALA SER GLU ASP ASP ALA ALA THR VAL TYR ARG ALA ALA MET LEU ASN MET

THR GLY SER GLY TYR VAL TRP LEU VAL GLY GLU ARG GLU ILE SER GLY ASN ALA LEU ARG TYR ALA PRO ASP GLY ILE LEU GLY LEU GLN LEU ILE ASN GLY LYS ASN GLU SER ALA HIS ILE SER ASP ALA VAL GLY VAL VAL ALA GLN ALA VAL HIS GLU LEU LEU GLU LYS GLU ASN

ILE THR ASP PRO PRO ARG GLY CYS VAL GLY ASN THR ASN ILE TRP LYS THR GLY PRO LEU PHE LYS ARG VAL LEU MET SER SER LYS TYR ALA ASP GLY VAL THR GLY ARG VAL GLU PHE ASN GLU ASP GLY ASP ARG LYS PHE ALA ASN TYR SER ILE MET ASN LEU GLN ASN ARG LYS

LEU VAL GLN VAL GLY ILE TYR ASN GLY THR HIS VAL ILE PRO ASN ASP ARG LYS ILE ILE TRP PRO GLY GLY GLU THR GLU LYS PRO ARG GLY TYR GLN MET SER THR ARG LEU LYS ILE VAL THR ILE HIS GLN GLU PRO PHE VAL TYR VAL LYS PRO THR LEU SER ASP GLY THR CYS

LYS GLU GLU PHE THR VAL ASN GLY ASP PRO VAL LYS LYS VAL ILE CYS THR GLY PRO ASN ASP THR SER PRO GLY SER PRO ARG HIS THR VAL PRO GLN CYS CYS TYR GLY PHE CYS ILE ASP LEU LEU ILE LYS LEU ALA ARG THR MET ASN PHE THR TYR GLU VAL HIS LEU VAL ALA

ASP GLY LYS PHE GLY THR GLN GLU ARG VAL ASN ASN SER ASN LYS LYS GLU TRP ASN GLY MET MET GLY GLU LEU LEU SER GLY GLN ALA ASP MET ILE VAL ALA PRO LEU THR ILE ASN ASN GLU ARG ALA GLN TYR ILE GLU PHE SER LYS PRO PHE LYS TYR GLN GLY LEU THR ILE

LEU VAL LYS LYS GLU ILE PRO ARG SER THR LEU ASP SER PHE MET GLN PRO PHE GLN SER THR LEU TRP LEU LEU VAL GLY LEU SER VAL HIS VAL VAL ALA VAL MET LEU TYR LEU LEU ASP ARG PHE SER PRO PHE GLY ARG PHE LYS VAL ASN SER GLU GLU GLU GLU GLU ASP ALA

LEU THR LEU SER SER ALA MET TRP PHE SER TRP GLY VAL LEU LEU ASN SER GLY ILE GLY GLU GLY ALA PRO ARG SER PHE SER ALA ARG ILE LEU GLY MET VAL TRP ALA GLY PHE ALA MET ILE ILE VAL ALA SER TYR THR ALA ASN LEU ALA ALA PHE LEU VAL LEU ASP ARG PRO

GLU GLU ARG ILE THR GLY ILE ASN ASP PRO ARG LEU ARG ASN PRO SER ASP LYS PHE ILE TYR ALA THR VAL LYS GLN SER SER VAL ASP ILE TYR PHE ARG ARG VAL GLU LEU SER THR MET TYR ARG HIS MET GLU LYS HIS ASN GLU SER ALA ALA GLU ILE GLN ALA

VAL ARG ASP ASN LYS LEU HIS ALA PHE ILE TRP ASP SER ALA VAL LEU GLU PHE GLU ALA SER GLN LYS CYS ASP LEU VAL THR THR GLY GLU LEU PHE PHE ARG SER GLY PHE GLY ILE GLY MET ARG LYS ASP SER PRO TRP LYS GLN ASN VAL SER LEU SER ILE LEU LYS SER HIS

GLU ASN GLY PHE MET GLU ASP LEU ASP LYS THR TRP VAL ARG TYR GLN GLU CYS ASP SER ARG SER ASN ALA PRO ALA THR LEU THR PHE GLU ASN MET ALA GLY VAL PHE MET LEU VAL ALA GLY GLY ILE VAL ALA GLY ILE PHE LEU ILE PHE ILE GLU ILE ALA TYR LYS ARG HIS

LYS ASP ALA ARG ARG **K846** **W858** **N861** **D864** **R865** LYS SER GLY ARG ALA GLU PRO ASP PRO LYS LYS ALA THR PHE ARG ALA ILE THR SER THR LEU ALA SER SER PHE LYS ARG ARG ARG SER SER LYS ASP THR SER THR GLY GLY GLY ARG GLY ALA LEU GLN ASN GLN

LYS ASP THR VAL LEU PRO ARG ARG ALA ILE GLU ARG GLU GLU GLU GLU LEU GLN LEU CYS SER ARG HIS ARG GLU SER

4.2.5 Score per residue for model 5

● Molecule 1: Calmodulin-1

Chain A:

MET ALA ASP Q4 L5 T6 E7 K14 E15 A16 L19 D23 T29 T30 K31 S39 L40 T45 E48 L49 I53 V56 D59 T63 M72 T80 D81 S82 E83 E84 E85 E88 R91 D94 A104 H108 V109 M110 K116 L117 T118

D119 E120 D123 E124 E128 Y139 E140 V143 Q144 K149

● Molecule 2: Glutamate receptor ionotropic, NMDA 1

Chain B:

MET SER THR MET ARG LEU LEU THR LEU ALA LEU LEU PHE SER CYS SER VAL ALA ARG ALA ALA CYS ASP PRO LYS ILE VAL ASN ILE GLY ALA VAL LEU SER THR ARG LYS HIS GLU GLN MET PHE ARG GLU ALA VAL ASN GLN ALA ASN LYS ARG HIS GLY SER TRP LYS ILE GLN LEU

ASN ALA THR SER VAL THR HIS LYS PRO ASN ALA ILE GLN MET ALA LEU SER VAL CYS GLU ASP LEU ILE SER SER GLN VAL TYR ALA ILE LEU VAL SER HIS PRO PRO THR PRO ASN ASP HIS PHE THR PRO THR PRO VAL SER TYR THR ALA GLY PHE TYR ARG ILE PRO VAL LEU GLY LEU

LEU THR THR ARG MET SER ILE TYR SER ASP LYS SER ILE HIS LEU SER PHE LEU ARG THR VAL PRO PRO TYR SER HIS GLN SER SER VAL TRP PHE GLU MET MET ARG VAL TYR SER TRP ASN HIS ILE ILE LEU LEU VAL SER ASP ASP HIS GLU GLY ARG ALA ALA GLN LYS ARG LEU

GLU THR LEU LEU GLU GLU ARG GLU SER LYS ALA GLU LYS VAL LEU GLN PHE ASP PRO GLY THR LYS ASN VAL THR ALA LEU LEU MET GLU ALA LYS GLU LEU GLU ALA ARG VAL ILE ILE LEU SER ALA SER GLU ASP ASP ALA ALA THR VAL TYR ARG ALA ALA ALA MET LEU ASN MET

THR GLY SER GLY TYR VAL TRP LEU VAL GLY GLU ARG GLU ILE SER GLY ASN ALA LEU ARG TYR ALA PRO ASP GLY ILE LEU GLY LEU GLN LEU ILE ASN GLY LYS ASN GLU SER ALA HIS ILE SER ASP ALA VAL GLY VAL VAL ALA GLN ALA VAL HIS GLU LEU LEU GLU LYS GLU ASN

ILE THR ASP PRO PRO ARG GLY CYS VAL GLY ASN THR ASN ILE TRP LYS THR GLY PRO LEU PHE LYS ARG VAL LEU MET SER SER LYS TYR ALA ASP GLY VAL THR GLY ARG VAL GLU PHE ASN GLU ASP GLY ASP ARG LYS PHE ALA ASN TYR SER ILE MET ASN LEU GLN ASN ARG LYS

LEU VAL GLN VAL GLY ILE TYR ASN GLY THR HIS VAL ILE PRO ASN ASP ARG LYS ILE ILE TRP PRO GLY GLY GLU THR GLU LYS PRO ARG GLY TYR GLN MET SER THR ARG LEU LYS ILE VAL THR ILE HIS GLN GLU PRO PHE VAL TYR VAL LYS PRO THR LEU SER ASP GLY THR CYS

4.2.6 Score per residue for model 6

• Molecule 1: Calmodulin-1

Chain A:

71%　　　　23%

• Molecule 2: Glutamate receptor ionotropic, NMDA 1

Chain B:

98%

GLU THR LEU LEU GLU GLU ARG GLU SER LYS ALA GLU LYS VAL LEU GLN PHE ASP PRO GLY THR LYS ASN VAL THR ALA LEU LEU MET GLU ALA LYS GLU LEU GLU ALA ARG VAL ILE LEU SER ALA GLU ASP ALA THR VAL TYR ARG ALA ALA MET LEU ASN MET

THR GLY SER GLY TYR VAL TRP LEU VAL GLY VAL GLY ASN ARG GLU ILE SER GLY ASN ALA LEU ARG TYR ALA PRO ASP GLY ILE LEU GLN ILE ASN LYS ASN SER ALA HIS ILE SER ASP ALA VAL GLY VAL ALA GLN ALA VAL HIS GLU LEU LEU GLU LYS GLU ASN

ILE THR ASP PRO ARG GLY CYS VAL ASN THR ILE TRP THR LYS THR GLY PRO LEU PHE LYS ARG VAL LEU MET SER SER LYS TYR ALA ASP GLY VAL THR GLY ARG VAL GLU PHE ASN GLU ASP GLY ASP ARG LYS PHE ALA ASN TYR SER ILE MET ASN LEU GLN ASN ARG LYS

LEU VAL GLN VAL GLY ILE TYR ASN GLY THR HIS VAL ILE PRO ASN ASP ARG LYS ILE ILE TRP PRO GLY GLY GLU THR GLU LYS PRO ARG GLY TYR GLN MET SER THR ARG LEU LYS ILE VAL THR ILE HIS GLN GLU PRO PHE VAL TYR VAL LYS PRO THR LEU SER ASP GLY THR CYS

LYS GLU GLU PHE THR VAL ASN GLY ASP PRO VAL LYS LYS VAL ILE CYS THR GLY PRO ASN ASP THR SER PRO GLY SER PRO ARG HIS THR VAL PRO GLN CYS CYS TYR GLY PHE CYS ILE ASP LEU LEU ILE LYS LEU ALA ARG THR MET ASN PHE THR TYR GLU VAL HIS LEU VAL ALA

ASP GLY LYS PHE GLY THR GLN GLU ARG VAL ASN ASN SER ASN LYS LYS GLU TRP ASN GLY MET MET GLY GLU LEU LEU SER GLY GLN ALA ASP MET ILE VAL ALA PRO LEU THR ILE ASN ASN GLU ARG ALA GLN TYR ILE GLU PHE SER LYS PRO PHE LYS TYR GLN GLY LEU THR ILE

LEU VAL LYS LYS GLU ILE PRO ARG SER THR LEU ASP SER PHE MET GLN PRO PHE GLN SER THR LEU TRP LEU LEU VAL GLY LEU SER VAL HIS VAL VAL ALA VAL MET LEU TYR LEU LEU ASP ARG PHE SER PRO PHE GLY ARG PHE LYS VAL ASN SER GLU GLU GLU GLU ASP ALA

LEU THR LEU SER ALA MET TRP PHE SER TRP GLY VAL LEU LEU ASN SER GLY ILE GLY GLU GLY ALA PRO ARG SER PHE SER ALA ARG ILE LEU GLY MET VAL TRP ALA GLY PHE ALA MET ILE ILE VAL ALA SER TYR THR ALA ASN LEU ALA ALA PHE LEU VAL LEU ASP ARG PRO

GLU GLU ARG ILE THR GLY ILE ASN ASP PRO ARG LEU ARG ASN PRO SER ASP LYS PHE ILE TYR ALA THR VAL LYS GLN SER SER VAL ASP ILE TYR PHE ARG ARG GLN VAL GLU LEU SER THR MET TYR ARG HIS MET GLU LYS HIS ASN TYR GLU SER ALA ALA GLU ALA ILE GLN ALA

VAL ARG ASP ASN LYS LEU HIS ALA PHE ILE TRP ASP SER ALA VAL LEU GLU PHE GLU ALA SER GLN LYS CYS ASP LEU VAL THR THR GLY GLU LEU PHE PHE ARG SER GLY PHE GLY ILE GLY MET ARG LYS ASP SER PRO TRP LYS GLN ASN VAL SER LEU SER ILE LEU LYS SER HIS

GLU ASN GLY PHE MET GLU ASP LEU ASP LYS THR TRP VAL ARG TYR GLN GLU CYS ASP SER ARG SER ASN ALA PRO ALA THR LEU THR PHE GLU ASN MET ALA GLY VAL PHE MET LEU VAL ALA GLY GLY ILE VAL ALA GLY ILE PHE LEU ILE PHE ILE GLU ILE ALA TYR LYS ARG HIS

LYS ASP ALA ARG K946 A853 A854 V855 N856 V857 W858 R859 R865 LYS SER GLY ARG ALA GLU GLU PRO ASP PRO LYS LYS LYS ALA THR PHE ARG ALA ILE THR SER THR LEU ALA SER SER PHE LYS ARG ARG ARG SER SER LYS ASP THR SER THR GLY GLY GLY ARG GLY ALA LEU

GLN ASN GLN GLN LYS ASP THR VAL LEU PRO ARG ARG ALA ILE GLU ARG GLU GLU GLY GLN LEU GLN LEU CYS SER ARG HIS ARG GLU SER

4.2.7 Score per residue for model 7

• Molecule 1: Calmodulin-1

Chain A:

• Molecule 2: Glutamate receptor ionotropic, NMDA 1

Chain B:

4.2.8 Score per residue for model 8

● Molecule 1: Calmodulin-1

Chain A: 76%   19%   ・ ・ ・

MET ALA ASP Q4 L5 T6 E7 E12 F13 K14 L19 T27 K31 M37 R38 S39 L40 E48 L49 M52 I53 V56 D65 F66 P67 M72 K76 T80 E85 E88 R91 D94 L106 M110 K116 D119 D123 R127

E128 K149

• Molecule 2: Glutamate receptor ionotropic, NMDA 1

Chain B: •   98%

MET SER THR MET ARG LEU LEU THR LEU LEU ALA LEU LEU PHE SER CYS SER VAL ALA ALA ARG ALA ALA CYS ASP PRO LYS ILE VAL ASN ILE GLY ALA VAL LEU SER THR ARG LYS HIS GLU GLN MET PHE ARG GLU ALA VAL ASN GLN ALA ASN LYS ARG HIS GLY SER TRP LYS ILE GLN LEU

ASN ALA THR SER VAL THR HIS LYS PRO ASN ALA ILE GLN MET ALA LEU SER VAL CYS GLU ASP LEU ILE SER SER GLN VAL TYR ALA ILE LEU VAL SER HIS PRO PRO THR PRO ASP ASP HIS PHE THR PRO THR PRO VAL SER TYR THR ALA GLY PHE TYR ARG ILE PRO VAL LEU GLY

LEU THR THR ARG MET SER ILE TYR SER ASP LYS SER ILE HIS LEU SER PHE LEU ARG THR VAL PRO PRO TYR SER HIS GLN SER SER VAL TRP PHE GLU MET MET ARG VAL TYR SER TRP ASN HIS ILE ILE LEU LEU VAL SER ASP ASP HIS GLU GLY ARG ALA ALA GLN LYS ARG LEU

GLU THR LEU LEU GLU GLU ARG GLU SER LYS ALA GLU LYS VAL LEU GLN PHE ASP PRO GLY THR LYS ASN VAL THR ALA LEU LEU MET GLU ALA LYS GLU LEU GLU ALA ARG VAL ILE ILE LEU SER ALA SER GLU ASP ASP ALA ALA THR VAL TYR ARG ALA ALA MET LEU ASN MET

THR GLY SER GLY TYR VAL TRP LEU VAL GLY GLU ARG ILE SER ASN ALA LEU ARG TYR ALA PRO ASP GLY ILE ILE GLY LEU GLN LEU ILE ASN GLY LYS ASN GLU SER ALA HIS ILE SER ASP ALA VAL GLY VAL VAL ALA GLN ALA VAL HIS GLU LEU LEU LYS GLU ASN

ILE THR ASP PRO PRO ARG GLY CYS VAL GLY ASP THR PRO VAL TYR ASN ILE LEU ARG THR ASP SER VAL VAL TYR ALA PRO VAL SER CYS ASN GLY ARG VAL ASN PHE THR GLY PHE GLN GLY ASP LEU TYR GLU LYS PRO ASN ARG THR MET GLU SER ALA GLU PHE THR ASP TYR ILE SER ASN THR LEU GLU ASN ARG LYS

LEU VAL GLN ILE GLY ILE TYR ASN GLY THR HIS VAL ILE PRO ASN ASP ARG LYS ILE ILE TRP PRO GLY GLY GLU THR GLU LYS PRO ARG GLY TYR GLN MET SER THR ARG LEU LYS ILE VAL THR ILE HIS GLN GLU PRO PHE VAL TYR VAL LYS PRO THR LEU SER ASP GLY THR CYS

LYS GLU GLU PHE THR VAL ASN GLY ASP PRO VAL LYS LYS VAL ILE CYS THR GLY PRO ASN ASP THR SER PRO GLY SER PRO ARG HIS THR VAL PRO GLN CYS CYS TYR GLY PHE CYS ILE ASP LEU LEU ILE LYS LEU ALA ARG THR MET ASN PHE THR TYR GLU VAL HIS LEU VAL ALA

ASP GLY LYS PHE GLY THR GLN GLU ARG VAL ASN ASN SER ASN LYS LYS GLU TRP ASN GLY MET MET GLY GLU LEU LEU SER GLY GLN ALA ASP MET ILE VAL ALA PRO LEU THR ILE ASN ASN GLU ARG ALA GLN TYR ILE GLU PHE SER LYS PRO PHE LYS TYR GLN GLY LEU THR ILE

LEU VAL LYS LYS GLU ILE PRO ARG SER THR LEU ASP SER PHE MET GLN PRO PHE GLN SER THR LEU TRP LEU LEU VAL GLY LEU SER VAL HIS VAL VAL ALA VAL MET LEU TYR LEU LEU ASP ARG PHE SER PRO PHE GLY ARG PHE LYS VAL ASN SER GLU GLU GLU GLU ASP ALA

LEU THR LEU SER SER ALA MET TRP PHE SER TRP GLY VAL LEU LEU ASN SER GLY ILE GLY GLU GLY ALA PRO ARG SER PHE SER ALA ARG ILE LEU GLY MET VAL TRP ALA GLY PHE ALA MET ILE ILE VAL ALA SER TYR THR ALA ASN LEU ALA ALA PHE LEU VAL LEU ASP ARG PRO

GLU GLU ARG ILE THR GLY ILE ASN ASP PRO ARG LEU ARG ASN PRO SER ASP LYS PHE ILE TYR ALA THR VAL LYS GLN SER SER VAL ASP ILE TYR PHE ARG ARG GLN VAL GLU LEU SER THR MET TYR ARG HIS MET GLU LYS HIS ASN TYR GLU SER ALA ALA GLU ALA ILE GLN ALA

VAL ARG ASP ASN LYS LEU HIS ALA PHE ILE TRP ASP SER ALA VAL LEU GLU PHE GLU ALA SER GLN LYS CYS ASP LEU VAL THR THR GLY GLU LEU PHE PHE ARG SER GLY PHE GLY ILE GLY MET ARG LYS ASP SER PRO TRP LYS GLN ASN VAL SER LEU SER ILE LEU LYS SER HIS

GLU ASN GLY PHE MET GLU ASP LEU ASP LYS THR TRP VAL ARG TYR GLN GLU CYS ASP SER ARG SER ASN ALA PRO ALA THR LEU THR PHE GLU ASN MET ALA GLY VAL PHE MET LEU VAL ALA GLY GLY ILE VAL ALA GLY ILE PHE LEU ILE PHE ILE GLU ILE ALA TYR LYS ARG HIS

LYS ASP ALA ARG ARG K946 V855 W858 R859 K860 N861 L862 Q863 D864 R865 LYS SER GLY ARG ALA GLU GLU PRO ASP PRO LYS LYS LYS ALA THR PHE ARG ALA ILE THR SER THR LEU ALA SER SER PHE LYS ARG ARG ARG SER SER LYS ASP THR SER THR GLY GLY GLY ARG GLY ALA

LEU GLN ASN GLN LYS ASP THR VAL LEU PRO ARG ARG ALA ALA ILE GLU GLU GLU GLN GLN LEU LEU CYS SER ARG HIS ARG GLU SER

4.2.9 Score per residue for model 9 (medoid)

• Molecule 1: Calmodulin-1

Chain A:

77%   17%   • • •

MET ALA ASP Q4 L5 T6 E7 K14 E15 A16 L19 T29 T30 K31 M37 R38 S39 A47 E48 L49 Q50 I53 N54 E55 D59 T63 T80 D81 S82 E83 R87 E88 R91 V92 F93 I101 M110 K116 E120 V137 M145 K149

• Molecule 2: Glutamate receptor ionotropic, NMDA 1

Chain B: •

98%

MET SER THR MET ARG LEU LEU THR LEU ALA LEU LEU PHE SER CYS SER VAL ALA ARG ALA ALA CYS ASP PRO LYS ILE VAL ASN ILE GLY ALA VAL LEU SER THR ARG LYS HIS GLU GLN MET PHE ARG GLU ALA VAL ASN GLN ALA ASN LYS ARG HIS GLY SER TRP LYS ILE GLN LEU

ASN ALA THR SER VAL THR HIS LYS PRO ASN ALA ILE GLN MET ALA LEU SER VAL CYS GLU ASP LEU ILE SER SER GLN VAL TYR ALA ILE LEU VAL SER HIS PRO PRO THR PRO ASN ASP HIS PHE THR PRO THR PRO VAL SER TYR THR ALA GLY PHE TYR ARG ILE PRO VAL LEU GLY

LEU THR THR ARG MET SER ILE TYR SER ASP LYS SER ILE HIS LEU SER PHE LEU ARG THR VAL PRO PRO TYR SER HIS GLN SER SER VAL TRP PHE GLU MET MET ARG VAL TYR SER TRP ASN HIS ILE ILE LEU LEU VAL SER ASP ASP GLU GLY ARG ALA ALA GLN LYS ARG LEU

GLU THR LEU LEU GLU GLU ARG GLU SER LYS ALA GLU LYS VAL LEU GLN PHE ASP PRO GLY THR LYS ASN VAL THR ALA LEU LEU MET GLU ALA LYS GLU LEU GLU ALA ARG VAL ILE ILE LEU SER ALA SER GLU ASP ASP ALA ALA THR VAL TYR ARG ALA ALA MET LEU ASN MET

THR GLY SER GLY TYR VAL TRP LEU VAL GLY GLU ARG GLU ILE SER GLY ASN ALA LEU ARG TYR ALA PRO ASP GLY ILE LEU GLY LEU GLN LEU ILE ASN GLY LYS ASN GLU SER ALA HIS ILE SER ASP ALA VAL GLY VAL VAL ALA GLN ALA VAL HIS GLU LEU LEU GLU LYS GLU ASN

ILE THR ASP PRO PRO ARG GLY CYS VAL GLY ASN THR ASN ILE TRP LYS THR GLY PRO LEU PHE LYS ARG VAL LEU MET SER SER LYS TYR ALA ASP GLY VAL THR GLY ARG VAL GLU PHE ASN GLU ASP GLY ASP ARG LYS PHE ALA ASN TYR SER ILE MET ASN LEU GLN ASN ARG LYS

LEU VAL GLN VAL GLY ILE TYR ASN GLY THR HIS VAL ILE PRO ASN ASP ARG LYS ILE ILE TRP PRO GLY GLY GLU THR GLU LYS PRO ARG GLY TYR GLN MET SER THR ARG LEU LYS ILE VAL THR ILE HIS GLN GLU PRO PHE VAL TYR VAL LYS PRO THR LEU SER ASP GLY THR CYS

LYS GLU GLU PHE THR VAL ASN GLY ASP PRO VAL LYS LYS VAL ILE CYS THR GLY PRO ASN ASP THR SER PRO GLY SER PRO ARG HIS THR VAL PRO GLN CYS CYS TYR GLY PHE CYS ILE ASP LEU LEU ILE LYS LEU ALA ARG THR MET ASN PHE THR TYR GLU VAL HIS LEU VAL ALA

ASP GLY LYS PHE GLY THR GLN GLU ARG VAL ASN ASN SER ASN LYS LYS GLU TRP ASN GLY MET MET GLY GLU LEU LEU SER GLY GLN ALA ASP MET ILE VAL ALA PRO LEU THR ILE ASN ASN GLU ARG ALA GLN TYR ILE GLU PHE SER LYS PRO PHE LYS TYR GLN GLY LEU THR ILE

LEU VAL LYS LYS GLU ILE PRO ARG SER THR LEU ASP SER PHE MET GLN PRO PHE GLN SER THR LEU TRP LEU LEU VAL GLY LEU SER VAL HIS VAL VAL ALA VAL MET LEU TYR LEU LEU ASP ARG PHE SER PRO PHE GLY ARG PHE LYS VAL ASN SER GLU GLU GLU GLU GLU ASP ALA

LEU THR LEU SER SER ALA MET TRP PHE SER TRP GLY VAL LEU LEU ASN SER GLY ILE GLY GLU GLY ALA PRO ARG SER PHE SER ALA ARG ILE LEU GLY MET VAL TRP ALA GLY PHE ALA MET ILE ILE VAL ALA SER TYR THR ALA ASN LEU ALA ALA PHE LEU VAL LEU ASP ARG PRO

GLU GLU ARG ILE THR GLY ILE ASN ASP PRO ARG LEU ARG ASN PRO SER ASP LYS PHE ILE TYR ALA THR VAL LYS GLN SER SER VAL ASP ILE TYR PHE ARG ARG GLN VAL GLU LEU SER THR MET TYR ARG HIS MET GLU LYS HIS ASN TYR GLU SER ALA ALA GLU ALA ILE GLN ALA

VAL ARG ASP ASN LYS LEU HIS ALA PHE ILE TRP ASP SER ALA VAL LEU GLU PHE GLU ALA SER GLN LYS CYS ASP LEU VAL THR THR GLY GLU LEU PHE PHE ARG SER PHE GLY ILE MET ARG LYS ASP SER PRO TRP LYS GLN ASN VAL SER LEU SER ILE LEU LYS SER HIS

GLU ASN GLY PHE MET GLU ASP LEU ASP LYS THR TRP VAL ARG TYR GLN GLU CYS ASP SER ARG ASN ALA PRO ALA THR LEU THR PHE GLU ASN MET ALA GLY VAL PHE MET LEU VAL ALA GLY GLY ILE VAL ALA GLY ILE LEU PHE LEU PHE ILE GLU ILE ALA TYR LYS ARG HIS

LYS ASP ALA ARG ARG **K846** **L850** **A851** **F852** **A853** **A854** **R865** LYS SER GLY ARG ALA GLU PRO ASP PRO LYS LYS LYS ALA THR PHE ARG ALA ILE THR SER THR LEU ALA SER SER PHE LYS ARG ARG ARG SER SER LYS ASP THR SER THR GLY GLY ARG GLY ALA LEU GLN ASN

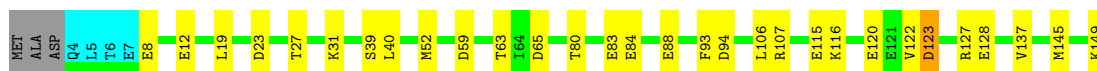GLN LYS ASP THR VAL LEU PRO ARG ARG ALA ILE GLU ARG GLU GLU GLY GLN LEU GLN LEU CYS SER ARG HIS ARG GLU SER

4.2.10 Score per residue for model 10

• Molecule 1: Calmodulin-1

Chain A:

• Molecule 2: Glutamate receptor ionotropic, NMDA 1

Chain B:

MET SER THR MET ARG LEU LEU THR LEU ALA LEU LEU PHE SER CYS SER VAL ALA ARG ALA ALA CYS ASP PRO LYS ILE VAL ASN ILE GLY ALA VAL LEU SER THR ARG LYS HIS GLU GLN MET PHE ARG GLU ALA VAL ASN GLN ALA ASN LYS ARG HIS GLY SER TRP LYS ILE GLN LEU

ASN ALA THR SER VAL THR HIS LYS PRO ASN ALA ILE GLN MET ALA LEU SER VAL CYS GLU ASP LEU ILE SER SER GLN VAL TYR ALA ILE LEU VAL SER HIS PRO PRO THR PRO ASN ASP HIS PHE THR PRO THR PRO VAL SER TYR THR ALA GLY PHE TYR ARG ILE PRO VAL LEU GLY

LEU THR THR ARG MET SER ILE TYR SER ASP LYS SER ILE HIS LEU SER PHE LEU ARG THR VAL PRO PRO TYR SER HIS GLN SER SER VAL TRP PHE GLU MET MET ARG VAL TYR SER TRP ASN HIS ILE ILE LEU LEU VAL SER ASP ASP HIS GLU GLY ARG ALA ALA GLN LYS ARG LEU

GLU THR LEU LEU GLU GLU ARG GLU SER LYS ALA GLU LYS VAL LEU GLN PHE ASP PRO GLY THR LYS ASN VAL THR ALA LEU LEU MET GLU ALA LYS GLU LEU GLU ALA ARG VAL ILE ILE LEU SER ALA SER GLU ASP ASP ALA ALA THR VAL TYR ARG ALA ALA MET LEU ASN MET

THR GLY SER GLY TYR VAL TRP LEU VAL GLY GLU ARG GLU ILE SER GLY ASN ALA LEU ARG TYR ALA PRO ASP GLY ILE ILE GLY LEU GLN LEU ILE ASN GLY LYS ASN GLU SER ALA HIS ILE SER ASP ALA VAL GLY VAL VAL ALA GLN ALA VAL HIS GLU LEU LEU GLU LYS GLU ASN

ILE THR ASP PRO PRO ARG GLY CYS VAL GLY ASN THR ASN ILE TRP LYS THR GLY PRO LEU PHE LYS ARG VAL LEU MET SER SER LYS TYR ALA ASP GLY VAL THR GLY ARG VAL GLU PHE ASN GLU ASP GLY ASP ARG LYS PHE ALA ASN TYR SER ILE MET ASN LEU GLN ASN ARG LYS

LEU VAL GLN VAL GLY ILE TYR ASN GLY THR HIS VAL ILE PRO ASN ASP ARG LYS ILE ILE TRP PRO GLY GLY GLU THR GLU LYS PRO ARG GLY TYR GLN MET SER THR ARG LEU LYS ILE VAL THR ILE HIS GLN GLU PRO PHE VAL TYR VAL LYS PRO THR LEU SER ASP GLY THR CYS

LYS GLU GLU PHE THR VAL ASN GLY ASP PRO VAL LYS LYS VAL ILE CYS THR GLY PRO ASN ASP THR SER PRO GLY SER PRO ARG HIS THR VAL PRO GLN CYS CYS TYR GLY PHE CYS ILE ASP LEU LEU ILE LYS LEU ALA ARG THR MET ASN PHE THR TYR GLU VAL HIS LEU VAL ALA

ASP GLY LYS PHE GLY THR GLN GLU ARG VAL ASN ASN SER ASN LYS LYS GLU TRP ASN GLY MET MET GLY GLU LEU LEU SER GLY GLN ALA ASP MET ILE VAL ALA PRO LEU THR ILE ASN ASN GLU ARG ALA GLN TYR ILE GLU PHE SER LYS PRO PHE LYS TYR GLN GLY LEU THR ILE

LEU VAL LYS LYS GLU ILE PRO ARG SER THR LEU ASP SER PHE MET GLN PRO PHE GLN SER THR LEU TRP LEU VAL GLY LEU SER VAL HIS VAL VAL ALA VAL MET LEU TYR LEU LEU ASP ARG PHE SER PRO PHE GLY ARG PHE LYS VAL ASN SER GLU GLU GLU GLU ASP ALA

LEU THR LEU SER ALA MET TRP PHE SER TRP GLY VAL LEU LEU ASN SER GLY ILE GLY GLU GLY ALA PRO ARG SER PHE SER ALA ARG ILE LEU GLY MET VAL TRP ALA GLY PHE ALA MET ILE ILE VAL ALA SER TYR THR ALA ASN LEU ALA ALA PHE LEU VAL LEU ASP ARG PRO

GLU GLU ARG ILE THR GLY ILE ASN ASP PRO ARG LEU ARG ASN PRO SER ASP LYS PHE ILE TYR ALA THR VAL LYS GLN SER SER VAL ASP ILE TYR PHE ARG ARG GLN VAL GLU LEU SER THR MET TYR ARG HIS MET GLU LYS HIS ASN TYR GLU SER ALA ALA GLU ALA ILE GLN ALA

VAL ARG ASP ASN LYS LEU HIS ALA PHE ILE TRP ASP SER ALA VAL LEU GLU PHE GLU ALA SER GLN LYS CYS ASP LEU VAL THR THR GLY GLU LEU PHE ARG SER GLY PHE GLY ILE GLY MET ARG LYS ASP SER PRO TRP LYS GLN ASN VAL SER LEU ILE LEU LEU LYS SER HIS

GLU ASN GLY PHE MET GLU ASP LEU ASP LYS THR TRP VAL ARG TYR GLN GLU CYS ASP SER ARG SER ASN ALA PRO ALA THR LEU THR PHE GLU ASN MET ALA GLY VAL PHE MET LEU VAL ALA GLY GLY ILE VAL ALA GLY ILE PHE LEU ILE PHE ILE GLU ILE ALA TYR LYS ARG HIS

LEU GLN ASN GLN LYS ASP THR VAL LEU PRO ARG ARG ALA ILE GLU ARG GLU GLY GLY GLN GLN LEU GLN LEU LEU CYS SER ARG ARG HIS ARG GLU GLU SER

5 Refinement protocol and experimental data overview ⓘ

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

Of the 200 calculated structures, 10 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
HADDOCK	structure calculation	
HADDOCK	refinement	

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

Chemical shift file(s)	working_cs.cif
Number of chemical shift lists	1
Total number of shifts	1586
Number of shifts mapped to atoms	1580
Number of unparsed shifts	0
Number of shifts with mapping errors	6
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	70%

6 Model quality ⓘ

6.1 Standard geometry ⓘ

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

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	1119	1053	1053	9±2
2	B	169	175	174	3±2
All	All	12920	12280	12270	104

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 4.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Models Total
2:B:861:ASN:HA	2:B:864:ASP:OD1	0.65	1.90	2	4
1:A:29:THR:HA	1:A:63:THR:HG22	0.60	1.74	2	6
1:A:85:GLU:OE1	2:B:860:LYS:HB3	0.57	1.99	8	1
1:A:48:GLU:O	1:A:52:MET:HG3	0.53	2.04	8	1
1:A:93:PHE:CE1	1:A:106:LEU:HA	0.51	2.41	7	1
1:A:118:THR:HB	1:A:120:GLU:OE2	0.51	2.06	5	1
1:A:123:ASP:O	1:A:127:ARG:HG3	0.51	2.06	8	4
1:A:81:ASP:O	1:A:85:GLU:HG2	0.49	2.07	2	1
1:A:47:ALA:O	1:A:50:GLN:HG2	0.49	2.07	6	2
1:A:65:ASP:OD1	1:A:67:PRO:HD2	0.48	2.08	3	5
2:B:855:VAL:O	2:B:859:ARG:HB3	0.48	2.08	6	2

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:140:GLU:O	1:A:144:GLN:HB2	0.48	2.08	5	1
1:A:84:GLU:O	1:A:88:GLU:HG2	0.48	2.07	7	1
1:A:16:ALA:HB2	2:B:854:ALA:HB1	0.48	1.86	5	2
1:A:88:GLU:OE1	1:A:91:ARG:HD2	0.48	2.09	4	5
1:A:83:GLU:O	1:A:87:ARG:HG3	0.47	2.09	9	5
1:A:49:LEU:O	1:A:53:ILE:HG12	0.47	2.09	9	4
2:B:856:ASN:O	2:B:859:ARG:HG3	0.47	2.09	2	1
2:B:852:PHE:O	2:B:856:ASN:HB2	0.47	2.09	2	1
1:A:20:PHE:HA	1:A:36:VAL:HG21	0.47	1.87	3	1
1:A:149:LYS:N	1:A:149:LYS:HD2	0.47	2.25	7	1
1:A:83:GLU:OE1	1:A:87:ARG:HD3	0.47	2.10	1	2
1:A:15:GLU:OE1	1:A:15:GLU:HA	0.46	2.10	3	1
1:A:56:VAL:HG22	1:A:72:MET:HG3	0.45	1.89	8	2
1:A:128:GLU:OE1	2:B:846:LYS:HE2	0.45	2.11	7	1
1:A:45:THR:OG1	1:A:48:GLU:HB2	0.45	2.12	3	4
1:A:109:VAL:O	1:A:113:LEU:HG	0.45	2.12	4	2
1:A:137:VAL:HG23	1:A:141:GLU:HB2	0.45	1.88	6	2
1:A:55:GLU:CD	2:B:865:ARG:HE	0.45	2.20	10	1
1:A:140:GLU:O	1:A:143:VAL:HG22	0.45	2.12	2	2
1:A:82:SER:HA	1:A:85:GLU:CD	0.45	2.37	10	2
1:A:146:MET:SD	2:B:853:ALA:HB2	0.45	2.52	6	2
1:A:93:PHE:HE2	2:B:852:PHE:CE2	0.45	2.30	9	1
1:A:85:GLU:OE1	2:B:857:VAL:HA	0.44	2.12	5	1
1:A:128:GLU:HG3	2:B:846:LYS:HE2	0.44	1.89	7	1
1:A:123:ASP:OD2	1:A:127:ARG:NH1	0.44	2.51	1	3
1:A:139:TYR:O	1:A:143:VAL:HG22	0.44	2.13	5	1
1:A:8:GLU:O	1:A:12:GLU:HG2	0.44	2.13	7	1
2:B:856:ASN:O	2:B:859:ARG:HG2	0.43	2.13	7	4
1:A:139:TYR:O	1:A:143:VAL:HG13	0.43	2.14	2	1
2:B:858:TRP:O	2:B:862:LEU:HG	0.43	2.14	2	1
1:A:107:ARG:HB2	1:A:122:VAL:HG11	0.43	1.91	7	2
2:B:858:TRP:CE3	2:B:862:LEU:HD11	0.42	2.49	2	2
1:A:141:GLU:O	1:A:145:MET:HG3	0.42	2.14	3	1
1:A:88:GLU:OE1	1:A:91:ARG:HD3	0.42	2.14	8	1
1:A:95:LYS:HE2	1:A:108:HIS:ND1	0.42	2.29	6	1
1:A:137:VAL:HG21	1:A:145:MET:SD	0.42	2.55	4	4
1:A:66:PHE:HB3	1:A:67:PRO:HD3	0.42	1.92	6	1
1:A:101:ILE:HB	1:A:137:VAL:CG1	0.42	2.45	9	1
1:A:128:GLU:OE1	2:B:846:LYS:NZ	0.41	2.52	5	1
2:B:858:TRP:CZ3	2:B:862:LEU:HD11	0.41	2.50	2	1
1:A:85:GLU:OE2	2:B:857:VAL:HA	0.40	2.16	2	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Total
1:A:15:GLU:O	1:A:19:LEU:HG	0.40	2.17	2	1
1:A:104:ALA:O	1:A:108:HIS:HB2	0.40	2.16	5	1
1:A:72:MET:SD	1:A:76:LYS:HG3	0.40	2.56	8	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	141/149 (95%)	138±1 (98±1%)	3±1 (2±1%)	0±0 (0±0%)	100	100
2	B	18/938 (2%)	18±0 (100±0%)	0±0 (0±0%)	0±0 (0±0%)	100	100
All	All	1590/10870 (15%)	1556 (98%)	34 (2%)	0 (0%)	100	100

There are no Ramachandran outliers.

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	121/127 (95%)	104±3 (86±2%)	17±3 (14±2%)	5	44
2	B	17/806 (2%)	15±1 (87±8%)	2±1 (13±8%)	6	47
All	All	1380/9330 (15%)	1186 (86%)	194 (14%)	5	44

All 51 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	31	LYS	10
1	A	116	LYS	10

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Mol	Chain	Res	Type	Models (Total)
1	A	14	LYS	9
1	A	40	LEU	9
1	A	59	ASP	9
1	A	94	ASP	9
2	B	858	TRP	9
1	A	80	THR	9
1	A	39	SER	8
1	A	110	MET	8
1	A	123	ASP	8
1	A	83	GLU	8
1	A	19	LEU	8
1	A	23	ASP	7
1	A	37	MET	6
1	A	55	GLU	4
1	A	63	THR	4
1	A	119	ASP	4
1	A	27	THR	4
2	B	850	LEU	4
1	A	15	GLU	3
1	A	113	LEU	3
1	A	128	GLU	3
1	A	65	ASP	3
2	B	856	ASN	3
1	A	149	LYS	3
1	A	71	THR	2
2	B	857	VAL	2
1	A	81	ASP	2
1	A	120	GLU	2
1	A	54	ASN	1
1	A	42	GLN	1
1	A	88	GLU	1
1	A	131	ILE	1
1	A	147	THR	1
2	B	860	LYS	1
2	B	863	GLN	1
1	A	18	SER	1
1	A	85	GLU	1
1	A	112	ASN	1
1	A	84	GLU	1
1	A	124	GLU	1
1	A	46	GLU	1
1	A	73	MET	1

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Mol	Chain	Res	Type	Models (Total)
1	A	52	MET	1
1	A	115	GLU	1
1	A	12	GLU	1
1	A	76	LYS	1
1	A	106	LEU	1
2	B	859	ARG	1
2	B	861	ASN	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 oligosaccharides in this entry.

6.6 Ligand geometry ⓘ

Of 4 ligands modelled in this entry, 4 are monoatomic - leaving 0 for Mogul analysis.

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 ⓘ

The completeness of assignment taking into account all chemical shift lists is 70% for the well-defined parts and 71% for the entire structure.

7.1   Chemical shift list 1

File name: working_cs.cif

Chemical shift list name: *assigned_chemical_shifts_1*

7.1.1   Bookkeeping ⓘ

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

Total number of shifts	1586
Number of shifts mapped to atoms	1580
Number of unparsed shifts	0
Number of shifts with mapping errors	6
Number of shifts with mapping warnings	0
Number of shift outliers (ShiftChecker)	0

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

- No matching atom found in the structure. All 6 occurrences are reported below.

List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	3	ASP	HA	4.623	0.004	1
1	A	3	ASP	HB2	2.684	0.008	2
1	A	3	ASP	HB3	2.531	0.003	2
1	A	3	ASP	C	175.607	0.000	1
1	A	3	ASP	CA	54.845	0.000	1
1	A	3	ASP	CB	41.44	0.038	1

7.1.2   Chemical shift referencing ⓘ

The following table shows the suggested chemical shift referencing corrections.

Nucleus	# values	Correction ± precision, *ppm*	Suggested action
$^{13}C_{\alpha}$	146	-0.32 ± 0.08	None needed (< 0.5 ppm)
$^{13}C_{\beta}$	135	0.19 ± 0.07	None needed (< 0.5 ppm)

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Nucleus	# values	Correction $\pm$ precision, *ppm*	Suggested action
$^{13}C'$	142	-0.47 $\pm$ 0.11	None needed (< 0.5 ppm)
^{15}N	143	0.27 $\pm$ 0.19	None needed (< 0.5 ppm)

7.1.3   Completeness of resonance assignments ⓘ

The following table shows the completeness of the chemical shift assignments for the well-defined regions of the structure. The overall completeness is 70%, i.e. 1531 atoms were assigned a chemical shift out of a possible 2173. 0 out of 19 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	709/817 (87%)	292/333 (88%)	278/324 (86%)	139/160 (87%)
Sidechain	786/1229 (64%)	534/786 (68%)	252/393 (64%)	0/50 (0%)
Aromatic	36/127 (28%)	36/63 (57%)	0/62 (0%)	0/2 (0%)
Overall	1531/2173 (70%)	862/1182 (73%)	530/779 (68%)	139/212 (66%)

The following table shows the completeness of the chemical shift assignments for the full structure. The overall completeness is 71%, i.e. 1580 atoms were assigned a chemical shift out of a possible 2229. 0 out of 20 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

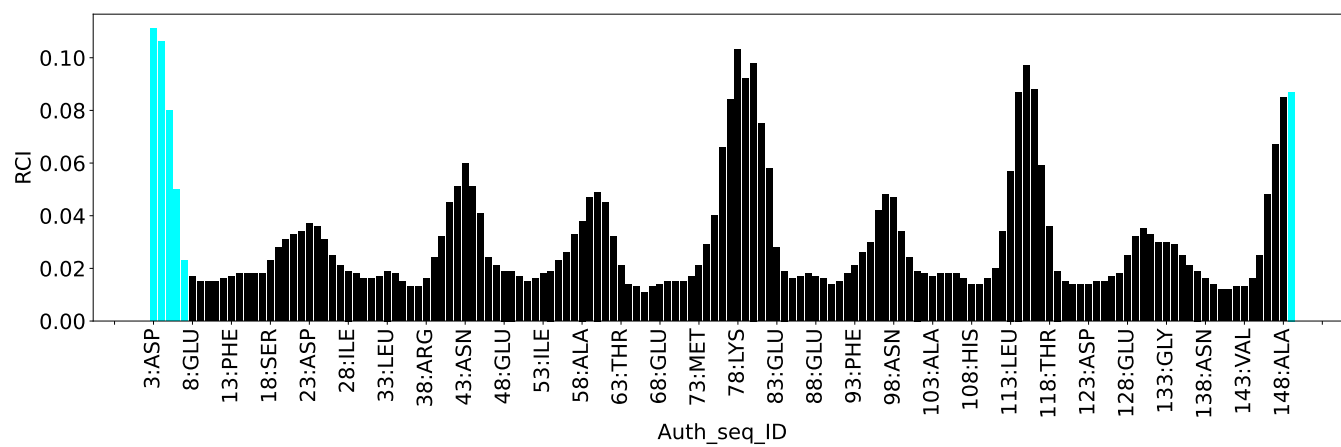|	Total	^{1}H	^{13}C	^{15}N
Backbone	729/837 (87%)	300/341 (88%)	286/332 (86%)	143/164 (87%)
Sidechain	815/1265 (64%)	554/809 (68%)	261/405 (64%)	0/51 (0%)
Aromatic	36/127 (28%)	36/63 (57%)	0/62 (0%)	0/2 (0%)
Overall	1580/2229 (71%)	890/1213 (73%)	547/799 (68%)	143/217 (66%)

7.1.4   Statistically unusual chemical shifts ⓘ

There are no statistically unusual chemical shifts.

7.1.5   Random Coil Index (RCI) plots ⓘ

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

Random coil index (RCI) for chain A:

8 NMR restraints analysis ⓘ

8.1 Conformationally restricting restraints ⓘ

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	60
Intra-residue ($|i\text{-}j|$=0)	0
Sequential ($|i\text{-}j|$=1)	0
Medium range ($|i\text{-}j|$>1 and $|i\text{-}j|$<5)	0
Long range ($|i\text{-}j|$≥5)	0
Inter-chain	60
Hydrogen bond restraints	0
Disulfide bond restraints	0
Total dihedral-angle restraints	0
Number of unmapped restraints	0
Number of restraints per residue	0.1
Number of long range restraints per residue[1]	0.0

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

8.2 Residual restraint violations ⓘ

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.

8.2.1 Average number of distance violations per model ⓘ

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)	1.0	0.16
0.2-0.5 (Medium)	None	None
>0.5 (Large)	None	None

8.2.2 Average number of dihedral-angle violations per model ⓘ

Dihedral-angle violations less than 1° are not included in the calculation.There are no dihedral-angle violations
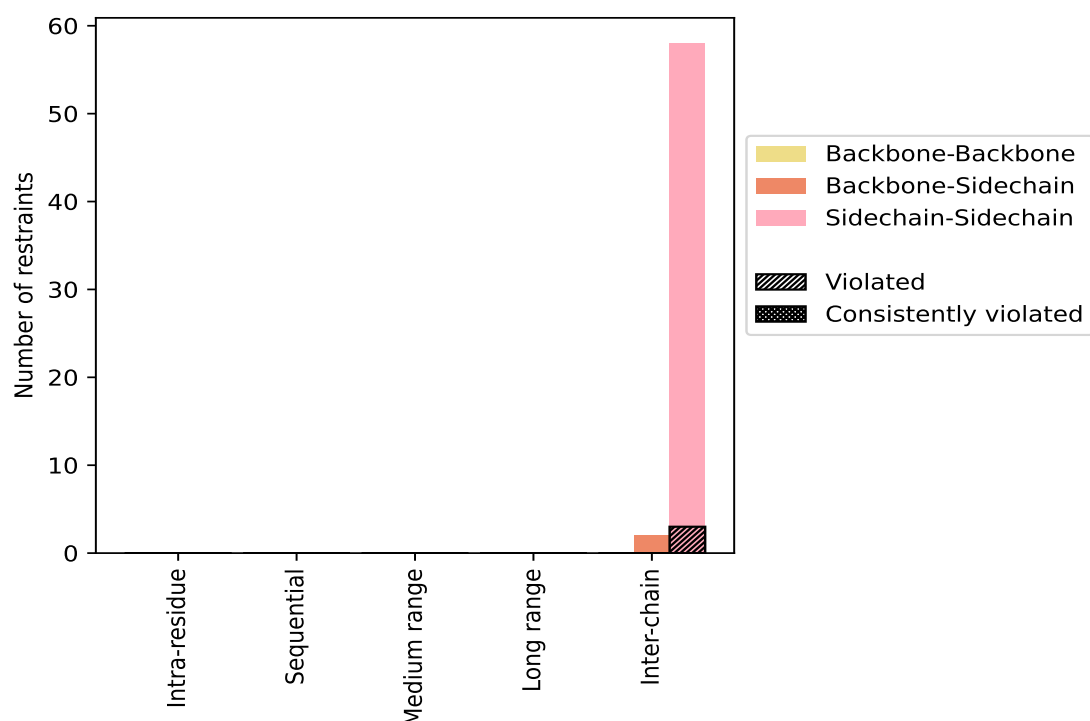
9 Distance violation analysis ⓘ

9.1 Summary of distance violations ⓘ

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.

Restraints type	Count	$\%^1$	Violated[3]			Consistently Violated[4]		
			Count	$\%^2$	$\%^1$	Count	$\%^2$	$\%^1$
Intra-residue (|i-j|=0)	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
Sequential (|i-j|=1)	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
Medium range (|i-j|>1 & |i-j|<5)	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
Long range (|i-j|≥5)	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
Inter-chain	60	100.0	3	5.0	5.0	0	0.0	0.0
Backbone-Backbone	0	0.0	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	2	3.3	0	0.0	0.0	0	0.0	0.0
Sidechain-Sidechain	58	96.7	3	5.2	5.0	0	0.0	0.0
Hydrogen bond	0	0.0	0	0.0	0.0	0	0.0	0.0
Disulfide bond	0	0.0	0	0.0	0.0	0	0.0	0.0
Total	60	100.0	3	5.0	5.0	0	0.0	0.0
Backbone-Backbone	0	0.0	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	2	3.3	0	0.0	0.0	0	0.0	0.0
Sidechain-Sidechain	58	96.7	3	5.2	5.0	0	0.0	0.0

[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

9.1.1 Bar chart : Distribution of distance restraints and violations ⓘ

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
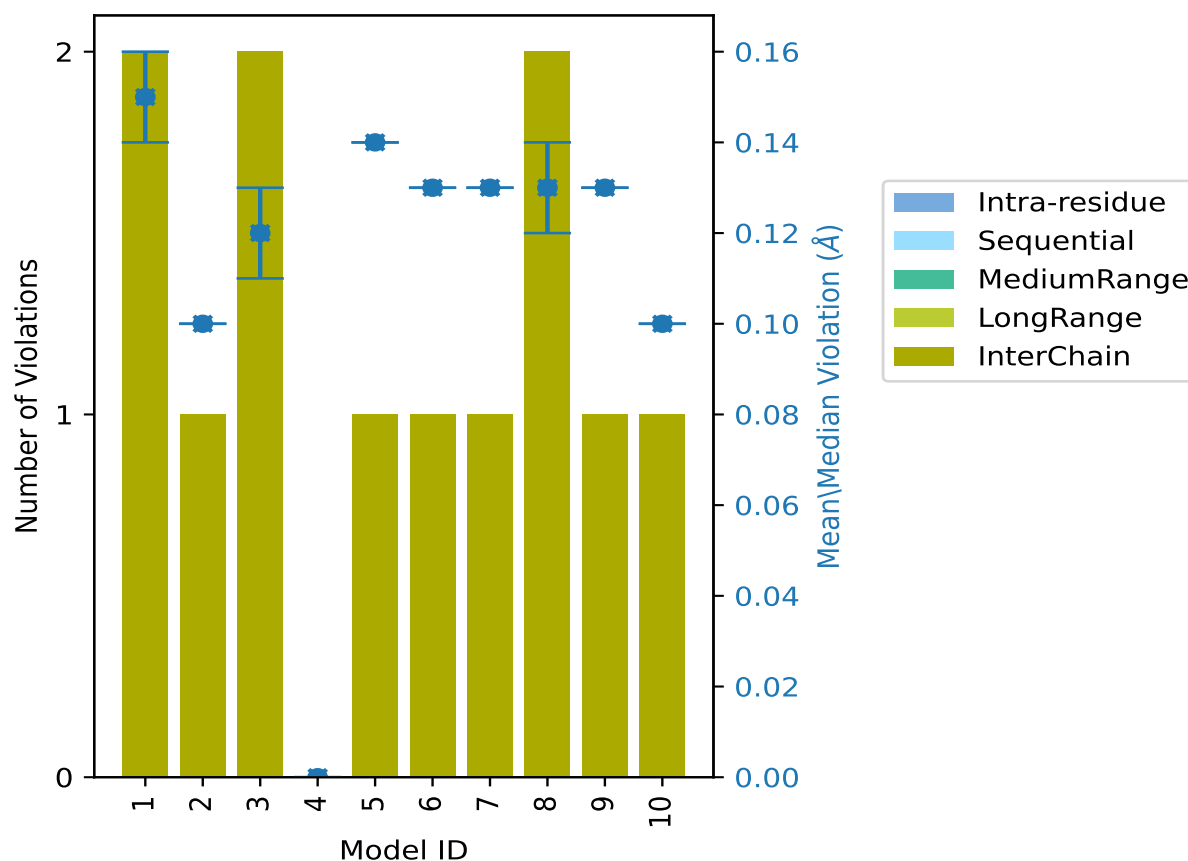
9.2 Distance violation statistics for each model ⓘ

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)	SD[6] (Å)	Median (Å)
	IR[1]	SQ[2]	MR[3]	LR[4]	IC[5]	Total				
1	0	0	0	0	2	2	0.15	0.16	0.01	0.15
2	0	0	0	0	1	1	0.1	0.1	0.0	0.1
3	0	0	0	0	2	2	0.12	0.13	0.01	0.12
4	0	0	0	0	0	0	0.0	0.0	0.0	0.0
5	0	0	0	0	1	1	0.14	0.14	0.0	0.14
6	0	0	0	0	1	1	0.13	0.13	0.0	0.13
7	0	0	0	0	1	1	0.13	0.13	0.0	0.13
8	0	0	0	0	2	2	0.13	0.14	0.01	0.13
9	0	0	0	0	1	1	0.13	0.13	0.0	0.13
10	0	0	0	0	1	1	0.1	0.1	0.0	0.1

[1]Intra-residue restraints, [2]Sequential restraints, [3]Medium range restraints, [4]Long range restraints, [5]Inter-chain restraints, [6]Standard deviation

9.2.1 Bar graph : Distance Violation statistics for each model ⓘ

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

9.3 Distance violation statistics for the ensemble ⓘ

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, 57(IR:0, SQ:0, MR:0, LR:0, IC:57) restraints are not violated in the ensemble.

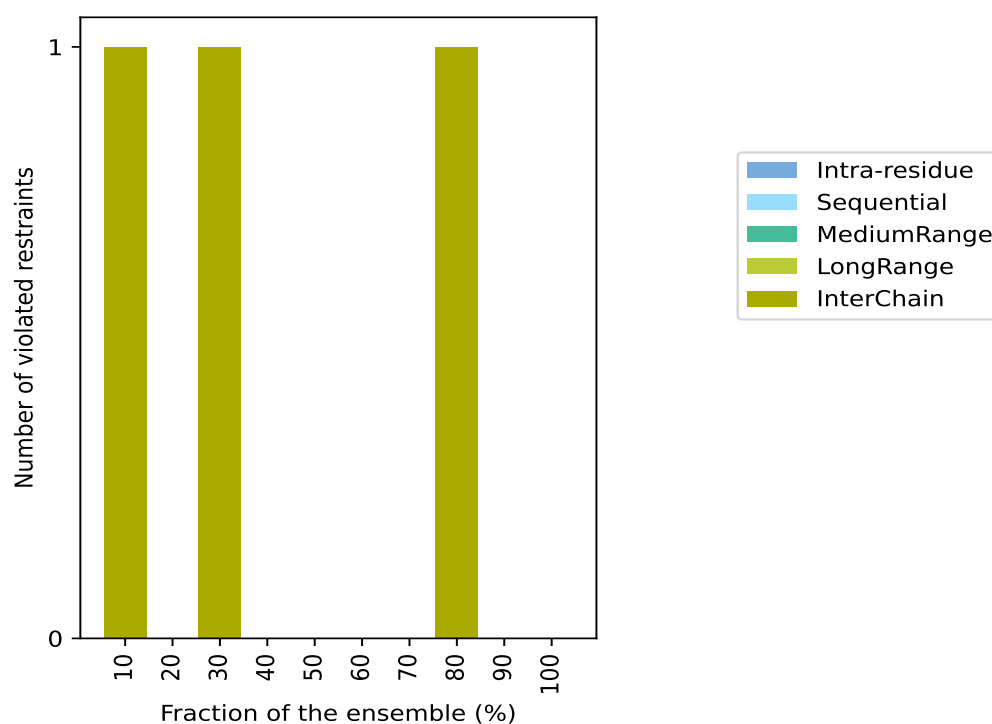| Number of violated restraints						Fraction of the ensemble	
IR[1]	SQ[2]	MR[3]	LR[4]	IC[5]	Total	Count[6]	%
0	0	0	0	1	1	1	10.0
0	0	0	0	0	0	2	20.0
0	0	0	0	1	1	3	30.0

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Number of violated restraints						Fraction of the ensemble	
IR[1]	SQ[2]	MR[3]	LR[4]	IC[5]	Total	Count[6]	%
0	0	0	0	0	0	4	40.0
0	0	0	0	0	0	5	50.0
0	0	0	0	0	0	6	60.0
0	0	0	0	0	0	7	70.0
0	0	0	0	1	1	8	80.0
0	0	0	0	0	0	9	90.0
0	0	0	0	0	0	10	100.0

[1]Intra-residue restraints, [2]Sequential restraints, [3]Medium range restraints, [4]Long range restraints, [5]Inter-chain restraints, [6] Number of models with violations

9.3.1　Bar graph : Distance violation statistics for the ensemble ⓘ
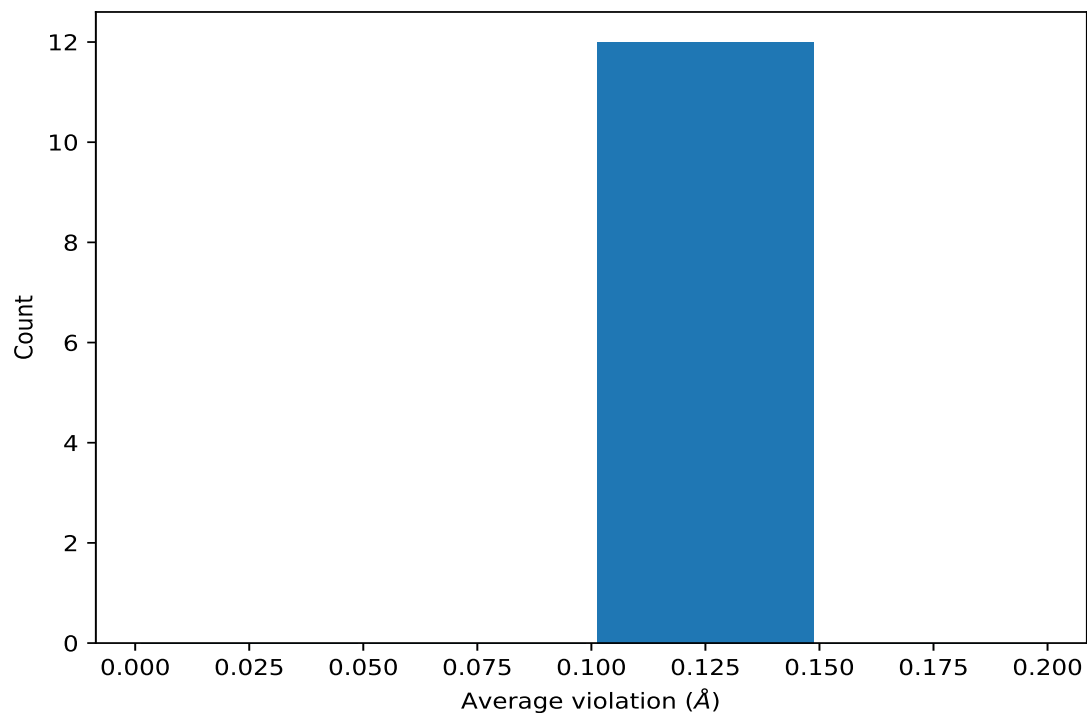

9.4　Most violated distance restraints in the ensemble ⓘ

9.4.1　Histogram : Distribution of mean distance violations ⓘ

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 distance restraints ⓘ

The following table provides the mean and the standard deviation of theviolation for each restraint sorted by number of violated models and the mean 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.
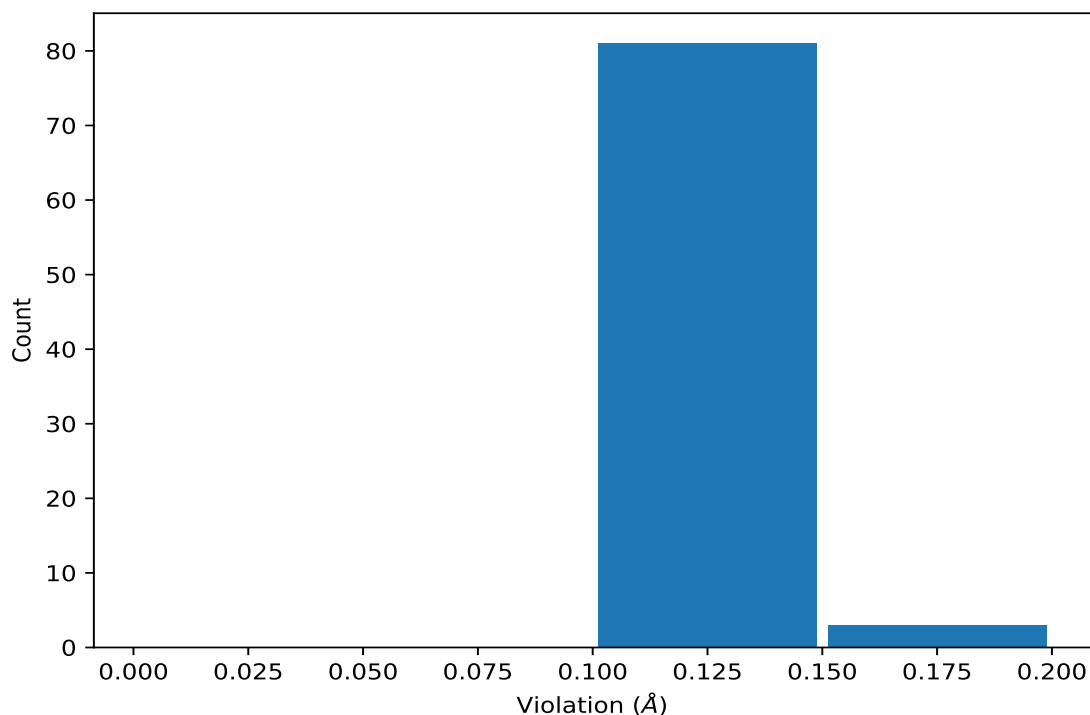
Key	Atom-1	Atom-2	Models[1]	Mean (Å)	SD[1] (Å)	Median (Å)
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG11	8	0.13	0.02	0.13
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG12	8	0.13	0.02	0.13
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG13	8	0.13	0.02	0.13
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG11	8	0.13	0.02	0.13
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG12	8	0.13	0.02	0.13
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG13	8	0.13	0.02	0.13
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG11	8	0.13	0.02	0.13
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG12	8	0.13	0.02	0.13
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG13	8	0.13	0.02	0.13
(1,2)	1:16:A:ALA:HB1	2:858:B:TRP:HE3	3	0.13	0.02	0.12
(1,2)	1:16:A:ALA:HB2	2:858:B:TRP:HE3	3	0.13	0.02	0.12
(1,2)	1:16:A:ALA:HB3	2:858:B:TRP:HE3	3	0.13	0.02	0.12

[1]Number of violated models, [2]Standard deviation

9.5 All violated distance restraints ⓘ

9.5.1 Histogram : Distribution of distance violations ⓘ

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 distance violations ⓘ

The following table lists the absolute value of the violation for each restraint in the ensemble sorted by its 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)
(1,2)	1:16:A:ALA:HB1	2:858:B:TRP:HE3	1	0.16
(1,2)	1:16:A:ALA:HB2	2:858:B:TRP:HE3	1	0.16
(1,2)	1:16:A:ALA:HB3	2:858:B:TRP:HE3	1	0.16
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG11	1	0.14
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG12	1	0.14
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG13	1	0.14
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG11	1	0.14
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG12	1	0.14
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG13	1	0.14
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG11	1	0.14

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG12	1	0.14
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG13	1	0.14
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG11	5	0.14
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG12	5	0.14
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG13	5	0.14
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG11	5	0.14
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG12	5	0.14
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG13	5	0.14
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG11	5	0.14
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG12	5	0.14
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG13	5	0.14
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG11	8	0.14
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG12	8	0.14
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG13	8	0.14
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG11	8	0.14
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG12	8	0.14
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG13	8	0.14
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG11	8	0.14
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG12	8	0.14
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG13	8	0.14
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG11	3	0.13
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG12	3	0.13
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG13	3	0.13
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG11	3	0.13
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG12	3	0.13
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG13	3	0.13
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG11	3	0.13
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG12	3	0.13
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG13	3	0.13
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG11	6	0.13
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG12	6	0.13
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG13	6	0.13
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG11	6	0.13
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG12	6	0.13
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG13	6	0.13
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG11	6	0.13
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG12	6	0.13
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG13	6	0.13
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG11	9	0.13
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG12	9	0.13
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG13	9	0.13
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG11	9	0.13

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG12	9	0.13
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG13	9	0.13
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG11	9	0.13
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG12	9	0.13
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG13	9	0.13
(1,27)	1:72:A:MET:HE1	2:858:B:TRP:HZ2	7	0.13
(1,27)	1:72:A:MET:HE2	2:858:B:TRP:HZ2	7	0.13
(1,27)	1:72:A:MET:HE3	2:858:B:TRP:HZ2	7	0.13
(1,2)	1:16:A:ALA:HB1	2:858:B:TRP:HE3	3	0.12
(1,2)	1:16:A:ALA:HB2	2:858:B:TRP:HE3	3	0.12
(1,2)	1:16:A:ALA:HB3	2:858:B:TRP:HE3	3	0.12
(1,2)	1:16:A:ALA:HB1	2:858:B:TRP:HE3	8	0.12
(1,2)	1:16:A:ALA:HB2	2:858:B:TRP:HE3	8	0.12
(1,2)	1:16:A:ALA:HB3	2:858:B:TRP:HE3	8	0.12
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG11	2	0.1
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG12	2	0.1
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG13	2	0.1
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG11	2	0.1
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG12	2	0.1
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG13	2	0.1
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG11	2	0.1
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG12	2	0.1
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG13	2	0.1
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG11	10	0.1
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG12	10	0.1
(1,60)	1:147:A:THR:HG21	2:857:B:VAL:HG13	10	0.1
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG11	10	0.1
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG12	10	0.1
(1,60)	1:147:A:THR:HG22	2:857:B:VAL:HG13	10	0.1
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG11	10	0.1
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG12	10	0.1
(1,60)	1:147:A:THR:HG23	2:857:B:VAL:HG13	10	0.1

10   Dihedral-angle violation analysis ⓘ

No dihedral-angle restraints found