



wwPDB X-ray Structure Validation Summary Report

Mar 10, 2024 – 06:58 AM EDT

PDB ID : 4GQH
Title : The Conformations and Interactions of the Four-Layer Aggregate Revealed by X-ray Crystallography Diffraction Implied the Importance of Peptides at Opposite Ends in Their Assemblies
Authors : Li, X.Y.; Song, B.A.; Hu, D.Y.; Chen, X.; Wang, Z.C.; Zeng, M.J.; Yu, D.D.; Chen, Z.; Jin, L.H.; Yang, S.
Deposited on : 2012-08-23
Resolution : 3.06 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the  symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

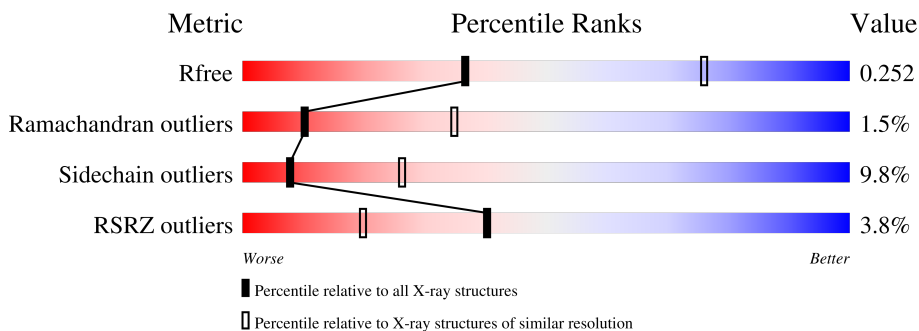
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.06 Å.

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



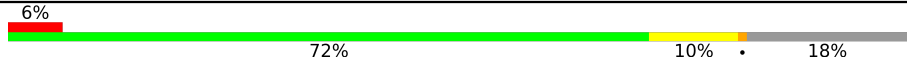

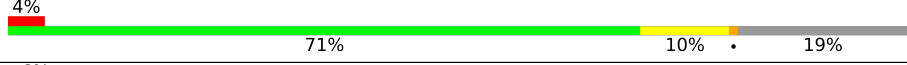

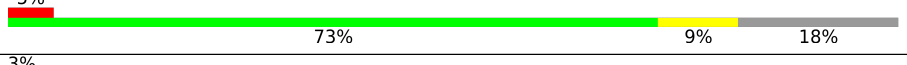
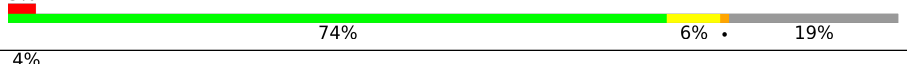
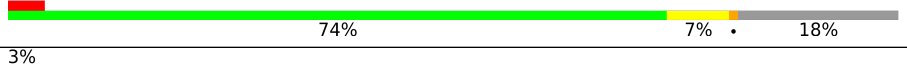

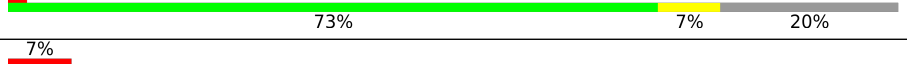


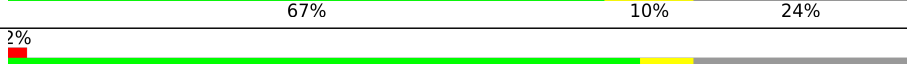
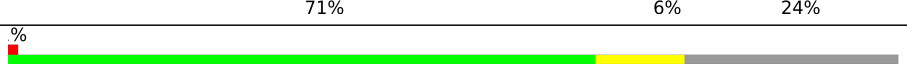
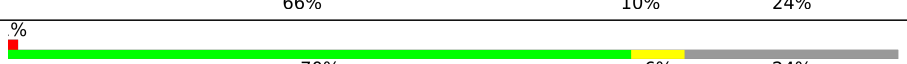

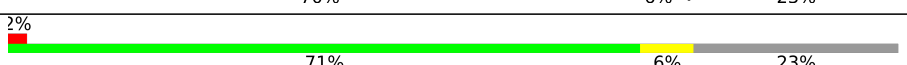
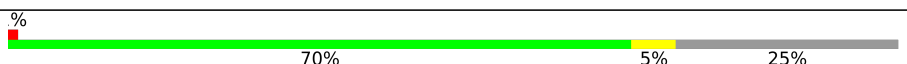
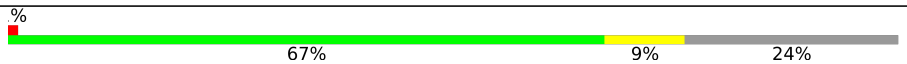
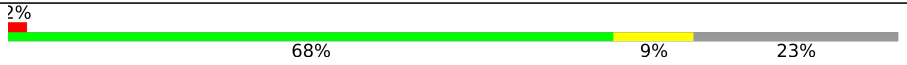


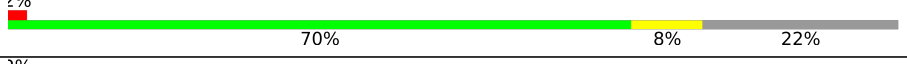
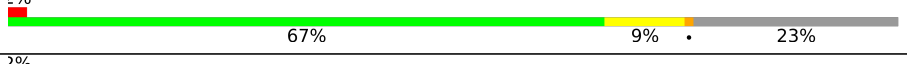


Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1754 (3.10-3.02)
Ramachandran outliers	138981	1794 (3.10-3.02)
Sidechain outliers	138945	1793 (3.10-3.02)
RSRZ outliers	127900	1713 (3.10-3.02)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	174	 3% 75% 6% 18%
1	B	174	 2% 72% 7% 20%
1	C	174	 6% 77% 6% 17%
1	D	174	 5% 74% 9% 18%
1	E	174	 3% 71% 9% 20%
1	F	174	 5% 74% 9% 18%

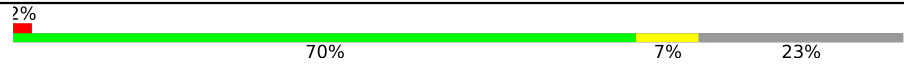


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Mol	Chain	Length	Quality of chain
1	G	174	
1	H	174	
1	I	174	
1	J	174	
1	K	174	
1	L	174	
1	M	174	
1	N	174	
1	O	174	
1	P	174	
1	Q	174	
1	R	174	
1	S	174	
1	T	174	
1	U	174	
1	V	174	
1	W	174	
1	X	174	
1	Y	174	
1	Z	174	
1	a	174	
1	b	174	
1	c	174	
1	d	174	
1	e	174	

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Mol	Chain	Length	Quality of chain
1	f	174	 2% 70% 7% 23%
1	h	174	 2% 68% 9% 23%
1	i	174	 2% 70% 7% 23%

2 Entry composition [i](#)

There is only 1 type of molecule in this entry. The entry contains 36918 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Capsid protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	142	1115	703	195	216	1	0	0	0
1	B	139	1096	691	192	212	1	0	0	0
1	C	144	1132	713	197	221	1	0	0	0
1	D	143	1126	709	199	217	1	0	0	0
1	E	140	1100	693	193	213	1	0	0	0
1	F	143	1131	712	199	219	1	0	0	0
1	G	143	1131	715	199	216	1	0	0	0
1	H	144	1135	714	200	220	1	0	0	0
1	I	141	1111	701	194	215	1	0	0	0
1	J	145	1143	719	201	222	1	0	0	0
1	K	143	1131	712	199	219	1	0	0	0
1	L	141	1111	701	194	215	1	0	0	0
1	M	142	1122	707	198	216	1	0	0	0
1	N	142	1122	707	198	216	1	0	0	0
1	O	140	1100	693	193	213	1	0	0	0
1	P	147	1157	728	203	225	1	0	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	Q	146	1150	723	202	224	1	0	0	0
1	R	133	1046	664	179	202	1	0	0	0
1	S	133	1046	664	179	202	1	0	0	0
1	T	132	1039	659	178	201	1	0	0	0
1	U	133	1046	664	179	202	1	0	0	0
1	V	134	1054	668	181	204	1	0	0	0
1	W	134	1054	668	181	204	1	0	0	0
1	X	131	1028	653	174	200	1	0	0	0
1	Y	132	1035	658	175	201	1	0	0	0
1	Z	134	1054	668	181	204	1	0	0	0
1	a	131	1029	655	174	199	1	0	0	0
1	b	132	1035	658	175	201	1	0	0	0
1	c	136	1069	676	186	206	1	0	0	0
1	d	134	1054	668	181	204	1	0	0	0
1	e	134	1054	668	181	204	1	0	0	0
1	f	134	1054	668	181	204	1	0	0	0
1	h	134	1054	668	181	204	1	0	0	0
1	i	134	1054	668	181	204	1	0	0	0

There are 680 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	expression tag	UNP P69687
A	-18	GLY	-	expression tag	UNP P69687
A	-17	SER	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-16	SER	-	expression tag	UNP P69687
A	-15	HIS	-	expression tag	UNP P69687
A	-14	HIS	-	expression tag	UNP P69687
A	-13	HIS	-	expression tag	UNP P69687
A	-12	HIS	-	expression tag	UNP P69687
A	-11	HIS	-	expression tag	UNP P69687
A	-10	HIS	-	expression tag	UNP P69687
A	-9	SER	-	expression tag	UNP P69687
A	-8	SER	-	expression tag	UNP P69687
A	-7	GLY	-	expression tag	UNP P69687
A	-6	LEU	-	expression tag	UNP P69687
A	-5	VAL	-	expression tag	UNP P69687
A	-4	PRO	-	expression tag	UNP P69687
A	-3	ARG	-	expression tag	UNP P69687
A	-2	GLY	-	expression tag	UNP P69687
A	-1	SER	-	expression tag	UNP P69687
A	0	HIS	-	expression tag	UNP P69687
B	-19	MET	-	expression tag	UNP P69687
B	-18	GLY	-	expression tag	UNP P69687
B	-17	SER	-	expression tag	UNP P69687
B	-16	SER	-	expression tag	UNP P69687
B	-15	HIS	-	expression tag	UNP P69687
B	-14	HIS	-	expression tag	UNP P69687
B	-13	HIS	-	expression tag	UNP P69687
B	-12	HIS	-	expression tag	UNP P69687
B	-11	HIS	-	expression tag	UNP P69687
B	-10	HIS	-	expression tag	UNP P69687
B	-9	SER	-	expression tag	UNP P69687
B	-8	SER	-	expression tag	UNP P69687
B	-7	GLY	-	expression tag	UNP P69687
B	-6	LEU	-	expression tag	UNP P69687
B	-5	VAL	-	expression tag	UNP P69687
B	-4	PRO	-	expression tag	UNP P69687
B	-3	ARG	-	expression tag	UNP P69687
B	-2	GLY	-	expression tag	UNP P69687
B	-1	SER	-	expression tag	UNP P69687
B	0	HIS	-	expression tag	UNP P69687
C	-19	MET	-	expression tag	UNP P69687
C	-18	GLY	-	expression tag	UNP P69687
C	-17	SER	-	expression tag	UNP P69687
C	-16	SER	-	expression tag	UNP P69687
C	-15	HIS	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-14	HIS	-	expression tag	UNP P69687
C	-13	HIS	-	expression tag	UNP P69687
C	-12	HIS	-	expression tag	UNP P69687
C	-11	HIS	-	expression tag	UNP P69687
C	-10	HIS	-	expression tag	UNP P69687
C	-9	SER	-	expression tag	UNP P69687
C	-8	SER	-	expression tag	UNP P69687
C	-7	GLY	-	expression tag	UNP P69687
C	-6	LEU	-	expression tag	UNP P69687
C	-5	VAL	-	expression tag	UNP P69687
C	-4	PRO	-	expression tag	UNP P69687
C	-3	ARG	-	expression tag	UNP P69687
C	-2	GLY	-	expression tag	UNP P69687
C	-1	SER	-	expression tag	UNP P69687
C	0	HIS	-	expression tag	UNP P69687
D	-19	MET	-	expression tag	UNP P69687
D	-18	GLY	-	expression tag	UNP P69687
D	-17	SER	-	expression tag	UNP P69687
D	-16	SER	-	expression tag	UNP P69687
D	-15	HIS	-	expression tag	UNP P69687
D	-14	HIS	-	expression tag	UNP P69687
D	-13	HIS	-	expression tag	UNP P69687
D	-12	HIS	-	expression tag	UNP P69687
D	-11	HIS	-	expression tag	UNP P69687
D	-10	HIS	-	expression tag	UNP P69687
D	-9	SER	-	expression tag	UNP P69687
D	-8	SER	-	expression tag	UNP P69687
D	-7	GLY	-	expression tag	UNP P69687
D	-6	LEU	-	expression tag	UNP P69687
D	-5	VAL	-	expression tag	UNP P69687
D	-4	PRO	-	expression tag	UNP P69687
D	-3	ARG	-	expression tag	UNP P69687
D	-2	GLY	-	expression tag	UNP P69687
D	-1	SER	-	expression tag	UNP P69687
D	0	HIS	-	expression tag	UNP P69687
E	-19	MET	-	expression tag	UNP P69687
E	-18	GLY	-	expression tag	UNP P69687
E	-17	SER	-	expression tag	UNP P69687
E	-16	SER	-	expression tag	UNP P69687
E	-15	HIS	-	expression tag	UNP P69687
E	-14	HIS	-	expression tag	UNP P69687
E	-13	HIS	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
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E	-11	HIS	-	expression tag	UNP P69687
E	-10	HIS	-	expression tag	UNP P69687
E	-9	SER	-	expression tag	UNP P69687
E	-8	SER	-	expression tag	UNP P69687
E	-7	GLY	-	expression tag	UNP P69687
E	-6	LEU	-	expression tag	UNP P69687
E	-5	VAL	-	expression tag	UNP P69687
E	-4	PRO	-	expression tag	UNP P69687
E	-3	ARG	-	expression tag	UNP P69687
E	-2	GLY	-	expression tag	UNP P69687
E	-1	SER	-	expression tag	UNP P69687
E	0	HIS	-	expression tag	UNP P69687
F	-19	MET	-	expression tag	UNP P69687
F	-18	GLY	-	expression tag	UNP P69687
F	-17	SER	-	expression tag	UNP P69687
F	-16	SER	-	expression tag	UNP P69687
F	-15	HIS	-	expression tag	UNP P69687
F	-14	HIS	-	expression tag	UNP P69687
F	-13	HIS	-	expression tag	UNP P69687
F	-12	HIS	-	expression tag	UNP P69687
F	-11	HIS	-	expression tag	UNP P69687
F	-10	HIS	-	expression tag	UNP P69687
F	-9	SER	-	expression tag	UNP P69687
F	-8	SER	-	expression tag	UNP P69687
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F	-5	VAL	-	expression tag	UNP P69687
F	-4	PRO	-	expression tag	UNP P69687
F	-3	ARG	-	expression tag	UNP P69687
F	-2	GLY	-	expression tag	UNP P69687
F	-1	SER	-	expression tag	UNP P69687
F	0	HIS	-	expression tag	UNP P69687
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G	-18	GLY	-	expression tag	UNP P69687
G	-17	SER	-	expression tag	UNP P69687
G	-16	SER	-	expression tag	UNP P69687
G	-15	HIS	-	expression tag	UNP P69687
G	-14	HIS	-	expression tag	UNP P69687
G	-13	HIS	-	expression tag	UNP P69687
G	-12	HIS	-	expression tag	UNP P69687
G	-11	HIS	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
G	-10	HIS	-	expression tag	UNP P69687
G	-9	SER	-	expression tag	UNP P69687
G	-8	SER	-	expression tag	UNP P69687
G	-7	GLY	-	expression tag	UNP P69687
G	-6	LEU	-	expression tag	UNP P69687
G	-5	VAL	-	expression tag	UNP P69687
G	-4	PRO	-	expression tag	UNP P69687
G	-3	ARG	-	expression tag	UNP P69687
G	-2	GLY	-	expression tag	UNP P69687
G	-1	SER	-	expression tag	UNP P69687
G	0	HIS	-	expression tag	UNP P69687
H	-19	MET	-	expression tag	UNP P69687
H	-18	GLY	-	expression tag	UNP P69687
H	-17	SER	-	expression tag	UNP P69687
H	-16	SER	-	expression tag	UNP P69687
H	-15	HIS	-	expression tag	UNP P69687
H	-14	HIS	-	expression tag	UNP P69687
H	-13	HIS	-	expression tag	UNP P69687
H	-12	HIS	-	expression tag	UNP P69687
H	-11	HIS	-	expression tag	UNP P69687
H	-10	HIS	-	expression tag	UNP P69687
H	-9	SER	-	expression tag	UNP P69687
H	-8	SER	-	expression tag	UNP P69687
H	-7	GLY	-	expression tag	UNP P69687
H	-6	LEU	-	expression tag	UNP P69687
H	-5	VAL	-	expression tag	UNP P69687
H	-4	PRO	-	expression tag	UNP P69687
H	-3	ARG	-	expression tag	UNP P69687
H	-2	GLY	-	expression tag	UNP P69687
H	-1	SER	-	expression tag	UNP P69687
H	0	HIS	-	expression tag	UNP P69687
I	-19	MET	-	expression tag	UNP P69687
I	-18	GLY	-	expression tag	UNP P69687
I	-17	SER	-	expression tag	UNP P69687
I	-16	SER	-	expression tag	UNP P69687
I	-15	HIS	-	expression tag	UNP P69687
I	-14	HIS	-	expression tag	UNP P69687
I	-13	HIS	-	expression tag	UNP P69687
I	-12	HIS	-	expression tag	UNP P69687
I	-11	HIS	-	expression tag	UNP P69687
I	-10	HIS	-	expression tag	UNP P69687
I	-9	SER	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
I	-8	SER	-	expression tag	UNP P69687
I	-7	GLY	-	expression tag	UNP P69687
I	-6	LEU	-	expression tag	UNP P69687
I	-5	VAL	-	expression tag	UNP P69687
I	-4	PRO	-	expression tag	UNP P69687
I	-3	ARG	-	expression tag	UNP P69687
I	-2	GLY	-	expression tag	UNP P69687
I	-1	SER	-	expression tag	UNP P69687
I	0	HIS	-	expression tag	UNP P69687
J	-19	MET	-	expression tag	UNP P69687
J	-18	GLY	-	expression tag	UNP P69687
J	-17	SER	-	expression tag	UNP P69687
J	-16	SER	-	expression tag	UNP P69687
J	-15	HIS	-	expression tag	UNP P69687
J	-14	HIS	-	expression tag	UNP P69687
J	-13	HIS	-	expression tag	UNP P69687
J	-12	HIS	-	expression tag	UNP P69687
J	-11	HIS	-	expression tag	UNP P69687
J	-10	HIS	-	expression tag	UNP P69687
J	-9	SER	-	expression tag	UNP P69687
J	-8	SER	-	expression tag	UNP P69687
J	-7	GLY	-	expression tag	UNP P69687
J	-6	LEU	-	expression tag	UNP P69687
J	-5	VAL	-	expression tag	UNP P69687
J	-4	PRO	-	expression tag	UNP P69687
J	-3	ARG	-	expression tag	UNP P69687
J	-2	GLY	-	expression tag	UNP P69687
J	-1	SER	-	expression tag	UNP P69687
J	0	HIS	-	expression tag	UNP P69687
K	-19	MET	-	expression tag	UNP P69687
K	-18	GLY	-	expression tag	UNP P69687
K	-17	SER	-	expression tag	UNP P69687
K	-16	SER	-	expression tag	UNP P69687
K	-15	HIS	-	expression tag	UNP P69687
K	-14	HIS	-	expression tag	UNP P69687
K	-13	HIS	-	expression tag	UNP P69687
K	-12	HIS	-	expression tag	UNP P69687
K	-11	HIS	-	expression tag	UNP P69687
K	-10	HIS	-	expression tag	UNP P69687
K	-9	SER	-	expression tag	UNP P69687
K	-8	SER	-	expression tag	UNP P69687
K	-7	GLY	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
K	-6	LEU	-	expression tag	UNP P69687
K	-5	VAL	-	expression tag	UNP P69687
K	-4	PRO	-	expression tag	UNP P69687
K	-3	ARG	-	expression tag	UNP P69687
K	-2	GLY	-	expression tag	UNP P69687
K	-1	SER	-	expression tag	UNP P69687
K	0	HIS	-	expression tag	UNP P69687
L	-19	MET	-	expression tag	UNP P69687
L	-18	GLY	-	expression tag	UNP P69687
L	-17	SER	-	expression tag	UNP P69687
L	-16	SER	-	expression tag	UNP P69687
L	-15	HIS	-	expression tag	UNP P69687
L	-14	HIS	-	expression tag	UNP P69687
L	-13	HIS	-	expression tag	UNP P69687
L	-12	HIS	-	expression tag	UNP P69687
L	-11	HIS	-	expression tag	UNP P69687
L	-10	HIS	-	expression tag	UNP P69687
L	-9	SER	-	expression tag	UNP P69687
L	-8	SER	-	expression tag	UNP P69687
L	-7	GLY	-	expression tag	UNP P69687
L	-6	LEU	-	expression tag	UNP P69687
L	-5	VAL	-	expression tag	UNP P69687
L	-4	PRO	-	expression tag	UNP P69687
L	-3	ARG	-	expression tag	UNP P69687
L	-2	GLY	-	expression tag	UNP P69687
L	-1	SER	-	expression tag	UNP P69687
L	0	HIS	-	expression tag	UNP P69687
M	-19	MET	-	expression tag	UNP P69687
M	-18	GLY	-	expression tag	UNP P69687
M	-17	SER	-	expression tag	UNP P69687
M	-16	SER	-	expression tag	UNP P69687
M	-15	HIS	-	expression tag	UNP P69687
M	-14	HIS	-	expression tag	UNP P69687
M	-13	HIS	-	expression tag	UNP P69687
M	-12	HIS	-	expression tag	UNP P69687
M	-11	HIS	-	expression tag	UNP P69687
M	-10	HIS	-	expression tag	UNP P69687
M	-9	SER	-	expression tag	UNP P69687
M	-8	SER	-	expression tag	UNP P69687
M	-7	GLY	-	expression tag	UNP P69687
M	-6	LEU	-	expression tag	UNP P69687
M	-5	VAL	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
M	-4	PRO	-	expression tag	UNP P69687
M	-3	ARG	-	expression tag	UNP P69687
M	-2	GLY	-	expression tag	UNP P69687
M	-1	SER	-	expression tag	UNP P69687
M	0	HIS	-	expression tag	UNP P69687
N	-19	MET	-	expression tag	UNP P69687
N	-18	GLY	-	expression tag	UNP P69687
N	-17	SER	-	expression tag	UNP P69687
N	-16	SER	-	expression tag	UNP P69687
N	-15	HIS	-	expression tag	UNP P69687
N	-14	HIS	-	expression tag	UNP P69687
N	-13	HIS	-	expression tag	UNP P69687
N	-12	HIS	-	expression tag	UNP P69687
N	-11	HIS	-	expression tag	UNP P69687
N	-10	HIS	-	expression tag	UNP P69687
N	-9	SER	-	expression tag	UNP P69687
N	-8	SER	-	expression tag	UNP P69687
N	-7	GLY	-	expression tag	UNP P69687
N	-6	LEU	-	expression tag	UNP P69687
N	-5	VAL	-	expression tag	UNP P69687
N	-4	PRO	-	expression tag	UNP P69687
N	-3	ARG	-	expression tag	UNP P69687
N	-2	GLY	-	expression tag	UNP P69687
N	-1	SER	-	expression tag	UNP P69687
N	0	HIS	-	expression tag	UNP P69687
O	-19	MET	-	expression tag	UNP P69687
O	-18	GLY	-	expression tag	UNP P69687
O	-17	SER	-	expression tag	UNP P69687
O	-16	SER	-	expression tag	UNP P69687
O	-15	HIS	-	expression tag	UNP P69687
O	-14	HIS	-	expression tag	UNP P69687
O	-13	HIS	-	expression tag	UNP P69687
O	-12	HIS	-	expression tag	UNP P69687
O	-11	HIS	-	expression tag	UNP P69687
O	-10	HIS	-	expression tag	UNP P69687
O	-9	SER	-	expression tag	UNP P69687
O	-8	SER	-	expression tag	UNP P69687
O	-7	GLY	-	expression tag	UNP P69687
O	-6	LEU	-	expression tag	UNP P69687
O	-5	VAL	-	expression tag	UNP P69687
O	-4	PRO	-	expression tag	UNP P69687
O	-3	ARG	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
O	-2	GLY	-	expression tag	UNP P69687
O	-1	SER	-	expression tag	UNP P69687
O	0	HIS	-	expression tag	UNP P69687
P	-19	MET	-	expression tag	UNP P69687
P	-18	GLY	-	expression tag	UNP P69687
P	-17	SER	-	expression tag	UNP P69687
P	-16	SER	-	expression tag	UNP P69687
P	-15	HIS	-	expression tag	UNP P69687
P	-14	HIS	-	expression tag	UNP P69687
P	-13	HIS	-	expression tag	UNP P69687
P	-12	HIS	-	expression tag	UNP P69687
P	-11	HIS	-	expression tag	UNP P69687
P	-10	HIS	-	expression tag	UNP P69687
P	-9	SER	-	expression tag	UNP P69687
P	-8	SER	-	expression tag	UNP P69687
P	-7	GLY	-	expression tag	UNP P69687
P	-6	LEU	-	expression tag	UNP P69687
P	-5	VAL	-	expression tag	UNP P69687
P	-4	PRO	-	expression tag	UNP P69687
P	-3	ARG	-	expression tag	UNP P69687
P	-2	GLY	-	expression tag	UNP P69687
P	-1	SER	-	expression tag	UNP P69687
P	0	HIS	-	expression tag	UNP P69687
Q	-19	MET	-	expression tag	UNP P69687
Q	-18	GLY	-	expression tag	UNP P69687
Q	-17	SER	-	expression tag	UNP P69687
Q	-16	SER	-	expression tag	UNP P69687
Q	-15	HIS	-	expression tag	UNP P69687
Q	-14	HIS	-	expression tag	UNP P69687
Q	-13	HIS	-	expression tag	UNP P69687
Q	-12	HIS	-	expression tag	UNP P69687
Q	-11	HIS	-	expression tag	UNP P69687
Q	-10	HIS	-	expression tag	UNP P69687
Q	-9	SER	-	expression tag	UNP P69687
Q	-8	SER	-	expression tag	UNP P69687
Q	-7	GLY	-	expression tag	UNP P69687
Q	-6	LEU	-	expression tag	UNP P69687
Q	-5	VAL	-	expression tag	UNP P69687
Q	-4	PRO	-	expression tag	UNP P69687
Q	-3	ARG	-	expression tag	UNP P69687
Q	-2	GLY	-	expression tag	UNP P69687
Q	-1	SER	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
Q	0	HIS	-	expression tag	UNP P69687
R	-19	MET	-	expression tag	UNP P69687
R	-18	GLY	-	expression tag	UNP P69687
R	-17	SER	-	expression tag	UNP P69687
R	-16	SER	-	expression tag	UNP P69687
R	-15	HIS	-	expression tag	UNP P69687
R	-14	HIS	-	expression tag	UNP P69687
R	-13	HIS	-	expression tag	UNP P69687
R	-12	HIS	-	expression tag	UNP P69687
R	-11	HIS	-	expression tag	UNP P69687
R	-10	HIS	-	expression tag	UNP P69687
R	-9	SER	-	expression tag	UNP P69687
R	-8	SER	-	expression tag	UNP P69687
R	-7	GLY	-	expression tag	UNP P69687
R	-6	LEU	-	expression tag	UNP P69687
R	-5	VAL	-	expression tag	UNP P69687
R	-4	PRO	-	expression tag	UNP P69687
R	-3	ARG	-	expression tag	UNP P69687
R	-2	GLY	-	expression tag	UNP P69687
R	-1	SER	-	expression tag	UNP P69687
R	0	HIS	-	expression tag	UNP P69687
S	-19	MET	-	expression tag	UNP P69687
S	-18	GLY	-	expression tag	UNP P69687
S	-17	SER	-	expression tag	UNP P69687
S	-16	SER	-	expression tag	UNP P69687
S	-15	HIS	-	expression tag	UNP P69687
S	-14	HIS	-	expression tag	UNP P69687
S	-13	HIS	-	expression tag	UNP P69687
S	-12	HIS	-	expression tag	UNP P69687
S	-11	HIS	-	expression tag	UNP P69687
S	-10	HIS	-	expression tag	UNP P69687
S	-9	SER	-	expression tag	UNP P69687
S	-8	SER	-	expression tag	UNP P69687
S	-7	GLY	-	expression tag	UNP P69687
S	-6	LEU	-	expression tag	UNP P69687
S	-5	VAL	-	expression tag	UNP P69687
S	-4	PRO	-	expression tag	UNP P69687
S	-3	ARG	-	expression tag	UNP P69687
S	-2	GLY	-	expression tag	UNP P69687
S	-1	SER	-	expression tag	UNP P69687
S	0	HIS	-	expression tag	UNP P69687
T	-19	MET	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
T	-18	GLY	-	expression tag	UNP P69687
T	-17	SER	-	expression tag	UNP P69687
T	-16	SER	-	expression tag	UNP P69687
T	-15	HIS	-	expression tag	UNP P69687
T	-14	HIS	-	expression tag	UNP P69687
T	-13	HIS	-	expression tag	UNP P69687
T	-12	HIS	-	expression tag	UNP P69687
T	-11	HIS	-	expression tag	UNP P69687
T	-10	HIS	-	expression tag	UNP P69687
T	-9	SER	-	expression tag	UNP P69687
T	-8	SER	-	expression tag	UNP P69687
T	-7	GLY	-	expression tag	UNP P69687
T	-6	LEU	-	expression tag	UNP P69687
T	-5	VAL	-	expression tag	UNP P69687
T	-4	PRO	-	expression tag	UNP P69687
T	-3	ARG	-	expression tag	UNP P69687
T	-2	GLY	-	expression tag	UNP P69687
T	-1	SER	-	expression tag	UNP P69687
T	0	HIS	-	expression tag	UNP P69687
U	-19	MET	-	expression tag	UNP P69687
U	-18	GLY	-	expression tag	UNP P69687
U	-17	SER	-	expression tag	UNP P69687
U	-16	SER	-	expression tag	UNP P69687
U	-15	HIS	-	expression tag	UNP P69687
U	-14	HIS	-	expression tag	UNP P69687
U	-13	HIS	-	expression tag	UNP P69687
U	-12	HIS	-	expression tag	UNP P69687
U	-11	HIS	-	expression tag	UNP P69687
U	-10	HIS	-	expression tag	UNP P69687
U	-9	SER	-	expression tag	UNP P69687
U	-8	SER	-	expression tag	UNP P69687
U	-7	GLY	-	expression tag	UNP P69687
U	-6	LEU	-	expression tag	UNP P69687
U	-5	VAL	-	expression tag	UNP P69687
U	-4	PRO	-	expression tag	UNP P69687
U	-3	ARG	-	expression tag	UNP P69687
U	-2	GLY	-	expression tag	UNP P69687
U	-1	SER	-	expression tag	UNP P69687
U	0	HIS	-	expression tag	UNP P69687
V	-19	MET	-	expression tag	UNP P69687
V	-18	GLY	-	expression tag	UNP P69687
V	-17	SER	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
V	-16	SER	-	expression tag	UNP P69687
V	-15	HIS	-	expression tag	UNP P69687
V	-14	HIS	-	expression tag	UNP P69687
V	-13	HIS	-	expression tag	UNP P69687
V	-12	HIS	-	expression tag	UNP P69687
V	-11	HIS	-	expression tag	UNP P69687
V	-10	HIS	-	expression tag	UNP P69687
V	-9	SER	-	expression tag	UNP P69687
V	-8	SER	-	expression tag	UNP P69687
V	-7	GLY	-	expression tag	UNP P69687
V	-6	LEU	-	expression tag	UNP P69687
V	-5	VAL	-	expression tag	UNP P69687
V	-4	PRO	-	expression tag	UNP P69687
V	-3	ARG	-	expression tag	UNP P69687
V	-2	GLY	-	expression tag	UNP P69687
V	-1	SER	-	expression tag	UNP P69687
V	0	HIS	-	expression tag	UNP P69687
W	-19	MET	-	expression tag	UNP P69687
W	-18	GLY	-	expression tag	UNP P69687
W	-17	SER	-	expression tag	UNP P69687
W	-16	SER	-	expression tag	UNP P69687
W	-15	HIS	-	expression tag	UNP P69687
W	-14	HIS	-	expression tag	UNP P69687
W	-13	HIS	-	expression tag	UNP P69687
W	-12	HIS	-	expression tag	UNP P69687
W	-11	HIS	-	expression tag	UNP P69687
W	-10	HIS	-	expression tag	UNP P69687
W	-9	SER	-	expression tag	UNP P69687
W	-8	SER	-	expression tag	UNP P69687
W	-7	GLY	-	expression tag	UNP P69687
W	-6	LEU	-	expression tag	UNP P69687
W	-5	VAL	-	expression tag	UNP P69687
W	-4	PRO	-	expression tag	UNP P69687
W	-3	ARG	-	expression tag	UNP P69687
W	-2	GLY	-	expression tag	UNP P69687
W	-1	SER	-	expression tag	UNP P69687
W	0	HIS	-	expression tag	UNP P69687
X	-19	MET	-	expression tag	UNP P69687
X	-18	GLY	-	expression tag	UNP P69687
X	-17	SER	-	expression tag	UNP P69687
X	-16	SER	-	expression tag	UNP P69687
X	-15	HIS	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
X	-14	HIS	-	expression tag	UNP P69687
X	-13	HIS	-	expression tag	UNP P69687
X	-12	HIS	-	expression tag	UNP P69687
X	-11	HIS	-	expression tag	UNP P69687
X	-10	HIS	-	expression tag	UNP P69687
X	-9	SER	-	expression tag	UNP P69687
X	-8	SER	-	expression tag	UNP P69687
X	-7	GLY	-	expression tag	UNP P69687
X	-6	LEU	-	expression tag	UNP P69687
X	-5	VAL	-	expression tag	UNP P69687
X	-4	PRO	-	expression tag	UNP P69687
X	-3	ARG	-	expression tag	UNP P69687
X	-2	GLY	-	expression tag	UNP P69687
X	-1	SER	-	expression tag	UNP P69687
X	0	HIS	-	expression tag	UNP P69687
Y	-19	MET	-	expression tag	UNP P69687
Y	-18	GLY	-	expression tag	UNP P69687
Y	-17	SER	-	expression tag	UNP P69687
Y	-16	SER	-	expression tag	UNP P69687
Y	-15	HIS	-	expression tag	UNP P69687
Y	-14	HIS	-	expression tag	UNP P69687
Y	-13	HIS	-	expression tag	UNP P69687
Y	-12	HIS	-	expression tag	UNP P69687
Y	-11	HIS	-	expression tag	UNP P69687
Y	-10	HIS	-	expression tag	UNP P69687
Y	-9	SER	-	expression tag	UNP P69687
Y	-8	SER	-	expression tag	UNP P69687
Y	-7	GLY	-	expression tag	UNP P69687
Y	-6	LEU	-	expression tag	UNP P69687
Y	-5	VAL	-	expression tag	UNP P69687
Y	-4	PRO	-	expression tag	UNP P69687
Y	-3	ARG	-	expression tag	UNP P69687
Y	-2	GLY	-	expression tag	UNP P69687
Y	-1	SER	-	expression tag	UNP P69687
Y	0	HIS	-	expression tag	UNP P69687
Z	-19	MET	-	expression tag	UNP P69687
Z	-18	GLY	-	expression tag	UNP P69687
Z	-17	SER	-	expression tag	UNP P69687
Z	-16	SER	-	expression tag	UNP P69687
Z	-15	HIS	-	expression tag	UNP P69687
Z	-14	HIS	-	expression tag	UNP P69687
Z	-13	HIS	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
Z	-12	HIS	-	expression tag	UNP P69687
Z	-11	HIS	-	expression tag	UNP P69687
Z	-10	HIS	-	expression tag	UNP P69687
Z	-9	SER	-	expression tag	UNP P69687
Z	-8	SER	-	expression tag	UNP P69687
Z	-7	GLY	-	expression tag	UNP P69687
Z	-6	LEU	-	expression tag	UNP P69687
Z	-5	VAL	-	expression tag	UNP P69687
Z	-4	PRO	-	expression tag	UNP P69687
Z	-3	ARG	-	expression tag	UNP P69687
Z	-2	GLY	-	expression tag	UNP P69687
Z	-1	SER	-	expression tag	UNP P69687
Z	0	HIS	-	expression tag	UNP P69687
a	-19	MET	-	expression tag	UNP P69687
a	-18	GLY	-	expression tag	UNP P69687
a	-17	SER	-	expression tag	UNP P69687
a	-16	SER	-	expression tag	UNP P69687
a	-15	HIS	-	expression tag	UNP P69687
a	-14	HIS	-	expression tag	UNP P69687
a	-13	HIS	-	expression tag	UNP P69687
a	-12	HIS	-	expression tag	UNP P69687
a	-11	HIS	-	expression tag	UNP P69687
a	-10	HIS	-	expression tag	UNP P69687
a	-9	SER	-	expression tag	UNP P69687
a	-8	SER	-	expression tag	UNP P69687
a	-7	GLY	-	expression tag	UNP P69687
a	-6	LEU	-	expression tag	UNP P69687
a	-5	VAL	-	expression tag	UNP P69687
a	-4	PRO	-	expression tag	UNP P69687
a	-3	ARG	-	expression tag	UNP P69687
a	-2	GLY	-	expression tag	UNP P69687
a	-1	SER	-	expression tag	UNP P69687
a	0	HIS	-	expression tag	UNP P69687
b	-19	MET	-	expression tag	UNP P69687
b	-18	GLY	-	expression tag	UNP P69687
b	-17	SER	-	expression tag	UNP P69687
b	-16	SER	-	expression tag	UNP P69687
b	-15	HIS	-	expression tag	UNP P69687
b	-14	HIS	-	expression tag	UNP P69687
b	-13	HIS	-	expression tag	UNP P69687
b	-12	HIS	-	expression tag	UNP P69687
b	-11	HIS	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
b	-10	HIS	-	expression tag	UNP P69687
b	-9	SER	-	expression tag	UNP P69687
b	-8	SER	-	expression tag	UNP P69687
b	-7	GLY	-	expression tag	UNP P69687
b	-6	LEU	-	expression tag	UNP P69687
b	-5	VAL	-	expression tag	UNP P69687
b	-4	PRO	-	expression tag	UNP P69687
b	-3	ARG	-	expression tag	UNP P69687
b	-2	GLY	-	expression tag	UNP P69687
b	-1	SER	-	expression tag	UNP P69687
b	0	HIS	-	expression tag	UNP P69687
c	-19	MET	-	expression tag	UNP P69687
c	-18	GLY	-	expression tag	UNP P69687
c	-17	SER	-	expression tag	UNP P69687
c	-16	SER	-	expression tag	UNP P69687
c	-15	HIS	-	expression tag	UNP P69687
c	-14	HIS	-	expression tag	UNP P69687
c	-13	HIS	-	expression tag	UNP P69687
c	-12	HIS	-	expression tag	UNP P69687
c	-11	HIS	-	expression tag	UNP P69687
c	-10	HIS	-	expression tag	UNP P69687
c	-9	SER	-	expression tag	UNP P69687
c	-8	SER	-	expression tag	UNP P69687
c	-7	GLY	-	expression tag	UNP P69687
c	-6	LEU	-	expression tag	UNP P69687
c	-5	VAL	-	expression tag	UNP P69687
c	-4	PRO	-	expression tag	UNP P69687
c	-3	ARG	-	expression tag	UNP P69687
c	-2	GLY	-	expression tag	UNP P69687
c	-1	SER	-	expression tag	UNP P69687
c	0	HIS	-	expression tag	UNP P69687
d	-19	MET	-	expression tag	UNP P69687
d	-18	GLY	-	expression tag	UNP P69687
d	-17	SER	-	expression tag	UNP P69687
d	-16	SER	-	expression tag	UNP P69687
d	-15	HIS	-	expression tag	UNP P69687
d	-14	HIS	-	expression tag	UNP P69687
d	-13	HIS	-	expression tag	UNP P69687
d	-12	HIS	-	expression tag	UNP P69687
d	-11	HIS	-	expression tag	UNP P69687
d	-10	HIS	-	expression tag	UNP P69687
d	-9	SER	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
d	-8	SER	-	expression tag	UNP P69687
d	-7	GLY	-	expression tag	UNP P69687
d	-6	LEU	-	expression tag	UNP P69687
d	-5	VAL	-	expression tag	UNP P69687
d	-4	PRO	-	expression tag	UNP P69687
d	-3	ARG	-	expression tag	UNP P69687
d	-2	GLY	-	expression tag	UNP P69687
d	-1	SER	-	expression tag	UNP P69687
d	0	HIS	-	expression tag	UNP P69687
e	-19	MET	-	expression tag	UNP P69687
e	-18	GLY	-	expression tag	UNP P69687
e	-17	SER	-	expression tag	UNP P69687
e	-16	SER	-	expression tag	UNP P69687
e	-15	HIS	-	expression tag	UNP P69687
e	-14	HIS	-	expression tag	UNP P69687
e	-13	HIS	-	expression tag	UNP P69687
e	-12	HIS	-	expression tag	UNP P69687
e	-11	HIS	-	expression tag	UNP P69687
e	-10	HIS	-	expression tag	UNP P69687
e	-9	SER	-	expression tag	UNP P69687
e	-8	SER	-	expression tag	UNP P69687
e	-7	GLY	-	expression tag	UNP P69687
e	-6	LEU	-	expression tag	UNP P69687
e	-5	VAL	-	expression tag	UNP P69687
e	-4	PRO	-	expression tag	UNP P69687
e	-3	ARG	-	expression tag	UNP P69687
e	-2	GLY	-	expression tag	UNP P69687
e	-1	SER	-	expression tag	UNP P69687
e	0	HIS	-	expression tag	UNP P69687
f	-19	MET	-	expression tag	UNP P69687
f	-18	GLY	-	expression tag	UNP P69687
f	-17	SER	-	expression tag	UNP P69687
f	-16	SER	-	expression tag	UNP P69687
f	-15	HIS	-	expression tag	UNP P69687
f	-14	HIS	-	expression tag	UNP P69687
f	-13	HIS	-	expression tag	UNP P69687
f	-12	HIS	-	expression tag	UNP P69687
f	-11	HIS	-	expression tag	UNP P69687
f	-10	HIS	-	expression tag	UNP P69687
f	-9	SER	-	expression tag	UNP P69687
f	-8	SER	-	expression tag	UNP P69687
f	-7	GLY	-	expression tag	UNP P69687

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Chain	Residue	Modelled	Actual	Comment	Reference
f	-6	LEU	-	expression tag	UNP P69687
f	-5	VAL	-	expression tag	UNP P69687
f	-4	PRO	-	expression tag	UNP P69687
f	-3	ARG	-	expression tag	UNP P69687
f	-2	GLY	-	expression tag	UNP P69687
f	-1	SER	-	expression tag	UNP P69687
f	0	HIS	-	expression tag	UNP P69687
h	-19	MET	-	expression tag	UNP P69687
h	-18	GLY	-	expression tag	UNP P69687
h	-17	SER	-	expression tag	UNP P69687
h	-16	SER	-	expression tag	UNP P69687
h	-15	HIS	-	expression tag	UNP P69687
h	-14	HIS	-	expression tag	UNP P69687
h	-13	HIS	-	expression tag	UNP P69687
h	-12	HIS	-	expression tag	UNP P69687
h	-11	HIS	-	expression tag	UNP P69687
h	-10	HIS	-	expression tag	UNP P69687
h	-9	SER	-	expression tag	UNP P69687
h	-8	SER	-	expression tag	UNP P69687
h	-7	GLY	-	expression tag	UNP P69687
h	-6	LEU	-	expression tag	UNP P69687
h	-5	VAL	-	expression tag	UNP P69687
h	-4	PRO	-	expression tag	UNP P69687
h	-3	ARG	-	expression tag	UNP P69687
h	-2	GLY	-	expression tag	UNP P69687
h	-1	SER	-	expression tag	UNP P69687
h	0	HIS	-	expression tag	UNP P69687
i	-19	MET	-	expression tag	UNP P69687
i	-18	GLY	-	expression tag	UNP P69687
i	-17	SER	-	expression tag	UNP P69687
i	-16	SER	-	expression tag	UNP P69687
i	-15	HIS	-	expression tag	UNP P69687
i	-14	HIS	-	expression tag	UNP P69687
i	-13	HIS	-	expression tag	UNP P69687
i	-12	HIS	-	expression tag	UNP P69687
i	-11	HIS	-	expression tag	UNP P69687
i	-10	HIS	-	expression tag	UNP P69687
i	-9	SER	-	expression tag	UNP P69687
i	-8	SER	-	expression tag	UNP P69687
i	-7	GLY	-	expression tag	UNP P69687
i	-6	LEU	-	expression tag	UNP P69687
i	-5	VAL	-	expression tag	UNP P69687

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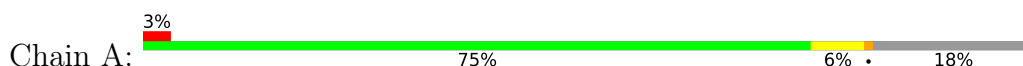
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Chain	Residue	Modelled	Actual	Comment	Reference
i	-4	PRO	-	expression tag	UNP P69687
i	-3	ARG	-	expression tag	UNP P69687
i	-2	GLY	-	expression tag	UNP P69687
i	-1	SER	-	expression tag	UNP P69687
i	0	HIS	-	expression tag	UNP P69687

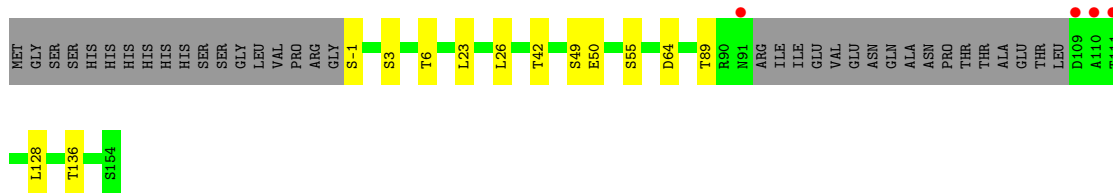
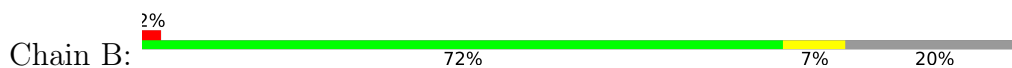
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

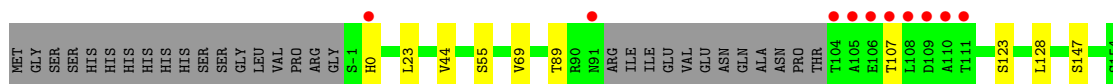
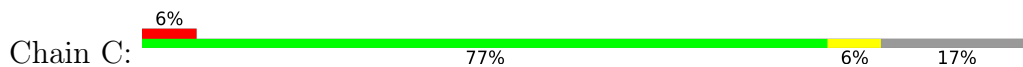
- Molecule 1: Capsid protein



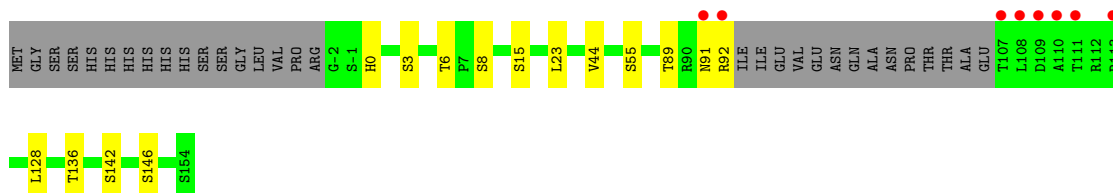
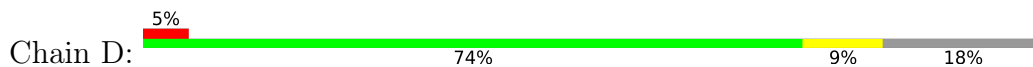
- Molecule 1: Capsid protein



- Molecule 1: Capsid protein



- Molecule 1: Capsid protein



- Molecule 1: Capsid protein



- Molecule 1: Capsid protein



- Molecule 1: Capsid protein



- Molecule 1: Capsid protein

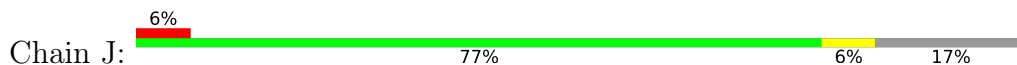


- Molecule 1: Capsid protein

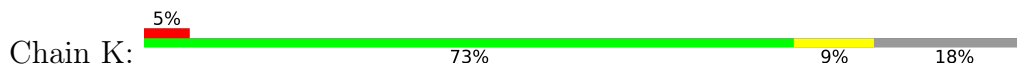




• Molecule 1: Capsid protein



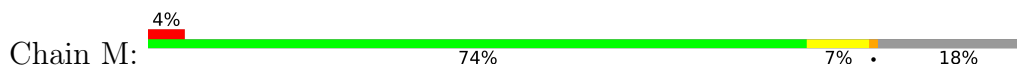
• Molecule 1: Capsid protein



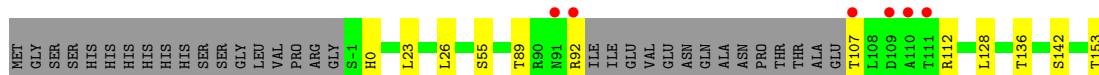
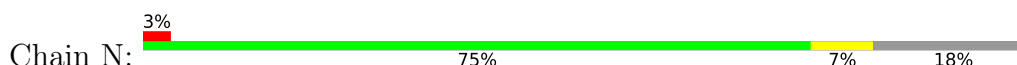
• Molecule 1: Capsid protein



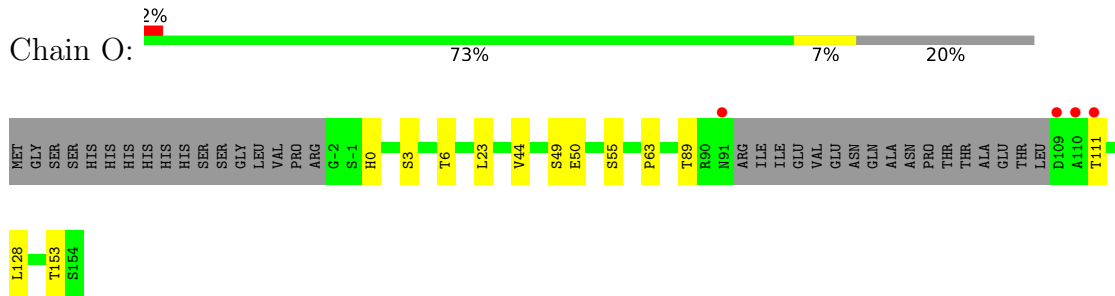
• Molecule 1: Capsid protein



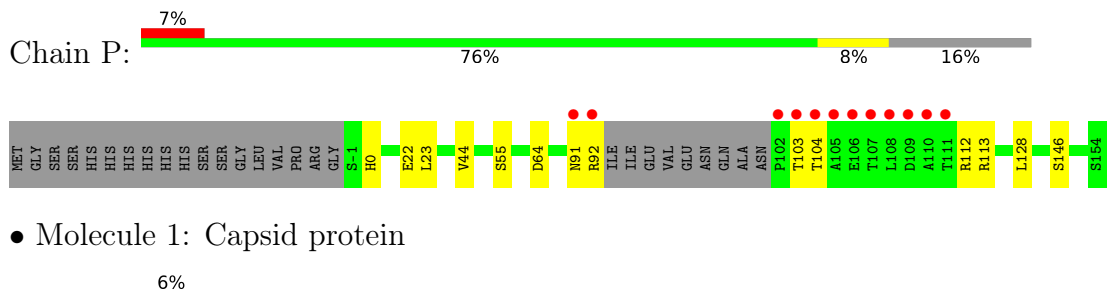
• Molecule 1: Capsid protein



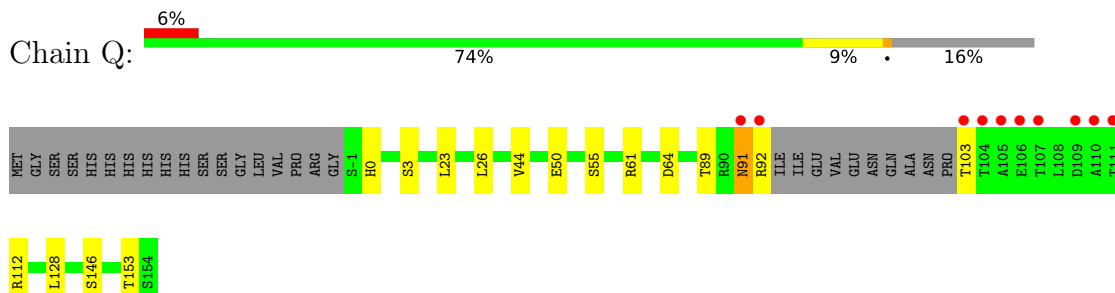
• Molecule 1: Capsid protein



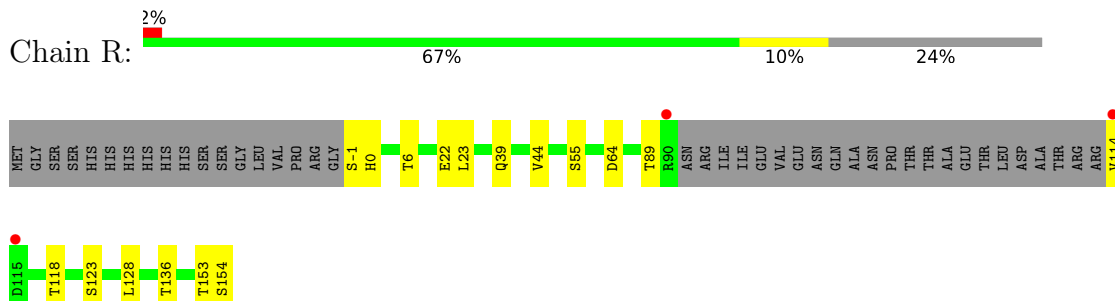
• Molecule 1: Capsid protein



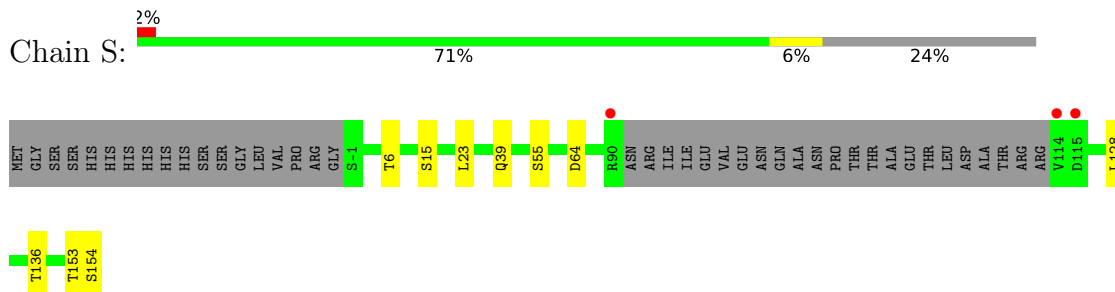
• Molecule 1: Capsid protein



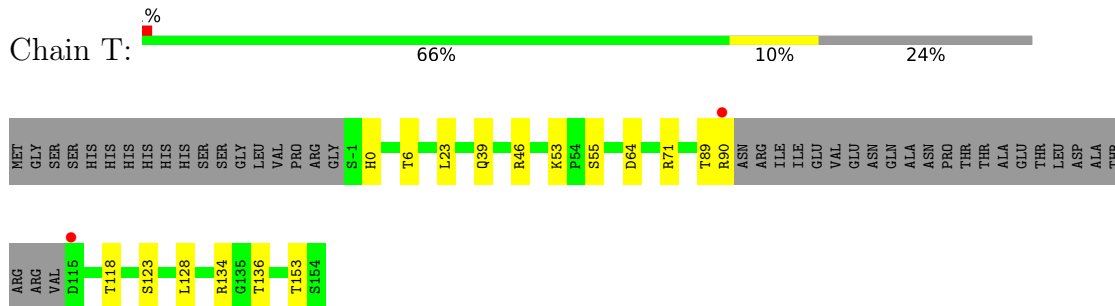
• Molecule 1: Capsid protein



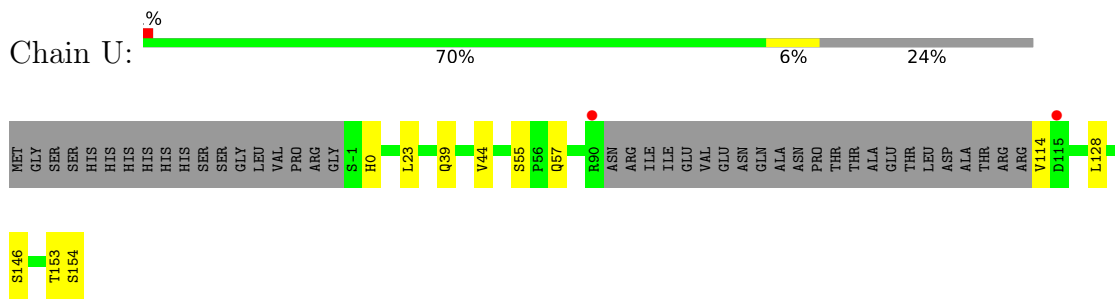
• Molecule 1: Capsid protein



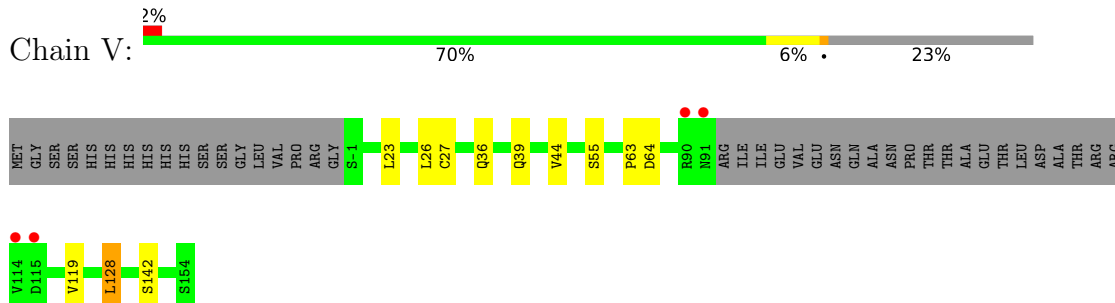
• Molecule 1: Capsid protein



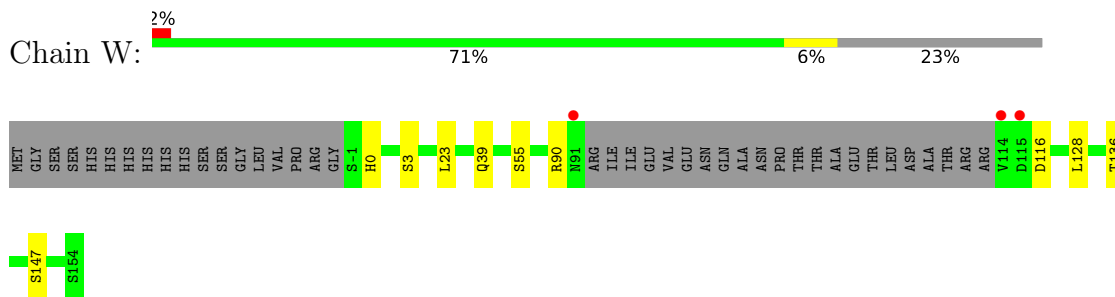
• Molecule 1: Capsid protein



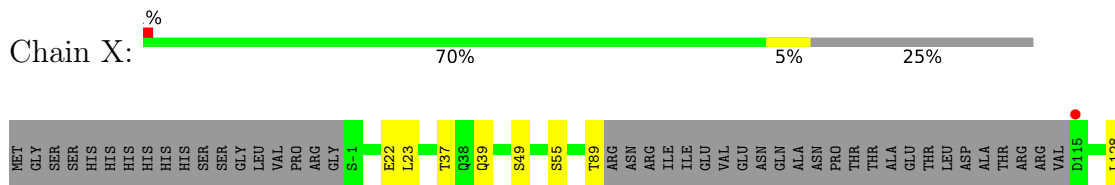
• Molecule 1: Capsid protein



• Molecule 1: Capsid protein



• Molecule 1: Capsid protein





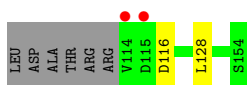
- Molecule 1: Capsid protein



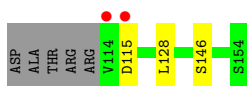
- Molecule 1: Capsid protein



- Molecule 1: Capsid protein



- Molecule 1: Capsid protein

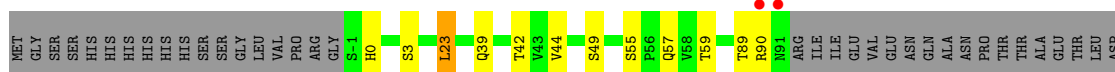


- Molecule 1: Capsid protein

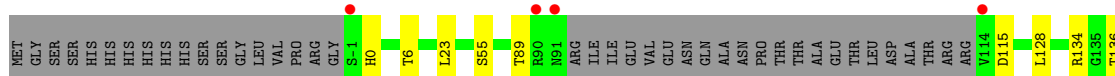




● Molecule 1: Capsid protein



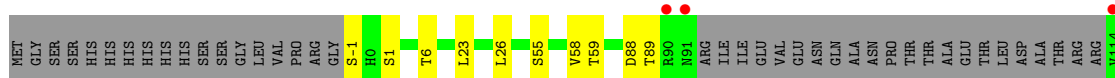
● Molecule 1: Capsid protein



● Molecule 1: Capsid protein



● Molecule 1: Capsid protein



- Molecule 1: Capsid protein



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	173.07Å 221.68Å 225.61Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 3.06 49.91 – 3.06	Depositor EDS
% Data completeness (in resolution range)	99.7 (50.00-3.06) 99.7 (49.91-3.06)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.90 (at 3.07Å)	Xtrriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.204 , 0.255 0.202 , 0.252	Depositor DCC
R_{free} test set	8201 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	51.4	Xtrriage
Anisotropy	0.012	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 17.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	0.007 for -h,l,k	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	36918	wwPDB-VP
Average B, all atoms (Å ²)	47.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.95% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.64	0/1138	0.72	0/1552
1	B	0.62	0/1119	0.70	0/1526
1	C	0.67	0/1155	0.74	0/1576
1	D	0.65	0/1149	0.74	0/1566
1	E	0.64	0/1123	0.75	0/1531
1	F	0.63	0/1154	0.69	0/1573
1	G	0.63	0/1154	0.73	0/1573
1	H	0.61	0/1158	0.71	0/1578
1	I	0.58	0/1134	0.71	0/1547
1	J	0.61	0/1166	0.69	0/1590
1	K	0.66	0/1154	0.73	0/1573
1	L	0.62	0/1134	0.76	1/1547 (0.1%)
1	M	0.65	0/1145	0.71	0/1561
1	N	0.59	0/1145	0.70	0/1561
1	O	0.64	1/1123 (0.1%)	0.70	0/1531
1	P	0.65	0/1181	0.69	0/1611
1	Q	0.65	1/1173 (0.1%)	0.72	1/1600 (0.1%)
1	R	0.67	0/1069	0.73	0/1459
1	S	0.65	0/1069	0.74	0/1459
1	T	0.64	0/1062	0.73	1/1449 (0.1%)
1	U	0.61	0/1069	0.67	0/1459
1	V	0.69	1/1077 (0.1%)	0.78	1/1470 (0.1%)
1	W	0.65	0/1077	0.72	0/1470
1	X	0.63	0/1051	0.71	0/1435
1	Y	0.66	0/1058	0.72	0/1445
1	Z	0.64	0/1077	0.72	0/1470
1	a	0.61	0/1052	0.69	0/1437
1	b	0.63	0/1058	0.73	0/1445
1	c	0.67	1/1092 (0.1%)	0.73	0/1489
1	d	0.70	0/1077	0.79	1/1470 (0.1%)
1	e	0.65	0/1077	0.73	0/1470
1	f	0.66	0/1077	0.75	0/1470
1	h	0.61	0/1077	0.75	0/1470
1	i	0.68	0/1077	0.74	0/1470

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
All	All	0.64	4/37701 (0.0%)	0.72	5/51433 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	L	0	1
1	d	0	1
All	All	0	2

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	V	27	CYS	CB-SG	-6.52	1.71	1.82
1	Q	103	THR	CB-OG1	5.65	1.54	1.43
1	O	50	GLU	CG-CD	5.38	1.60	1.51
1	c	27	CYS	CB-SG	-5.08	1.73	1.81

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	T	71	ARG	NE-CZ-NH2	-6.50	117.05	120.30
1	d	23	LEU	CA-CB-CG	5.63	128.24	115.30
1	L	152	TRP	C-N-CA	5.45	135.32	121.70
1	V	128	LEU	CA-CB-CG	5.28	127.45	115.30
1	Q	61	ARG	NE-CZ-NH1	-5.17	117.71	120.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	L	152	TRP	Peptide
1	d	153	THR	Peptide

5.2 Too-close contacts

Due to software issues we are unable to calculate clashes - this section is therefore empty.

5.3 Torsion angles

5.3.1 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 X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	138/174 (79%)	129 (94%)	7 (5%)	2 (1%)	11	36
1	B	135/174 (78%)	129 (96%)	5 (4%)	1 (1%)	22	52
1	C	140/174 (80%)	130 (93%)	9 (6%)	1 (1%)	22	52
1	D	139/174 (80%)	128 (92%)	10 (7%)	1 (1%)	22	52
1	E	136/174 (78%)	126 (93%)	7 (5%)	3 (2%)	6	25
1	F	139/174 (80%)	127 (91%)	10 (7%)	2 (1%)	11	36
1	G	139/174 (80%)	129 (93%)	8 (6%)	2 (1%)	11	36
1	H	140/174 (80%)	126 (90%)	10 (7%)	4 (3%)	4	20
1	I	137/174 (79%)	121 (88%)	11 (8%)	5 (4%)	3	16
1	J	141/174 (81%)	129 (92%)	11 (8%)	1 (1%)	22	52
1	K	139/174 (80%)	128 (92%)	9 (6%)	2 (1%)	11	36
1	L	137/174 (79%)	128 (93%)	7 (5%)	2 (2%)	10	35
1	M	138/174 (79%)	131 (95%)	4 (3%)	3 (2%)	6	25
1	N	138/174 (79%)	129 (94%)	8 (6%)	1 (1%)	22	52
1	O	136/174 (78%)	127 (93%)	7 (5%)	2 (2%)	10	35
1	P	143/174 (82%)	131 (92%)	8 (6%)	4 (3%)	5	21
1	Q	142/174 (82%)	132 (93%)	7 (5%)	3 (2%)	7	26
1	R	129/174 (74%)	122 (95%)	5 (4%)	2 (2%)	9	33
1	S	129/174 (74%)	121 (94%)	6 (5%)	2 (2%)	9	33
1	T	128/174 (74%)	122 (95%)	5 (4%)	1 (1%)	19	50
1	U	129/174 (74%)	118 (92%)	9 (7%)	2 (2%)	9	33
1	V	130/174 (75%)	122 (94%)	6 (5%)	2 (2%)	10	35
1	W	130/174 (75%)	119 (92%)	10 (8%)	1 (1%)	19	50
1	X	127/174 (73%)	117 (92%)	9 (7%)	1 (1%)	19	50
1	Y	128/174 (74%)	118 (92%)	9 (7%)	1 (1%)	19	50

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	Z	130/174 (75%)	123 (95%)	6 (5%)	1 (1%)	19	50
1	a	127/174 (73%)	117 (92%)	8 (6%)	2 (2%)	9	33
1	b	128/174 (74%)	115 (90%)	10 (8%)	3 (2%)	6	24
1	c	132/174 (76%)	120 (91%)	9 (7%)	3 (2%)	6	24
1	d	130/174 (75%)	119 (92%)	10 (8%)	1 (1%)	19	50
1	e	130/174 (75%)	116 (89%)	13 (10%)	1 (1%)	19	50
1	f	130/174 (75%)	121 (93%)	8 (6%)	1 (1%)	19	50
1	h	130/174 (75%)	122 (94%)	6 (5%)	2 (2%)	10	35
1	i	130/174 (75%)	116 (89%)	11 (8%)	3 (2%)	6	24
All	All	4554/5916 (77%)	4208 (92%)	278 (6%)	68 (2%)	10	35

5 of 68 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	55	SER
1	G	55	SER
1	I	1	SER
1	L	153	THR
1	M	0	HIS

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	125/153 (82%)	115 (92%)	10 (8%)	12	36
1	B	123/153 (80%)	111 (90%)	12 (10%)	8	26
1	C	127/153 (83%)	118 (93%)	9 (7%)	14	41
1	D	126/153 (82%)	112 (89%)	14 (11%)	6	21
1	E	123/153 (80%)	109 (89%)	14 (11%)	5	20
1	F	127/153 (83%)	114 (90%)	13 (10%)	7	24
1	G	127/153 (83%)	110 (87%)	17 (13%)	4	14

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	H	127/153 (83%)	108 (85%)	19 (15%)	3	11
1	I	125/153 (82%)	111 (89%)	14 (11%)	6	21
1	J	128/153 (84%)	118 (92%)	10 (8%)	12	37
1	K	127/153 (83%)	113 (89%)	14 (11%)	6	22
1	L	125/153 (82%)	114 (91%)	11 (9%)	10	32
1	M	126/153 (82%)	114 (90%)	12 (10%)	8	28
1	N	126/153 (82%)	115 (91%)	11 (9%)	10	33
1	O	123/153 (80%)	113 (92%)	10 (8%)	11	35
1	P	130/153 (85%)	120 (92%)	10 (8%)	13	38
1	Q	129/153 (84%)	116 (90%)	13 (10%)	7	25
1	R	118/153 (77%)	103 (87%)	15 (13%)	4	16
1	S	118/153 (77%)	110 (93%)	8 (7%)	16	42
1	T	117/153 (76%)	102 (87%)	15 (13%)	4	16
1	U	118/153 (77%)	109 (92%)	9 (8%)	13	38
1	V	119/153 (78%)	110 (92%)	9 (8%)	13	38
1	W	119/153 (78%)	110 (92%)	9 (8%)	13	38
1	X	116/153 (76%)	108 (93%)	8 (7%)	15	42
1	Y	117/153 (76%)	103 (88%)	14 (12%)	5	18
1	Z	119/153 (78%)	105 (88%)	14 (12%)	5	18
1	a	116/153 (76%)	105 (90%)	11 (10%)	8	28
1	b	117/153 (76%)	106 (91%)	11 (9%)	8	28
1	c	120/153 (78%)	110 (92%)	10 (8%)	11	35
1	d	119/153 (78%)	102 (86%)	17 (14%)	3	12
1	e	119/153 (78%)	109 (92%)	10 (8%)	11	34
1	f	119/153 (78%)	107 (90%)	12 (10%)	7	25
1	h	119/153 (78%)	105 (88%)	14 (12%)	5	18
1	i	119/153 (78%)	110 (92%)	9 (8%)	13	38
All	All	4153/5202 (80%)	3745 (90%)	408 (10%)	8	26

5 of 408 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	S	39	GLN

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Mol	Chain	Res	Type
1	Y	0	HIS
1	i	0	HIS
1	T	23	LEU
1	V	23	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 136 such sidechains are listed below:

Mol	Chain	Res	Type
1	d	126	ASN
1	e	126	ASN
1	i	34	GLN
1	L	126	ASN
1	L	36	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	142/174 (81%)	-0.28	6 (4%) 36 17	35, 41, 84, 113	0
1	B	139/174 (79%)	-0.36	4 (2%) 51 26	34, 41, 76, 107	0
1	C	144/174 (82%)	-0.18	10 (6%) 16 6	33, 41, 105, 128	0
1	D	143/174 (82%)	-0.22	8 (5%) 24 10	31, 40, 87, 111	0
1	E	140/174 (80%)	-0.29	5 (3%) 42 21	33, 40, 80, 108	0
1	F	143/174 (82%)	-0.20	8 (5%) 24 10	35, 44, 92, 121	0
1	G	143/174 (82%)	-0.20	10 (6%) 16 6	36, 42, 101, 117	0
1	H	144/174 (82%)	-0.23	7 (4%) 29 13	35, 45, 93, 116	0
1	I	141/174 (81%)	-0.32	7 (4%) 28 12	35, 44, 88, 114	0
1	J	145/174 (83%)	-0.15	10 (6%) 16 6	34, 44, 105, 124	0
1	K	143/174 (82%)	-0.22	8 (5%) 24 10	32, 40, 90, 116	0
1	L	141/174 (81%)	-0.26	6 (4%) 35 16	35, 43, 84, 112	0
1	M	142/174 (81%)	-0.29	7 (4%) 29 13	34, 43, 90, 112	0
1	N	142/174 (81%)	-0.24	6 (4%) 36 17	35, 44, 88, 106	0
1	O	140/174 (80%)	-0.33	4 (2%) 51 26	37, 45, 79, 107	0
1	P	147/174 (84%)	-0.13	12 (8%) 11 4	36, 45, 114, 130	0
1	Q	146/174 (83%)	-0.16	10 (6%) 17 6	36, 44, 110, 129	0
1	R	133/174 (76%)	-0.46	3 (2%) 60 36	32, 40, 65, 86	0
1	S	133/174 (76%)	-0.47	3 (2%) 60 36	33, 42, 63, 87	0
1	T	132/174 (75%)	-0.36	2 (1%) 73 51	36, 44, 62, 83	0
1	U	133/174 (76%)	-0.34	2 (1%) 73 51	36, 47, 69, 89	0
1	V	134/174 (77%)	-0.39	4 (2%) 50 25	29, 40, 65, 86	0
1	W	134/174 (77%)	-0.37	3 (2%) 62 38	35, 42, 67, 88	0
1	X	131/174 (75%)	-0.40	1 (0%) 86 70	36, 44, 59, 81	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	Y	132/174 (75%)	-0.40	2 (1%) 73 51	33, 43, 61, 85	0
1	Z	134/174 (77%)	-0.45	3 (2%) 62 38	34, 42, 69, 87	0
1	a	131/174 (75%)	-0.38	2 (1%) 73 51	37, 47, 64, 89	0
1	b	132/174 (75%)	-0.38	3 (2%) 60 36	37, 47, 67, 83	0
1	c	136/174 (78%)	-0.36	4 (2%) 51 26	36, 45, 76, 95	0
1	d	134/174 (77%)	-0.44	3 (2%) 62 38	30, 41, 68, 85	0
1	e	134/174 (77%)	-0.33	4 (2%) 50 25	37, 46, 68, 88	0
1	f	134/174 (77%)	-0.45	3 (2%) 62 38	30, 41, 65, 84	0
1	h	134/174 (77%)	-0.43	4 (2%) 50 25	35, 45, 69, 88	0
1	i	134/174 (77%)	-0.32	3 (2%) 62 38	34, 43, 68, 86	0
All	All	4690/5916 (79%)	-0.31	177 (3%) 40 20	29, 43, 82, 130	0

The worst 5 of 177 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	O	109	ASP	7.6
1	L	107	THR	7.4
1	Q	104	THR	6.9
1	A	107	THR	6.5
1	N	107	THR	6.3

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.