



wwPDB X-ray Structure Validation Summary Report ⓘ

May 7, 2026 – 08:09 AM EDT

PDB ID : 4WSN / pdb_00004wsn
Title : Crystal structure of the COP9 signalosome, a P1 crystal form
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Deposited on : 2014-10-28
Resolution : 5.50 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	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

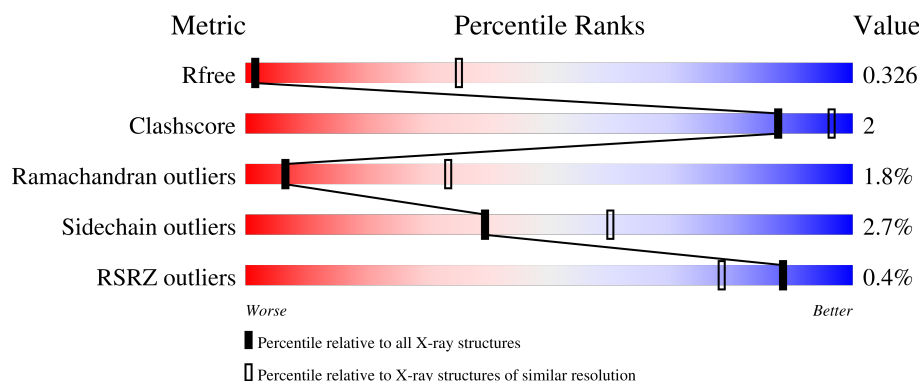
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 5.50 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.



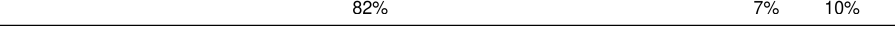
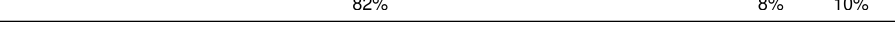
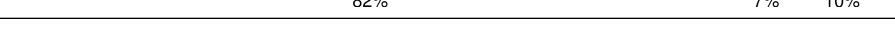
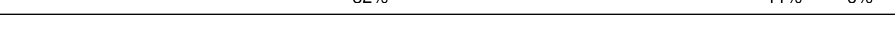
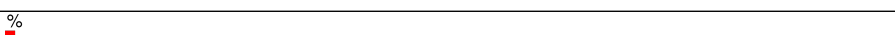
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1088 (7.00-4.00)
Clashscore	190562	1147 (7.00-4.00)
Ramachandran outliers	187476	1012 (7.02-3.98)
Sidechain outliers	187428	1023 (7.04-3.96)
RSRZ outliers	180081	1081 (7.00-4.00)

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	480	 79% 8% 13%
1	I	480	 79% 8% 13%
1	Q	480	 80% 7% 13%
1	Y	480	 80% 7% 13%
1	g	480	 79% 8% 13%

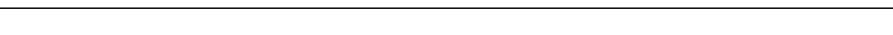
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Mol	Chain	Length	Quality of chain
1	o	480	
2	B	447	 %
2	J	447	 %
2	R	447	 %
2	Z	447	 %
2	h	447	
2	p	447	
3	C	427	
3	K	427	
3	S	427	 %
3	a	427	 %
3	i	427	 %
3	q	427	
4	D	410	 ..
4	L	410	 ..
4	T	410	 ..
4	b	410	 ..
4	j	410	 ..
4	r	410	 ..
5	E	325	 %
5	M	325	 %
5	U	325	 %
5	c	325	
5	k	325	 2%
5	s	325	 %

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Mol	Chain	Length	Quality of chain
6	F	331	
6	N	331	
6	V	331	
6	d	331	
6	l	331	
6	t	331	
7	G	222	
7	O	222	
7	W	222	
7	e	222	
7	m	222	
7	u	222	
8	H	213	
8	P	213	
8	X	213	
8	f	213	
8	n	213	
8	v	213	

2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 124428 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 COP9 signalosome complex subunit 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	419	Total	C	N	O	S	0	0	0
			3348	2113	588	625	22			
1	I	419	Total	C	N	O	S	0	0	0
			3348	2113	588	625	22			
1	Q	419	Total	C	N	O	S	0	0	0
			3348	2113	588	625	22			
1	Y	419	Total	C	N	O	S	0	0	0
			3348	2113	588	625	22			
1	g	419	Total	C	N	O	S	0	0	0
			3348	2113	588	625	22			
1	o	419	Total	C	N	O	S	0	0	0
			3348	2113	588	625	22			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	48	GLY	-	expression tag	UNP Q13098
A	49	GLY	-	expression tag	UNP Q13098
A	50	GLY	-	expression tag	UNP Q13098
A	51	ARG	-	expression tag	UNP Q13098
I	48	GLY	-	expression tag	UNP Q13098
I	49	GLY	-	expression tag	UNP Q13098
I	50	GLY	-	expression tag	UNP Q13098
I	51	ARG	-	expression tag	UNP Q13098
Q	48	GLY	-	expression tag	UNP Q13098
Q	49	GLY	-	expression tag	UNP Q13098
Q	50	GLY	-	expression tag	UNP Q13098
Q	51	ARG	-	expression tag	UNP Q13098
Y	48	GLY	-	expression tag	UNP Q13098
Y	49	GLY	-	expression tag	UNP Q13098
Y	50	GLY	-	expression tag	UNP Q13098
Y	51	ARG	-	expression tag	UNP Q13098
g	48	GLY	-	expression tag	UNP Q13098

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Chain	Residue	Modelled	Actual	Comment	Reference
g	49	GLY	-	expression tag	UNP Q13098
g	50	GLY	-	expression tag	UNP Q13098
g	51	ARG	-	expression tag	UNP Q13098
o	48	GLY	-	expression tag	UNP Q13098
o	49	GLY	-	expression tag	UNP Q13098
o	50	GLY	-	expression tag	UNP Q13098
o	51	ARG	-	expression tag	UNP Q13098

- Molecule 2 is a protein called COP9 signalosome complex subunit 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	403	Total	C	N	O	S	0	0	0
			3304	2102	566	621	15			
2	J	403	Total	C	N	O	S	0	0	0
			3304	2102	566	621	15			
2	R	403	Total	C	N	O	S	0	0	0
			3304	2102	566	621	15			
2	Z	403	Total	C	N	O	S	0	0	0
			3304	2102	566	621	15			
2	h	403	Total	C	N	O	S	0	0	0
			3304	2102	566	621	15			
2	p	403	Total	C	N	O	S	0	0	0
			3304	2102	566	621	15			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-3	GLY	-	expression tag	UNP P61201
B	-2	GLY	-	expression tag	UNP P61201
B	-1	GLY	-	expression tag	UNP P61201
B	0	ARG	-	expression tag	UNP P61201
J	-3	GLY	-	expression tag	UNP P61201
J	-2	GLY	-	expression tag	UNP P61201
J	-1	GLY	-	expression tag	UNP P61201
J	0	ARG	-	expression tag	UNP P61201
R	-3	GLY	-	expression tag	UNP P61201
R	-2	GLY	-	expression tag	UNP P61201
R	-1	GLY	-	expression tag	UNP P61201
R	0	ARG	-	expression tag	UNP P61201
Z	-3	GLY	-	expression tag	UNP P61201
Z	-2	GLY	-	expression tag	UNP P61201
Z	-1	GLY	-	expression tag	UNP P61201

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Chain	Residue	Modelled	Actual	Comment	Reference
Z	0	ARG	-	expression tag	UNP P61201
h	-3	GLY	-	expression tag	UNP P61201
h	-2	GLY	-	expression tag	UNP P61201
h	-1	GLY	-	expression tag	UNP P61201
h	0	ARG	-	expression tag	UNP P61201
p	-3	GLY	-	expression tag	UNP P61201
p	-2	GLY	-	expression tag	UNP P61201
p	-1	GLY	-	expression tag	UNP P61201
p	0	ARG	-	expression tag	UNP P61201

- Molecule 3 is a protein called COP9 signalosome complex subunit 3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	401	Total	C	N	O	S	0	0	0
			3191	2032	535	598	26			
3	K	401	Total	C	N	O	S	0	0	0
			3191	2032	535	598	26			
3	S	401	Total	C	N	O	S	0	0	0
			3191	2032	535	598	26			
3	a	401	Total	C	N	O	S	0	0	0
			3191	2032	535	598	26			
3	i	401	Total	C	N	O	S	0	0	0
			3191	2032	535	598	26			
3	q	401	Total	C	N	O	S	0	0	0
			3191	2032	535	598	26			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-3	GLY	-	expression tag	UNP Q9UNS2
C	-2	GLY	-	expression tag	UNP Q9UNS2
C	-1	GLY	-	expression tag	UNP Q9UNS2
C	0	ARG	-	expression tag	UNP Q9UNS2
K	-3	GLY	-	expression tag	UNP Q9UNS2
K	-2	GLY	-	expression tag	UNP Q9UNS2
K	-1	GLY	-	expression tag	UNP Q9UNS2
K	0	ARG	-	expression tag	UNP Q9UNS2
S	-3	GLY	-	expression tag	UNP Q9UNS2
S	-2	GLY	-	expression tag	UNP Q9UNS2
S	-1	GLY	-	expression tag	UNP Q9UNS2
S	0	ARG	-	expression tag	UNP Q9UNS2
a	-3	GLY	-	expression tag	UNP Q9UNS2

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Chain	Residue	Modelled	Actual	Comment	Reference
a	-2	GLY	-	expression tag	UNP Q9UNS2
a	-1	GLY	-	expression tag	UNP Q9UNS2
a	0	ARG	-	expression tag	UNP Q9UNS2
i	-3	GLY	-	expression tag	UNP Q9UNS2
i	-2	GLY	-	expression tag	UNP Q9UNS2
i	-1	GLY	-	expression tag	UNP Q9UNS2
i	0	ARG	-	expression tag	UNP Q9UNS2
q	-3	GLY	-	expression tag	UNP Q9UNS2
q	-2	GLY	-	expression tag	UNP Q9UNS2
q	-1	GLY	-	expression tag	UNP Q9UNS2
q	0	ARG	-	expression tag	UNP Q9UNS2

- Molecule 4 is a protein called COP9 signalosome complex subunit 4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	406	Total	C	N	O	S	0	0	0
			3251	2047	566	622	16			
4	L	406	Total	C	N	O	S	0	0	0
			3251	2047	566	622	16			
4	T	406	Total	C	N	O	S	0	0	0
			3251	2047	566	622	16			
4	b	406	Total	C	N	O	S	0	0	0
			3251	2047	566	622	16			
4	j	406	Total	C	N	O	S	0	0	0
			3251	2047	566	622	16			
4	r	406	Total	C	N	O	S	0	0	0
			3251	2047	566	622	16			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	-3	GLY	-	expression tag	UNP Q9BT78
D	-2	GLY	-	expression tag	UNP Q9BT78
D	-1	GLY	-	expression tag	UNP Q9BT78
D	0	ARG	-	expression tag	UNP Q9BT78
L	-3	GLY	-	expression tag	UNP Q9BT78
L	-2	GLY	-	expression tag	UNP Q9BT78
L	-1	GLY	-	expression tag	UNP Q9BT78
L	0	ARG	-	expression tag	UNP Q9BT78
T	-3	GLY	-	expression tag	UNP Q9BT78
T	-2	GLY	-	expression tag	UNP Q9BT78
T	-1	GLY	-	expression tag	UNP Q9BT78

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Chain	Residue	Modelled	Actual	Comment	Reference
T	0	ARG	-	expression tag	UNP Q9BT78
b	-3	GLY	-	expression tag	UNP Q9BT78
b	-2	GLY	-	expression tag	UNP Q9BT78
b	-1	GLY	-	expression tag	UNP Q9BT78
b	0	ARG	-	expression tag	UNP Q9BT78
j	-3	GLY	-	expression tag	UNP Q9BT78
j	-2	GLY	-	expression tag	UNP Q9BT78
j	-1	GLY	-	expression tag	UNP Q9BT78
j	0	ARG	-	expression tag	UNP Q9BT78
r	-3	GLY	-	expression tag	UNP Q9BT78
r	-2	GLY	-	expression tag	UNP Q9BT78
r	-1	GLY	-	expression tag	UNP Q9BT78
r	0	ARG	-	expression tag	UNP Q9BT78

- Molecule 5 is a protein called COP9 signalosome complex subunit 5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	E	298	Total	C	N	O	S	0	0	0
			2366	1510	393	450	13			
5	M	298	Total	C	N	O	S	0	0	0
			2366	1510	393	450	13			
5	U	298	Total	C	N	O	S	0	0	0
			2366	1510	393	450	13			
5	c	298	Total	C	N	O	S	0	0	0
			2366	1510	393	450	13			
5	k	298	Total	C	N	O	S	0	0	0
			2366	1510	393	450	13			
5	s	298	Total	C	N	O	S	0	0	0
			2366	1510	393	450	13			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	10	GLY	-	expression tag	UNP Q92905
E	11	GLY	-	expression tag	UNP Q92905
E	12	GLY	-	expression tag	UNP Q92905
E	13	ARG	-	expression tag	UNP Q92905
M	10	GLY	-	expression tag	UNP Q92905
M	11	GLY	-	expression tag	UNP Q92905
M	12	GLY	-	expression tag	UNP Q92905
M	13	ARG	-	expression tag	UNP Q92905
U	10	GLY	-	expression tag	UNP Q92905

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Chain	Residue	Modelled	Actual	Comment	Reference
U	11	GLY	-	expression tag	UNP Q92905
U	12	GLY	-	expression tag	UNP Q92905
U	13	ARG	-	expression tag	UNP Q92905
c	10	GLY	-	expression tag	UNP Q92905
c	11	GLY	-	expression tag	UNP Q92905
c	12	GLY	-	expression tag	UNP Q92905
c	13	ARG	-	expression tag	UNP Q92905
k	10	GLY	-	expression tag	UNP Q92905
k	11	GLY	-	expression tag	UNP Q92905
k	12	GLY	-	expression tag	UNP Q92905
k	13	ARG	-	expression tag	UNP Q92905
s	10	GLY	-	expression tag	UNP Q92905
s	11	GLY	-	expression tag	UNP Q92905
s	12	GLY	-	expression tag	UNP Q92905
s	13	ARG	-	expression tag	UNP Q92905

- Molecule 6 is a protein called COP9 signalosome complex subunit 6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	F	288	Total	C	N	O	S	0	0	0
			2263	1445	375	428	15			
6	N	288	Total	C	N	O	S	0	0	0
			2263	1445	375	428	15			
6	V	288	Total	C	N	O	S	0	0	0
			2263	1445	375	428	15			
6	d	288	Total	C	N	O	S	0	0	0
			2263	1445	375	428	15			
6	l	288	Total	C	N	O	S	0	0	0
			2263	1445	375	428	15			
6	t	288	Total	C	N	O	S	0	0	0
			2263	1445	375	428	15			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	-3	GLY	-	expression tag	UNP Q7L5N1
F	-2	GLY	-	expression tag	UNP Q7L5N1
F	-1	GLY	-	expression tag	UNP Q7L5N1
F	0	ARG	-	expression tag	UNP Q7L5N1
N	-3	GLY	-	expression tag	UNP Q7L5N1
N	-2	GLY	-	expression tag	UNP Q7L5N1
N	-1	GLY	-	expression tag	UNP Q7L5N1

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Chain	Residue	Modelled	Actual	Comment	Reference
N	0	ARG	-	expression tag	UNP Q7L5N1
V	-3	GLY	-	expression tag	UNP Q7L5N1
V	-2	GLY	-	expression tag	UNP Q7L5N1
V	-1	GLY	-	expression tag	UNP Q7L5N1
V	0	ARG	-	expression tag	UNP Q7L5N1
d	-3	GLY	-	expression tag	UNP Q7L5N1
d	-2	GLY	-	expression tag	UNP Q7L5N1
d	-1	GLY	-	expression tag	UNP Q7L5N1
d	0	ARG	-	expression tag	UNP Q7L5N1
l	-3	GLY	-	expression tag	UNP Q7L5N1
l	-2	GLY	-	expression tag	UNP Q7L5N1
l	-1	GLY	-	expression tag	UNP Q7L5N1
l	0	ARG	-	expression tag	UNP Q7L5N1
t	-3	GLY	-	expression tag	UNP Q7L5N1
t	-2	GLY	-	expression tag	UNP Q7L5N1
t	-1	GLY	-	expression tag	UNP Q7L5N1
t	0	ARG	-	expression tag	UNP Q7L5N1

- Molecule 7 is a protein called COP9 signalosome complex subunit 7a.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	G	208	Total	C	N	O	S	0	0	0
			1631	1028	287	312	4			
7	O	208	Total	C	N	O	S	0	0	0
			1631	1028	287	312	4			
7	W	208	Total	C	N	O	S	0	0	0
			1631	1028	287	312	4			
7	e	208	Total	C	N	O	S	0	0	0
			1631	1028	287	312	4			
7	m	208	Total	C	N	O	S	0	0	0
			1631	1028	287	312	4			
7	u	208	Total	C	N	O	S	0	0	0
			1631	1028	287	312	4			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	-3	GLY	-	expression tag	UNP Q9UBW8
G	-2	GLY	-	expression tag	UNP Q9UBW8
G	-1	GLY	-	expression tag	UNP Q9UBW8
G	0	ARG	-	expression tag	UNP Q9UBW8
O	-3	GLY	-	expression tag	UNP Q9UBW8

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Chain	Residue	Modelled	Actual	Comment	Reference
O	-2	GLY	-	expression tag	UNP Q9UBW8
O	-1	GLY	-	expression tag	UNP Q9UBW8
O	0	ARG	-	expression tag	UNP Q9UBW8
W	-3	GLY	-	expression tag	UNP Q9UBW8
W	-2	GLY	-	expression tag	UNP Q9UBW8
W	-1	GLY	-	expression tag	UNP Q9UBW8
W	0	ARG	-	expression tag	UNP Q9UBW8
e	-3	GLY	-	expression tag	UNP Q9UBW8
e	-2	GLY	-	expression tag	UNP Q9UBW8
e	-1	GLY	-	expression tag	UNP Q9UBW8
e	0	ARG	-	expression tag	UNP Q9UBW8
m	-3	GLY	-	expression tag	UNP Q9UBW8
m	-2	GLY	-	expression tag	UNP Q9UBW8
m	-1	GLY	-	expression tag	UNP Q9UBW8
m	0	ARG	-	expression tag	UNP Q9UBW8
u	-3	GLY	-	expression tag	UNP Q9UBW8
u	-2	GLY	-	expression tag	UNP Q9UBW8
u	-1	GLY	-	expression tag	UNP Q9UBW8
u	0	ARG	-	expression tag	UNP Q9UBW8

- Molecule 8 is a protein called COP9 signalosome complex subunit 8.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	H	173	Total 1383	C 885	N 240	O 254	S 4	0	0	0
8	P	173	Total 1383	C 885	N 240	O 254	S 4	0	0	0
8	X	173	Total 1383	C 885	N 240	O 254	S 4	0	0	0
8	f	173	Total 1383	C 885	N 240	O 254	S 4	0	0	0
8	n	173	Total 1383	C 885	N 240	O 254	S 4	0	0	0
8	v	173	Total 1383	C 885	N 240	O 254	S 4	0	0	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
H	-3	GLY	-	expression tag	UNP Q99627
H	-2	GLY	-	expression tag	UNP Q99627
H	-1	GLY	-	expression tag	UNP Q99627

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Chain	Residue	Modelled	Actual	Comment	Reference
H	0	ARG	-	expression tag	UNP Q99627
P	-3	GLY	-	expression tag	UNP Q99627
P	-2	GLY	-	expression tag	UNP Q99627
P	-1	GLY	-	expression tag	UNP Q99627
P	0	ARG	-	expression tag	UNP Q99627
X	-3	GLY	-	expression tag	UNP Q99627
X	-2	GLY	-	expression tag	UNP Q99627
X	-1	GLY	-	expression tag	UNP Q99627
X	0	ARG	-	expression tag	UNP Q99627
f	-3	GLY	-	expression tag	UNP Q99627
f	-2	GLY	-	expression tag	UNP Q99627
f	-1	GLY	-	expression tag	UNP Q99627
f	0	ARG	-	expression tag	UNP Q99627
n	-3	GLY	-	expression tag	UNP Q99627
n	-2	GLY	-	expression tag	UNP Q99627
n	-1	GLY	-	expression tag	UNP Q99627
n	0	ARG	-	expression tag	UNP Q99627
v	-3	GLY	-	expression tag	UNP Q99627
v	-2	GLY	-	expression tag	UNP Q99627
v	-1	GLY	-	expression tag	UNP Q99627
v	0	ARG	-	expression tag	UNP Q99627

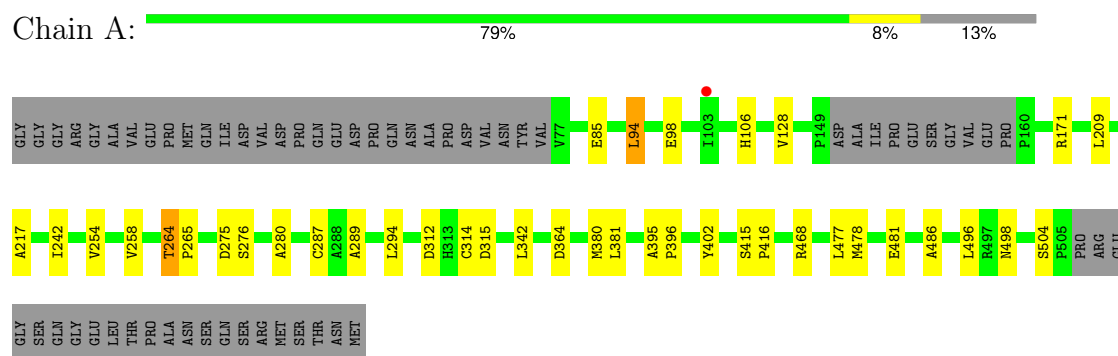
- Molecule 9 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	E	1	Total Zn 1 1	0	0
9	M	1	Total Zn 1 1	0	0
9	U	1	Total Zn 1 1	0	0
9	c	1	Total Zn 1 1	0	0
9	k	1	Total Zn 1 1	0	0
9	s	1	Total Zn 1 1	0	0

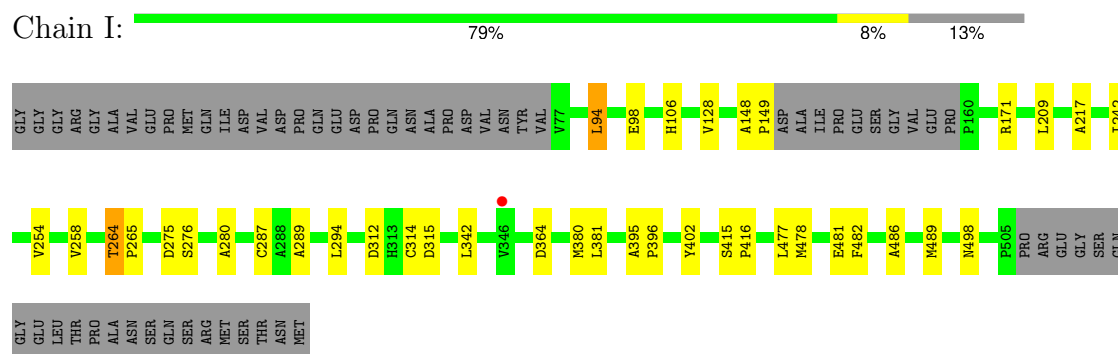
3 Residue-property plots

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.

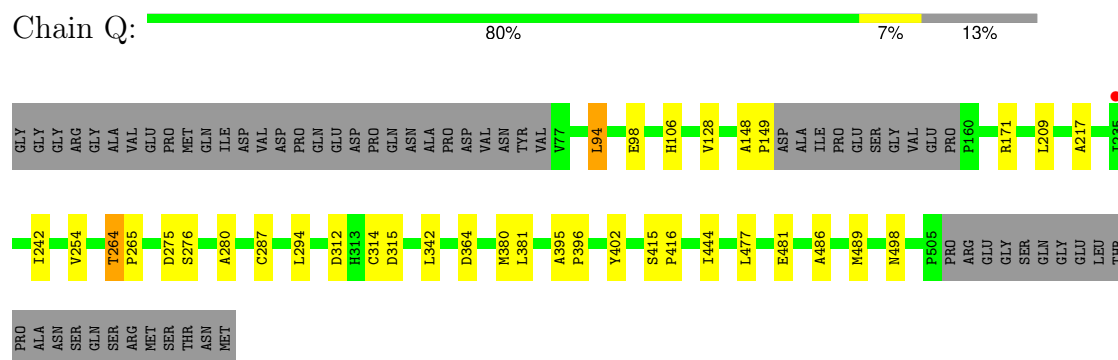
• Molecule 1: COP9 signalosome complex subunit 1



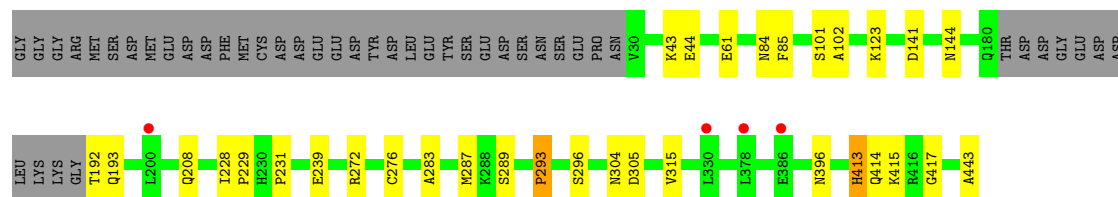
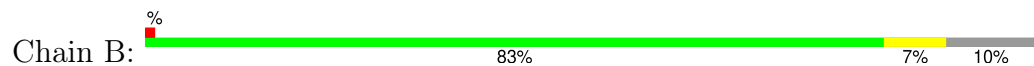
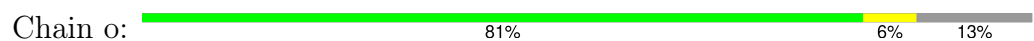
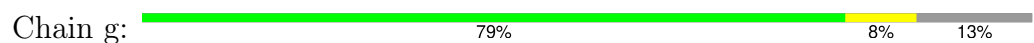
• Molecule 1: COP9 signalosome complex subunit 1



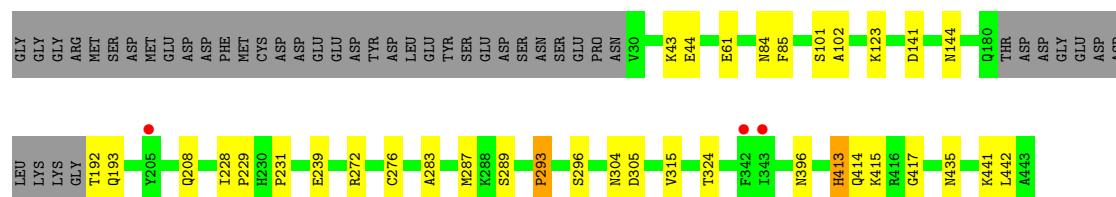
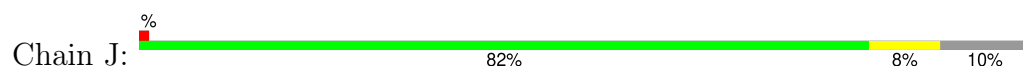
• Molecule 1: COP9 signalosome complex subunit 1



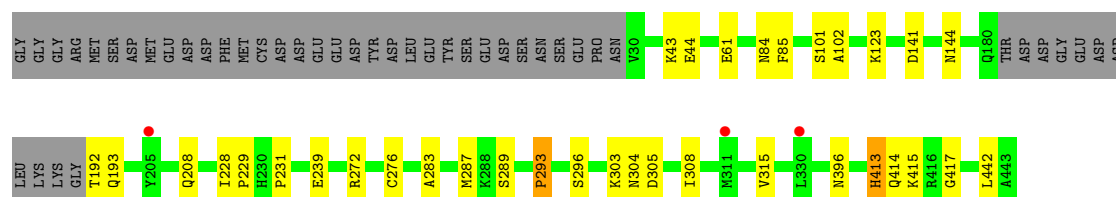
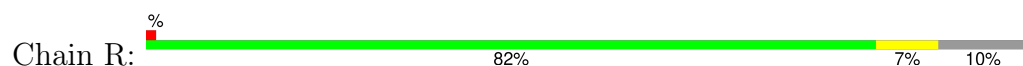
Chain Y: 80% 7% 13%



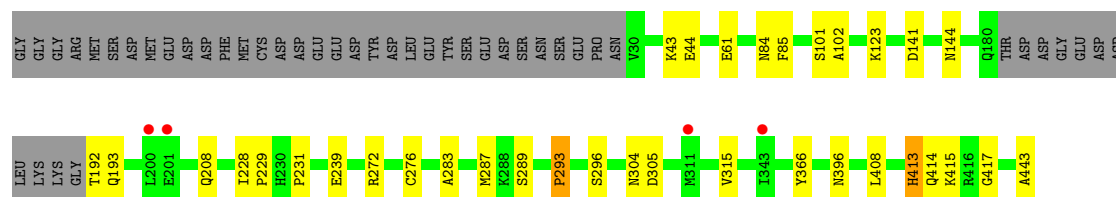
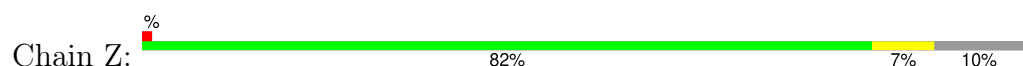
- Molecule 2: COP9 signalosome complex subunit 2



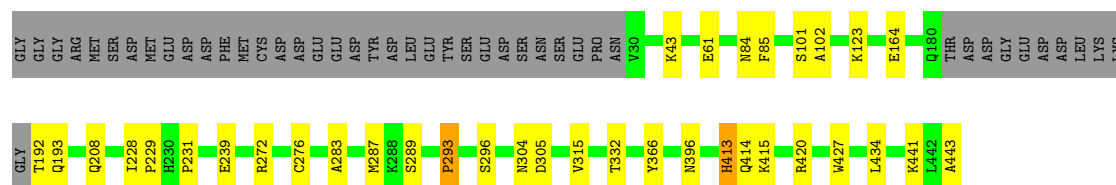
- Molecule 2: COP9 signalosome complex subunit 2



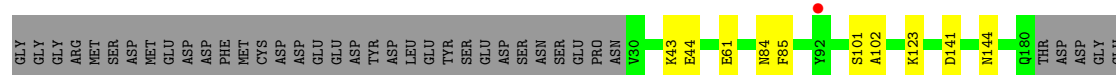
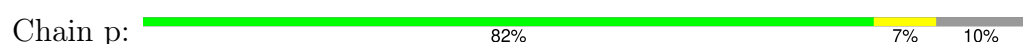
- Molecule 2: COP9 signalosome complex subunit 2



- Molecule 2: COP9 signalosome complex subunit 2

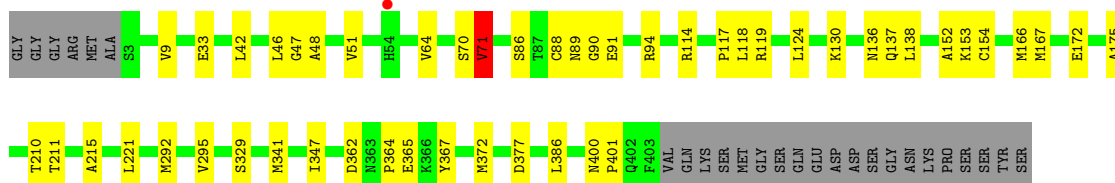
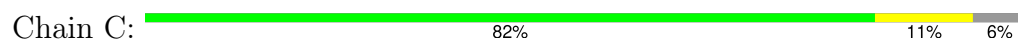


- Molecule 2: COP9 signalosome complex subunit 2

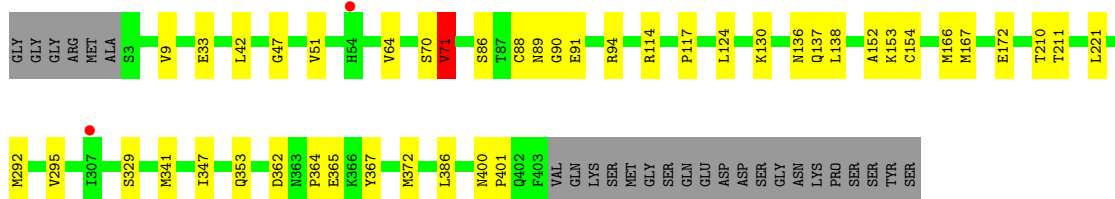
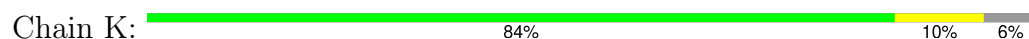




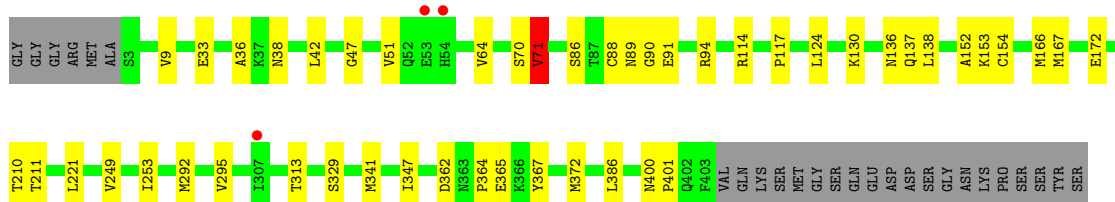
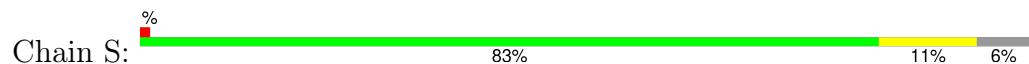
- Molecule 3: COP9 signalosome complex subunit 3



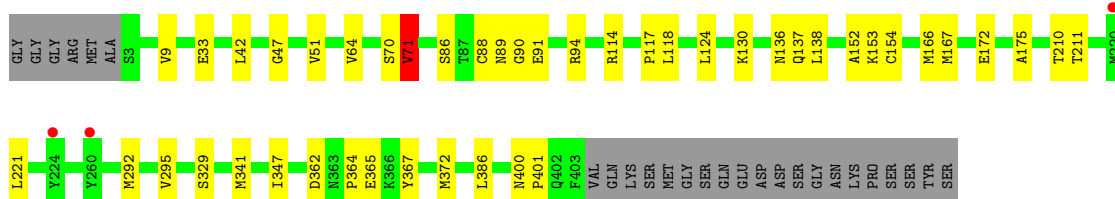
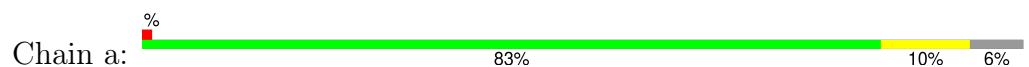
- Molecule 3: COP9 signalosome complex subunit 3



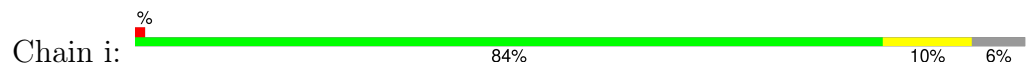
- Molecule 3: COP9 signalosome complex subunit 3

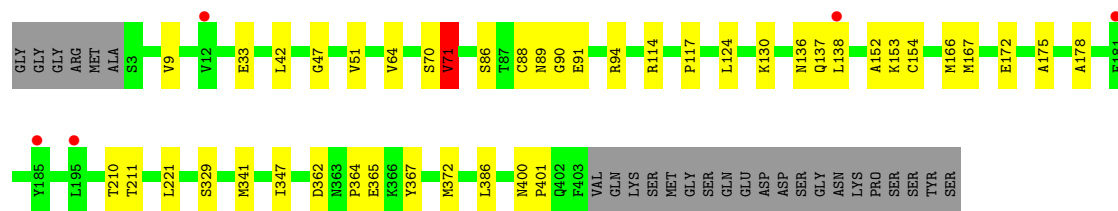


- Molecule 3: COP9 signalosome complex subunit 3



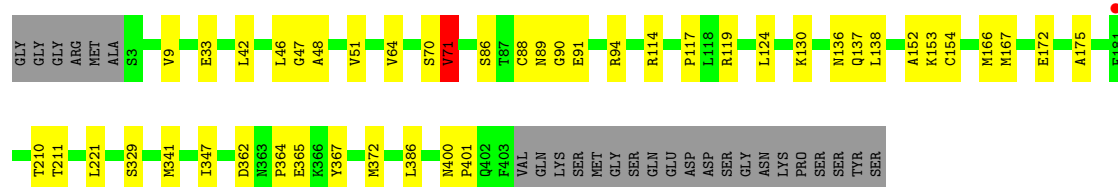
- Molecule 3: COP9 signalosome complex subunit 3





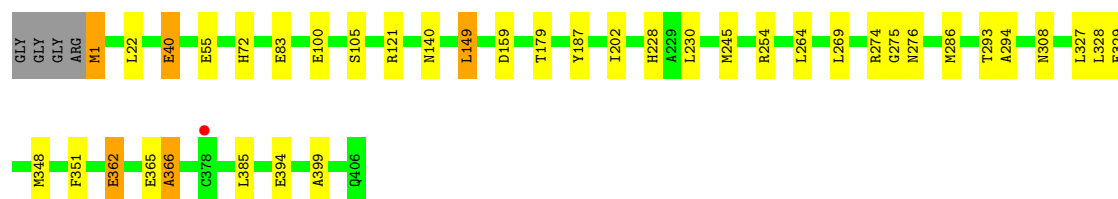
• Molecule 3: COP9 signalosome complex subunit 3

Chain q: 83% 10% 6%



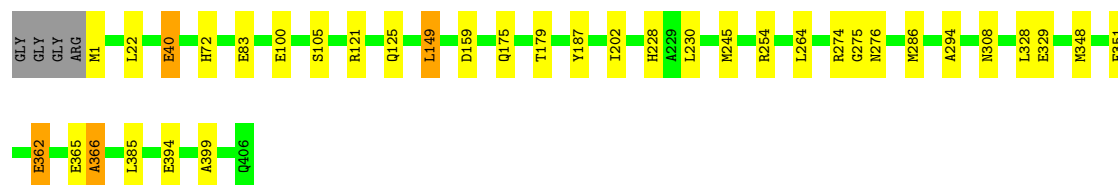
• Molecule 4: COP9 signalosome complex subunit 4

Chain D: 90% 8% ..



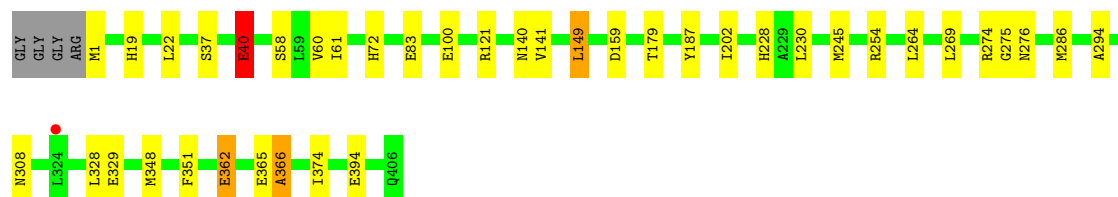
• Molecule 4: COP9 signalosome complex subunit 4

Chain L: 90% 8% ..



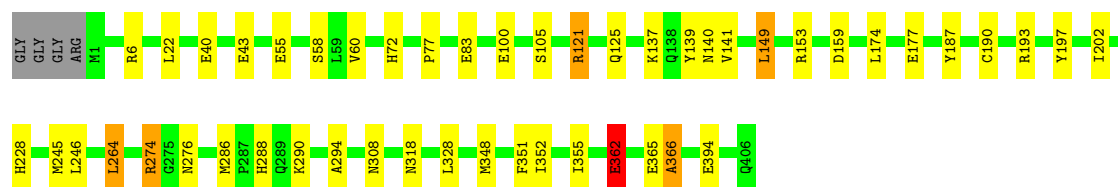
• Molecule 4: COP9 signalosome complex subunit 4

Chain T: 89% 9% ..



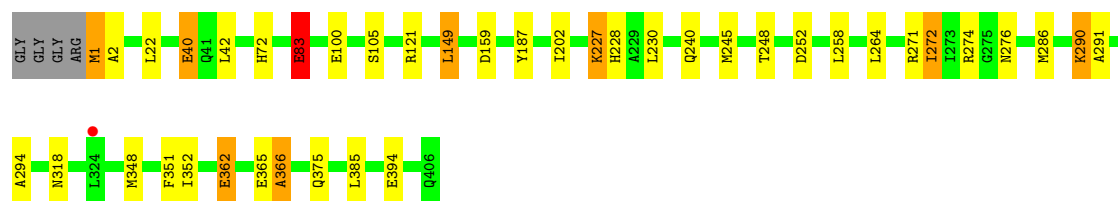
• Molecule 4: COP9 signalosome complex subunit 4

Chain b:  87% 10% ..



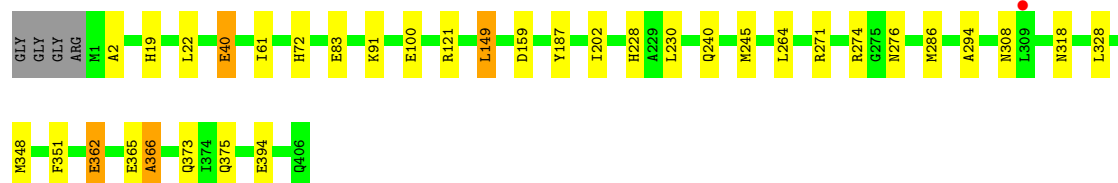
- Molecule 4: COP9 signalosome complex subunit 4

Chain j:  89% 8% ..



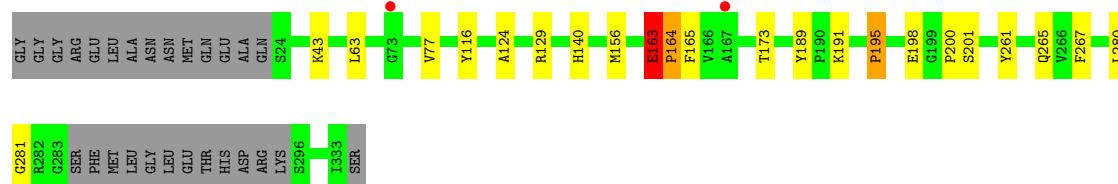
- Molecule 4: COP9 signalosome complex subunit 4

Chain r:  90% 8% ..



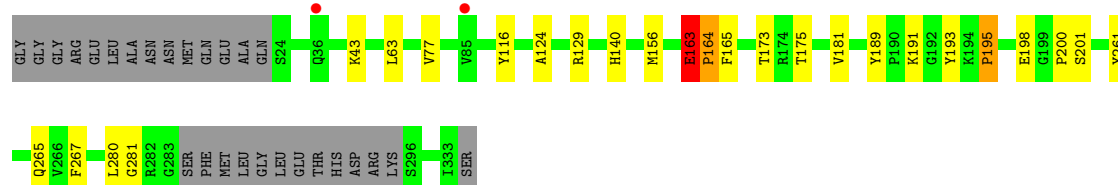
- Molecule 5: COP9 signalosome complex subunit 5

Chain E:  85% 6% • 8%



- Molecule 5: COP9 signalosome complex subunit 5

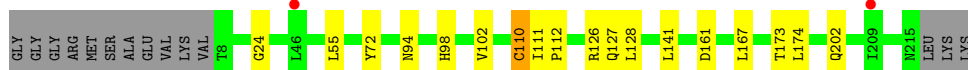
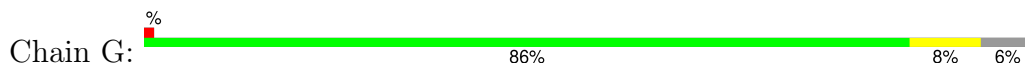
Chain M:  84% 7% • 8%



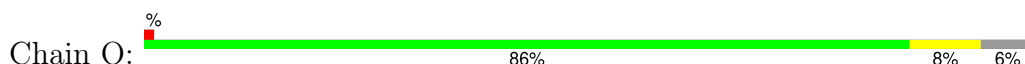
GLY	GLY	GLY	ARG	MET	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	THR	ASN	GLY	THR	GLY	GLY	SER	SER	GLY	MET	GIJ	VAL	ASP	ALA	ALA	VAL	VAL	PRO	S29	V30	T36	R57	R79	E110	Q111	F112	K113	Q114	E120	N155	P164	I174	E213	N214	V217	C218
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------



- Molecule 7: COP9 signalosome complex subunit 7a



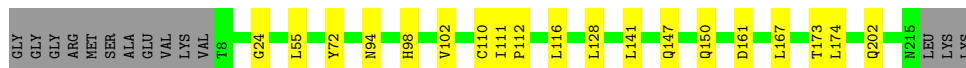
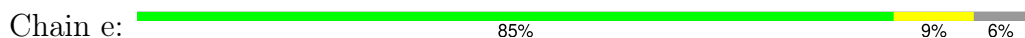
- Molecule 7: COP9 signalosome complex subunit 7a



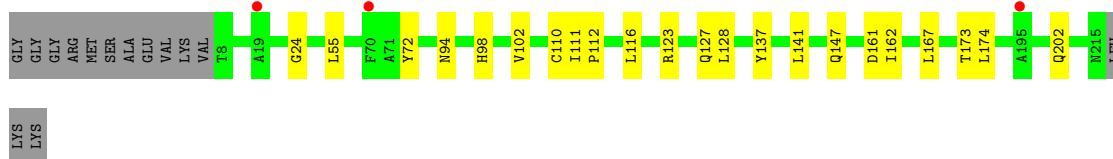
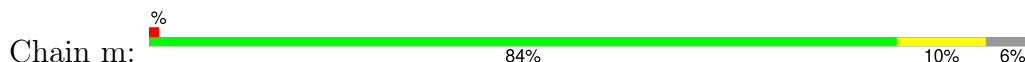
- Molecule 7: COP9 signalosome complex subunit 7a



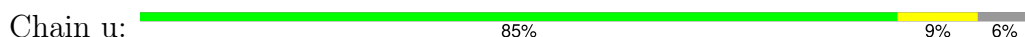
- Molecule 7: COP9 signalosome complex subunit 7a



- Molecule 7: COP9 signalosome complex subunit 7a



- Molecule 7: COP9 signalosome complex subunit 7a





- Molecule 8: COP9 signalosome complex subunit 8



- Molecule 8: COP9 signalosome complex subunit 8



- Molecule 8: COP9 signalosome complex subunit 8

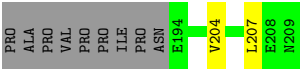
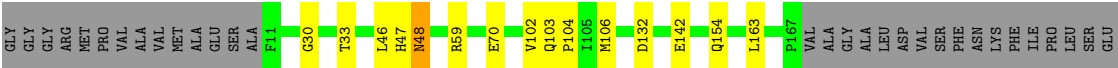


- Molecule 8: COP9 signalosome complex subunit 8



- Molecule 8: COP9 signalosome complex subunit 8





● Molecule 8: COP9 signalosome complex subunit 8



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	150.64Å 150.98Å 336.72Å 92.34° 92.62° 119.88°	Depositor
Resolution (Å)	49.64 – 5.50 49.64 – 5.50	Depositor EDS
% Data completeness (in resolution range)	96.9 (49.64-5.50) 83.7 (49.64-5.50)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.56 (at 5.39Å)	Xtriage
Refinement program	REFMAC 5.8.0073	Depositor
R, R_{free}	0.254 , 0.282 0.293 , 0.326	Depositor DCC
R_{free} test set	1948 reflections (2.34%)	wwPDB-VP
Wilson B-factor (Å ²)	264.4	Xtriage
Anisotropy	0.062	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.28 , 203.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.43$, $\langle L^2 \rangle = 0.25$	Xtriage
Estimated twinning fraction	0.059 for -k,-h,-l	Xtriage
F_o, F_c correlation	0.88	EDS
Total number of atoms	124428	wwPDB-VP
Average B, all atoms (Å ²)	126.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.50% 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 ⓘ

5.1 Standard geometry ⓘ

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

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	0.44	0/3404	0.73	0/4588
1	I	0.44	0/3404	0.72	0/4588
1	Q	0.43	0/3404	0.72	0/4588
1	Y	0.44	0/3404	0.73	0/4588
1	g	0.43	0/3404	0.72	0/4588
1	o	0.43	0/3404	0.72	0/4588
2	B	0.43	0/3360	0.72	0/4519
2	J	0.43	0/3360	0.72	0/4519
2	R	0.44	0/3360	0.72	0/4519
2	Z	0.43	0/3360	0.72	0/4519
2	h	0.43	0/3360	0.72	0/4519
2	p	0.44	0/3360	0.72	0/4519
3	C	0.42	0/3250	0.74	2/4390 (0.0%)
3	K	0.41	0/3250	0.73	2/4390 (0.0%)
3	S	0.42	0/3250	0.73	2/4390 (0.0%)
3	a	0.41	0/3250	0.73	2/4390 (0.0%)
3	i	0.41	0/3250	0.74	2/4390 (0.0%)
3	q	0.41	0/3250	0.74	2/4390 (0.0%)
4	D	0.48	0/3303	0.74	0/4460
4	L	0.48	0/3303	0.74	1/4460 (0.0%)
4	T	0.51	1/3303 (0.0%)	0.76	2/4460 (0.0%)
4	b	0.49	0/3303	0.76	1/4460 (0.0%)
4	j	0.48	1/3302 (0.0%)	0.75	2/4457 (0.0%)
4	r	0.48	0/3302	0.74	0/4457
5	E	0.42	0/2417	0.69	1/3266 (0.0%)
5	M	0.42	0/2417	0.69	1/3266 (0.0%)
5	U	0.42	0/2417	0.71	1/3266 (0.0%)
5	c	0.42	0/2417	0.69	0/3266
5	k	0.43	0/2417	0.69	1/3266 (0.0%)
5	s	0.42	0/2417	0.69	1/3266 (0.0%)
6	F	0.86	1/2310 (0.0%)	0.72	1/3133 (0.0%)
6	N	0.85	1/2310 (0.0%)	0.72	1/3133 (0.0%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
6	V	0.77	1/2310 (0.0%)	0.73	1/3133 (0.0%)
6	d	0.83	1/2310 (0.0%)	0.72	1/3133 (0.0%)
6	l	0.46	0/2310	0.72	1/3133 (0.0%)
6	t	0.46	0/2310	0.71	1/3133 (0.0%)
7	G	0.45	0/1652	0.76	0/2239
7	O	0.45	0/1652	0.76	0/2239
7	W	0.45	0/1652	0.76	1/2239 (0.0%)
7	e	0.45	0/1652	0.76	0/2239
7	m	0.46	0/1652	0.76	1/2239 (0.0%)
7	u	0.46	0/1652	0.76	0/2239
8	H	0.44	0/1416	0.75	0/1924
8	P	0.44	0/1416	0.75	0/1924
8	X	0.44	0/1416	0.75	0/1924
8	f	0.43	0/1416	0.75	0/1924
8	n	0.44	0/1416	0.75	0/1924
8	v	0.44	0/1416	0.75	0/1924
All	All	0.48	6/126670 (0.0%)	0.73	31/171108 (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
5	E	0	1
5	M	0	1
5	U	0	1
5	c	0	1
5	k	0	1
5	s	0	1
All	All	0	6

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	F	217	VAL	C-N	35.36	1.80	1.33
6	N	217	VAL	C-N	34.88	1.79	1.33
6	d	217	VAL	C-N	33.95	1.78	1.33
6	V	217	VAL	C-N	30.47	1.75	1.33
4	j	272	ILE	CB-CG1	5.53	1.64	1.53

The worst 5 of 31 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	V	217	VAL	O-C-N	-9.83	110.69	121.80
4	T	40	GLU	CB-CA-C	7.29	122.56	109.29
6	d	217	VAL	O-C-N	-7.22	113.64	121.80
4	b	290	LYS	N-CA-C	-7.10	104.54	112.57
6	F	217	VAL	O-C-N	-7.09	113.79	121.80

There are no chirality outliers.

5 of 6 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
5	E	163	GLU	Peptide
5	M	163	GLU	Peptide
5	U	163	GLU	Peptide
5	c	163	GLU	Peptide
5	k	163	GLU	Peptide

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the 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 within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3348	0	3385	19	0
1	I	3348	0	3385	17	0
1	Q	3348	0	3385	16	0
1	Y	3348	0	3385	14	0
1	g	3348	0	3385	17	0
1	o	3348	0	3385	12	0
2	B	3304	0	3350	10	0
2	J	3304	0	3350	13	0
2	R	3304	0	3350	11	0
2	Z	3304	0	3350	13	0
2	h	3304	0	3350	17	0
2	p	3304	0	3350	14	0
3	C	3191	0	3208	20	0
3	K	3191	0	3208	14	0
3	S	3191	0	3208	17	0
3	a	3191	0	3208	14	0
3	i	3191	0	3208	14	0
3	q	3191	0	3208	14	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	D	3251	0	3253	15	0
4	L	3251	0	3253	10	0
4	T	3251	0	3253	12	0
4	b	3251	0	3253	29	0
4	j	3251	0	3252	20	0
4	r	3251	0	3252	11	0
5	E	2366	0	2340	9	0
5	M	2366	0	2340	12	0
5	U	2366	0	2340	23	0
5	c	2366	0	2340	8	0
5	k	2366	0	2340	15	0
5	s	2366	0	2340	19	0
6	F	2263	0	2235	15	0
6	N	2263	0	2235	12	0
6	V	2263	0	2235	16	0
6	d	2263	0	2235	9	0
6	l	2263	0	2236	19	0
6	t	2263	0	2236	13	0
7	G	1631	0	1654	8	0
7	O	1631	0	1654	5	0
7	W	1631	0	1654	6	0
7	e	1631	0	1654	7	0
7	m	1631	0	1654	9	0
7	u	1631	0	1654	8	0
8	H	1383	0	1366	9	0
8	P	1383	0	1366	6	0
8	X	1383	0	1366	4	0
8	f	1383	0	1366	6	0
8	n	1383	0	1366	7	0
8	v	1383	0	1366	9	0
9	E	1	0	0	0	0
9	M	1	0	0	0	0
9	U	1	0	0	0	0
9	c	1	0	0	0	0
9	k	1	0	0	0	0
9	s	1	0	0	0	0
All	All	124428	0	124746	499	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 2.

The worst 5 of 499 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:V:217:VAL:C	6:V:218:ALA:N	1.75	1.44
6:N:217:VAL:C	6:N:218:ALA:N	1.79	1.40
6:d:217:VAL:C	6:d:218:ALA:N	1.78	1.40
6:F:217:VAL:C	6:F:218:ALA:N	1.80	1.37
5:U:196:PRO:HA	4:b:140:ASN:CG	2.03	0.81

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	415/480 (86%)	374 (90%)	37 (9%)	4 (1%)	12	48
1	I	415/480 (86%)	373 (90%)	38 (9%)	4 (1%)	12	48
1	Q	415/480 (86%)	374 (90%)	37 (9%)	4 (1%)	12	48
1	Y	415/480 (86%)	373 (90%)	38 (9%)	4 (1%)	12	48
1	g	415/480 (86%)	374 (90%)	37 (9%)	4 (1%)	12	48
1	o	415/480 (86%)	373 (90%)	38 (9%)	4 (1%)	12	48
2	B	397/447 (89%)	351 (88%)	34 (9%)	12 (3%)	3	22
2	J	397/447 (89%)	351 (88%)	34 (9%)	12 (3%)	3	22
2	R	397/447 (89%)	353 (89%)	32 (8%)	12 (3%)	3	22
2	Z	397/447 (89%)	351 (88%)	34 (9%)	12 (3%)	3	22
2	h	397/447 (89%)	351 (88%)	36 (9%)	10 (2%)	4	25
2	p	397/447 (89%)	351 (88%)	35 (9%)	11 (3%)	4	24
3	C	399/427 (93%)	342 (86%)	42 (10%)	15 (4%)	2	19
3	K	399/427 (93%)	342 (86%)	43 (11%)	14 (4%)	3	20
3	S	399/427 (93%)	342 (86%)	43 (11%)	14 (4%)	3	20
3	a	399/427 (93%)	341 (86%)	43 (11%)	15 (4%)	2	19

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	i	399/427 (93%)	342 (86%)	42 (10%)	15 (4%)	2	19
3	q	399/427 (93%)	342 (86%)	42 (10%)	15 (4%)	2	19
4	D	404/410 (98%)	372 (92%)	28 (7%)	4 (1%)	12	48
4	L	404/410 (98%)	373 (92%)	27 (7%)	4 (1%)	12	48
4	T	404/410 (98%)	372 (92%)	28 (7%)	4 (1%)	12	48
4	b	404/410 (98%)	374 (93%)	26 (6%)	4 (1%)	12	48
4	j	402/410 (98%)	372 (92%)	26 (6%)	4 (1%)	12	48
4	r	402/410 (98%)	372 (92%)	26 (6%)	4 (1%)	12	48
5	E	294/325 (90%)	262 (89%)	26 (9%)	6 (2%)	6	30
5	M	294/325 (90%)	262 (89%)	26 (9%)	6 (2%)	6	30
5	U	294/325 (90%)	262 (89%)	28 (10%)	4 (1%)	9	39
5	c	294/325 (90%)	262 (89%)	26 (9%)	6 (2%)	6	30
5	k	294/325 (90%)	261 (89%)	27 (9%)	6 (2%)	6	30
5	s	294/325 (90%)	261 (89%)	27 (9%)	6 (2%)	6	30
6	F	286/331 (86%)	257 (90%)	25 (9%)	4 (1%)	9	39
6	N	286/331 (86%)	257 (90%)	25 (9%)	4 (1%)	9	39
6	V	286/331 (86%)	258 (90%)	24 (8%)	4 (1%)	9	39
6	d	286/331 (86%)	257 (90%)	25 (9%)	4 (1%)	9	39
6	l	286/331 (86%)	257 (90%)	25 (9%)	4 (1%)	9	39
6	t	286/331 (86%)	257 (90%)	25 (9%)	4 (1%)	9	39
7	G	206/222 (93%)	193 (94%)	12 (6%)	1 (0%)	24	64
7	O	206/222 (93%)	194 (94%)	11 (5%)	1 (0%)	24	64
7	W	206/222 (93%)	194 (94%)	11 (5%)	1 (0%)	24	64
7	e	206/222 (93%)	193 (94%)	12 (6%)	1 (0%)	24	64
7	m	206/222 (93%)	193 (94%)	12 (6%)	1 (0%)	24	64
7	u	206/222 (93%)	193 (94%)	12 (6%)	1 (0%)	24	64
8	H	169/213 (79%)	156 (92%)	11 (6%)	2 (1%)	10	43
8	P	169/213 (79%)	156 (92%)	11 (6%)	2 (1%)	10	43
8	X	169/213 (79%)	156 (92%)	11 (6%)	2 (1%)	10	43
8	f	169/213 (79%)	156 (92%)	11 (6%)	2 (1%)	10	43
8	n	169/213 (79%)	156 (92%)	11 (6%)	2 (1%)	10	43

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
8	v	169/213 (79%)	156 (92%)	11 (6%)	2 (1%)	10	43
All	All	15416/17130 (90%)	13844 (90%)	1291 (8%)	281 (2%)	6	33

5 of 281 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	229	PRO
2	B	414	GLN
3	C	51	VAL
3	C	89	ASN
3	C	364	PRO

5.3.2 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 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	365/415 (88%)	358 (98%)	7 (2%)	50	66
1	I	365/415 (88%)	358 (98%)	7 (2%)	50	66
1	Q	365/415 (88%)	358 (98%)	7 (2%)	50	66
1	Y	365/415 (88%)	358 (98%)	7 (2%)	50	66
1	g	365/415 (88%)	358 (98%)	7 (2%)	50	66
1	o	365/415 (88%)	358 (98%)	7 (2%)	50	66
2	B	367/406 (90%)	363 (99%)	4 (1%)	65	75
2	J	367/406 (90%)	363 (99%)	4 (1%)	65	75
2	R	367/406 (90%)	363 (99%)	4 (1%)	65	75
2	Z	367/406 (90%)	363 (99%)	4 (1%)	65	75
2	h	367/406 (90%)	363 (99%)	4 (1%)	65	75
2	p	367/406 (90%)	363 (99%)	4 (1%)	65	75
3	C	358/378 (95%)	351 (98%)	7 (2%)	48	66
3	K	358/378 (95%)	351 (98%)	7 (2%)	48	66
3	S	358/378 (95%)	351 (98%)	7 (2%)	48	66

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	a	358/378 (95%)	351 (98%)	7 (2%)	48	66
3	i	358/378 (95%)	351 (98%)	7 (2%)	48	66
3	q	358/378 (95%)	351 (98%)	7 (2%)	48	66
4	D	347/348 (100%)	326 (94%)	21 (6%)	17	38
4	L	347/348 (100%)	328 (94%)	19 (6%)	19	41
4	T	347/348 (100%)	328 (94%)	19 (6%)	19	41
4	b	347/348 (100%)	326 (94%)	21 (6%)	17	38
4	j	347/348 (100%)	326 (94%)	21 (6%)	17	38
4	r	347/348 (100%)	329 (95%)	18 (5%)	21	42
5	E	255/276 (92%)	248 (97%)	7 (3%)	39	60
5	M	255/276 (92%)	248 (97%)	7 (3%)	39	60
5	U	255/276 (92%)	248 (97%)	7 (3%)	39	60
5	c	255/276 (92%)	248 (97%)	7 (3%)	39	60
5	k	255/276 (92%)	248 (97%)	7 (3%)	39	60
5	s	255/276 (92%)	248 (97%)	7 (3%)	39	60
6	F	250/277 (90%)	246 (98%)	4 (2%)	55	69
6	N	250/277 (90%)	245 (98%)	5 (2%)	48	66
6	V	250/277 (90%)	246 (98%)	4 (2%)	55	69
6	d	250/277 (90%)	246 (98%)	4 (2%)	55	69
6	l	250/277 (90%)	246 (98%)	4 (2%)	55	69
6	t	250/277 (90%)	246 (98%)	4 (2%)	55	69
7	G	174/184 (95%)	168 (97%)	6 (3%)	32	54
7	O	174/184 (95%)	168 (97%)	6 (3%)	32	54
7	W	174/184 (95%)	168 (97%)	6 (3%)	32	54
7	e	174/184 (95%)	168 (97%)	6 (3%)	32	54
7	m	174/184 (95%)	168 (97%)	6 (3%)	32	54
7	u	174/184 (95%)	168 (97%)	6 (3%)	32	54
8	H	144/174 (83%)	139 (96%)	5 (4%)	32	53
8	P	144/174 (83%)	139 (96%)	5 (4%)	32	53
8	X	144/174 (83%)	139 (96%)	5 (4%)	32	53
8	f	144/174 (83%)	139 (96%)	5 (4%)	32	53

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
8	n	144/174 (83%)	139 (96%)	5 (4%)	32	53
8	v	144/174 (83%)	139 (96%)	5 (4%)	32	53
All	All	13560/14748 (92%)	13200 (97%)	360 (3%)	39	60

5 of 360 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
7	e	161	ASP
5	k	267	PHE
8	f	70	GLU
4	j	22	LEU
8	n	132	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 200 such sidechains are listed below:

Mol	Chain	Res	Type
3	a	89	ASN
2	h	370	HIS
8	v	68	ASN
4	b	276	ASN
8	f	68	ASN

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 6 ligands modelled in this entry, 6 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
4	r	1
2	J	1
2	B	1
2	R	1
2	p	1
2	Z	1
2	h	1
4	j	1
6	F	1
6	N	1
6	d	1
6	V	1

The worst 5 of 12 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	r	290:LYS	C	291:ALA	N	3.62
1	J	193:GLN	C	194:LEU	N	2.88
1	B	193:GLN	C	194:LEU	N	2.87
1	R	193:GLN	C	194:LEU	N	2.86
1	p	193:GLN	C	194:LEU	N	2.85

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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	419/480 (87%)	-0.53	1 (0%) 91 84	60, 128, 170, 185	0
1	I	419/480 (87%)	-0.46	1 (0%) 91 84	67, 120, 169, 191	0
1	Q	419/480 (87%)	-0.45	1 (0%) 91 84	81, 121, 167, 197	0
1	Y	419/480 (87%)	-0.51	3 (0%) 84 73	68, 108, 148, 176	0
1	g	419/480 (87%)	-0.49	1 (0%) 91 84	80, 111, 161, 190	0
1	o	419/480 (87%)	-0.55	1 (0%) 91 84	75, 109, 168, 189	0
2	B	403/447 (90%)	-0.40	4 (0%) 79 67	65, 127, 155, 189	0
2	J	403/447 (90%)	-0.49	3 (0%) 84 73	70, 125, 159, 172	0
2	R	403/447 (90%)	-0.41	3 (0%) 84 73	75, 108, 139, 162	0
2	Z	403/447 (90%)	-0.45	4 (0%) 79 67	68, 139, 167, 189	0
2	h	403/447 (90%)	-0.47	0 100 100	85, 135, 176, 202	0
2	p	403/447 (90%)	-0.51	1 (0%) 91 84	81, 126, 165, 179	0
3	C	401/427 (93%)	-0.46	1 (0%) 91 84	58, 118, 219, 260	0
3	K	401/427 (93%)	-0.42	2 (0%) 87 77	69, 118, 201, 220	0
3	S	401/427 (93%)	-0.45	3 (0%) 84 73	68, 99, 195, 216	0
3	a	401/427 (93%)	-0.40	3 (0%) 84 73	69, 134, 218, 238	0
3	i	401/427 (93%)	-0.47	5 (1%) 76 64	81, 114, 207, 257	0
3	q	401/427 (93%)	-0.47	1 (0%) 91 84	77, 116, 208, 249	0
4	D	406/410 (99%)	-0.53	1 (0%) 91 84	68, 145, 251, 272	0
4	L	406/410 (99%)	-0.54	0 100 100	80, 152, 188, 216	0
4	T	406/410 (99%)	-0.53	1 (0%) 91 84	88, 131, 183, 209	0
4	b	406/410 (99%)	-0.41	0 100 100	73, 166, 243, 253	0
4	j	406/410 (99%)	-0.42	1 (0%) 91 84	86, 132, 269, 285	0
4	r	406/410 (99%)	-0.44	1 (0%) 91 84	81, 162, 253, 272	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
5	E	298/325 (91%)	-0.37	2 (0%) 84 73	73, 112, 148, 170	0
5	M	298/325 (91%)	-0.38	2 (0%) 84 73	78, 107, 159, 185	0
5	U	298/325 (91%)	-0.47	1 (0%) 90 81	89, 121, 174, 198	0
5	c	298/325 (91%)	-0.42	0 100 100	61, 88, 126, 144	0
5	k	298/325 (91%)	-0.43	5 (1%) 69 58	85, 107, 145, 166	0
5	s	298/325 (91%)	-0.42	3 (1%) 79 67	84, 108, 148, 170	0
6	F	288/331 (87%)	-0.57	0 100 100	62, 114, 153, 184	0
6	N	288/331 (87%)	-0.54	1 (0%) 90 81	73, 113, 165, 193	0
6	V	288/331 (87%)	-0.46	2 (0%) 84 73	84, 120, 160, 194	0
6	d	288/331 (87%)	-0.54	0 100 100	63, 97, 150, 185	0
6	l	288/331 (87%)	-0.41	0 100 100	84, 116, 156, 182	0
6	t	288/331 (87%)	-0.49	2 (0%) 84 73	77, 116, 160, 190	0
7	G	208/222 (93%)	-0.50	2 (0%) 79 67	92, 114, 162, 187	0
7	O	208/222 (93%)	-0.52	3 (1%) 73 61	68, 115, 160, 181	0
7	W	208/222 (93%)	-0.50	1 (0%) 87 77	111, 135, 161, 174	0
7	e	208/222 (93%)	-0.55	0 100 100	84, 106, 145, 168	0
7	m	208/222 (93%)	-0.44	3 (1%) 73 61	72, 98, 143, 188	0
7	u	208/222 (93%)	-0.48	1 (0%) 87 77	73, 111, 149, 164	0
8	H	173/213 (81%)	-0.48	0 100 100	82, 123, 154, 168	0
8	P	173/213 (81%)	-0.55	0 100 100	91, 121, 147, 161	0
8	X	173/213 (81%)	-0.59	0 100 100	91, 114, 142, 150	0
8	f	173/213 (81%)	-0.57	0 100 100	81, 169, 190, 196	0
8	n	173/213 (81%)	-0.57	0 100 100	98, 129, 164, 181	0
8	v	173/213 (81%)	-0.64	0 100 100	94, 139, 175, 187	0
All	All	15576/17130 (90%)	-0.48	70 (0%) 88 78	58, 119, 209, 285	0

The worst 5 of 70 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	i	181	PHE	7.5
3	S	54	HIS	4.2
7	O	66	LEU	4.0
3	C	54	HIS	4.0
3	K	54	HIS	3.8

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 oligosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
9	ZN	s	401	1/1	0.96	0.10	130,130,130,130	0
9	ZN	M	401	1/1	0.99	0.05	130,130,130,130	0
9	ZN	U	401	1/1	0.99	0.05	130,130,130,130	0
9	ZN	c	401	1/1	0.99	0.12	130,130,130,130	0
9	ZN	E	401	1/1	0.99	0.06	130,130,130,130	0
9	ZN	k	401	1/1	1.00	0.05	130,130,130,130	0

6.5 Other polymers [i](#)

There are no such residues in this entry.