wwPDB EM Validation Summary Report (i)

Jun 1, 2024 – 06:58 AM EDT

PDB ID	:	7TZO
EMDB ID	:	EMD-26213
Title	:	The apo structure of human mTORC2 complex
Authors	:	Yu, Z.; Chen, J.; Pearce, D.
Deposited on	:	2022-02-16
Resolution	:	3.28 Å(reported)

This is a wwPDB EM 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/EMValidationReportHelp
with specific help available everywhere you see the (i) 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 (i)) were used in the production of this report:

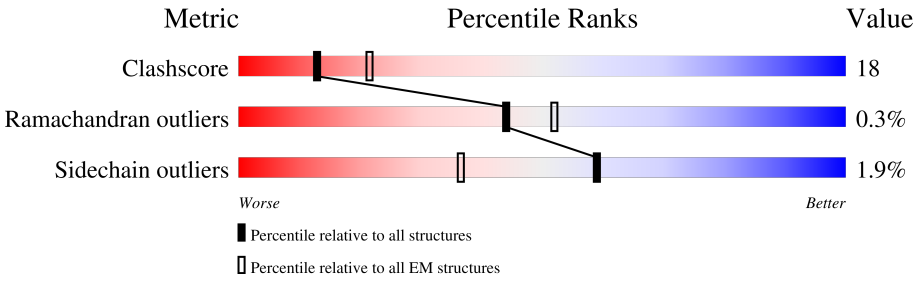
EMDB validation analysis	:	0.0.1.dev92
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.28 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)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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 <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	2674	14% 57% 24% 18%
1	B	2674	14% 58% 24% 18%
2	C	347	5% 52% 40% 8%
2	D	347	5% 54% 38% 8%
3	E	1720	38% 26% 35%
3	F	1720	38% 26% 35%
4	G	538	13% 5% 78%
4	H	538	13% 5% 78%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 57117 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called Serine/threonine-protein kinase mTOR.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	2184	Total 16337	C 10356	N 2906	O 2977	S 98	0	0
1	B	2185	Total 16304	C 10330	N 2904	O 2972	S 98	0	0

There are 250 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-124	MET	-	initiating methionine	UNP P42345
A	-123	VAL	-	expression tag	UNP P42345
A	-122	THR	-	expression tag	UNP P42345
A	-121	THR	-	expression tag	UNP P42345
A	-120	LEU	-	expression tag	UNP P42345
A	-119	SER	-	expression tag	UNP P42345
A	-118	GLY	-	expression tag	UNP P42345
A	-117	LEU	-	expression tag	UNP P42345
A	-116	SER	-	expression tag	UNP P42345
A	-115	GLY	-	expression tag	UNP P42345
A	-114	GLU	-	expression tag	UNP P42345
A	-113	GLN	-	expression tag	UNP P42345
A	-112	GLY	-	expression tag	UNP P42345
A	-111	PRO	-	expression tag	UNP P42345
A	-110	SER	-	expression tag	UNP P42345
A	-109	GLY	-	expression tag	UNP P42345
A	-108	ASP	-	expression tag	UNP P42345
A	-107	MET	-	expression tag	UNP P42345
A	-106	THR	-	expression tag	UNP P42345
A	-105	THR	-	expression tag	UNP P42345
A	-104	GLU	-	expression tag	UNP P42345
A	-103	GLU	-	expression tag	UNP P42345
A	-102	ASP	-	expression tag	UNP P42345
A	-101	SER	-	expression tag	UNP P42345
A	-100	ALA	-	expression tag	UNP P42345
A	-99	THR	-	expression tag	UNP P42345

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-98	HIS	-	expression tag	UNP P42345
A	-97	ILE	-	expression tag	UNP P42345
A	-96	LYS	-	expression tag	UNP P42345
A	-95	PHE	-	expression tag	UNP P42345
A	-94	SER	-	expression tag	UNP P42345
A	-93	LYS	-	expression tag	UNP P42345
A	-92	ARG	-	expression tag	UNP P42345
A	-91	ASP	-	expression tag	UNP P42345
A	-90	GLU	-	expression tag	UNP P42345
A	-89	ASP	-	expression tag	UNP P42345
A	-88	GLY	-	expression tag	UNP P42345
A	-87	ARG	-	expression tag	UNP P42345
A	-86	GLU	-	expression tag	UNP P42345
A	-85	LEU	-	expression tag	UNP P42345
A	-84	ALA	-	expression tag	UNP P42345
A	-83	GLY	-	expression tag	UNP P42345
A	-82	ALA	-	expression tag	UNP P42345
A	-81	THR	-	expression tag	UNP P42345
A	-80	MET	-	expression tag	UNP P42345
A	-79	GLU	-	expression tag	UNP P42345
A	-78	LEU	-	expression tag	UNP P42345
A	-77	ARG	-	expression tag	UNP P42345
A	-76	ASP	-	expression tag	UNP P42345
A	-75	SER	-	expression tag	UNP P42345
A	-74	SER	-	expression tag	UNP P42345
A	-73	GLY	-	expression tag	UNP P42345
A	-72	LYS	-	expression tag	UNP P42345
A	-71	THR	-	expression tag	UNP P42345
A	-70	ILE	-	expression tag	UNP P42345
A	-69	SER	-	expression tag	UNP P42345
A	-68	THR	-	expression tag	UNP P42345
A	-67	TRP	-	expression tag	UNP P42345
A	-66	ILE	-	expression tag	UNP P42345
A	-65	SER	-	expression tag	UNP P42345
A	-64	ASP	-	expression tag	UNP P42345
A	-63	GLY	-	expression tag	UNP P42345
A	-62	HIS	-	expression tag	UNP P42345
A	-61	VAL	-	expression tag	UNP P42345
A	-60	LYS	-	expression tag	UNP P42345
A	-59	ASP	-	expression tag	UNP P42345
A	-58	PHE	-	expression tag	UNP P42345
A	-57	TYR	-	expression tag	UNP P42345

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-56	LEU	-	expression tag	UNP P42345
A	-55	TYR	-	expression tag	UNP P42345
A	-54	PRO	-	expression tag	UNP P42345
A	-53	GLY	-	expression tag	UNP P42345
A	-52	LYS	-	expression tag	UNP P42345
A	-51	TYR	-	expression tag	UNP P42345
A	-50	THR	-	expression tag	UNP P42345
A	-49	PHE	-	expression tag	UNP P42345
A	-48	VAL	-	expression tag	UNP P42345
A	-47	GLU	-	expression tag	UNP P42345
A	-46	THR	-	expression tag	UNP P42345
A	-45	ALA	-	expression tag	UNP P42345
A	-44	ALA	-	expression tag	UNP P42345
A	-43	PRO	-	expression tag	UNP P42345
A	-42	ASP	-	expression tag	UNP P42345
A	-41	GLY	-	expression tag	UNP P42345
A	-40	TYR	-	expression tag	UNP P42345
A	-39	GLU	-	expression tag	UNP P42345
A	-38	VAL	-	expression tag	UNP P42345
A	-37	ALA	-	expression tag	UNP P42345
A	-36	THR	-	expression tag	UNP P42345
A	-35	PRO	-	expression tag	UNP P42345
A	-34	ILE	-	expression tag	UNP P42345
A	-33	GLU	-	expression tag	UNP P42345
A	-32	PHE	-	expression tag	UNP P42345
A	-31	THR	-	expression tag	UNP P42345
A	-30	VAL	-	expression tag	UNP P42345
A	-29	ASN	-	expression tag	UNP P42345
A	-28	GLU	-	expression tag	UNP P42345
A	-27	ASP	-	expression tag	UNP P42345
A	-26	GLY	-	expression tag	UNP P42345
A	-25	GLN	-	expression tag	UNP P42345
A	-24	VAL	-	expression tag	UNP P42345
A	-23	THR	-	expression tag	UNP P42345
A	-22	VAL	-	expression tag	UNP P42345
A	-21	ASP	-	expression tag	UNP P42345
A	-20	GLY	-	expression tag	UNP P42345
A	-19	GLU	-	expression tag	UNP P42345
A	-18	ALA	-	expression tag	UNP P42345
A	-17	THR	-	expression tag	UNP P42345
A	-16	GLU	-	expression tag	UNP P42345
A	-15	GLY	-	expression tag	UNP P42345

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-14	ASP	-	expression tag	UNP P42345
A	-13	ALA	-	expression tag	UNP P42345
A	-12	HIS	-	expression tag	UNP P42345
A	-11	THR	-	expression tag	UNP P42345
A	-10	GLY	-	expression tag	UNP P42345
A	-9	SER	-	expression tag	UNP P42345
A	-8	SER	-	expression tag	UNP P42345
A	-7	GLY	-	expression tag	UNP P42345
A	-6	SER	-	expression tag	UNP P42345
A	-5	GLY	-	expression tag	UNP P42345
A	-4	SER	-	expression tag	UNP P42345
A	-3	GLY	-	expression tag	UNP P42345
A	-2	THR	-	expression tag	UNP P42345
A	-1	GLY	-	expression tag	UNP P42345
A	0	SER	-	expression tag	UNP P42345
B	-124	MET	-	initiating methionine	UNP P42345
B	-123	VAL	-	expression tag	UNP P42345
B	-122	THR	-	expression tag	UNP P42345
B	-121	THR	-	expression tag	UNP P42345
B	-120	LEU	-	expression tag	UNP P42345
B	-119	SER	-	expression tag	UNP P42345
B	-118	GLY	-	expression tag	UNP P42345
B	-117	LEU	-	expression tag	UNP P42345
B	-116	SER	-	expression tag	UNP P42345
B	-115	GLY	-	expression tag	UNP P42345
B	-114	GLU	-	expression tag	UNP P42345
B	-113	GLN	-	expression tag	UNP P42345
B	-112	GLY	-	expression tag	UNP P42345
B	-111	PRO	-	expression tag	UNP P42345
B	-110	SER	-	expression tag	UNP P42345
B	-109	GLY	-	expression tag	UNP P42345
B	-108	ASP	-	expression tag	UNP P42345
B	-107	MET	-	expression tag	UNP P42345
B	-106	THR	-	expression tag	UNP P42345
B	-105	THR	-	expression tag	UNP P42345
B	-104	GLU	-	expression tag	UNP P42345
B	-103	GLU	-	expression tag	UNP P42345
B	-102	ASP	-	expression tag	UNP P42345
B	-101	SER	-	expression tag	UNP P42345
B	-100	ALA	-	expression tag	UNP P42345
B	-99	THR	-	expression tag	UNP P42345
B	-98	HIS	-	expression tag	UNP P42345

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-97	ILE	-	expression tag	UNP P42345
B	-96	LYS	-	expression tag	UNP P42345
B	-95	PHE	-	expression tag	UNP P42345
B	-94	SER	-	expression tag	UNP P42345
B	-93	LYS	-	expression tag	UNP P42345
B	-92	ARG	-	expression tag	UNP P42345
B	-91	ASP	-	expression tag	UNP P42345
B	-90	GLU	-	expression tag	UNP P42345
B	-89	ASP	-	expression tag	UNP P42345
B	-88	GLY	-	expression tag	UNP P42345
B	-87	ARG	-	expression tag	UNP P42345
B	-86	GLU	-	expression tag	UNP P42345
B	-85	LEU	-	expression tag	UNP P42345
B	-84	ALA	-	expression tag	UNP P42345
B	-83	GLY	-	expression tag	UNP P42345
B	-82	ALA	-	expression tag	UNP P42345
B	-81	THR	-	expression tag	UNP P42345
B	-80	MET	-	expression tag	UNP P42345
B	-79	GLU	-	expression tag	UNP P42345
B	-78	LEU	-	expression tag	UNP P42345
B	-77	ARG	-	expression tag	UNP P42345
B	-76	ASP	-	expression tag	UNP P42345
B	-75	SER	-	expression tag	UNP P42345
B	-74	SER	-	expression tag	UNP P42345
B	-73	GLY	-	expression tag	UNP P42345
B	-72	LYS	-	expression tag	UNP P42345
B	-71	THR	-	expression tag	UNP P42345
B	-70	ILE	-	expression tag	UNP P42345
B	-69	SER	-	expression tag	UNP P42345
B	-68	THR	-	expression tag	UNP P42345
B	-67	TRP	-	expression tag	UNP P42345
B	-66	ILE	-	expression tag	UNP P42345
B	-65	SER	-	expression tag	UNP P42345
B	-64	ASP	-	expression tag	UNP P42345
B	-63	GLY	-	expression tag	UNP P42345
B	-62	HIS	-	expression tag	UNP P42345
B	-61	VAL	-	expression tag	UNP P42345
B	-60	LYS	-	expression tag	UNP P42345
B	-59	ASP	-	expression tag	UNP P42345
B	-58	PHE	-	expression tag	UNP P42345
B	-57	TYR	-	expression tag	UNP P42345
B	-56	LEU	-	expression tag	UNP P42345

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-55	TYR	-	expression tag	UNP P42345
B	-54	PRO	-	expression tag	UNP P42345
B	-53	GLY	-	expression tag	UNP P42345
B	-52	LYS	-	expression tag	UNP P42345
B	-51	TYR	-	expression tag	UNP P42345
B	-50	THR	-	expression tag	UNP P42345
B	-49	PHE	-	expression tag	UNP P42345
B	-48	VAL	-	expression tag	UNP P42345
B	-47	GLU	-	expression tag	UNP P42345
B	-46	THR	-	expression tag	UNP P42345
B	-45	ALA	-	expression tag	UNP P42345
B	-44	ALA	-	expression tag	UNP P42345
B	-43	PRO	-	expression tag	UNP P42345
B	-42	ASP	-	expression tag	UNP P42345
B	-41	GLY	-	expression tag	UNP P42345
B	-40	TYR	-	expression tag	UNP P42345
B	-39	GLU	-	expression tag	UNP P42345
B	-38	VAL	-	expression tag	UNP P42345
B	-37	ALA	-	expression tag	UNP P42345
B	-36	THR	-	expression tag	UNP P42345
B	-35	PRO	-	expression tag	UNP P42345
B	-34	ILE	-	expression tag	UNP P42345
B	-33	GLU	-	expression tag	UNP P42345
B	-32	PHE	-	expression tag	UNP P42345
B	-31	THR	-	expression tag	UNP P42345
B	-30	VAL	-	expression tag	UNP P42345
B	-29	ASN	-	expression tag	UNP P42345
B	-28	GLU	-	expression tag	UNP P42345
B	-27	ASP	-	expression tag	UNP P42345
B	-26	GLY	-	expression tag	UNP P42345
B	-25	GLN	-	expression tag	UNP P42345
B	-24	VAL	-	expression tag	UNP P42345
B	-23	THR	-	expression tag	UNP P42345
B	-22	VAL	-	expression tag	UNP P42345
B	-21	ASP	-	expression tag	UNP P42345
B	-20	GLY	-	expression tag	UNP P42345
B	-19	GLU	-	expression tag	UNP P42345
B	-18	ALA	-	expression tag	UNP P42345
B	-17	THR	-	expression tag	UNP P42345
B	-16	GLU	-	expression tag	UNP P42345
B	-15	GLY	-	expression tag	UNP P42345
B	-14	ASP	-	expression tag	UNP P42345

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-13	ALA	-	expression tag	UNP P42345
B	-12	HIS	-	expression tag	UNP P42345
B	-11	THR	-	expression tag	UNP P42345
B	-10	GLY	-	expression tag	UNP P42345
B	-9	SER	-	expression tag	UNP P42345
B	-8	SER	-	expression tag	UNP P42345
B	-7	GLY	-	expression tag	UNP P42345
B	-6	SER	-	expression tag	UNP P42345
B	-5	GLY	-	expression tag	UNP P42345
B	-4	SER	-	expression tag	UNP P42345
B	-3	GLY	-	expression tag	UNP P42345
B	-2	THR	-	expression tag	UNP P42345
B	-1	GLY	-	expression tag	UNP P42345
B	0	SER	-	expression tag	UNP P42345

- Molecule 2 is a protein called Target of rapamycin complex subunit LST8.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	319	Total	C	N	O	S	0	0
			2465	1533	437	477	18		
2	D	319	Total	C	N	O	S	0	0
			2465	1533	437	477	18		

There are 42 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-20	MET	-	initiating methionine	UNP Q9BVC4
C	-19	GLY	-	expression tag	UNP Q9BVC4
C	-18	TYR	-	expression tag	UNP Q9BVC4
C	-17	PRO	-	expression tag	UNP Q9BVC4
C	-16	TYR	-	expression tag	UNP Q9BVC4
C	-15	ASP	-	expression tag	UNP Q9BVC4
C	-14	VAL	-	expression tag	UNP Q9BVC4
C	-13	PRO	-	expression tag	UNP Q9BVC4
C	-12	ASP	-	expression tag	UNP Q9BVC4
C	-11	TYR	-	expression tag	UNP Q9BVC4
C	-10	ALA	-	expression tag	UNP Q9BVC4
C	-9	ASP	-	expression tag	UNP Q9BVC4
C	-8	LEU	-	expression tag	UNP Q9BVC4
C	-7	ASN	-	expression tag	UNP Q9BVC4
C	-6	GLY	-	expression tag	UNP Q9BVC4
C	-5	GLY	-	expression tag	UNP Q9BVC4

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-4	GLY	-	expression tag	UNP Q9BVC4
C	-3	GLY	-	expression tag	UNP Q9BVC4
C	-2	GLY	-	expression tag	UNP Q9BVC4
C	-1	SER	-	expression tag	UNP Q9BVC4
C	0	THR	-	expression tag	UNP Q9BVC4
D	-20	MET	-	initiating methionine	UNP Q9BVC4
D	-19	GLY	-	expression tag	UNP Q9BVC4
D	-18	TYR	-	expression tag	UNP Q9BVC4
D	-17	PRO	-	expression tag	UNP Q9BVC4
D	-16	TYR	-	expression tag	UNP Q9BVC4
D	-15	ASP	-	expression tag	UNP Q9BVC4
D	-14	VAL	-	expression tag	UNP Q9BVC4
D	-13	PRO	-	expression tag	UNP Q9BVC4
D	-12	ASP	-	expression tag	UNP Q9BVC4
D	-11	TYR	-	expression tag	UNP Q9BVC4
D	-10	ALA	-	expression tag	UNP Q9BVC4
D	-9	ASP	-	expression tag	UNP Q9BVC4
D	-8	LEU	-	expression tag	UNP Q9BVC4
D	-7	ASN	-	expression tag	UNP Q9BVC4
D	-6	GLY	-	expression tag	UNP Q9BVC4
D	-5	GLY	-	expression tag	UNP Q9BVC4
D	-4	GLY	-	expression tag	UNP Q9BVC4
D	-3	GLY	-	expression tag	UNP Q9BVC4
D	-2	GLY	-	expression tag	UNP Q9BVC4
D	-1	SER	-	expression tag	UNP Q9BVC4
D	0	THR	-	expression tag	UNP Q9BVC4

- Molecule 3 is a protein called Rapamycin-insensitive companion of mTOR.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	1117	Total	C	N	O	S	0	0
			8931	5689	1584	1611	47		
3	F	1117	Total	C	N	O	S	0	0
			8931	5689	1584	1611	47		

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	-11	MET	-	initiating methionine	UNP Q6R327
E	-10	ASP	-	expression tag	UNP Q6R327
E	-9	TYR	-	expression tag	UNP Q6R327
E	-8	LYS	-	expression tag	UNP Q6R327

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-7	ASP	-	expression tag	UNP Q6R327
E	-6	ASP	-	expression tag	UNP Q6R327
E	-5	ASP	-	expression tag	UNP Q6R327
E	-4	ASP	-	expression tag	UNP Q6R327
E	-3	LYS	-	expression tag	UNP Q6R327
E	-2	GLY	-	expression tag	UNP Q6R327
E	-1	SER	-	expression tag	UNP Q6R327
E	0	THR	-	expression tag	UNP Q6R327
F	-11	MET	-	initiating methionine	UNP Q6R327
F	-10	ASP	-	expression tag	UNP Q6R327
F	-9	TYR	-	expression tag	UNP Q6R327
F	-8	LYS	-	expression tag	UNP Q6R327
F	-7	ASP	-	expression tag	UNP Q6R327
F	-6	ASP	-	expression tag	UNP Q6R327
F	-5	ASP	-	expression tag	UNP Q6R327
F	-4	ASP	-	expression tag	UNP Q6R327
F	-3	LYS	-	expression tag	UNP Q6R327
F	-2	GLY	-	expression tag	UNP Q6R327
F	-1	SER	-	expression tag	UNP Q6R327
F	0	THR	-	expression tag	UNP Q6R327

- Molecule 4 is a protein called Target of rapamycin complex 2 subunit MAPKAP1.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	G	120	Total	C	N	O	S	0	0
			842	518	158	162	4		
4	H	120	Total	C	N	O	S	0	0
			842	518	158	162	4		

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	523	ALA	-	expression tag	UNP Q9BPZ7
G	524	ALA	-	expression tag	UNP Q9BPZ7
G	525	ALA	-	expression tag	UNP Q9BPZ7
G	526	GLY	-	expression tag	UNP Q9BPZ7
G	527	GLY	-	expression tag	UNP Q9BPZ7
G	528	GLY	-	expression tag	UNP Q9BPZ7
G	529	GLY	-	expression tag	UNP Q9BPZ7
G	530	TYR	-	expression tag	UNP Q9BPZ7
G	531	PRO	-	expression tag	UNP Q9BPZ7
G	532	TYR	-	expression tag	UNP Q9BPZ7

Continued on next page...

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Chain	Residue	Modelled	Actual	Comment	Reference
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G	534	VAL	-	expression tag	UNP Q9BPZ7
G	535	PRO	-	expression tag	UNP Q9BPZ7
G	536	ASP	-	expression tag	UNP Q9BPZ7
G	537	TYR	-	expression tag	UNP Q9BPZ7
G	538	ALA	-	expression tag	UNP Q9BPZ7
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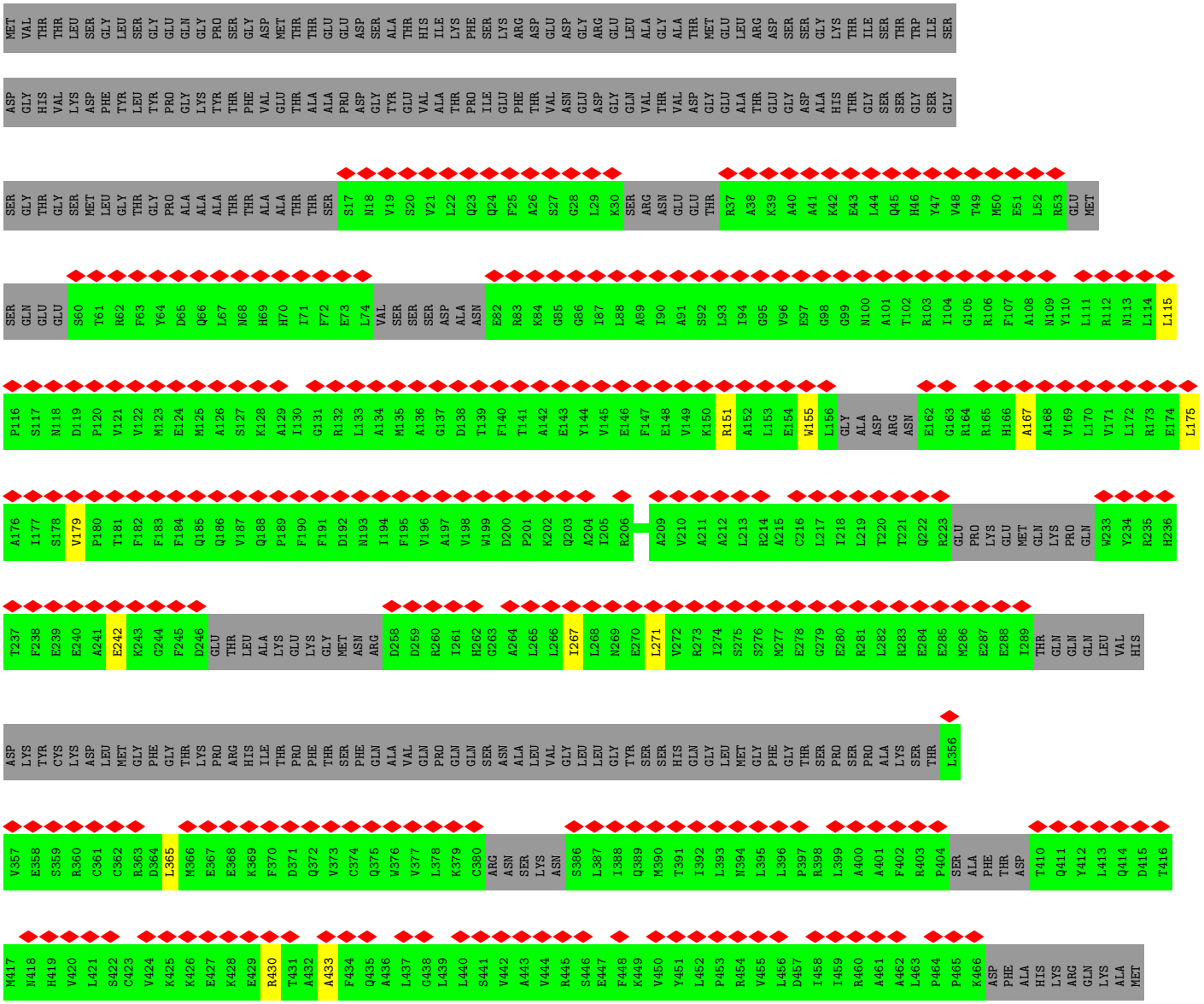
H	524	ALA	-	expression tag	UNP Q9BPZ7
H	525	ALA	-	expression tag	UNP Q9BPZ7
H	526	GLY	-	expression tag	UNP Q9BPZ7
H	527	GLY	-	expression tag	UNP Q9BPZ7
H	528	GLY	-	expression tag	UNP Q9BPZ7
H	529	GLY	-	expression tag	UNP Q9BPZ7
H	530	TYR	-	expression tag	UNP Q9BPZ7
H	531	PRO	-	expression tag	UNP Q9BPZ7
H	532	TYR	-	expression tag	UNP Q9BPZ7
H	533	ASP	-	expression tag	UNP Q9BPZ7
H	534	VAL	-	expression tag	UNP Q9BPZ7
H	535	PRO	-	expression tag	UNP Q9BPZ7
H	536	ASP	-	expression tag	UNP Q9BPZ7
H	537	TYR	-	expression tag	UNP Q9BPZ7
H	538	ALA	-	expression tag	UNP Q9BPZ7

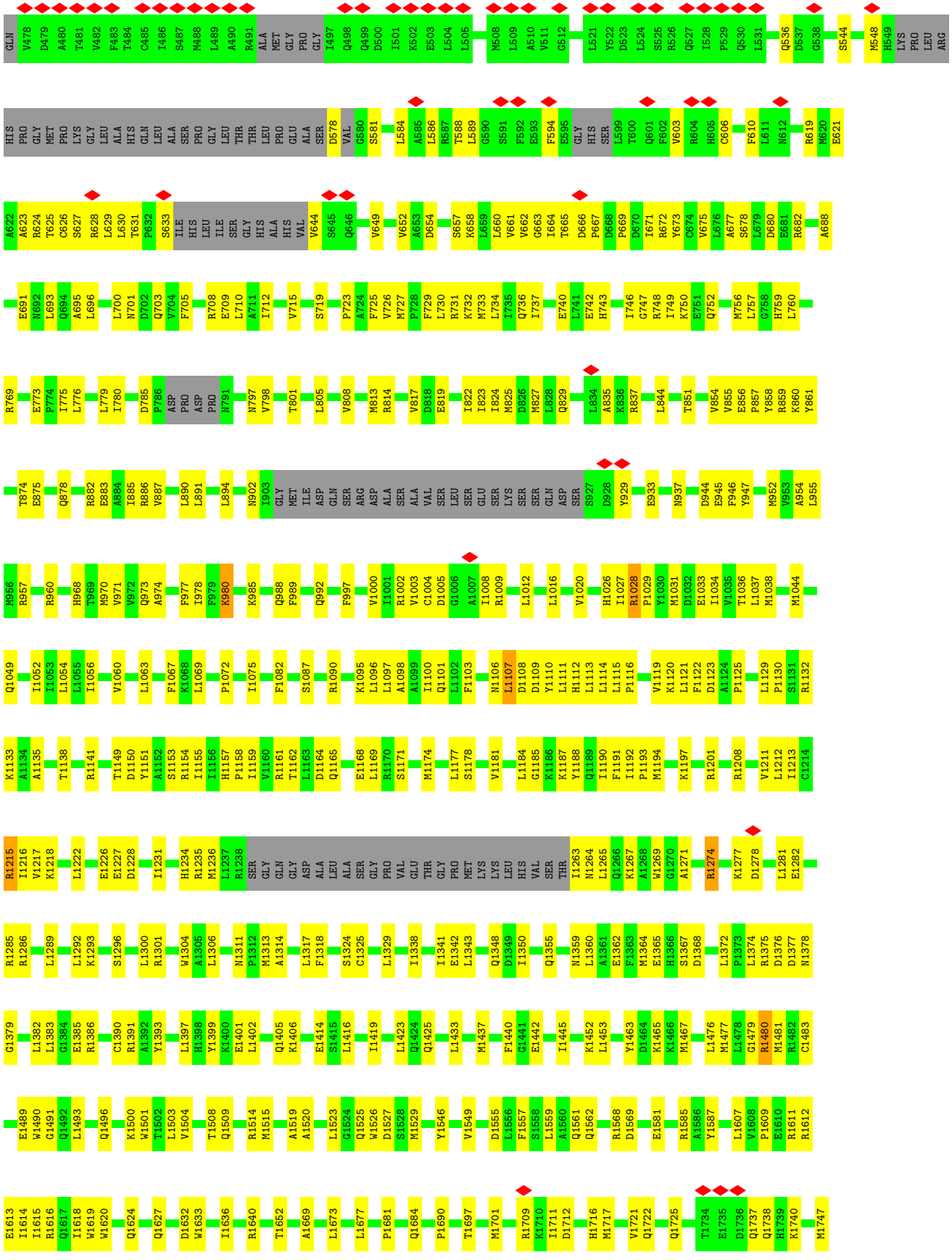
3 Residue-property plots (i)

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 atom inclusion in map 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 diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). 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: Serine/threonine-protein kinase mTOR

Chain A:

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HIS PRO GLY MET PRO LYS GLY LEU ALA HIS GLN LEU ALA SER PRO GLY LEU THR THR LEU PRO GLU ALA SER D578 VAL G580 S581 L584 A585 L586 R587 T588 L589 G590 S591 F592 E593 F594 E595 GLY HIS SER L599 T600 Q601 F602 V603 R604 H605 C606 F610 L611 N612 R619 W620 E621
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E691 N692 L693 Q694 A695 L696 L700 N701 D702 Q703 V704 F705 R708 E709 L710 A711 I712 V715 S719 P723 A724 F725 V726 M727 P728 F729 L730 R731 K732 M733 L734 I735 Q736 I737 E740 L741 E742 H743 I746 G747 R748 I749 K750 E751 Q752 M756 L757 G758 H759 L760
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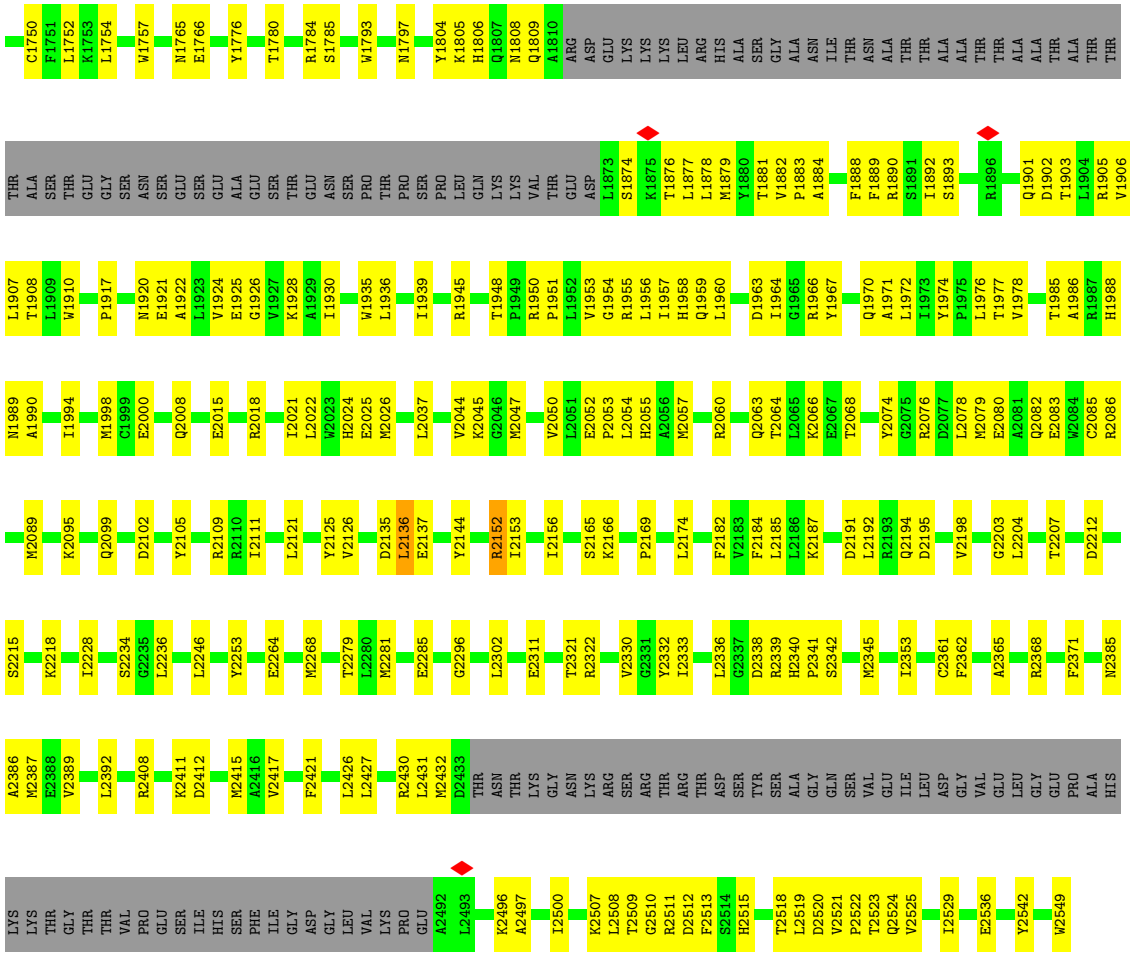
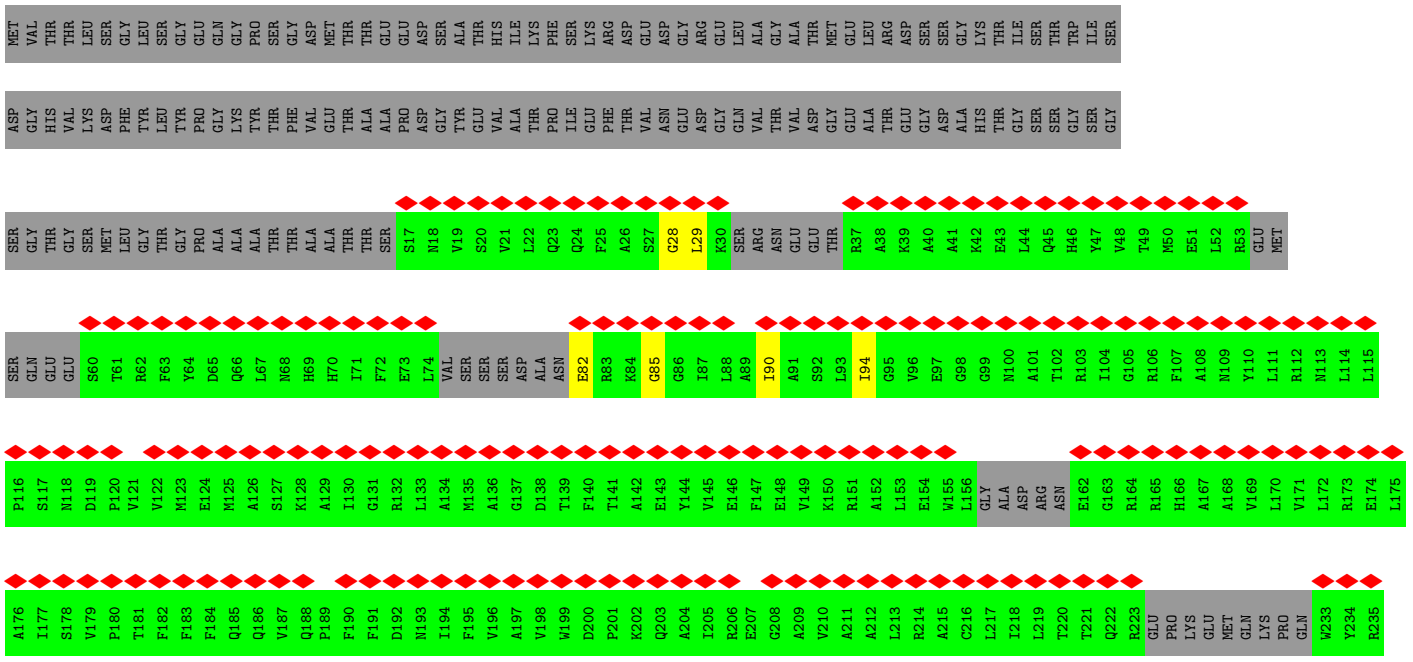
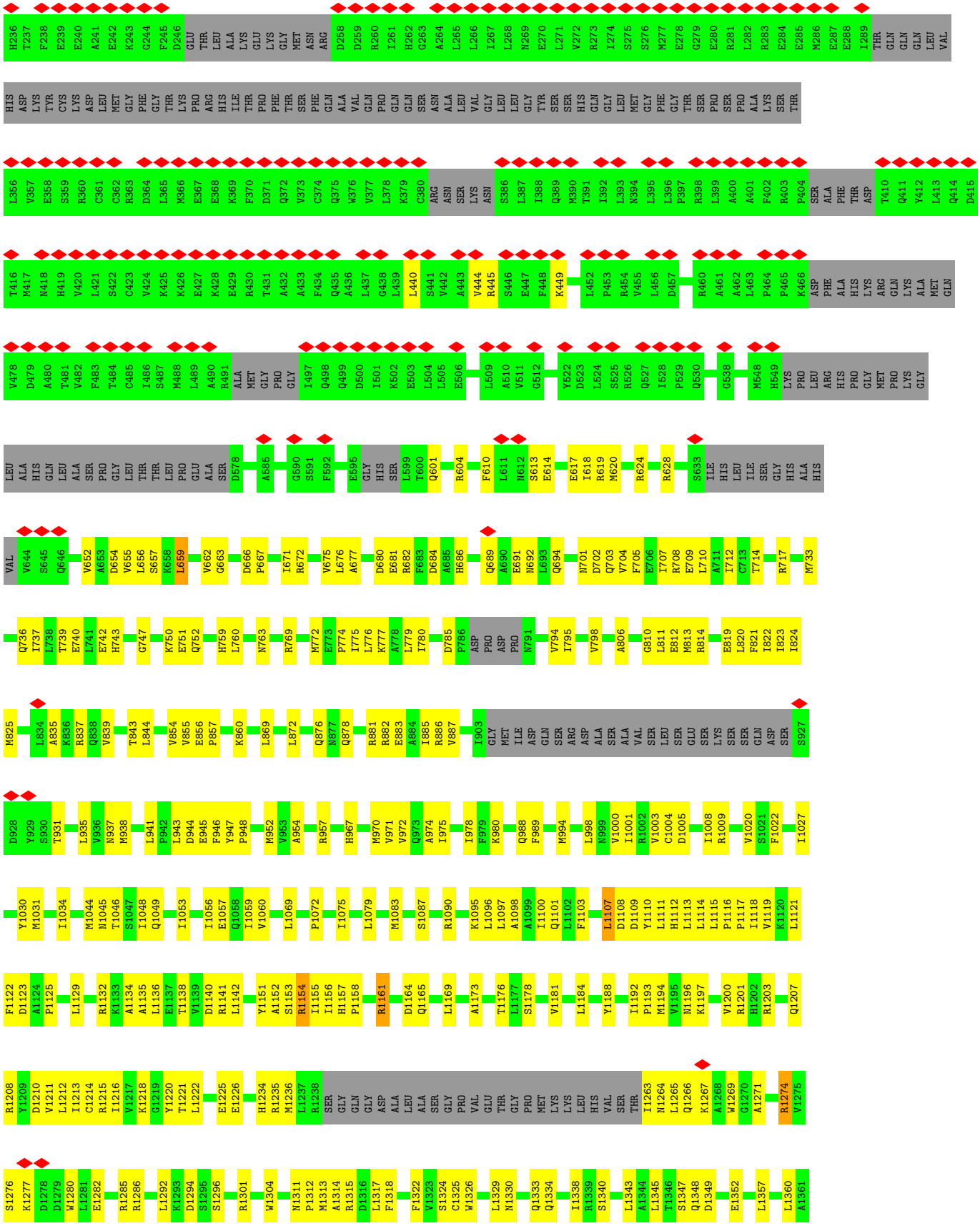
K1133 A1134 A1135 T1138 R1141 T1149 D1150 Y1151 A1152 S1153 R1154 I1155 T1156 H1157 P1158 I1159 V1160 R1161 T1162 L1163 D1164 Q1165 E1168 L1169 R1170 S1171 M1174 L1177 S1178 V1181 L1184 G1185 K1186 K1187 Y1188 Q1189 I1190 F1191 I1192 P1193 M1194 K1197 R1201 R1208 V1211 L1212 I1213 C1214
R1215 I1216 V1217 K1218 L1222 E1226 E1227 D1228 I1231 H1234 R1235 M1236 L1237 R1238 SER GLY GLN GLY ASP ALA LEU ALA SER GLY PRO VAL GLU THR GLY PRO MET LYS LYS LEU HIS VAL SER THR I1263 N1264 L1265 Q1266 K1267 A1268 W1269 G1270 A1271 R1274 K1277 D1278 L1281 E1282
R1285 R1286 L1289 L1292 K1293 S1296 L1300 R1301 W1304 A1305 L1306 N1311 P1312 M1313 A1314 L1317 F1318 S1324 C1325 L1329 I1338 I1341 E1342 L1343 Q1348 D1349 I1350 Q1355 N1359 L1360 A1361 E1362 F1363 M1364 E1365 H1366 S1367 D1368 L1372 P1373 L1374 R1375 D1376 D1377 N1378
G1379 L1382 L1383 G1384 E1385 R1386 C1390 R1391 A1392 Y1393 L1397 H1398 Y1399 K1400 E1401 L1402 Q1405 K1406 E1414 S1415 L1416 I1419 L1423 Q1424 Q1425 L1433 M1437 F1440 G1441 E1442 I1445 K1452 L1453 Y1463 D1464 K1465 K1466 M1467 L1476 M1477 L1478 G1479 R1480 M1481 R1482 C1483
E1489 W1490 G1491 Q1492 L1493 Q1496 K1500 W1501 T1502 L1503 V1504 T1508 Q1509 R1514 M1515 A1519 A1520 L1523 G1524 Q1525 W1526 D1527 S1528 M1529 Y1546 V1549 D1555 L1556 F1557 S1558 L1559 A1560 Q1561 Q1562 R1568 D1569 E1581 R1585 A1586 Y1587 L1607 Y1608 P1609 E1610 R1611 R1612
E1613 I1614 I1615 R1616 Q1617 I1618 W1619 W1620 Q1624 Q1627 D1632 W1633 I1636 R1640 T1652 A1669 L1673 L1677 P1681 Q1684 P1690 T1697 M1701 R1709 K1710 I1711 D1712 H1716 M1717 V1721 Q1722 Q1725 T1734 E1735 D1736 Q1737 Q1738 H1739 K1740 M1747



• Molecule 1: Serine/threonine-protein kinase mTOR

Chain B:

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HIS ASP LYS TYR CYS LYS ASP LEU MET GLY PHE GLY THR LYS PRO ARG HIS ILE THR PRO PHE THR SER PHE GLN ALA VAL GLN PRO GLN GLN SER ASN ALA LEU VAL GLY LEU LEU GLY TYR SER SER HIS GLN GLY LEU MET GLY PHE GLY THR SER PRO SER PRO ALA LYS SER THR
L356 V357 E358 S359 R360 C361 C362 R363 D364 L365 M366 E367 E368 K369 F370 D371 V372 V373 C374 Q375 W376 V377 L378 K379 C380 ARG ASN SER LYS ASN S386 L387 I388 Q389 M390 T391 I392 L393 N394 L395 L396 P397 R398 L399 A400 A401 F402 R403 P404 SER ALA PHE THR ASP T410 Q411 Y412 L413 Q414 D415
T416 M417 N418 H419 V420 L421 S422 C423 V424 K425 K426 E427 K428 E429 R430 T431 A432 A433 F434 Q435 A436 L437 G438 L439 L440 S441 V442 A443 V444 R445 S446 E447 F448 K449 L452 P453 R454 V455 L456 D457 R460 A461 A462 L463 P464 P465 K466 ASP PHE ALA HIS LYS ARG GLN LYS ALA MET GLN
V478 D479 A480 T481 V482 F483 T484 C485 I486 S487 M488 L489 A490 R491 ALA MET GLY PRO GLY I497 Q498 Q499 D500 I501 K502 E503 L504 L505 E506 L509 A510 V511 G512 Y522 D523 L524 S525 R526 Q527 I528 P529 Q530 G538 M548 H549 LYS PRO LEU ARG HIS PRO GLY MET PRO LYS GLY
LEU ALA HIS GLN LEU ALA SER PRO GLY LEU THR THR LEU PRO GLU ALA SER D578 A585 G590 S591 F592 E595 GLY HIS SER L599 T600 Q601 R604 F610 L611 N612 S613 E614 E617 I618 R619 M620 R624 R628 S633 ILE HIS LEU ILE SER GLY HIS ALA HIS
VAL V644 S645 Q646 V652 A653 D654 V655 L656 S657 K658 L659 V662 G663 D666 P667 I671 R672 V675 L676 A677 D680 E681 R682 F683 D684 A685 H686 Q689 A690 E691 N692 L693 Q694 N701 D702 Q703 V704 F705 E706 I707 R708 E709 L710 A711 I712 C713 T714 R717 M733
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M825 L834 A835 K836 R837 Q838 V839 T843 L844 V854 V855 E856 P857 K860 L869 L872 Q876 N877 Q878 R881 R882 E883 A884 I885 R886 V887 I903 GLY MET ILE ASP GLN SER ARG ASP ALA SER ALA VAL SER LEU SER GLU SER LYS SER SER GLN ASP SER S927
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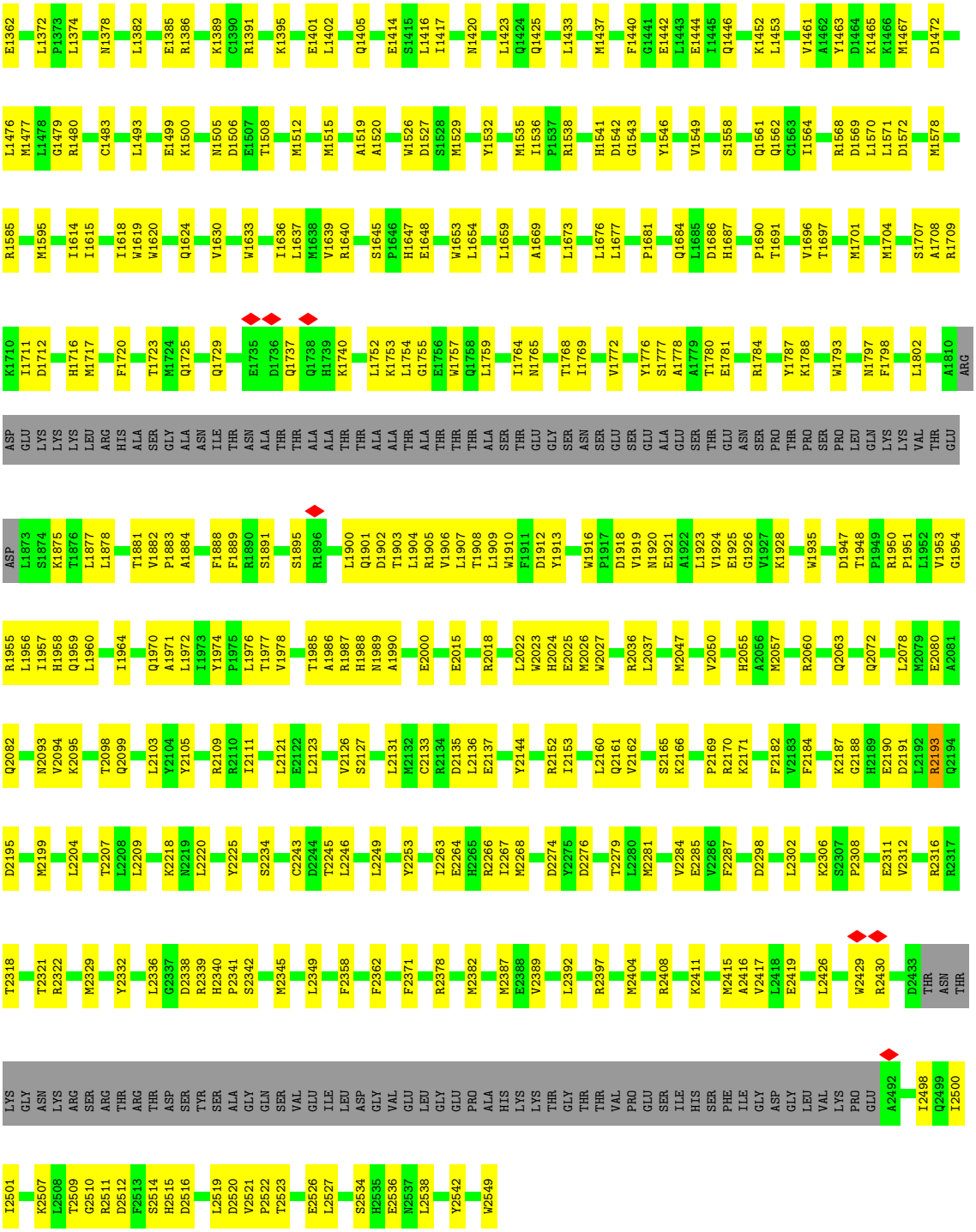
F1122 D1123 A1124 P1125 L1129 R1132 K1133 A1134 A1135 L1136 E1137 T1138 V1139 D1140 R1141 L1142 Y1151 A1152 S1153 R1154 I1155 I1156 H1157 P1158 R1161 D1164 Q1165 L1169 A1173 T1176 L1177 S1178 V1181 L1184 Y1188 I1192 P1193 M1194 V1195 N1196 K1197 V1200 R1201 H1202 R1203 Q1207
R1208 Y1209 D1210 V1211 L1212 I1213 C1214 R1215 I1216 V1217 K1218 G1219 Y1220 T1221 L1222 E1225 E1226 H1234 R1235 M1236 L1237 R1238 SER GLY GLN GLY ASP ALA LEU ALA SER GLY PRO VAL GLU THR GLY PRO MET LYS LYS LEU HIS VAL SER THR I1263 N1264 L1265 Q1266 K1267 A1268 W1269 G1270 A1271 R1274 V1275
S1276 K1277 D1278 D1279 W1280 L1281 E1282 R1285 R1286 L1292 K1293 D1294 S1295 S1296 R1301 W1304 N1311 P1312 M1313 A1314 R1315 D1316 L1317 F1318 F1322 V1323 S1324 C1325 W1326 L1329 N1330 Q1333 Q1334 I1338 R1339 S1340 L1343 A1344 L1345 T1346 S1347 Q1348 D1349 E1352 L1357 L1360 A1361



• Molecule 2: Target of rapamycin complex subunit LST8

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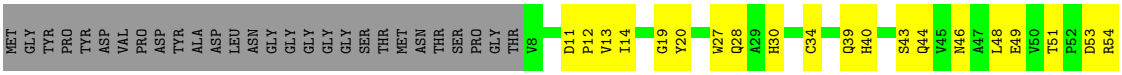
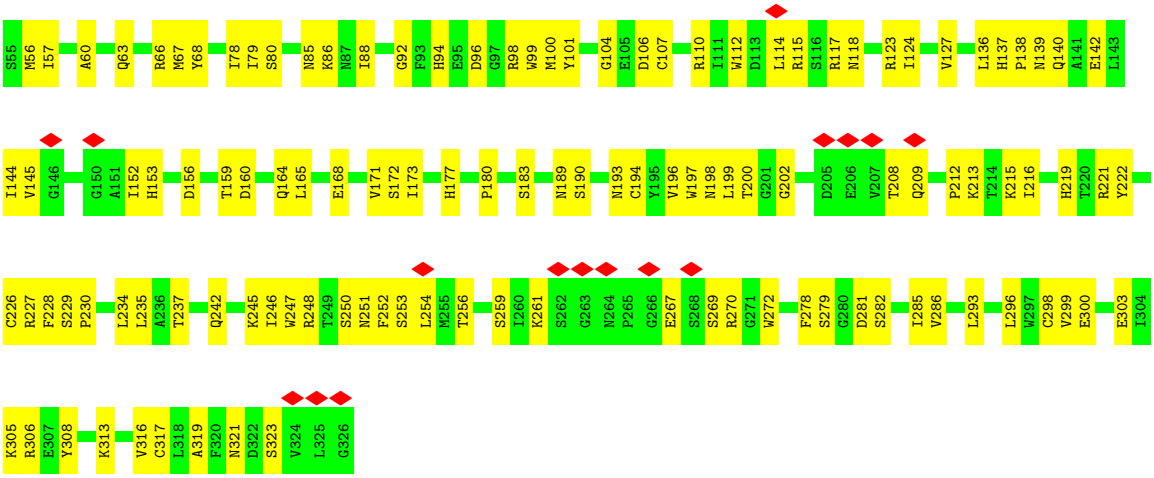
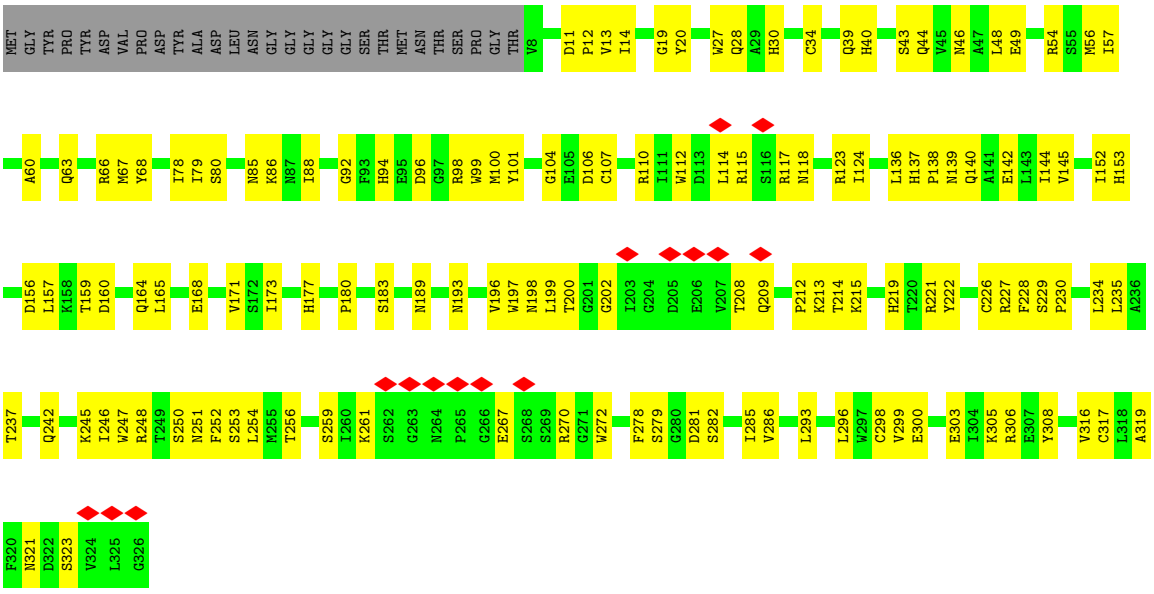




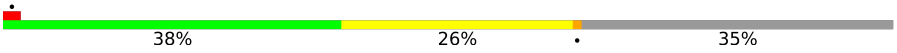
• Molecule 2: Target of rapamycin complex subunit LST8

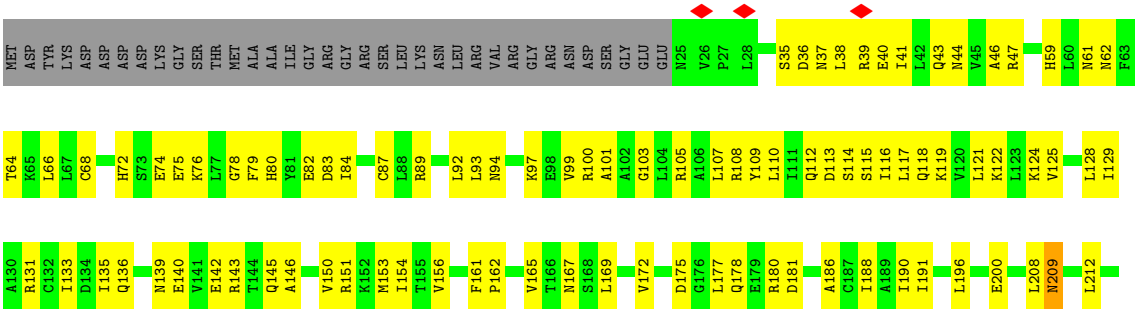
Chain D:

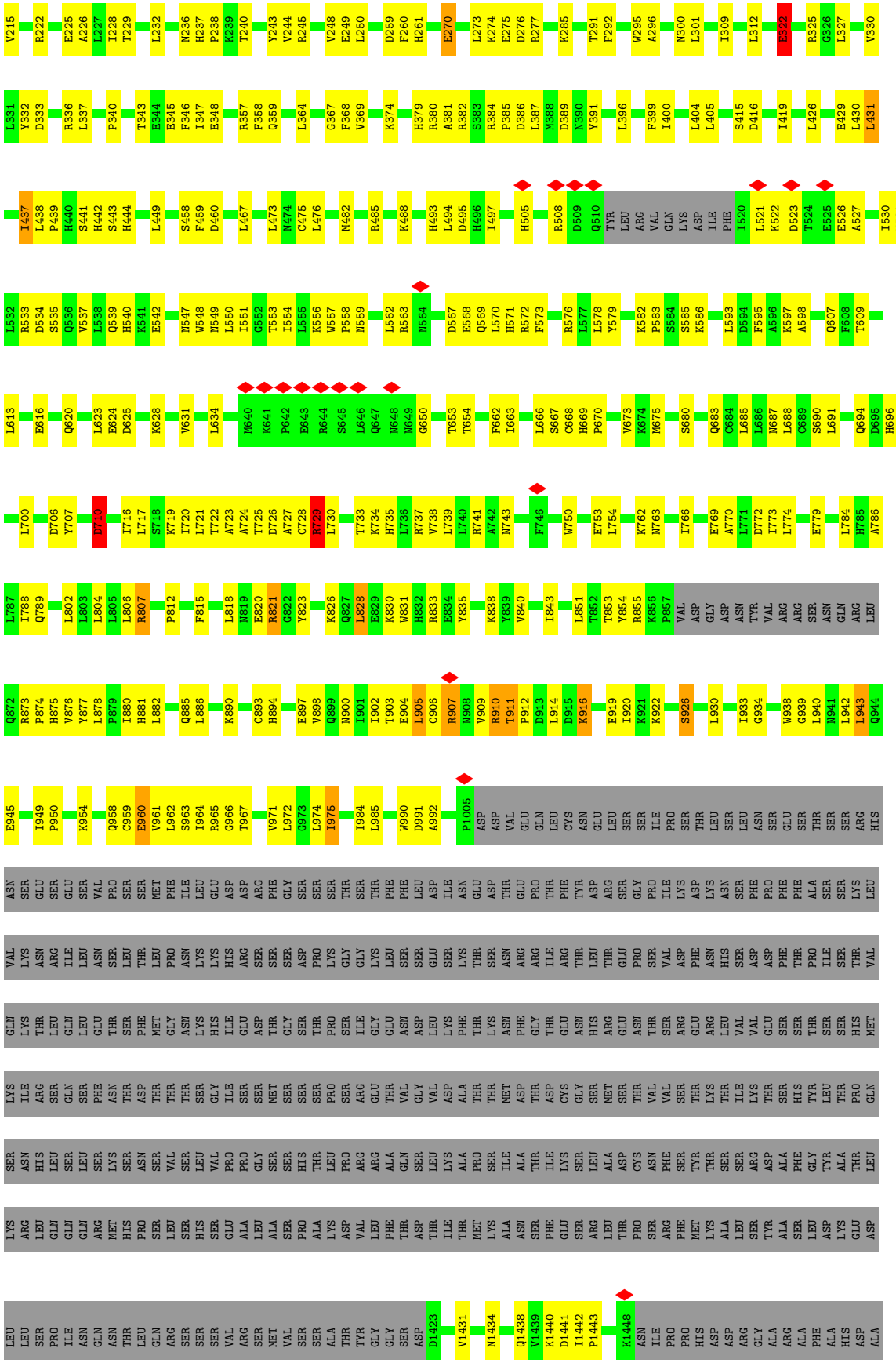


• Molecule 3: Rapamycin-insensitive companion of mTOR

Chain E:



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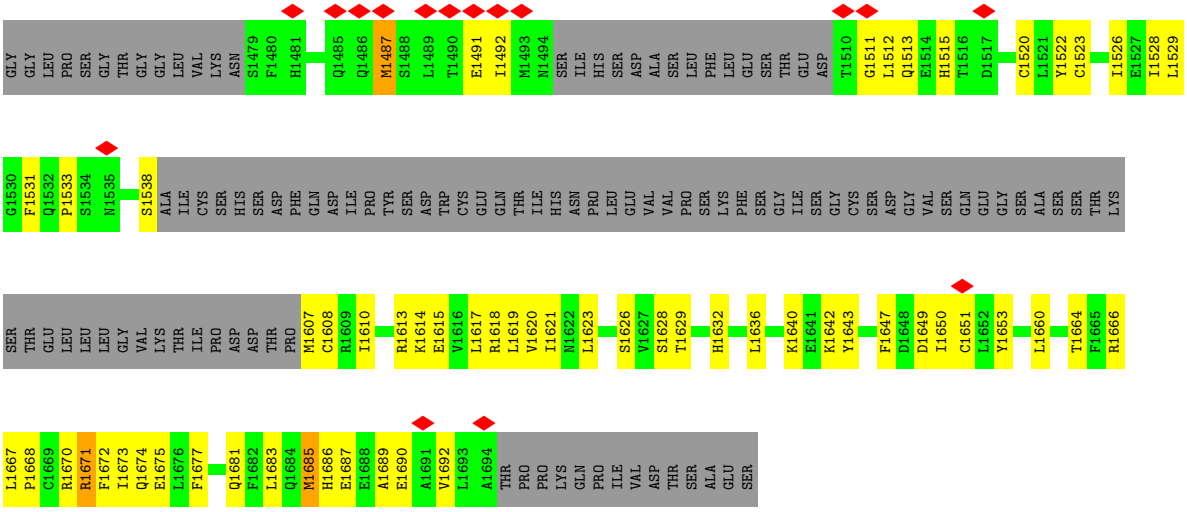
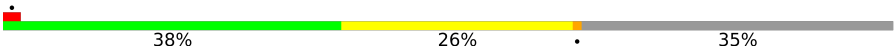
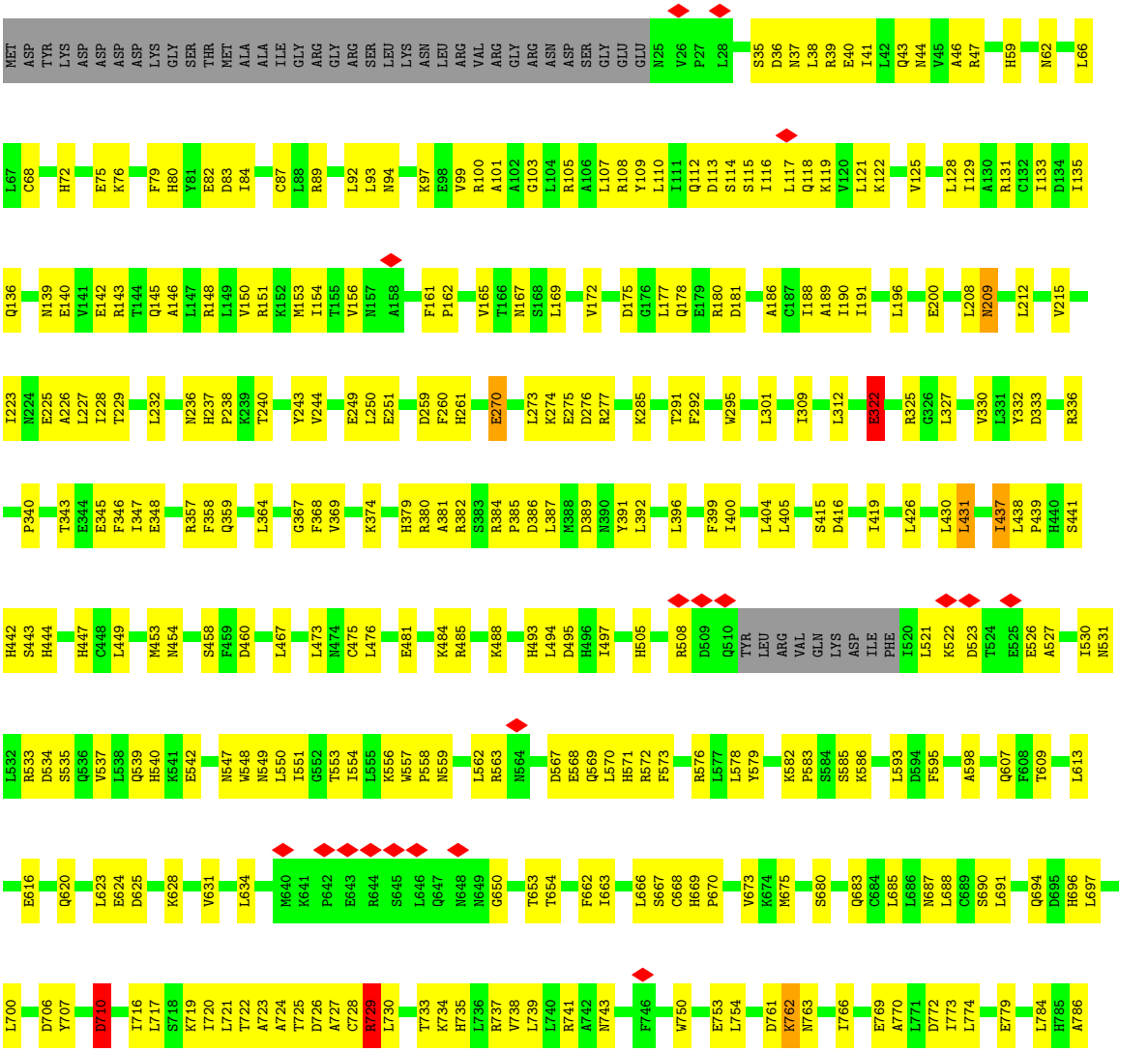
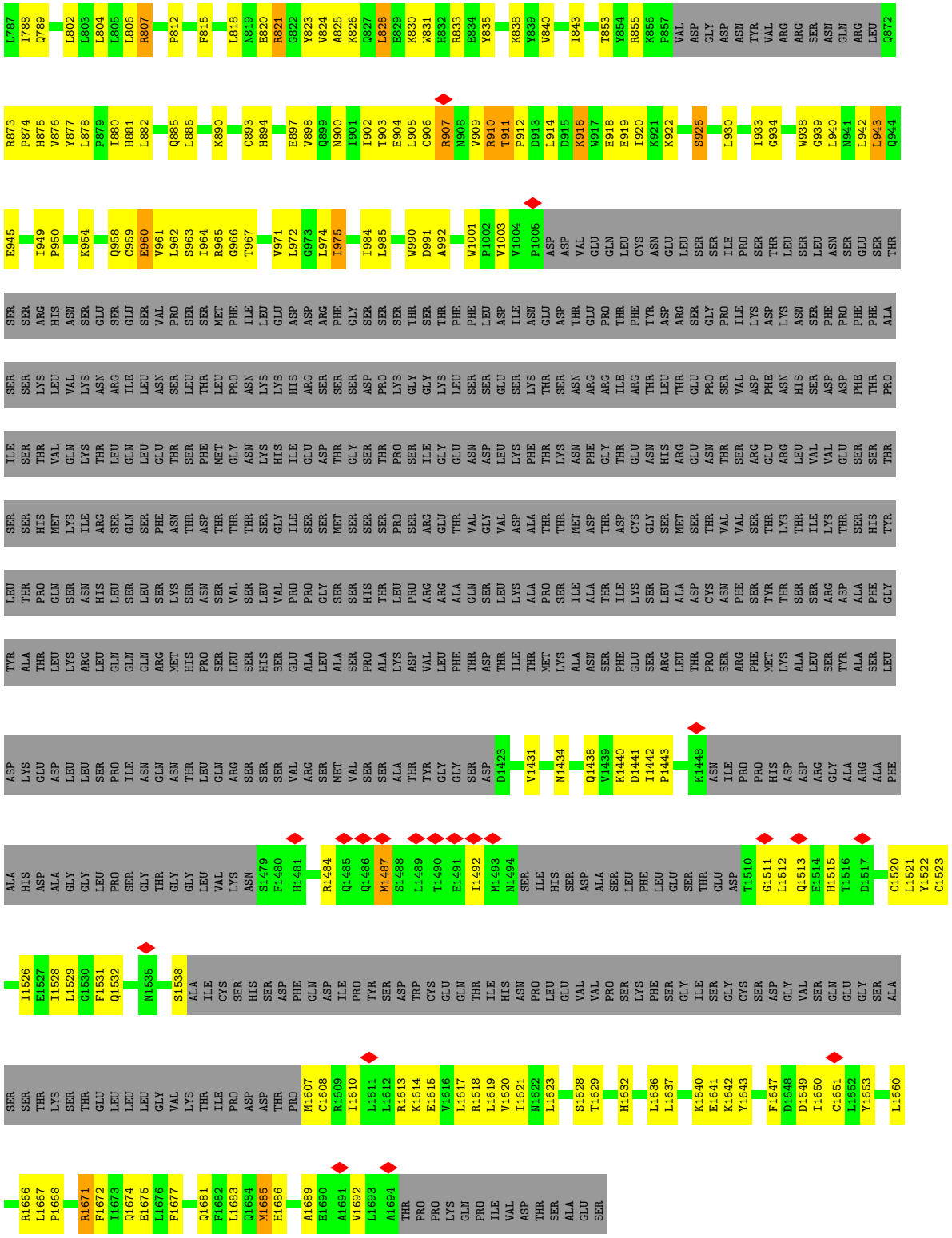


• Molecule 3: Rapamycin-insensitive companion of mTOR

Chain F:

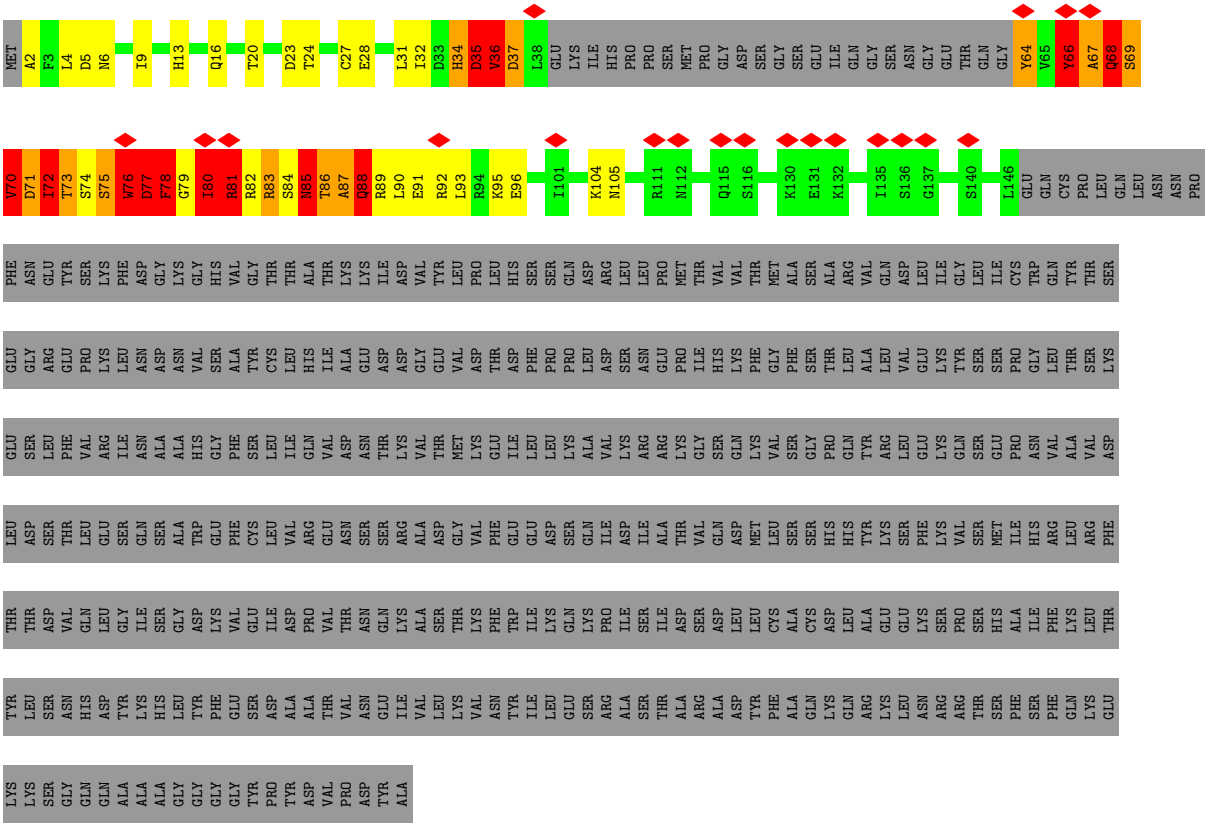






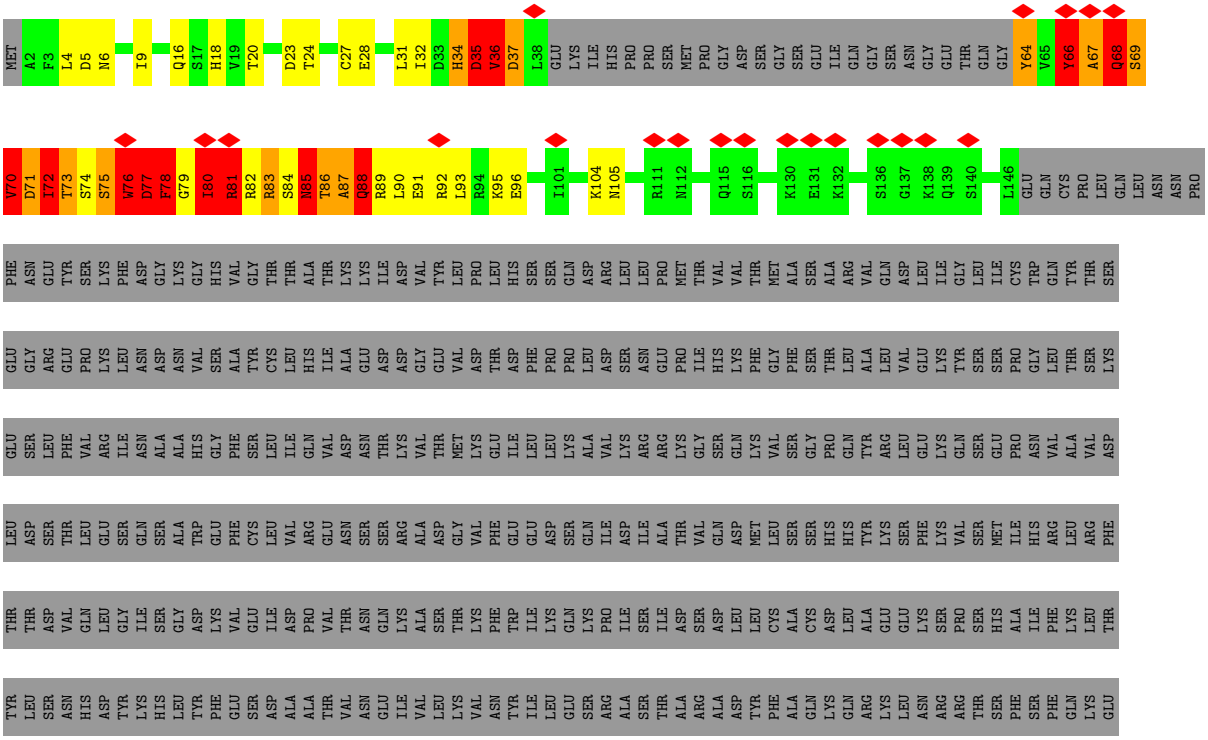
• Molecule 4: Target of rapamycin complex 2 subunit MAPKAP1

Chain G:



• Molecule 4: Target of rapamycin complex 2 subunit MAPKAP1

Chain H:



LYS
LYS
SER
GLY
GLN
GLN
ALA
ALA
ALA
GLY
GLY
GLY
GLY
TYR
PRO
TYR
ASP
VAL
PRO
ASP
TYR
ALA

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	288538	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	60	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	22.607	Depositor
Minimum map value	-11.647	Depositor
Average map value	0.026	Depositor
Map value standard deviation	1.029	Depositor
Recommended contour level	2.64	Depositor
Map size (Å)	356.4, 356.4, 356.4	wwPDB
Map dimensions	324, 324, 324	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.1, 1.1, 1.1	Depositor

5 Model quality

5.1 Standard geometry

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	0.31	0/16632	0.50	3/22593 (0.0%)
1	B	0.31	0/16598	0.50	3/22552 (0.0%)
2	C	0.28	0/2523	0.54	0/3438
2	D	0.28	0/2523	0.54	0/3438
3	E	0.31	1/9092 (0.0%)	0.54	8/12300 (0.1%)
3	F	0.31	1/9092 (0.0%)	0.54	8/12300 (0.1%)
4	G	1.95	39/852 (4.6%)	2.07	51/1161 (4.4%)
4	H	1.95	39/852 (4.6%)	2.07	51/1161 (4.4%)
All	All	0.45	80/58164 (0.1%)	0.62	124/78943 (0.2%)

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
3	E	0	1
3	F	0	1
4	G	2	6
4	H	2	6
All	All	4	14

The worst 5 of 80 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	G	77	ASP	CB-CG	-11.57	1.27	1.51
4	H	77	ASP	CB-CG	-11.54	1.27	1.51
4	G	86	THR	C-O	11.16	1.44	1.23
4	H	86	THR	C-O	11.13	1.44	1.23
4	H	88	GLN	CG-CD	-10.90	1.25	1.51

The worst 5 of 124 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	G	35	ASP	CB-CG-OD1	19.25	135.62	118.30
4	H	35	ASP	CB-CG-OD1	19.16	135.54	118.30
4	H	77	ASP	N-CA-C	16.71	156.12	111.00
4	G	77	ASP	N-CA-C	16.70	156.08	111.00
4	G	77	ASP	CB-CA-C	-16.17	78.05	110.40

All (4) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	G	80	ILE	CA
4	G	85	ASN	CA
4	H	80	ILE	CA
4	H	85	ASN	CA

5 of 14 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	E	367	GLY	Peptide
3	F	367	GLY	Peptide
4	G	34	HIS	Mainchain
4	G	36	VAL	Mainchain
4	G	69	SER	Mainchain

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	16337	0	15369	521	0
1	B	16304	0	15298	477	0
2	C	2465	0	2351	106	0
2	D	2465	0	2351	105	0
3	E	8931	0	9083	369	0
3	F	8931	0	9083	382	0
4	G	842	0	695	83	0
4	H	842	0	695	96	0
All	All	57117	0	54925	2072	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 18.

The worst 5 of 2072 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)
4:H:67:ALA:O	4:H:68:GLN:CG	1.78	1.31
4:G:67:ALA:O	4:G:68:GLN:CG	1.78	1.30
4:H:87:ALA:O	4:H:90:LEU:N	1.71	1.21
4:G:87:ALA:O	4:G:90:LEU:N	1.71	1.21
4:G:32:ILE:HD12	4:G:34:HIS:CD2	1.79	1.17

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 PDB entries followed by that with respect to all EM entries.

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	2143/2674 (80%)	2026 (94%)	117 (6%)	0	100	100
1	B	2145/2674 (80%)	2012 (94%)	133 (6%)	0	100	100
2	C	317/347 (91%)	292 (92%)	25 (8%)	0	100	100
2	D	317/347 (91%)	292 (92%)	25 (8%)	0	100	100
3	E	1103/1720 (64%)	1027 (93%)	76 (7%)	0	100	100
3	F	1103/1720 (64%)	1027 (93%)	76 (7%)	0	100	100
4	G	116/538 (22%)	87 (75%)	17 (15%)	12 (10%)	0	3
4	H	116/538 (22%)	87 (75%)	17 (15%)	12 (10%)	0	3
All	All	7360/10558 (70%)	6850 (93%)	486 (7%)	24 (0%)	44	72

5 of 24 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	G	35	ASP
4	G	37	ASP

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Continued from previous page...

Mol	Chain	Res	Type
4	G	72	ILE
4	G	74	SER
4	G	78	PHE

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 PDB entries followed by that with respect to all EM entries.

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	1563/2319 (67%)	1554 (99%)	9 (1%)	86 91
1	B	1552/2319 (67%)	1546 (100%)	6 (0%)	91 95
2	C	269/290 (93%)	266 (99%)	3 (1%)	73 85
2	D	269/290 (93%)	266 (99%)	3 (1%)	73 85
3	E	987/1550 (64%)	957 (97%)	30 (3%)	41 68
3	F	987/1550 (64%)	957 (97%)	30 (3%)	41 68
4	G	70/479 (15%)	57 (81%)	13 (19%)	1 7
4	H	70/479 (15%)	57 (81%)	13 (19%)	1 7
All	All	5767/9276 (62%)	5660 (98%)	107 (2%)	59 77

5 of 107 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	F	333	ASP
3	F	910	ARG
4	H	70	VAL
3	F	430	LEU
3	F	821	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 22 such sidechains are listed below:

Mol	Chain	Res	Type
3	F	94	ASN
3	F	1438	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
3	F	607	GLN
4	G	34	HIS
1	B	1049	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

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

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

The following chains have linkage breaks:

Mol	Chain	Number of breaks
4	G	1
4	H	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	G	85:ASN	C	86:THR	N	1.20
1	H	85:ASN	C	86:THR	N	1.20

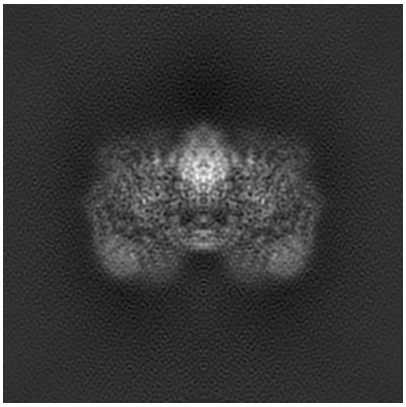
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-26213. These allow visual inspection of the internal detail of the map and identification of artifacts.

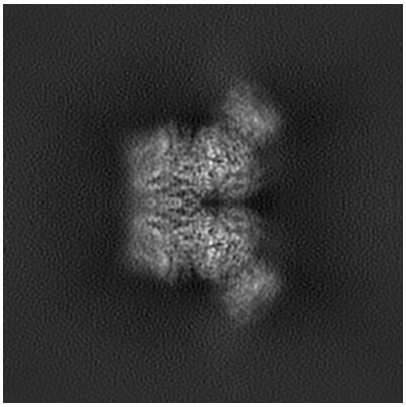
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

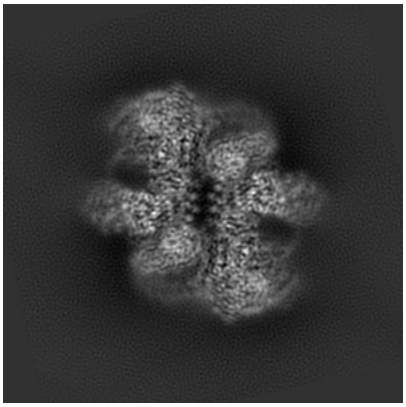
6.1.1 Primary map



X



Y

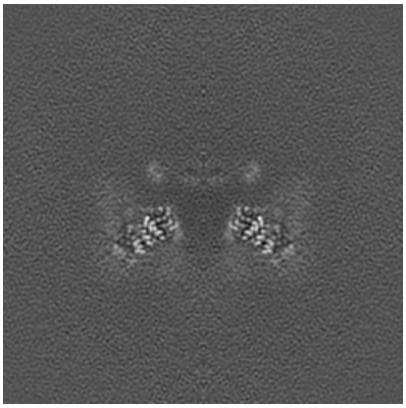


Z

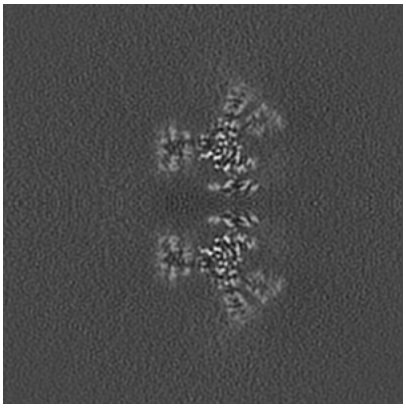
The images above show the map projected in three orthogonal directions.

6.2 Central slices

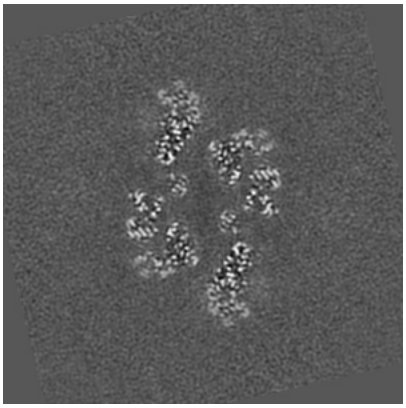
6.2.1 Primary map



X Index: 162



Y Index: 162

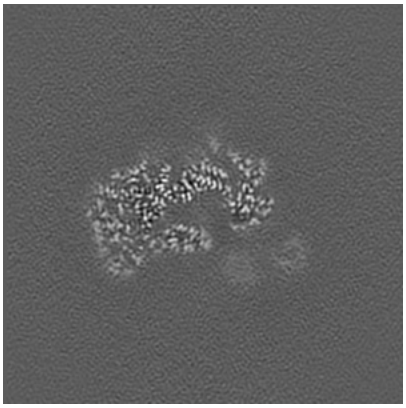


Z Index: 162

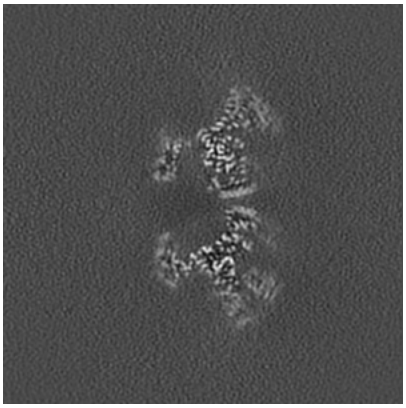
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

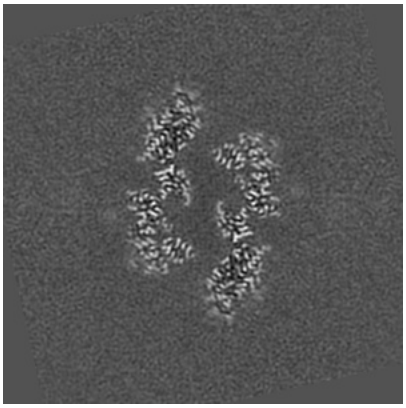
6.3.1 Primary map



X Index: 190



Y Index: 157

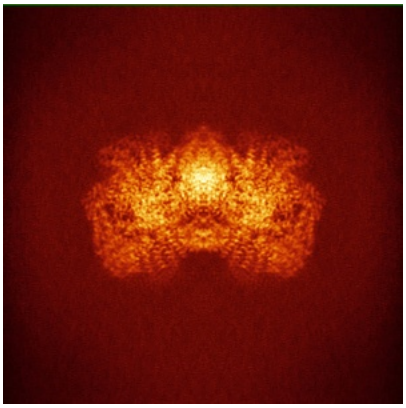


Z Index: 167

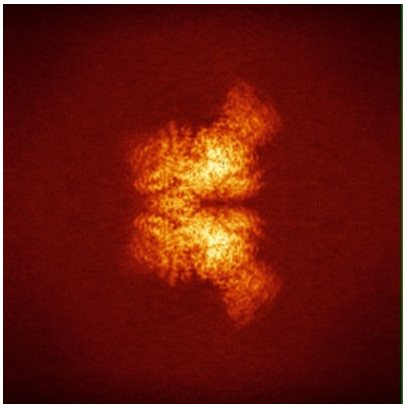
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

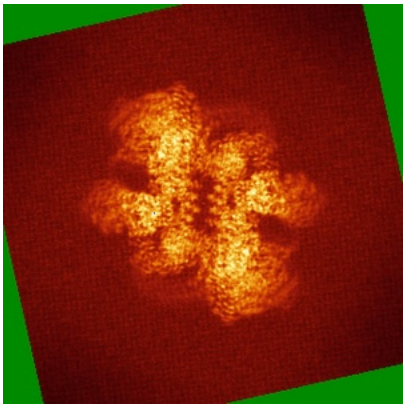
6.4.1 Primary map



X



Y

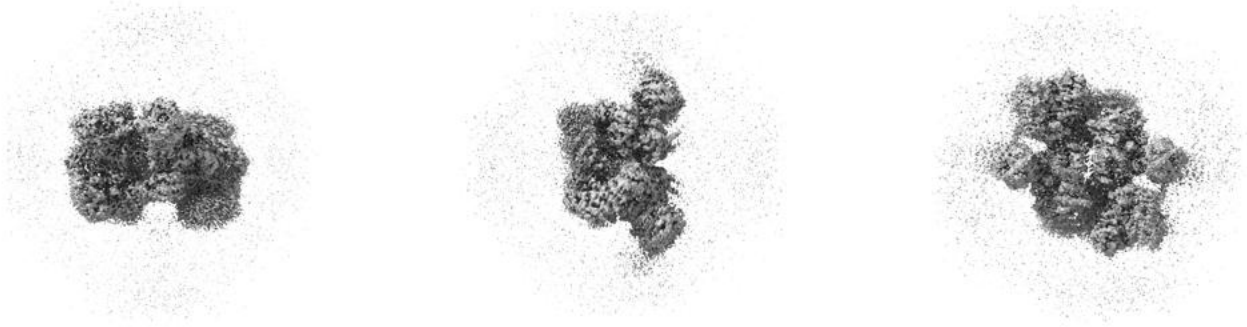


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 2.64. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

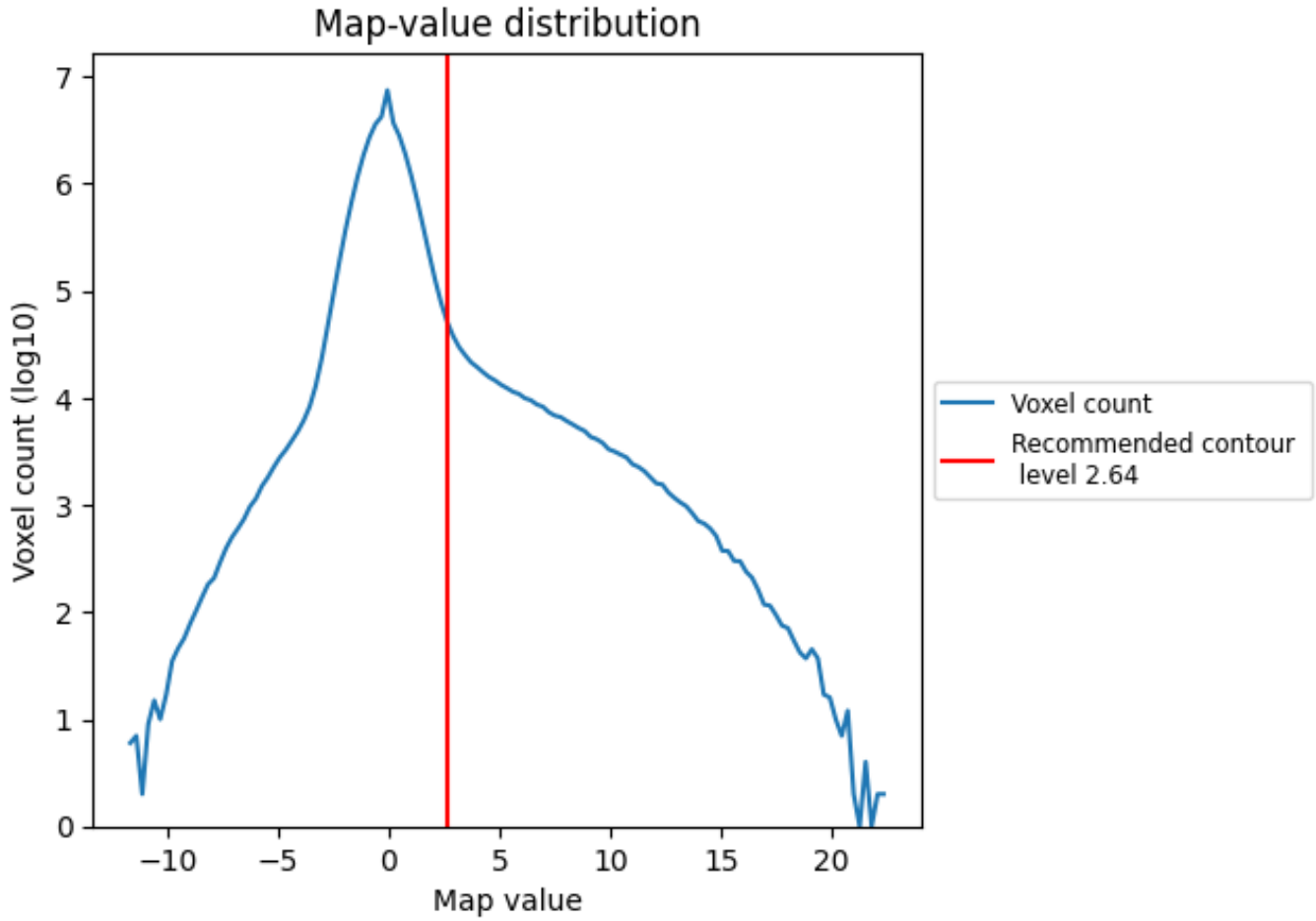
6.6 Mask visualisation (i)

This section was not generated. No masks/segmentation were deposited.

7 Map analysis

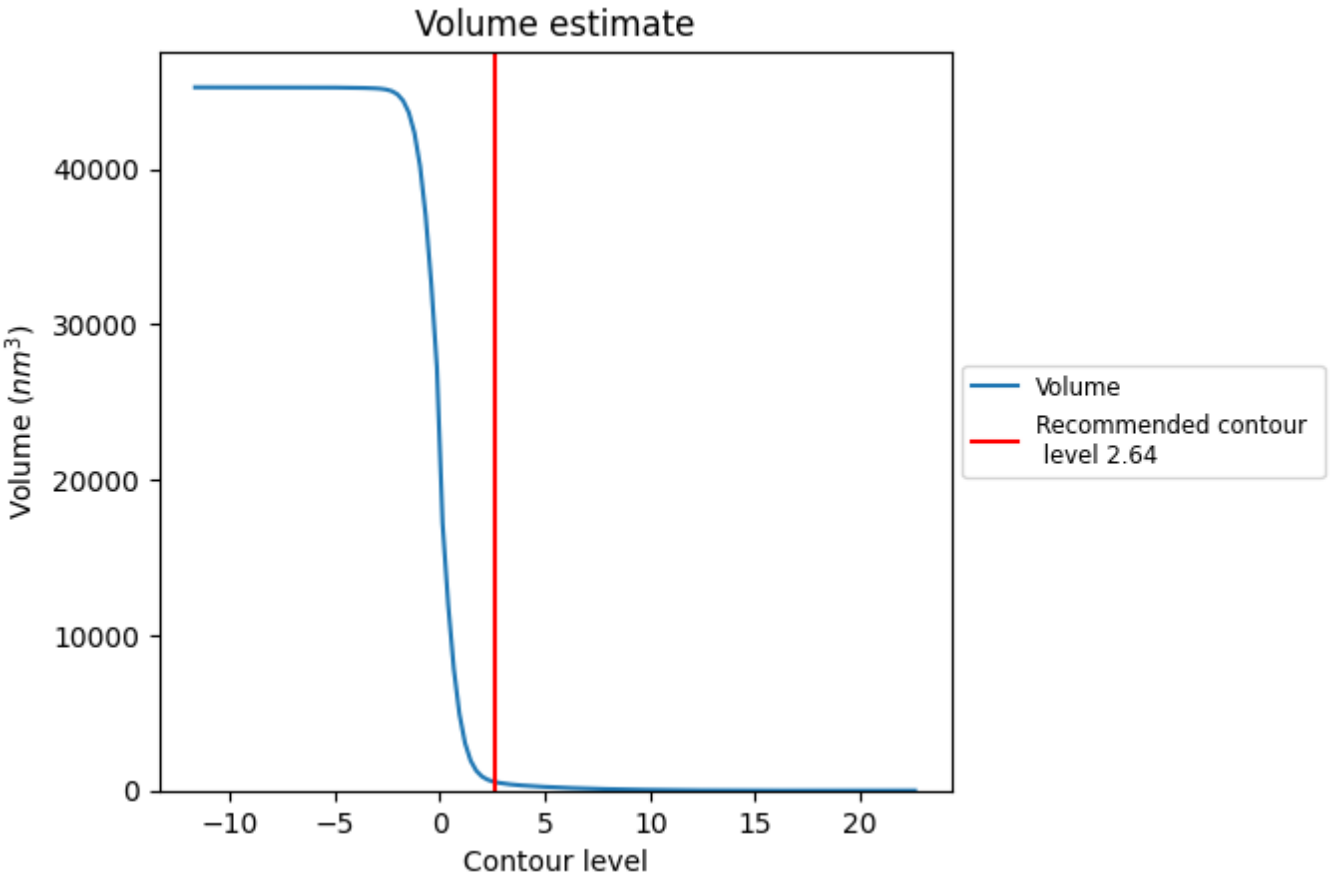
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

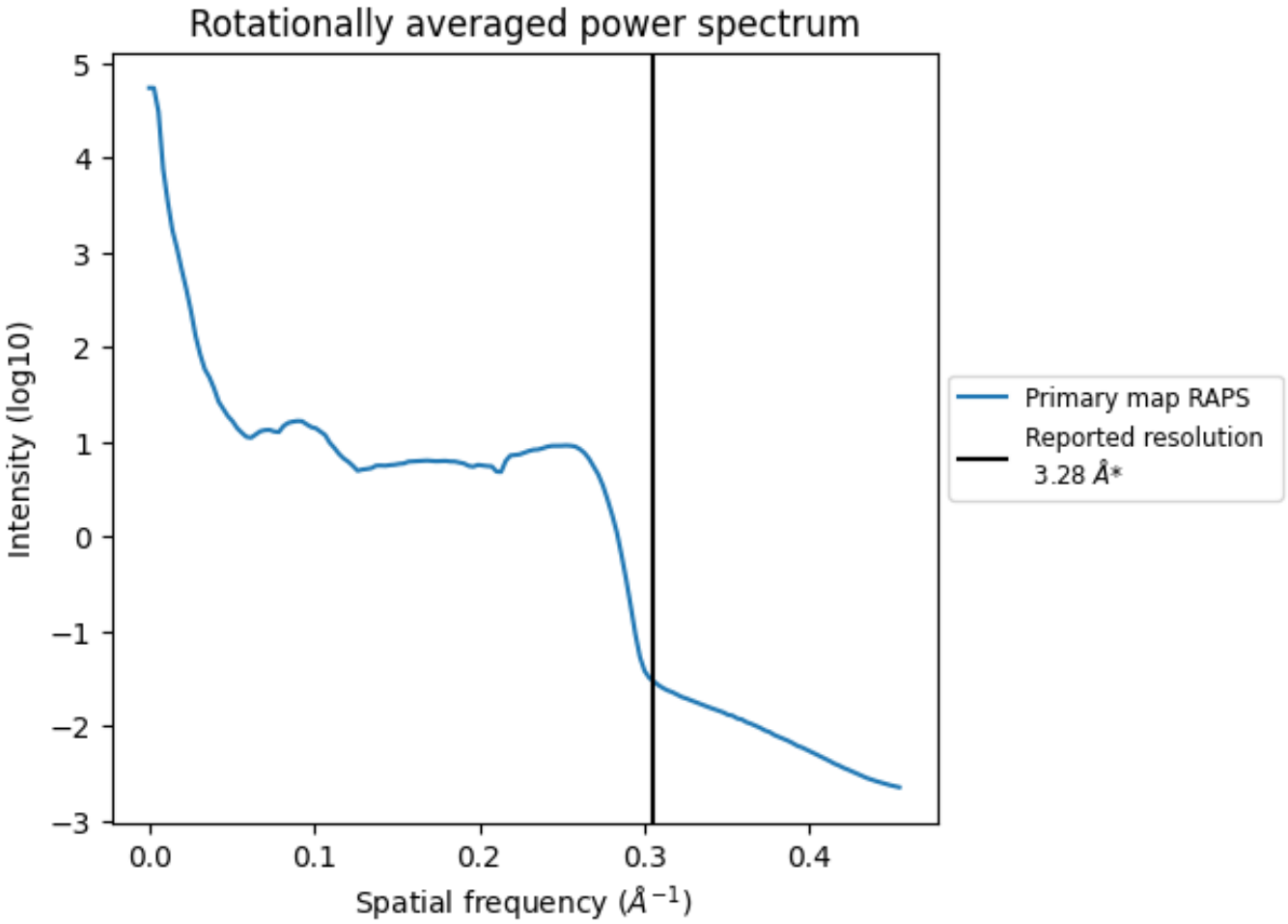
7.2 Volume estimate (i)



The volume at the recommended contour level is 548 nm^3; this corresponds to an approximate mass of 495 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum (i)



*Reported resolution corresponds to spatial frequency of 0.305 Å^{-1}

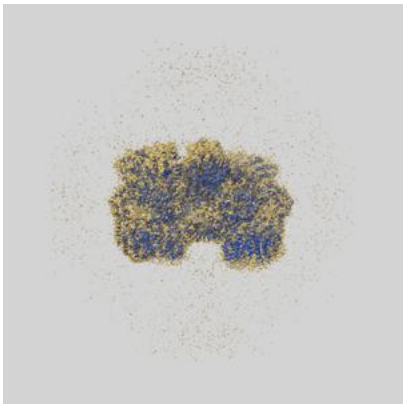
8 Fourier-Shell correlation (i)

This section was not generated. No FSC curve or half-maps provided.

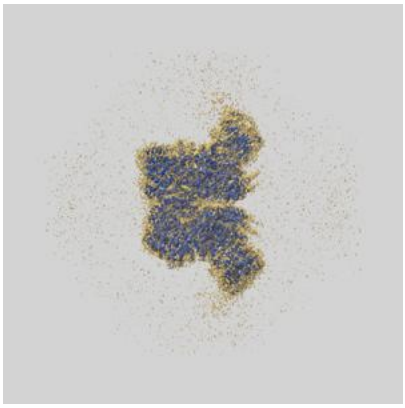
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-26213 and PDB model 7TZO. Per-residue inclusion information can be found in section 3 on page 13.

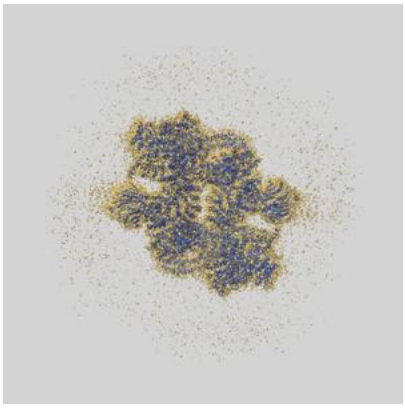
9.1 Map-model overlay



X



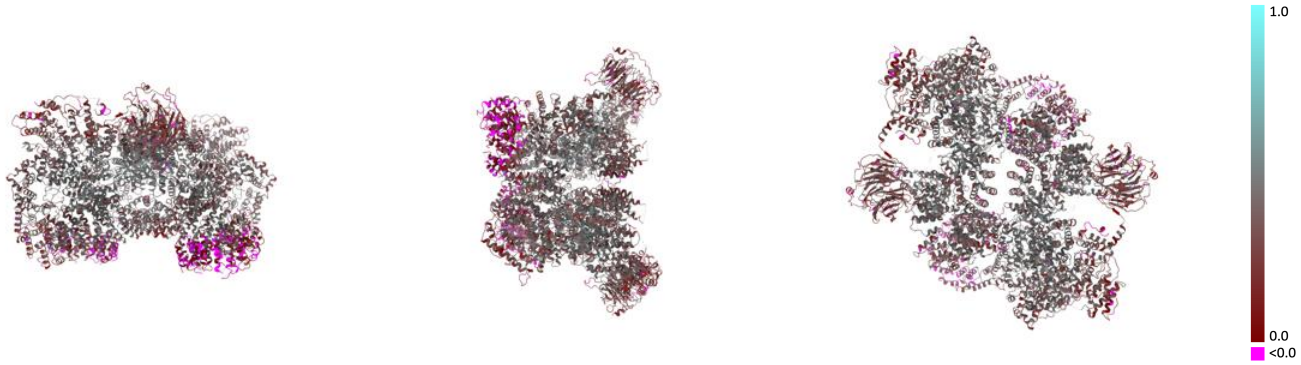
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 2.64 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

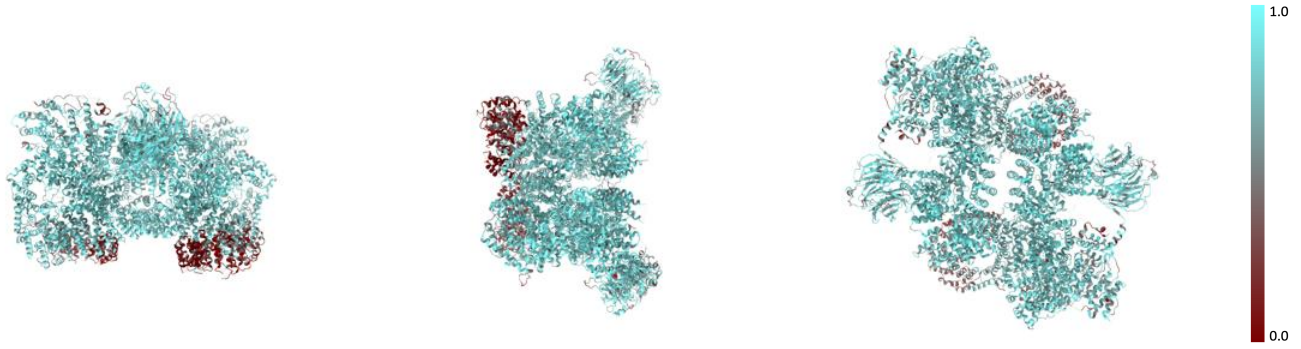
9.2 Q-score mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

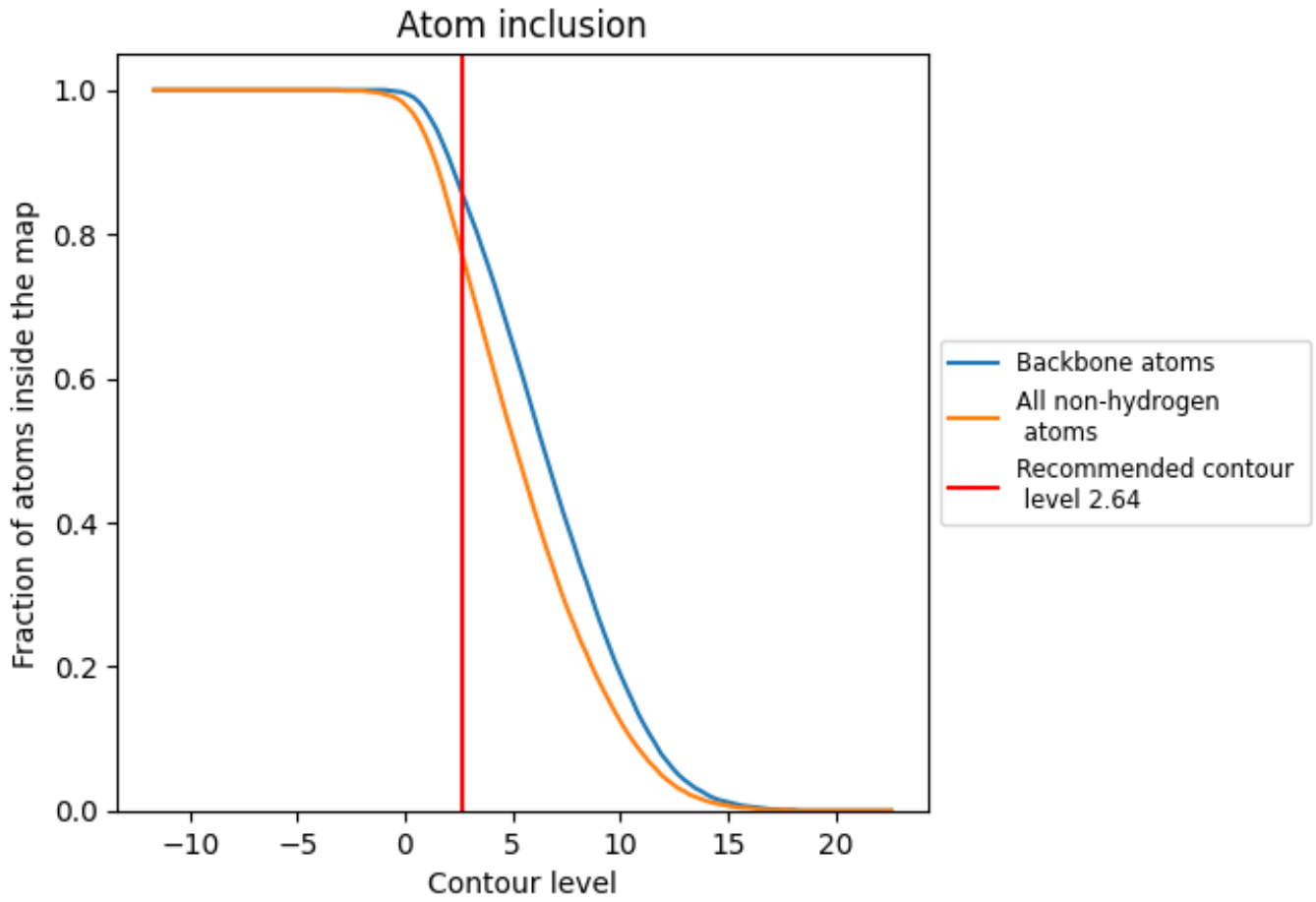
9.3 Atom inclusion mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (2.64).

9.4 Atom inclusion (i)



At the recommended contour level, 86% of all backbone atoms, 77% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (2.64) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7740	0.3530
A	0.7620	0.3570
B	0.7660	0.3630
C	0.7690	0.2750
D	0.7720	0.2860
E	0.8010	0.3650
F	0.7980	0.3600
G	0.7110	0.3150
H	0.7100	0.3180