Full wwPDB EM Validation Report ⓘ

Nov 6, 2023 – 05:03 pm GMT

PDB ID	:	8QHC
EMDB ID	:	EMD-18407
Title	:	Cryo-EM structure of SidH from Legionella pneumophila in complex with LubX
Authors	:	Sharma, R.; Adams, M.; Bhogaraju, S.
Deposited on	:	2023-09-07
Resolution	:	3.10 Å(reported)

This is a Full wwPDB EM Validation 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 ⓘ 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:

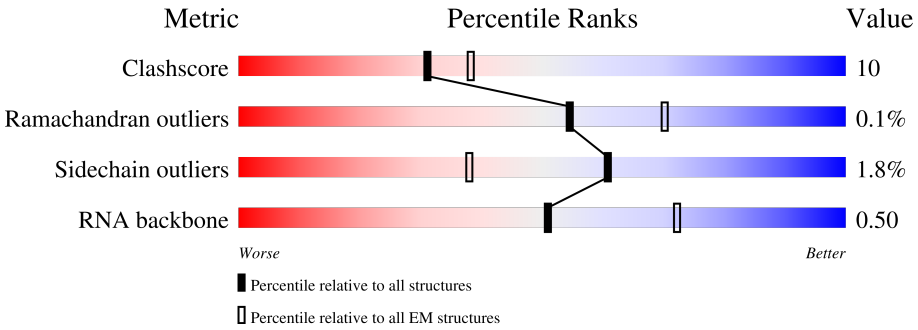
EMDB validation analysis	:	0.0.1.dev70
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.10 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
RNA backbone	4643	859

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%

Mol	Chain	Length	Quality of chain
1	C	394	77% 22% .
2	B	76	42% 24% 12% . 20%
3	A	2244	41% 11% 47%
4	D	264	45% 25% . 29%

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 14829 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 Elongation factor Tu.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	C	393	Total	C	N	O	S	0	0
			2937	1864	513	547	13		

- Molecule 2 is a RNA chain called t-RNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	B	61	Total	C	N	O	P	S	0	0
			1309	584	231	432	61	1		

- Molecule 3 is a protein called Protein SidH.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	A	1183	Total	C	N	O	S	0	0
			9015	5746	1516	1730	23		

There are 19 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-18	MET	-	initiating methionine	UNP Q6RCQ4
A	-17	GLY	-	expression tag	UNP Q6RCQ4
A	-16	SER	-	expression tag	UNP Q6RCQ4
A	-15	SER	-	expression tag	UNP Q6RCQ4
A	-14	HIS	-	expression tag	UNP Q6RCQ4
A	-13	HIS	-	expression tag	UNP Q6RCQ4
A	-12	HIS	-	expression tag	UNP Q6RCQ4
A	-11	HIS	-	expression tag	UNP Q6RCQ4
A	-10	HIS	-	expression tag	UNP Q6RCQ4
A	-9	HIS	-	expression tag	UNP Q6RCQ4
A	-8	SER	-	expression tag	UNP Q6RCQ4
A	-7	SER	-	expression tag	UNP Q6RCQ4
A	-6	GLY	-	expression tag	UNP Q6RCQ4
A	-5	LEU	-	expression tag	UNP Q6RCQ4
A	-4	VAL	-	expression tag	UNP Q6RCQ4

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	PRO	-	expression tag	UNP Q6RCQ4
A	-2	ARG	-	expression tag	UNP Q6RCQ4
A	-1	GLY	-	expression tag	UNP Q6RCQ4
A	0	SER	-	expression tag	UNP Q6RCQ4

- Molecule 4 is a protein called E3 ubiquitin–protein ligase.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	188	Total	C	N	O	S	1	0
			1535	986	258	288	3		

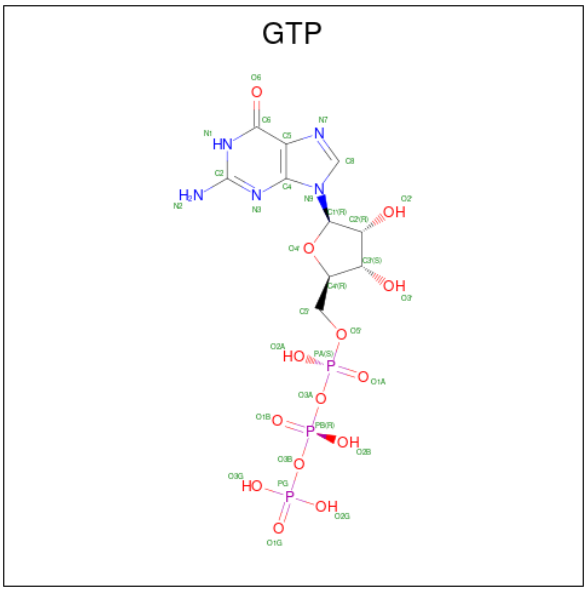
There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	-17	MET	-	initiating methionine	UNP A0A2S6F0E3
D	-16	HIS	-	expression tag	UNP A0A2S6F0E3
D	-15	HIS	-	expression tag	UNP A0A2S6F0E3
D	-14	HIS	-	expression tag	UNP A0A2S6F0E3
D	-13	HIS	-	expression tag	UNP A0A2S6F0E3
D	-12	HIS	-	expression tag	UNP A0A2S6F0E3
D	-11	HIS	-	expression tag	UNP A0A2S6F0E3
D	-10	SER	-	expression tag	UNP A0A2S6F0E3
D	-9	ALA	-	expression tag	UNP A0A2S6F0E3
D	-8	GLY	-	expression tag	UNP A0A2S6F0E3
D	-7	LEU	-	expression tag	UNP A0A2S6F0E3
D	-6	GLU	-	expression tag	UNP A0A2S6F0E3
D	-5	VAL	-	expression tag	UNP A0A2S6F0E3
D	-4	LEU	-	expression tag	UNP A0A2S6F0E3
D	-3	PHE	-	expression tag	UNP A0A2S6F0E3
D	-2	GLN	-	expression tag	UNP A0A2S6F0E3
D	-1	GLY	-	expression tag	UNP A0A2S6F0E3
D	0	PRO	-	expression tag	UNP A0A2S6F0E3

- Molecule 5 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
5	C	1	Total	Mg	0
			1	1	

- Molecule 6 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).



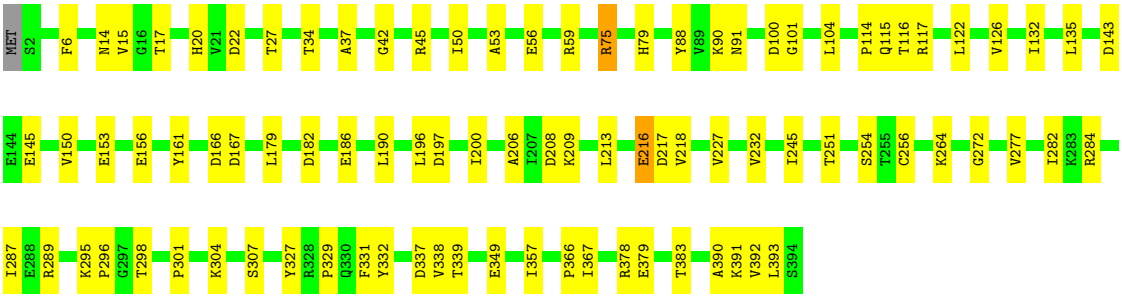
Mol	Chain	Residues	Atoms					AltConf
6	C	1	Total	C	N	O	P	0
			32	10	5	14	3	

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. 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. 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.

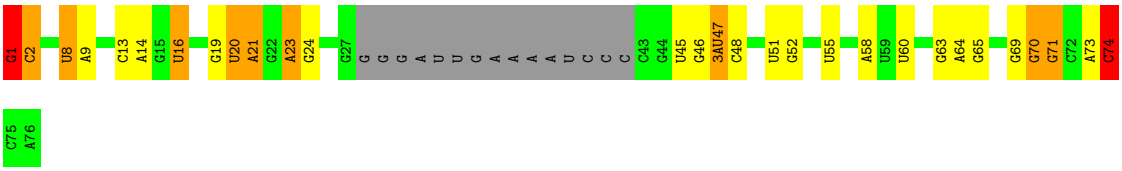
- Molecule 1: Elongation factor Tu

Chain C:



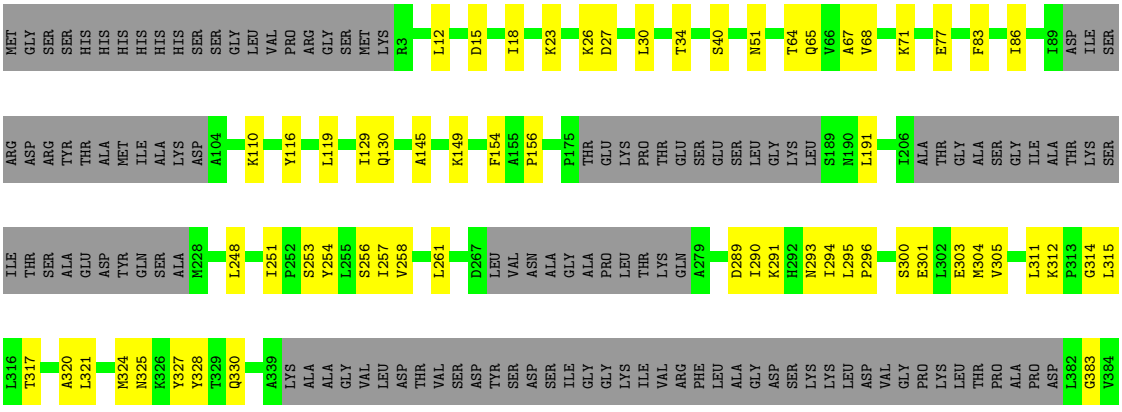
- Molecule 2: t-RNA

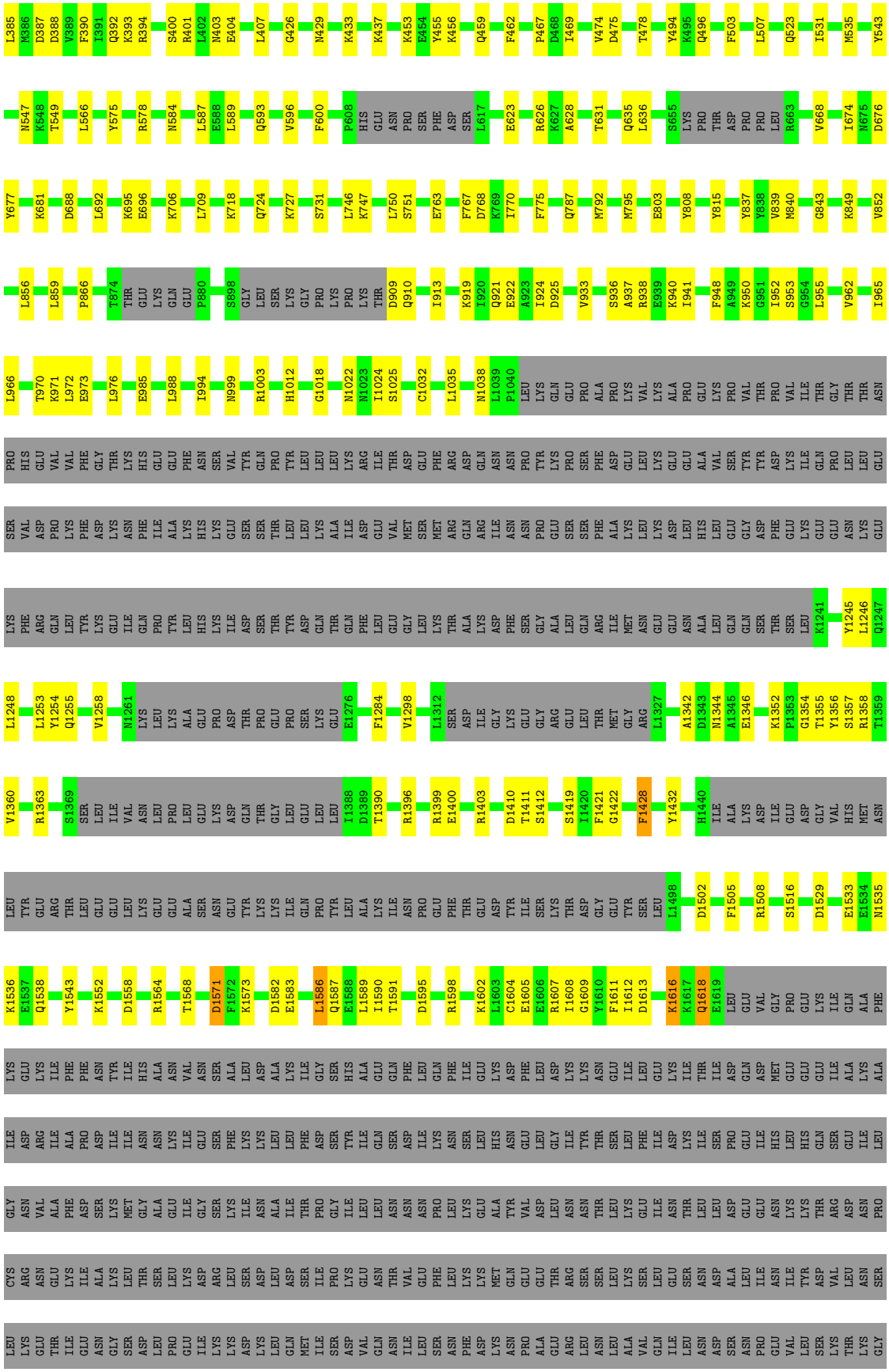
Chain B:

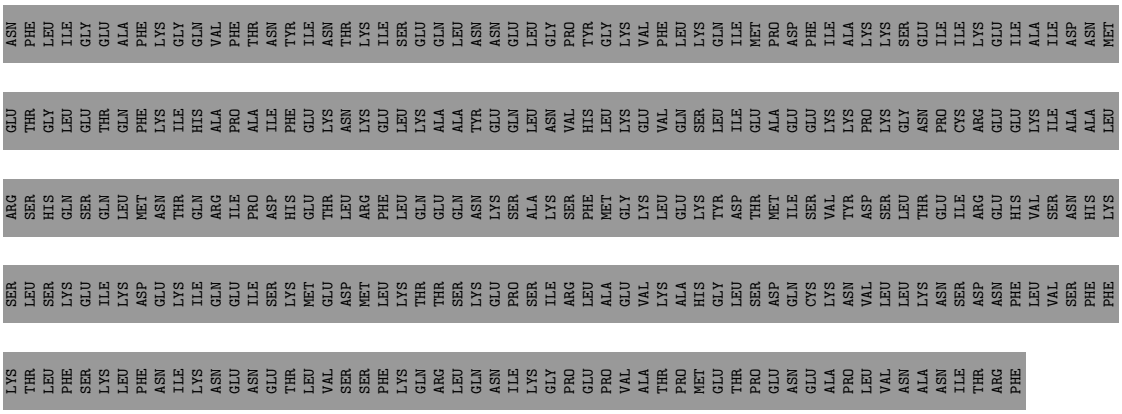


- Molecule 3: Protein SidH

Chain A:

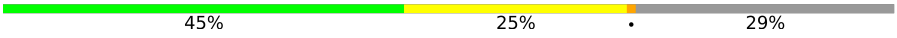


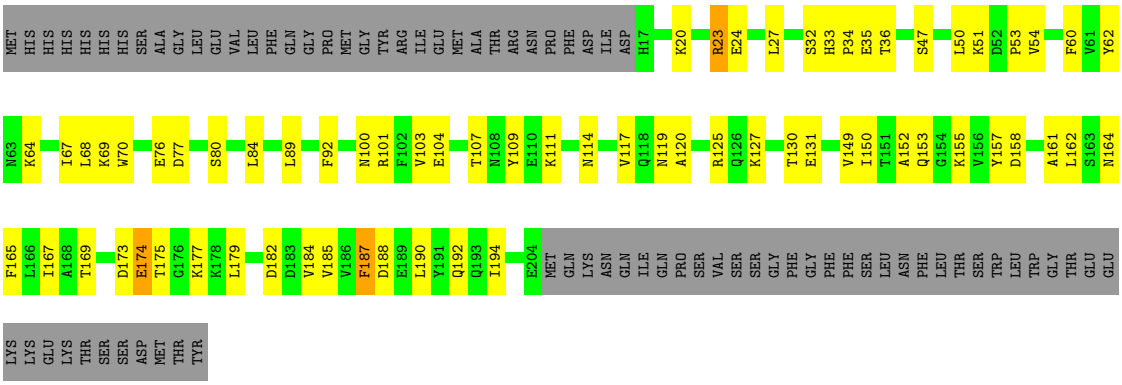

L385 M386 D387 D388 V389 F390 I391 Q392 K393 R394 S400 R401 L402 N403 E404 L407 G426 N429 K433 K437 K453 E454 Y455 K456 Q459 F462 P467 D468 I469 V474 D475 T478 Y494 K496 Q496 F503 L507 Q523 I531 M535 Y543
N547 K548 T549 L566 Y575 R578 N584 L587 E588 L589 Q593 V596 F600 P608 HIS GLU ASN PRO SER PHE ASP SER L617 E623 R626 K627 A628 T631 Q635 L636 S655 LYS PRO THR ASP PRO PRO LEU R663 V668 I674 N675 D676
Y677 K681 D688 L692 K695 E696 K706 L709 K718 Q724 K727 S731 L746 K747 L750 S751 E763 F767 D768 K769 I770 F775 Q787 M792 M795 E803 Y808 Y815 Y837 Y838 V839 M840 G843 K849 V852
L856 L859 P866 T874 THR GLU LYS GLN GLU P880 S898 GLY LEU SER LYS GLY PRO LYS PRO LYS THR D909 Q910 I913 K919 I920 Q921 E922 A923 I924 D925 V933 S936 A937 R938 E939 K940 I941 F948 A949 K950 G961 I952 S953 G954 L955 V962 I965
L966 T970 K971 L972 E973 L976 E985 L988 I994 N999 R1003 H1012 G1018 N1022 N1023 I1024 S1025 C1032 L1035 N1038 L1039 P1040 LEU LYS GLN GLU PRO ALA PRO LYS VAL LYS ALA PRO GLU LYS GLN VAL ILE THR GLY THR ASN
PRO HIS GLU VAL VAL PHE GLY THR LYS HIS GLU GLU GLU PHE ASN SER VAL TYR GLN PRO TYR LEU LEU LEU LYS ARG ILE THR ASP GLU PHE ARG ASP GLN ASN ASN PRO TYR LYS PRO SER PHE ASP GLU LEU GLU GLU ALA PHE GLU ASP ILE GLN LEU LEU LYS ILE ASP LEU GLN PRO GLU
SER VAL ASP PRO LYS PHE ASP LYS ASN PHE ILE ALA LYS HIS LYS GLU SER SER THR LEU LEU LYS ALA ILE ASP GLU VAL MET SER MET ARG GLN ARG ILE ASN ASN PRO GLU SER SER PHE ALA LYS LEU LYS ASP PHE ALA LEU GLY GLY ASP PHE GLU LYS GLU GLY PRO GLU LEU
LYS PHE ARG GLN LEU TYR LYS GLU ILE GLN PRO TYR LEU GLU GLY LEU LYS THR ALA LYS ASP PHE SER GLY ALA LEU GLN ARG ILE MET ASN GLU GLU ASN ALA LEU GLN GLN GLN SER THR SER LEU K1241 Y1245 L1246 Q1247
L1248 L1253 Y1254 Q1255 V1258 N1261 LYS LEU LYS ALA GLU PRO ASP THR PRO GLU PRO SER LYS GLU E1276 F1284 V1298 L1312 SER ASP ILE GLY LYS GLU GLY ARG GLU LEU THR MET THR GLY ARG L1327 A1342 D1343 N1344 A1345 E1346 K1352 P1353 G1354 T1355 Y1356 S1357 R1358 T1359
V1360 R1363 S1369 SER LEU ILE VAL ASN LEU PRO LEU GLU LYS ASP GLN THR GLY LEU GLU LEU LEU I1388 D1389 T1390 R1396 R1399 E1400 R1403 D1410 T1411 S1412 S1419 I1420 F1421 G1422 F1428 Y1432 H1440 ILE ALA LYS ASP ILE GLU GLY ASP VAL HIS MET ASN
LEU TYR GLU ARG THR LEU GLU GLU GLU LEU LYS GLU GLU GLU ALA SER ASN GLU TYR LYS ILE GLN PRO LEU ALA LYS ILE GLN PRO GLU PHE THR GLU ASP TYR ILE SER LYS THR ASP GLY GLU TYR SER LEU L1498 D1502 F1505 R1508 S1516 D1529 E1533 E1534 N1535
K1536 E1537 Q1538 Y1543 K1552 D1558 R1564 T1568 D1571 F1572 K1573 D1582 E1583 L1586 Q1587 E1588 L1589 I1590 T1591 D1595 R1598 K1602 L1603 C1604 E1605 E1606 R1607 I1608 G1609 Y1610 F1611 I1612 D1613 K1616 K1617 Q1618 E1619 LEU GLU VAL GLY PRO GLU LYS ILE GLN ALA PHE
LYS GLU LYS ILE PHE PHE ASN TYR ILE HIS ALA ASN VAL ASN SER ALA LEU ASP ALA LYS ILE GLY SER HIS ALA GLU GLN PHE ILE GLU LEU GLN PHE ILE GLU ASP LYS LYS ASN GLU ILE LEU GLU LYS ILE THR ILE ASP LYS ILE SER ASP ASN ILE ASP PRO GLU ASP ILE ILE GLU ASP GLN ASP MET GLU GLU ILE ALA LYS LYS ALA
ILE ASP ARG ILE ALA PRO ASP ILE ILE ASN ASN PHE ALA LYS ASN GLU PHE LYS LYS MET GLN GLU GLU LEU ASN ASN THR LEU LYS SER LEU GLU SER ASN ASP ASP ALA LEU GLU ILE HIS LEU HIS GLN SER GLU ILE LEU
GLY ASN VAL ALA PHE ASP SER LYS MET GLY ALA GLU ILE GLY SER LYS ILE ASN ALA PHE GLY ILE LEU LEU ASN ASN PRO LEU LYS GLU ALA TYR VAL ASP LEU ASN ASN THR LEU LYS GLU ILE ASN THR LEU LEU ASP GLU GLU ASN LYS LYS THR ARG ASP ASN PRO
CYS ARG ASN GLU LYS ILE ALA LYS LEU LYS ASP ARG LEU SER ASP LEU ASP SER ILE PRO LYS GLU ASN THR VAL GLU PHE LEU LYS LYS MET GLN GLU GLU THR ARG SER SER LEU LYS SER LEU GLU SER ASN ASP ALA LEU ILE ASN LEU TYR ASP SER ASN
LEU LYS GLU THR ILE GLU ASN GLY SER ASP VAL GLN ASN ILE LEU ILE SER ASN PHE ASP LYS ASN PRO ALA GLU ARG LEU ASN LEU ALA VAL GLN ILE LEU ASN ASP SER ASN LEU ASP ASN VAL ILE LEU SER ASP PRO GLU ILE ASN ASP PRO



• Molecule 4: E3 ubiquitin–protein ligase

Chain D:





4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	255829	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	43.37	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MG, 4SU, 5MU, H2U, PSU, 3AU, GTP

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	C	0.26	0/2987	0.51	0/4060
2	B	0.42	1/1318 (0.1%)	0.90	3/2048 (0.1%)
3	A	0.25	0/9163	0.44	1/12405 (0.0%)
4	D	0.26	0/1569	0.51	0/2124
All	All	0.27	1/15037 (0.0%)	0.53	4/20637 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1	G	OP3-P	-10.71	1.48	1.61

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	74	C	C2-N1-C1'	7.34	126.87	118.80
3	A	1586	LEU	CA-CB-CG	6.44	130.11	115.30
2	B	74	C	N1-C2-O2	6.31	122.68	118.90
2	B	74	C	C6-N1-C1'	-5.20	114.56	120.80

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in 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	C	2937	0	2899	53	0
2	B	1309	0	672	16	0
3	A	9015	0	8710	161	0
4	D	1535	0	1578	56	0
5	C	1	0	0	0	0
6	C	32	0	12	1	0
All	All	14829	0	13871	278	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 10.

All (278) 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)
1:C:284:ARG:HH12	2:B:74:C:H42	1.24	0.84
2:B:51:U:H3	2:B:63:G:H1	0.86	0.82
3:A:314:GLY:HA2	3:A:317:THR:HG22	1.67	0.77
4:D:174:GLU:HG3	4:D:175:THR:HG23	1.70	0.73
3:A:1529:ASP:O	3:A:1535:ASN:ND2	2.19	0.73
3:A:767:PHE:HA	3:A:770:ILE:HG12	1.71	0.73
3:A:403:ASN:ND2	3:A:584:ASN:OD1	2.24	0.71
3:A:972:LEU:HB2	3:A:994:ILE:HG21	1.73	0.71
3:A:999:ASN:OD1	3:A:1003:ARG:NH2	2.22	0.69
4:D:33:HIS:HD2	4:D:34:PRO:HD2	1.58	0.69
1:C:53:ALA:HB3	1:C:56:GLU:HG3	1.75	0.68
3:A:1428:PHE:O	3:A:1432:TYR:HB3	1.93	0.68
4:D:24:GLU:HA	4:D:27:LEU:HG	1.75	0.67
3:A:763:GLU:OE2	3:A:763:GLU:N	2.29	0.66
1:C:213:LEU:HD12	1:C:232:VAL:HG22	1.78	0.65
3:A:600:PHE:HE1	3:A:668:VAL:HA	1.60	0.65
3:A:311:LEU:HD13	3:A:315:LEU:HD23	1.79	0.65
3:A:795:MET:HE1	3:A:839:VAL:HG21	1.79	0.64
3:A:936:SER:OG	3:A:940:LYS:NZ	2.30	0.64
4:D:23:ARG:HH21	4:D:27:LEU:HB3	1.61	0.64
3:A:320:ALA:O	3:A:324:MET:HG2	1.98	0.63
3:A:623:GLU:OE1	3:A:626:ARG:NH1	2.31	0.63
3:A:1344:ASN:OD1	3:A:1403:ARG:NH2	2.32	0.63
3:A:300:SER:O	3:A:304:MET:HG3	1.97	0.63
3:A:840:MET:HG2	3:A:856:LEU:HD11	1.82	0.62
3:A:575:TYR:HB2	3:A:696:GLU:OE1	2.00	0.62
4:D:149:VAL:HG22	4:D:184:VAL:HG12	1.81	0.62
3:A:30:LEU:O	3:A:34:THR:OG1	2.17	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:33:HIS:CD2	4:D:34:PRO:HD2	2.35	0.61
4:D:33:HIS:HE1	4:D:150:ILE:HG23	1.65	0.61
3:A:478:THR:HG21	3:A:709:LEU:HB3	1.82	0.60
1:C:104:LEU:HD11	1:C:116:THR:HG23	1.82	0.60
3:A:955:LEU:HD21	3:A:1024:ILE:HG13	1.84	0.60
1:C:14:ASN:ND2	1:C:272:GLY:O	2.36	0.58
4:D:101:ARG:O	4:D:104:GLU:HG3	2.02	0.58
1:C:339:THR:OG1	2:B:65:G:O2'	2.16	0.58
3:A:1399:ARG:HH21	3:A:1403:ARG:HB2	1.68	0.58
3:A:15:ASP:OD2	3:A:1564:ARG:NH1	2.35	0.58
4:D:33:HIS:HB3	4:D:36:THR:HG23	1.85	0.57
3:A:1583:GLU:HA	3:A:1586:LEU:HD23	1.85	0.57
3:A:1018:GLY:O	3:A:1022:ASN:ND2	2.37	0.57
2:B:8:4SU:O2'	2:B:21:A:N1	2.29	0.57
4:D:100:ASN:OD1	4:D:101:ARG:N	2.37	0.57
3:A:1582:ASP:O	3:A:1586:LEU:HD22	2.06	0.56
3:A:843:GLY:HA3	3:A:852:VAL:HG11	1.87	0.56
4:D:23:ARG:NH2	4:D:27:LEU:HB3	2.20	0.56
3:A:724:GLN:HA	3:A:727:LYS:HE3	1.87	0.56
4:D:23:ARG:NE	4:D:23:ARG:O	2.39	0.56
1:C:289:ARG:NE	2:B:1:G:OP2	2.36	0.56
1:C:17:THR:HG23	1:C:79:HIS:CE1	2.41	0.56
3:A:1543:TYR:OH	3:A:1558:ASP:O	2.20	0.56
3:A:962:VAL:HA	3:A:965:ILE:HG12	1.87	0.56
3:A:566:LEU:HD11	3:A:695:LYS:HD3	1.88	0.56
3:A:628:ALA:O	3:A:631:THR:OG1	2.23	0.56
3:A:1595:ASP:OD1	3:A:1598:ARG:NH2	2.39	0.56
3:A:531:ILE:O	3:A:535:MET:HG3	2.06	0.55
3:A:1583:GLU:O	3:A:1587:GLN:HG2	2.05	0.55
1:C:91:ASN:ND2	2:B:2:C:OP1	2.29	0.55
4:D:190:LEU:O	4:D:194:ILE:HG12	2.06	0.55
3:A:23:LYS:NZ	3:A:27:ASP:OD2	2.37	0.55
3:A:589:LEU:HD23	3:A:635:GLN:HE21	1.72	0.55
3:A:676:ASP:OD1	3:A:677:TYR:N	2.39	0.55
3:A:837:TYR:HA	3:A:840:MET:HE3	1.89	0.55
1:C:135:LEU:HD21	1:C:150:VAL:HG11	1.88	0.55
3:A:1421:PHE:HA	3:A:1516:SER:HB2	1.88	0.54
3:A:1568:THR:OG1	3:A:1571:ASP:OD1	2.23	0.54
4:D:70:TRP:NE1	4:D:76:GLU:O	2.35	0.54
3:A:327:TYR:O	3:A:330:GLN:HG3	2.08	0.54
4:D:50:LEU:HD22	4:D:53:PRO:HB3	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:83:PHE:HA	3:A:86:ILE:HD12	1.88	0.54
1:C:245:ILE:O	1:C:251:THR:HA	2.07	0.54
3:A:792:MET:HA	3:A:795:MET:HE3	1.89	0.54
1:C:45:ARG:HH11	1:C:50:ILE:HD13	1.73	0.53
3:A:296:PRO:HG3	3:A:390:PHE:CD2	2.43	0.53
4:D:107:THR:O	4:D:111:LYS:N	2.37	0.53
3:A:387:ASP:N	3:A:387:ASP:OD1	2.41	0.53
1:C:327:TYR:OH	1:C:379:GLU:OE1	2.26	0.52
3:A:971:LYS:HD3	3:A:994:ILE:HG12	1.91	0.52
3:A:1390:THR:HG22	3:A:1618:GLN:NE2	2.25	0.52
1:C:59:ARG:NH2	1:C:88:TYR:OH	2.42	0.52
3:A:317:THR:O	3:A:321:LEU:HB2	2.10	0.52
1:C:75:ARG:NH2	1:C:200:ILE:O	2.42	0.52
3:A:938:ARG:O	3:A:941:ILE:HG13	2.09	0.52
1:C:22:ASP:OD2	3:A:437:LYS:NZ	2.30	0.51
1:C:254:SER:HB2	1:C:282:ILE:HD11	1.92	0.51
3:A:747:LYS:HD3	3:A:763:GLU:HA	1.91	0.51
3:A:1355:THR:OG1	3:A:1356:TYR:N	2.44	0.51
1:C:357:ILE:HD11	3:A:156:PRO:HG3	1.92	0.51
3:A:475:ASP:OD2	3:A:494:TYR:OH	2.21	0.51
4:D:32:SER:OG	4:D:36:THR:OG1	2.28	0.51
3:A:1354:GLY:HA3	3:A:1358:ARG:HH21	1.76	0.51
1:C:20:HIS:ND1	1:C:115:GLN:HB2	2.26	0.51
4:D:60:PHE:HE2	4:D:80:SER:HB3	1.76	0.51
1:C:301:PRO:HB2	1:C:366:PRO:HB2	1.92	0.51
2:B:63:G:H2'	2:B:64:A:C8	2.46	0.51
3:A:952:ILE:HG23	3:A:955:LEU:HD12	1.93	0.51
3:A:1032:CYS:HA	3:A:1035:LEU:HG	1.93	0.50
2:B:63:G:H2'	2:B:64:A:H8	1.75	0.50
4:D:33:HIS:CD2	4:D:152:ALA:HA	2.46	0.50
1:C:338:VAL:HG21	1:C:367:ILE:HG21	1.93	0.50
3:A:12:LEU:HD22	3:A:18:ILE:HD12	1.92	0.50
1:C:117:ARG:NH1	1:C:161:TYR:OH	2.41	0.50
3:A:948:PHE:O	3:A:952:ILE:HG12	2.11	0.50
3:A:746:LEU:O	3:A:750:LEU:HB2	2.11	0.50
3:A:1602:LYS:O	3:A:1605:GLU:HG2	2.11	0.50
3:A:775:PHE:CE1	3:A:787:GLN:HG2	2.48	0.49
3:A:910:GLN:NE2	3:A:953:SER:O	2.45	0.49
4:D:76:GLU:HA	4:D:84:LEU:H	1.76	0.49
3:A:291:LYS:HD3	3:A:328:TYR:CZ	2.48	0.49
4:D:54:VAL:HG11	4:D:64:LYS:HE2	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:68:LEU:HD12	4:D:69:LYS:HG3	1.94	0.49
4:D:157:TYR:HD1	4:D:162:LEU:HD13	1.78	0.49
3:A:1255:GLN:HA	3:A:1258:VAL:HG12	1.94	0.49
3:A:635:GLN:N	3:A:635:GLN:OE1	2.46	0.48
3:A:1608:ILE:O	3:A:1612:ILE:HG23	2.13	0.48
4:D:165:PHE:O	4:D:169:THR:HG22	2.14	0.48
1:C:206:ALA:HB1	1:C:209:LYS:HG3	1.94	0.48
4:D:84:LEU:HD13	4:D:89:LEU:HD21	1.95	0.48
4:D:164:ASN:OD1	4:D:165:PHE:N	2.46	0.48
2:B:69:G:O2'	2:B:70:G:H5'	2.13	0.48
4:D:173:ASP:O	4:D:177:LYS:NZ	2.47	0.48
3:A:1410:ASP:OD2	3:A:1411:THR:N	2.47	0.48
4:D:33:HIS:ND1	4:D:185:VAL:HG12	2.29	0.48
1:C:6:PHE:HB2	1:C:264:LYS:HB3	1.96	0.48
3:A:795:MET:SD	3:A:859:LEU:HD21	2.54	0.48
4:D:150:ILE:O	4:D:184:VAL:HG13	2.14	0.48
3:A:1355:THR:O	3:A:1358:ARG:HG2	2.14	0.48
4:D:182:ASP:OD2	4:D:182:ASP:N	2.45	0.48
3:A:547:ASN:HB3	3:A:549:THR:HG23	1.95	0.47
1:C:349:GLU:HB2	3:A:154:PHE:HB3	1.96	0.47
4:D:153:GLN:NE2	4:D:155:LYS:HB2	2.29	0.47
4:D:158:ASP:HB3	4:D:161:ALA:HB3	1.97	0.47
1:C:307:SER:HA	1:C:390:ALA:H	1.79	0.47
1:C:391:LYS:NZ	1:C:392:VAL:O	2.47	0.47
2:B:51:U:O4	2:B:63:G:O6	2.31	0.47
3:A:1538:GLN:HA	3:A:1538:GLN:OE1	2.14	0.47
3:A:1422:GLY:H	3:A:1516:SER:HB3	1.80	0.47
1:C:37:ALA:HA	1:C:42:GLY:HA3	1.97	0.46
3:A:400:SER:O	3:A:404:GLU:HG2	2.14	0.46
3:A:433:LYS:HG2	3:A:503:PHE:CD1	2.50	0.46
3:A:1284:PHE:HD1	3:A:1363:ARG:HH12	1.63	0.46
3:A:191:LEU:HD12	3:A:248:LEU:HD12	1.96	0.46
3:A:429:ASN:OD1	3:A:429:ASN:N	2.41	0.46
3:A:921:GLN:NE2	3:A:925:ASP:OD2	2.48	0.46
3:A:1346:GLU:OE2	3:A:1357:SER:N	2.43	0.46
3:A:67:ALA:O	3:A:71:LYS:HG3	2.15	0.46
3:A:937:ALA:HA	3:A:940:LYS:HE2	1.98	0.46
3:A:40:SER:HB3	3:A:312:LYS:HA	1.98	0.46
3:A:474:VAL:HG22	3:A:709:LEU:HG	1.98	0.46
1:C:295:LYS:HG3	1:C:296:PRO:HD2	1.98	0.46
4:D:114:ASN:OD1	4:D:114:ASN:N	2.48	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:130:GLN:HB3	3:A:866:PRO:HG2	1.98	0.46
3:A:636:LEU:HD12	3:A:674:ILE:HD11	1.97	0.46
3:A:1607:ARG:O	3:A:1611:PHE:CD1	2.68	0.46
3:A:325:ASN:HA	3:A:385:LEU:HD22	1.98	0.45
3:A:1604:CYS:O	3:A:1608:ILE:HG23	2.16	0.45
3:A:1410:ASP:OD2	3:A:1412:SER:N	2.45	0.45
3:A:116:TYR:HD1	3:A:119:LEU:HD12	1.82	0.45
3:A:253:SER:O	3:A:257:ILE:HD12	2.16	0.45
3:A:1246:LEU:HD23	3:A:1246:LEU:HA	1.80	0.45
4:D:53:PRO:HG2	4:D:92:PHE:O	2.17	0.45
3:A:456:LYS:HG3	3:A:709:LEU:HD13	1.99	0.45
3:A:972:LEU:HA	3:A:994:ILE:HD13	1.97	0.45
4:D:54:VAL:HG23	4:D:62:TYR:HB2	1.99	0.45
4:D:127:LYS:HB2	4:D:127:LYS:HE2	1.85	0.45
3:A:388:ASP:O	3:A:392:GLN:HG2	2.17	0.45
2:B:23:A:H2'	2:B:24:G:C8	2.52	0.45
3:A:26:LYS:HE2	3:A:77:GLU:HG2	1.99	0.45
3:A:257:ILE:HD12	3:A:257:ILE:H	1.82	0.45
3:A:718:LYS:HZ3	3:A:808:TYR:H	1.65	0.45
3:A:51:ASN:OD1	3:A:51:ASN:N	2.50	0.45
3:A:751:SER:HA	3:A:1352:LYS:HG3	1.98	0.45
3:A:1245:TYR:HE1	3:A:1298:VAL:HG13	1.82	0.45
1:C:378:ARG:HG2	1:C:383:THR:HA	1.97	0.44
3:A:253:SER:O	3:A:256:SER:OG	2.25	0.44
3:A:65:GLN:HA	3:A:68:VAL:HG12	1.99	0.44
3:A:919:LYS:O	3:A:922:GLU:HG3	2.17	0.44
3:A:970:THR:O	3:A:973:GLU:HG3	2.17	0.44
4:D:23:ARG:HH21	4:D:27:LEU:CB	2.28	0.44
4:D:187:PHE:CD1	4:D:190:LEU:HB2	2.52	0.44
1:C:304:LYS:HG2	1:C:393:LEU:HD12	1.98	0.44
1:C:332:TYR:HE1	1:C:378:ARG:HB2	1.83	0.44
3:A:578:ARG:HB3	3:A:692:LEU:HD13	1.98	0.44
3:A:26:LYS:HB3	3:A:26:LYS:HE3	1.72	0.44
3:A:681:LYS:HD3	3:A:681:LYS:HA	1.88	0.44
4:D:119:ASN:OD1	4:D:120:ALA:N	2.51	0.44
3:A:1342:ALA:HB2	3:A:1360:VAL:HG11	1.99	0.44
2:B:23:A:H2'	2:B:24:G:H8	1.82	0.44
1:C:122:LEU:O	1:C:126:VAL:HG22	2.17	0.43
2:B:1:G:HO2'	2:B:2:C:P	2.40	0.43
3:A:924:ILE:HD11	3:A:976:LEU:HD13	1.99	0.43
4:D:164:ASN:HA	4:D:167:ILE:HG12	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:153:GLU:O	1:C:156:GLU:HG2	2.18	0.43
4:D:20:LYS:O	4:D:24:GLU:HG3	2.18	0.43
1:C:14:ASN:O	1:C:100:ASP:N	2.50	0.43
3:A:145:ALA:O	3:A:149:LYS:HG3	2.19	0.43
3:A:257:ILE:HG23	3:A:294:ILE:CG2	2.48	0.43
3:A:289:ASP:OD1	3:A:293:ASN:ND2	2.47	0.43
3:A:593:GLN:HA	3:A:596:VAL:HG12	1.99	0.43
3:A:727:LYS:HB3	3:A:727:LYS:HE2	1.80	0.43
4:D:62:TYR:OH	4:D:77:ASP:OD1	2.29	0.43
1:C:135:LEU:HD23	1:C:135:LEU:HA	1.83	0.43
3:A:1552:LYS:HB2	3:A:1589:LEU:HD11	1.99	0.43
4:D:51:LYS:HA	4:D:51:LYS:HD3	1.65	0.43
1:C:216:GLU:HG3	1:C:217:ASP:N	2.33	0.43
3:A:453:LYS:HE2	3:A:453:LYS:HB3	1.81	0.43
4:D:153:GLN:HE21	4:D:155:LYS:HB2	1.84	0.43
4:D:36:THR:OG1	4:D:36:THR:O	2.37	0.43
1:C:114:PRO:HG3	3:A:496:GLN:HG3	2.01	0.42
1:C:182:ASP:O	1:C:186:GLU:HG3	2.19	0.42
1:C:190:LEU:HD23	1:C:190:LEU:HA	1.87	0.42
4:D:190:LEU:HD12	4:D:190:LEU:HA	1.79	0.42
3:A:393:LYS:HE2	3:A:393:LYS:HB2	1.86	0.42
3:A:1003:ARG:HG3	3:A:1025:SER:OG	2.19	0.42
3:A:1590:ILE:HG13	3:A:1591:THR:N	2.33	0.42
2:B:58:A:O2'	2:B:60:U:OP2	2.28	0.42
3:A:985:GLU:O	3:A:988:LEU:HG	2.19	0.42
3:A:1400:GLU:HG3	3:A:1611:PHE:CE1	2.54	0.42
4:D:130:THR:OG1	4:D:131:GLU:OE1	2.37	0.42
3:A:706:LYS:HD3	3:A:706:LYS:HA	1.75	0.42
3:A:933:VAL:O	3:A:938:ARG:NH1	2.53	0.42
4:D:177:LYS:HB2	4:D:179:LEU:HD23	2.00	0.42
4:D:188:ASP:O	4:D:192:GLN:HG2	2.19	0.42
2:B:70:G:O2'	2:B:71:G:O5'	2.32	0.42
1:C:295:LYS:O	1:C:298:THR:HG22	2.18	0.42
3:A:303:GLU:OE2	3:A:394:ARG:NH2	2.47	0.42
1:C:218:VAL:HG21	1:C:287:ILE:HG22	2.02	0.42
4:D:157:TYR:CD1	4:D:162:LEU:HD13	2.55	0.42
1:C:34:THR:HG21	1:C:179:LEU:HD12	2.02	0.42
3:A:304:MET:HG2	3:A:401:ARG:HD3	2.01	0.42
3:A:261:LEU:HD23	3:A:290:ILE:HD12	2.00	0.42
3:A:328:TYR:HE2	3:A:383:GLY:HA2	1.85	0.42
3:A:1253:LEU:HD23	3:A:1253:LEU:HA	1.85	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:1245:TYR:O	3:A:1248:LEU:HG	2.20	0.41
4:D:35:GLU:HB3	4:D:109:TYR:HE2	1.85	0.41
1:C:329:PRO:HG2	1:C:331:PHE:CE1	2.56	0.41
3:A:455:TYR:CE2	3:A:459:GLN:HG3	2.55	0.41
3:A:909:ASP:N	3:A:909:ASP:OD1	2.52	0.41
1:C:27:THR:OG1	6:C:402:GTP:O1A	2.26	0.41
1:C:132:ILE:HD13	1:C:196:LEU:HD12	2.02	0.41
1:C:332:TYR:CE1	1:C:378:ARG:HB2	2.56	0.41
3:A:64:THR:H	3:A:523:GLN:HB2	1.85	0.41
3:A:295:LEU:HD23	3:A:295:LEU:HA	1.87	0.41
3:A:940:LYS:HB3	3:A:1038:ASN:HD22	1.85	0.41
3:A:1390:THR:HG22	3:A:1618:GLN:HE21	1.86	0.41
3:A:1399:ARG:HH21	3:A:1403:ARG:CB	2.33	0.41
3:A:1502:ASP:O	3:A:1505:PHE:HB2	2.20	0.41
1:C:90:LYS:HD2	1:C:289:ARG:NH2	2.35	0.41
1:C:331:PHE:O	1:C:337:ASP:HA	2.21	0.41
4:D:64:LYS:HA	4:D:67:ILE:HG22	2.03	0.41
4:D:100:ASN:O	4:D:103:VAL:HG22	2.20	0.41
2:B:46:G:OP1	2:B:47:3AU:H5'A	2.20	0.41
1:C:15:VAL:HA	1:C:101:GLY:O	2.20	0.41
3:A:191:LEU:HD21	3:A:305:VAL:HG11	2.03	0.41
3:A:587:LEU:HD23	3:A:587:LEU:HA	1.88	0.41
3:A:1533:GLU:HA	3:A:1536:LYS:HD3	2.02	0.41
4:D:60:PHE:CE2	4:D:80:SER:HB3	2.55	0.41
3:A:110:LYS:HE3	3:A:110:LYS:HB3	1.80	0.41
3:A:910:GLN:HA	3:A:913:ILE:HG12	2.03	0.41
3:A:1399:ARG:O	3:A:1399:ARG:NE	2.52	0.41
3:A:1609:GLY:O	3:A:1612:ILE:HG13	2.21	0.41
3:A:462:PHE:HE1	3:A:469:ILE:HB	1.85	0.41
3:A:731:SER:OG	3:A:803:GLU:OE1	2.24	0.41
3:A:1613:ASP:O	3:A:1616:LYS:HG3	2.21	0.40
3:A:426:GLY:HA2	3:A:507:LEU:HD11	2.02	0.40
3:A:129:ILE:HD13	3:A:129:ILE:HA	1.96	0.40
3:A:254:TYR:O	3:A:258:VAL:HG13	2.21	0.40
3:A:933:VAL:HB	3:A:938:ARG:CZ	2.51	0.40
3:A:1396:ARG:O	3:A:1400:GLU:HG2	2.21	0.40
1:C:15:VAL:O	1:C:79:HIS:HA	2.22	0.40
3:A:251:ILE:HG22	3:A:301:GLU:HB3	2.03	0.40
1:C:143:ASP:OD1	1:C:145:GLU:N	2.53	0.40
1:C:227:VAL:HA	1:C:277:VAL:O	2.21	0.40
3:A:407:LEU:HD23	3:A:407:LEU:HA	1.88	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:467:PRO:HG2	3:A:815:TYR:O	2.22	0.40
3:A:965:ILE:HG13	3:A:966:LEU:N	2.37	0.40
4:D:117:VAL:O	4:D:120:ALA:HB3	2.21	0.40
4:D:155:LYS:HD2	4:D:157:TYR:CE2	2.57	0.40

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	C	391/394 (99%)	379 (97%)	12 (3%)	0	100	100
3	A	1153/2244 (51%)	1113 (96%)	40 (4%)	0	100	100
4	D	187/264 (71%)	182 (97%)	4 (2%)	1 (0%)	29	64
All	All	1731/2902 (60%)	1674 (97%)	56 (3%)	1 (0%)	54	83

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	D	174	GLU

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	C	301/327 (92%)	294 (98%)	7 (2%)	50 77
3	A	932/2015 (46%)	918 (98%)	14 (2%)	65 85
4	D	174/241 (72%)	170 (98%)	4 (2%)	50 77
All	All	1407/2583 (54%)	1382 (98%)	25 (2%)	61 82

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	75	ARG
1	C	166	ASP
1	C	167	ASP
1	C	197	ASP
1	C	208	ASP
1	C	216	GLU
1	C	256	CYS
3	A	543	TYR
3	A	688	ASP
3	A	768	ASP
3	A	849	LYS
3	A	950	LYS
3	A	1012	HIS
3	A	1254	TYR
3	A	1419	SER
3	A	1428	PHE
3	A	1508	ARG
3	A	1571	ASP
3	A	1573	LYS
3	A	1616	LYS
3	A	1618	GLN
4	D	23	ARG
4	D	47	SER
4	D	125	ARG
4	D	187	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
3	A	1022	ASN

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	B	59/76 (77%)	15 (25%)	3 (5%)

All (15) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	B	2	C
2	B	9	A
2	B	14	A
2	B	16	H2U
2	B	19	G
2	B	20	H2U
2	B	21	A
2	B	23	A
2	B	45	U
2	B	48	C
2	B	52	G
2	B	70	G
2	B	71	G
2	B	73	A
2	B	74	C

All (3) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	B	1	G
2	B	13	C
2	B	70	G

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

6 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	PSU	B	55	2	18,21,22	1.03	1 (5%)	22,30,33	1.78	3 (13%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
2	4SU	B	8	2	18,21,22	3.64	7 (38%)	26,30,33	2.30	4 (15%)
2	5MU	B	54	2	19,22,23	0.47	0	28,32,35	0.61	0
2	H2U	B	16	2	18,21,22	0.49	0	21,30,33	0.98	1 (4%)
2	3AU	B	47	2	24,28,29	2.74	9 (37%)	33,40,43	1.35	4 (12%)
2	H2U	B	20	2	18,21,22	0.57	0	21,30,33	1.43	3 (14%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	PSU	B	55	2	-	0/7/25/26	0/2/2/2
2	4SU	B	8	2	-	0/7/25/26	0/2/2/2
2	5MU	B	54	2	-	0/7/25/26	0/2/2/2
2	H2U	B	16	2	-	3/7/38/39	0/2/2/2
2	3AU	B	47	2	-	6/16/34/35	0/2/2/2
2	H2U	B	20	2	-	6/7/38/39	0/2/2/2

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	8	4SU	C2-N3	7.07	1.50	1.38
2	B	8	4SU	C2-N1	7.02	1.49	1.38
2	B	8	4SU	C4-N3	6.81	1.44	1.37
2	B	47	3AU	C2-N1	6.30	1.47	1.38
2	B	47	3AU	C6-C5	6.11	1.49	1.35
2	B	47	3AU	C2-N3	5.95	1.49	1.38
2	B	8	4SU	C5-C4	5.63	1.49	1.42
2	B	8	4SU	C6-C5	5.44	1.47	1.35
2	B	8	4SU	C4-S4	-4.39	1.60	1.68
2	B	47	3AU	O2-C2	-3.63	1.15	1.22
2	B	47	3AU	C4-N3	3.62	1.46	1.40
2	B	47	3AU	C6-N1	3.52	1.46	1.38
2	B	55	PSU	C6-C5	3.17	1.39	1.35
2	B	47	3AU	C11-C10	3.00	1.58	1.52
2	B	8	4SU	C6-N1	2.78	1.44	1.38
2	B	47	3AU	O4-C4	-2.33	1.18	1.23
2	B	47	3AU	O30-C13	2.30	1.29	1.22

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	8	4SU	C4-N3-C2	-7.97	119.59	127.34
2	B	8	4SU	C5-C4-N3	5.90	120.16	114.69
2	B	55	PSU	C4-N3-C2	-4.78	119.45	126.34
2	B	55	PSU	N1-C2-N3	4.44	120.16	115.13
2	B	8	4SU	C5-C4-S4	-3.88	119.47	124.47
2	B	47	3AU	C4-N3-C2	-3.73	119.95	124.63
2	B	20	H2U	C5-C4-N3	-3.62	112.58	116.65
2	B	8	4SU	N3-C2-N1	3.59	119.65	114.89
2	B	20	H2U	O2-C2-N1	3.56	127.57	123.11
2	B	16	H2U	C5-C4-N3	-3.13	113.14	116.65
2	B	47	3AU	C5-C4-N3	3.08	119.56	115.50
2	B	55	PSU	O2-C2-N1	-2.54	120.00	122.79
2	B	47	3AU	O2-C2-N3	-2.46	118.57	121.99
2	B	20	H2U	O2-C2-N3	-2.39	117.05	121.50
2	B	47	3AU	C6-N1-C2	-2.38	119.65	121.79

There are no chirality outliers.

All (15) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	47	3AU	C10-C11-C12-N40
2	B	47	3AU	O4'-C4'-C5'-O5'
2	B	16	H2U	O4'-C4'-C5'-O5'
2	B	16	H2U	C3'-C4'-C5'-O5'
2	B	20	H2U	C2'-C1'-N1-C2
2	B	47	3AU	C3'-C4'-C5'-O5'
2	B	20	H2U	C2'-C1'-N1-C6
2	B	47	3AU	C11-C12-C13-O31
2	B	47	3AU	C11-C12-C13-O30
2	B	20	H2U	O4'-C4'-C5'-O5'
2	B	20	H2U	C4'-C5'-O5'-P
2	B	20	H2U	C3'-C4'-C5'-O5'
2	B	47	3AU	C10-C11-C12-C13
2	B	16	H2U	C4'-C5'-O5'-P
2	B	20	H2U	O4'-C1'-N1-C2

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	8	4SU	1	0
2	B	47	3AU	1	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 2 ligands modelled in this entry, 1 is monoatomic - leaving 1 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
6	GTP	C	402	5	26,34,34	1.15	1 (3%)	32,54,54	1.62	7 (21%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	GTP	C	402	5	-	8/18/38/38	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	C	402	GTP	C5-C6	-4.07	1.39	1.47

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	C	402	GTP	PB-O3B-PG	-3.76	119.91	132.83
6	C	402	GTP	C5-C6-N1	3.36	119.88	113.95
6	C	402	GTP	C2-N1-C6	-2.99	119.58	125.10
6	C	402	GTP	C8-N7-C5	2.97	108.65	102.99
6	C	402	GTP	C3'-C2'-C1'	2.94	105.40	100.98
6	C	402	GTP	PA-O3A-PB	-2.82	123.15	132.83
6	C	402	GTP	O6-C6-C5	-2.24	120.00	124.37

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	C	402	GTP	C5'-O5'-PA-O1A
6	C	402	GTP	O4'-C4'-C5'-O5'
6	C	402	GTP	C3'-C4'-C5'-O5'
6	C	402	GTP	PG-O3B-PB-O2B
6	C	402	GTP	C5'-O5'-PA-O3A
6	C	402	GTP	PG-O3B-PB-O1B
6	C	402	GTP	PA-O3A-PB-O1B
6	C	402	GTP	PA-O3A-PB-O2B

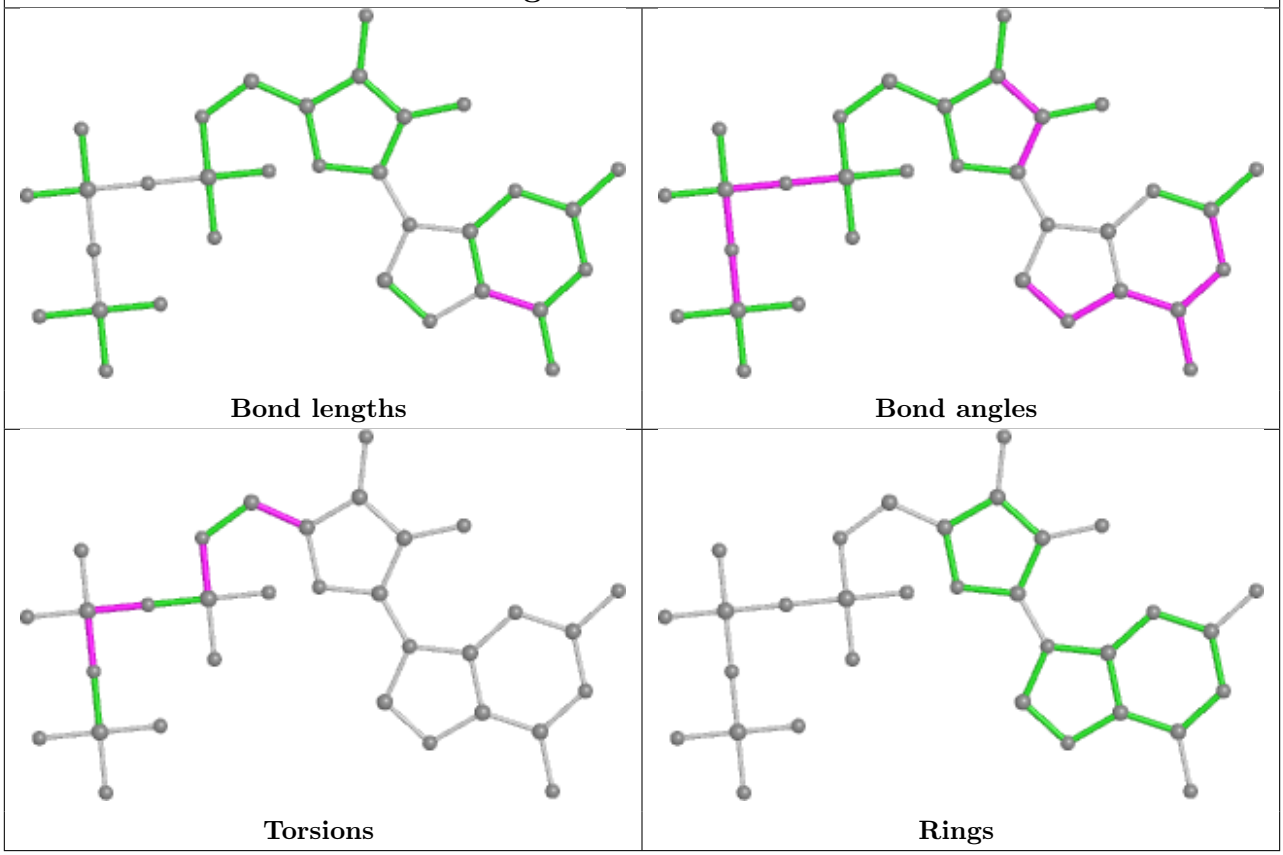
There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	C	402	GTP	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand GTP C 402



5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Map visualisation

This section contains visualisations of the EMDB entry EMD-18407. These allow visual inspection of the internal detail of the map and identification of artifacts.

Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

This section was not generated.

6.2 Central slices

This section was not generated.

6.3 Largest variance slices

This section was not generated.

6.4 Orthogonal standard-deviation projections (False-color)

This section was not generated.

6.5 Orthogonal surface views

This section was not generated.

6.6 Mask visualisation

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

This section was not generated.

7.2 Volume estimate versus contour level

This section was not generated.

7.3 Rotationally averaged power spectrum

This section was not generated. The rotationally averaged power spectrum had issues being displayed.

8 Fourier-Shell correlation (i)

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

9 Map-model fit

This section was not generated.