wwPDB EM Validation Summary Report (i)

Mar 6, 2025 – 03:14 pm GMT

PDB ID	:	7ABZ
EMDB ID	:	EMD-11710
Title	:	Structure of pre-accomodated trans-translation complex on E. coli stalled ribosome.
Authors	:	Guyomar, C.; D'Urso, G.; Chat, S.; Giudice, E.; Gillet, R.
Deposited on	:	2020-09-09
Resolution	:	3.21 Å(reported)
Based on initial model	:	4YBB

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:

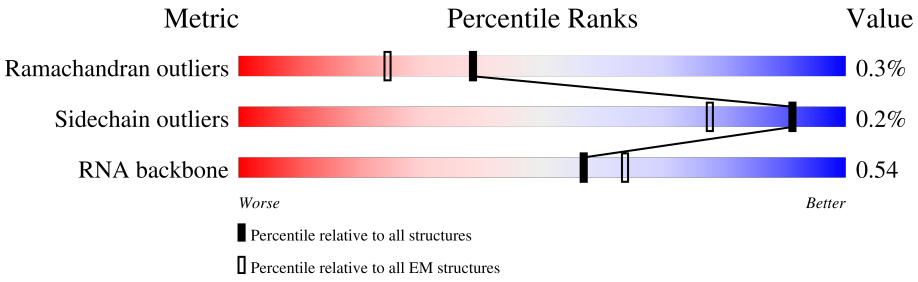
EMDB validation analysis	:	FAILED
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.41

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 3.21 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)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	1	2904	80% 20%
2	2	1540	77% 23% .
3	3	118	81% 19%
4	4	363	49% 50% .
5	5	146	99% .
6	6	394	93% . 6%
7	7	76	71% 22% 7%
8	8	15	33% 60% 7%
9	A	80	100%

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Mol	Chain	Length	Quality of chain
10	B	271	100%
11	C	209	100%
12	D	201	100%
13	E	177	96%
14	F	176	98%
15	G	149	97%
16	H	130	100%
17	I	142	46% 54%
18	J	142	99%
19	K	122	99%
20	L	144	100%
21	M	136	98%
22	N	120	100%
23	O	116	100%
24	P	114	100%
25	Q	117	100%
26	R	103	100%
27	S	110	99%
28	T	93	100%
29	U	102	96%
30	V	94	100%
31	X	77	99%
32	Y	62	100%
33	Z	58	100%
34	b	56	95% 5%

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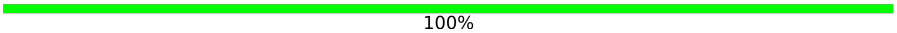
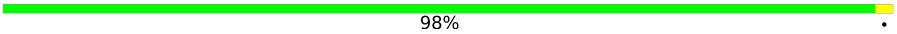
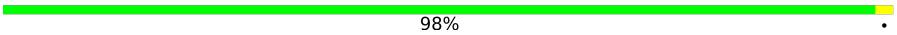
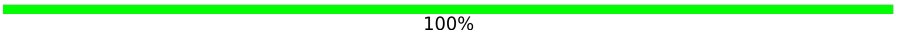
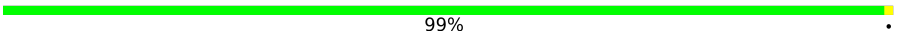
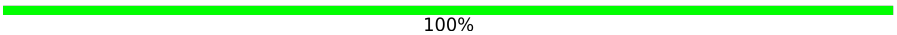
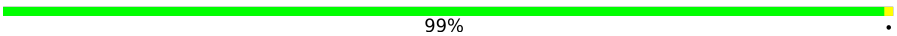
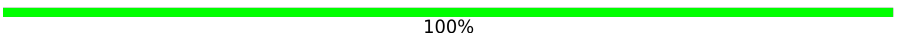
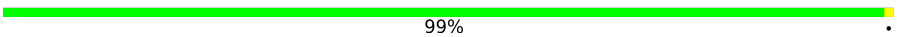
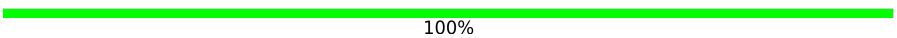
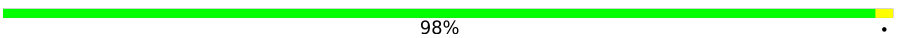
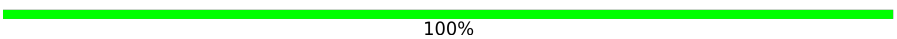
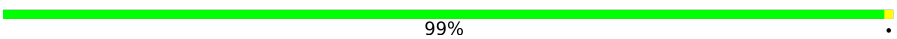
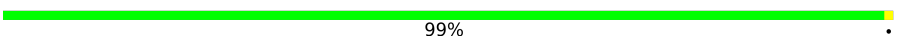
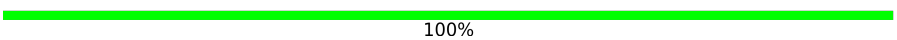
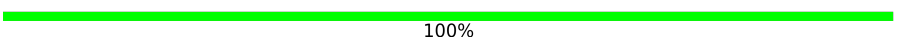
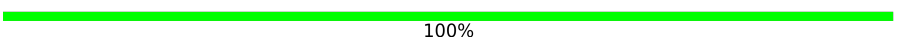
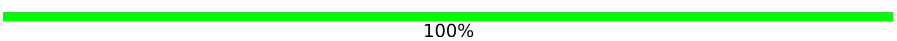
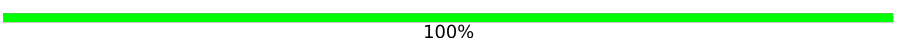
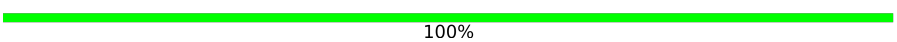
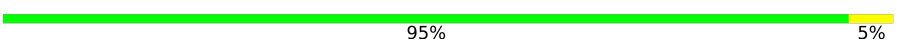
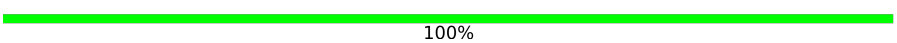
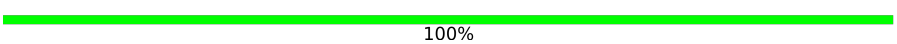
Mol	Chain	Length	Quality of chain
35	c	50	
36	d	46	
37	e	64	
38	f	38	
39	g	224	
40	h	206	
41	i	205	
42	j	167	
43	k	100	
44	l	151	
45	m	129	
46	n	127	
47	o	98	
48	p	117	
49	q	123	
50	r	114	
51	s	100	
52	t	88	
53	u	82	
54	v	80	
55	w	55	
56	x	79	
57	y	85	
58	z	56	

2 Entry composition (i)

There are 62 unique types of molecules in this entry. The entry contains 157227 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 RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	1	2904	62355	27825	11472	20154	2904	0	0

- Molecule 2 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	2	1540	33048	14747	6054	10707	1540	0	0

- Molecule 3 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	3	118	2529	1126	464	821	118	0	0

- Molecule 4 is a RNA chain called transfer-messenger RNA (tmRNA).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	4	363	7760	3466	1410	2521	363	0	0

- Molecule 5 is a protein called SsrA-binding protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	5	146	1181	747	219	211	4	0	0

- Molecule 6 is a protein called Elongation factor Tu 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	6	371	2871	1818	492	548	13	0	0

- Molecule 7 is a RNA chain called tRNA-Phe.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	7	76	Total	C	N	O	P	S	0	0
			1635	735	291	532	75	2		

- Molecule 8 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	8	15	Total	C	N	O	P	0	0
			327	145	60	107	15		

- Molecule 9 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	A	80	Total	C	N	O	S	0	0
			601	370	121	109	1		

- Molecule 10 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	B	271	Total	C	N	O	S	0	0
			2082	1288	423	364	7		

- Molecule 11 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	C	209	Total	C	N	O	S	0	0
			1565	979	288	294	4		

- Molecule 12 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	D	201	Total	C	N	O	S	0	0
			1552	974	283	290	5		

- Molecule 13 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	E	177	Total	C	N	O	S	0	0
			1410	899	249	256	6		

- Molecule 14 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	F	176	Total	C	N	O	S	0	0
			1322	832	243	245	2		

- Molecule 15 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	G	149	Total	C	N	O	S	0	0
			1111	699	197	214	1		

- Molecule 16 is a protein called 50S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	H	130	Total	C	N	O	S	0	0
			980	620	174	182	4		

- Molecule 17 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	I	66	Total	C	N	O	S	0	0
			470	289	87	91	3		

- Molecule 18 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	J	142	Total	C	N	O	S	0	0
			1129	714	212	199	4		

- Molecule 19 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	K	122	Total	C	N	O	S	0	0
			938	587	180	165	6		

- Molecule 20 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	L	144	Total	C	N	O	S	0	0
			1053	654	207	190	2		

- Molecule 21 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	M	136	Total	C	N	O	S	0	0
			1075	686	205	178	6		

- Molecule 22 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	N	120	Total	C	N	O	S	0	0
			960	593	196	166	5		

- Molecule 23 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	O	116	Total	C	N	O	0	0
			892	552	178	162		

- Molecule 24 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	P	114	Total	C	N	O	S	0	0
			917	574	179	163	1		

- Molecule 25 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms				AltConf	Trace
25	Q	117	Total	C	N	O	0	0
			947	604	192	151		

- Molecule 26 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	R	103	Total	C	N	O	S	0	0
			816	516	153	145	2		

- Molecule 27 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	S	110	Total	C	N	O	S	0	0
			857	532	166	156	3		

- Molecule 28 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	T	93	Total	C	N	O	S	0	0
			739	466	139	132	2		

- Molecule 29 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
29	U	102	Total	C	N	O	0	0
			780	492	146	142		

- Molecule 30 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	V	94	Total	C	N	O	S	0	0
			753	479	137	134	3		

- Molecule 31 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	X	77	Total	C	N	O	S	0	0
			625	388	129	106	2		

- Molecule 32 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	Y	62	Total	C	N	O	S	0	0
			501	308	98	94	1		

- Molecule 33 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	Z	58	Total	C	N	O	S	0	0
			449	281	87	79	2		

- Molecule 34 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	b	56	Total	C	N	O	S	0	0
			444	269	94	80	1		

- Molecule 35 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
35	c	50	Total	C	N	O	0	0
			409	263	75	71		

- Molecule 36 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	d	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 37 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	e	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 38 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	f	38	Total	C	N	O	S	0	0
			302	185	65	48	4		

- Molecule 39 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	g	224	Total	C	N	O	S	0	0
			1753	1109	315	321	8		

- Molecule 40 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	h	206	Total	C	N	O	S	0	0
			1625	1028	305	289	3		

- Molecule 41 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	i	205	Total	C	N	O	S	0	0
			1643	1026	315	298	4		

- Molecule 42 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	j	152	Total	C	N	O	S	0	0
			1118	695	214	203	6		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
j	161	LYS	VAL	conflict	UNP P0A7W1

- Molecule 43 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	k	100	Total	C	N	O	S	0	0
			817	515	148	148	6		

- Molecule 44 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	l	151	Total	C	N	O	S	0	0
			1182	735	227	216	4		

- Molecule 45 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	m	129	Total	C	N	O	S	0	0
			979	616	173	184	6		

- Molecule 46 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	n	127	Total	C	N	O	S	0	0
			1022	634	206	179	3		

- Molecule 47 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	o	98	Total	C	N	O	S	0	0
			787	493	150	143	1		

- Molecule 48 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	p	117	Total 876	C 540	N 174	O 159	S 3	0	0

- Molecule 49 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	q	123	Total 956	C 591	N 196	O 164	S 5	0	0

- Molecule 50 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	r	114	Total 883	C 546	N 178	O 156	S 3	0	0

- Molecule 51 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	s	100	Total 805	C 499	N 164	O 139	S 3	0	0

- Molecule 52 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	t	88	Total 714	C 439	N 144	O 130	S 1	0	0

- Molecule 53 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	u	82	Total 649	C 406	N 128	O 114	S 1	0	0

- Molecule 54 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	v	80	Total 649	C 411	N 121	O 114	S 3	0	0

- Molecule 55 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms				AltConf	Trace
55	w	55	Total 456	C 288	N 86	O 82	0	0

- Molecule 56 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	x	79	Total 638	C 408	N 120	O 108	S 2	0	0

- Molecule 57 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	y	85	Total 665	C 411	N 137	O 114	S 3	0	0

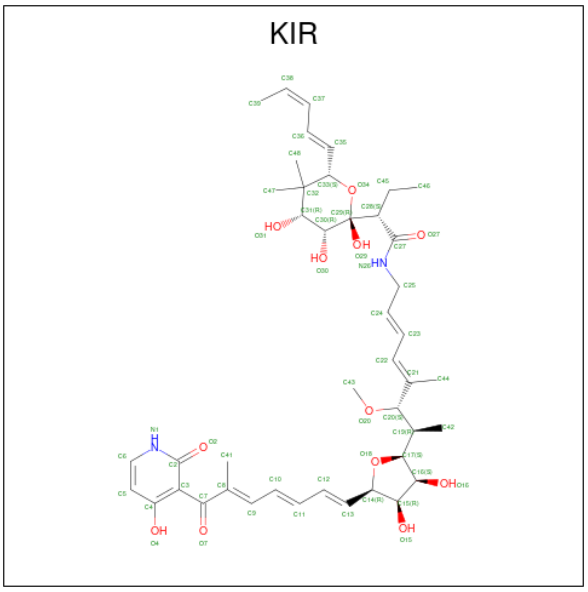
- Molecule 58 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	z	56	Total 466	C 290	N 96	O 79	S 1	0	0

- Molecule 59 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

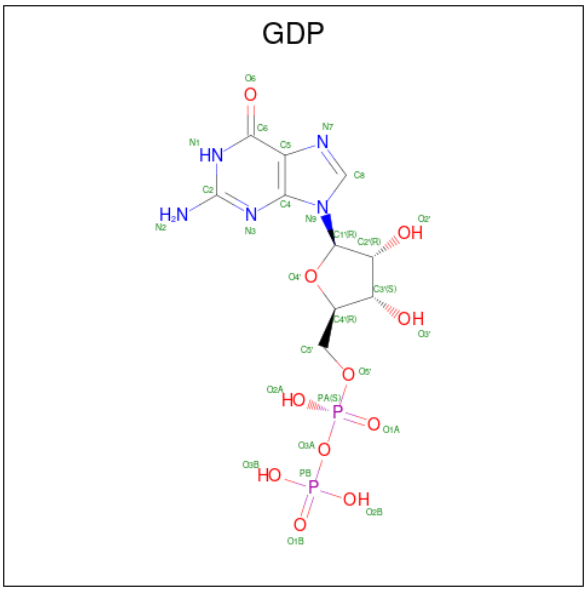
Mol	Chain	Residues	Atoms		AltConf
59	1	168	Total 168	Mg 168	0
59	2	18	Total 18	Mg 18	0
59	3	3	Total 3	Mg 3	0
59	B	1	Total 1	Mg 1	0
59	C	1	Total 1	Mg 1	0
59	O	1	Total 1	Mg 1	0

- Molecule 60 is KIRROMYCIN (three-letter code: KIR) (formula: $C_{43}H_{60}N_2O_{12}$).



Mol	Chain	Residues	Atoms				AltConf
60	6	1	Total	C	N	O	0
			57	43	2	12	

- Molecule 61 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: $C_{10}H_{15}N_5O_{11}P_2$).



Mol	Chain	Residues	Atoms					AltConf
61	6	1	Total	C	N	O	P	0
			28	10	5	11	2	

- Molecule 62 is ZINC ION (three-letter code: ZN) (formula: Zn).

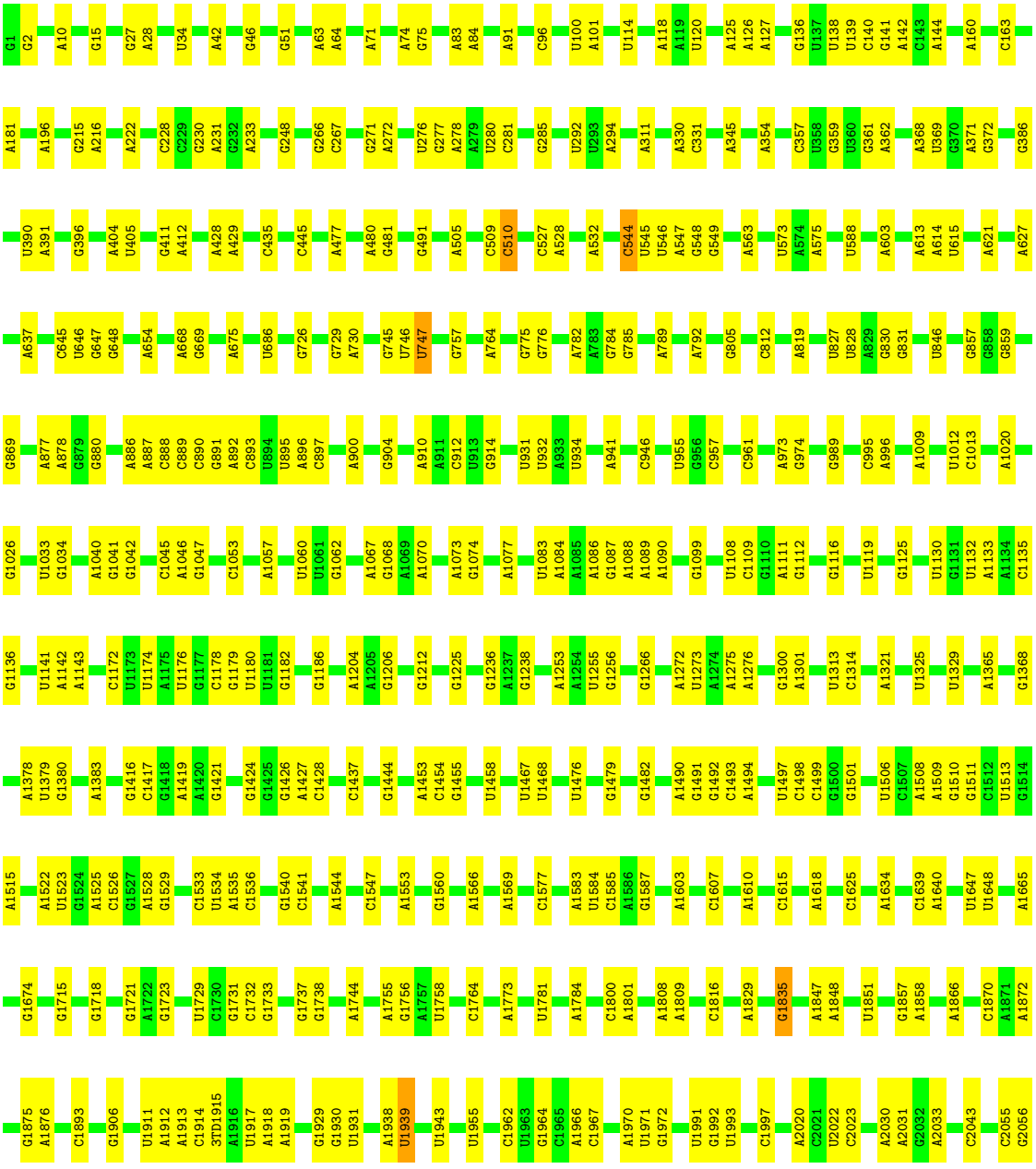
Mol	Chain	Residues	Atoms		AltConf
62	f	1	Total	Zn	0
			1	1	

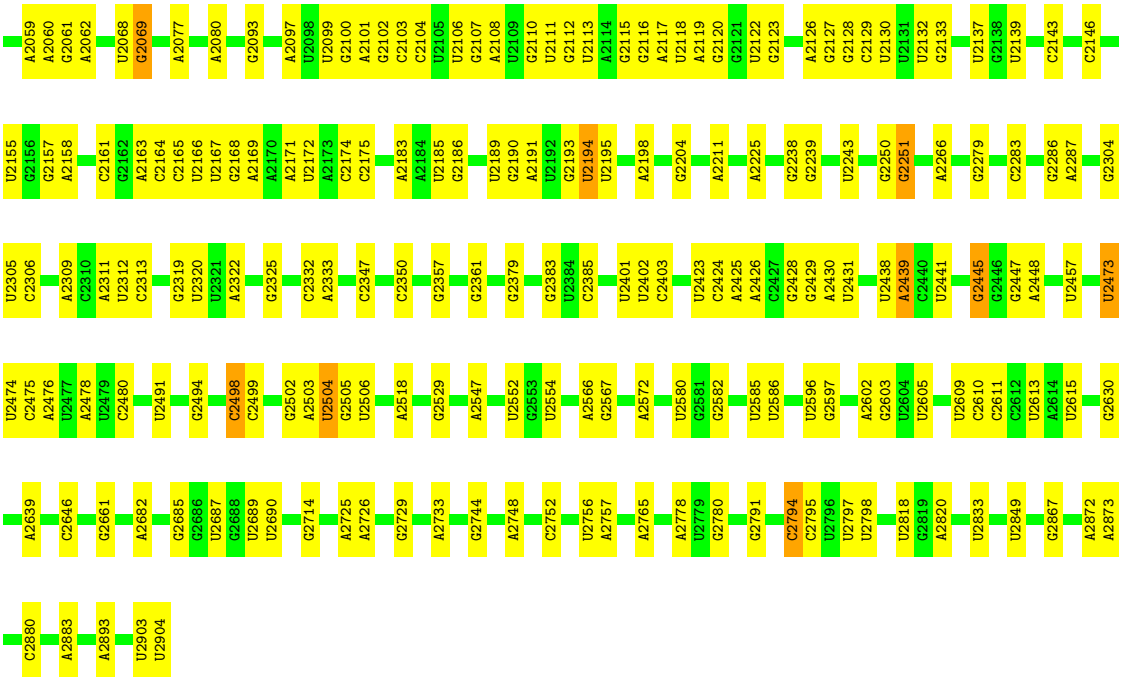
3 Residue-property plots (i)

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: 23S ribosomal RNA

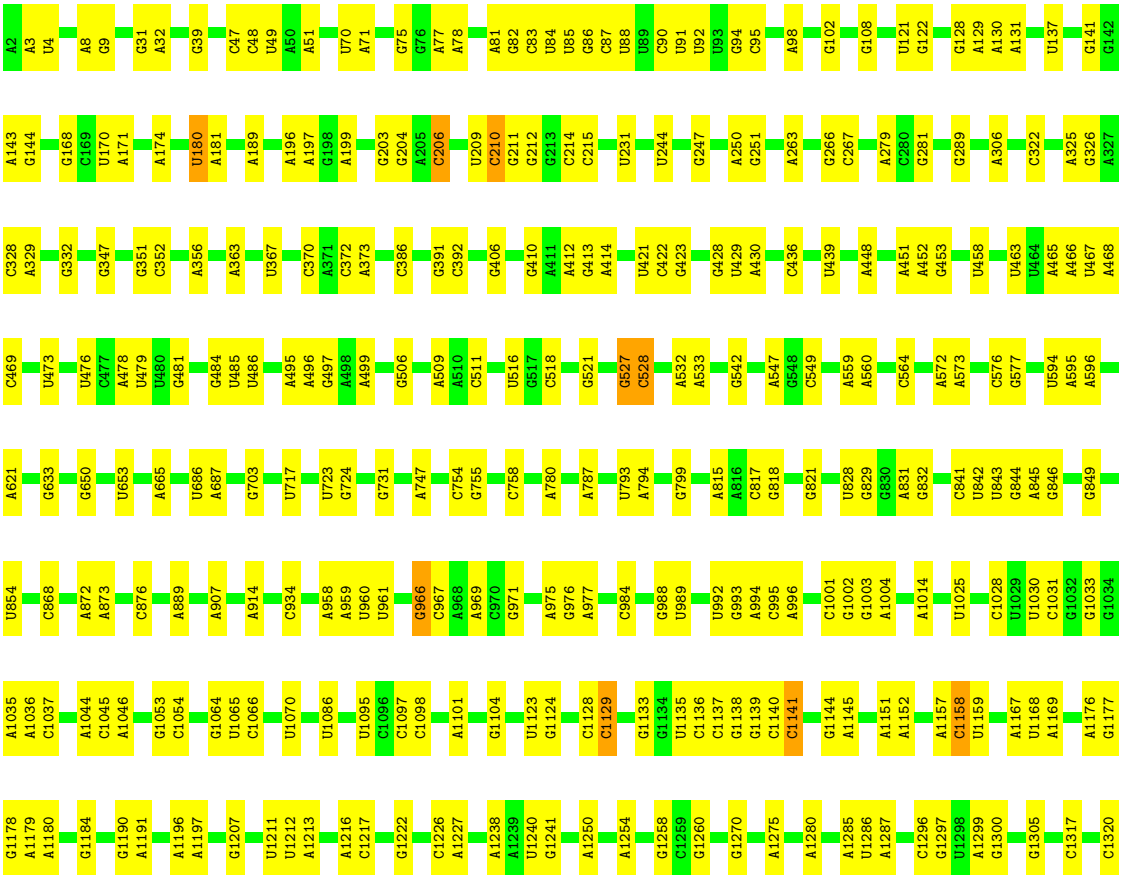
Chain 1:





• Molecule 2: 16S ribosomal RNA

Chain 2:

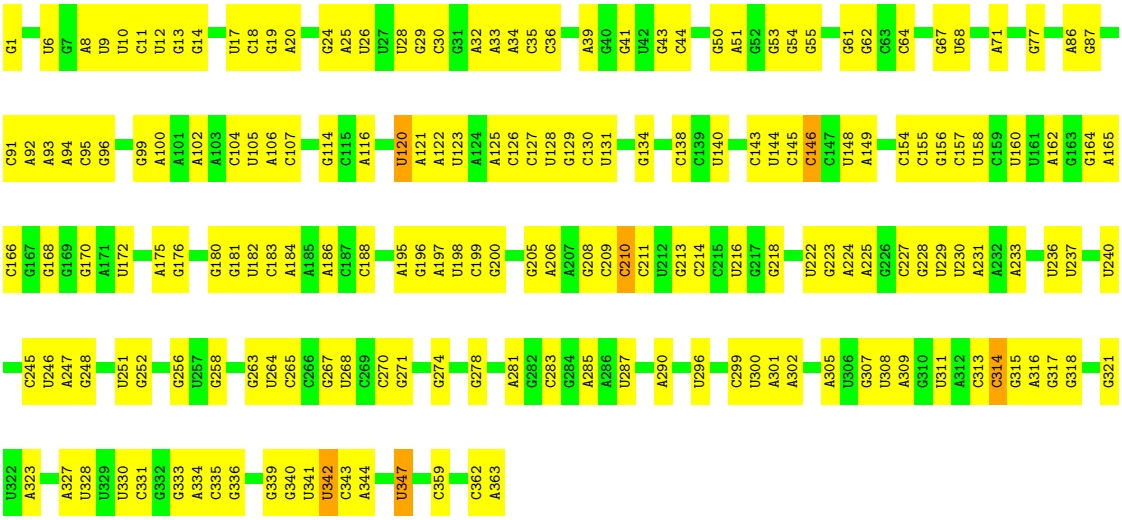


• Molecule 3: 5S ribosomal RNA

Chain 3:

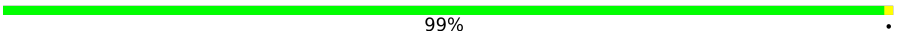
• Molecule 4: transfer-messenger RNA (tmRNA)

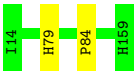
Chain 4:



• Molecule 5: SsrA-binding protein

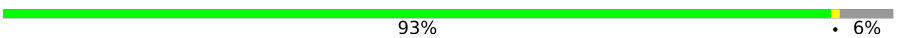
Chain 5:

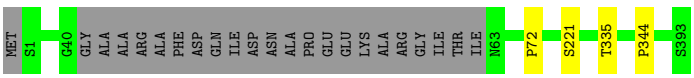




• Molecule 6: Elongation factor Tu 2

Chain 6:



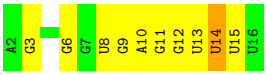


• Molecule 7: tRNA-Phe

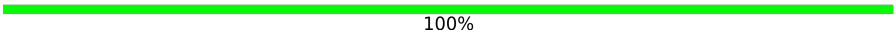
Chain 7:

• Molecule 8: mRNA

Chain 8: 



• Molecule 9: 50S ribosomal protein L27

Chain A: 

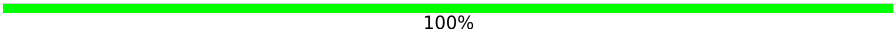
There are no outlier residues recorded for this chain.

• Molecule 10: 50S ribosomal protein L2

Chain B: 

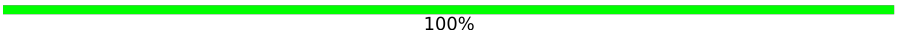
There are no outlier residues recorded for this chain.

• Molecule 11: 50S ribosomal protein L3

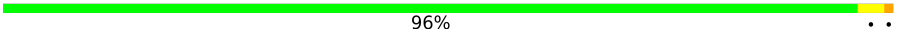
Chain C: 

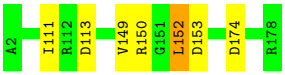
There are no outlier residues recorded for this chain.

• Molecule 12: 50S ribosomal protein L4

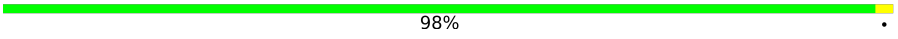
Chain D: 

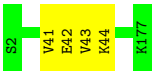
• Molecule 13: 50S ribosomal protein L5

Chain E: 



• Molecule 14: 50S ribosomal protein L6

Chain F: 



• Molecule 15: 50S ribosomal protein L9

Chain G: 97%

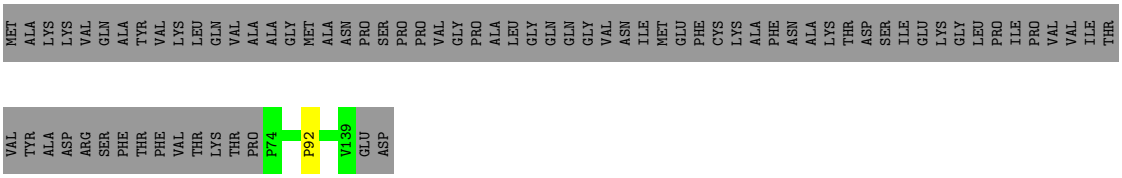
• Molecule 16: 50S ribosomal protein L10

Chain H: 100%

There are no outlier residues recorded for this chain.

• Molecule 17: 50S ribosomal protein L11

Chain I: 46% 54%



• Molecule 18: 50S ribosomal protein L13

Chain J: 99%

• Molecule 19: 50S ribosomal protein L14

Chain K: 99%

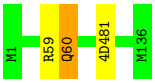
• Molecule 20: 50S ribosomal protein L15

Chain L: 100%

There are no outlier residues recorded for this chain.

• Molecule 21: 50S ribosomal protein L16

Chain M: 98%



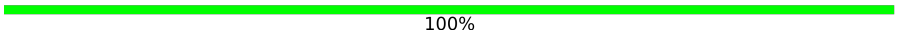
• Molecule 22: 50S ribosomal protein L17

Chain N: 100%

There are no outlier residues recorded for this chain.

• Molecule 23: 50S ribosomal protein L18

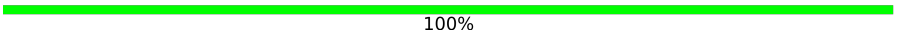
Chain O:



There are no outlier residues recorded for this chain.

• Molecule 24: 50S ribosomal protein L19

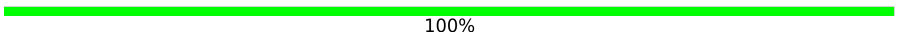
Chain P:



There are no outlier residues recorded for this chain.

• Molecule 25: 50S ribosomal protein L20

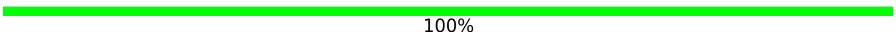
Chain Q:



There are no outlier residues recorded for this chain.

• Molecule 26: 50S ribosomal protein L21

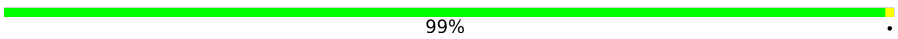
Chain R:



There are no outlier residues recorded for this chain.

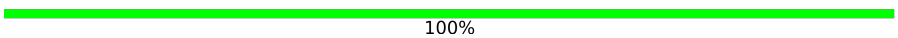
• Molecule 27: 50S ribosomal protein L22

Chain S:



• Molecule 28: 50S ribosomal protein L23

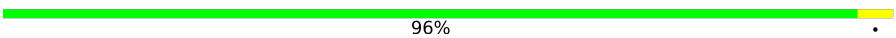
Chain T:

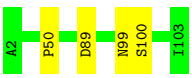


There are no outlier residues recorded for this chain.

• Molecule 29: 50S ribosomal protein L24

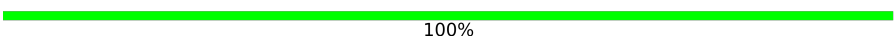
Chain U:





• Molecule 30: 50S ribosomal protein L25

Chain V:



There are no outlier residues recorded for this chain.

• Molecule 31: 50S ribosomal protein L28

Chain X: 99%

• Molecule 32: 50S ribosomal protein L29

Chain Y: 100%

There are no outlier residues recorded for this chain.

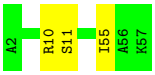
• Molecule 33: 50S ribosomal protein L30

Chain Z: 100%

There are no outlier residues recorded for this chain.

• Molecule 34: 50S ribosomal protein L32

Chain b: 95% 5%



• Molecule 35: 50S ribosomal protein L33

Chain c: 100%

There are no outlier residues recorded for this chain.

• Molecule 36: 50S ribosomal protein L34

Chain d: 98%

• Molecule 37: 50S ribosomal protein L35

Chain e: 98%

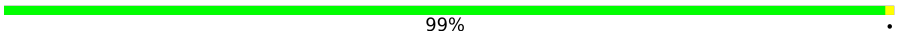
• Molecule 38: 50S ribosomal protein L36

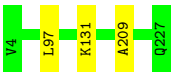
Chain f: 100%

There are no outlier residues recorded for this chain.

• Molecule 39: 30S ribosomal protein S2

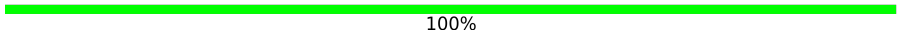
Chain g:





• Molecule 40: 30S ribosomal protein S3

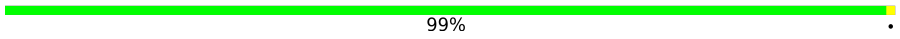
Chain h:



There are no outlier residues recorded for this chain.

• Molecule 41: 30S ribosomal protein S4

Chain i:

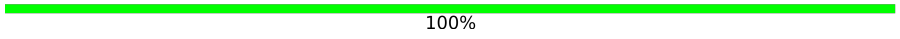


• Molecule 42: 30S ribosomal protein S5

Chain j:

• Molecule 43: 30S ribosomal protein S6

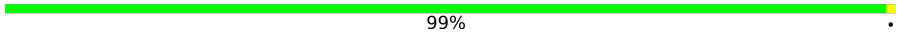
Chain k:



There are no outlier residues recorded for this chain.

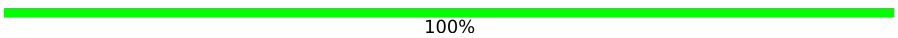
• Molecule 44: 30S ribosomal protein S7

Chain l:



• Molecule 45: 30S ribosomal protein S8

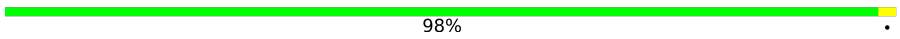
Chain m:

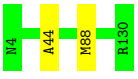


There are no outlier residues recorded for this chain.

• Molecule 46: 30S ribosomal protein S9

Chain n:





• Molecule 47: 30S ribosomal protein S10

Chain o: 100%

There are no outlier residues recorded for this chain.

• Molecule 48: 30S ribosomal protein S11

Chain p: 99%

• Molecule 49: 30S ribosomal protein S12

Chain q: 99%

• Molecule 50: 30S ribosomal protein S13

Chain r: 100%

There are no outlier residues recorded for this chain.

• Molecule 51: 30S ribosomal protein S14

Chain s: 100%

There are no outlier residues recorded for this chain.

• Molecule 52: 30S ribosomal protein S15

Chain t: 100%

There are no outlier residues recorded for this chain.

• Molecule 53: 30S ribosomal protein S16

Chain u: 100%

There are no outlier residues recorded for this chain.

• Molecule 54: 30S ribosomal protein S17

Chain v: 100%

There are no outlier residues recorded for this chain.

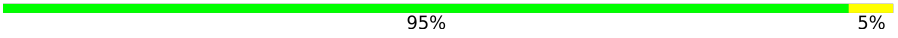
• Molecule 55: 30S ribosomal protein S18

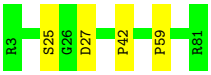
Chain w:

There are no outlier residues recorded for this chain.

• Molecule 56: 30S ribosomal protein S19

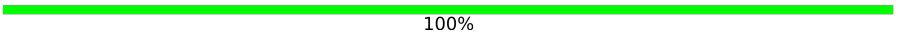
Chain x:





• Molecule 57: 30S ribosomal protein S20

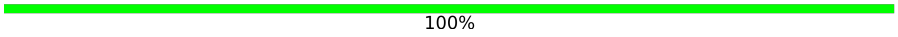
Chain y:



There are no outlier residues recorded for this chain.

• Molecule 58: 30S ribosomal protein S21

Chain z:



There are no outlier residues recorded for this chain.

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	18452	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 ($e^-/Å^2$)	35	Depositor
Minimum defocus (nm)	-1000	Depositor
Maximum defocus (nm)	-3000	Depositor
Magnification	105000	Depositor
Image detector	GATAN K2 BASE (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: OMC, 2MA, OMU, 3TD, 3AU, 4OC, ZN, 6MZ, OMG, 5MC, 0TD, MA6, 1MG, G7M, MG, 4D4, MIA, GDP, PSU, 5MU, 2MG, 4SU, UR3, KIR

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	1	0.18	1/69307 (0.0%)	0.78	42/108118 (0.0%)
2	2	0.19	0/36722	0.78	20/57280 (0.0%)
3	3	0.15	0/2828	0.74	0/4410
4	4	0.22	1/8616 (0.0%)	0.81	19/13430 (0.1%)
5	5	0.33	1/1203 (0.1%)	0.61	1/1616 (0.1%)
6	6	0.34	2/2924 (0.1%)	0.59	2/3955 (0.1%)
7	7	1.10	14/1624 (0.9%)	1.01	11/2527 (0.4%)
8	8	0.25	0/366	0.95	1/570 (0.2%)
9	A	0.24	0/608	0.42	0/804
10	B	0.23	0/2121	0.46	0/2852
11	C	0.24	0/1586	0.45	0/2134
12	D	0.23	0/1571	0.44	1/2113 (0.0%)
13	E	0.30	0/1434	0.60	1/1926 (0.1%)
14	F	0.26	0/1342	0.59	1/1816 (0.1%)
15	G	0.42	2/1122 (0.2%)	0.61	1/1515 (0.1%)
16	H	0.25	0/993	0.51	0/1340
17	I	0.25	0/471	0.53	0/627
18	J	0.46	1/1152 (0.1%)	0.52	2/1551 (0.1%)
19	K	0.27	0/947	0.56	1/1268 (0.1%)
20	L	0.24	0/1062	0.49	0/1413
21	M	0.24	0/1081	0.51	2/1443 (0.1%)
22	N	0.23	0/973	0.41	0/1301
23	O	0.23	0/902	0.40	0/1209
24	P	0.24	0/929	0.51	0/1242
25	Q	0.24	0/960	0.41	0/1278
26	R	0.27	0/829	0.50	0/1107
27	S	0.24	0/864	0.49	1/1156 (0.1%)
28	T	0.22	0/745	0.42	0/994
29	U	0.48	1/788 (0.1%)	0.65	3/1051 (0.3%)
30	V	0.23	0/766	0.41	0/1025
31	X	0.26	0/635	0.52	1/848 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
32	Y	0.22	0/502	0.36	0/667
33	Z	0.22	0/453	0.47	0/605
34	b	0.58	2/450 (0.4%)	0.69	0/599
35	c	0.23	0/416	0.47	0/554
36	d	0.23	0/380	0.41	0/498
37	e	0.32	0/513	0.60	1/676 (0.1%)
38	f	0.22	0/303	0.41	0/397
39	g	0.26	0/1784	0.58	3/2403 (0.1%)
40	h	0.23	0/1652	0.45	0/2225
41	i	0.27	0/1665	0.62	3/2227 (0.1%)
42	j	0.29	0/1131	0.60	1/1520 (0.1%)
43	k	0.23	0/835	0.49	0/1128
44	l	0.25	0/1196	0.53	0/1602
45	m	0.23	0/989	0.44	0/1326
46	n	0.25	0/1034	0.64	2/1375 (0.1%)
47	o	0.25	0/797	0.53	0/1077
48	p	0.24	0/892	0.50	1/1205 (0.1%)
49	q	0.23	0/959	0.49	0/1286
50	r	0.24	0/892	0.54	0/1193
51	s	0.22	0/817	0.38	0/1088
52	t	0.22	0/722	0.44	0/964
53	u	0.23	0/659	0.44	0/884
54	v	0.24	0/658	0.57	0/881
55	w	0.22	0/463	0.38	0/621
56	x	0.71	2/653 (0.3%)	0.74	2/877 (0.2%)
57	y	0.23	0/671	0.40	0/888
58	z	0.23	0/473	0.36	0/627
All	All	0.24	27/169430 (0.0%)	0.72	123/253312 (0.0%)

The worst 5 of 27 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	7	20	U	C5-C6	17.59	1.50	1.34
7	7	16	U	C5-C6	17.51	1.50	1.34
7	7	20	U	C2-N3	15.76	1.48	1.37
7	7	16	U	C2-N3	15.68	1.48	1.37
56	x	59	PRO	N-CD	14.86	1.68	1.47

The worst 5 of 123 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	1	2195	U	O5'-P-OP2	-29.62	75.16	110.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	1	2195	U	OP1-P-OP2	-27.22	78.78	119.60
1	1	2195	U	O5'-P-OP1	17.37	131.55	110.70
1	1	2194	U	OP2-P-O3'	13.99	135.97	105.20
1	1	2194	U	OP1-P-O3'	-13.66	75.15	105.20

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

5.3 Torsion angles

5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	
5	5	144/146 (99%)	127 (88%)	17 (12%)	0	100	100
6	6	367/394 (93%)	343 (94%)	24 (6%)	0	100	100
9	A	78/80 (98%)	74 (95%)	4 (5%)	0	100	100
10	B	269/271 (99%)	257 (96%)	12 (4%)	0	100	100
11	C	207/209 (99%)	200 (97%)	7 (3%)	0	100	100
12	D	199/201 (99%)	196 (98%)	3 (2%)	0	100	100
13	E	175/177 (99%)	149 (85%)	23 (13%)	3 (2%)	7	35
14	F	174/176 (99%)	161 (92%)	11 (6%)	2 (1%)	12	43
15	G	147/149 (99%)	133 (90%)	14 (10%)	0	100	100
16	H	128/130 (98%)	105 (82%)	23 (18%)	0	100	100
17	I	64/142 (45%)	55 (86%)	8 (12%)	1 (2%)	8	36
18	J	140/142 (99%)	134 (96%)	6 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
19	K	120/122 (98%)	116 (97%)	4 (3%)	0	100	100
20	L	142/144 (99%)	131 (92%)	11 (8%)	0	100	100
21	M	133/136 (98%)	127 (96%)	5 (4%)	1 (1%)	16	50
22	N	118/120 (98%)	111 (94%)	7 (6%)	0	100	100
23	O	114/116 (98%)	113 (99%)	1 (1%)	0	100	100
24	P	112/114 (98%)	110 (98%)	2 (2%)	0	100	100
25	Q	115/117 (98%)	114 (99%)	1 (1%)	0	100	100
26	R	101/103 (98%)	97 (96%)	4 (4%)	0	100	100
27	S	108/110 (98%)	103 (95%)	5 (5%)	0	100	100
28	T	91/93 (98%)	86 (94%)	5 (6%)	0	100	100
29	U	100/102 (98%)	88 (88%)	10 (10%)	2 (2%)	6	31
30	V	92/94 (98%)	90 (98%)	2 (2%)	0	100	100
31	X	75/77 (97%)	75 (100%)	0	0	100	100
32	Y	60/62 (97%)	55 (92%)	5 (8%)	0	100	100
33	Z	56/58 (97%)	55 (98%)	1 (2%)	0	100	100
34	b	54/56 (96%)	47 (87%)	5 (9%)	2 (4%)	2	18
35	c	48/50 (96%)	47 (98%)	1 (2%)	0	100	100
36	d	44/46 (96%)	42 (96%)	1 (2%)	1 (2%)	5	28
37	e	62/64 (97%)	60 (97%)	2 (3%)	0	100	100
38	f	36/38 (95%)	35 (97%)	1 (3%)	0	100	100
39	g	222/224 (99%)	201 (90%)	20 (9%)	1 (0%)	25	59
40	h	204/206 (99%)	194 (95%)	10 (5%)	0	100	100
41	i	203/205 (99%)	185 (91%)	17 (8%)	1 (0%)	25	59
42	j	150/167 (90%)	129 (86%)	20 (13%)	1 (1%)	19	53
43	k	98/100 (98%)	89 (91%)	9 (9%)	0	100	100
44	l	149/151 (99%)	143 (96%)	5 (3%)	1 (1%)	19	53
45	m	127/129 (98%)	124 (98%)	3 (2%)	0	100	100
46	n	125/127 (98%)	114 (91%)	11 (9%)	0	100	100
47	o	96/98 (98%)	87 (91%)	9 (9%)	0	100	100
48	p	115/117 (98%)	98 (85%)	17 (15%)	0	100	100
49	q	120/123 (98%)	114 (95%)	6 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
50	r	112/114 (98%)	100 (89%)	12 (11%)	0	100	100
51	s	98/100 (98%)	93 (95%)	5 (5%)	0	100	100
52	t	86/88 (98%)	83 (96%)	3 (4%)	0	100	100
53	u	80/82 (98%)	69 (86%)	11 (14%)	0	100	100
54	v	78/80 (98%)	75 (96%)	3 (4%)	0	100	100
55	w	53/55 (96%)	50 (94%)	3 (6%)	0	100	100
56	x	77/79 (98%)	68 (88%)	9 (12%)	0	100	100
57	y	83/85 (98%)	81 (98%)	2 (2%)	0	100	100
58	z	54/56 (96%)	54 (100%)	0	0	100	100
All	All	6203/6425 (96%)	5787 (93%)	400 (6%)	16 (0%)	38	68

5 of 16 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
14	F	42	GLU
42	j	103	THR
21	M	60	GLN
29	U	99	ASN
34	b	11	SER

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	
5	5	122/122 (100%)	122 (100%)	0	100	100
6	6	310/327 (95%)	310 (100%)	0	100	100
9	A	59/59 (100%)	59 (100%)	0	100	100
10	B	216/216 (100%)	216 (100%)	0	100	100
11	C	164/164 (100%)	164 (100%)	0	100	100
12	D	165/165 (100%)	165 (100%)	0	100	100
13	E	148/148 (100%)	144 (97%)	4 (3%)	40	67

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
14	F	137/137 (100%)	136 (99%)	1 (1%)	81 90
15	G	114/114 (100%)	113 (99%)	1 (1%)	75 87
16	H	99/99 (100%)	99 (100%)	0	100 100
17	I	48/110 (44%)	48 (100%)	0	100 100
18	J	116/116 (100%)	116 (100%)	0	100 100
19	K	103/103 (100%)	103 (100%)	0	100 100
20	L	103/103 (100%)	103 (100%)	0	100 100
21	M	108/108 (100%)	108 (100%)	0	100 100
22	N	100/100 (100%)	100 (100%)	0	100 100
23	O	86/86 (100%)	86 (100%)	0	100 100
24	P	99/99 (100%)	99 (100%)	0	100 100
25	Q	89/89 (100%)	89 (100%)	0	100 100
26	R	84/84 (100%)	84 (100%)	0	100 100
27	S	93/93 (100%)	93 (100%)	0	100 100
28	T	80/80 (100%)	80 (100%)	0	100 100
29	U	83/83 (100%)	83 (100%)	0	100 100
30	V	78/78 (100%)	78 (100%)	0	100 100
31	X	67/67 (100%)	67 (100%)	0	100 100
32	Y	54/54 (100%)	54 (100%)	0	100 100
33	Z	48/48 (100%)	48 (100%)	0	100 100
34	b	47/47 (100%)	47 (100%)	0	100 100
35	c	45/45 (100%)	45 (100%)	0	100 100
36	d	38/38 (100%)	38 (100%)	0	100 100
37	e	51/51 (100%)	51 (100%)	0	100 100
38	f	34/34 (100%)	34 (100%)	0	100 100
39	g	186/186 (100%)	186 (100%)	0	100 100
40	h	170/170 (100%)	170 (100%)	0	100 100
41	i	172/172 (100%)	172 (100%)	0	100 100
42	j	114/126 (90%)	113 (99%)	1 (1%)	75 87
43	k	87/87 (100%)	87 (100%)	0	100 100
44	l	124/124 (100%)	124 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
45	m	104/104 (100%)	104 (100%)	0	100 100
46	n	105/105 (100%)	105 (100%)	0	100 100
47	o	86/86 (100%)	86 (100%)	0	100 100
48	p	90/90 (100%)	90 (100%)	0	100 100
49	q	102/102 (100%)	102 (100%)	0	100 100
50	r	92/92 (100%)	92 (100%)	0	100 100
51	s	83/83 (100%)	83 (100%)	0	100 100
52	t	76/76 (100%)	76 (100%)	0	100 100
53	u	65/65 (100%)	65 (100%)	0	100 100
54	v	74/74 (100%)	74 (100%)	0	100 100
55	w	48/48 (100%)	48 (100%)	0	100 100
56	x	70/70 (100%)	68 (97%)	2 (3%)	37 65
57	y	65/65 (100%)	65 (100%)	0	100 100
58	z	48/48 (100%)	48 (100%)	0	100 100
All	All	5149/5240 (98%)	5140 (100%)	9 (0%)	91 96

5 of 9 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
56	x	25	SER
56	x	27	ASP
13	E	153	ASP
14	F	41	VAL
15	G	130	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 23 such sidechains are listed below:

Mol	Chain	Res	Type
43	k	3	HIS
47	o	58	ASN
45	m	18	GLN
48	p	101	ASN
24	P	56	HIS

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	2899/2904 (99%)	559 (19%)	24 (0%)
2	2	1536/1540 (99%)	335 (21%)	14 (0%)
3	3	117/118 (99%)	22 (18%)	3 (2%)
4	4	362/363 (99%)	175 (48%)	10 (2%)
7	7	73/76 (96%)	13 (17%)	3 (4%)
8	8	14/15 (93%)	10 (71%)	1 (7%)
All	All	5001/5016 (99%)	1114 (22%)	55 (1%)

5 of 1114 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	2	G
1	1	10	A
1	1	15	G
1	1	27	G
1	1	28	A

5 of 55 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	2	391	G
2	2	1346	A
8	8	14	U
4	4	334	A
2	2	429	U

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

46 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	$\#\|Z\| > 2$
1	6MZ	1	1618	1	18,25,26	2.00	3 (16%)	16,36,39	2.08	4 (25%)
4	5MU	4	341	4	19,22,23	5.27	5 (26%)	28,32,35	3.52	9 (32%)
7	MIA	7	37	7	24,31,32	2.49	3 (12%)	26,44,47	3.52	8 (30%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
1	5MU	1	747	1	19,22,23	5.26	5 (26%)	28,32,35	3.60	9 (32%)
1	5MU	1	1939	1	19,22,23	5.27	5 (26%)	28,32,35	3.60	9 (32%)
1	5MC	1	1962	1	18,22,23	3.74	7 (38%)	26,32,35	1.04	2 (7%)
2	2MG	2	966	2	18,26,27	2.73	6 (33%)	16,38,41	1.47	3 (18%)
2	4OC	2	1402	2	20,23,24	3.21	8 (40%)	26,32,35	0.88	1 (3%)
2	2MG	2	1516	2	18,26,27	2.72	6 (33%)	16,38,41	1.42	4 (25%)
1	PSU	1	955	1	18,21,22	1.10	1 (5%)	22,30,33	1.74	4 (18%)
7	3AU	7	47	7	24,28,29	2.40	8 (33%)	33,40,43	1.23	2 (6%)
2	MA6	2	1519	2	18,26,27	1.46	3 (16%)	19,38,41	4.25	3 (15%)
1	PSU	1	1917	1	18,21,22	1.14	2 (11%)	22,30,33	1.84	5 (22%)
7	PSU	7	39	7	18,21,22	1.10	1 (5%)	22,30,33	1.73	4 (18%)
2	PSU	2	516	2	18,21,22	1.08	1 (5%)	22,30,33	1.75	4 (18%)
2	MA6	2	1518	2	18,26,27	1.45	3 (16%)	19,38,41	4.25	3 (15%)
1	OMC	1	2498	59,1	19,22,23	3.40	8 (42%)	26,31,34	0.75	0
1	G7M	1	2069	1	20,26,27	2.47	7 (35%)	17,39,42	1.14	1 (5%)
1	3TD	1	1915	1	18,22,23	4.22	6 (33%)	22,32,35	1.65	3 (13%)
1	2MA	1	2503	59,1	19,25,26	3.46	5 (26%)	21,37,40	3.58	4 (19%)
2	G7M	2	527	2	20,26,27	2.49	7 (35%)	17,39,42	1.14	1 (5%)
2	5MC	2	967	2	18,22,23	3.75	7 (38%)	26,32,35	0.98	1 (3%)
7	5MU	7	54	7	19,22,23	5.19	5 (26%)	28,32,35	3.51	9 (32%)
7	PSU	7	32	7	18,21,22	1.10	1 (5%)	22,30,33	1.69	5 (22%)
1	OMG	1	2251	7,1	18,26,27	2.90	7 (38%)	19,38,41	1.50	4 (21%)
21	4D4	M	81	21	9,11,12	2.03	2 (22%)	8,13,15	1.86	3 (37%)
1	PSU	1	2605	1	18,21,22	1.11	1 (5%)	22,30,33	1.75	4 (18%)
49	0TD	q	89	49	7,9,10	1.47	0	6,11,13	2.02	2 (33%)
2	2MG	2	1207	2	18,26,27	2.74	6 (33%)	16,38,41	1.43	3 (18%)
1	1MG	1	745	1	18,26,27	2.59	5 (27%)	19,39,42	1.42	3 (15%)
1	6MZ	1	2030	1	18,25,26	1.99	3 (16%)	16,36,39	2.18	4 (25%)
1	2MG	1	1835	1	18,26,27	2.73	6 (33%)	16,38,41	1.47	3 (18%)
1	2MG	1	2445	1	18,26,27	2.68	6 (33%)	16,38,41	1.41	3 (18%)
7	PSU	7	55	7	18,21,22	1.10	1 (5%)	22,30,33	1.74	4 (18%)
7	4SU	7	8	7	18,21,22	3.83	7 (38%)	26,30,33	2.23	4 (15%)
1	PSU	1	2457	1	18,21,22	1.04	1 (5%)	22,30,33	1.73	4 (18%)
2	5MC	2	1407	2	18,22,23	3.76	7 (38%)	26,32,35	0.99	2 (7%)
1	PSU	1	2580	1	18,21,22	1.05	1 (5%)	22,30,33	1.86	5 (22%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	PSU	4	342	4	18,21,22	1.12	1 (5%)	22,30,33	1.76	4 (18%)
7	G7M	7	46	7	20,26,27	4.49	9 (45%)	17,39,42	1.04	1 (5%)
1	PSU	1	2504	1	18,21,22	1.09	1 (5%)	22,30,33	1.76	4 (18%)
1	OMU	1	2552	1	19,22,23	2.99	8 (42%)	26,31,34	1.70	5 (19%)
1	PSU	1	1911	1	18,21,22	1.08	1 (5%)	22,30,33	1.76	4 (18%)
4	PSU	4	347	4	18,21,22	1.10	1 (5%)	22,30,33	1.82	5 (22%)
1	PSU	1	746	59,1	18,21,22	1.07	1 (5%)	22,30,33	1.71	5 (22%)
2	UR3	2	1498	2	19,22,23	3.01	8 (42%)	26,32,35	1.29	2 (7%)

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
1	6MZ	1	1618	1	-	2/5/27/28	0/3/3/3
4	5MU	4	341	4	-	2/7/25/26	0/2/2/2
7	MIA	7	37	7	-	2/11/33/34	0/3/3/3
1	5MU	1	747	1	-	1/7/25/26	0/2/2/2
1	5MU	1	1939	1	-	0/7/25/26	0/2/2/2
1	5MC	1	1962	1	-	0/7/25/26	0/2/2/2
2	2MG	2	966	2	-	2/5/27/28	0/3/3/3
2	4OC	2	1402	2	-	0/9/29/30	0/2/2/2
2	2MG	2	1516	2	-	0/5/27/28	0/3/3/3
1	PSU	1	955	1	-	0/7/25/26	0/2/2/2
7	3AU	7	47	7	-	1/16/34/35	0/2/2/2
2	MA6	2	1519	2	-	2/7/29/30	0/3/3/3
1	PSU	1	1917	1	-	0/7/25/26	0/2/2/2
7	PSU	7	39	7	-	0/7/25/26	0/2/2/2
2	PSU	2	516	2	-	0/7/25/26	0/2/2/2
2	MA6	2	1518	2	-	2/7/29/30	0/3/3/3
1	OMC	1	2498	59,1	-	2/9/27/28	0/2/2/2
1	G7M	1	2069	1	-	1/3/25/26	0/3/3/3
1	3TD	1	1915	1	-	4/7/25/26	0/2/2/2
1	2MA	1	2503	59,1	-	3/3/25/26	0/3/3/3
2	G7M	2	527	2	-	2/3/25/26	0/3/3/3
2	5MC	2	967	2	-	0/7/25/26	0/2/2/2
7	5MU	7	54	7	-	0/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	PSU	7	32	7	-	0/7/25/26	0/2/2/2
1	OMG	1	2251	7,1	-	3/5/27/28	0/3/3/3
21	4D4	M	81	21	-	4/11/12/14	-
1	PSU	1	2605	1	-	0/7/25/26	0/2/2/2
49	0TD	q	89	49	-	5/7/12/14	-
2	2MG	2	1207	2	-	0/5/27/28	0/3/3/3
1	1MG	1	745	1	-	0/3/25/26	0/3/3/3
1	6MZ	1	2030	1	-	4/5/27/28	0/3/3/3
1	2MG	1	1835	1	-	0/5/27/28	0/3/3/3
1	2MG	1	2445	1	-	3/5/27/28	0/3/3/3
7	PSU	7	55	7	-	0/7/25/26	0/2/2/2
7	4SU	7	8	7	-	1/7/25/26	0/2/2/2
1	PSU	1	2457	1	-	0/7/25/26	0/2/2/2
2	5MC	2	1407	2	-	0/7/25/26	0/2/2/2
1	PSU	1	2580	1	-	0/7/25/26	0/2/2/2
4	PSU	4	342	4	-	2/7/25/26	0/2/2/2
7	G7M	7	46	7	-	2/3/25/26	0/3/3/3
1	PSU	1	2504	1	-	2/7/25/26	0/2/2/2
1	OMU	1	2552	1	-	0/9/27/28	0/2/2/2
1	PSU	1	1911	1	-	0/7/25/26	0/2/2/2
4	PSU	4	347	4	-	0/7/25/26	0/2/2/2
1	PSU	1	746	59,1	-	2/7/25/26	0/2/2/2
2	UR3	2	1498	2	-	2/7/25/26	0/2/2/2

The worst 5 of 196 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	4	341	5MU	C6-N1	12.75	1.59	1.38
1	1	1939	5MU	C6-N1	12.71	1.59	1.38
1	1	747	5MU	C6-N1	12.70	1.59	1.38
7	7	54	5MU	C6-N1	12.64	1.59	1.38
1	1	1915	3TD	C6-C5	12.36	1.49	1.35

The worst 5 of 176 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	2	1519	MA6	N1-C6-N6	-15.63	100.61	117.06
2	2	1518	MA6	N1-C6-N6	-15.48	100.76	117.06
1	1	2503	2MA	C1'-N9-C4	14.56	152.22	126.64
1	1	747	5MU	C5-C4-N3	11.99	125.55	115.31

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	1	1939	5MU	C5-C4-N3	11.99	125.55	115.31

There are no chirality outliers.

5 of 56 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
21	M	81	4D4	C-CA-CB-OB
21	M	81	4D4	C-CA-CB-CG
21	M	81	4D4	N-CA-CB-OB
21	M	81	4D4	N-CA-CB-CG
49	q	89	0TD	CG-CB-SB-CSB

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 195 ligands modelled in this entry, 193 are monoatomic - leaving 2 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	$\#\|Z\| > 2$
61	GDP	6	402	-	24,30,30	0.95	1 (4%)	30,47,47	1.29	4 (13%)
60	KIR	6	401	-	56,59,59	1.08	4 (7%)	62,84,84	1.09	4 (6%)

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
61	GDP	6	402	-	-	1/12/32/32	0/3/3/3
60	KIR	6	401	-	-	22/54/98/98	0/3/3/3

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
60	6	401	KIR	C37-C36	-4.13	1.32	1.44
60	6	401	KIR	C23-C22	-3.55	1.32	1.43
60	6	401	KIR	C2-N1	3.39	1.38	1.33
61	6	402	GDP	C6-N1	-2.43	1.34	1.37
60	6	401	KIR	C8-C7	-2.26	1.42	1.48

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
60	6	401	KIR	C11-C10-C9	3.73	131.10	123.47
61	6	402	GDP	PA-O3A-PB	-3.49	120.84	132.83
60	6	401	KIR	C20-C21-C22	3.44	122.41	119.13
61	6	402	GDP	C3'-C2'-C1'	3.11	105.66	100.98
60	6	401	KIR	C6-N1-C2	2.96	123.52	116.43

There are no chirality outliers.

5 of 23 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
60	6	401	KIR	C17-C19-C20-O20
60	6	401	KIR	C20-C21-C22-C23
60	6	401	KIR	C44-C21-C22-C23
60	6	401	KIR	C22-C23-C24-C25
60	6	401	KIR	C9-C10-C11-C12

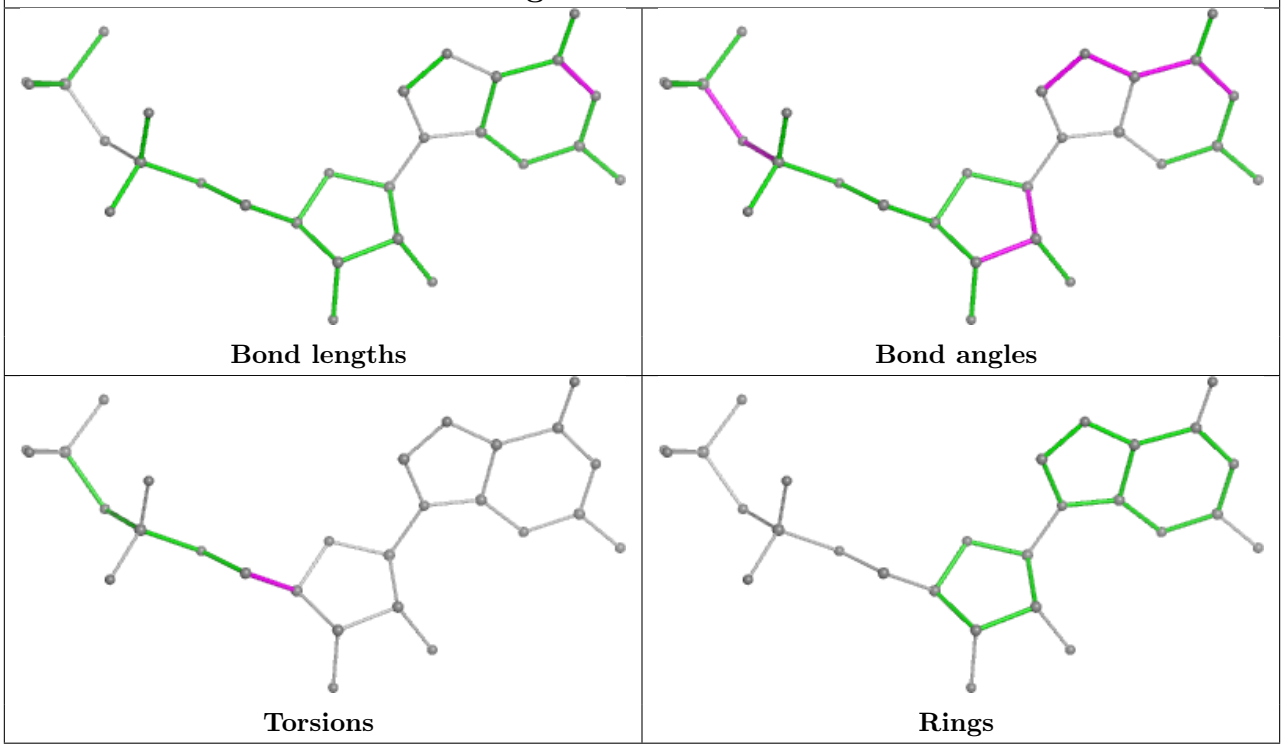
There are no ring outliers.

No monomer is involved in short contacts.

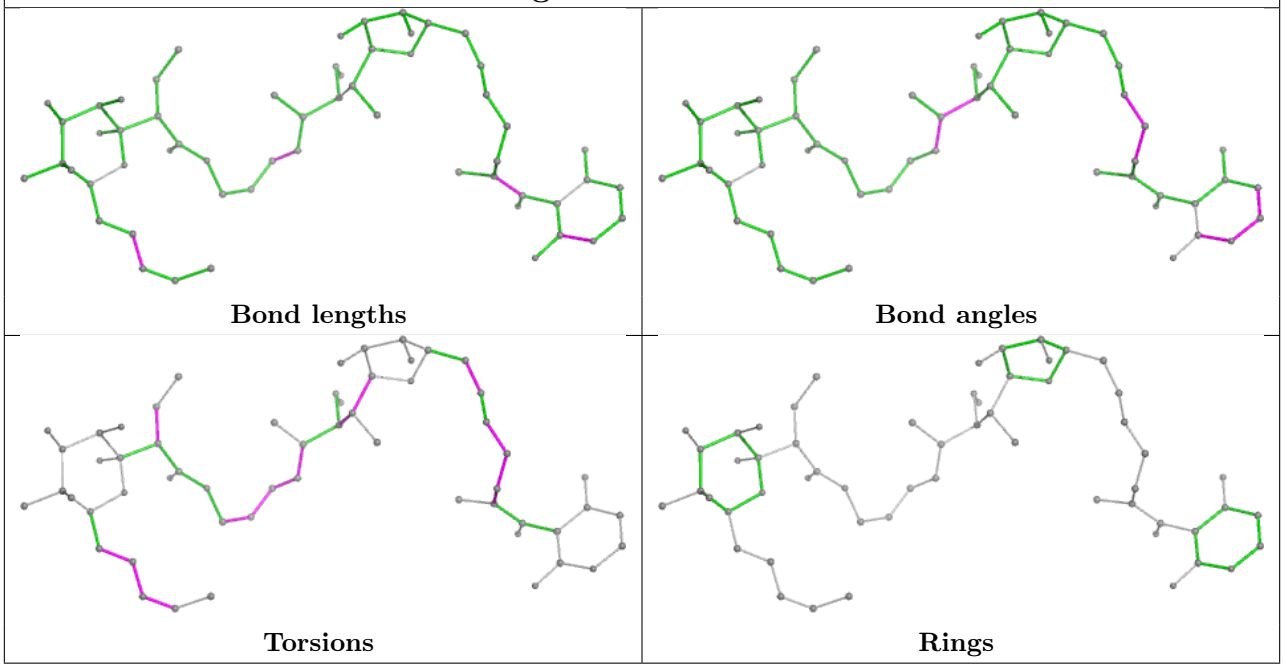
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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 GDP 6 402



Ligand KIR 6 401



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.