

# wwPDB X-ray Structure Validation Summary Report (i)

#### Jan 2, 2024 – 12:03 pm GMT

PDB ID	:	4V8Q
Title	:	Complex of SmpB, a tmRNA fragment and EF-Tu-GDP-Kirromycin with the
		70S ribosome
Authors	:	Neubauer, C.; Gillet, R.; Kelley, A.C.; Ramakrishnan, V.
Deposited on	:	2011-12-10
Resolution	:	3.10  Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org A user guide is available at https://www.wwpdb.org/validation/2017/XrayValidationReportHelp with specific help available everywhere you see the (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 (1)) were used in the production of this report:

MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7(2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

# 1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:  $X\text{-}RAY \, DIFFRACTION$ 

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	$egin{array}{c} { m Whole \ archive} \ (\#{ m Entries}) \end{array}$	${f Similar resolution} \ (\# { m Entries}, { m resolution range}({ m \AA}))$				
R <sub>free</sub>	130704	1094 (3.10-3.10)				
Clashscore	141614	1184 (3.10-3.10)				
Ramachandran outliers	138981	1141 (3.10-3.10)				
Sidechain outliers	138945	1141 (3.10-3.10)				
RSRZ outliers	127900	1067 (3.10-3.10)				
RNA backbone	3102	1116 (3.40-2.80)				

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

Mol	Chain	Length		Quality of chain	
1	A0	85	27%	61%	8% ••
2	A1	98	2% 	45%	12% • •
3	A2	72	3% 18%	64%	17% •
4	A3	60	2% 	55%	7% •



		Length	Chain	Mol		
	270/	1.40/	8%	71	Δ.4	ц
	37%	14% •	13% 32% 10%	11	A4	
%•	13% 89	38%	38%	60	A5	6
7%	11%	33%	11% 6% 43%	54	A6	7
6%	39%	39	2%	49	A7	8
• •	22%	51%	23%	65	A8	9
	22%	54%	24%	37	A9	10
, •	14%	51%	<mark>6%</mark> 33%	2915	AA	11
••	20%	48%	27%	122	AB	12
10	149	62%	23%	229	AC	13
<u> </u>	147	0270	.% •			10
<b>b</b> •	13%	51%	34%	276	AD	14
•	19%	50%	29%	206	AE	15
Ď •	15%	53%	31%	210	AF	16
••	20%	63%	9% 16%	182	AG	17
11%	15% •	42%	31%	180	AH	18
þ	17%	83%		130	AJ	19
	26%	74%	20/	140	AK	20
	19%	56%	22%	140	AN	21
% •	9	48%	41%	122	AO	22
% •	26% 89	45% 2	18%	150	AP	23
% •	119	55%	32%	141	AQ	24
••	14%	59%	24%	118	AR	25
12%	17% · 3	44%	24%	112	AS	26
5%	26% ·	47%	18%	146	AT	27
••	10%	44%	42%	118	AU	28
•	14%	55%	27%	101	AV	29
	26% 89 110 14% 17% • 5 26% • 10% 14% nued on next p	45% 2 55% 59% 44% 47% 44% 55% Continu	18% % 32% 24% 4% 24% 5% 18% 2% 42% 3% 27%	150         141         118         112         146         118         101	AP AQ AR AS AT AU AV	23 24 25 26 27 28 29

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Quality of chain Chain Length Mol 2% AW 30 11334% 51% 13% . 31 AX 96 41% 49% 7% • 12% 32AY 11012% 42% 33% 5% 8% 4% AZ33 20647% 17% 23% 11% • 15% B2• 3414422% 56% 19% 3% 35BA 152226% • • 58% 13% 4% BΒ 36 25652% 22% 18% 8% • BC3723934% 46% 5% 13% 6% BD 38 209 23% 56% 18% . .% 39BE16233% 52% 6% • 7% 2% 40 BF 101 38% 49% 13% • 8% 8% •• BG 41 15642% 48% 42BH138••• 45% 53% 6% BI ••• 4312822% 61% 16% 16% ΒJ 1054419% 56% 18% • 6% 5% 45BK12932% 53% 8% 8% 3% BL13546 38% 40% 11% 7% . 6% 47BM126••• 20% 59% 17% 3% 48BN 61 5%• 25% 49% 20% 7% •• BO 4989 44% 47% .% 50BP 88 5% 28% 56% 11% BQ 1055142% 49% 5% 5% % BR5288 24% 48% 8% 20% 11% BS93 5314% 51% 19% 15% 4% BT5410658% 7% 25% 11%Continued on next page...



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Continued	from	previous	page

Mol	Chain	Length		Quality of chain	
55	BU	27	52%	26%	11% • 7%
56	BV	77	.% • 38%	48%	13% •
56	BW	77	27%	87% 58%	10% •
57	BX	19	5% 16% 5%	74%	
58	BY	90	7% 32%	23% 7%	31%
59	BZ	405	2% 	50%	10% • 7%



# 2 Entry composition (i)

There are 63 unique types of molecules in this entry. The entry contains 154205 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

• Molecule 1 is a protein called 50S RIBOSOMAL PROTEIN L27.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
1	A0	84	Total 662	C 410	N 140	0 111	S 1	0	0	0

• Molecule 2 is a protein called 50S RIBOSOMAL PROTEIN L28.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
2	A1	94	Total 732	C 460	N 146	0 125	S 1	0	0	1

• Molecule 3 is a protein called 50S RIBOSOMAL PROTEIN L29.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
3	A2	71	Total 598	C 370	N 121	0 106	S 1	0	0	0

• Molecule 4 is a protein called 50S RIBOSOMAL PROTEIN L30.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	A3	60	Total 468	C 298	N 91	0 78	S 1	0	0	1

• Molecule 5 is a protein called 50S RIBOSOMAL PROTEIN L31.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	A4	45	Total 341	C 218	N 58	O 61	${S \atop 4}$	0	0	1

• Molecule 6 is a protein called 50S RIBOSOMAL PROTEIN L32.

Mol	Chain	Residues		Ato	$\mathbf{ms}$			ZeroOcc	AltConf	Trace
6	A5	59	Total 459	C 288	N 90	O 76	${ m S}{ m 5}$	0	0	0



• Molecule 7 is a protein called 50S RIBOSOMAL PROTEIN L33.

Mol	Chain	Residues		Ato	oms			ZeroOcc	AltConf	Trace
7	A6	50	Total 433	C 270	N 88	0 71	${S \over 4}$	0	0	0

• Molecule 8 is a protein called 50S RIBOSOMAL PROTEIN L34.

Mol	Chain	Residues		Ate	oms			ZeroOcc	AltConf	Trace
8	A7	49	Total 419	C 257	N 105	O 55	${ m S} { m 2}$	0	0	1

• Molecule 9 is a protein called 50S RIBOSOMAL PROTEIN L35.

Mol	Chain	Residues		Ate	oms			ZeroOcc	AltConf	Trace
9	A8	64	Total 508	C 326	N 102	0 78	${S \over 2}$	0	0	1

• Molecule 10 is a protein called 50S RIBOSOMAL PROTEIN L36.

Mol	Chain	Residues		Ato	$\mathbf{ms}$			ZeroOcc	AltConf	Trace
10	A9	37	Total 307	C 188	N 68	0 47	$\frac{S}{4}$	0	0	0

• Molecule 11 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues			Atoms			ZeroOcc	AltConf	Trace
11	AA	2901	Total 62479	C 27808	N 11685	O 20086	Р 2900	0	0	0

• Molecule 12 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues		A	toms			ZeroOcc	AltConf	Trace
12	AB	119	Total 2551	C 1136	N 471	O 826	Р 118	0	0	0

• Molecule 13 is a protein called 50S RIBOSOMAL PROTEIN L1.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
12		228	Total	С	Ν	0	$\mathbf{S}$	0	0	0
10	AU	220	1742	1101	318	319	4	0	0	0

There are 3 discrepancies between the modelled and reference sequences:



Chain	Residue	Modelled	Actual	Comment	Reference
AC	19	ILE	VAL	conflict	UNP Q5SLP7
AC	27	HIS	ARG	conflict	UNP Q5SLP7
AC	127	MET	LEU	conflict	UNP Q5SLP7

• Molecule 14 is a protein called 50S RIBOSOMAL PROTEIN L2.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
14	AD	275	Total 2145	C 1353	N 428	O 361	${ m S} { m 3}$	0	0	0

• Molecule 15 is a protein called 50S RIBOSOMAL PROTEIN L3.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
15	AE	205	Total 1564	C 988	N 300	O 270	S 6	0	0	1

• Molecule 16 is a protein called 50S RIBOSOMAL PROTEIN L4.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
16	AF	208	Total 1624	C 1035	N 304	0 282	${ m S} { m 3}$	0	0	1

• Molecule 17 is a protein called 50S RIBOSOMAL PROTEIN L5.

Mol	Chain	Residues		At	$\mathbf{oms}$			ZeroOcc	AltConf	Trace
17	AG	181	Total 1474	C 942	N 268	O 260	$\frac{S}{4}$	0	0	0

• Molecule 18 is a protein called 50S RIBOSOMAL PROTEIN L6.

Mol	Chain	Residues		At	oms		ZeroOcc	AltConf	Trace	
18	AH	160	Total 1223	С 773	N 229	O 220	${ m S}$ 1	0	0	1

• Molecule 19 is a protein called 50S RIBOSOMAL PROTEIN L10.

Mol	Chain	Residues		Ato	$\mathbf{ms}$		ZeroOcc	AltConf	Trace
19	AJ	130	Total 654	C 393	N 130	O 131	0	0	0

• Molecule 20 is a protein called 50S RIBOSOMAL PROTEIN L11.



Mol	Chain	Residues		Ato	$\mathbf{ms}$		ZeroOcc	AltConf	Trace
20	AK	140	Total 701	C 420	N 140	0 141	0	0	0

• Molecule 21 is a protein called 50S RIBOSOMAL PROTEIN L13.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
21	AN	139	Total 1105	C 712	N 207	O 182	$\frac{S}{4}$	0	0	1

• Molecule 22 is a protein called 50S RIBOSOMAL PROTEIN L14.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
22	AO	122	Total 933	$\begin{array}{c} \mathrm{C} \\ 588 \end{array}$	N 171	O 170	${S \atop 4}$	0	0	0

• Molecule 23 is a protein called 50S RIBOSOMAL PROTEIN L15.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
23	AP	146	Total 1114	C 692	N 227	0 193	${S \over 2}$	0	0	0

• Molecule 24 is a protein called 50S RIBOSOMAL PROTEIN L16.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
24	AQ	141	Total 1122	C 715	N 212	0 188	${f S}{7}$	0	0	0

• Molecule 25 is a protein called 50S RIBOSOMAL PROTEIN L17.

Mol	Chain	Residues		Ato	$\mathbf{ms}$		ZeroOcc	AltConf	Trace
25	AR	117	Total 960	C 599	N 202	O 159	0	0	0

• Molecule 26 is a protein called 50S RIBOSOMAL PROTEIN L18.

Mol	Chain	Residues		Ato	ms		ZeroOcc	AltConf	Trace
26	AS	99	Total 771	C 486	N 155	O 130	0	0	1

• Molecule 27 is a protein called 50S RIBOSOMAL PROTEIN L19.



Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
27	AT	138	Total 1142	C 710	N 235	O 196	S 1	0	0	1

• Molecule 28 is a protein called 50S RIBOSOMAL PROTEIN L20.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
28	AU	117	Total 958	C 604	N 202	0 151	S 1	0	0	0

• Molecule 29 is a protein called 50S RIBOSOMAL PROTEIN L21.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
29	AV	101	Total 779	C 501	N 142	0 135	S 1	0	0	0

• Molecule 30 is a protein called 50S RIBOSOMAL PROTEIN L22.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
30	AW	113	Total 896	C 563	N 176	0 155	${ m S} { m 2}$	0	0	0

• Molecule 31 is a protein called 50S RIBOSOMAL PROTEIN L23.

Mol	Chain	Residues		Ato	ms		ZeroOcc	AltConf	Trace
31	AX	93	Total 726	С 471	N 132	O 123	0	0	1

• Molecule 32 is a protein called 50S RIBOSOMAL PROTEIN L24.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
32	AY	101	Total 776	C 500	N 149	0 123	${f S}$ $4$	0	0	1

• Molecule 33 is a protein called 50S RIBOSOMAL PROTEIN L25.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
33	AZ	184	Total 1460	C 932	N 261	O 265	$\begin{array}{c} \mathrm{S} \\ \mathrm{2} \end{array}$	0	0	1

• Molecule 34 is a protein called SMALL PROTEIN B SMPB.



Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
34	B2	144	Total 1184	С 754	N 219	O 210	S 1	0	0	0

• Molecule 35 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues		1	Atoms			ZeroOcc	AltConf	Trace
35	BA	1504	Total 32330	C 14391	N 5994	O 10442	Р 1503	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
BA	1489	А	G	conflict	GB NC_006461
BA	1490	А	С	conflict	GB NC_006461

• Molecule 36 is a protein called 30S RIBOSOMAL PROTEIN S2.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
36	BB	235	Total 1901	C 1213	N 342	0 341	${f S}{5}$	0	0	1

• Molecule 37 is a protein called 30S RIBOSOMAL PROTEIN S3.

Mol	Chain	Residues		Ate	oms			ZeroOcc	AltConf	Trace
37	BC	207	Total 1613	C 1016	N 315	0 281	S 1	0	0	1

• Molecule 38 is a protein called 30S RIBOSOMAL PROTEIN S4.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
38	BD	208	Total 1703	C 1066	N 339	0 291	${ m S} 7$	0	0	0

• Molecule 39 is a protein called 30S RIBOSOMAL PROTEIN S5.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
39	BE	151	Total 1147	С 724	N 218	O 201	$\frac{S}{4}$	0	0	1

• Molecule 40 is a protein called 30S RIBOSOMAL PROTEIN S6.



Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
40	BF	101	Total 843	C 531	N 155	O 154	${ m S} { m 3}$	0	0	0

• Molecule 41 is a protein called 30S RIBOSOMAL PROTEIN S7.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
41	BG	155	Total 1257	C 781	N 252	0 218	S 6	0	0	0

• Molecule 42 is a protein called 30S RIBOSOMAL PROTEIN S8.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
42	BH	138	Total 1116	$\begin{array}{c} \mathrm{C} \\ 705 \end{array}$	N 215	O 193	${ m S} { m 3}$	0	0	0

• Molecule 43 is a protein called 30S RIBOSOMAL PROTEIN S9.

Mol	Chain	Residues		Ato	ms		ZeroOcc	AltConf	Trace
43	BI	127	Total 1011	C 639	N 198	О 174	0	0	0

• Molecule 44 is a protein called 30S RIBOSOMAL PROTEIN S10.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
44	BJ	99	Total 795	C 499	N 157	0 138	S 1	0	0	1

• Molecule 45 is a protein called 30S RIBOSOMAL PROTEIN S11.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
45	BK	119	Total 885	C 549	N 168	0 165	${ m S} { m 3}$	0	0	0

• Molecule 46 is a protein called 30S RIBOSOMAL PROTEIN S12.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
46	BL	125	Total 971	C 611	N 196	0 163	S 1	0	0	1

There are 4 discrepancies between the modelled and reference sequences:



Chain	Residue	Modelled	Actual	Comment	Reference
BL	1	MET	-	expression tag	UNP Q5SHN3
BL	2	VAL	-	expression tag	UNP Q5SHN3
BL	3	ALA	-	expression tag	UNP Q5SHN3
BL	4	LEU	-	expression tag	UNP Q5SHN3

• Molecule 47 is a protein called 30S RIBOSOMAL PROTEIN S13.

Mol	Chain	Residues		At	$\mathbf{oms}$			ZeroOcc	AltConf	Trace
47	BM	125	Total 988	C 611	N 206	O 169	${ m S} { m 2}$	0	0	1

• Molecule 48 is a protein called 30S RIBOSOMAL PROTEIN S14.

Mol	Chain	Residues		Ate	oms			ZeroOcc	AltConf	Trace
48	BN	60	Total 492	C 312	N 104	0 72	$\frac{S}{4}$	0	0	0

• Molecule 49 is a protein called 30S RIBOSOMAL PROTEIN S15.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
49	ВО	88	Total 734	C 459	N 147	O 126	$\begin{array}{c} \mathrm{S} \\ \mathrm{2} \end{array}$	0	0	0

• Molecule 50 is a protein called 30S RIBOSOMAL PROTEIN S16.

Mol	Chain	Residues		At	oms			ZeroOcc	AltConf	Trace
50	BP	84	Total 701	C 443	N 140	0 117	S 1	0	0	1

• Molecule 51 is a protein called 30S RIBOSOMAL PROTEIN S17.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
51	BQ	100	Total 824	$\begin{array}{c} \mathrm{C} \\ 528 \end{array}$	N 152	0 142	${S \over 2}$	0	0	1

• Molecule 52 is a protein called 30S RIBOSOMAL PROTEIN S18.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
52	BR	70	Total 574	C 367	N 112	O 95	0	0	0

• Molecule 53 is a protein called 30S RIBOSOMAL PROTEIN S19.



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
53	BS	79	Total 630	C 403	N 115	O 110	${ m S} { m 2}$	0	0	1

• Molecule 54 is a protein called 30S RIBOSOMAL PROTEIN S20.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
54	BT	99	Total 763	C 470	N 162	O 129	${ m S} { m 2}$	0	0	0

• Molecule 55 is a protein called 30S RIBOSOMAL PROTEIN THX.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
55	BU	25	Total 209	C 128	N 51	O 30	0	0	1

• Molecule 56 is a RNA chain called E-SITE or P-SITE TRNA FMET.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
56	DV	77	Total	С	Ν	0	Р	0	0	0
- 50	90 BV		1640	732	297	535	76	0		
56	BW	77	Total	С	Ν	Ο	Р	0	0	0
- 50	DW	11	1640	732	297	535	76	0	U	0

• Molecule 57 is a RNA chain called MRNA.

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace		
57	BX	5	Total 104	C 48	N 19	O 33	Р 4	0	0	0

• Molecule 58 is a RNA chain called TMRNA DELA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
58	BY	62	Total 1305	$\begin{array}{c} \mathrm{C} \\ 582 \end{array}$	N 233	0 429	Р 61	0	0	0

• Molecule 59 is a protein called ELONGATION FACTOR TU.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
59	BZ	378	Total 2929	C 1854	N 510	O 553	S 12	0	0	1

There are 9 discrepancies between the modelled and reference sequences:



Chain	Residue	Modelled	Actual	Comment	Reference
BZ	181	GLU	GLN	conflict	UNP Q5SHN6
BZ	184	LYS	ARG	conflict	UNP Q5SHN6
BZ	189	LYS	ARG	conflict	UNP Q5SHN6
BZ	264	LYS	ARG	conflict	UNP Q5SHN6
BZ	288	LEU	VAL	conflict	UNP Q5SHN6
BZ	322	ILE	VAL	conflict	UNP Q5SHN6
BZ	336	THR	SER	conflict	UNP Q5SHN6
BZ	354	ARG	GLN	conflict	UNP Q5SHN6
BZ	357	GLN	PRO	conflict	UNP Q5SHN6

• Molecule 60 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
60	A9	1	Total Zn 1 1	0	0
60	BD	1	Total Zn 1 1	0	0
60	BN	1	Total Zn 1 1	0	0

• Molecule 61 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
61	AA	1	Total Mg 1 1	0	0
61	BZ	1	Total Mg 1 1	0	0

• Molecule 62 is KIRROMYCIN (three-letter code: KIR) (formula:  $C_{43}H_{60}N_2O_{12}$ ).





Mol	Chain	Residues	I	Aton	ns		ZeroOcc	AltConf
62	BZ	1	Total	С	Ν	0	0	0
02	DL	1	57	43	2	12	0	0

• Molecule 63 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula:  $\rm C_{10}H_{15}N_5O_{11}P_2).$ 



Mol	Chain	Residues		Ate	oms			ZeroOcc	AltConf
63	BZ	1	Total 28	C 10	N 5	0 11	Р 2	0	0



# 3 Residue-property plots (i)

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



• Molecule 1: 50S RIBOSOMAL PROTEIN L27









IJ	5	00	A	A6 G7	A8	09 G 10	G11	U12	G17		C20	A21 C22	G23	G24 1105	0.25 G26	G27	A.28	C31	C32	033 C34	G35	<b>G36</b>	C37 A38	C39		C45	A49	USO	A53	G54	C57	<b>G58</b>	C65	<b>C66</b>	C69	G70	A71	A73	A74 G75		G80 G81	G82
G83	A84	688	<mark>G89</mark>	U90 A92	<b>G</b> 93	C94 C94 A	G95	696 202	C97 698	000 0100	G100	G102 A103	U104	C105	C107	U108	6109 6110	A111	U112	G113	C116	G117	A118 A119	0120	G121	G123	G124	6135 6135	G136	C137 C139	G139A	G140 A121	A142	C142A	G143 C143A	C144	G145 C146	0147 0147	G152	C153	U156	<b>U157</b>
U158	6171	G173	C174	G175 G176	G177	G178	A181	2	C184 1185	G186	G187	6189 6189	A190	A191	U193	G194	A195 A196	A197	C198	A199	C203	A204	G205 U206	A207	C208	C210	A211	G212 A213	G214	G215 A216	G217	A218	A221	A222	<u>A225</u>	G226	A227 A228	A229	0230 C231	G232	A233 C234	U235
C236	C237	0239 U239	G240	A241 G242	U243	A244 G245	C246	G247	G248 C249	G250	A251	G253	G254	A 255	A 250 A 257	G258	G259 C260	G261	A262	C263 C264	020 <del>1</del> A265	G266	C267 C268	U269	A270	A2/1 A271A	C271B	C271C G271D	U271E	C2716	G271H	G2711	U271K	U271L	G271M U271N	C2710	C271P	G271R	G271S C271T	G271U	G271V G271W	G271X
U271Y	11070A	G272B	G272C	G272D	C272H	02721 C9791	G274	G275	A2/6	A278	C279	C280 G281		U284	C286	C287	C.288	C291	C292	U293	C296	C297	G298 A299	A300	G301	0302 U303		U306 G307	<b>G</b> 308	G309 A310	A311	A314	G315		A320 G321	A322	G323 A32A	<b>G325</b>	G326 G327	U328	G329 A330	A331
A332	G333	C335	C336	C337	A340	6341 6342	C343		G352 G353	<b>G354</b>	( 10)	U358 A359	<b>G360</b>	G361	0202	C363B	G363C G363D	U363E	A363F	C364	A371	G372	U373 A374		C378	u380	G381	G382 11383	U384	C385 G386	U387	G388 C380	A390	G391	C392 C393	A394	U395 C306	<b>G397</b>	<b>G</b> 398	A402	U403 C404	U405
G406		G410 G410	G411	A412 C413	C414	A415	G418	C419	C420 11421	A422	A423	G425	C426	U427	A4 20	C435	C436	G438	G440	0441 6442	4443 A443	C444	C445 G446	A447	U448	C451	G452	C453 A454	C455	C456 A457	G458	U459	G463	U464 2425	6465 A466	G467	G468 C160	A470	A471 A472	G473	G476	A477
A478	A479	G481	A482	A483 C484	C485	C486	G491	A492	6493 6494	G495	G496	A497 G498	0499		<b>A502</b>	A505	G506 A507	G508	<b>C509</b>	GE10	7100	C517	G518 U519	<b>G520</b>		0523 0524	<b>U525</b>	A526 CE27	A528	4529 G530	C531	A532 6533	0534	C535	A536 C537	<b>G538</b>	(1539 (1540)	C541	C542 C543		A547 A548	G549
G551		U555	G556	U557 G558	-	0562 G563	C564	C565	U566 A567	U568	U569	G570 A571	A572	G573	Co/4 A575		A578 GE70	C580	C581	G582 G583		A586	C587 U588	C589	A590	G592	G593	U594	U597	G598 G599		G602 A603	G604	C605	0606 0607	A608	A609	C611	C612 G613	U614	U614A G614B	A614C
G615	G616	G619 G619	G620	A621 G622	G623	C624 C625	U626	A627	G628 G629	<b>G630</b>	A631	A632 A633	C634	C635	4637 A637	G638	0639	G642	A643	A644 C645	A646	G647	G648 G649	CGEO	G651	C652 A653	A654	G654A	G654C	G654D	C654F	C654G	C654I	A654J	C654K G654L	C654M	G654N	C654P	C6540 C654R	G654S	C654T A654U	A654V
A655	G656 11657	C658	C659	G660 C661	G662	C671	C672	C673	G674 A675	AG76		G681		A685	C687	U688	A689	C691	C692	C693 11694	H 000	U703	G704 A705		C708	0/09 G710		G717 4718	C719	C720	A722	<b>6705</b>	G726	A727	G729 G729	C730	6733	A734	A735 C736	C737	U740	G741
	G7 44 G7 45	A746	U747	G748 C749		A752 C753	C754	C755	C/ 56	G760	A761	A764	G7 65	C766	G771	C772	0773 4774	G775	G776	4782	A783	A784	G785 C786	U787	A788	A/ 89 C790	C791	G7 92	<mark>C795</mark>	C796 C797		A802 11803	A804	G805	C806 U807	<b>G808</b>	G809 11840	U811	C812 U813	C814	C815	<mark>4819</mark>
	A824	U826	<b>U827</b>	U828 4829	<b>G830</b>	6831 6833	<b>U833</b>		C840 4841	G842	G843	C844 G845	C846	U847	4040 A849	C850	0851 2852	G853	G854	6855 C856	C857	<b>U858</b>	G859 U860	A861	G862	4803 G864	C865	A866 C867	<mark>U868</mark>	G869 4870	U871	A872 C873	G874	G875	C876 U877	A878	G879 C880	G881	G882 G883	C884	C885 C886	A887
C888	C889	<b>G</b> 892	C893	C894 11895	A896	C897	A899		C903 C904	<b>U905</b>	6906	1060	A910	A911	U913	C914	C915 C916	A917		0922 C923	C924	C925	A926 G927	G928		4933 A933		G940 A941	G942	U943 0944	A945	G946 C947	G948	C949	G950 C951	G952	A953 C954	C955	G956 A957	<b>U958</b>	A959 A960	C961



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U1033	G1034 U1035		C1038	G1039	G1041	G1042	C1043 C1044	A1045	A1046	G1047	C1049	A1050	G1051	C1053	A1054	G1055	G1056	G1058	G1059	U1060	01061 G1062	G1063	C1064	U1065	A1067	G1068	A1069 A1070	G1071	C1072	e / Ot A	C1076	A1077	C1079	C1080	01081 01082	U1083	A1084	A1085 A1086	G1087	A1088	U1090	G1091	G1093	U1094
A1095	A1096 U1097	A1098	<mark>G1099</mark>	C1100 11101	C1102	A1103	C1104 11105	G1106	G1107	U1108	G1110 G1110	A1111	G1112 11112	G1113 G1114	G1115	C1116		C1121	-	G1125	A1128	A1129	U1130	G1131 A1132	U1133	C1135	G1136 C1137	G1138	G1139	U1141	U1142	A1142A	C1145	C1146	G1151	C1152	C1153	G1154 A1155		G1164	01165 C1166	U1167	G1168 G1169	G1170
G1171	G1173 • 41174 •	U1175	G1176	A1177	C1179 C1179	C1180	C1181	G1186	G1187	U1188 A1180	G1190	G1191	G1192 C1103	A1194	G1195		U1198	C1200	C1201	C1202	61203 A1204	U1205	G1206	C1207 C1208	G1209	A1210		G1215	G1216	C1221	C1221A	C1222	C1224	G1225	A1 220 G1 227		G1232	C1233 U1234	G1235		01240 A1241	A1242	G1243 G1244	G1245
A1246	A1247 G1248		C1251	G1252	COZIN	G1256	C1257 C1258	G1259	G1260	C1261	01263	G1264	A1265	A1268	A1269	C1270	G1271	01273	A1274	A1275	A12/6 G1277	A1278	<mark>G1279</mark>	41286	A1287	U1288	C1289	C1291	11001	01294 C1295	G1296	1100	U1300	A1301	A LOUZ	C1314	C1315	U1316 A1317	C1318	G1319	01320 A1321	A1322	01323 G1324	-
G1328	U1329 C1330	A1331	G1332	C1333	A1336	G1337	G1338 G1339	U1340	U1341		C1345	G1346	G1347	A1349	C1350	C1351	01352 1952	A1303 A1354	G1355		A1359 A1360	G1361	C1362	C1363 G1364	A1365	A1366	A1367 C1368	G1369		61374 G1374	C1375	C1376	A1378	A1379	00010	A1384	G1385	C1386 C1387	G1388	G1389	01390 01391	A1392	A1393 U1394	A1395
U1396	01397 C1398	C1399	G1400	G1401	C1403 C1403	C1404	01405 111406	C1407	C1408	11111	01412 A1412	G1413	9777 2	C1417	G1418	A1419	01420	17510	A1427	C1428	G1429 C1430	U1431	C1432	U1433 A1434	G1435		01438 01030	G1440	G1441	G1442 G1443	G1444	A1445	C1446	G1447	61448 A1449	G1450	(     	A1452 U1453	G1455		61459 A1460	G1461	C1462 C1463	C1464
G1465	G1466 C1467	C1468	A1469	G1470	A14/1 A1472	G1473	C1474 C1475	C1476	A1477	G1478	G1482	G1484	G1485	G1487		A1490	G1491	C1493	A1494	A1495	A1496 U1497	C1498	C1499	G1500 C1501	C1502	U1503	C1504 C1505	C1506	A1507		A1509A	A1509B	C1511	U1512	01514	G1515	C1516	G1517 U1518	G1519	G1520	A1528	A1528A	G1529 C1530	C1531
C1532	G1533 U1534	A1535	C1536	G1537	G1539	U1540	G1541 A1542	C1543	A1544	A1545	C1547	C1548	C1549		A1553	A1554	G1555	C1557	A1558	G1559	G1561 G1561	A1562	G1563	C1564 C1565	A1566	A1567	G1568 A1560	A1570	A1571	G1573	-	C1577 111570	A1579		C1584	A1586	A1587	C1588 C1589	U1590	G1591	G1595	A1596	A1597 C1598	-
A1603	A1608	A1609	A1610	A1 61 /	A1014 C1615	A1616	C1617 A1618	G1619	G1620	U1621	C1625	G1626	114 600	G1630	C1631	A1631A	A1632	A1634	G1635	C1636	A163/ C1638	U1639	C1640	A1641 G1642	G1643		G1647 C1648		G1651	A1052 G1653	A1654	A1655 71656	C1657	C1658	C1662	C1663	A1664	A1665 G1666	G1667	A1668	A1009 C1670	U1671	C1672 U1673	G1674
C1675	A1676 A1677	G1678	U1679	U1680	G1682	C1683	C1684 C1685	C1686	G1687	U1688 A1680	A1690	C1691	U1692	G1695	G1696	G1697	A1698	A1700	A1701	G1702	61/03	C1708	U1709	C1710 C1711	C1712	U1713	G1714 C1717	G1718	G1719 11720	01/20 G1721	A1722	U1739 C1740	A1741	G1742	C1744 C1744		G1747A	G1748 A1749	G1750	C1751	C1 / 52 G1 753		G1756 U1757	G1758
-	C1761 A1762	G1763	G1764	C1765	C1767	U1768	G1769 G1770	C1771	G1772	A1773	U1775		U1779	C1781	C1782	A1783	A1784	A1786	A1787	C1788	A1/89 C1790	A1791	G1792	111796	C1797	U1798	61799 C1800	G1801	A1802	A1603 C1804	U1805	C1806	U1808	A1809	G1811	A1812	G1813	G1816	G1817	U1818	A 1619 U1820	A1821	G1824	A1825
G1826	C1827 G1828	A1829	C1830	G1831	U1834	G1835	C1836 C1837	C1838	G1839	G1840	G1842	C1843	C1844	A1847		A1854	G1855	G1857	G1858	A1859	G1860 G1861	G1862	G1863	U1864 C1865	C1866	A1876	A1877 C1878		C1881	G1883	A1884	A1885	C1887	G1888	A1003	U1898	G1899	A1900 A1901	C1902	1000	G1907	C1908	61910 G1910	U1911
A1912	A1913 A1914	U1915	A1916	U1917	OTATY	G1922	01923 C1924	C1925	U1926	A1927	G1929	G1930	U1931	G1933	C1934	G1935	A1936 A1027	A1337 A1938		C1947	G1948 G1949	G1950	U1951	A1952 A1953	G1954	U1955	10F2	G1959	00010	U1963	G1964	C1 067	G1968	A1969	A1971	A1972	G1973	C1974	C1979	G1980	C1982	C1983	61984 61985	A1986



• Molecule 12: 5S ribosomal RNA





D89 T90 T92 V93 .95 96























G64	066 066	C67	G68	G70	C71	C/2 G73	C76	G77 970	679 679	680	U81		U84	A88	C89	C91	C92	693		C100	A101	G102	C103	C106	G107	G108	C110	G111	G112 6112	0113 0114	G115	A116 C117	U118	A119	A120 C121	G122	C123	6124 U125	G126	G127	0719	A130	C131 C132	U133
A134	C135 C136	C137	G138	ci cy	A143	G1 44	G147	G148	A149 C150	A151	A152		G159	A160	A161	A102 C163	0010	G167	G168	0170 U170	A171	A172	U173	C1 /4 C1 75	C176	C1 77	0170 A179	U180	10 10 10	4104 A185	C186	C187 C188		C189B	C189D		G189H	G1891 G189J	U189K	G189L	6191	U192	C193 C194	A195
A196	A1.97 G1.98	G199	G200		U203	0204 G216	C217	C218	C219	C221	<mark>U222</mark>	0223	C225 C225	G226	G227	(1030	C233	C234	C235	6230 C237	G238	<mark>U239</mark>	C240	C241 C242	A243	U244	0245 A246	G247		A250 G251		G254 C255	U256	G257	G259	-	A262	A263 U264	G265	G266 C767	C268	C269	A270 C271	<mark>C272</mark>
A273	A2/4 G275	G276	C277	077.9	C283	U287	A288	G289	0230 0291	G292	G293	U294 C20F	U296	G297	A298	4300	<b>G301</b>	G302	A303	0304	C307	C308	G309	G310 C311	C312	A313	4315 A315	G316		6322 C322	<b>U323</b>	G324 ∆325	G326	A327	4329	<mark>C330</mark>	G331	6333 6333	C334	C335 C336	C337	A338	<b>C339</b>	<mark>0343</mark>
A344	C345 G346	G347	G348	A349 G350	G351	C352 A353	G354		(357) 11358	U359	A360	G361	4363 A363	A364	L.) 011	1368	C369	C370	G371	C3/2 A373	A374	<b>U375</b>	G376	G378 G378	C379	G380	4382	A383	G384	C386 C386	U387	G388 ≜380	C390	G391	4393 A393	G394	C395	6396 A397	C398	6399 2400	C401	G402	C403 U404	U405
G406	G407 A408	G409	G410	A411 A412	G413	A414 A415	G416	C417	C418 C419	0420 U420	U421	C422	6423 6424	G425	G426	0421 G428	U429	A430	A431	A432 C433	U434	C435	C436	0437 G438	A439	A441	C443	C444	G445	04440	A452	A453 C454	C455	C456	C457 C458	G460	A461	G471	A472	G473	6475 G475	G476	A477 C479	U480
	6484 6485	0486	A487	C488 C489	G490	6491 6492		A495	A4.96	A499	G500	C501	G503	C504	<b>G505</b>	0200 0507	C508	A509	A510	U512 U512	C513		U516 0117	G51/ C518	C519	A520	C5 22	A523	G524	0526 C526	G527	CE30	U531	A532	4033 U534	A535	C536	G538	A539	G540	G542	C543	G544 C545	G546
A547	G549 C549	GEEO	U551		C556	G558	A559	U560	0561 0562	2000	<mark>G566</mark>	A 570	A573	A574	G575	0210 0277		<b>U580</b>	G581	<b>G585</b>	C586		C590	0591 (5592	G593	G594	C596	G597	U598	C600	C601	A602 11603	G604	U605 Cene	4607 A607	A608	A609	G610 A611	C612	C613	U619	C620	A621 A622	C623
C624	G625 U626	G627	G628	G630 G630	G631	A632 G633	C634	G635	0630 6637	G638	G639	A640	0041 A642	C643	G644	U045	C647	A648	G649	0000	A653	G654	A655	0656 0657	G658	U659	G661	G662	A663	4004 A665	<mark>G666</mark>	G667 G668		G671	00/2 G673	G674	A675	AG / G UG 77		C681	7005	<mark>G685</mark>	U686 A687	G688
C689	6690 6691	<b>U692</b>	10001	0698 6698	10110		G703	A704	0/05 4706	CT07	C708	G709	G711 G711	A712	G713	A716		C719	C720	4722 4722	U723	G724	G725	G727 G727		G731	4733		C736	A 131 C738	C739	U740 C741	G742	C17 0	C749	G750		G755	C756	U757 6769	4759	G760	G761 C762	G763
C764	G7 65 A7 66		6769	G771	U772	G776	A7.77	G778 G770	07.79 47.80	A781	A782	C783	C/ 04 G7 85	<mark>G786</mark>	A787	01 00	A790	G791	A792	0794 A794		C797	G7 98	G800	U801	A802	4000	<mark>C808</mark>	<mark>6809</mark>	A814	A815	A816 C817	G818	A819 11620	0820 G821	C822	G823	C826	U827	A828	U833	C834	<mark>G838</mark>	<mark>U839</mark>
C840	U841 C848	C849	U850	G852	G853	1854 18	C857	G858	4859 4860	G861		A864	4800 C866	G867	C868	6000	A872		C875	G878	C879	C880	G881	C883 C883	<mark>U884</mark>		4009 G890	U891	A892	C683	<mark>G895</mark>	C896	<mark>C899</mark>	A900	G902	<mark>G903</mark>	C904	<b>A909</b>	C910	U911 7012	Caiz A913	A914	A915 G916	G917
A918	A919 U920	U921	G922	C924	<mark>G925</mark>	G927 G927	<mark>G928</mark>	G929	C930		C934	A935	C930 A937	<mark>A938</mark>	G939	C340 C941	G942		G945	6947 6947	C948	A949	U950	1951 1952	<b>G953</b>	G954	U956	<mark>U957</mark>	A958	0960	U961	C962 C963	A964	A965 6666	C967	A968	A969	G971	C972	6973	A975	G976	A977 A978	C979
C980	1981 1982	A983		6987 G987		1991	G993	A994	6995 4996		U1000	A1001	G1002	G1003	A1004	C1007	C1008	G1009	G1010	01015 01012	G1013	A1014	A1015	A1016 G1017	C1018	C1019		G1023	G1024	01025 G1026	C1027	C1028	C1030	G1030A	G1030C	A1030D	G1031	G1032 G1033	G1034	A1035		C1038	C1039 U1040	A1041
G1042	A1046	G1047	G1048	01049 G1050	C1051	01052 G1053	C1054	A1055	01056 61057	G1058	C1059	C1060	01062	C1063	G1064	C1066		U1070		C1076	G1077		A1080	G1081 G1082		U1090	TENTO	G1094	U1095	C1097	C1098	G1099 C1100	A1101	A1102	G1104 G1104	A1105	G1106	G1107 G1108		A1111	C1113	C1114	C1115 C1116	G1117



























LLA LLA VSS VSS VSS VSS VSS VSS VSS VSS VSS VS	116 113 119 119 123 123 126 126 126 126 126 126	331 332 332 335 34 44 44 44 44 44 48 45 48 48	61 155 155 155 155 156 156 158 158 158 158 158 158 158 158 158 158
~ ~ Э Н Н Н <mark>К <b>2 Н</b> О</mark> <del>Х К</del>			
K65 A66 A67 L72 L72 H73 K73 A76 A76 A76 A76 R79 R879 R879 K81	882 885 886 886 886 886 888 889 890 191 191 192 192	696 798 1998 1100 1100 1104 1104 1104 1104 1104 110	
• Molecule 55: 30S	RIBOSOMAL	PROTEIN THX	
Chain BU:	52%	26%	11% • 7%
G C C C C C C C C C C C C C C C C C C C	Y18 R22 LYS		
• Molecule 56: E-S	ITE or P-SITE	TRNA FMET	
Chain BV:	38%	48%	13% •
	<u>а а на е с а а о о о о о о о о о о о о о о о о о</u>	<u>, , , , , , , , , , , , , , , , , , , </u>	~ @ @ Q + Q @ 0 O + <mark>0</mark> @ 4
66666666666666666666666666666666666666	2 3 3 2 <mark>7</mark> 8 2 3 2 8 2 3 3 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	0.02 0.02 0.02 0.05	C5 A55 A55 A55 A55 C6 C6 C7 A77 A77 A77 A77 C6 C6 C7 A77 A77 A77 A77 A77 A77 A77 A77 A77
C75 A77 A77			
• Molecule 56: E-S	ITE or P-SITE	TRNA FMET	
		970/	
Chain BW:	27%	87% 58%	10% •
Chain BW:		87% 58% 58%	447 447 1448 1448 155 155 155 155 155 155 155 155 155 15
Chain BW:	27% 519 519 519 519 519 519 519 519 519 519	87% 58% 58%	A 44 A 47 A 47 A 47 A 47 A 46 B 10 A 46 A 46 A 46 A 46 A 46 A 46 A 46 A 46
Chain BW:	C75 C76 C15 C16 C176	87% 58% 58% 600 11 2 58% 58% 58% 600 11 2 58% 58% 600 11 2 58% 600 11 2 58%	A60 A58 A58 A58 A58 A58 A58 A59 A58 A59 A50 A58 A58 A58 A58 A58 A58 A58 A58
Chain BW:	27%	87% 58% 600 600 600 600 600 600 600 600 600 60	A 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
Chain BW:	27% 50 50 50 50 50 50 50 50 50 50 50 50 50 5	87%       58%       80 </td <td>۰ 10% و</td>	۰ 10% و
Chain BW:	27% 50 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	58% 58% 58% 58% 58% 58% 58% 58% 58% 58%	10% •
Chain BW: 5885888888888888888888888888888888888	27% 5 5 5 6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7	58% 58% 58% 58% 58% 58% 74%	10% • 90 92 92 92 92 92 92 92 92 92 92
Chain BW:	27% 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	87%       58%       80 80 80 80 80 80 80 80 80 80 80 80 80 8	
Chain BW:	27% 9 9 6 8 8 9 8 8 8 8 8 8 8 8 8 8 8 8 8 8	87%       58%       58%       58%       58%       58%       28%       74%       23%       7%	10% •
Chain BW:         S & 8 & 8 & 8 & 8 & 8 & 8 & 8 & 8 & 8 &	27% 5 5 6 6 8 6 8 6 8 6 8 6 8 6 8 6 8 6 8 6	87%       58%       3 50 80 80 80 80 80 80 80 80 80 80 80 80 80	







## 4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants	202.17Å 290.76Å 250.65Å	Depositor
a, b, c, $\alpha$ , $\beta$ , $\gamma$	$90.00^{\circ}$ $97.63^{\circ}$ $90.00^{\circ}$	Depositor
Bosolution(Å)	50.00 - 3.10	Depositor
Itesolution (A)	49.68 - 3.10	EDS
% Data completeness	97.9 (50.00-3.10)	Depositor
(in resolution range)	$97.4 \ (49.68-3.10)$	EDS
$R_{merge}$	0.24	Depositor
$R_{sym}$	(Not available)	Depositor
$< I/\sigma(I) > 1$	$1.94 (at 3.12 \text{\AA})$	Xtriage
Refinement program	CNS 1.2	Depositor
B B.	0.230 , $0.270$	Depositor
$\mathbf{n}, \mathbf{n}_{free}$	0.228 , $0.268$	DCC
$R_{free}$ test set	24443 reflections $(4.85%)$	wwPDB-VP
Wilson B-factor $(Å^2)$	44.8	Xtriage
Anisotropy	0.304	Xtriage
Bulk solvent $k_{sol}(e/Å^3)$ , $B_{sol}(Å^2)$	0.29, 58.1	EDS
L-test for $twinning^2$	$ < L >=0.46, < L^2>=0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.88	EDS
Total number of atoms	154205	wwPDB-VP
Average B, all atoms $(Å^2)$	58.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: The largest off-origin peak in the Patterson function is 1.67% of the height of the origin peak. No significant pseudotranslation is detected.

<sup>&</sup>lt;sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.



<sup>&</sup>lt;sup>1</sup>Intensities estimated from amplitudes.

# 5 Model quality (i)

### 5.1 Standard geometry (i)

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

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).

Mal	Chain	B	ond lengths	I	Bond angles
1VIOI	Unam	RMSZ	# Z  > 5	RMSZ	# Z  > 5
1	A0	0.46	0/671	0.72	1/892~(0.1%)
2	A1	0.46	0/739	0.74	0/983
3	A2	0.43	0/600	0.73	0/793
4	A3	0.45	0/473	0.70	0/636
5	A4	0.47	0/350	0.62	0/476
6	A5	0.53	0/473	0.86	1/639~(0.2%)
7	A6	0.69	0/440	0.99	1/586~(0.2%)
8	A7	0.49	0/427	0.69	0/563
9	A8	0.59	0/516	0.94	1/681~(0.1%)
10	A9	0.48	0/310	0.75	0/407
11	AA	0.57	5/69979~(0.0%)	0.81	83/109249~(0.1%)
12	AB	0.44	0/2853	0.79	2/4451~(0.0%)
13	AC	0.46	1/1775~(0.1%)	0.65	0/2392
14	AD	0.53	0/2195	0.83	2/2955~(0.1%)
15	AE	0.54	0/1597	0.84	1/2155~(0.0%)
16	AF	0.45	0/1659	0.78	1/2246~(0.0%)
17	AG	0.38	0/1499	0.69	1/2016~(0.0%)
18	AH	0.44	0/1246	0.77	0/1684
21	AN	0.49	0/1132	0.82	0/1527
22	AO	0.50	0/943	0.77	1/1269~(0.1%)
23	AP	0.54	0/1131	1.06	6/1504~(0.4%)
24	AQ	0.51	0/1143	0.74	0/1527
25	AR	0.45	0/974	0.82	1/1302~(0.1%)
26	AS	0.43	0/779	0.75	0/1038
27	AT	0.54	0/1156	0.88	2/1544~(0.1%)
28	AU	0.56	0/975	0.80	0/1297
29	AV	0.49	0/790	0.86	1/1057~(0.1%)
30	AW	0.54	0/907	0.83	2/1216~(0.2%)
31	AX	0.52	0/740	0.74	0/995
32	AY	0.59	0/789	0.95	$\overline{3/1053}~(0.3\%)$
33	AZ	0.47	0/1492	0.76	0/2026
34	B2	0.49	0/1203	0.71	1/1606~(0.1%)



Mal	Chain	В	ond lengths	I	Bond angles
	Unam	RMSZ	# Z  > 5	RMSZ	# Z  > 5
35	BA	0.48	1/36192~(0.0%)	0.78	39/56489~(0.1%)
36	BB	0.46	0/1936	0.72	0/2611
37	BC	0.43	0/1637	0.69	0/2207
38	BD	0.40	0/1733	0.68	0/2318
39	BE	0.49	0/1163	0.72	0/1566
40	BF	0.43	0/856	0.68	1/1154~(0.1%)
41	BG	0.36	0/1276	0.61	0/1709
42	BH	0.45	0/1136	0.75	0/1527
43	BI	0.41	0/1029	0.67	0/1378
44	BJ	0.42	0/808	0.69	0/1087
45	BK	0.39	0/900	0.65	0/1213
46	BL	0.45	0/987	0.74	0/1322
47	BM	0.38	0/999	0.71	0/1338
48	BN	0.45	0/501	0.75	0/664
49	BO	0.45	0/745	0.70	0/992
50	BP	0.42	0/717	0.65	0/965
51	BQ	0.42	0/837	0.67	0/1119
52	BR	0.42	0/579	0.70	0/768
53	BS	0.45	0/643	0.67	1/867~(0.1%)
54	BT	0.37	0/765	0.65	0/1007
55	BU	0.48	0/213	0.63	0/279
56	BV	0.45	0/1832	0.79	1/2855~(0.0%)
56	BW	0.45	0/1832	0.81	3/2855~(0.1%)
57	BX	0.71	0/116	0.89	0/179
58	BY	0.80	4/1454~(0.3%)	0.97	5/2258~(0.2%)
59	BZ	0.42	0/2986	0.69	0/4050
All	All	0.52	11/165828~(0.0%)	0.79	161/247542~(0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
11	AA	9	95
12	AB	0	3
14	AD	0	1
30	AW	0	1
33	AZ	0	1
35	BA	4	40
56	BV	0	1
56	BW	0	3



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Mol	Chain	#Chirality outliers	#Planarity outliers
58	BY	0	3
All	All	13	148

The worst 5 of 11 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	$\operatorname{Ideal}(\operatorname{\AA})$
58	BY	12	G	C2-N2	-13.61	1.21	1.34
11	AA	761	A	C5-C6	-11.47	1.30	1.41
58	BY	1	G	OP3-P	-6.81	1.52	1.61
11	AA	761	А	C6-N6	-6.64	1.28	1.33
11	AA	1332	G	N9-C4	-6.30	1.32	1.38

The worst 5 of 161 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	$Observed(^{o})$	$Ideal(^{o})$
11	AA	1992	G	C2'-C3'-O3'	10.04	131.59	109.50
35	BA	115	G	C2'-C3'-O3'	9.61	130.64	109.50
11	AA	1786	A	N9-C1'-C2'	9.57	126.44	114.00
11	AA	527	С	O4'-C1'-N1	9.54	115.83	108.20
35	BA	966	G	N9-C1'-C2'	-9.47	101.58	112.00

5 of 13 chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
11	AA	614(C)	А	C3'
11	AA	1300	U	C3'
11	AA	1378	А	C3'
11	AA	1427	А	C3'
11	AA	1799	G	C3'

5 of 148 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
11	AA	122	G	Sidechain
11	AA	25	U	Sidechain
11	AA	27	G	Sidechain
11	AA	50	U	Sidechain
11	AA	90	U	Sidechain



#### 5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A0	662	0	688	113	0
2	A1	732	0	808	72	0
3	A2	598	0	653	74	0
4	A3	468	0	523	35	0
5	A4	341	0	339	67	0
6	A5	459	0	480	71	0
7	A6	433	0	461	148	0
8	A7	419	0	467	30	0
9	A8	508	0	576	97	0
10	A9	307	0	335	40	0
11	AA	62479	0	31495	2218	0
12	AB	2551	0	1295	109	0
13	AC	1742	0	1794	315	0
14	AD	2145	0	2234	279	0
15	AE	1564	0	1629	224	0
16	AF	1624	0	1677	194	0
17	AG	1474	0	1535	276	0
18	AH	1223	0	1282	159	0
19	AJ	654	0	142	11	0
20	AK	701	0	163	25	0
21	AN	1105	0	1180	160	0
22	AO	933	0	996	95	0
23	AP	1114	0	1187	270	0
24	AQ	1122	0	1179	154	0
25	AR	960	0	1021	136	0
26	AS	771	0	832	122	0
27	AT	1142	0	1202	267	0
28	AU	958	0	1015	128	0
29	AV	779	0	852	147	0
30	AW	896	0	953	83	0
31	AX	726	0	778	77	0
32	AY	776	0	870	193	0
33	AZ	1460	0	1488	183	0
34	B2	1184	0	1235	205	0
35	BA	32330	0	16318	1299	0
36	BB	1901	0	1951	255	0
37	BC	1613	0	1677	152	0



Mol	Chain	Non-H	H(model)	H(added) Clashes		Symm-Clashes
38	BD	1703	0	1764	265	0
39	BE	1147	0	1207	135	0
40	BF	843	0	857	69	0
41	BG	1257	0	1296	103	0
42	BH	1116	0	1177	77	0
43	BI	1011	0	1043	155	0
44	BJ	795	0	840	176	0
45	BK	885	0	904	83	0
46	BL	971	0	1057	105	0
47	BM	988	0	1059	186	0
48	BN	492	0	529	90	0
49	BO	734	0	771	61	0
50	BP	701	0	720	70	0
51	BQ	824	0	891	54	0
52	BR	574	0	644	62	0
53	BS	630	0	652	103	0
54	BT	763	0	861	83	0
55	BU	209	0	221	14	0
56	BV	1640	0	837	44	0
56	BW	1640	0	837	160	0
57	BX	104	0	55	4	0
58	BY	1305	0	663	87	0
59	BZ	2929	0	2941	341	0
60	A9	1	0	0	0	0
60	BD	1	0	0	1	0
60	BN	1	0	0	0	0
61	AA	1	0	0	0	0
61	BZ	1	0	0	0	0
62	BZ	57	0	58	7	0
63	BZ	28	0	12	2	0
All	All	154205	0	105206	9943	0

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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 38.

The worst 5 of 9943 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)
38:BD:20:TYR:HA	38:BD:26:CYS:SG	1.82	1.19
14:AD:44:ASN:HB3	14:AD:49:ILE:HA	1.21	1.18
1:A0:40:GLN:HE22	1:A0:43:THR:HA	1.02	1.17



Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)	
7:A6:11:LEU:HD22	7:A6:12:GLU:H	1.08	1.15	
13:AC:167:LYS:HB2	56:BW:18:U:H5"	1.18	1.15	

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There are no symmetry-related clashes.

### 5.3 Torsion angles (i)

#### 5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Perce	entiles
1	A0	82/85~(96%)	62~(76%)	14 (17%)	6(7%)	1	6
2	A1	92/98~(94%)	80 (87%)	7 (8%)	5 (5%)	2	12
3	A2	69/72~(96%)	47 (68%)	13 (19%)	9 (13%)	0	1
4	A3	58/60~(97%)	46 (79%)	8 (14%)	4 (7%)	1	7
5	A4	43/71 (61%)	23 (54%)	10 (23%)	10 (23%)	0	0
6	A5	57/60~(95%)	39~(68%)	10 (18%)	8 (14%)	0	1
7	A6	48/54~(89%)	18 (38%)	15 (31%)	15 (31%)	0	0
8	A7	47/49~(96%)	45 (96%)	2(4%)	0	100	100
9	A8	62/65~(95%)	37~(60%)	14(23%)	11 (18%)	0	0
10	A9	35/37~(95%)	27 (77%)	6 (17%)	2(6%)	1	10
13	AC	226/229~(99%)	159 (70%)	46 (20%)	21 (9%)	0	3
14	AD	273/276~(99%)	210 (77%)	39~(14%)	24 (9%)	1	4
15	AE	203/206~(98%)	136~(67%)	40 (20%)	27~(13%)	0	1
16	AF	206/210~(98%)	147 (71%)	34~(16%)	25~(12%)	0	1
17	AG	179/182~(98%)	110 (62%)	46 (26%)	23 (13%)	0	1
18	AH	158/180 (88%)	98 (62%)	35 (22%)	25 (16%)	0	0
21	AN	137/140~(98%)	89 (65%)	27 (20%)	21 (15%)	0	0
22	AO	120/122~(98%)	103 (86%)	9 (8%)	8 (7%)	1	7



Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
23	AP	144/150~(96%)	74 (51%)	28~(19%)	42 (29%)	0 0
24	AQ	139/141~(99%)	104 (75%)	27~(19%)	8 (6%)	1 10
25	AR	115/118~(98%)	80 (70%)	21~(18%)	14 (12%)	0 1
26	AS	97/112~(87%)	57 (59%)	20 (21%)	20 (21%)	0 0
27	AT	136/146~(93%)	89~(65%)	28 (21%)	19 (14%)	0 1
28	AU	115/118~(98%)	88 (76%)	18 (16%)	9 (8%)	1 5
29	AV	99/101~(98%)	61 (62%)	23~(23%)	15 (15%)	0 0
30	AW	111/113~(98%)	88 (79%)	15~(14%)	8 (7%)	1 6
31	AX	91/96~(95%)	78~(86%)	8 (9%)	5 (6%)	2 11
32	AY	99/110~(90%)	47 (48%)	18 (18%)	34 (34%)	0 0
33	AZ	182/206~(88%)	107 (59%)	40 (22%)	35 (19%)	0 0
34	B2	142/144~(99%)	124 (87%)	14 (10%)	4 (3%)	5 25
36	BB	233/256~(91%)	153 (66%)	55 (24%)	25 (11%)	0 2
37	BC	205/239~(86%)	141 (69%)	49 (24%)	15 (7%)	1 6
38	BD	206/209~(99%)	126 (61%)	52 (25%)	28 (14%)	0 1
39	BE	149/162~(92%)	121 (81%)	21 (14%)	7 (5%)	2 14
40	$\operatorname{BF}$	99/101~(98%)	80 (81%)	14 (14%)	5 (5%)	2 13
41	BG	153/156~(98%)	109 (71%)	34 (22%)	10 (6%)	1 8
42	BH	136/138~(99%)	120 (88%)	14 (10%)	2 (2%)	10 39
43	BI	125/128~(98%)	73~(58%)	33~(26%)	19 (15%)	0 0
44	BJ	97/105~(92%)	69~(71%)	18~(19%)	10 (10%)	0 3
45	BK	117/129~(91%)	87 (74%)	21~(18%)	9~(8%)	1 5
46	$\operatorname{BL}$	123/135~(91%)	84 (68%)	23~(19%)	16 (13%)	0 1
47	BM	123/126~(98%)	76~(62%)	28~(23%)	19 (15%)	0 0
48	BN	58/61~(95%)	43~(74%)	5~(9%)	10 (17%)	0 0
49	BO	86/89~(97%)	67~(78%)	16 (19%)	3~(4%)	3 20
50	BP	82/88~(93%)	53~(65%)	23~(28%)	6 (7%)	1 6
51	BQ	98/105~(93%)	76 (78%)	20 (20%)	2 (2%)	7 31
52	BR	68/88~(77%)	53 (78%)	10 (15%)	5 (7%)	1 6
53	BS	77/93~(83%)	53~(69%)	14 (18%)	10 (13%)	0 1
54	BT	97/106~(92%)	72 (74%)	17 (18%)	8 (8%)	1 5

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Pe	erce	enti	les
55	BU	23/27~(85%)	11 (48%)	10 (44%)	2 (9%)		1	4	
59	BZ	374/405~(92%)	295~(79%)	58 (16%)	21~(6%)		2	11	
All	All	6294/6697~(94%)	4435 (70%)	1170 (19%)	689 (11%)		0	2	

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5 of 689 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A1	30	VAL
2	A1	83	GLU
3	A2	47	ASN
3	A2	70	GLN
4	A3	13	ILE

#### 5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A0	66/67~(98%)	57~(86%)	9~(14%)	3 16
2	A1	78/83~(94%)	63~(81%)	15~(19%)	1 6
3	A2	66/67~(98%)	57~(86%)	9~(14%)	3 16
4	A3	51/52~(98%)	46 (90%)	5(10%)	8 29
5	A4	39/63~(62%)	30 (77%)	9(23%)	1 3
6	A5	51/52~(98%)	41 (80%)	10 (20%)	1 6
7	A6	49/52~(94%)	34 (69%)	15 (31%)	0 0
8	A7	41/42~(98%)	35~(85%)	6 (15%)	3 13
9	A8	53/55~(96%)	42 (79%)	11 (21%)	1 5
10	A9	34/34~(100%)	26 (76%)	8 (24%)	1 3
13	AC	180/181~(99%)	164 (91%)	16 (9%)	9 34
14	AD	$217/218\ (100\%)$	183 (84%)	34 (16%)	2 11
15	AE	165/166~(99%)	138 (84%)	27 (16%)	2 10
16	AF	165/166~(99%)	150 (91%)	15 (9%)	9 33



4100	8Q	V	4
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	9	1	1 0

Mol	Chain	Analysed	Rotameric Outliers Pe		Perce	entiles
17	AG	155/156~(99%)	135~(87%)	20~(13%)	4	18
18	AH	132/148~(89%)	116 (88%)	16~(12%)	5	20
21	AN	117/119~(98%)	101 (86%)	16 (14%)	3	16
22	AO	100/100~(100%)	88 (88%)	12 (12%)	5	20
23	AP	112/116~(97%)	89 (80%)	23~(20%)	1	5
24	AQ	$111/111 \ (100\%)$	90 (81%)	21 (19%)	1	6
25	AR	100/101~(99%)	85 (85%)	15~(15%)	3	12
26	AS	77/88~(88%)	67~(87%)	10~(13%)	4	18
27	AT	120/127~(94%)	91~(76%)	29 (24%)	0	2
28	AU	92/94~(98%)	82~(89%)	10 (11%)	6	25
29	AV	82/82~(100%)	72~(88%)	10 (12%)	5	19
30	AW	91/92~(99%)	77~(85%)	14 (15%)	2	11
31	AX	74/78~(95%)	67~(90%)	7~(10%)	8	31
32	AY	84/91~(92%)	69~(82%)	15 (18%)	2	8
33	AZ	161/179~(90%)	132 (82%)	29 (18%)	1	7
34	B2	120/120~(100%)	81 (68%)	39~(32%)	0	0
36	BB	202/220~(92%)	172 (85%)	30~(15%)	3	13
37	BC	160/188~(85%)	149 (93%)	11 (7%)	15	45
38	BD	180/181~(99%)	152 (84%)	28 (16%)	2	11
39	BE	115/123~(94%)	99~(86%)	16 (14%)	3	15
40	BF	90/90~(100%)	76 (84%)	14 (16%)	2	11
41	BG	126/127~(99%)	115 (91%)	11 (9%)	10	36
42	BH	119/119 (100%)	108 (91%)	11 (9%)	9	33
43	BI	98/99~(99%)	87 (89%)	11 (11%)	6	24
44	BJ	88/92~(96%)	74 (84%)	14 (16%)	2	11
45	BK	90/99~(91%)	84 (93%)	6 (7%)	16	46
46	BL	$104/111 \ (94\%)$	91 (88%)	13 (12%)	4	18
47	BM	99/101~(98%)	84 (85%)	15 (15%)	3	12
48	BN	49/50~(98%)	41 (84%)	8 (16%)	2	10
49	BO	79/80~(99%)	72 (91%)	7 (9%)	9	34
50	BP	72/74~(97%)	64 (89%)	8 (11%)	6	24



Mol	Chain	Analysed	Rotameric	Outliers	Perce	entiles
51	BQ	94/97~(97%)	89~(95%)	5~(5%)	22	54
52	BR	61/77~(79%)	56~(92%)	5 (8%)	11	38
53	BS	69/80~(86%)	57 (83%)	12 (17%)	2	9
54	BT	76/82~(93%)	68~(90%)	8 (10%)	7	26
55	BU	19/22~(86%)	16 (84%)	3~(16%)	2	11
59	BZ	316/338~(94%)	275~(87%)	41 (13%)	4	18
All	All	5289/5550~(95%)	4537 (86%)	752 (14%)	3	14

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5 of 752 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
34	B2	95	GLN
40	BF	98	LEU
36	BB	17	PHE
34	B2	90	LEU
38	BD	20	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 153 such sidechains are listed below:

Mol	Chain	Res	Type
41	BG	37	ASN
53	BS	14	HIS
43	BI	31	GLN
46	BL	49	ASN
59	BZ	159	ASN

#### 5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
11	AA	2900/2915~(99%)	536 (18%)	63~(2%)
12	AB	118/122~(96%)	27 (22%)	4(3%)
35	BA	1503/1522~(98%)	248 (16%)	56 (3%)
56	BV	76/77~(98%)	12 (15%)	2(2%)
56	BW	76/77~(98%)	11 (14%)	2(2%)
57	BX	4/19~(21%)	1 (25%)	0
58	BY	60/90~(66%)	22 (36%)	13 (21%)
All	All	4737/4822~(98%)	857 (18%)	140 (2%)



5 of 857 RNA backbone outliers are listed below:

Mol	Chain	$\mathbf{Res}$	Type
11	AA	9	U
11	AA	10	G
11	AA	32	С
11	AA	34	С
11	AA	45	С

5 of 140 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
35	BA	1305	G
35	BA	1492	А
58	BY	12	G
11	AA	2131	G
11	AA	2126	А

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

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

#### 5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

### 5.6 Ligand geometry (i)

Of 7 ligands modelled in this entry, 5 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).

Mal	Turne	Chain	Dec	Tinle	В	ond leng	gths	B	Bond ang	gles
NIOI	туре	Chain	nes	LIIIK	Counts	RMSZ	# Z >2	Counts	RMSZ	# Z >2
62	KIR	BZ	1002	-	$56,\!59,\!59$	3.28	20 (35%)	62,84,84	1.86	17 (27%)
63	GDP	BZ	1003	61	24,30,30	1.37	2 (8%)	30,47,47	1.46	5 (16%)



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
62	KIR	BZ	1002	-	-	9/54/98/98	0/3/3/3
63	GDP	BZ	1003	61	-	2/12/32/32	0/3/3/3

The worst 5 of 22 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
62	ΒZ	1002	KIR	O18-C17	-13.53	1.24	1.44
62	ΒZ	1002	KIR	O30-C30	-13.08	1.16	1.42
62	ΒZ	1002	KIR	C5-C4	5.16	1.48	1.39
63	ΒZ	1003	GDP	C5-C6	-4.45	1.38	1.47
62	BZ	1002	KIR	C27-N26	4.28	1.43	1.33

The worst 5 of 22 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	$\mathbf{Observed}(^{o})$	$Ideal(^{o})$
62	ΒZ	1002	KIR	C4-C3-C7	5.83	133.90	120.23
62	ΒZ	1002	KIR	O29-C29-O34	-5.71	100.64	110.21
62	ΒZ	1002	KIR	C20-C21-C22	-4.05	115.28	119.13
62	ΒZ	1002	KIR	O34-C29-C28	3.85	114.55	104.46
63	ΒZ	1003	GDP	PA-O3A-PB	-3.63	120.37	132.83

There are no chirality outliers.

5 of 11 torsion outliers are listed below:

Mol	Chain	$\mathbf{Res}$	Type	Atoms
62	ΒZ	1002	KIR	C12-C13-C14-O18
62	ΒZ	1002	KIR	C16-C17-C19-C20
62	ΒZ	1002	KIR	C16-C17-C19-C42
62	ΒZ	1002	KIR	O18-C17-C19-C20
62	BZ	1002	KIR	O18-C17-C19-C42

There are no ring outliers.

2 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
62	ΒZ	1002	KIR	7	0
63	ΒZ	1003	GDP	2	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 sufficient the outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.









## 5.7 Other polymers (i)

There are no such residues in this entry.

### 5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.



## 6 Fit of model and data (i)

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

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

Mol	Chain	$\begin{tabular}{ c c c c c } \hline Analysed & <\!\!RSRZ\!> & \#RSRZ\!>\!2 \end{tabular}$		$\mathbf{OWAB}(\mathbf{\AA}^2)$	Q<0.9	
1	A0	84/85~(98%)	0.48	9 (10%) 6 2	25, 44, 110, 136	0
2	A1	94/98~(95%)	0.19	2 (2%) 63 43	23,  43,  88,  95	0
3	A2	71/72~(98%)	0.14	2 (2%) 53 30	34, 61, 88, 98	0
4	A3	60/60~(100%)	-0.00	1 (1%) 70 49	20,  36,  55,  87	0
5	A4	45/71~(63%)	0.68	6 (13%) 3 1	98, 118, 132, 138	0
6	A5	59/60~(98%)	0.41	6 (10%) 6 2	14, 39, 121, 137	0
7	A6	50/54~(92%)	0.69	6 (12%) 4 2	31, 61, 79, 82	0
8	A7	49/49~(100%)	-0.22	0 100 100	14, 24, 77, 93	0
9	A8	64/65~(98%)	-0.05	1 (1%) 72 51	21, 40, 55, 83	0
10	A9	37/37~(100%)	0.33	1 (2%) 54 31	33, 49, 68, 72	0
11	AA	2901/2915~(99%)	0.12	167 (5%) 23 10	8, 36, 159, 189	0
12	AB	119/122~(97%)	0.01	0 100 100	26, 77, 104, 137	0
13	AC	228/229~(99%)	4.97	195 (85%) 0 0	131, 151, 164, 168	0
14	AD	275/276~(99%)	-0.38	3 (1%) 80 64	8, 27, 53, 87	0
15	AE	205/206~(99%)	-0.09	6 (2%) 51 28	10, 29, 75, 88	0
16	AF	208/210~(99%)	-0.11	4 (1%) 66 46	11, 49, 116, 129	0
17	AG	181/182~(99%)	0.53	17 (9%) 8 3	55, 86, 112, 132	0
18	AH	160/180~(88%)	0.61	14 (8%) 10 4	39, 83, 124, 134	0
19	AJ	0/130	-	-	-	-
20	AK	0/140	-	-	-	-
21	AN	$\overline{139/140}~(99\%)$	-0.19	3 (2%) 62 41	17, 37, 86, 94	0
22	AO	$\overline{122/122}~(100\%)$	-0.32	3 (2%) 57 34	15, 31, 49, 66	0
23	AP	$\overline{146/150}~(97\%)$	0.48	7 (4%) 30 14	18, 60, 93, 119	0
24	AQ	141/141 (100%)	-0.23	2 (1%) 75 56	22, 32, 57, 106	0



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Mol	Chain	Analysed	$\langle RSRZ \rangle$	#RSRZ>2	$OWAB(Å^2)$	Q<0.9
25	AR	117/118~(99%)	-0.34	0 100 100	19,31,54,67	0
26	AS	99/112~(88%)	0.51	4 (4%) 38 19	53, 76, 107, 109	0
27	AT	138/146~(94%)	0.11	8 (5%) 23 10	15,  48,  124,  143	0
28	AU	117/118~(99%)	-0.25	2 (1%) 70 49	15,  30,  57,  97	0
29	AV	101/101~(100%)	0.25	3 (2%) 50 27	9, 56, 76, 82	0
30	AW	113/113~(100%)	-0.29	2 (1%) 68 47	12, 29, 61, 106	0
31	AX	93/96~(96%)	-0.30	0 100 100	22, 41, 61, 75	0
32	AY	101/110 (91%)	0.77	13 (12%) 3 1	25, 56, 108, 128	0
33	AZ	184/206~(89%)	0.23	9 (4%) 29 14	28, 63, 98, 115	0
34	B2	144/144~(100%)	0.92	21 (14%) 2 1	49, 78, 118, 124	0
35	BA	1504/1522~(98%)	0.03	51 (3%) 45 24	14, 52, 128, 187	0
36	BB	235/256~(91%)	0.09	10 (4%) 35 17	27, 51, 114, 128	0
37	BC	207/239~(86%)	-0.07	0 100 100	36, 59, 86, 96	0
38	BD	208/209~(99%)	0.53	12 (5%) 23 10	47, 74, 111, 116	0
39	BE	151/162~(93%)	-0.34	1 (0%) 87 75	23, 40, 70, 92	0
40	BF	101/101 (100%)	-0.21	2 (1%) 65 44	33, 56, 71, 95	0
41	BG	155/156~(99%)	0.25	13 (8%) 11 4	52, 75, 107, 129	0
42	BH	138/138 (100%)	-0.36	0 100 100	17, 36, 54, 67	0
43	BI	127/128~(99%)	0.49	8 (6%) 20 8	46, 82, 107, 111	0
44	BJ	99/105~(94%)	0.89	17 (17%) 1 0	42, 82, 119, 122	0
45	BK	119/129~(92%)	0.22	6 (5%) 28 13	26, 56, 90, 107	0
46	BL	125/135~(92%)	0.03	4 (3%) 47 25	24, 50, 69, 112	0
47	BM	125/126~(99%)	0.53	8 (6%) 19 8	42, 80, 107, 139	0
48	BN	60/61~(98%)	0.07	2 (3%) 46 24	38, 48, 70, 77	0
49	BO	88/89~(98%)	-0.16	0 100 100	22, 41, 64, 69	0
50	BP	84/88~(95%)	0.19	1 (1%) 79 61	39, 58, 77, 102	0
51	BQ	100/105~(95%)	-0.27	0 100 100	27, 47, 68, 73	0
52	BR	70/88~(79%)	0.16	1 (1%) 75 56	28, 46, 71, 79	0
53	BS	79/93~(84%)	0.52	10 (12%) 3 1	55, 73, 101, 111	0
54	BT	99/106~(93%)	0.33	4 (4%) 38 19	46, 65, 101, 104	0
55	BU	25/27~(92%)	0.60	0 100 100	52, 65, 83, 84	0



Mol	Chain	Analysed	<RSRZ $>$	# RSRZ > 2	$\mathbf{OWAB}(\mathbf{\AA}^2)$	Q<0.9
56	BV	77/77~(100%)	0.02	1 (1%) 77 59	36, 57, 97, 104	0
56	BW	77/77~(100%)	5.39	67 (87%) 0 0	95, 192, 197, 199	0
57	BX	5/19~(26%)	0.76	0 100 100	34,  36,  69,  80	0
58	BY	62/90~(68%)	0.14	0 100 100	55, 85, 125, 135	0
59	ΒZ	378/405~(93%)	-0.04	8 (2%) 63 43	23, 56, 92, 124	0
All	All	11143/11789~(94%)	0.24	743 (6%) 17 7	8, 50, 137, 199	0

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The worst 5 of 743 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
13	AC	111	ASP	20.3
13	AC	173	ALA	18.7
13	AC	73	ARG	18.7
11	AA	2182	G	18.0
13	AC	172	HIS	17.7

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

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

#### 6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

#### 6.4 Ligands (i)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	$\mathbf{B} ext{-factors}(\mathbf{A}^2)$	Q<0.9
62	KIR	ΒZ	1002	57/57	0.89	0.36	101,117,134,134	0
61	MG	ΒZ	1001	1/1	0.97	0.14	$25,\!25,\!25,\!25$	0
63	GDP	ΒZ	1003	28/28	0.97	0.14	36,43,44,45	0
60	ZN	BN	1001	1/1	0.98	0.13	51,51,51,51	0
60	ZN	BD	1001	1/1	0.98	0.19	59,59,59,59	0
61	MG	AA	3001	1/1	0.99	0.22	10,10,10,10	0



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Mol	Type	Chain	Res	Atoms	RSCC	RSR	$B-factors(Å^2)$	Q<0.9
60	ZN	A9	1001	1/1	0.99	0.07	58, 58, 58, 58	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.







### 6.5 Other polymers (i)

There are no such residues in this entry.

