



wwPDB X-ray Structure Validation Summary Report ⓘ

Jun 1, 2020 – 02:50 am BST

PDB ID : 1JZY
Title : Structural Basis for the Interaction of Antibiotics with the Peptidyl Transferase Center in Eubacteria
Authors : Schluenzen, F.; Zarivach, R.; Harms, J.; Bashan, A.; Tocilj, A.; Albrecht, R.; Yonath, A.; Franceschi, F.
Deposited on : 2001-09-17
Resolution : 3.50 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

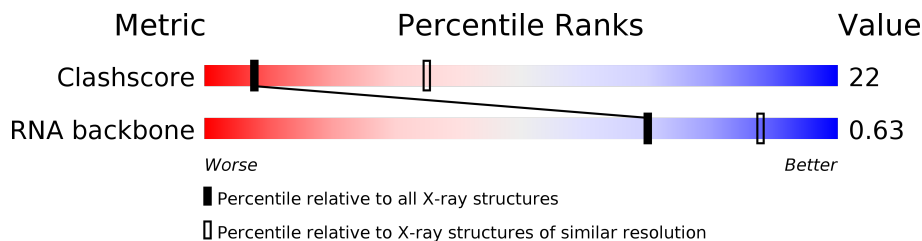
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.50 Å.

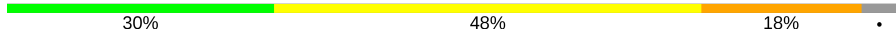


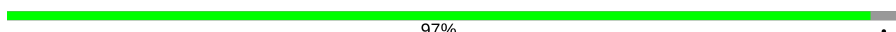
Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	1036 (3.58-3.42)
RNA backbone	3102	1002 (4.00-3.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	2880	
2	K	205	
3	L	134	
4	M	60	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	ERY	A	2881	-	-	X	-

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 59970 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 RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	A	2774	59532	26556	10982	19221	2773	0	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1526	U	Y	SEE REMARK 999	GB 15805042

- Molecule 2 is a protein called Ribosomal Protein L4.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf	Trace
			Total	C			
2	K	197	197	197	0	0	197

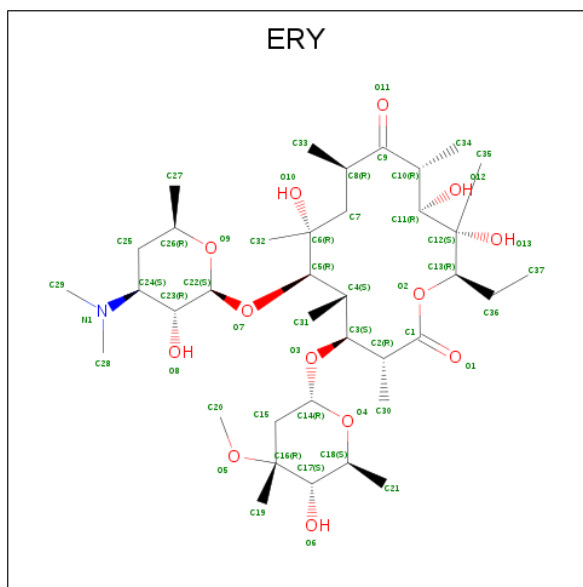
- Molecule 3 is a protein called Ribosomal Protein L22.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf	Trace
			Total	C			
3	L	130	130	130	0	0	130

- Molecule 4 is a protein called Ribosomal Protein L32.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf	Trace
			Total	C			
4	M	58	58	58	0	0	58

- Molecule 5 is ERYTHROMYCIN A (three-letter code: ERY) (formula: $C_{37}H_{67}NO_{13}$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
5	A	1	51	37	1	13	0	0

- Molecule 6 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

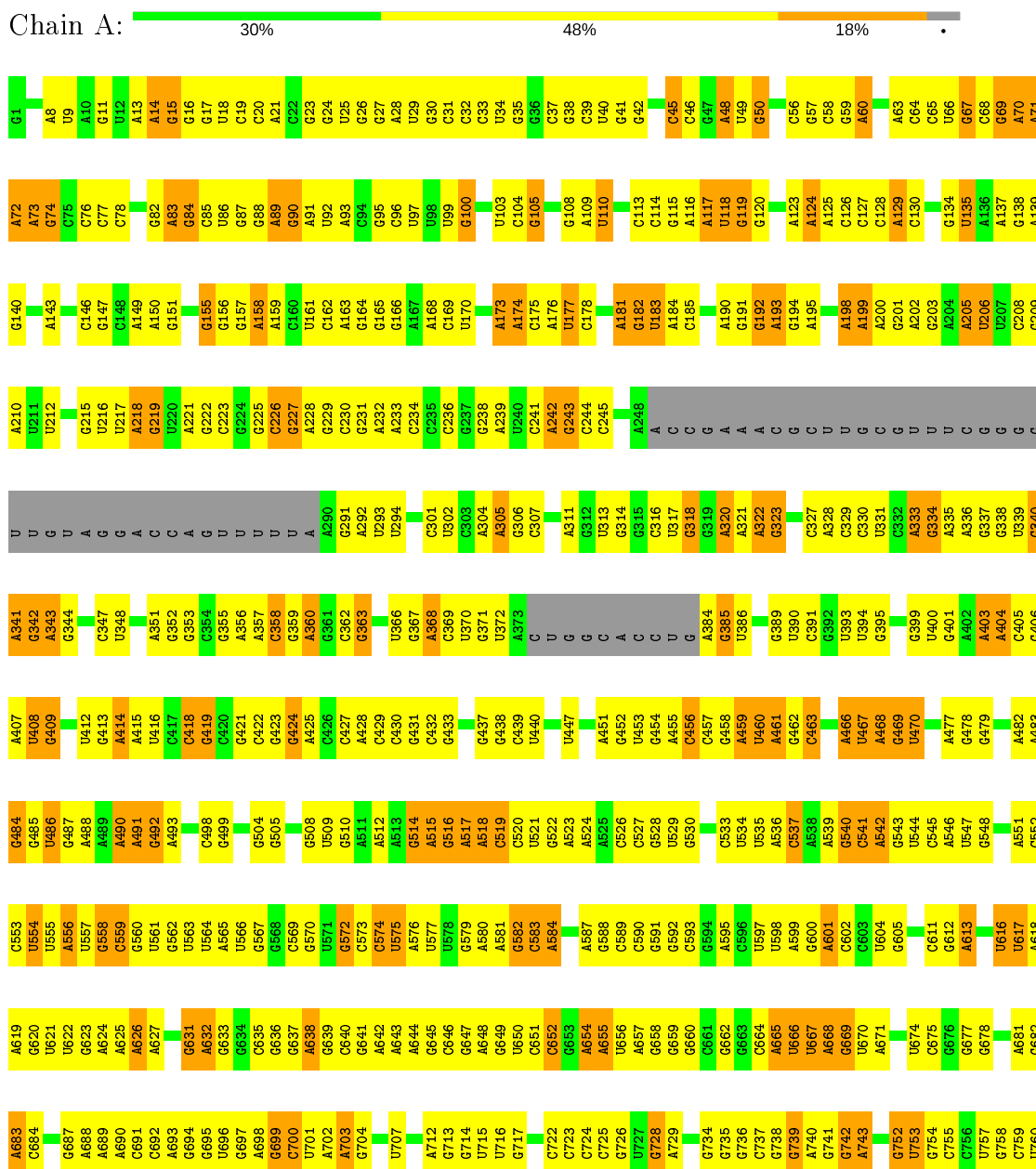
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Mg		
6	A	2	2	2	0	0

3 Residue-property plots

These plots are drawn for all protein, RNA and DNA 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.

Note EDS was not executed.

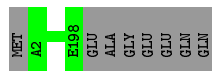
- Molecule 1: 23S rRNA



A1746	A1672	C1529	G1460	A1321	C1282	G1174	U1105	U1038	A964	C	C827	G761
G1747	C1673	U1530	G1465	G1322	C1283	A1175	A1106	A1039	C968	U	C828	A762
G1748	C1674	C1531	G1466	G1323	G1288	U1176	U1107	A1040	U969	A	C829	A763
G1749	C1675	A1532	U1467	G1324	A1288	U1177	U1108	G1041	A970	C	C830	A764
A1750	U1676	G1533	A1468	U1325	A1289	C1178	A1109	U1042	A971	A	C831	C765
A1751	A1604	A1534	U1469	U1326	A1290	C1183	G1110	U1043	A972	C	A832	C766
U1752	G1678	C1535	G1470	C1327	U1282	U1183	C1111	G1044	C972	C	A833	G767
A1753	U1679	G1536	G1471	G1328	U1283	U1187	C1112	U1045	C973	C	U768	U768
G1754	U1680	U1537	U1472	U1329	A1284	A1188	G1113	U1046	U974	U	A838	G772
G1755	A1681	A1538	U1473	G1330	G1285	A1189	G1114	U1047	C975	U	U839	G773
G1756	U1682	U1539	U1474	U1331	G1286	U1189	U1115	G1048	C976	A	U840	A774
G1757	G1683	C1540	G1475	G1332	A1286	C1190	U1116	U1049	U977	C	A841	U775
G1758	G1684	G1541	G1476	A1333	A1287	G1191	C1117	C1054	G978	C	G842	U776
A1759	A1685	U1541	U1477	A1334	U1288	A1192	G1118	A1055	U979	A	G843	G777
G1760	A1686	U1542	G1480	G1337	C1289	A1192	U1119	A1056	A980	C	G844	G778
G1761	C1687	U1543	U1481	U1338	G1289	U1193	A1120	U1057	G981	C	C850	U784
U1688	U1688	C1549	U1482	C1339	C1290	U1194	A1121	A1058	G982	C	C851	U785
G1763	G1618	C1550	G1483	U1340	G1272	U1195	G1123	U1059	C983	C	U852	U786
U1690	A1619	U1551	U1484	C1341	A1273	U1197	A1124	G1060	A984	C	C853	U787
G1691	G1691	C1552	U1485	U1342	U1274	C1198	U1125	A1061	G985	C	C854	A787
C1692	U1766	G1553	A1486	C1343	A1275	U1199	G1126	A1065	A994	C	G855	G788
A1693	G1767	A1554	C1417	G1344	U1276	G1200	A1129	G1066	A995	C	G856	G789
A1694	A1625	A1555	G1487	U1345	G1277	G1201	U1130	G1067	C996	C	U857	A790
U1769	A1626	U1556	C1489	G1346	A1278	U1202	U1131	A1068	C997	C	U858	G791
U1770	C1627	G1557	U1490	C1347	U1279	A1203	C1134	G1069	C998	C	U859	U792
A1771	C1688	C1558	U1491	U1348	U1280	G1204	C1135	U1070	C999	C	G860	G793
A1699	A1699	U1559	A1493	A1349	A1281	G1205	G1136	G1071	A999	C	G861	A794
C1772	G1703	G1560	G1494	U1350	U1282	U1209	U1137	U1072	G1000	C	G862	G795
A1773	C1704	A1561	G1495	G1351	C1283	G1210	A1138	G1073	A1001	C	A863	A796
A1774	G1704	G1562	G1496	U1352	G1284	G1210	A1139	U1074	C1002	C	C863	A797
A1775	U1705	U1563	C1497	G1353	A1285	U1211	A1140	G1075	C1003	C	A864	G798
A1776	U1635	G1564	G1498	A1354	U1286	U1212	U1141	G1076	A1004	C	A865	G799
A1777	U1584	U1565	G1499	A1355	A1287	U1213	G1142	U1077	U1005	C	U866	U800
U1778	C1640	G1566	U1500	U1356	A1288	C1214	A1143	U1078	C1006	C	G867	A801
A1782	G1642	C1571	U1501	G1357	A1289	A1215	U1144	G1079	A1007	C	U868	A802
U1787	U1645	U1572	G1502	A1433	G1291	U1216	C1145	U1080	C1008	C	C870	C803
C1788	G1716	A1574	G1504	U1434	A1292	C1218	G1146	A1081	A1012	C	U871	C804
U1789	A1717	G1575	G1505	G1435	A1293	G1219	G1149	G1082	G1013	C	G872	G805
G1790	C1576	C1576	U1506	G1436	A1293	G1220	U1150	G1083	G1014	C	U873	A806
C1791	U1651	G1579	A1507	A1366	G1298	C1221	C1151	A1084	U1015	C	A874	A807
C1792	G1652	C1580	G1508	A1367	A1299	G1222	C1152	G1085	U1016	C	G875	C808
A1793	A1653	U1581	U1509	G1368	U1300	G1223	A1153	U1086	C1016	C	A876	C809
A1794	C1654	C1582	A1510	G1369	U1301	U1224	A1154	G1087	A944	C	G877	U810
U1800	C1655	A1582	A1511	U1370	C1302	G1225	G1155	A1088	U1019	C	C878	G811
C1801	U1656	U1583	U1512	G1371	U1306	A1226	C1160	C1089	A1021	C	A879	G812
A1802	A1657	C1584	C1444	A1372	U1307	A1227	U1161	U1090	A1022	C	C880	A813
G1803	G1660	A1585	U1445	G1373	C1308	A1233	A1162	U1092	G950	C	A886	G814
U1807	C1661	U1588	U1446	G1374	G1309	C1234	C1163	U1093	G1024	C	G887	A815
C1808	G1662	G1589	U1447	G1377	C1310	U1240	C1164	A1096	G1028	C	G888	U816
C1809	C1663	U1590	G1450	C1380	C1311	G1241	G1165	A1097	C1029	C	C889	G818
U1810	G1664	U1591	U1451	U1381	U1312	G1241	A1166	G1098	U1030	C	U890	C819
A1811	C1736	C1592	U1452	G1382	U1313	U1244	A1167	U1099	G955	C	A891	U820
U1738	G1666	A1593	A1453	U1383	G1314	G1245	G1168	A1099	A1032	C	G892	A821
U1812	A1667	C1594	C1454	G1384	A1315	U1245	C1169	G1100	A956	C	G	G822
A1813	G1668	A1595	U1455	U1384	G1316	U1249	U1170	U1101	G957	C	G	U823
U1817	G1670	U1596	A1456	C1385	G1316	G1249	U1171	U1034	C958	C	G	U824
G1818	A1671	A1597	U1458	G1385	C1319	A1250	U1172	G1102	U1035	C	G	C825
		C1598	U1459	G1387	A1320	G1251	A1173	G1104	U1037	C	C	U826

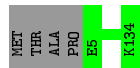
- Molecule 2: Ribosomal Protein L4

Chain K:  96%



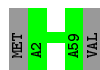
- Molecule 3: Ribosomal Protein L22

Chain L:  97%



- Molecule 4: Ribosomal Protein L32

Chain M:  97%



4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, α , β , γ	169.20Å 410.00Å 695.00Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 3.50	Depositor
% Data completeness (in resolution range)	(Not available) (20.00-3.50)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	CNS, REFMAC	Depositor
R, R_{free}	0.268 , 0.301	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	59970	wwPDB-VP
Average B, all atoms (Å ²)	66.0	wwPDB-VP

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: MG, ERY

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# $ Z > 5$	RMSZ	# $ Z > 5$
1	A	0.23	0/66661	0.66	3/103976 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1746	A	C2'-C3'-O3'	6.01	123.32	113.70
1	A	777	A	C2'-C3'-O3'	5.45	122.42	113.70
1	A	2588	U	C2'-C3'-O3'	5.12	121.89	113.70

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	59532	0	30004	1926	0
2	K	197	0	0	0	0
3	L	130	0	0	0	0
4	M	58	0	0	0	0
5	A	51	0	67	22	0
6	A	2	0	0	0	0
All	All	59970	0	30071	1944	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 22.

The worst 5 of 1944 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1747:G:H4'	1:A:1749:G:H11'	1.30	1.12
1:A:2668:U:H4'	1:A:2669:C:H5'	1.33	1.11
1:A:940:G:H3'	1:A:941:U:H5''	1.34	1.09
1:A:367:G:H2'	1:A:368:A:H5''	1.34	1.08
1:A:1199:U:H3'	1:A:1200:G:H5''	1.35	1.06

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

There are no protein backbone outliers to report in this entry.

5.3.2 Protein sidechains [i](#)

There are no protein residues with a non-rotameric sidechain to report in this entry.

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	2765/2880 (96%)	561 (20%)	147 (5%)

5 of 561 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	13	A
1	A	14	A
1	A	15	G
1	A	23	G
1	A	45	C

5 of 147 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	A	1285	A
1	A	1626	A
1	A	2615	U
1	A	1313	U
1	A	1357	U

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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 2 are monoatomic - leaving 1 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	ERY	A	2881	-	53,53,53	1.58	11 (20%)	82,82,82	3.07	44 (53%)

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
5	ERY	A	2881	-	-	7/72/107/107	1/3/3/3

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	2881	ERY	C7-C8	4.75	1.60	1.54
5	A	2881	ERY	O2-C13	-3.29	1.40	1.46
5	A	2881	ERY	C7-C6	3.20	1.59	1.54
5	A	2881	ERY	C35-C12	2.99	1.58	1.52
5	A	2881	ERY	C15-C14	2.88	1.58	1.51

The worst 5 of 44 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	2881	ERY	O5-C16-C19	-7.62	98.23	110.92
5	A	2881	ERY	O3-C3-C4	7.26	116.97	108.22
5	A	2881	ERY	C33-C8-C7	7.06	122.79	109.81
5	A	2881	ERY	C19-C16-C17	6.63	124.81	111.24
5	A	2881	ERY	O5-C16-C17	6.54	113.50	103.81

There are no chirality outliers.

5 of 7 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	2881	ERY	C17-C16-O5-C20
5	A	2881	ERY	O4-C14-O3-C3
5	A	2881	ERY	C1-C2-C3-O3
5	A	2881	ERY	C1-C2-C3-C4
5	A	2881	ERY	C6-C7-C8-C33

All (1) ring outliers are listed below:

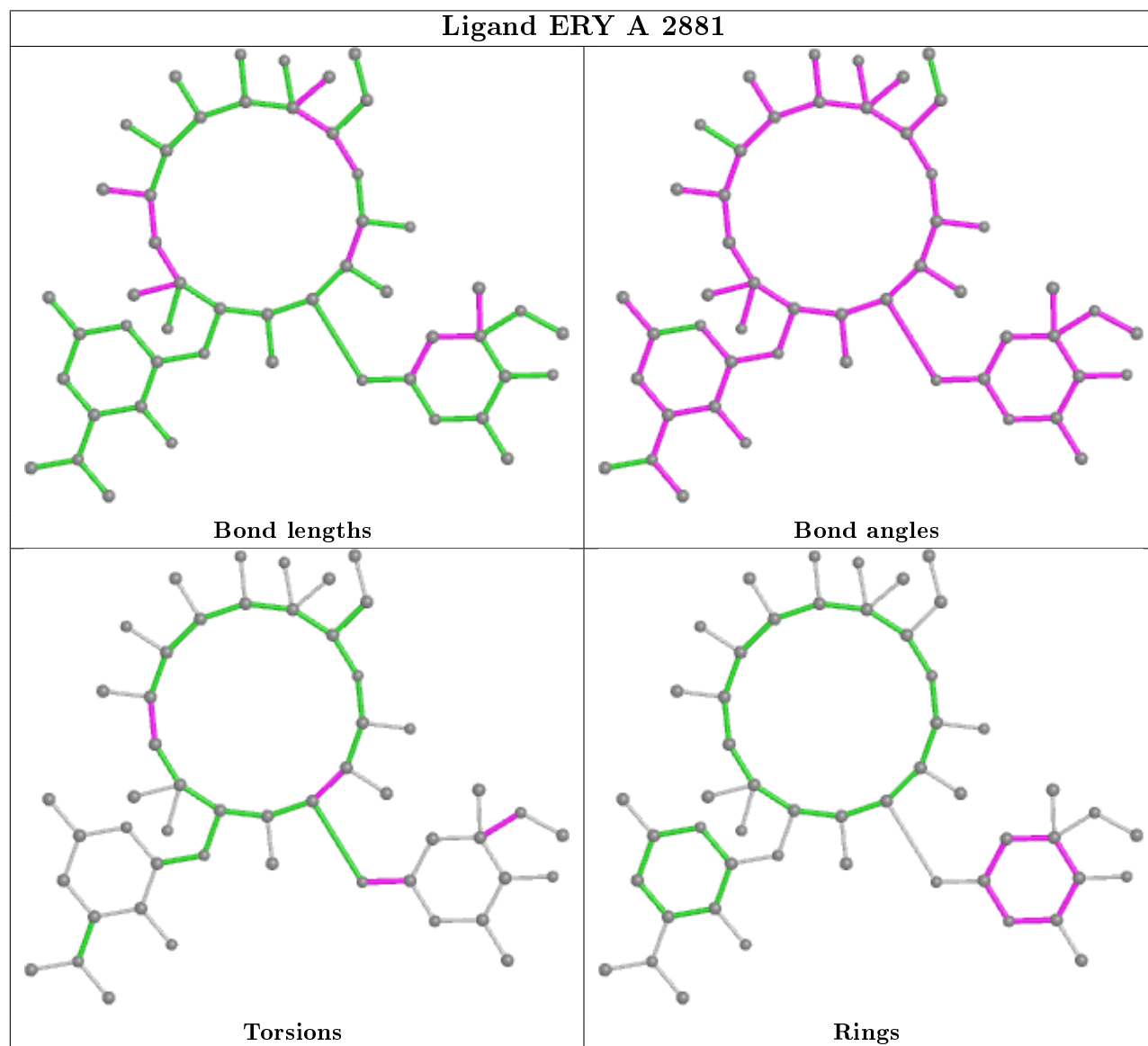
Mol	Chain	Res	Type	Atoms
5	A	2881	ERY	C14-C15-C16-C17-C18-O4

1 monomer is involved in 22 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	2881	ERY	22	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 than 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.



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

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.