



wwPDB X-ray Structure Validation Summary Report ⓘ

Feb 14, 2024 – 12:03 PM EST

PDB ID : 3LVG
Title : Crystal structure of a clathrin heavy chain and clathrin light chain complex
Authors : Wilbur, J.D.; Hwang, P.K.; Ybe, J.A.; Lane, M.; Sellers, B.D.; Jacobson, M.P.;
Fletterick, R.J.; Brodsky, F.M.
Deposited on : 2010-02-20
Resolution : 7.94 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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.36
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

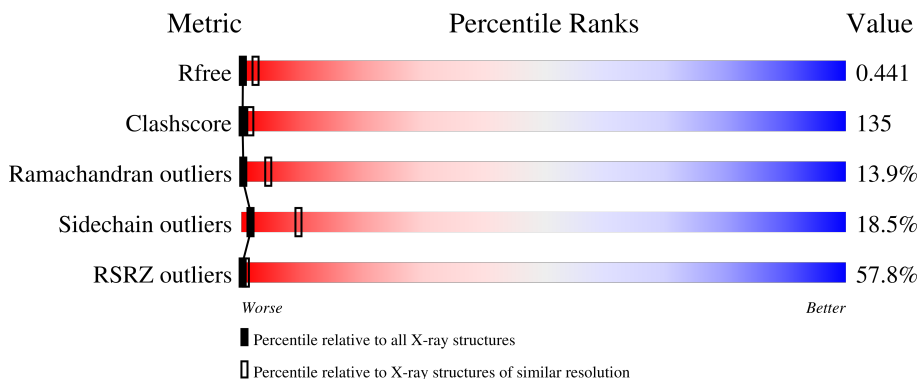
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 7.94 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))
R_{free}	130704	1005 (11.50-3.90)
Clashscore	141614	1070 (11.50-3.90)
Ramachandran outliers	138981	1003 (11.50-3.90)
Sidechain outliers	138945	1003 (11.50-3.86)
RSRZ outliers	127900	1004 (9.50-3.80)

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 $\leq 5\%$. 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	A	624	
1	B	624	
1	C	624	
2	D	190	
2	E	190	

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Mol	Chain	Length	Quality of chain
2	F	190	<p>A horizontal bar chart representing the quality of chain. The bar is divided into five segments with the following percentages from left to right: 19% (red), 18% (green), 36% (yellow), 13% (orange), and 31% (grey). A small black dot is located on the orange segment.</p>

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 16504 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 Clathrin heavy chain 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	553	4543	2896	767	855	25	0	0	0
1	B	553	4543	2896	767	855	25	0	0	0
1	C	553	4543	2896	767	855	25	0	0	0

There are 66 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1052	MET	-	expression tag	UNP P49951
A	1053	GLY	-	expression tag	UNP P49951
A	1054	SER	-	expression tag	UNP P49951
A	1055	SER	-	expression tag	UNP P49951
A	1056	HIS	-	expression tag	UNP P49951
A	1057	HIS	-	expression tag	UNP P49951
A	1058	HIS	-	expression tag	UNP P49951
A	1059	HIS	-	expression tag	UNP P49951
A	1060	HIS	-	expression tag	UNP P49951
A	1061	HIS	-	expression tag	UNP P49951
A	1062	SER	-	expression tag	UNP P49951
A	1063	SER	-	expression tag	UNP P49951
A	1064	GLY	-	expression tag	UNP P49951
A	1065	LEU	-	expression tag	UNP P49951
A	1066	VAL	-	expression tag	UNP P49951
A	1067	PRO	-	expression tag	UNP P49951
A	1068	ARG	-	expression tag	UNP P49951
A	1069	GLY	-	expression tag	UNP P49951
A	1070	SER	-	expression tag	UNP P49951
A	1071	HIS	-	expression tag	UNP P49951
A	1072	MET	-	expression tag	UNP P49951
A	1073	LEU	-	expression tag	UNP P49951
B	1052	MET	-	expression tag	UNP P49951

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Chain	Residue	Modelled	Actual	Comment	Reference
B	1053	GLY	-	expression tag	UNP P49951
B	1054	SER	-	expression tag	UNP P49951
B	1055	SER	-	expression tag	UNP P49951
B	1056	HIS	-	expression tag	UNP P49951
B	1057	HIS	-	expression tag	UNP P49951
B	1058	HIS	-	expression tag	UNP P49951
B	1059	HIS	-	expression tag	UNP P49951
B	1060	HIS	-	expression tag	UNP P49951
B	1061	HIS	-	expression tag	UNP P49951
B	1062	SER	-	expression tag	UNP P49951
B	1063	SER	-	expression tag	UNP P49951
B	1064	GLY	-	expression tag	UNP P49951
B	1065	LEU	-	expression tag	UNP P49951
B	1066	VAL	-	expression tag	UNP P49951
B	1067	PRO	-	expression tag	UNP P49951
B	1068	ARG	-	expression tag	UNP P49951
B	1069	GLY	-	expression tag	UNP P49951
B	1070	SER	-	expression tag	UNP P49951
B	1071	HIS	-	expression tag	UNP P49951
B	1072	MET	-	expression tag	UNP P49951
B	1073	LEU	-	expression tag	UNP P49951
C	1052	MET	-	expression tag	UNP P49951
C	1053	GLY	-	expression tag	UNP P49951
C	1054	SER	-	expression tag	UNP P49951
C	1055	SER	-	expression tag	UNP P49951
C	1056	HIS	-	expression tag	UNP P49951
C	1057	HIS	-	expression tag	UNP P49951
C	1058	HIS	-	expression tag	UNP P49951
C	1059	HIS	-	expression tag	UNP P49951
C	1060	HIS	-	expression tag	UNP P49951
C	1061	HIS	-	expression tag	UNP P49951
C	1062	SER	-	expression tag	UNP P49951
C	1063	SER	-	expression tag	UNP P49951
C	1064	GLY	-	expression tag	UNP P49951
C	1065	LEU	-	expression tag	UNP P49951
C	1066	VAL	-	expression tag	UNP P49951
C	1067	PRO	-	expression tag	UNP P49951
C	1068	ARG	-	expression tag	UNP P49951
C	1069	GLY	-	expression tag	UNP P49951
C	1070	SER	-	expression tag	UNP P49951
C	1071	HIS	-	expression tag	UNP P49951
C	1072	MET	-	expression tag	UNP P49951

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1073	LEU	-	expression tag	UNP P49951

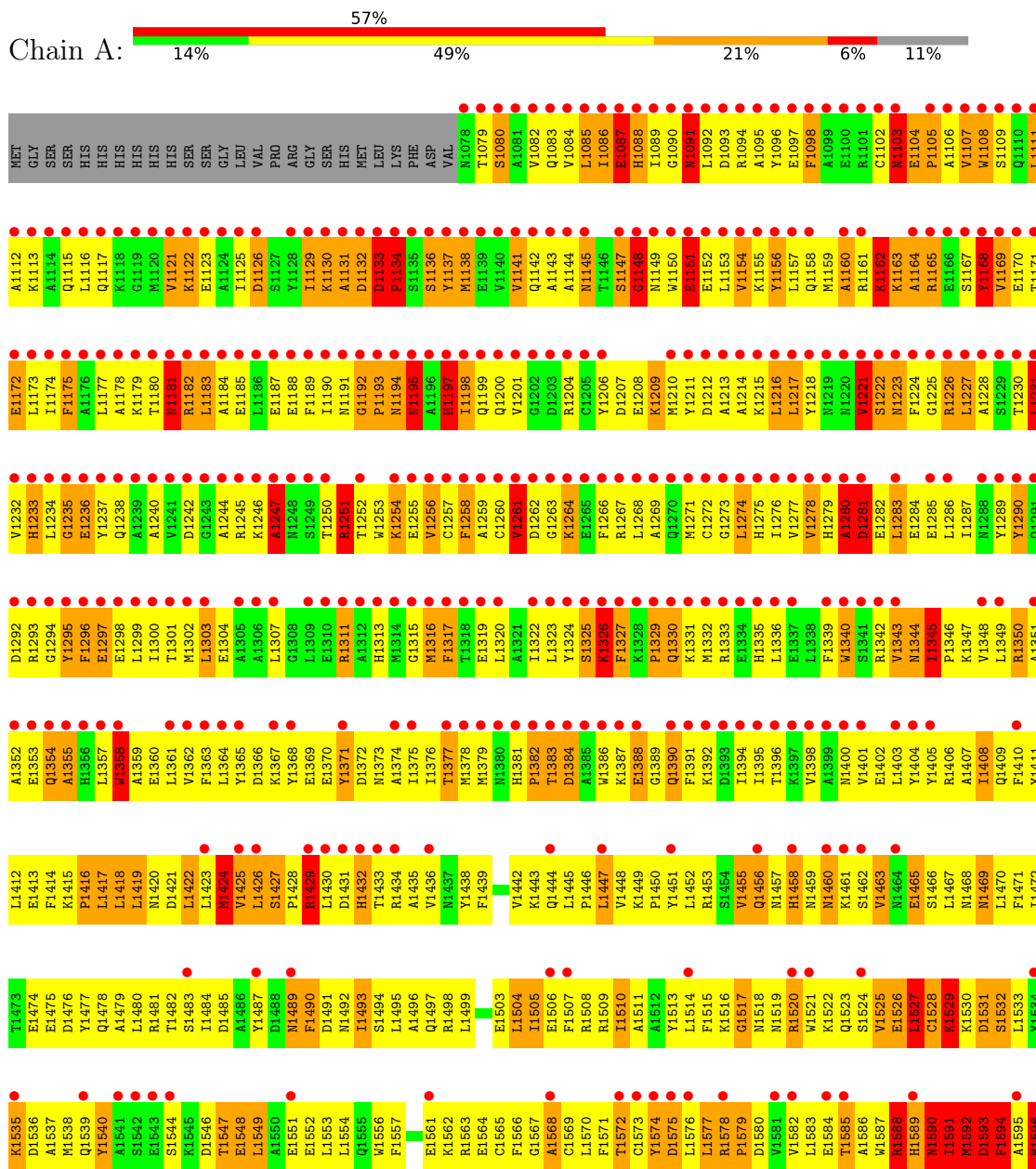
- Molecule 2 is a protein called Clathrin light chain B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	180	Total	C	N	O	S	0	0	0
			1146	690	227	228	1			
2	E	116	Total	C	N	O	S	0	0	0
			823	497	163	162	1			
2	F	132	Total	C	N	O	S	0	0	0
			906	546	179	180	1			

3 Residue-property plots

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.

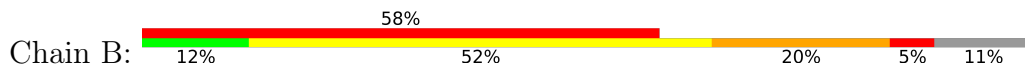
- Molecule 1: Clathrin heavy chain 1



F1597	F1598	F1599	I1600	Q1601	M1603	K1604	E1605	L1607	T1608	K1609	V1610	D1611	L1612	L1613	L1614	A1615	E1616	E1617	K1621	E1622	E1623	Q1625	A1626	T1627	E1628	T1629	Q1630
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TYR	GLY	TYR	THR	ALA	PRO	ALA	TYR	GLY	GLN	PRO	GLN	PRO	GLY	PHE	GLY	TYR	GLY	SER	SER	MET
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● Molecule 1: Clathrin heavy chain 1



MET	GLY	SER	SER	HIS	HIS	HIS	HIS	HIS	SER	SER	GLY	LEU	VAL	VAL	PRO	ARG	GLY	LEU	LYS	PHE	ASP	VAL	M1078	T1079	S1080	A1081	V1082	Q1083	V1084	L1085	L1086	E1087	H1088	I1089	G1090	R1091	L1092	D1093	R1094	LEU	MET	LEU	THR	ALA	PRO	GLY	SER	VAL	ALA	VAL	PRO	PRO	GLN	ALA	ALA	PHE	GLY
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A1112	K1113	Q1114	Q1115	H1116	Q1117	K1118	G1119	M1120	V1121	K1122	E1123	A1124	I1125	D1126	S1127	I1128	I1129	K1130	A1131	D1132	D1133	P1134	S1135	S1136	Y1137	M1138	E1139	V1140	V1141	Q1142	A1143	A1144	M1145	T1146	G1148	M1149	W1150	E1151	E1152	L1153	V1154	K1155	Y1156	Q1157	Q1158	A1159	A1160	R1161	K1162	K1163	A1164	R1165	E1166	L1167	Y1168	V1169	E1170	Q1171	T1171
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E1172	L1173	F1175	L1176	A1177	A1178	K1179	T1180	M1181	R1182	L1183	A1184	E1185	L1186	E1187	M1188	F1189	S1190	M1191	G1192	P1193	M1194	M1195	A1196	H1197	I1198	Q1199	I1200	V1201	G1202	D1203	R1204	C1205	F1206	D1207	E1208	K1209	M1210	Y1211	D1212	L1213	A1214	K1215	L1216	Y1217	Y1218	M1219	N1220	V1221	S1222	M1223	F1224	G1225	R1226	L1227	A1228	S1229	T1230	L1231
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V1232	H1233	L1234	G1235	L1236	Y1237	Q1238	A1239	A1240	D1241	D1242	G1243	A1244	R1245	K1246	L1247	M1248	F1249	T1250	R1251	W1252	K1253	E1254	V1255	C1257	F1258	A1259	I1260	V1261	D1262	G1263	K1264	E1265	R1266	L1267	L1268	A1269	G1270	M1271	C1272	G1273	L1274	H1275	I1276	V1277	L1278	V1279	H1279	A1280	D1281	E1282	L1283	E1284	G1285	L1286	L1287	M1288	Y1289	Q1291
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D1292	R1293	G1294	H1295	F1296	E1297	E1298	L1299	I1300	T1301	M1302	L1303	E1304	A1305	L1306	L1307	G1308	S1309	E1310	R1311	A1312	H1313	K1314	G1315	M1316	F1317	T1318	E1319	L1320	A1321	V1322	L1323	Y1324	S1325	K1326	F1327	K1328	P1329	Q1330	K1331	M1332	R1333	L1334	H1335	L1336	F1339	M1340	S1341	R1342	V1343	M1344	I1345	R1346	K1347	V1348	L1349	R1350	A1351	A1352
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E1353	Q1354	H1355	H1356	L1357	M1358	A1359	L1360	L1361	V1362	F1363	L1364	Y1365	D1366	K1367	Y1368	E1369	E1370	Y1371	D1372	M1373	A1374	I1375	L1376	T1377	M1378	M1379	N1380	H1381	Q1382	L1383	D1384	A1385	W1386	K1387	E1388	G1389	Q1390	F1391	K1392	D1393	I1394	I1395	T1396	K1397	V1398	A1399	M1400	V1401	E1402	L1403	Y1404	Y1405	R1406	A1407	I1408	I1409	F1410	L1411	L1412
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E1413	F1414	K1415	P1416	L1417	L1418	L1419	M1420	D1421	L1422	L1423	M1424	L1425	L1426	P1427	E1428	M1429	L1430	D1431	H1432	T1433	R1434	A1435	V1436	M1437	Y1438	F1439	S1440	K1441	V1442	K1443	Q1444	L1445	P1446	L1447	V1448	K1449	P1450	Y1451	L1452	R1453	S1454	V1455	Q1456	M1457	H1458	M1459	M1460	K1461	S1462	V1463	M1464	E1465	S1466	L1467	M1468	M1469	L1470	F1471	I1472
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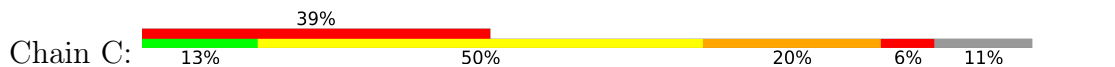
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Y1534	K1535	D1536	A1537	M1538	Q1539	Y1540	A1541	S1542	E1543	S1544	K1545	D1546	T1547	E1548	L1549	A1550	E1551	E1552	L1553	L1554	W1555	W1556	F1557	E1560	E1561	K1562	E1563	E1564	E1565	C1566	F1566	G1567	A1568	C1569	L1570	F1571	T1572	C1573	Y1574	D1575	L1576	L1577	R1578	P1579	D1580	V1581	V1582	L1583	E1584	T1585	A1586	W1587	R1588	C1589	M1590	I1591	M1592	D1593	F1594
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A1595	M1596	F1597	Y1598	F1599	I1600	Q1601	M1602	M1603	M1604	E1605	L1606	L1607	L1608	K1609	V1610	D1611	D1612	L1613	D1614	A1615	S1616	W1617	S1618	L1619	R1620	M1621	E1622	E1623	E1624	Q1625	A1626	M1627	E1628	T1629	Q1630	PRO	ILE	VAL	TYR	GLY	GLN	PRO	GLN	LEU	MET	LEU	LEU	THR	ALA	ALA	GLY	PRO	SER	VAL	VAL	ALA	VAL	PRO	PRO	PRO	GLN	ALA	PRO	PRO	GLY
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PHE	GLY	TYR	GLY	TYR	THR	ALA	PRO	ALA	TYR	GLY	GLN	PRO	GLN	PRO	GLY	PHE	GLY	TYR	GLY	SER	MET
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• Molecule 1: Clathrin heavy chain 1

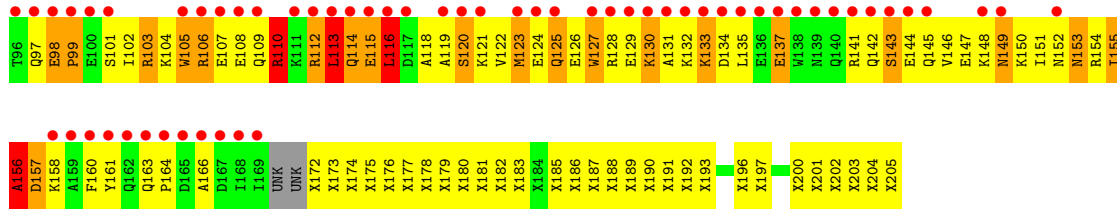


NET	M078	Y1298	L1361	R1481	Y1606	PRO
GLY	T1079	F1296	V1362	T1482	L1607	GLN
SER	S1080	E1297	F1363	I1483	L1608	GLN
SER	A1081	E1298	F1364	I1484	K1609	GLY
HIS	A1082	L1299	L1365	Y1423	V1610	PHE
HIS	Q1083	L1300	Y1366	Y1426	A1486	GLY
HIS	Q1084	T1301	K1367	S1427	Y1487	TYR
HIS	V1085	M1302	Y1368	F1428	D1488	SER
HIS	T1086	L1303	E1369	R1429	M1489	MET
SER	R1181	E1304	E1370	L1430	F1490	
SER	K1182	G1243	L1371	D1431	D1491	
GLY	E1183	L1244	L1307	H1432	H1492	
LEU	A1184	R1245	E1316	T1433	I1493	
VAL	L1185	K1246	R1311	A1434	S1494	
PRO	D1186	M1248	G1315	I1375	L1495	
PRO	S1127	E1187	G1316	T1377	A1496	
ARG	Y1128	F1188	M1317	M1378	R1497	
GLY	I1129	F1189	T1250	M1379	Q1498	
SER	K1130	I1190	R1251	M1380	L1499	
HIS	A1131	M1191	T1252	H1381	E1503	
MET	D1132	G1192	M1253	R1382	L1504	
LEU	D1133	P1193	K1254	T1383	I1505	
LYS	P1134	M1194	E1255	A1321	F1506	
PHE	S1135	M1195	Y1256	D1384	E1507	
ASP	S1136	A1196	C1257	A1385	L1508	
VAL	Y1137	H1197	F1258	W1386	R1508	
	M1138	I1198	A1259	S1325	R1509	
	I1139	Q1199	C1260	K1326	L1510	
	V1140	Q1200	Y1261	F1327	A1511	
	V1141	V1201	D1262	Q1328	P1450	
	Q1142	G1202	G1263	P1329	Q1390	
	A1143	D1203	K1264	Q1330	Y1451	
	A1144	L1204	E1265	K1331	L1452	
	T1145	C1205	R1266	D1332	R1453	
	S1147	Y1206	F1267	I1394	S1454	
	G1148	D1207	L1268	R1333	V1455	
	I1089	E1208	A1269	E1334	Q1456	
	G1090	K1209	Q1270	H1335	M1457	
	M1091	M1210	M1271	L1336	H1458	
	L1092	Y1211	C1272	F1339	M1459	
	D1093	D1212	G1273	W1340	M1460	
	R1094	A1213	L1274	V1343	K1461	
	A1095	V1154	H1275	M1344	S1462	
	Y1096	K1155	I1276	I1345	Y1463	
	F1097	Y1156	V1277	I1346	E1465	
	F1098	Q1158	V1278	P1346	S1466	
	A1099	M1159	H1279	K1347	L1467	
	R1101	E1160	D1281	V1348	M1468	
	C1102	R1161	E1282	L1349	M1469	
	M1103	K1162	L1283	R1350	F1470	
	E1104	K1163	E1284	A1351	I1471	
	P1105	A1164	E1285	A1352	L1472	
	A1106	R1165	L1286	E1353	E1473	
	V1107	E1166	L1287	Q1354	F1474	
	M1108	S1167	A1228	A1355	E1475	
	S1109	Y1168	S1229	H1356	D1476	
	I1170	V1169	T1231	L1357	L1416	
	L1171	V1232	G1294	W1358	L1417	
				A1359	L1418	
				E1360	L1419	
					M1420	

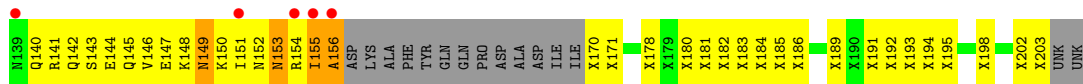
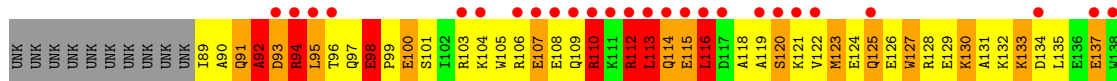
• Molecule 2: Clathrin light chain B



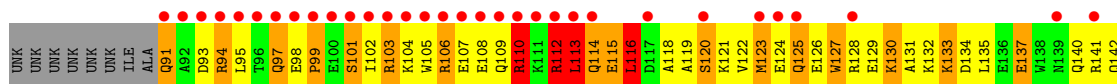
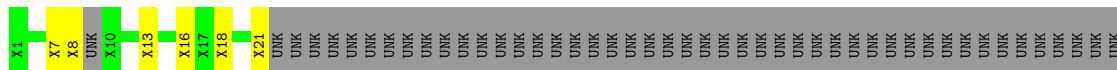
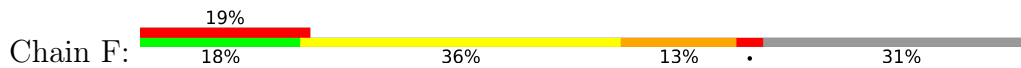
X1	X68	X69
X5	X60	X70
X10	X61	X71
UNK	X62	X72
X11	X63	UNK
X12	X64	UNK
X13	X65	UNK
X14	X66	UNK
X15	X67	UNK
X16	X68	UNK
X19	X69	UNK
X23	X70	UNK
UNK	X71	UNK
UNK	X72	UNK
X25	X73	UNK
X26	X74	UNK
X27	X75	UNK
X28	X76	UNK
X29	X77	UNK
X36	X78	UNK
UNK	X79	UNK
X38	X80	UNK
X45	X81	UNK
X46	X82	UNK
X47	X83	UNK
X48	X84	UNK
X49	X85	UNK
X50	X86	UNK
X51	X87	UNK
X52	X88	UNK
X53	X89	UNK
X54	X90	UNK
X55	X91	UNK
X58	X92	UNK
UNK	X93	UNK
UNK	X94	UNK
UNK	X95	UNK



• Molecule 2: Clathrin light chain B



• Molecule 2: Clathrin light chain B



4 Data and refinement statistics

Property	Value	Source
Space group	I 41 2 2	Depositor
Cell constants a, b, c, α , β , γ	228.56Å 228.56Å 710.32Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	100.00 – 7.94 82.22 – 4.99	Depositor EDS
% Data completeness (in resolution range)	99.6 (100.00-7.94) 63.0 (82.22-4.99)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.97 (at 5.12Å)	Xtrriage
Refinement program	CNS	Depositor
R, R_{free}	0.419 , 0.425 0.431 , 0.441	Depositor DCC
R_{free} test set	1304 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	310.7	Xtrriage
Anisotropy	0.082	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.41 , 472.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.30$, $\langle L^2 \rangle = 0.15$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.83	EDS
Total number of atoms	16504	wwPDB-VP
Average B, all atoms (Å ²)	295.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.39% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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.

5 Model quality i

5.1 Standard geometry i

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	0.83	20/4638 (0.4%)	1.27	83/6266 (1.3%)
1	B	0.80	17/4638 (0.4%)	1.26	83/6266 (1.3%)
1	C	0.77	13/4638 (0.3%)	1.20	73/6266 (1.2%)
2	D	0.75	0/647	1.15	8/866 (0.9%)
2	E	0.69	0/589	1.24	5/785 (0.6%)
2	F	0.77	0/642	1.20	8/859 (0.9%)
All	All	0.79	50/15792 (0.3%)	1.24	260/21308 (1.2%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	1	8
1	B	0	3
1	C	2	3
2	F	0	1
All	All	3	15

The worst 5 of 50 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	1162	LYS	C-O	-19.68	0.85	1.23
1	A	1222	SER	C-O	18.12	1.57	1.23
1	C	1182	ARG	C-O	17.19	1.56	1.23
1	C	1136	SER	C-O	-17.10	0.90	1.23
1	C	1248	ASN	N-CA	17.04	1.80	1.46

The worst 5 of 260 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	1162	LYS	CA-C-O	22.12	166.55	120.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	1279	HIS	O-C-N	-22.04	87.43	122.70
1	C	1223	ASN	N-CA-C	18.52	161.00	111.00
1	A	1103	ASN	C-N-CA	-17.51	77.93	121.70
1	A	1162	LYS	O-C-N	-16.77	95.87	122.70

All (3) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	A	1104	GLU	CA
1	C	1137	TYR	CA
1	C	1223	ASN	CA

5 of 15 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1103	ASN	Mainchain
1	A	1104	GLU	Mainchain
1	A	1133	ASP	Mainchain
1	A	1147	SER	Mainchain
1	A	1162	LYS	Mainchain

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4543	0	4454	1296	1
1	B	4543	0	4456	1248	3
1	C	4543	0	4455	1291	4
2	D	1146	0	735	252	0
2	E	823	0	633	246	0
2	F	906	0	669	239	0
All	All	16504	0	15402	4313	5

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 135.

The worst 5 of 4313 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:1258:PHE:HB2	1:A:1289:TYR:CD2	1.19	1.69
1:A:1253:TRP:CZ3	1:A:1276:ILE:HG22	1.25	1.64
1:C:1253:TRP:CZ3	1:C:1276:ILE:HG22	1.25	1.64
1:A:1258:PHE:CB	1:A:1289:TYR:CE2	1.75	1.63
1:B:1253:TRP:CZ3	1:B:1276:ILE:HG22	1.25	1.63

All (5) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1340:TRP:CZ2	1:C:1222:SER:OG[12_655]	1.80	0.40
1:C:1304:GLU:OE2	1:C:1334:GLU:OE2[15_645]	1.98	0.22
1:A:1199:GLN:NE2	1:A:1431:ASP:OD2[10_555]	2.13	0.07
1:B:1340:TRP:CZ2	1:C:1222:SER:CB[12_655]	2.15	0.05
1:B:1341:SER:OG	1:C:1203:ASP:OD2[12_655]	2.18	0.02

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	Percentiles	
1	A	551/624 (88%)	322 (58%)	152 (28%)	77 (14%)	0	4
1	B	551/624 (88%)	319 (58%)	161 (29%)	71 (13%)	0	5
1	C	551/624 (88%)	309 (56%)	164 (30%)	78 (14%)	0	4
2	D	77/190 (40%)	50 (65%)	16 (21%)	11 (14%)	0	4
2	E	66/190 (35%)	35 (53%)	21 (32%)	10 (15%)	0	4
2	F	76/190 (40%)	42 (55%)	20 (26%)	14 (18%)	0	2
All	All	1872/2442 (77%)	1077 (58%)	534 (28%)	261 (14%)	0	4

5 of 261 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1087	GLU
1	A	1091	ASN
1	A	1105	PRO
1	A	1122	LYS
1	A	1130	LYS

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 sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	485/541 (90%)	409 (84%)	76 (16%)	2	14
1	B	485/541 (90%)	404 (83%)	81 (17%)	2	12
1	C	485/541 (90%)	395 (81%)	90 (19%)	1	9
2	D	62/73 (85%)	45 (73%)	17 (27%)	0	3
2	E	61/73 (84%)	42 (69%)	19 (31%)	0	2
2	F	62/73 (85%)	42 (68%)	20 (32%)	0	2
All	All	1640/1842 (89%)	1337 (82%)	303 (18%)	1	9

5 of 303 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	1549	LEU
2	F	97	GLN
1	C	1591	ILE
2	D	133	LYS
2	F	137	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 63 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	1390	GLN
1	C	1590	ASN
1	B	1523	GLN
1	C	1539	GLN

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Mol	Chain	Res	Type
2	E	149	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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](#)

There are no ligands in this entry.

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, 95th 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	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	553/624 (88%)	4.14	356 (64%) 0 0	306, 348, 348, 348	0
1	B	553/624 (88%)	4.69	361 (65%) 0 0	257, 257, 318, 319	0
1	C	553/624 (88%)	2.70	241 (43%) 0 1	232, 232, 308, 309	0
2	D	79/190 (41%)	4.35	63 (79%) 0 0	298, 298, 298, 298	0
2	E	68/190 (35%)	2.31	31 (45%) 0 1	314, 314, 314, 314	0
2	F	78/190 (41%)	3.34	37 (47%) 0 1	339, 339, 339, 339	0
All	All	1884/2442 (77%)	3.79	1089 (57%) 0 1	232, 307, 348, 348	0

The worst 5 of 1089 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	1091	ASN	35.2
1	C	1078	ASN	33.8
1	C	1079	THR	31.8
1	C	1090	GLY	29.1
1	B	1105	PRO	27.6

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](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.