



Full wwPDB EM Validation Report ⓘ

Oct 16, 2024 – 01:21 AM JST

PDB ID : 8JY5
EMDB ID : EMD-36720
Title : Cryo-EM structure of human ABC transporter ABCC2 in apo" state
Authors : Mao, Y.X.; Chen, Z.P.; Wang, L.; Hou, W.T.; Chen, Y.X.; Zhou, C.Z.
Deposited on : 2023-07-03
Resolution : 4.17 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : **FAILED**
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

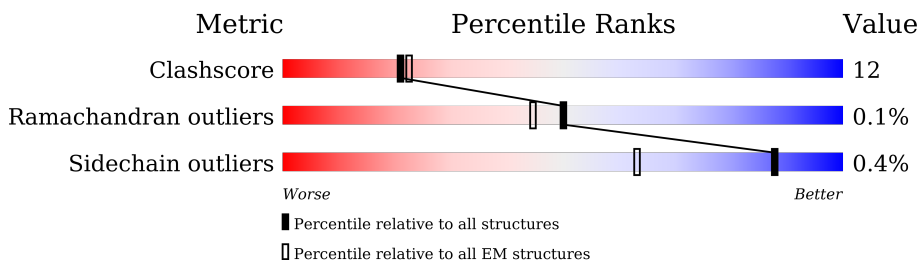
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.17 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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

Mol	Chain	Length	Quality of chain
1	A	1565	

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 11511 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called ATP-binding cassette sub-family C member 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1457	11511	7448	1908	2097	58	0	0

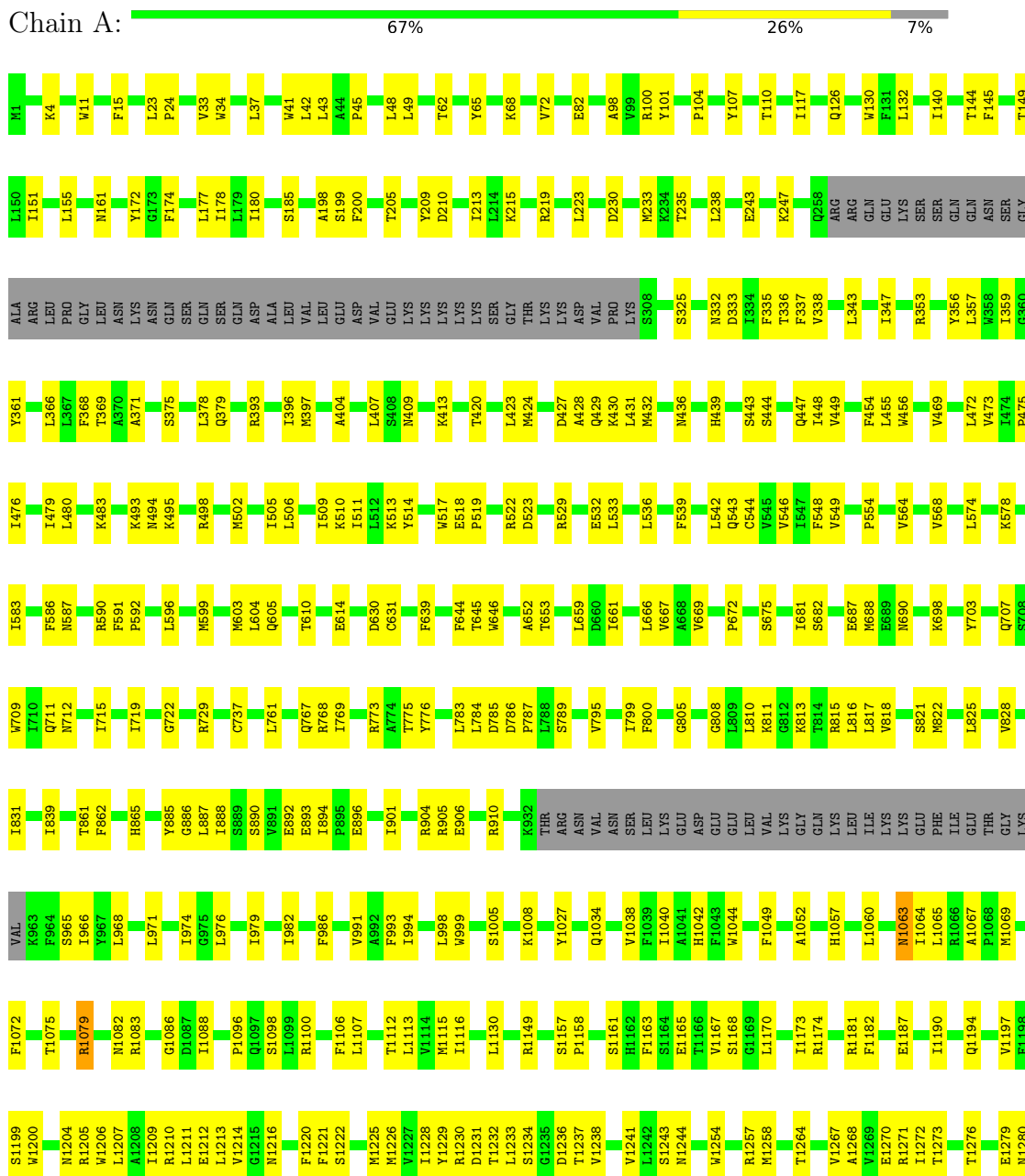
There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1546	LEU	-	expression tag	UNP Q92887
A	1547	GLU	-	expression tag	UNP Q92887
A	1548	ASP	-	expression tag	UNP Q92887
A	1549	TYR	-	expression tag	UNP Q92887
A	1550	LYS	-	expression tag	UNP Q92887
A	1551	ASP	-	expression tag	UNP Q92887
A	1552	ASP	-	expression tag	UNP Q92887
A	1553	ASP	-	expression tag	UNP Q92887
A	1554	ASP	-	expression tag	UNP Q92887
A	1555	LYS	-	expression tag	UNP Q92887
A	1556	VAL	-	expression tag	UNP Q92887
A	1557	GLU	-	expression tag	UNP Q92887
A	1558	HIS	-	expression tag	UNP Q92887
A	1559	HIS	-	expression tag	UNP Q92887
A	1560	HIS	-	expression tag	UNP Q92887
A	1561	HIS	-	expression tag	UNP Q92887
A	1562	HIS	-	expression tag	UNP Q92887
A	1563	HIS	-	expression tag	UNP Q92887
A	1564	HIS	-	expression tag	UNP Q92887
A	1565	HIS	-	expression tag	UNP Q92887

3 Residue-property plots i

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

- Molecule 1: ATP-binding cassette sub-family C member 2



E1281	Q1441	HIS
W1284	R1442	HIS
I1300	Q1443	HIS
F1302	L1444	HIS
Y1305	L1445	HIS
R1308	C1446	HIS
Y1309	L1447	HIS
L1315	R1453	
V1316	L1460	
I1320	D1461	
T1321	E1462	
C1322	A1463	
D1323	T1464	
I1324	A1465	
K1329	A1466	
I1330	V1467	
G1331	D1468	
V1332	I1475	
M1345	Q1476	
C1346	T1477	
R1349	T1478	
I1350	I1479	
I1368	V1488	
H1371	I1489	
L1377	T1490	
P1384	I1491	
G1389	I1498	
R1392	K1503	
L1395	I1512	
D1396	G1536	
P1397	I1E	
F1398	G1U	
M1399	A1S	
M1400	N1S	
D1403	V1L	
L1415	S1R	
V1430	T1R	
I1439	L1S	
G1440	P1H	
	L1U	
	A1P	
	T1Y	
	L1Y	
	A1P	
	A1P	
	L1S	
	V1L	
	G1U	
	H1S	

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	79970	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	55	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor

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	0.25	0/11752	0.48	0/15940

There are no bond length outliers.

There are no bond angle outliers.

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	11511	0	11670	271	0
All	All	11511	0	11670	271	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 12.

All (271) 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:767:GLN:NE2	1:A:786:ASP:O	2.12	0.83
1:A:518:GLU:HG2	1:A:519:PRO:HD3	1.60	0.83
1:A:894:ILE:HG13	1:A:1254:TRP:HE3	1.44	0.80
1:A:1149:ARG:HE	1:A:1264:THR:HG21	1.48	0.79
1:A:1447:LEU:HD21	1:A:1478:THR:HG21	1.68	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:639:PHE:HB2	1:A:659:LEU:H	1.51	0.75
1:A:510:LYS:HE3	1:A:1350:ILE:HG21	1.69	0.74
1:A:1300:ILE:HB	1:A:1324:ILE:HB	1.71	0.73
1:A:1170:LEU:HB3	1:A:1174:ARG:HH12	1.53	0.72
1:A:506:LEU:HD13	1:A:509:ILE:HD11	1.74	0.70
1:A:353:ARG:NH1	1:A:1230:ARG:O	2.25	0.70
1:A:23:LEU:HD12	1:A:24:PRO:HD2	1.73	0.69
1:A:1330:ILE:HG12	1:A:1503:LYS:HB3	1.74	0.69
1:A:886:GLY:HA3	1:A:1149:ARG:HH12	1.57	0.69
1:A:117:ILE:HG21	1:A:132:LEU:HD21	1.75	0.68
1:A:669:VAL:HB	1:A:818:VAL:HG22	1.75	0.68
1:A:800:PHE:O	1:A:805:GLY:N	2.24	0.68
1:A:1167:VAL:HA	1:A:1170:LEU:HD21	1.76	0.67
1:A:822:MET:HA	1:A:825:LEU:HD13	1.77	0.66
1:A:1392:ARG:NH1	1:A:1403:ASP:OD1	2.29	0.65
1:A:409:ASN:ND2	1:A:687:GLU:O	2.23	0.65
1:A:1395:LEU:HD21	1:A:1445:LEU:HD11	1.79	0.65
1:A:205:THR:HA	1:A:1209:ILE:HG21	1.77	0.65
1:A:1392:ARG:NH2	1:A:1399:ASN:OD1	2.29	0.65
1:A:979:ILE:HD12	1:A:982:ILE:HD11	1.78	0.64
1:A:813:LYS:O	1:A:815:ARG:NH1	2.31	0.64
1:A:1384:PRO:HG3	1:A:1443:GLN:OE1	1.96	0.64
1:A:1280:ASN:OD1	1:A:1281:GLU:N	2.31	0.64
1:A:1443:GLN:NE2	1:A:1463:ALA:O	2.30	0.63
1:A:1112:THR:HG23	1:A:1113:LEU:HD12	1.79	0.63
1:A:1284:TRP:HB3	1:A:1371:HIS:HB2	1.80	0.63
1:A:659:LEU:HD21	1:A:839:ILE:HG21	1.80	0.63
1:A:666:LEU:HB2	1:A:815:ARG:HH21	1.64	0.63
1:A:894:ILE:HG13	1:A:1254:TRP:CE3	2.32	0.62
1:A:1332:VAL:HB	1:A:1491:ILE:HG12	1.81	0.62
1:A:1476:GLN:HA	1:A:1479:ILE:HD12	1.81	0.62
1:A:1063:ASN:O	1:A:1067:ALA:N	2.33	0.61
1:A:1212:GLU:O	1:A:1216:ASN:N	2.28	0.61
1:A:325:SER:HG	1:A:439:HIS:HE2	1.43	0.61
1:A:729:ARG:NH2	1:A:775:THR:O	2.31	0.61
1:A:554:PRO:HB3	1:A:590:ARG:HD3	1.83	0.60
1:A:325:SER:OG	1:A:439:HIS:NE2	2.32	0.60
1:A:681:ILE:HD12	1:A:703:TYR:HE1	1.67	0.59
1:A:1234:SER:OG	1:A:1236:ASP:OD1	2.19	0.59
1:A:966:ILE:HG12	1:A:1270:GLU:OE2	2.03	0.59
1:A:1173:ILE:HD12	1:A:1182:PHE:HE2	1.68	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1462:GLU:HG3	1:A:1465:ALA:HB2	1.84	0.58
1:A:661:ILE:HD13	1:A:667:VAL:HG11	1.84	0.58
1:A:672:PRO:HG2	1:A:675:SER:HB3	1.86	0.58
1:A:810:LEU:O	1:A:815:ARG:NH1	2.36	0.58
1:A:1060:LEU:HD11	1:A:1272:ILE:HG23	1.86	0.58
1:A:82:GLU:OE2	1:A:104:PRO:HB3	2.03	0.58
1:A:1461:ASP:HA	1:A:1491:ILE:HB	1.85	0.58
1:A:1320:ILE:HD12	1:A:1512:ILE:HG23	1.85	0.57
1:A:994:ILE:HD11	1:A:1115:MET:HB2	1.86	0.57
1:A:511:ILE:HA	1:A:514:TYR:HD2	1.70	0.57
1:A:544:CYS:HB2	1:A:1042:HIS:HB3	1.86	0.57
1:A:1389:GLY:O	1:A:1430:VAL:N	2.35	0.57
1:A:1305:TYR:HE2	1:A:1346:CYS:HB3	1.70	0.56
1:A:62:THR:HG23	1:A:65:TYR:H	1.71	0.56
1:A:502:MET:HG3	1:A:505:ILE:HD11	1.87	0.56
1:A:1345:ASN:HA	1:A:1350:ILE:HD13	1.87	0.56
1:A:502:MET:HA	1:A:505:ILE:HG12	1.88	0.56
1:A:140:ILE:O	1:A:144:THR:OG1	2.24	0.55
1:A:235:THR:OG1	1:A:1187:GLU:HG2	2.06	0.55
1:A:1460:LEU:HB2	1:A:1490:THR:HA	1.89	0.55
1:A:432:MET:O	1:A:436:ASN:N	2.37	0.55
1:A:393:ARG:HD3	1:A:432:MET:HE3	1.89	0.55
1:A:991:VAL:HA	1:A:994:ILE:HG22	1.89	0.55
1:A:896:GLU:HB3	1:A:1254:TRP:CE3	2.41	0.55
1:A:518:GLU:HB2	1:A:1065:LEU:HD21	1.87	0.55
1:A:768:ARG:HH11	1:A:795:VAL:HG11	1.72	0.55
1:A:423:LEU:O	1:A:428:ALA:N	2.40	0.54
1:A:1384:PRO:CB	1:A:1442:ARG:HB3	2.37	0.54
1:A:1049:PHE:CD2	1:A:1096:PRO:HB3	2.43	0.54
1:A:890:SER:OG	1:A:892:GLU:OE1	2.25	0.54
1:A:1042:HIS:HD2	1:A:1100:ARG:HD3	1.73	0.54
1:A:1197:VAL:HA	1:A:1200:TRP:CD1	2.43	0.54
1:A:140:ILE:O	1:A:172:TYR:OH	2.24	0.54
1:A:1349:ARG:NH2	1:A:1368:ILE:O	2.41	0.54
1:A:1130:LEU:HD12	1:A:1214:VAL:HG13	1.90	0.53
1:A:1331:GLY:HA3	1:A:1498:ILE:HG23	1.89	0.53
1:A:564:VAL:O	1:A:568:VAL:HG13	2.09	0.53
1:A:808:GLY:O	1:A:811:LYS:NZ	2.31	0.53
1:A:480:LEU:HD12	1:A:542:LEU:HG	1.89	0.53
1:A:396:ILE:HD13	1:A:431:LEU:HD12	1.90	0.53
1:A:976:LEU:HA	1:A:979:ILE:HG22	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:887:LEU:HG	1:A:1149:ARG:NH1	2.24	0.52
1:A:1057:HIS:HD2	1:A:1088:ILE:HG12	1.75	0.52
1:A:1170:LEU:HB3	1:A:1174:ARG:NH1	2.24	0.52
1:A:1194:GLN:HA	1:A:1197:VAL:HG12	1.91	0.52
1:A:37:LEU:HD21	1:A:107:TYR:HE2	1.75	0.52
1:A:998:LEU:HD12	1:A:1115:MET:HE1	1.91	0.52
1:A:1209:ILE:O	1:A:1213:LEU:HD13	2.10	0.52
1:A:243:GLU:OE1	1:A:247:LYS:NZ	2.33	0.51
1:A:423:LEU:HA	1:A:427:ASP:HB2	1.92	0.51
1:A:887:LEU:HD11	1:A:1149:ARG:HD2	1.92	0.51
1:A:1415:LEU:HD21	1:A:1444:LEU:HB3	1.93	0.51
1:A:888:ILE:HG21	1:A:901:ILE:HG12	1.92	0.51
1:A:1206:TRP:CH2	1:A:1210:ARG:HG3	2.46	0.51
1:A:974:ILE:HG13	1:A:1052:ALA:HB2	1.92	0.51
1:A:325:SER:HG	1:A:439:HIS:CE1	2.29	0.50
1:A:1116:ILE:HA	1:A:1241:VAL:HG23	1.93	0.50
1:A:1460:LEU:O	1:A:1491:ILE:N	2.43	0.50
1:A:999:TRP:HZ3	1:A:1027:TYR:HD1	1.57	0.50
1:A:737:CYS:HA	1:A:799:ILE:HD13	1.94	0.50
1:A:1345:ASN:HB3	1:A:1350:ILE:HB	1.94	0.50
1:A:502:MET:HG2	1:A:506:LEU:HD23	1.93	0.49
1:A:548:PHE:HE2	1:A:1038:VAL:HG13	1.77	0.49
1:A:965:SER:HA	1:A:968:LEU:HD12	1.93	0.49
1:A:332:ASN:HD21	1:A:378:LEU:HD13	1.78	0.49
1:A:890:SER:HB3	1:A:893:GLU:HG3	1.93	0.49
1:A:420:THR:HG22	1:A:1163:PHE:HE2	1.77	0.49
1:A:666:LEU:HD11	1:A:817:LEU:HD23	1.94	0.49
1:A:1083:ARG:NE	1:A:1271:ARG:HB3	2.28	0.49
1:A:1232:THR:HG23	1:A:1233:LEU:HD22	1.95	0.49
1:A:126:GLN:NE2	1:A:198:ALA:O	2.36	0.49
1:A:1228:ILE:HG13	1:A:1229:TYR:CD1	2.48	0.49
1:A:1230:ARG:NH2	1:A:1231:ASP:OD1	2.46	0.49
1:A:1329:LYS:HD2	1:A:1488:VAL:HB	1.95	0.49
1:A:332:ASN:O	1:A:336:THR:HG23	2.13	0.48
1:A:522:ARG:NH2	1:A:523:ASP:OD1	2.46	0.48
1:A:1106:PHE:HD1	1:A:1107:LEU:HD12	1.78	0.48
1:A:529:ARG:HD3	1:A:1057:HIS:CE1	2.48	0.48
1:A:404:ALA:HA	1:A:407:LEU:HD23	1.96	0.48
1:A:1273:THR:HA	1:A:1276:THR:HG22	1.94	0.48
1:A:210:ASP:HA	1:A:213:ILE:HG22	1.95	0.48
1:A:666:LEU:HG	1:A:828:VAL:HG13	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:371:ALA:O	1:A:375:SER:N	2.37	0.48
1:A:786:ASP:OD2	1:A:789:SER:OG	2.21	0.48
1:A:1005:SER:HA	1:A:1008:LYS:NZ	2.29	0.48
1:A:337:PHE:HB3	1:A:454:PHE:HE2	1.79	0.48
1:A:494:ASN:HB3	1:A:532:GLU:OE2	2.14	0.48
1:A:1439:ILE:HD13	1:A:1442:ARG:HH21	1.79	0.47
1:A:548:PHE:CE2	1:A:1038:VAL:HG13	2.49	0.47
1:A:1075:THR:HA	1:A:1079:ARG:HH21	1.80	0.47
1:A:644:PHE:CD1	1:A:690:ASN:HA	2.50	0.47
1:A:1083:ARG:HD3	1:A:1271:ARG:HD2	1.96	0.47
1:A:709:TRP:HH2	1:A:711:GLN:HE21	1.63	0.47
1:A:904:ARG:HH22	1:A:1098:SER:HB2	1.79	0.47
1:A:1305:TYR:CE2	1:A:1346:CYS:HB3	2.49	0.47
1:A:368:PHE:HB2	1:A:1220:PHE:CD1	2.49	0.47
1:A:821:SER:HA	1:A:865:HIS:CD2	2.50	0.47
1:A:906:GLU:OE1	1:A:910:ARG:NH2	2.48	0.47
1:A:1384:PRO:HB3	1:A:1442:ARG:HB3	1.96	0.47
1:A:644:PHE:HB3	1:A:688:MET:HG3	1.96	0.47
1:A:784:LEU:HB3	1:A:787:PRO:HG3	1.97	0.47
1:A:825:LEU:HD23	1:A:831:ILE:HD13	1.97	0.47
1:A:215:LYS:NZ	1:A:219:ARG:HH11	2.13	0.47
1:A:574:LEU:HA	1:A:578:LYS:HD3	1.97	0.47
1:A:591:PHE:HB2	1:A:592:PRO:HD3	1.96	0.47
1:A:885:TYR:CZ	1:A:905:ARG:HD3	2.51	0.46
1:A:1206:TRP:CZ3	1:A:1210:ARG:HG3	2.50	0.46
1:A:1279:GLU:HG3	1:A:1280:ASN:H	1.80	0.46
1:A:583:ILE:HA	1:A:586:PHE:CD2	2.50	0.46
1:A:681:ILE:HD12	1:A:703:TYR:CE1	2.48	0.46
1:A:761:LEU:HD21	1:A:769:ILE:HD13	1.98	0.46
1:A:1467:VAL:HG11	1:A:1475:ILE:HD12	1.96	0.46
1:A:896:GLU:HB3	1:A:1254:TRP:CD2	2.51	0.46
1:A:357:LEU:HG	1:A:361:TYR:HE2	1.81	0.46
1:A:1234:SER:O	1:A:1237:THR:OG1	2.32	0.46
1:A:495:LYS:HZ3	1:A:498:ARG:HH12	1.65	0.45
1:A:1243:SER:OG	1:A:1244:ASN:N	2.48	0.45
1:A:469:VAL:O	1:A:473:VAL:HG23	2.16	0.45
1:A:543:GLN:HA	1:A:546:VAL:HG12	1.97	0.45
1:A:719:ILE:HG13	1:A:773:ARG:HA	1.97	0.45
1:A:712:ASN:ND2	1:A:1165:GLU:OE1	2.48	0.45
1:A:1157:SER:OG	1:A:1158:PRO:HD3	2.17	0.45
1:A:1149:ARG:HG2	1:A:1149:ARG:HH11	1.82	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:107:TYR:HA	1:A:110:THR:HG22	1.99	0.45
1:A:646:TRP:HD1	1:A:653:THR:HG1	1.63	0.45
1:A:821:SER:HA	1:A:865:HIS:HD2	1.81	0.45
1:A:15:PHE:HD2	1:A:24:PRO:HG3	1.82	0.45
1:A:41:TRP:HE1	1:A:110:THR:HB	1.82	0.45
1:A:45:PRO:HA	1:A:48:LEU:HG	1.99	0.45
1:A:1468:ASP:OD1	1:A:1468:ASP:N	2.50	0.45
1:A:413:LYS:HZ2	1:A:646:TRP:HB3	1.82	0.44
1:A:1302:PHE:HB2	1:A:1322:CYS:H	1.81	0.44
1:A:151:ILE:O	1:A:155:LEU:HG	2.16	0.44
1:A:645:THR:HB	1:A:652:ALA:HA	1.97	0.44
1:A:1309:TYR:HD2	1:A:1316:VAL:HG21	1.82	0.44
1:A:235:THR:HG21	1:A:1190:ILE:HG23	1.98	0.44
1:A:1207:LEU:O	1:A:1211:LEU:N	2.50	0.44
1:A:33:VAL:O	1:A:37:LEU:HD23	2.16	0.44
1:A:42:LEU:HG	1:A:43:LEU:HD22	1.99	0.44
1:A:533:LEU:HA	1:A:536:LEU:HB3	1.99	0.44
1:A:709:TRP:HE1	1:A:1168:SER:HG	1.63	0.44
1:A:1267:VAL:HA	1:A:1270:GLU:HG2	2.00	0.44
1:A:1079:ARG:HA	1:A:1082:ASN:HD21	1.83	0.44
1:A:1226:MET:HG2	1:A:1238:VAL:HG12	2.00	0.44
1:A:1396:ASP:OD2	1:A:1400:ASN:N	2.51	0.44
1:A:430:LYS:HE3	1:A:605:GLN:HG2	1.99	0.44
1:A:1005:SER:HA	1:A:1008:LYS:HZ2	1.83	0.44
1:A:509:ILE:O	1:A:513:LYS:HG2	2.18	0.43
1:A:145:PHE:O	1:A:149:THR:OG1	2.29	0.43
1:A:1377:LEU:O	1:A:1453:ARG:NH1	2.44	0.43
1:A:356:TYR:O	1:A:359:ILE:HG22	2.18	0.43
1:A:476:ILE:HG21	1:A:549:VAL:HG21	2.00	0.43
1:A:1236:ASP:OD1	1:A:1237:THR:N	2.51	0.43
1:A:1268:ALA:O	1:A:1272:ILE:HG12	2.19	0.43
1:A:33:VAL:HG23	1:A:34:TRP:HD1	1.84	0.43
1:A:68:LYS:O	1:A:72:VAL:HG23	2.18	0.43
1:A:177:LEU:HA	1:A:180:ILE:HG22	2.00	0.43
1:A:100:ARG:HH12	1:A:161:ASN:HD21	1.66	0.43
1:A:1441:GLN:O	1:A:1445:LEU:N	2.47	0.43
1:A:707:GLN:O	1:A:707:GLN:HG2	2.18	0.43
1:A:666:LEU:HD13	1:A:815:ARG:HE	1.83	0.43
1:A:455:LEU:HD12	1:A:456:TRP:N	2.34	0.43
1:A:1069:MET:HA	1:A:1072:PHE:HD2	1.84	0.43
1:A:586:PHE:O	1:A:590:ARG:HG3	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1060:LEU:HD21	1:A:1272:ILE:HD12	2.00	0.43
1:A:1308:ARG:HB3	1:A:1315:LEU:HD23	2.00	0.43
1:A:1221:PHE:HB3	1:A:1225:MET:HE1	2.01	0.42
1:A:429:GLN:HB3	1:A:905:ARG:NH2	2.34	0.42
1:A:587:ASN:HA	1:A:590:ARG:NH1	2.35	0.42
1:A:603:MET:SD	1:A:604:LEU:HD22	2.59	0.42
1:A:502:MET:HE1	1:A:1064:ILE:HD11	2.01	0.42
1:A:596:LEU:HA	1:A:599:MET:HE3	2.00	0.42
1:A:681:ILE:HD13	1:A:785:ASP:HB2	2.00	0.42
1:A:366:LEU:HA	1:A:369:THR:HG22	2.02	0.42
1:A:862:PHE:HB2	1:A:865:HIS:CE1	2.54	0.42
1:A:986:PHE:HB3	1:A:1107:LEU:HD22	2.02	0.42
1:A:233:MET:HA	1:A:238:LEU:HD11	2.02	0.42
1:A:443:SER:HB2	1:A:447:GLN:HE22	1.85	0.42
1:A:335:PHE:O	1:A:338:VAL:HG12	2.19	0.42
1:A:444:SER:HA	1:A:592:PRO:HB3	2.01	0.42
1:A:1082:ASN:O	1:A:1086:GLY:N	2.48	0.42
1:A:511:ILE:HD12	1:A:511:ILE:H	1.84	0.42
1:A:333:ASP:CG	1:A:447:GLN:HE21	2.23	0.42
1:A:610:THR:O	1:A:614:GLU:HG2	2.20	0.42
1:A:681:ILE:HG13	1:A:682:SER:N	2.34	0.42
1:A:722:GLY:HA3	1:A:1181:ARG:NH1	2.35	0.42
1:A:1197:VAL:HG23	1:A:1200:TRP:HE1	1.83	0.42
1:A:223:LEU:H	1:A:223:LEU:HD12	1.85	0.41
1:A:712:ASN:N	1:A:1165:GLU:OE2	2.44	0.41
1:A:413:LYS:NZ	1:A:646:TRP:HB3	2.34	0.41
1:A:1222:SER:HA	1:A:1225:MET:HE2	2.01	0.41
1:A:130:TRP:HB3	1:A:200:PHE:CE2	2.55	0.41
1:A:209:TYR:OH	1:A:1199:SER:O	2.23	0.41
1:A:1063:ASN:C	1:A:1063:ASN:HD22	2.24	0.41
1:A:379:GLN:HB2	1:A:1209:ILE:HD11	2.03	0.41
1:A:483:LYS:HD3	1:A:483:LYS:HA	1.86	0.41
1:A:1204:ASN:HB3	1:A:1205:ARG:NH1	2.36	0.41
1:A:185:SER:HB2	1:A:199:SER:H	1.85	0.41
1:A:448:ILE:HG13	1:A:449:VAL:N	2.35	0.41
1:A:517:TRP:CZ3	1:A:1397:PRO:HD2	2.55	0.41
1:A:971:LEU:HD23	1:A:979:ILE:HG12	2.03	0.41
1:A:23:LEU:HD12	1:A:24:PRO:CD	2.46	0.41
1:A:48:LEU:HD12	1:A:49:LEU:HD12	2.03	0.41
1:A:343:LEU:O	1:A:347:ILE:HG12	2.21	0.41
1:A:472:LEU:O	1:A:475:PRO:HD2	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:630:ASP:O	1:A:698:LYS:HG2	2.20	0.41
1:A:783:LEU:HD23	1:A:816:LEU:HB3	2.02	0.41
1:A:1040:ILE:O	1:A:1044:TRP:HB2	2.20	0.41
1:A:1257:ARG:HA	1:A:1257:ARG:HD3	1.78	0.41
1:A:1257:ARG:HB3	1:A:1258:MET:CE	2.51	0.41
1:A:861:THR:HG22	1:A:862:PHE:CD2	2.56	0.41
1:A:630:ASP:OD1	1:A:631:CYS:N	2.54	0.40
1:A:1069:MET:SD	1:A:1069:MET:N	2.93	0.40
1:A:429:GLN:HA	1:A:429:GLN:OE1	2.21	0.40
1:A:1439:ILE:HD13	1:A:1442:ARG:NH2	2.37	0.40
1:A:475:PRO:O	1:A:479:ILE:HG22	2.22	0.40
1:A:397:MET:HG3	1:A:424:MET:SD	2.62	0.40
1:A:539:PHE:O	1:A:543:GLN:HG2	2.22	0.40
1:A:729:ARG:HE	1:A:776:TYR:HA	1.86	0.40
1:A:11:TRP:HA	1:A:24:PRO:HG2	2.04	0.40
1:A:98:ALA:HA	1:A:101:TYR:CZ	2.56	0.40
1:A:174:PHE:O	1:A:178:ILE:HG12	2.21	0.40
1:A:715:ILE:H	1:A:715:ILE:HD12	1.86	0.40
1:A:993:PHE:HB2	1:A:1034:GLN:HE22	1.86	0.40
1:A:1158:PRO:HA	1:A:1161:SER:HB3	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	1451/1565 (93%)	1415 (98%)	35 (2%)	1 (0%)	48 82

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	230	ASP

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	1274/1392 (92%)	1269 (100%)	5 (0%)	89 91

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	LYS
1	A	493	LYS
1	A	1063	ASN
1	A	1079	ARG
1	A	1442	ARG

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

Mol	Chain	Res	Type
1	A	1057	HIS

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 oligosaccharides 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.