



Full wwPDB/EMDatabank EM Map/Model Validation Report ⓘ

Jan 26, 2020 – 10:45 PM EST

PDB ID : 6UEB
EMDB ID: : EMD-20753
Title : Structure of Rabies SAD-B19 L-P complex from cryo-EM
Authors : Horwitz, J.A.; Harrison, S.C.
Deposited on : 2019-09-20
Resolution : 3.30 Å(reported)

This is a Full wwPDB/EMDatabank EM Map/Model Validation Report
for a publicly released PDB/EMDB 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.

MolProbity : 4.02b-467
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP) : 2.4

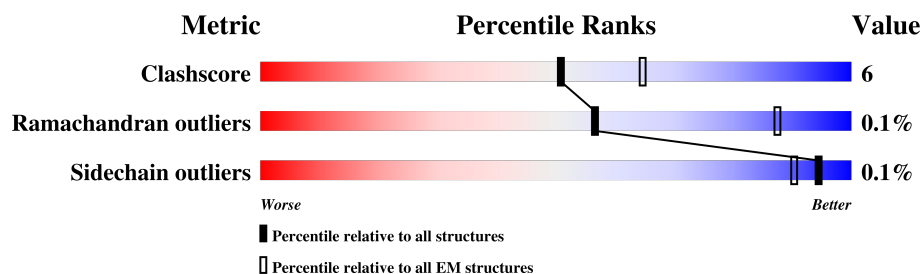
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY



The reported resolution of this entry is 3.30 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	136327	1886
Ramachandran outliers	132723	1663
Sidechain outliers	132532	1531

The table below summarises the geometric issues observed across the polymeric chains. The red, orange, yellow and green segments on the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	2127	 83% 16% .
2	B	42	 86% 14%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 34451 atoms, of which 17232 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 Large structural protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	2099	Total	C	H	N	O	S	0	0
			33865	10792	16965	2931	3097	80		

- Molecule 2 is a protein called Phosphoprotein,Phosphoprotein.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	B	42	Total	C	H	N	O	S	0	0
			584	190	267	57	68	2		

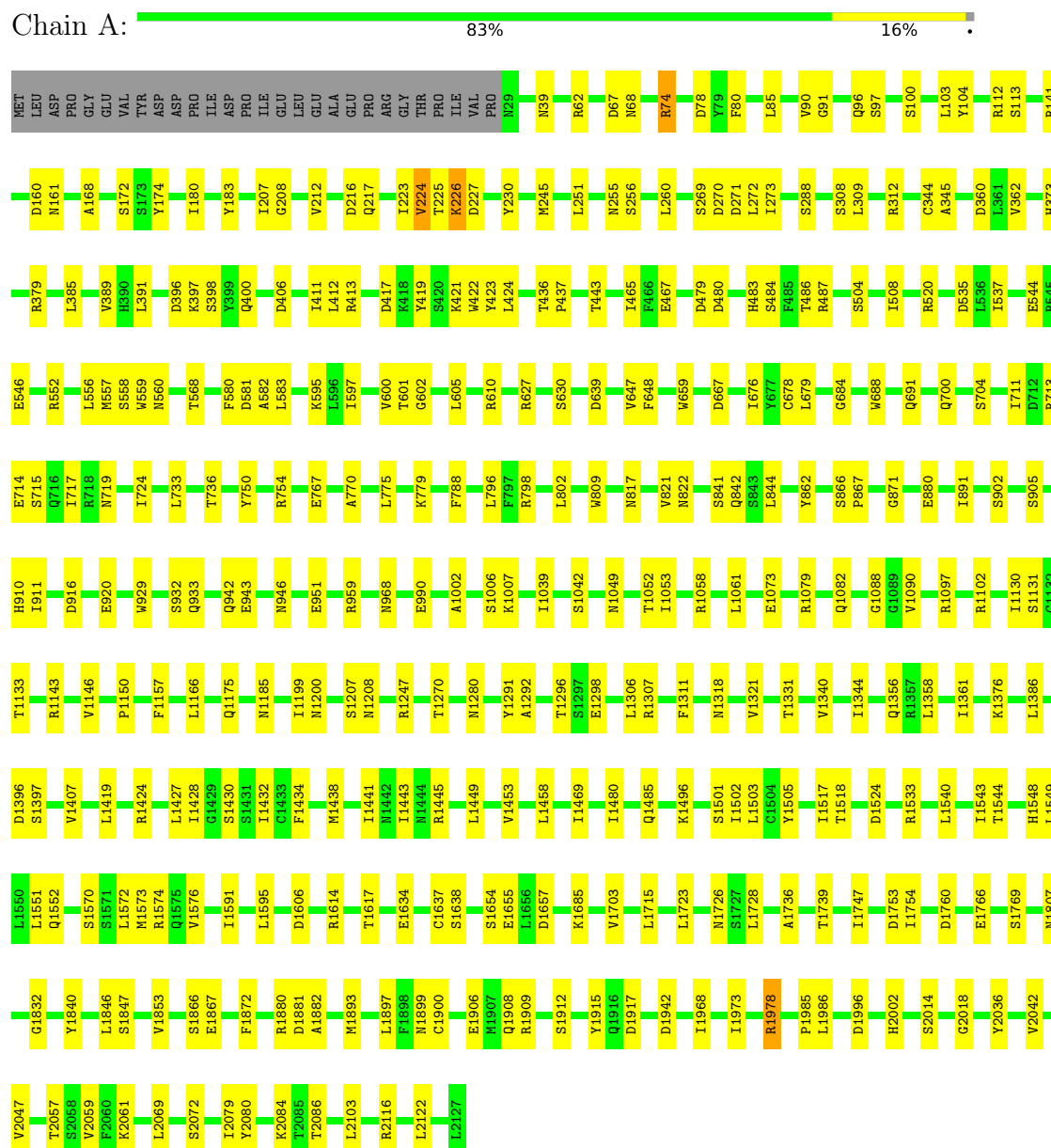
- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
3	A	2	Total	Zn	0
			2	2	

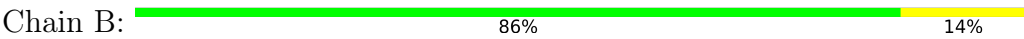
3 Residue-property plots

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.

- Molecule 1: Large structural protein



- Molecule 2: Phosphoprotein, Phosphoprotein



4 Experimental information

Property	Value	Source
Reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	44500	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI POLARA 300	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	72	Depositor
Minimum defocus (nm)	Not provided	Depositor
Maximum defocus (nm)	Not provided	Depositor
Magnification	Not provided	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor

5 Model quality

5.1 Standard geometry

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

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 >2	RMSZ	# Z >2
1	A	0.34	0/17290	0.52	0/23418
2	B	0.28	0/296	0.59	0/392
All	All	0.34	0/17586	0.52	0/23810

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

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	16900	16965	16964	218	0
2	B	317	267	268	5	0
3	A	2	0	0	0	0
All	All	17219	17232	17232	220	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 6.

All (220) 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:180:ILE:HD12	1:A:224:VAL:HG21	1.53	0.89
1:A:2042:VAL:HG12	1:A:2047:VAL:HG12	1.58	0.82
1:A:1469:ILE:HD11	1:A:1739:THR:HG21	1.61	0.82
1:A:255:ASN:ND2	1:A:809:TRP:O	2.13	0.81
1:A:68:ASN:HB3	1:A:227:ASP:OD2	1.83	0.78
1:A:1143:ARG:O	1:A:1270:THR:OG1	2.03	0.77
1:A:400:GLN:NE2	1:A:630:SER:O	2.19	0.76
1:A:1942:ASP:O	1:A:1978:ARG:NE	2.20	0.75
1:A:1496:LYS:NZ	2:B:72:VAL:O	2.19	0.75
1:A:1039:ILE:O	1:A:1042:SER:OG	2.05	0.73
1:A:1906:GLU:OE1	1:A:1909:ARG:NH2	2.23	0.72
1:A:951:GLU:O	1:A:968:ASN:ND2	2.22	0.72
1:A:610:ARG:NH2	1:A:736:THR:OG1	2.23	0.71
1:A:581:ASP:O	1:A:595:LYS:NZ	2.20	0.71
1:A:605:LEU:HD22	1:A:610:ARG:HB2	1.71	0.71
1:A:916:ASP:OD1	1:A:1102:ARG:NH2	2.25	0.70
1:A:1634:GLU:OE1	1:A:1634:GLU:N	2.24	0.70
1:A:1175:GLN:N	1:A:1175:GLN:OE1	2.25	0.70
1:A:1427:LEU:O	1:A:1430:SER:OG	2.05	0.69
1:A:1807:ASN:ND2	1:A:1840:TYR:O	2.25	0.69
1:A:546:GLU:OE2	1:A:552:ARG:NH1	2.26	0.69
1:A:308:SER:OG	1:A:312:ARG:NH1	2.25	0.68
1:A:1318:ASN:O	1:A:1321:VAL:HG12	1.93	0.68
1:A:112:ARG:NH1	1:A:172:SER:OG	2.26	0.68
1:A:68:ASN:OD1	1:A:226:LYS:NZ	2.25	0.68
1:A:260:LEU:HD23	1:A:273:ILE:HG22	1.77	0.67
1:A:767:GLU:OE1	1:A:779:LYS:NZ	2.28	0.66
1:A:2069:LEU:O	1:A:2072:SER:OG	2.11	0.65
1:A:1208:ASN:ND2	1:A:1331:THR:O	2.29	0.65
1:A:580:PHE:HB2	1:A:583:LEU:HD12	1.78	0.65
1:A:1432:ILE:HB	1:A:1544:THR:HG22	1.79	0.65
1:A:1150:PRO:O	1:A:1307:ARG:NH1	2.30	0.65
1:A:600:VAL:HG21	1:A:796:LEU:CD2	2.26	0.65
1:A:1280:ASN:OD1	1:A:1614:ARG:NH2	2.30	0.64
1:A:1053:ILE:HG23	1:A:1061:LEU:HD23	1.79	0.64
1:A:1469:ILE:CD1	1:A:1739:THR:HG21	2.27	0.64
1:A:483:HIS:O	1:A:504:SER:OG	2.17	0.63
1:A:174:TYR:CZ	1:A:251:LEU:HD13	2.34	0.62
1:A:910:HIS:O	1:A:911:ILE:HD13	1.99	0.62
1:A:1445:ARG:NH2	2:B:83:MET:O	2.31	0.62
1:A:1540:LEU:O	1:A:1544:THR:HG23	2.00	0.61
1:A:1185:ASN:OD1	1:A:1247:ARG:NH1	2.33	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:396:ASP:OD1	1:A:397:LYS:N	2.33	0.61
1:A:1549:LEU:O	1:A:1552:GLN:O	2.19	0.61
1:A:1428:ILE:HG22	1:A:1548:HIS:CG	2.36	0.61
1:A:103:LEU:HD12	1:A:104:TYR:N	2.17	0.60
1:A:1715:LEU:HD21	1:A:1723:LEU:HG	1.84	0.60
1:A:1434:PHE:CE2	1:A:1551:LEU:HD21	2.35	0.60
1:A:68:ASN:CB	1:A:227:ASP:OD2	2.49	0.60
1:A:62:ARG:NH1	1:A:667:ASP:OD2	2.35	0.59
1:A:97:SER:O	1:A:100:SER:OG	2.19	0.59
1:A:880:GLU:OE1	1:A:880:GLU:N	2.35	0.59
1:A:2014:SER:O	1:A:2018:GLY:N	2.36	0.58
1:A:557:MET:N	1:A:557:MET:SD	2.76	0.58
1:A:582:ALA:HA	1:A:724:ILE:O	2.02	0.58
1:A:1424:ARG:NH2	1:A:1524:ASP:O	2.36	0.58
1:A:1079:ARG:NH1	1:A:1082:GLN:OE1	2.37	0.57
1:A:1915:TYR:OH	1:A:2084:LYS:NZ	2.37	0.57
1:A:1485:GLN:NE2	1:A:1501:SER:O	2.38	0.57
1:A:1637:CYS:SG	1:A:1638:SER:N	2.78	0.57
1:A:1893:MET:HG2	1:A:1897:LEU:HD13	1.88	0.56
1:A:602:GLY:HA2	1:A:610:ARG:HB3	1.87	0.56
1:A:74:ARG:NH1	1:A:78:ASP:OD2	2.39	0.56
1:A:798:ARG:NH2	1:A:1157:PHE:O	2.39	0.56
1:A:866:SER:OG	1:A:871:GLY:O	2.22	0.56
1:A:1458:LEU:O	1:A:1503:LEU:HD21	2.06	0.55
1:A:391:LEU:O	1:A:627:ARG:NH1	2.40	0.55
1:A:1396:ASP:OD1	1:A:1397:SER:N	2.39	0.55
1:A:436:THR:HG23	1:A:437:PRO:HD3	1.89	0.55
1:A:2080:TYR:CE1	1:A:2086:THR:HG23	2.42	0.55
1:A:1549:LEU:O	1:A:1552:GLN:C	2.45	0.55
1:A:750:TYR:OH	1:A:754:ARG:NH1	2.40	0.55
1:A:1736:ALA:HB3	1:A:1739:THR:HG22	1.89	0.54
1:A:597:ILE:O	1:A:601:THR:HG23	2.07	0.54
1:A:67:ASP:OD1	1:A:68:ASN:ND2	2.41	0.54
1:A:1847:SER:OG	1:A:1880:ARG:NH2	2.38	0.54
1:A:1480:ILE:HD11	1:A:1502:ILE:HA	1.90	0.53
1:A:160:ASP:O	1:A:161:ASN:ND2	2.40	0.53
1:A:822:ASN:ND2	1:A:1073:GLU:OE1	2.41	0.53
1:A:1419:LEU:HD23	1:A:1505:TYR:CD2	2.44	0.53
1:A:582:ALA:CB	1:A:724:ILE:O	2.56	0.53
1:A:39:ASN:OD1	1:A:817:ASN:ND2	2.42	0.53
1:A:1143:ARG:NH2	1:A:1766:GLU:OE2	2.43	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:929:TRP:CD2	1:A:1090:VAL:HG12	2.45	0.52
1:A:1846:LEU:HD23	1:A:1846:LEU:O	2.10	0.52
1:A:2122:LEU:O	1:A:2122:LEU:HD12	2.10	0.52
1:A:715:SER:O	1:A:719:ASN:N	2.38	0.52
1:A:582:ALA:CA	1:A:724:ILE:O	2.58	0.52
1:A:1832:GLY:N	1:A:1866:SER:OG	2.42	0.52
1:A:1638:SER:OG	1:A:1917:ASP:OD1	2.25	0.52
1:A:422:TRP:NE1	1:A:443:THR:O	2.40	0.52
1:A:487:ARG:CG	1:A:537:ILE:HD11	2.40	0.52
1:A:600:VAL:HG21	1:A:796:LEU:HD23	1.92	0.52
1:A:841:SER:OG	1:A:842:GLN:N	2.43	0.52
1:A:180:ILE:HD12	1:A:224:VAL:CG2	2.34	0.51
1:A:1846:LEU:HD22	1:A:1872:PHE:CE2	2.45	0.51
1:A:1340:VAL:O	1:A:1340:VAL:HG12	2.11	0.51
1:A:582:ALA:HB2	1:A:724:ILE:O	2.11	0.51
1:A:2116:ARG:HG3	1:A:2122:LEU:HD11	1.93	0.50
1:A:821:VAL:HG23	1:A:821:VAL:O	2.11	0.50
1:A:1973:ILE:CD1	1:A:2103:LEU:HD13	2.41	0.50
1:A:1753:ASP:OD1	1:A:1754:ILE:N	2.44	0.50
1:A:1985:PRO:C	1:A:1986:LEU:HD23	2.32	0.50
1:A:990:GLU:OE2	1:A:1058:ARG:NH2	2.45	0.50
1:A:558:SER:OG	1:A:559:TRP:N	2.45	0.49
1:A:1655:GLU:N	1:A:1655:GLU:OE1	2.45	0.49
1:A:223:ILE:O	1:A:223:ILE:HG22	2.13	0.49
1:A:946:ASN:OD1	1:A:1097:ARG:NH2	2.44	0.49
1:A:1376:LYS:NZ	1:A:1617:THR:OG1	2.40	0.49
1:A:1306:LEU:HD12	1:A:1306:LEU:O	2.13	0.49
1:A:2057:THR:HG22	1:A:2057:THR:O	2.12	0.49
1:A:1543:ILE:HD11	1:A:1572:LEU:HD22	1.95	0.49
1:A:85:LEU:O	1:A:85:LEU:HD12	2.13	0.49
1:A:1973:ILE:HD11	1:A:2103:LEU:HD13	1.94	0.49
1:A:1292:ALA:O	1:A:1296:THR:HG22	2.13	0.49
1:A:113:SER:HB3	1:A:168:ALA:HB1	1.95	0.48
1:A:1002:ALA:HB2	1:A:1344:ILE:HD11	1.95	0.48
1:A:1832:GLY:N	1:A:1866:SER:O	2.41	0.48
1:A:269:SER:OG	1:A:270:ASP:N	2.45	0.48
1:A:309:LEU:HD23	1:A:788:PHE:HE1	1.78	0.48
1:A:1703:VAL:HG12	1:A:1726:ASN:HB3	1.96	0.48
1:A:942:GLN:OE1	1:A:1088:GLY:N	2.43	0.48
1:A:1654:SER:OG	1:A:1657:ASP:OD1	2.16	0.47
1:A:225:THR:HG22	1:A:225:THR:O	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:484:SER:HB3	1:A:556:LEU:HD12	1.96	0.47
1:A:141:ARG:NE	1:A:1291:TYR:OH	2.47	0.47
1:A:479:ASP:OD1	1:A:480:ASP:N	2.47	0.47
1:A:1386:LEU:HD13	1:A:1428:ILE:CD1	2.44	0.47
1:A:1760:ASP:OD1	1:A:1760:ASP:N	2.47	0.47
1:A:891:ILE:O	1:A:902:SER:OG	2.30	0.47
1:A:1899:ASN:OD1	1:A:1900:CYS:N	2.48	0.47
1:A:1881:ASP:OD1	1:A:1882:ALA:N	2.48	0.47
1:A:255:ASN:OD1	1:A:256:SER:N	2.48	0.47
1:A:1968:ILE:HG21	1:A:2079:ILE:HD12	1.97	0.47
1:A:183:TYR:OH	1:A:212:VAL:HG11	2.15	0.47
1:A:535:ASP:OD2	1:A:560:ASN:ND2	2.46	0.46
1:A:486:THR:HA	1:A:537:ILE:HD12	1.98	0.46
1:A:700:GLN:O	1:A:704:SER:OG	2.19	0.46
1:A:174:TYR:CE1	1:A:251:LEU:HD13	2.50	0.46
1:A:419:TYR:O	1:A:421:LYS:N	2.48	0.46
1:A:1306:LEU:HD13	1:A:1311:PHE:CZ	2.50	0.46
1:A:688:TRP:NE1	1:A:691:GLN:OE1	2.46	0.46
1:A:67:ASP:OD1	1:A:68:ASN:N	2.48	0.46
1:A:1361:ILE:O	1:A:1361:ILE:HG22	2.16	0.46
1:A:272:LEU:HD22	1:A:360:ASP:OD1	2.16	0.46
1:A:309:LEU:HD23	1:A:788:PHE:CE1	2.50	0.46
1:A:207:ILE:HG22	1:A:208:GLY:H	1.80	0.46
1:A:1573:MET:HA	1:A:1576:VAL:HG12	1.98	0.46
1:A:932:SER:OG	1:A:933:GLN:N	2.49	0.46
1:A:1207:SER:OG	1:A:1208:ASN:N	2.49	0.45
1:A:602:GLY:CA	1:A:610:ARG:HB3	2.45	0.45
1:A:2002:HIS:CE1	1:A:2036:TYR:HH	2.28	0.45
1:A:905:SER:OG	1:A:920:GLU:OE2	2.20	0.45
1:A:362:VAL:HG21	1:A:802:LEU:CD2	2.46	0.45
1:A:711:ILE:HG23	1:A:733:LEU:HD21	1.98	0.45
2:B:59:ASP:OD1	2:B:60:ASP:N	2.50	0.45
1:A:1407:VAL:HG12	1:A:1469:ILE:HG21	1.99	0.45
1:A:216:ASP:OD1	1:A:217:GLN:N	2.49	0.45
1:A:413:ARG:NH1	1:A:417:ASP:OD1	2.50	0.45
1:A:1133:THR:O	1:A:1133:THR:HG22	2.17	0.44
1:A:1438:MET:CG	1:A:1443:ILE:HD11	2.47	0.44
1:A:1728:LEU:HD12	1:A:1769:SER:OG	2.17	0.44
1:A:1356:GLN:O	1:A:1358:LEU:HD12	2.18	0.44
1:A:406:ASP:OD2	1:A:713:ARG:NH1	2.50	0.44
1:A:1747:ILE:HD12	1:A:1747:ILE:H	1.82	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1049:ASN:OD1	1:A:1052:THR:N	2.46	0.44
1:A:1441:ILE:HD12	2:B:84:ASP:HB3	2.00	0.44
1:A:1908:GLN:O	1:A:1912:SER:OG	2.29	0.44
1:A:959:ARG:NH2	1:A:968:ASN:OD1	2.51	0.44
1:A:183:TYR:CZ	1:A:212:VAL:HG11	2.53	0.44
1:A:467:GLU:OE2	1:A:520:ARG:NH2	2.51	0.44
1:A:1715:LEU:HD13	1:A:1754:ILE:HG13	2.00	0.44
1:A:423:TYR:CE1	1:A:465:ILE:HG23	2.53	0.44
1:A:1146:VAL:HG11	1:A:1296:THR:HG21	1.99	0.43
1:A:2080:TYR:HE1	1:A:2086:THR:HG23	1.83	0.43
1:A:1449:LEU:O	1:A:1453:VAL:HG23	2.18	0.43
1:A:1996:ASP:OD1	1:A:2061:LYS:NZ	2.50	0.43
1:A:821:VAL:HG21	1:A:867:PRO:HG2	2.00	0.43
1:A:80:PHE:HZ	1:A:230:TYR:CD1	2.36	0.43
1:A:1006:SER:OG	1:A:1007:LYS:N	2.51	0.43
1:A:245:MET:SD	1:A:373:HIS:N	2.87	0.43
1:A:412:LEU:HD21	1:A:424:LEU:HD21	2.00	0.43
1:A:487:ARG:HG2	1:A:537:ILE:HD11	2.01	0.42
2:B:68:GLU:N	2:B:68:GLU:OE1	2.41	0.42
1:A:344:CYS:SG	1:A:345:ALA:N	2.93	0.42
1:A:862:TYR:OH	1:A:1073:GLU:OE2	2.30	0.42
1:A:1715:LEU:HB2	1:A:1754:ILE:HD11	2.01	0.42
1:A:269:SER:OG	1:A:271:ASP:OD1	2.35	0.42
1:A:1591:ILE:HG12	1:A:1595:LEU:HD12	2.01	0.42
1:A:379:ARG:NH2	1:A:684:GLY:O	2.49	0.42
1:A:396:ASP:OD1	1:A:398:SER:N	2.47	0.42
1:A:659:TRP:CD2	1:A:676:ILE:HD11	2.55	0.42
1:A:1199:ILE:HG23	1:A:1200:ASN:N	2.36	0.41
1:A:1853:VAL:HG22	1:A:1872:PHE:CD1	2.56	0.41
1:A:568:THR:HG23	1:A:648:PHE:CE2	2.55	0.41
1:A:1570:SER:OG	1:A:1574:ARG:NH1	2.53	0.41
1:A:508:ILE:H	1:A:508:ILE:HD12	1.86	0.41
1:A:90:VAL:HG12	1:A:91:GLY:H	1.85	0.41
1:A:544:GLU:OE1	1:A:544:GLU:N	2.54	0.41
1:A:770:ALA:HB1	1:A:775:LEU:O	2.21	0.41
1:A:2002:HIS:ND1	1:A:2036:TYR:OH	2.36	0.41
1:A:385:LEU:O	1:A:389:VAL:HG23	2.21	0.41
1:A:1130:ILE:O	1:A:1131:SER:OG	2.34	0.41
1:A:678:CYS:SG	1:A:679:LEU:N	2.94	0.41
1:A:943:GLU:OE2	1:A:1079:ARG:NH1	2.53	0.41
1:A:1517:ILE:O	1:A:1518:THR:OG1	2.31	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1893:MET:CG	1:A:1897:LEU:HD13	2.50	0.41
1:A:714:GLU:O	1:A:717:ILE:HG22	2.21	0.41
1:A:2059:VAL:HG23	1:A:2059:VAL:O	2.20	0.41
1:A:639:ASP:OD2	1:A:647:VAL:N	2.39	0.40
1:A:1407:VAL:CG1	1:A:1469:ILE:HG21	2.51	0.40
1:A:1533:ARG:NH1	1:A:1606:ASP:OD1	2.54	0.40
1:A:1166:LEU:N	1:A:1166:LEU:HD12	2.37	0.40
1:A:844:LEU:N	1:A:1298:GLU:OE1	2.53	0.40
1:A:602:GLY:HA2	1:A:610:ARG:CB	2.49	0.40
1:A:96:GLN:NE2	1:A:288:SER:O	2.54	0.40
1:A:1685:LYS:NZ	1:A:1867:GLU:OE1	2.50	0.40
1:A:269:SER:HG	1:A:271:ASP:CG	2.22	0.40
1:A:174:TYR:CE2	1:A:251:LEU:HD13	2.57	0.40
1:A:411:ILE:HG23	1:A:412:LEU:HD12	2.02	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	2097/2127 (99%)	2085 (99%)	10 (0%)	2 (0%)	53	84
2	B	35/42 (83%)	34 (97%)	1 (3%)	0	100	100
All	All	2132/2169 (98%)	2119 (99%)	11 (0%)	2 (0%)	56	84

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	224	VAL
1	A	226	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 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	1901/1927 (99%)	1899 (100%)	2 (0%)	94	98
2	B	30/30 (100%)	30 (100%)	0	100	100
All	All	1931/1957 (99%)	1929 (100%)	2 (0%)	94	98

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	74	ARG
1	A	1978	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	B	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	B	5:UNK	C	51:GLU	N	20.90