Full wwPDB EM Validation Report ⓘ

Jul 16, 2025 – 10:52 AM JST

PDB ID	:	8JB5 / pdb_00008jb5
EMDB ID	:	EMD-36141
Title	:	The cryo-EM structure of Paeniclostridium sordellii lethal toxin (TcsL)
Authors	:	Zhan, X.; Tao, L.
Deposited on	:	2023-05-08
Resolution	:	2.90 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:

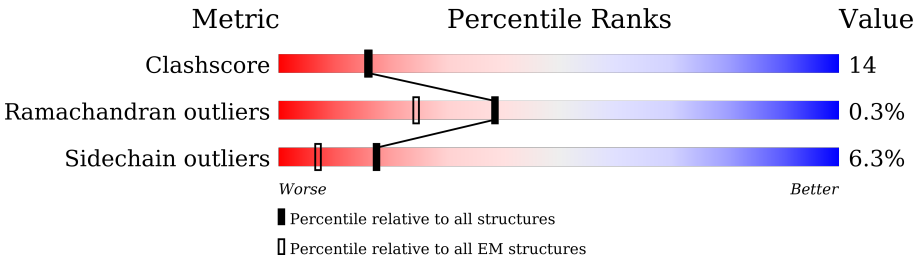
EMDB validation analysis	:	FAILED
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 2.90 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 <=5%

Mol	Chain	Length	Quality of chain
1	A	2372	69% 27%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 19027 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 Cytotoxin-L.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2355	19026	12183	3022	3774	47	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	2365	HIS	-	expression tag	UNP T0D3N5
A	2366	HIS	-	expression tag	UNP T0D3N5
A	2367	HIS	-	expression tag	UNP T0D3N5
A	2368	HIS	-	expression tag	UNP T0D3N5
A	2369	HIS	-	expression tag	UNP T0D3N5
A	2370	HIS	-	expression tag	UNP T0D3N5
A	2371	HIS	-	expression tag	UNP T0D3N5
A	2372	HIS	-	expression tag	UNP T0D3N5

- Molecule 2 is ZINC ION (CCD ID: ZN) (formula: Zn).

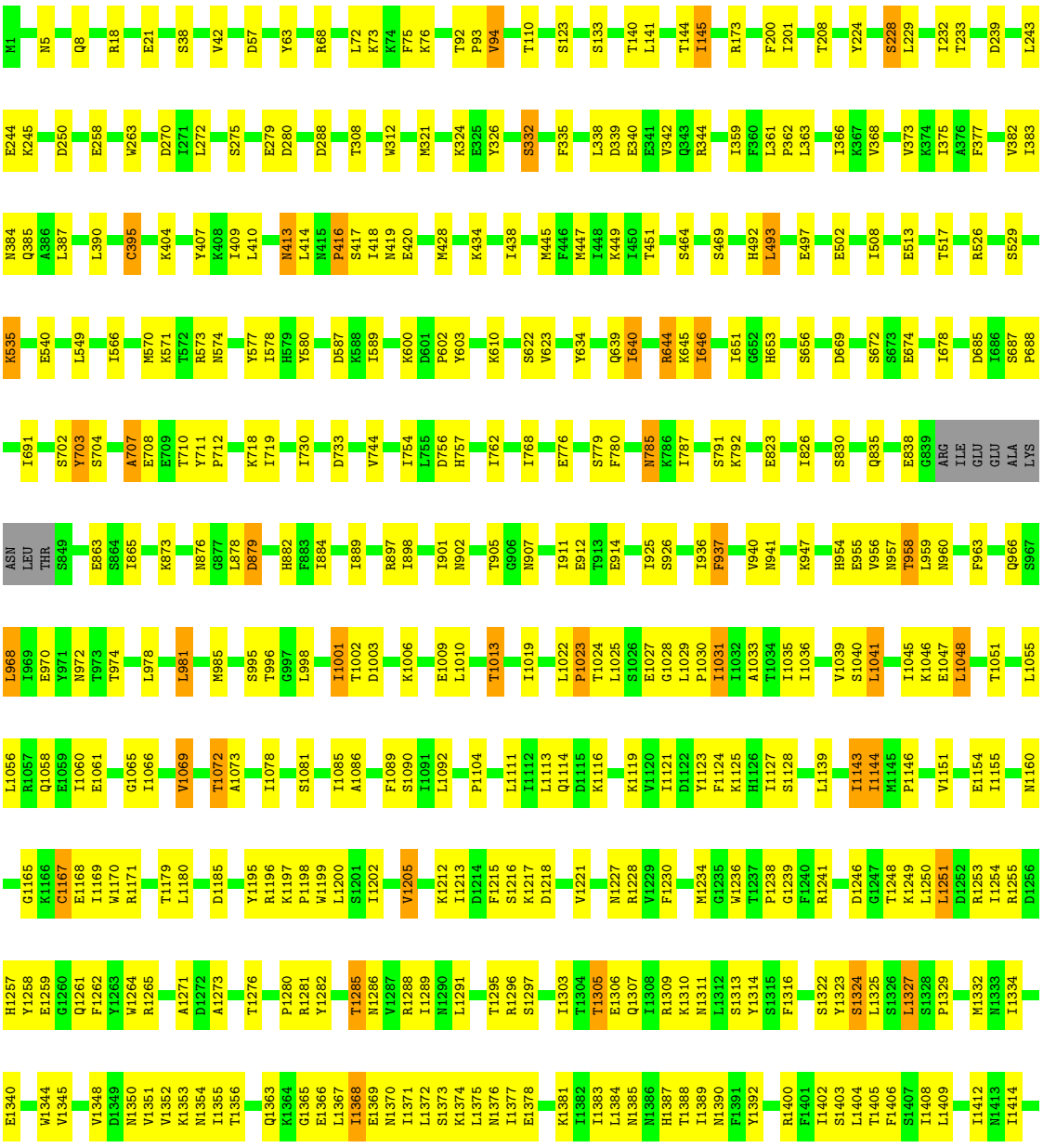
Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
2	A	1	1	1	0

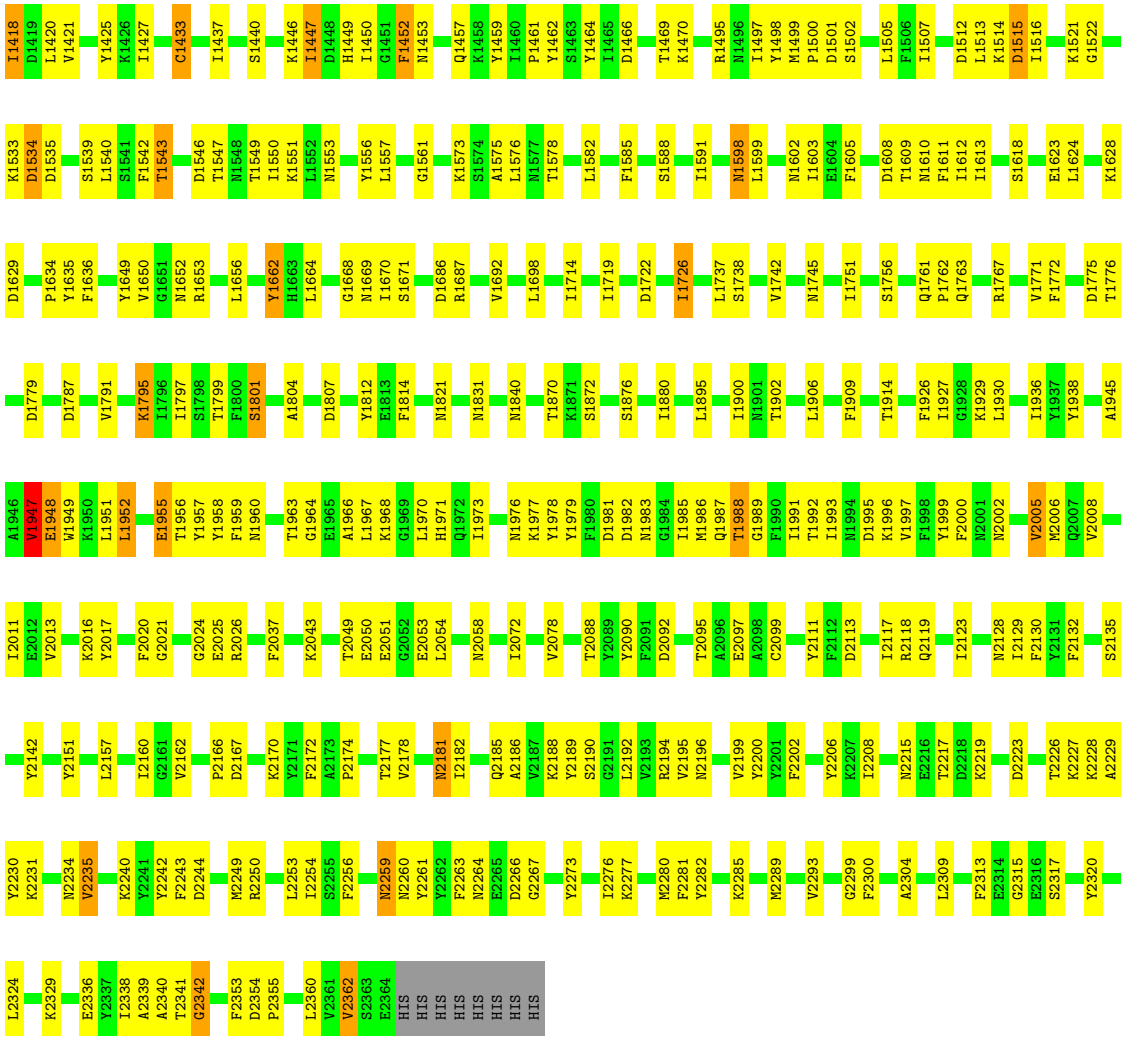
3 Residue-property plots (i)

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. 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: Cytotoxin-L

Chain A:




I1418 D1419 L1420 V1421 Y1425 K1426 I1427 C1433 I1437 S1440 K1446 I1447 D1448 H1449 I1450 G1451 F1452 N1453 Q1457 K1458 Y1459 I1460 P1461 Y1462 S1463 Y1464 I1465 D1466 T1469 K1470 R1495 N1496 I1497 Y1498 M1499 P1500 D1501 S1502 L1505 F1506 I1507 D1512 L1513 K1514 D1515 I1516 K1521 G1522
K1533 D1534 D1535 S1539 L1540 S1541 F1542 T1543 D1546 T1547 N1548 T1549 I1550 K1551 L1552 N1553 Y1556 L1557 G1561 K1573 S1574 A1575 L1576 N1577 T1578 L1582 F1585 S1588 I1591 N1598 L1599 N1602 I1603 E1604 F1605 D1608 T1609 N1610 F1611 I1612 I1613 S1618 E1623 L1624 K1628
D1629 P1634 Y1635 F1636 Y1649 V1650 G1651 N1652 R1653 L1656 Y1662 H1663 L1664 G1668 N1669 I1670 S1671 D1686 R1687 V1692 L1698 I1714 I1719 D1722 I1726 L1737 S1738 V1742 N1745 I1751 S1756 Q1761 P1762 Q1763 R1767 V1771 F1772 D1775 T1776
D1779 D1787 V1791 K1795 I1796 I1797 S1798 T1799 F1800 S1801 A1804 D1807 Y1812 E1813 F1814 N1821 N1831 N1840 T1870 K1871 S1872 S1876 I1880 L1895 I1900 N1901 T1902 L1906 F1909 T1914 F1926 I1927 G1928 K1929 L1930 I1936 Y1937 Y1938 A1945
A1946 V1947 E1948 W1949 K1950 L1951 L1962 E1955 T1956 Y1957 Y1958 F1959 N1960 T1963 G1964 E1965 A1966 L1967 K1968 G1969 L1970 H1971 Q1972 I1973 N1976 K1977 Y1978 Y1979 F1980 D1981 D1982 N1983 G1984 I1985 M1986 Q1987 T1988 G1989 F1990 I1991 T1992 I1993 N1994 D1995 K1996 V1997 F1998 Y1999 F2000 N2001 N2002 V2005 M2006 Q2007 V2008
I2011 E2012 V2013 K2016 Y2017 F2020 G2021 G2024 E2025 R2026 F2037 K2043 T2049 E2050 E2051 G2052 E2053 L2054 N2058 I2072 V2078 T2088 Y2089 Y2090 F2091 D2092 T2095 A2096 E2097 A2098 C2099 Y2111 F2112 D2113 I2117 R2118 Q2119 I2123 N2128 I2129 F2130 Y2131 F2132 S2135
Y2142 Y2151 L2157 I2160 G2161 V2162 P2166 D2167 K2170 Y2171 F2172 A2173 P2174 T2177 V2178 N2181 I2182 Q2185 A2186 V2187 K2188 Y2189 S2190 G2191 L2192 V2193 R2194 V2195 N2196 V2199 Y2200 Y2201 F2202 Y2206 K2207 I2208 N2215 E2216 T2217 D2218 K2219 D2223 T2226 K2227 K2228 A2229
Y2230 K2231 N2234 V2235 K2240 Y2241 Y2242 F2243 D2244 M2249 R2250 L2253 I2254 S2255 F2256 N2259 N2260 Y2261 Y2262 F2263 N2264 E2265 D2266 G2267 Y2273 I2276 K2277 M2280 F2281 Y2282 K2285 M2289 V2293 G2299 F2300 A2304 L2309 F2313 E2314 G2315 E2316 S2317 Y2320
L2324 K2329 E2336 Y2337 I2338 A2339 A2340 T2341 G2342 F2353 D2354 P2355 L2360 V2361 V2362 S2363 E2364 HIS HIS HIS HIS HIS HIS HIS HIS

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	229156	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k 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	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.43	1/19409 (0.0%)	0.61	4/26261 (0.0%)

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	0	2

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	409	ILE	C-O	6.21	1.31	1.24

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	416	PRO	CA-N-CD	-13.11	93.65	112.00
1	A	1947	VAL	CA-C-N	5.88	132.77	121.54
1	A	1947	VAL	C-N-CA	5.88	132.77	121.54
1	A	1069	VAL	N-CA-C	-5.28	107.22	111.91

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1028	GLY	Peptide
1	A	1452	PHE	Peptide

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	19026	0	18584	534	0
2	A	1	0	0	0	0
All	All	19027	0	18584	534	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 14.

All (534) 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:1023:PRO:HG3	1:A:1649:TYR:CZ	1.49	1.48
1:A:1956:THR:HG23	1:A:1986:MET:N	1.21	1.45
1:A:1956:THR:CG2	1:A:1986:MET:N	1.86	1.38
1:A:1023:PRO:CG	1:A:1649:TYR:CZ	2.18	1.26
1:A:1180:LEU:HD21	1:A:1185:ASP:OD1	1.34	1.22
1:A:1956:THR:HG21	1:A:1986:MET:CA	1.72	1.20
1:A:1022:LEU:HD22	1:A:1023:PRO:CD	1.72	1.20
1:A:1180:LEU:CD2	1:A:1185:ASP:HA	1.70	1.19
1:A:1956:THR:HG21	1:A:1986:MET:CB	1.74	1.18
1:A:1022:LEU:CD2	1:A:1023:PRO:HD3	1.74	1.17
1:A:1023:PRO:HG2	1:A:1649:TYR:CE2	1.79	1.17
1:A:1023:PRO:CG	1:A:1649:TYR:OH	1.93	1.16
1:A:1023:PRO:HG3	1:A:1649:TYR:OH	0.96	1.12
1:A:1956:THR:CG2	1:A:1986:MET:H	1.50	1.10
1:A:1956:THR:HG21	1:A:1986:MET:HB3	1.32	1.07
1:A:1023:PRO:CG	1:A:1649:TYR:CE2	2.37	1.05
1:A:1022:LEU:HD22	1:A:1023:PRO:HD3	1.07	1.05
1:A:1036:ILE:HG21	1:A:1521:LYS:HG2	1.35	1.05
1:A:1956:THR:CG2	1:A:1986:MET:CA	2.32	1.04
1:A:1956:THR:CG2	1:A:1986:MET:CB	2.34	1.04
1:A:1956:THR:HG22	1:A:1985:ILE:HG22	1.40	1.02
1:A:1180:LEU:HD23	1:A:1185:ASP:CA	1.90	1.01
1:A:1180:LEU:CD2	1:A:1185:ASP:CA	2.44	0.95
1:A:1180:LEU:HD21	1:A:1185:ASP:CG	1.90	0.95
1:A:1956:THR:CG2	1:A:1986:MET:HB3	1.96	0.94

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1180:LEU:HD23	1:A:1185:ASP:HA	0.97	0.94
1:A:1180:LEU:CD2	1:A:1185:ASP:OD1	2.16	0.93
1:A:1023:PRO:HG3	1:A:1649:TYR:HH	1.27	0.92
1:A:1295:THR:HA	1:A:1322:SER:O	1.71	0.90
1:A:1505:LEU:O	1:A:1599:LEU:HD11	1.73	0.89
1:A:744:VAL:HG22	1:A:754:ILE:HG22	1.55	0.88
1:A:1956:THR:HG21	1:A:1986:MET:C	1.99	0.88
1:A:1534:ASP:O	1:A:1535:ASP:OD1	1.96	0.84
1:A:1025:LEU:HB3	1:A:1033:ALA:HB1	1.60	0.83
1:A:1180:LEU:CD2	1:A:1185:ASP:CG	2.54	0.81
1:A:589:ILE:HD13	1:A:757:HIS:HA	1.64	0.80
1:A:622:SER:HA	1:A:639:GLN:HE22	1.48	0.79
1:A:1956:THR:OG1	1:A:1986:MET:HB2	1.83	0.78
1:A:577:TYR:HB3	1:A:645:LYS:HB2	1.65	0.78
1:A:1036:ILE:HG21	1:A:1521:LYS:CG	2.14	0.77
1:A:1550:ILE:HG21	1:A:1605:PHE:HE1	1.47	0.77
1:A:1956:THR:OG1	1:A:1986:MET:CB	2.33	0.77
1:A:1507:ILE:O	1:A:1598:ASN:OD1	2.03	0.76
1:A:1795:LYS:O	1:A:1799:THR:OG1	2.03	0.76
1:A:754:ILE:HD12	1:A:754:ILE:O	1.86	0.76
1:A:2194:ARG:HG2	1:A:2199:VAL:HG12	1.67	0.75
1:A:1069:VAL:HG23	1:A:1461:PRO:HB3	1.69	0.75
1:A:1956:THR:CB	1:A:1986:MET:HB3	2.18	0.74
1:A:1956:THR:HG21	1:A:1986:MET:O	1.88	0.74
1:A:1041:LEU:HD23	1:A:1041:LEU:N	2.02	0.74
1:A:2128:ASN:HB3	1:A:2157:LEU:HD22	1.71	0.73
1:A:941:ASN:HD22	1:A:1056:LEU:HD13	1.54	0.73
1:A:1146:PRO:HD2	1:A:1221:VAL:HB	1.71	0.73
1:A:1956:THR:O	1:A:1985:ILE:HA	1.90	0.72
1:A:2088:THR:HG21	1:A:2118:ARG:HH21	1.55	0.72
1:A:589:ILE:CD1	1:A:757:HIS:HA	2.19	0.71
1:A:1031:ILE:HG22	1:A:1046:LYS:HD3	1.73	0.71
1:A:960:ASN:OD1	1:A:1652:ASN:ND2	2.20	0.70
1:A:1550:ILE:HB	1:A:1605:PHE:CD1	2.26	0.70
1:A:1737:LEU:HD13	1:A:1872:SER:HB2	1.74	0.69
1:A:1113:LEU:HG	1:A:1114:GLN:HG2	1.72	0.69
1:A:5:ASN:ND2	1:A:8:GLN:OE1	2.25	0.69
1:A:1022:LEU:HD22	1:A:1023:PRO:HD2	1.73	0.69
1:A:1772:PHE:HE1	1:A:1797:ILE:HD11	1.58	0.69
1:A:1025:LEU:HG	1:A:1612:ILE:HD13	1.75	0.68
1:A:1025:LEU:HD21	1:A:1635:TYR:CE1	2.28	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:708:GLU:HG3	1:A:787:ILE:HD12	1.76	0.68
1:A:1425:TYR:OH	1:A:1453:ASN:ND2	2.23	0.68
1:A:2123:ILE:O	1:A:2130:PHE:HB2	1.92	0.68
1:A:413:ASN:HD22	1:A:413:ASN:H	1.40	0.68
1:A:889:ILE:HG12	1:A:898:ILE:HG12	1.76	0.67
1:A:1180:LEU:CD2	1:A:1185:ASP:CB	2.72	0.67
1:A:2119:GLN:HG3	1:A:2123:ILE:HG13	1.76	0.67
1:A:1180:LEU:HD21	1:A:1185:ASP:CB	2.24	0.67
1:A:1952:LEU:HD12	1:A:1952:LEU:N	2.09	0.67
1:A:1408:ILE:HB	1:A:1446:LYS:HD2	1.76	0.67
1:A:1325:LEU:HD21	1:A:1334:ILE:HD12	1.77	0.67
1:A:792:LYS:HB2	1:A:835:GLN:HG3	1.77	0.66
1:A:1550:ILE:HG21	1:A:1605:PHE:CE1	2.30	0.66
1:A:1956:THR:O	1:A:1985:ILE:HG23	1.96	0.66
1:A:373:VAL:HG23	1:A:395:CYS:HB3	1.77	0.66
1:A:2017:TYR:HB2	1:A:2054:LEU:HD22	1.76	0.66
1:A:1025:LEU:HB3	1:A:1033:ALA:CB	2.26	0.66
1:A:2253:LEU:HG	1:A:2260:ASN:HD21	1.61	0.65
1:A:73:LYS:HD2	1:A:1726:ILE:HG23	1.78	0.65
1:A:2118:ARG:NH1	1:A:2135:SER:O	2.30	0.65
1:A:1089:PHE:HA	1:A:1092:LEU:HG	1.76	0.65
1:A:2111:TYR:HE1	1:A:2123:ILE:HB	1.61	0.65
1:A:1280:PRO:HB2	1:A:1282:TYR:HE1	1.61	0.64
1:A:879:ASP:N	1:A:879:ASP:OD1	2.31	0.64
1:A:577:TYR:HB3	1:A:645:LYS:CB	2.28	0.64
1:A:2244:ASP:HB3	1:A:2250:ARG:CZ	2.29	0.63
1:A:1111:LEU:H	1:A:1281:ARG:HH12	1.46	0.63
1:A:2174:PRO:O	1:A:2181:ASN:ND2	2.31	0.63
1:A:1197:LYS:NZ	1:A:1261:GLN:OE1	2.29	0.63
1:A:1368:ILE:HG23	1:A:1371:ILE:HB	1.80	0.62
1:A:956:VAL:HG21	1:A:1653:ARG:NE	2.14	0.62
1:A:2289:MET:HE2	1:A:2315:GLY:HA3	1.81	0.62
1:A:1003:ASP:HB3	1:A:1006:LYS:HE2	1.82	0.62
1:A:94:VAL:HG22	1:A:368:VAL:HG22	1.81	0.62
1:A:644:ARG:NH1	1:A:687:SER:O	2.32	0.62
1:A:754:ILE:HG23	1:A:768:ILE:HG12	1.79	0.62
1:A:361:LEU:HD12	1:A:362:PRO:HD2	1.82	0.62
1:A:623:VAL:H	1:A:639:GLN:HE22	1.47	0.62
1:A:1550:ILE:HB	1:A:1605:PHE:CE1	2.34	0.62
1:A:1960:ASN:HB3	1:A:1964:GLY:H	1.65	0.62
1:A:754:ILE:CG2	1:A:768:ILE:HG12	2.29	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1022:LEU:CD2	1:A:1023:PRO:CD	2.53	0.62
1:A:1550:ILE:CG2	1:A:1605:PHE:CE1	2.82	0.62
1:A:1505:LEU:O	1:A:1599:LEU:CD1	2.45	0.61
1:A:1314:TYR:HB2	1:A:1334:ILE:HD13	1.82	0.61
1:A:173:ARG:NH2	1:A:823:GLU:OE2	2.28	0.61
1:A:873:LYS:NZ	1:A:882:HIS:O	2.33	0.61
1:A:2043:LYS:H	1:A:2051:GLU:HG2	1.65	0.61
1:A:2282:TYR:H	1:A:2289:MET:HE1	1.64	0.61
1:A:1197:LYS:HG2	1:A:1198:PRO:HD2	1.83	0.60
1:A:57:ASP:OD1	1:A:76:LYS:NZ	2.33	0.60
1:A:1384:LEU:O	1:A:1387:HIS:HB2	2.01	0.60
1:A:1807:ASP:HB2	1:A:1812:TYR:HE2	1.67	0.60
1:A:243:LEU:HB3	1:A:245:LYS:HG2	1.84	0.60
1:A:1025:LEU:CD2	1:A:1635:TYR:CE1	2.85	0.60
1:A:1025:LEU:N	1:A:1025:LEU:HD22	2.16	0.60
1:A:1947:VAL:O	1:A:1959:PHE:HB2	2.01	0.60
1:A:1956:THR:CG2	1:A:1985:ILE:HG22	2.26	0.60
1:A:1968:LYS:O	1:A:1971:HIS:NE2	2.33	0.60
1:A:1955:GLU:HG2	1:A:1985:ILE:HD13	1.84	0.60
1:A:1575:ALA:HA	1:A:1578:THR:HG22	1.84	0.59
1:A:1495:ARG:HG2	1:A:1507:ILE:HG23	1.84	0.59
1:A:1239:GLY:H	1:A:1241:ARG:HH12	1.51	0.59
1:A:413:ASN:HD22	1:A:413:ASN:N	2.00	0.59
1:A:1956:THR:OG1	1:A:1986:MET:HB3	2.01	0.58
1:A:1354:ASN:O	1:A:1365:GLY:N	2.32	0.58
1:A:1296:ARG:HB2	1:A:1323:TYR:HD1	1.66	0.58
1:A:2273:TYR:HE2	1:A:2280:MET:HB3	1.68	0.58
1:A:1550:ILE:CG2	1:A:1605:PHE:HE1	2.17	0.58
1:A:1970:LEU:HD21	1:A:1977:LYS:HD3	1.84	0.58
1:A:1624:LEU:HD23	1:A:1634:PRO:HA	1.85	0.58
1:A:1128:SER:HB3	1:A:1250:LEU:HD22	1.84	0.58
1:A:540:GLU:OE2	1:A:540:GLU:HA	2.03	0.57
1:A:566:ILE:HD13	1:A:602:PRO:HB3	1.86	0.57
1:A:1447:ILE:O	1:A:1450:ILE:HG12	2.03	0.57
1:A:1400:ARG:HA	1:A:1420:LEU:HD12	1.87	0.57
1:A:270:ASP:OD2	1:A:384:ASN:ND2	2.37	0.57
1:A:587:ASP:OD1	1:A:653:HIS:NE2	2.35	0.57
1:A:1113:LEU:HB2	1:A:1280:PRO:HD3	1.87	0.57
1:A:1956:THR:HG23	1:A:1986:MET:H	0.58	0.57
1:A:1956:THR:CB	1:A:1986:MET:CB	2.78	0.57
1:A:2188:LYS:HB3	1:A:2206:TYR:CD2	2.40	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1144:ILE:HD11	1:A:1217:LYS:HB2	1.86	0.57
1:A:1327:LEU:HD23	1:A:1351:VAL:HG21	1.87	0.57
1:A:2244:ASP:HB3	1:A:2250:ARG:NE	2.19	0.57
1:A:1598:ASN:OD1	1:A:1598:ASN:N	2.33	0.56
1:A:451:THR:OG1	1:A:826:ILE:HD13	2.05	0.56
1:A:622:SER:HA	1:A:639:GLN:NE2	2.17	0.56
1:A:1348:VAL:HB	1:A:1351:VAL:HB	1.87	0.56
1:A:1139:LEU:HD23	1:A:1143:ILE:HD12	1.88	0.56
1:A:133:SER:OG	1:A:239:ASP:OD2	2.17	0.56
1:A:704:SER:HB3	1:A:776:GLU:OE2	2.06	0.56
1:A:1023:PRO:HG3	1:A:1649:TYR:CE2	2.12	0.56
1:A:1787:ASP:N	1:A:1787:ASP:OD1	2.37	0.56
1:A:1433:CYS:O	1:A:1437:ILE:HG12	2.06	0.56
1:A:1022:LEU:HD23	1:A:1023:PRO:HD3	1.82	0.56
1:A:1218:ASP:HA	1:A:1296:ARG:HH11	1.71	0.56
1:A:1329:PRO:HB3	1:A:1355:ILE:HG13	1.88	0.56
1:A:2320:TYR:HE1	1:A:2324:LEU:HB2	1.69	0.56
1:A:1168:GLU:HB3	1:A:1199:TRP:HB3	1.88	0.55
1:A:1334:ILE:HB	1:A:1389:ILE:HD12	1.87	0.55
1:A:1929:LYS:HE3	1:A:1936:ILE:HG23	1.87	0.55
1:A:1949:TRP:CZ2	1:A:1973:ILE:HG21	2.40	0.55
1:A:1104:PRO:HG2	1:A:1305:THR:HG21	1.87	0.55
1:A:2293:VAL:HG12	1:A:2300:PHE:HD2	1.72	0.55
1:A:1356:THR:HG22	1:A:1363:GLN:HB3	1.88	0.55
1:A:1956:THR:CG2	1:A:1986:MET:O	2.54	0.55
1:A:420:GLU:O	1:A:420:GLU:HG3	2.07	0.55
1:A:688:PRO:HG2	1:A:730:ILE:HD11	1.89	0.55
1:A:1086:ALA:O	1:A:1090:SER:OG	2.20	0.55
1:A:589:ILE:HD11	1:A:757:HIS:O	2.05	0.55
1:A:791:SER:HA	1:A:838:GLU:OE2	2.05	0.55
1:A:1258:TYR:HB3	1:A:1261:GLN:HB2	1.87	0.55
1:A:2276:ILE:HG22	1:A:2277:LYS:HG2	1.88	0.55
1:A:2043:LYS:HE2	1:A:2050:GLU:HA	1.88	0.55
1:A:1585:PHE:O	1:A:1588:SER:OG	2.22	0.54
1:A:1656:LEU:HD23	1:A:1692:VAL:HG13	1.88	0.54
1:A:998:LEU:HD12	1:A:1001:ILE:HD12	1.88	0.54
1:A:1375:LEU:HB2	1:A:1384:LEU:HD13	1.89	0.54
1:A:1381:LYS:NZ	1:A:1383:ILE:HD11	2.22	0.54
1:A:1719:ILE:HG12	1:A:1767:ARG:HD2	1.89	0.54
1:A:2300:PHE:HB3	1:A:2339:ALA:HB3	1.88	0.54
1:A:428:MET:HE1	1:A:451:THR:O	2.06	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:445:MET:HE3	1:A:449:LYS:HE3	1.87	0.54
1:A:2011:ILE:HD12	1:A:2020:PHE:HD2	1.72	0.54
1:A:2190:SER:HA	1:A:2202:PHE:HB2	1.90	0.54
1:A:954:HIS:O	1:A:954:HIS:ND1	2.40	0.54
1:A:995:SER:OG	1:A:996:THR:N	2.40	0.54
1:A:308:THR:HA	1:A:785:ASN:HD22	1.73	0.54
1:A:708:GLU:H	1:A:708:GLU:CD	2.13	0.54
1:A:145:ILE:HD12	1:A:263:TRP:HH2	1.73	0.54
1:A:707:ALA:O	1:A:710:THR:OG1	2.24	0.53
1:A:1045:ILE:HG12	1:A:1066:ILE:HD13	1.91	0.53
1:A:1876:SER:HB3	1:A:1880:ILE:HG13	1.90	0.53
1:A:258:GLU:OE1	1:A:407:TYR:OH	2.16	0.53
1:A:1030:PRO:HB2	1:A:1556:TYR:CZ	2.43	0.53
1:A:1291:LEU:HD21	1:A:1316:PHE:HD1	1.73	0.53
1:A:447:MET:O	1:A:451:THR:HG23	2.08	0.53
1:A:1989:GLY:H	1:A:2000:PHE:HB2	1.74	0.53
1:A:754:ILE:HD12	1:A:754:ILE:C	2.33	0.53
1:A:1251:LEU:HA	1:A:1254:ILE:HD12	1.90	0.53
1:A:963:PHE:HD2	1:A:1022:LEU:HD11	1.72	0.53
1:A:1371:ILE:HA	1:A:1374:LYS:NZ	2.24	0.53
1:A:610:LYS:HE3	1:A:674:GLU:OE2	2.09	0.52
1:A:711:TYR:HB3	1:A:712:PRO:HD3	1.91	0.52
1:A:733:ASP:OD1	1:A:733:ASP:N	2.38	0.52
1:A:2244:ASP:CB	1:A:2250:ARG:CZ	2.87	0.52
1:A:2336:GLU:HG3	1:A:2338:ILE:HG22	1.91	0.52
1:A:1072:THR:HG22	1:A:1073:ALA:H	1.74	0.52
1:A:1171:ARG:HE	1:A:1261:GLN:HG2	1.74	0.52
1:A:2160:ILE:HA	1:A:2172:PHE:O	2.10	0.52
1:A:2244:ASP:CB	1:A:2250:ARG:NH2	2.73	0.52
1:A:968:LEU:HD12	1:A:978:LEU:HD21	1.92	0.52
1:A:1324:SER:HB3	1:A:1345:VAL:HG23	1.91	0.52
1:A:1024:THR:HG22	1:A:1636:PHE:CD1	2.45	0.52
1:A:1061:GLU:O	1:A:1065:GLY:N	2.43	0.52
1:A:1249:LYS:NZ	1:A:1253:ARG:HE	2.09	0.51
1:A:1366:GLU:OE2	1:A:1449:HIS:NE2	2.43	0.51
1:A:1383:ILE:HA	1:A:1387:HIS:O	2.11	0.51
1:A:1996:LYS:HB3	1:A:2025:GLU:HG2	1.91	0.51
1:A:2223:ASP:HB2	1:A:2230:TYR:HE2	1.73	0.51
1:A:2142:TYR:OH	1:A:2167:ASP:OD2	2.21	0.51
1:A:1377:ILE:HD11	1:A:1420:LEU:HD23	1.92	0.51
1:A:2006:MET:HE3	1:A:2024:GLY:HA3	1.93	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:578:ILE:HD11	1:A:640:ILE:O	2.11	0.51
1:A:703:TYR:CD2	1:A:710:THR:HG21	2.45	0.51
1:A:756:ASP:HB2	1:A:762:ILE:HD12	1.93	0.51
1:A:438:ILE:O	1:A:438:ILE:HG13	2.10	0.51
1:A:1505:LEU:HG	1:A:1507:ILE:HD11	1.93	0.51
1:A:1540:LEU:HG	1:A:1542:PHE:HD1	1.75	0.51
1:A:1981:ASP:OD1	1:A:1985:ILE:N	2.41	0.51
1:A:2208:ILE:HD13	1:A:2227:LYS:HG2	1.93	0.51
1:A:623:VAL:H	1:A:639:GLN:NE2	2.06	0.51
1:A:1550:ILE:CB	1:A:1605:PHE:CE1	2.94	0.51
1:A:2177:THR:OG1	1:A:2181:ASN:ND2	2.31	0.51
1:A:1022:LEU:CB	1:A:1023:PRO:CD	2.89	0.51
1:A:2049:THR:HG22	1:A:2053:GLU:HB3	1.92	0.51
1:A:2242:TYR:HB2	1:A:2263:PHE:CZ	2.46	0.51
1:A:1968:LYS:HE2	1:A:1982:ASP:O	2.11	0.51
1:A:1976:ASN:HB3	1:A:2005:VAL:HG13	1.93	0.51
1:A:672:SER:OG	1:A:719:ILE:HG22	2.11	0.51
1:A:1383:ILE:HG12	1:A:1388:THR:HG22	1.93	0.51
1:A:1440:SER:HB3	1:A:1499:MET:SD	2.50	0.51
1:A:1957:TYR:HE1	1:A:1983:ASN:O	1.93	0.51
1:A:1154:GLU:HG2	1:A:1288:ARG:HB2	1.91	0.51
1:A:1981:ASP:OD1	1:A:1981:ASP:N	2.44	0.51
1:A:1367:LEU:HD21	1:A:1408:ILE:HG22	1.92	0.50
1:A:1354:ASN:N	1:A:1366:GLU:O	2.44	0.50
1:A:2264:ASN:OD1	1:A:2267:GLY:N	2.44	0.50
1:A:1495:ARG:HG2	1:A:1507:ILE:HD12	1.93	0.50
1:A:878:LEU:HD11	1:A:911:ILE:HD11	1.93	0.50
1:A:1628:LYS:HG3	1:A:1629:ASP:OD1	2.12	0.50
1:A:1906:LEU:HB2	1:A:1945:ALA:HB3	1.93	0.50
1:A:610:LYS:HE3	1:A:674:GLU:CD	2.37	0.50
1:A:1025:LEU:CD2	1:A:1025:LEU:N	2.75	0.50
1:A:1036:ILE:HB	1:A:1041:LEU:HD21	1.94	0.50
1:A:145:ILE:HD12	1:A:263:TRP:CH2	2.47	0.50
1:A:413:ASN:N	1:A:413:ASN:ND2	2.60	0.50
1:A:2011:ILE:HD12	1:A:2020:PHE:CD2	2.47	0.50
1:A:2058:ASN:HD21	1:A:2072:ILE:HA	1.77	0.50
1:A:383:ILE:HG12	1:A:385:GLN:HG3	1.93	0.49
1:A:513:GLU:O	1:A:517:THR:HG23	2.12	0.49
1:A:1151:VAL:HG12	1:A:1165:GLY:HA3	1.94	0.49
1:A:1171:ARG:HH21	1:A:1261:GLN:HG2	1.77	0.49
1:A:275:SER:O	1:A:279:GLU:HG2	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:368:VAL:HG23	1:A:390:LEU:HG	1.94	0.49
1:A:956:VAL:HG23	1:A:957:ASN:N	2.28	0.49
1:A:1085:ILE:HG13	1:A:1086:ALA:N	2.28	0.49
1:A:1375:LEU:HD12	1:A:1384:LEU:HB2	1.94	0.49
1:A:1956:THR:HG22	1:A:1985:ILE:CG2	2.26	0.49
1:A:1239:GLY:H	1:A:1241:ARG:NH1	2.09	0.49
1:A:2230:TYR:HD1	1:A:2234:ASN:HB3	1.78	0.49
1:A:2244:ASP:HB2	1:A:2250:ARG:NH2	2.27	0.49
1:A:21:GLU:HG2	1:A:63:TYR:CZ	2.48	0.49
1:A:1216:SER:O	1:A:1216:SER:OG	2.29	0.49
1:A:1369:GLU:OE1	1:A:1370:ASN:HB2	2.12	0.49
1:A:1124:PHE:HA	1:A:1127:ILE:HG12	1.95	0.49
1:A:1048:LEU:HD22	1:A:1066:ILE:HD11	1.94	0.49
1:A:1381:LYS:HD3	1:A:1390:ASN:HD22	1.77	0.48
1:A:1791:VAL:HG13	1:A:1795:LYS:HD2	1.94	0.48
1:A:21:GLU:OE2	1:A:68:ARG:NH2	2.37	0.48
1:A:1041:LEU:HD12	1:A:1045:ILE:HD11	1.94	0.48
1:A:1255:ARG:HH22	1:A:1259:GLU:HG2	1.79	0.48
1:A:2172:PHE:CE2	1:A:2186:ALA:HB2	2.48	0.48
1:A:549:LEU:HD11	1:A:589:ILE:HD12	1.96	0.48
1:A:1238:PRO:HG3	1:A:1271:ALA:HB1	1.94	0.48
1:A:1745:ASN:N	1:A:1745:ASN:OD1	2.46	0.48
1:A:2341:THR:O	1:A:2353:PHE:HB2	2.14	0.48
1:A:1030:PRO:HB2	1:A:1556:TYR:OH	2.14	0.48
1:A:1303:ILE:O	1:A:1309:ARG:HD2	2.14	0.48
1:A:1385:ASN:O	1:A:1387:HIS:ND1	2.44	0.48
1:A:1041:LEU:HD23	1:A:1041:LEU:H	1.75	0.47
1:A:703:TYR:CD2	1:A:703:TYR:N	2.82	0.47
1:A:925:ILE:HG13	1:A:926:SER:N	2.28	0.47
1:A:940:VAL:HG21	1:A:1060:ILE:HA	1.96	0.47
1:A:974:THR:HG21	1:A:1664:LEU:H	1.80	0.47
1:A:1973:ILE:HD13	1:A:1978:TYR:HD2	1.79	0.47
1:A:1464:TYR:CE1	1:A:1466:ASP:HB2	2.50	0.47
1:A:1977:LYS:HD2	1:A:2006:MET:SD	2.55	0.47
1:A:1024:THR:HG22	1:A:1636:PHE:CE1	2.50	0.47
1:A:1967:LEU:HB3	1:A:1971:HIS:CD2	2.50	0.47
1:A:1195:TYR:HD2	1:A:1196:ARG:HD3	1.79	0.47
1:A:1502:SER:O	1:A:1505:LEU:HB2	2.15	0.47
1:A:1345:VAL:HG12	1:A:1403:SER:HB2	1.97	0.47
1:A:2243:PHE:CE2	1:A:2249:MET:HG3	2.50	0.47
1:A:1550:ILE:HD12	1:A:1605:PHE:CZ	2.50	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:140:THR:O	1:A:144:THR:OG1	2.29	0.47
1:A:1168:GLU:O	1:A:1230:PHE:HB2	2.15	0.47
1:A:1170:TRP:CE2	1:A:1195:TYR:HB3	2.50	0.47
1:A:1427:ILE:HG13	1:A:1452:PHE:CE2	2.49	0.47
1:A:2317:SER:O	1:A:2317:SER:OG	2.32	0.47
1:A:375:ILE:HG12	1:A:383:ILE:O	2.15	0.46
1:A:902:ASN:CG	1:A:905:THR:HG22	2.39	0.46
1:A:905:THR:HG23	1:A:907:ASN:H	1.79	0.46
1:A:1947:VAL:O	1:A:1948:GLU:O	2.33	0.46
1:A:2264:ASN:HD21	1:A:2266:ASP:HB3	1.80	0.46
1:A:1205:VAL:HG13	1:A:1257:HIS:CD2	2.50	0.46
1:A:2129:ILE:O	1:A:2157:LEU:HA	2.15	0.46
1:A:2223:ASP:HB2	1:A:2230:TYR:CE2	2.49	0.46
1:A:2360:LEU:HG	1:A:2362:VAL:HG13	1.97	0.46
1:A:882:HIS:HA	1:A:901:ILE:O	2.16	0.46
1:A:1955:GLU:CG	1:A:1985:ILE:HD13	2.45	0.46
1:A:779:SER:OG	1:A:780:PHE:N	2.48	0.46
1:A:1307:GLN:O	1:A:1311:ASN:ND2	2.31	0.46
1:A:1738:SER:O	1:A:1840:ASN:ND2	2.43	0.46
1:A:1402:ILE:CG2	1:A:1418:ILE:HB	2.46	0.46
1:A:1452:PHE:HZ	1:A:1457:GLN:HB3	1.81	0.46
1:A:2177:THR:N	1:A:2181:ASN:OD1	2.43	0.46
1:A:2215:ASN:O	1:A:2217:THR:N	2.37	0.46
1:A:1543:THR:HG23	1:A:1551:LYS:HB3	1.96	0.46
1:A:1756:SER:HB2	1:A:1763:GLN:HB2	1.98	0.46
1:A:1988:THR:HG21	1:A:2002:ASN:HA	1.98	0.46
1:A:2151:TYR:HB2	1:A:2172:PHE:CZ	2.51	0.46
1:A:2242:TYR:HE1	1:A:2256:PHE:HB2	1.81	0.46
1:A:970:GLU:C	1:A:972:ASN:H	2.24	0.46
1:A:1036:ILE:CG2	1:A:1521:LYS:HG2	2.26	0.46
1:A:2289:MET:HE2	1:A:2315:GLY:CA	2.44	0.46
1:A:384:ASN:OD1	1:A:384:ASN:N	2.48	0.46
1:A:669:ASP:OD1	1:A:718:LYS:HE2	2.16	0.46
1:A:1125:LYS:HD3	1:A:1246:ASP:HB3	1.97	0.46
1:A:2050:GLU:N	1:A:2053:GLU:OE2	2.48	0.46
1:A:324:LYS:HE3	1:A:359:ILE:HD11	1.98	0.45
1:A:646:ILE:CG2	1:A:691:ILE:HG13	2.46	0.45
1:A:1546:ASP:OD2	1:A:1549:THR:OG1	2.27	0.45
1:A:1437:ILE:HD12	1:A:1497:ILE:HD12	1.98	0.45
1:A:2113:ASP:OD2	1:A:2117:ILE:HB	2.16	0.45
1:A:1371:ILE:HA	1:A:1374:LYS:HZ3	1.80	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2090:TYR:O	1:A:2099:CYS:N	2.50	0.45
1:A:1761:GLN:O	1:A:1763:GLN:N	2.46	0.45
1:A:1179:THR:O	1:A:1180:LEU:HD23	2.17	0.45
1:A:229:LEU:O	1:A:233:THR:OG1	2.30	0.45
1:A:573:ARG:HD2	1:A:1804:ALA:O	2.17	0.45
1:A:1557:LEU:HB3	1:A:1561:GLY:HA3	1.98	0.45
1:A:1629:ASP:OD1	1:A:1629:ASP:N	2.50	0.45
1:A:1997:VAL:HB	1:A:2026:ARG:HB3	1.98	0.45
1:A:2170:LYS:HE3	1:A:2186:ALA:HB1	1.98	0.45
1:A:1009:GLU:O	1:A:1013:THR:OG1	2.35	0.45
1:A:2353:PHE:CZ	1:A:2360:LEU:HB2	2.51	0.45
1:A:623:VAL:N	1:A:639:GLN:HE22	2.12	0.45
1:A:1035:ILE:HB	1:A:1610:ASN:HD22	1.82	0.45
1:A:1533:LYS:O	1:A:1535:ASP:N	2.42	0.45
1:A:1957:TYR:CE1	1:A:1983:ASN:O	2.70	0.45
1:A:1352:VAL:O	1:A:1368:ILE:HG22	2.16	0.44
1:A:1979:TYR:HD1	1:A:1987:GLN:HB2	1.81	0.44
1:A:2092:ASP:N	1:A:2092:ASP:OD1	2.50	0.44
1:A:580:TYR:OH	1:A:634:TYR:HA	2.18	0.44
1:A:2299:GLY:HA3	1:A:2338:ILE:HD12	1.99	0.44
1:A:966:GLN:HE21	1:A:970:GLU:HG3	1.83	0.44
1:A:1036:ILE:HG21	1:A:1521:LYS:HE2	1.99	0.44
1:A:1081:SER:O	1:A:1085:ILE:HG23	2.17	0.44
1:A:876:ASN:N	1:A:876:ASN:HD22	2.16	0.44
1:A:1255:ARG:HA	1:A:1262:PHE:HB3	2.00	0.44
1:A:2277:LYS:HZ1	1:A:2313:PHE:HE1	1.66	0.44
1:A:2354:ASP:OD1	1:A:2355:PRO:HD2	2.17	0.44
1:A:332:SER:O	1:A:335:PHE:N	2.50	0.44
1:A:1025:LEU:CD2	1:A:1025:LEU:H	2.30	0.44
1:A:1047:GLU:O	1:A:1051:THR:OG1	2.29	0.44
1:A:1344:TRP:O	1:A:1402:ILE:HD12	2.17	0.44
1:A:1400:ARG:NH2	1:A:1421:VAL:HB	2.32	0.44
1:A:1959:PHE:HE1	1:A:1966:ALA:HB2	1.82	0.44
1:A:321:MET:SD	1:A:326:TYR:HB2	2.58	0.44
1:A:1025:LEU:HD23	1:A:1623:GLU:OE2	2.17	0.44
1:A:589:ILE:HD11	1:A:757:HIS:HA	1.99	0.44
1:A:1353:LYS:HA	1:A:1367:LEU:HA	2.00	0.44
1:A:2095:THR:HG23	1:A:2097:GLU:HG3	1.99	0.44
1:A:955:GLU:O	1:A:959:LEU:HG	2.17	0.44
1:A:1123:TYR:O	1:A:1127:ILE:HG23	2.17	0.44
1:A:1993:ILE:O	1:A:1996:LYS:HB2	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2195:VAL:HG12	1:A:2196:ASN:N	2.32	0.44
1:A:2230:TYR:CD1	1:A:2234:ASN:HB3	2.53	0.44
1:A:1376:ASN:ND2	1:A:1378:GLU:OE2	2.51	0.44
1:A:1686:ASP:OD1	1:A:1686:ASP:N	2.51	0.44
1:A:2254:ILE:HB	1:A:2263:PHE:HE2	1.82	0.44
1:A:2285:LYS:HA	1:A:2285:LYS:HD3	1.72	0.44
1:A:570:MET:HE2	1:A:570:MET:HA	2.00	0.43
1:A:674:GLU:O	1:A:678:ILE:HG13	2.18	0.43
1:A:1154:GLU:O	1:A:1155:ILE:HD13	2.18	0.43
1:A:1507:ILE:CG2	1:A:1598:ASN:HD21	2.31	0.43
1:A:1949:TRP:CE3	1:A:1958:TYR:HB2	2.53	0.43
1:A:1951:LEU:CD2	1:A:1956:THR:HA	2.48	0.43
1:A:377:PHE:CD2	1:A:502:GLU:HG3	2.53	0.43
1:A:1253:ARG:HD2	1:A:1257:HIS:HE1	1.83	0.43
1:A:2013:VAL:O	1:A:2016:LYS:HE2	2.18	0.43
1:A:2142:TYR:CD2	1:A:2166:PRO:HD2	2.53	0.43
1:A:2329:LYS:HE3	1:A:2360:LEU:H	1.82	0.43
1:A:308:THR:HA	1:A:785:ASN:ND2	2.34	0.43
1:A:1030:PRO:CB	1:A:1556:TYR:OH	2.66	0.43
1:A:1306:GLU:O	1:A:1310:LYS:HE2	2.19	0.43
1:A:1466:ASP:O	1:A:1469:THR:HB	2.18	0.43
1:A:1498:TYR:HB3	1:A:1501:ASP:O	2.19	0.43
1:A:1959:PHE:CE1	1:A:1966:ALA:HB2	2.53	0.43
1:A:2304:ALA:O	1:A:2315:GLY:N	2.52	0.43
1:A:414:LEU:HG	1:A:418:ILE:CD1	2.48	0.43
1:A:1022:LEU:HB3	1:A:1023:PRO:CD	2.48	0.43
1:A:1381:LYS:HZ2	1:A:1383:ILE:HD11	1.84	0.43
1:A:2185:GLN:NE2	1:A:2186:ALA:O	2.51	0.43
1:A:2235:VAL:HG22	1:A:2240:LYS:HG3	2.00	0.43
1:A:1123:TYR:OH	1:A:1228:ARG:NH2	2.52	0.43
1:A:1371:ILE:HG23	1:A:1372:LEU:HD22	2.00	0.43
1:A:1498:TYR:CE2	1:A:1500:PRO:HD2	2.54	0.43
1:A:577:TYR:HB2	1:A:645:LYS:O	2.18	0.43
1:A:1167:CYS:SG	1:A:1202:ILE:HD12	2.59	0.43
1:A:1515:ASP:OD1	1:A:1515:ASP:N	2.49	0.43
1:A:925:ILE:HD13	1:A:985:MET:HE1	1.99	0.43
1:A:1155:ILE:HB	1:A:1289:ILE:HD12	2.00	0.43
1:A:1427:ILE:HG13	1:A:1452:PHE:HE2	1.84	0.43
1:A:1459:TYR:OH	1:A:1522:GLY:O	2.25	0.43
1:A:1900:ILE:HD12	1:A:1909:PHE:CD2	2.54	0.43
1:A:1973:ILE:HB	1:A:1978:TYR:CE2	2.53	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2219:LYS:HE3	1:A:2249:MET:HB3	2.00	0.43
1:A:535:LYS:HB3	1:A:535:LYS:HE3	1.81	0.43
1:A:937:PHE:CD2	1:A:947:LYS:HB2	2.54	0.43
1:A:958:THR:OG1	1:A:959:LEU:N	2.51	0.43
1:A:1041:LEU:N	1:A:1041:LEU:CD2	2.73	0.43
1:A:968:LEU:HD12	1:A:968:LEU:HA	1.83	0.43
1:A:1212:LYS:HA	1:A:1212:LYS:HD3	1.76	0.43
1:A:1251:LEU:HD22	1:A:1264:TRP:CG	2.54	0.43
1:A:2178:VAL:HG21	1:A:2189:TYR:HB2	2.00	0.43
1:A:708:GLU:OE2	1:A:708:GLU:N	2.29	0.42
1:A:1116:LYS:NZ	1:A:1276:THR:OG1	2.42	0.42
1:A:1370:ASN:OD1	1:A:1373:SER:OG	2.24	0.42
1:A:1543:THR:HG22	1:A:1553:ASN:HD21	1.84	0.42
1:A:1722:ASP:OD1	1:A:1722:ASP:N	2.49	0.42
1:A:1742:VAL:HG12	1:A:1801:SER:HB2	2.00	0.42
1:A:2182:ILE:HB	1:A:2185:GLN:HB2	2.01	0.42
1:A:375:ILE:HG13	1:A:387:LEU:HD23	2.01	0.42
1:A:571:LYS:HA	1:A:600:LYS:O	2.19	0.42
1:A:1662:TYR:HD2	1:A:1670:ILE:HG23	1.85	0.42
1:A:224:TYR:O	1:A:228:SER:OG	2.33	0.42
1:A:250:ASP:HB2	1:A:404:LYS:HE2	2.02	0.42
1:A:1200:LEU:HD22	1:A:1258:TYR:CG	2.54	0.42
1:A:1513:LEU:HD23	1:A:1516:ILE:HD11	2.00	0.42
1:A:1650:VAL:O	1:A:1650:VAL:HG12	2.18	0.42
1:A:646:ILE:HG23	1:A:691:ILE:HG13	2.00	0.42
1:A:704:SER:HB3	1:A:776:GLU:CD	2.44	0.42
1:A:1306:GLU:HA	1:A:1309:ARG:HG3	2.02	0.42
1:A:1384:LEU:HD22	1:A:1404:LEU:HD21	2.01	0.42
1:A:2309:LEU:HD12	1:A:2309:LEU:HA	1.87	0.42
1:A:1036:ILE:CG2	1:A:1521:LYS:HE2	2.49	0.42
1:A:981:LEU:HA	1:A:981:LEU:HD12	1.78	0.42
1:A:1354:ASN:HB3	1:A:1365:GLY:HA3	2.00	0.42
1:A:1512:ASP:O	1:A:1514:LYS:HG3	2.19	0.42
1:A:1664:LEU:HD23	1:A:1669:ASN:O	2.20	0.42
1:A:2276:ILE:HB	1:A:2281:PHE:CE2	2.54	0.42
1:A:18:ARG:NH1	1:A:1668:GLY:O	2.53	0.42
1:A:578:ILE:HG12	1:A:640:ILE:HB	2.02	0.42
1:A:1169:ILE:HA	1:A:1230:PHE:HB2	2.02	0.42
1:A:312:TRP:HA	1:A:312:TRP:CE3	2.55	0.42
1:A:1114:GLN:OE1	1:A:1119:LYS:HB3	2.20	0.42
1:A:1236:TRP:CZ3	1:A:1273:ALA:HB2	2.55	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:911:ILE:HG22	1:A:912:GLU:O	2.20	0.41
1:A:1041:LEU:HD12	1:A:1045:ILE:CD1	2.50	0.41
1:A:1227:ASN:H	1:A:1285:THR:HG1	1.67	0.41
1:A:1958:TYR:HD1	1:A:1967:LEU:HD13	1.85	0.41
1:A:2226:THR:HG22	1:A:2228:LYS:HD3	2.00	0.41
1:A:1022:LEU:HB3	1:A:1023:PRO:HD2	2.02	0.41
1:A:2243:PHE:HE2	1:A:2249:MET:HG3	1.85	0.41
1:A:2259:ASN:HB2	1:A:2261:TYR:CE2	2.55	0.41
1:A:2342:GLY:HA2	1:A:2353:PHE:O	2.20	0.41
1:A:1264:TRP:CE2	1:A:1265:ARG:HD2	2.55	0.41
1:A:937:PHE:CE2	1:A:947:LYS:HB2	2.55	0.41
1:A:1086:ALA:HB2	1:A:1405:THR:OG1	2.20	0.41
1:A:1121:ILE:HD13	1:A:1248:THR:HG22	2.02	0.41
1:A:1329:PRO:HD3	1:A:1350:ASN:CG	2.45	0.41
1:A:2229:ALA:O	1:A:2231:LYS:HD2	2.20	0.41
1:A:416:PRO:HB2	1:A:434:LYS:HE2	2.03	0.41
1:A:1573:LYS:HD3	1:A:1687:ARG:HH22	1.84	0.41
1:A:1999:TYR:CE1	1:A:2011:ILE:HG21	2.56	0.41
1:A:2340:ALA:HB3	1:A:2353:PHE:CG	2.56	0.41
1:A:1582:LEU:HD21	1:A:1611:PHE:CD1	2.54	0.41
1:A:1608:ASP:OD1	1:A:1609:THR:N	2.52	0.41
1:A:2235:VAL:HG13	1:A:2240:LYS:HG3	2.02	0.41
1:A:526:ARG:HH11	1:A:526:ARG:HG3	1.85	0.41
1:A:2162:VAL:HG11	1:A:2200:TYR:HD2	1.85	0.41
1:A:280:ASP:N	1:A:280:ASP:OD1	2.54	0.41
1:A:340:GLU:O	1:A:344:ARG:HG3	2.21	0.41
1:A:493:LEU:HD22	1:A:497:GLU:OE1	2.20	0.41
1:A:1452:PHE:CZ	1:A:1457:GLN:HB3	2.56	0.41
1:A:72:LEU:HA	1:A:72:LEU:HD23	1.73	0.41
1:A:93:PRO:HA	1:A:366:ILE:O	2.21	0.41
1:A:1406:PHE:CE1	1:A:1414:ILE:HB	2.56	0.41
1:A:1539:SER:HB2	1:A:1556:TYR:HB3	2.02	0.41
1:A:603:TYR:CD1	1:A:623:VAL:HG22	2.56	0.41
1:A:622:SER:CA	1:A:639:GLN:HE22	2.26	0.41
1:A:1253:ARG:HH11	1:A:1257:HIS:HE1	1.69	0.41
1:A:1550:ILE:HD12	1:A:1603:ILE:HG21	2.02	0.41
1:A:1973:ILE:HB	1:A:1978:TYR:HE2	1.85	0.41
1:A:1991:ILE:HD12	1:A:2000:PHE:CD2	2.56	0.41
1:A:2016:LYS:HB3	1:A:2053:GLU:CD	2.46	0.41
1:A:2223:ASP:O	1:A:2227:LYS:HA	2.21	0.41
1:A:2242:TYR:HB2	1:A:2263:PHE:CE1	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:566:ILE:CD1	1:A:602:PRO:HB3	2.48	0.40
1:A:1938:TYR:CE2	1:A:1952:LEU:HD23	2.56	0.40
1:A:2281:PHE:HD1	1:A:2289:MET:SD	2.45	0.40
1:A:72:LEU:O	1:A:75:PHE:HB3	2.22	0.40
1:A:1031:ILE:CG2	1:A:1046:LYS:HD3	2.48	0.40
1:A:1160:ASN:HA	1:A:1215:PHE:CE2	2.56	0.40
1:A:1195:TYR:CD2	1:A:1196:ARG:HD3	2.56	0.40
1:A:1286:ASN:OD1	1:A:1313:SER:HB2	2.21	0.40
1:A:1470:LYS:HE3	1:A:1470:LYS:HB2	1.99	0.40
1:A:2008:VAL:HG23	1:A:2021:GLY:O	2.21	0.40
1:A:363:LEU:HD22	1:A:366:ILE:HD11	2.02	0.40
1:A:1926:PHE:HE1	1:A:1930:LEU:HB2	1.86	0.40
1:A:1111:LEU:N	1:A:1281:ARG:HH12	2.13	0.40
1:A:2130:PHE:CD2	1:A:2132:PHE:HE2	2.40	0.40
1:A:1280:PRO:C	1:A:1281:ARG:HD2	2.46	0.40
1:A:1409:LEU:HB2	1:A:1412:ILE:HB	2.03	0.40
1:A:2174:PRO:HG2	1:A:2177:THR:HG21	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	2351/2372 (99%)	2210 (94%)	135 (6%)	6 (0%)	37 66

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	707	ALA
1	A	1948	GLU
1	A	1029	LEU
1	A	1762	PRO

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Mol	Chain	Res	Type
1	A	2342	GLY
1	A	1023	PRO

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	2130/2146 (99%)	1995 (94%)	135 (6%)	15 42

All (135) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	38	SER
1	A	42	VAL
1	A	92	THR
1	A	94	VAL
1	A	110	THR
1	A	123	SER
1	A	141	LEU
1	A	145	ILE
1	A	200	PHE
1	A	201	ILE
1	A	208	THR
1	A	228	SER
1	A	232	ILE
1	A	244	GLU
1	A	272	LEU
1	A	288	ASP
1	A	332	SER
1	A	338	LEU
1	A	339	ASP
1	A	342	VAL
1	A	382	VAL
1	A	395	CYS
1	A	410	LEU
1	A	413	ASN

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Mol	Chain	Res	Type
1	A	417	SER
1	A	419	ASN
1	A	464	SER
1	A	469	SER
1	A	492	HIS
1	A	493	LEU
1	A	508	ILE
1	A	529	SER
1	A	535	LYS
1	A	574	ASN
1	A	640	ILE
1	A	644	ARG
1	A	646	ILE
1	A	651	ILE
1	A	656	SER
1	A	685	ASP
1	A	702	SER
1	A	703	TYR
1	A	785	ASN
1	A	830	SER
1	A	863	GLU
1	A	865	ILE
1	A	879	ASP
1	A	884	ILE
1	A	897	ARG
1	A	914	GLU
1	A	936	ILE
1	A	937	PHE
1	A	958	THR
1	A	968	LEU
1	A	981	LEU
1	A	1001	ILE
1	A	1002	THR
1	A	1010	LEU
1	A	1013	THR
1	A	1019	ILE
1	A	1027	GLU
1	A	1031	ILE
1	A	1039	VAL
1	A	1040	SER
1	A	1041	LEU
1	A	1048	LEU

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Mol	Chain	Res	Type
1	A	1055	LEU
1	A	1058	GLN
1	A	1072	THR
1	A	1078	ILE
1	A	1143	ILE
1	A	1144	ILE
1	A	1167	CYS
1	A	1205	VAL
1	A	1213	ILE
1	A	1234	MET
1	A	1251	LEU
1	A	1285	THR
1	A	1297	SER
1	A	1305	THR
1	A	1324	SER
1	A	1327	LEU
1	A	1332	MET
1	A	1340	GLU
1	A	1368	ILE
1	A	1392	TYR
1	A	1418	ILE
1	A	1433	CYS
1	A	1447	ILE
1	A	1462	TYR
1	A	1515	ASP
1	A	1534	ASP
1	A	1543	THR
1	A	1547	THR
1	A	1576	LEU
1	A	1591	ILE
1	A	1598	ASN
1	A	1602	ASN
1	A	1613	ILE
1	A	1618	SER
1	A	1662	TYR
1	A	1671	SER
1	A	1698	LEU
1	A	1714	ILE
1	A	1726	ILE
1	A	1751	ILE
1	A	1771	VAL
1	A	1775	ASP

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Mol	Chain	Res	Type
1	A	1776	THR
1	A	1779	ASP
1	A	1795	LYS
1	A	1801	SER
1	A	1814	PHE
1	A	1821	ASN
1	A	1831	ASN
1	A	1870	THR
1	A	1895	LEU
1	A	1902	THR
1	A	1914	THR
1	A	1927	ILE
1	A	1947	VAL
1	A	1952	LEU
1	A	1955	GLU
1	A	1963	THR
1	A	1988	THR
1	A	1992	THR
1	A	1995	ASP
1	A	2005	VAL
1	A	2037	PHE
1	A	2078	VAL
1	A	2181	ASN
1	A	2192	LEU
1	A	2235	VAL
1	A	2259	ASN
1	A	2362	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (41) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	5	ASN
1	A	8	GLN
1	A	35	HIS
1	A	53	ASN
1	A	58	ASN
1	A	97	ASN
1	A	106	GLN
1	A	139	ASN
1	A	169	ASN
1	A	222	ASN
1	A	413	ASN

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Mol	Chain	Res	Type
1	A	419	ASN
1	A	639	GLN
1	A	732	GLN
1	A	741	GLN
1	A	785	ASN
1	A	795	HIS
1	A	876	ASN
1	A	907	ASN
1	A	941	ASN
1	A	949	ASN
1	A	972	ASN
1	A	988	GLN
1	A	1109	ASN
1	A	1257	HIS
1	A	1390	ASN
1	A	1453	ASN
1	A	1504	ASN
1	A	1520	ASN
1	A	1553	ASN
1	A	1593	ASN
1	A	1727	ASN
1	A	1731	ASN
1	A	1735	ASN
1	A	1761	GLN
1	A	1763	GLN
1	A	2032	ASN
1	A	2058	ASN
1	A	2146	ASN
1	A	2260	ASN
1	A	2319	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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 1 ligands modelled in this entry, 1 is 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)

There are no chain breaks in this entry.