Full wwPDB EM Validation Report ⓘ

Jul 9, 2025 – 12:51 PM JST

PDB ID	:	8X2I / pdb_00008x2i
EMDB ID	:	EMD-38011
Title	:	Cryo-EM structure of the TcsL at pH 5.0 in its open conformation
Authors	:	Zhan, X.; Tao, L.
Deposited on	:	2023-11-09
Resolution	:	2.50 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:

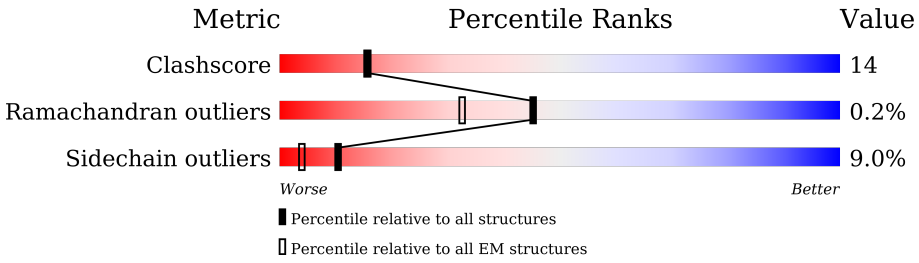
EMDB validation analysis	:	FAILED
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)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

1 Overall quality at a glance

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

The reported resolution of this entry is 2.50 Å.

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



Metric	Whole archive (#Entries)	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	64% 29%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 18645 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
1	A	2303	Total	C	N	O	S	0	0
			18644	11942	2959	3697	46		

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).

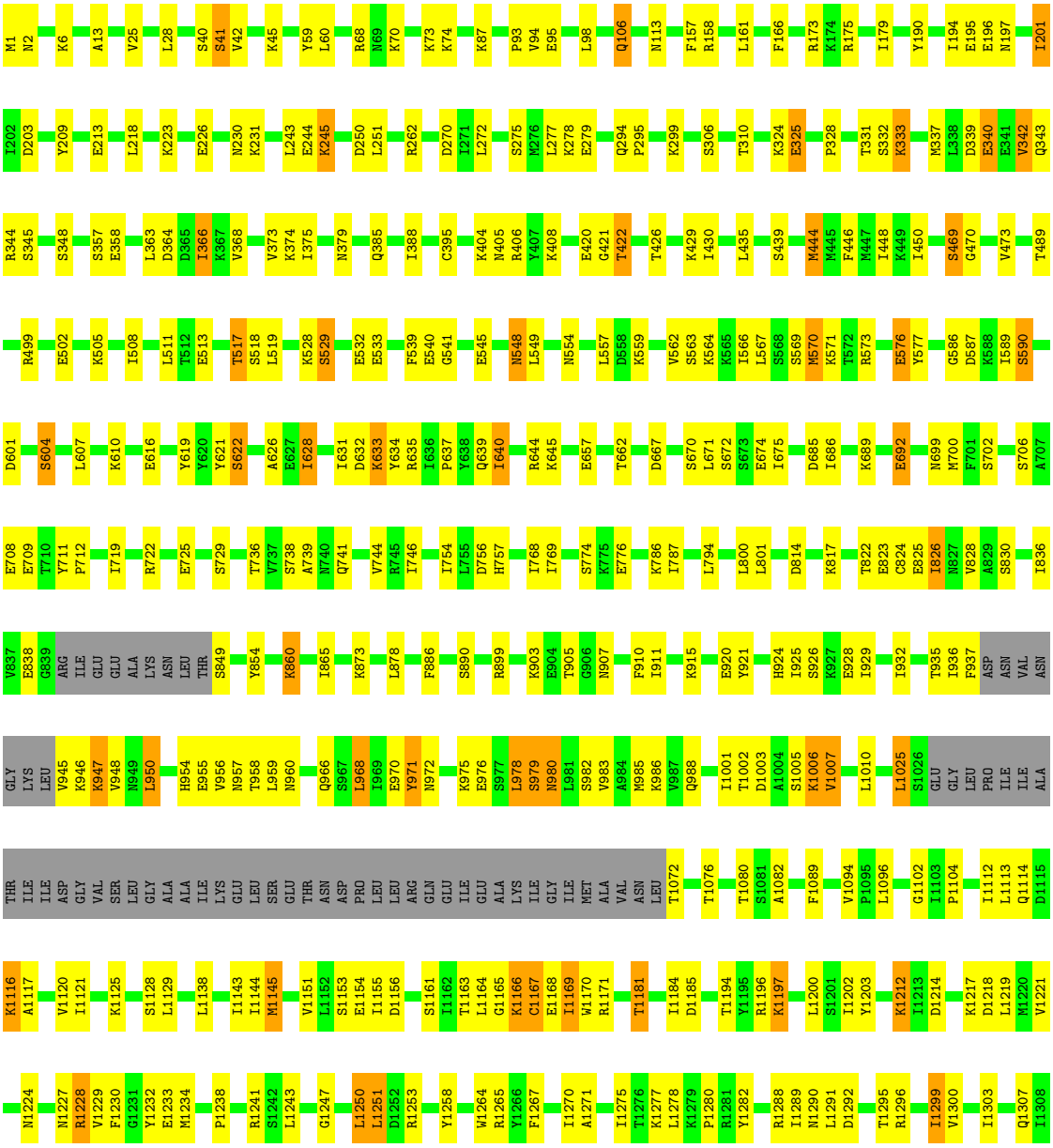
Mol	Chain	Residues	Atoms		AltConf
2	A	1	Total	Zn	0
			1	1	

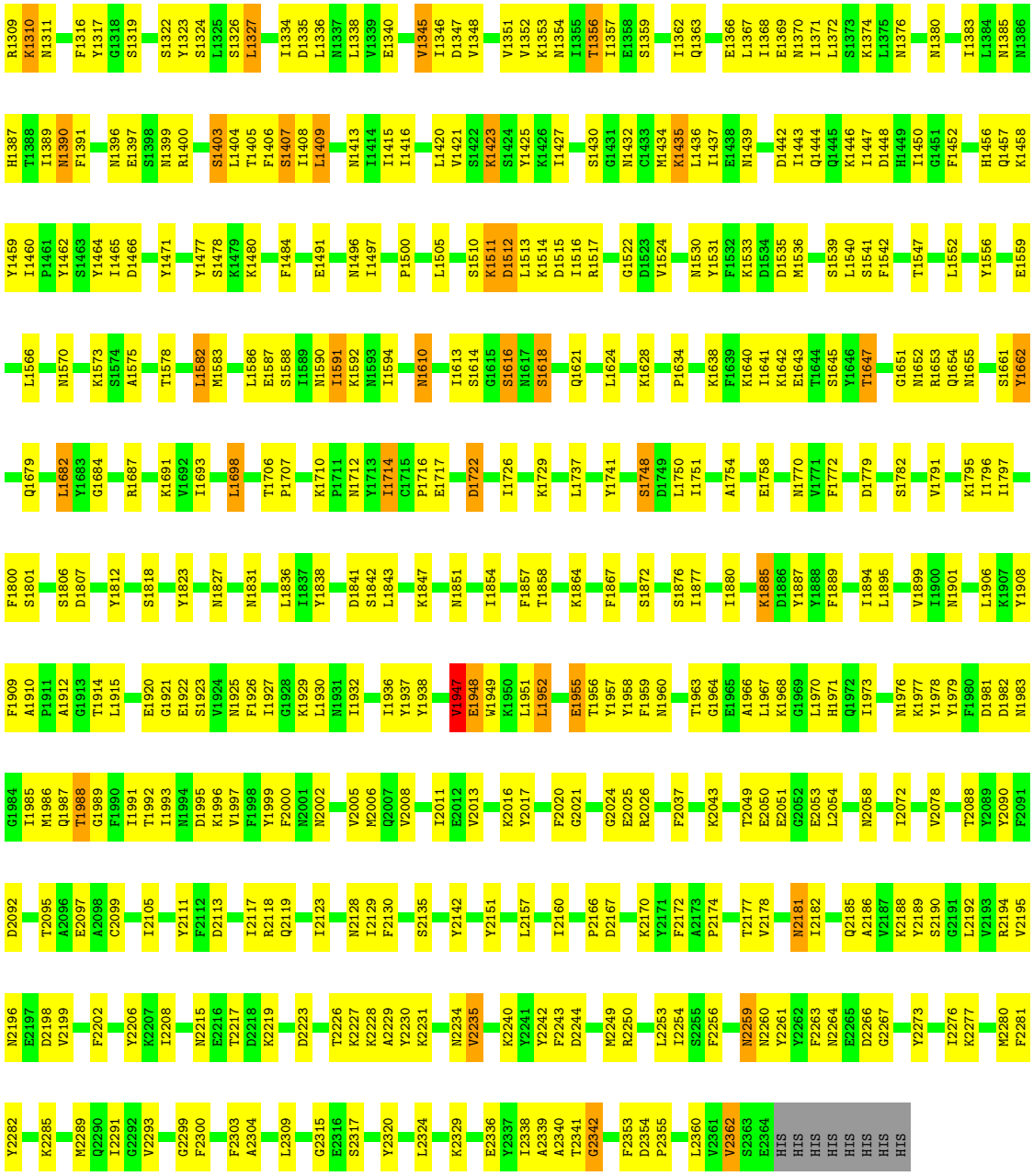
3 Residue-property plots (i)

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:




R1309 K1310 N1311 F1316 Y1317 G1318 S1319 S1322 Y1323 S1324 L1325 S1326 L1327 I1334 D1335 L1336 N1337 L1338 V1339 E1340 V1345 I1346 D1347 V1348 V1351 V1352 K1353 N1354 I1355 T1356 I1357 E1358 S1359 I1362 Q1363 E1366 L1367 I1368 E1369 N1370 I1371 L1372 S1373 K1374 L1375 N1376 N1380 I1383 L1384 N1385 N1386
H1387 T1388 I1389 N1390 F1391 N1396 E1397 S1398 N1399 R1400 S1403 L1404 T1405 F1406 S1407 I1408 L1409 N1413 I1414 I1415 I1416 L1420 V1421 S1422 K1423 S1424 Y1425 K1426 I1427 S1430 G1431 N1432 C1433 M1434 K1435 L1436 I1437 E1438 N1439 D1442 I1443 Q1444 Q1445 K1446 I1447 D1448 H1449 I1450 G1451 F1452 H1456 Q1457 K1458
Y1459 I1460 P1461 Y1462 S1463 Y1464 I1465 D1466 Y1471 Y1477 S1478 K1479 K1480 F1484 E1491 N1496 I1497 P1500 L1505 S1510 K1511 D1512 L1513 K1514 D1515 I1516 R1517 G1522 D1523 V1524 N1530 Y1531 F1532 K1533 D1534 D1535 M1536 S1539 L1540 S1541 F1542 T1547 L1552 Y1556 E1559
L1566 N1570 K1573 S1574 A1575 T1578 L1582 M1583 L1586 E1587 S1588 I1589 N1590 I1591 K1592 N1593 I1594 N1610 I1613 S1614 G1615 S1616 N1617 S1618 Q1621 L1624 K1628 P1634 K1638 F1639 K1640 I1641 K1642 E1643 T1644 S1645 Y1646 T1647 G1651 N1652 R1653 Q1654 N1655 S1661 Y1662
Q1679 L1682 Y1683 G1684 R1687 K1691 V1692 I1693 L1698 T1706 P1707 K1710 P1711 N1712 Y1713 I1714 G1715 P1716 E1717 D1722 I1726 K1729 L1737 Y1741 S1748 D1749 L1750 I1751 A1754 E1758 N1770 V1771 F1772 D1779 S1782 V1791 K1795 I1796 I1797
F1800 S1801 S1806 D1807 Y1812 S1818 Y1823 N1827 N1831 L1836 I1837 Y1838 D1841 S1842 L1843 K1847 N1851 I1854 F1857 T1858 K1864 F1867 S1872 S1876 I1877 I1880 K1885 D1886 Y1887 Y1888 F1889 I1894 L1895 V1899 I1900 N1901 L1906 K1907 Y1908
F1909 A1910 P1911 A1912 G1913 T1914 L1915 E1920 G1921 E1922 S1923 V1924 N1925 F1926 I1927 G1928 K1929 L1930 N1931 I1932 I1936 Y1937 Y1938 V1947 E1948 W1949 K1950 L1951 L1962 E1965 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 I2105 Y2111 F2112 D2113 I2117 R2118 Q2119 I2123 N2128 I2129 F2130 S2135 Y2142 Y2151 L2157 I2160 P2166 D2167 K2170 Y2171 F2172 A2173 P2174 T2177 V2178 N2181 I2182 Q2185 A2186 V2187 K2188 Y2189 S2190 G2191 L2192 V2193 R2194 V2195
N2196 E2197 D2198 V2199 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 Q2290 I2291 G2292 V2293 G2299 F2300 F2303 A2304 L2309 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

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1045888	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	0.39	0/19023	0.57	2/25734 (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

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	1947	VAL	CA-C-N	5.87	132.75	121.54
1	A	1947	VAL	C-N-CA	5.87	132.75	121.54

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1511	LYS	Peptide
1	A	364	ASP	Peptide

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	18644	0	18175	530	0
2	A	1	0	0	0	0
All	All	18645	0	18175	530	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 (530) 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:1956:THR:HG23	1:A:1986:MET:N	1.21	1.51
1:A:1956:THR:CG2	1:A:1986:MET:N	1.86	1.38
1:A:1956:THR:HG21	1:A:1986:MET:CA	1.71	1.19
1:A:1956:THR:HG21	1:A:1986:MET:CB	1.74	1.18
1:A:1956:THR:CG2	1:A:1986:MET:CB	2.34	1.05
1:A:1956:THR:CG2	1:A:1986:MET:H	1.50	1.04
1:A:1956:THR:HG22	1:A:1985:ILE:HG22	1.40	1.03
1:A:1956:THR:HG21	1:A:1986:MET:HB3	1.32	1.03
1:A:1956:THR:CG2	1:A:1986:MET:CA	2.32	1.03
1:A:699:ASN:H	1:A:741:GLN:HE21	1.12	0.95
1:A:1956:THR:CG2	1:A:1986:MET:HB3	1.96	0.94
1:A:1956:THR:HG21	1:A:1986:MET:C	1.99	0.88
1:A:1356:THR:HG23	1:A:1363:GLN:HB3	1.59	0.84
1:A:1591:ILE:HG22	1:A:1592:LYS:HD2	1.64	0.79
1:A:1154:GLU:HG3	1:A:1163:THR:HG22	1.65	0.79
1:A:1573:LYS:HA	1:A:1687:ARG:HH12	1.47	0.78
1:A:1956:THR:OG1	1:A:1986:MET:HB2	1.83	0.77
1:A:1956:THR:OG1	1:A:1986:MET:CB	2.33	0.77
1:A:1326:SER:HA	1:A:1347:ASP:HB3	1.65	0.76
1:A:1082:ALA:HB1	1:A:1405:THR:HG21	1.68	0.76
1:A:957:ASN:HA	1:A:960:ASN:HB2	1.68	0.76
1:A:2194:ARG:HG2	1:A:2199:VAL:HG12	1.67	0.75
1:A:1628:LYS:H	1:A:1628:LYS:HD2	1.51	0.74
1:A:2128:ASN:HB3	1:A:2157:LEU:HD22	1.70	0.73
1:A:499:ARG:NH1	1:A:502:GLU:OE1	2.22	0.73
1:A:1827:ASN:ND2	1:A:1831:ASN:O	2.22	0.72
1:A:1956:THR:HG21	1:A:1986:MET:O	1.88	0.72
1:A:1956:THR:CB	1:A:1986:MET:HB3	2.18	0.72
1:A:1956:THR:O	1:A:1985:ILE:HA	1.90	0.71
1:A:2088:THR:HG21	1:A:2118:ARG:HH21	1.54	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1791:VAL:HG13	1:A:1795:LYS:HD2	1.72	0.71
1:A:1570:ASN:O	1:A:1687:ARG:NH2	2.24	0.70
1:A:1464:TYR:HB3	1:A:1471:TYR:HB2	1.71	0.70
1:A:1334:ILE:HB	1:A:1389:ILE:HG23	1.75	0.69
1:A:1427:ILE:HD13	1:A:1452:PHE:HE2	1.57	0.69
1:A:1345:VAL:HA	1:A:1403:SER:O	1.93	0.69
1:A:1233:GLU:HB3	1:A:1277:LYS:HB2	1.74	0.68
1:A:2123:ILE:O	1:A:2130:PHE:HB2	1.92	0.68
1:A:1952:LEU:HD12	1:A:1952:LEU:N	2.09	0.68
1:A:1427:ILE:O	1:A:1457:GLN:NE2	2.19	0.67
1:A:924:HIS:O	1:A:928:GLU:HG3	1.93	0.67
1:A:2017:TYR:HB2	1:A:2054:LEU:HD22	1.76	0.67
1:A:1128:SER:HB2	1:A:1250:LEU:HG	1.77	0.67
1:A:1371:ILE:HG23	1:A:1372:LEU:HD22	1.74	0.67
1:A:2119:GLN:HG3	1:A:2123:ILE:HG13	1.76	0.67
1:A:1353:LYS:HA	1:A:1367:LEU:HA	1.76	0.66
1:A:1348:VAL:HG21	1:A:1404:LEU:HD13	1.77	0.66
1:A:1956:THR:O	1:A:1985:ILE:HG23	1.95	0.65
1:A:2118:ARG:NH1	1:A:2135:SER:O	2.30	0.65
1:A:1307:GLN:O	1:A:1311:ASN:ND2	2.22	0.64
1:A:2253:LEU:HG	1:A:2260:ASN:HD21	1.61	0.64
1:A:294:GLN:NE2	1:A:357:SER:O	2.30	0.64
1:A:1899:VAL:HG11	1:A:1937:TYR:CE1	2.32	0.64
1:A:295:PRO:O	1:A:299:LYS:HE3	1.98	0.64
1:A:2111:TYR:HE1	1:A:2123:ILE:HB	1.61	0.64
1:A:1096:LEU:HD11	1:A:1357:ILE:HD11	1.79	0.63
1:A:1184:ILE:HD12	1:A:1265:ARG:HB3	1.79	0.63
1:A:2174:PRO:O	1:A:2181:ASN:ND2	2.31	0.63
1:A:921:TYR:CZ	1:A:925:ILE:HG21	2.33	0.63
1:A:1827:ASN:HD21	1:A:1831:ASN:HB2	1.63	0.63
1:A:1218:ASP:HB2	1:A:1296:ARG:HA	1.80	0.63
1:A:2282:TYR:H	1:A:2289:MET:HE1	1.64	0.63
1:A:1737:LEU:HD13	1:A:1872:SER:HB2	1.82	0.62
1:A:985:MET:HE2	1:A:985:MET:HA	1.81	0.62
1:A:2244:ASP:HB3	1:A:2250:ARG:CZ	2.29	0.62
1:A:1290:ASN:HA	1:A:1317:TYR:HB3	1.82	0.62
1:A:559:LYS:O	1:A:563:SER:OG	2.14	0.62
1:A:1960:ASN:HB3	1:A:1964:GLY:H	1.65	0.62
1:A:2289:MET:HE2	1:A:2315:GLY:HA3	1.82	0.62
1:A:1405:THR:HG22	1:A:1415:ILE:HG12	1.81	0.62
1:A:421:GLY:O	1:A:426:THR:HB	2.00	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1324:SER:HB2	1:A:1345:VAL:HG23	1.82	0.62
1:A:1143:ILE:HG23	1:A:1219:LEU:HG	1.82	0.61
1:A:622:SER:HA	1:A:639:GLN:HE22	1.64	0.61
1:A:1295:THR:HA	1:A:1322:SER:O	2.00	0.61
1:A:1003:ASP:HB3	1:A:1006:LYS:HB2	1.80	0.61
1:A:2043:LYS:H	1:A:2051:GLU:HG2	1.65	0.61
1:A:744:VAL:HG22	1:A:754:ILE:HG22	1.82	0.61
1:A:1170:TRP:O	1:A:1232:TYR:OH	2.12	0.60
1:A:769:ILE:HG21	1:A:824:CYS:HB3	1.82	0.60
1:A:1181:THR:O	1:A:1184:ILE:HG22	2.01	0.60
1:A:1316:PHE:HE2	1:A:1334:ILE:HG23	1.65	0.60
1:A:250:ASP:HB3	1:A:404:LYS:HE2	1.83	0.60
1:A:324:LYS:O	1:A:325:GLU:HG2	2.02	0.60
1:A:1001:ILE:HD12	1:A:1010:LEU:HD13	1.84	0.60
1:A:1956:THR:CB	1:A:1986:MET:CB	2.78	0.60
1:A:1722:ASP:OD1	1:A:1722:ASP:N	2.25	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	0.59
1:A:1956:THR:OG1	1:A:1986:MET:HB3	2.01	0.59
1:A:1587:GLU:HA	1:A:1592:LYS:HD3	1.84	0.59
1:A:1818:SER:HB2	1:A:1823:TYR:CE1	2.37	0.59
1:A:1970:LEU:HD21	1:A:1977:LYS:HD3	1.84	0.58
1:A:854:TYR:CE1	1:A:960:ASN:HB3	2.37	0.58
1:A:1947:VAL:O	1:A:1959:PHE:HB2	2.01	0.58
1:A:959:LEU:HB2	1:A:1651:GLY:HA3	1.85	0.58
1:A:1772:PHE:CE1	1:A:1797:ILE:HD11	2.39	0.58
1:A:1915:LEU:CD2	1:A:1925:ASN:O	2.51	0.58
1:A:158:ARG:HG3	1:A:539:PHE:HE1	1.68	0.58
1:A:637:PRO:HD2	1:A:640:ILE:HD11	1.84	0.58
1:A:966:GLN:O	1:A:970:GLU:HB3	2.03	0.58
1:A:1153:SER:HB2	1:A:1163:THR:HG23	1.85	0.58
1:A:1496:ASN:O	1:A:1505:LEU:HA	2.03	0.58
1:A:979:SER:HA	1:A:982:SER:HB3	1.85	0.58
1:A:2244:ASP:HB3	1:A:2250:ARG:NE	2.19	0.58
1:A:631:ILE:HD12	1:A:637:PRO:HG3	1.86	0.58
1:A:2320:TYR:HE1	1:A:2324:LEU:HB2	1.69	0.57
1:A:1858:THR:HB	1:A:1867:PHE:HE2	1.70	0.57
1:A:1956:THR:HG23	1:A:1986:MET:H	0.58	0.57
1:A:2273:TYR:HE2	1:A:2280:MET:HB3	1.68	0.57
1:A:1640:LYS:HE2	1:A:1643:GLU:HA	1.86	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:1533:LYS:HE2	1:A:1536:MET:HE3	1.87	0.57
1:A:173:ARG:NH2	1:A:823:GLU:OE2	2.34	0.57
1:A:528:LYS:NZ	1:A:545:GLU:OE2	2.33	0.57
1:A:577:TYR:HB3	1:A:645:LYS:HB2	1.87	0.57
1:A:1748:SER:HB2	1:A:1770:ASN:HA	1.86	0.57
1:A:1929:LYS:HE3	1:A:1936:ILE:HG23	1.87	0.57
1:A:196:GLU:HG3	1:A:197:ASN:N	2.20	0.57
1:A:540:GLU:HG2	1:A:541:GLY:H	1.70	0.57
1:A:702:SER:HB3	1:A:776:GLU:HB2	1.86	0.57
1:A:529:SER:O	1:A:533:GLU:HG3	2.04	0.56
1:A:1511:LYS:HG2	1:A:1512:ASP:OD1	2.05	0.56
1:A:1908:TYR:O	1:A:1923:SER:HA	2.05	0.56
1:A:1908:TYR:CE2	1:A:1930:LEU:HD21	2.40	0.56
1:A:1348:VAL:HG23	1:A:1406:PHE:HB3	1.86	0.56
1:A:921:TYR:CE1	1:A:925:ILE:HD13	2.40	0.56
1:A:1385:ASN:O	1:A:1387:HIS:ND1	2.34	0.56
1:A:2300:PHE:HB3	1:A:2339:ALA:HB3	1.88	0.56
1:A:60:LEU:HD13	1:A:73:LYS:HE2	1.87	0.56
1:A:1437:ILE:HD12	1:A:1497:ILE:HD12	1.87	0.56
1:A:1899:VAL:HG11	1:A:1937:TYR:CZ	2.40	0.56
1:A:1956:THR:CG2	1:A:1985:ILE:HG22	2.26	0.56
1:A:1292:ASP:OD1	1:A:1296:ARG:NH1	2.26	0.56
1:A:1949:TRP:CZ2	1:A:1973:ILE:HG21	2.40	0.56
1:A:1864:LYS:HE3	1:A:1895:LEU:HD13	1.87	0.56
1:A:1956:THR:CG2	1:A:1986:MET:O	2.54	0.56
1:A:310:THR:HG23	1:A:511:LEU:HD13	1.87	0.56
1:A:1154:GLU:HA	1:A:1288:ARG:O	2.06	0.56
1:A:1345:VAL:HG12	1:A:1403:SER:HB3	1.87	0.55
1:A:1586:LEU:HD21	1:A:1613:ILE:HD11	1.88	0.55
1:A:2276:ILE:HG22	1:A:2277:LYS:HG2	1.88	0.55
1:A:1303:ILE:HB	1:A:1309:ARG:HG2	1.88	0.55
1:A:1151:VAL:HG12	1:A:1165:GLY:HA3	1.88	0.55
1:A:545:GLU:HB2	1:A:757:HIS:CD2	2.41	0.55
1:A:1346:ILE:HG22	1:A:1348:VAL:HG13	1.87	0.55
1:A:1515:ASP:HB3	1:A:1530:ASN:ND2	2.22	0.55
1:A:562:VAL:O	1:A:566:ILE:HG13	2.07	0.55
1:A:2293:VAL:HG12	1:A:2300:PHE:HD2	1.72	0.55
1:A:955:GLU:O	1:A:959:LEU:HG	2.07	0.55
1:A:2011:ILE:HD12	1:A:2020:PHE:HD2	1.72	0.55
1:A:1316:PHE:HB2	1:A:1336:LEU:HD23	1.89	0.54
1:A:2043:LYS:HE2	1:A:2050:GLU:HA	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:708:GLU:HG3	1:A:787:ILE:HD12	1.89	0.54
1:A:814:ASP:OD2	1:A:814:ASP:N	2.37	0.54
1:A:968:LEU:HG	1:A:985:MET:HG3	1.90	0.54
1:A:1185:ASP:HB2	1:A:1265:ARG:O	2.07	0.54
1:A:1425:TYR:O	1:A:1456:HIS:NE2	2.36	0.54
1:A:1166:LYS:HD2	1:A:1227:ASN:HB3	1.90	0.54
1:A:2190:SER:HA	1:A:2202:PHE:HB2	1.90	0.54
1:A:559:LYS:NZ	1:A:628:ILE:O	2.35	0.53
1:A:1168:GLU:HB2	1:A:1229:VAL:HA	1.90	0.53
1:A:1432:ASN:OD1	1:A:1435:LYS:N	2.30	0.53
1:A:420:GLU:HG3	1:A:430:ILE:HD13	1.91	0.53
1:A:226:GLU:OE1	1:A:230:ASN:ND2	2.39	0.53
1:A:1514:LYS:N	1:A:1530:ASN:O	2.39	0.53
1:A:1638:LYS:HG3	1:A:1647:THR:HG23	1.90	0.53
1:A:1714:ILE:HG13	1:A:1716:PRO:HD3	1.89	0.53
1:A:1512:ASP:OD1	1:A:1512:ASP:N	2.41	0.53
1:A:2223:ASP:HB2	1:A:2230:TYR:HE2	1.73	0.53
1:A:1316:PHE:CE2	1:A:1334:ILE:HG23	2.43	0.53
1:A:1448:ASP:OD1	1:A:1477:TYR:OH	2.25	0.53
1:A:692:GLU:HG2	1:A:736:THR:HB	1.90	0.53
1:A:719:ILE:HA	1:A:722:ARG:HE	1.73	0.53
1:A:1125:LYS:HG3	1:A:1247:GLY:HA3	1.91	0.53
1:A:1698:LEU:HD12	1:A:1726:ILE:HG13	1.89	0.53
1:A:1334:ILE:HB	1:A:1389:ILE:HD12	1.91	0.53
1:A:672:SER:HB3	1:A:722:ARG:NH2	2.24	0.53
1:A:1264:TRP:HE1	1:A:1265:ARG:HH21	1.56	0.53
1:A:1996:LYS:HB3	1:A:2025:GLU:HG2	1.91	0.53
1:A:1989:GLY:H	1:A:2000:PHE:HB2	1.73	0.53
1:A:587:ASP:OD2	1:A:590:SER:OG	2.21	0.52
1:A:980:ASN:N	1:A:980:ASN:OD1	2.41	0.52
1:A:373:VAL:HG23	1:A:395:CYS:HB3	1.91	0.52
1:A:1624:LEU:HD23	1:A:1634:PRO:HA	1.91	0.52
1:A:573:ARG:HG2	1:A:1806:SER:O	2.09	0.52
1:A:633:LYS:HE2	1:A:634:TYR:CE1	2.44	0.52
1:A:1340:GLU:HB2	1:A:1396:ASN:HD21	1.74	0.52
1:A:175:ARG:O	1:A:179:ILE:HG13	2.09	0.52
1:A:1847:LYS:O	1:A:1851:ASN:N	2.39	0.52
1:A:1336:LEU:HD12	1:A:1338:LEU:HD23	1.92	0.52
1:A:1221:VAL:HG22	1:A:1299:ILE:HG23	1.90	0.52
1:A:2160:ILE:HA	1:A:2172:PHE:O	2.10	0.52
1:A:1575:ALA:HA	1:A:1578:THR:HG22	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1796:ILE:O	1:A:1800:PHE:HB2	2.10	0.52
1:A:2244:ASP:CB	1:A:2250:ARG:CZ	2.87	0.52
1:A:2049:THR:HG22	1:A:2053:GLU:HB3	1.92	0.51
1:A:1510:SER:OG	1:A:1511:LYS:O	2.27	0.51
1:A:1540:LEU:HD11	1:A:1552:LEU:HD22	1.92	0.51
1:A:1957:TYR:HE1	1:A:1983:ASN:O	1.93	0.51
1:A:196:GLU:HG3	1:A:197:ASN:H	1.74	0.51
1:A:2336:GLU:HG3	1:A:2338:ILE:HG22	1.91	0.51
1:A:975:LYS:O	1:A:976:GLU:HG2	2.11	0.51
1:A:1120:VAL:HG13	1:A:1278:LEU:HD11	1.92	0.51
1:A:2242:TYR:HB2	1:A:2263:PHE:CZ	2.46	0.51
1:A:513:GLU:O	1:A:517:THR:HG23	2.09	0.51
1:A:549:LEU:HD11	1:A:589:ILE:HD12	1.92	0.51
1:A:621:TYR:HD2	1:A:628:ILE:HG13	1.76	0.51
1:A:1264:TRP:NE1	1:A:1265:ARG:HE	2.08	0.51
1:A:1976:ASN:HB3	1:A:2005:VAL:HG13	1.93	0.51
1:A:2244:ASP:CB	1:A:2250:ARG:NH2	2.73	0.51
1:A:13:ALA:O	1:A:68:ARG:NH1	2.44	0.51
1:A:1444:GLN:HA	1:A:1447:ILE:HG22	1.93	0.51
1:A:1968:LYS:HE2	1:A:1982:ASP:O	2.11	0.51
1:A:1116:LYS:O	1:A:1120:VAL:HG23	2.11	0.51
1:A:1559:GLU:OE1	1:A:1618:SER:OG	2.27	0.51
1:A:576:GLU:HB2	1:A:577:TYR:CD1	2.46	0.51
1:A:979:SER:O	1:A:983:VAL:HG22	2.11	0.51
1:A:1117:ALA:O	1:A:1121:ILE:HD12	2.10	0.51
1:A:1292:ASP:O	1:A:1323:TYR:OH	2.24	0.51
1:A:966:GLN:HE21	1:A:970:GLU:HB2	1.76	0.50
1:A:2177:THR:OG1	1:A:2181:ASN:ND2	2.31	0.50
1:A:1586:LEU:O	1:A:1591:ILE:HB	2.11	0.50
1:A:1400:ARG:NH2	1:A:1421:VAL:HB	2.26	0.50
1:A:2011:ILE:HD12	1:A:2020:PHE:CD2	2.47	0.50
1:A:1497:ILE:HG12	1:A:1505:LEU:HB2	1.93	0.50
1:A:1291:LEU:O	1:A:1319:SER:OG	2.22	0.50
1:A:1459:TYR:OH	1:A:1522:GLY:O	2.27	0.50
1:A:2177:THR:N	1:A:2181:ASN:OD1	2.43	0.50
1:A:340:GLU:O	1:A:344:ARG:HG2	2.12	0.50
1:A:1251:LEU:HD13	1:A:1264:TRP:CZ2	2.46	0.50
1:A:1352:VAL:HG13	1:A:1371:ILE:HG12	1.93	0.50
1:A:2244:ASP:HB2	1:A:2250:ARG:NH2	2.27	0.50
1:A:2006:MET:HE3	1:A:2024:GLY:HA3	1.92	0.50
1:A:1981:ASP:N	1:A:1981:ASP:OD1	2.44	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:190:TYR:O	1:A:194:ILE:HG13	2.12	0.49
1:A:700:MET:HB3	1:A:739:ALA:HB1	1.94	0.49
1:A:2264:ASN:OD1	1:A:2267:GLY:N	2.45	0.49
1:A:1327:LEU:HD13	1:A:1346:ILE:HG23	1.94	0.49
1:A:1807:ASP:HB2	1:A:1812:TYR:HE2	1.77	0.49
1:A:1104:PRO:HA	1:A:1112:ILE:O	2.13	0.49
1:A:886:PHE:HB2	1:A:988:GLN:HE22	1.77	0.49
1:A:1238:PRO:HG3	1:A:1271:ALA:HB1	1.94	0.49
1:A:1582:LEU:O	1:A:1586:LEU:HG	2.13	0.49
1:A:722:ARG:HA	1:A:725:GLU:HG2	1.94	0.49
1:A:1169:ILE:HG23	1:A:1232:TYR:HE2	1.77	0.49
1:A:2208:ILE:HD13	1:A:2227:LYS:HG2	1.93	0.49
1:A:557:LEU:HD22	1:A:607:LEU:HD23	1.95	0.49
1:A:2172:PHE:CE2	1:A:2186:ALA:HB2	2.48	0.49
1:A:2215:ASN:O	1:A:2217:THR:N	2.37	0.49
1:A:106:GLN:NE2	1:A:231:LYS:HD3	2.28	0.48
1:A:1956:THR:HG22	1:A:1985:ILE:CG2	2.26	0.48
1:A:2058:ASN:HD21	1:A:2072:ILE:HA	1.77	0.48
1:A:2230:TYR:HD1	1:A:2234:ASN:HB3	1.77	0.48
1:A:1144:ILE:HD11	1:A:1217:LYS:HD2	1.95	0.48
1:A:1113:LEU:HB2	1:A:1280:PRO:HD3	1.94	0.48
1:A:1352:VAL:HG13	1:A:1371:ILE:HG21	1.95	0.48
1:A:1981:ASP:OD1	1:A:1985:ILE:N	2.41	0.48
1:A:1348:VAL:HB	1:A:1351:VAL:HB	1.96	0.48
1:A:1437:ILE:HD11	1:A:1484:PHE:CE2	2.47	0.48
1:A:959:LEU:HB2	1:A:1651:GLY:CA	2.43	0.48
1:A:1076:THR:O	1:A:1080:THR:HG23	2.13	0.48
1:A:921:TYR:O	1:A:925:ILE:HG12	2.14	0.48
1:A:1901:ASN:HA	1:A:1906:LEU:HA	1.96	0.48
1:A:635:ARG:NH2	1:A:685:ASP:OD1	2.47	0.47
1:A:1154:GLU:HG3	1:A:1163:THR:CG2	2.39	0.47
1:A:2341:THR:O	1:A:2353:PHE:HB2	2.14	0.47
1:A:838:GLU:HA	1:A:838:GLU:OE1	2.13	0.47
1:A:2289:MET:HE2	1:A:2315:GLY:CA	2.44	0.47
1:A:956:VAL:HG23	1:A:957:ASN:H	1.79	0.47
1:A:1439:ASN:OD1	1:A:1442:ASP:HB3	2.14	0.47
1:A:1542:PHE:HB3	1:A:1552:LEU:HD23	1.94	0.47
1:A:1967:LEU:HB3	1:A:1971:HIS:CD2	2.50	0.47
1:A:2317:SER:O	1:A:2317:SER:OG	2.32	0.47
1:A:41:SER:O	1:A:45:LYS:HG3	2.13	0.47
1:A:1610:ASN:OD1	1:A:1610:ASN:N	2.47	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1634:PRO:HD2	1:A:1654:GLN:NE2	2.30	0.47
1:A:2129:ILE:O	1:A:2157:LEU:HA	2.15	0.47
1:A:1292:ASP:OD1	1:A:1292:ASP:N	2.46	0.47
1:A:1409:LEU:HD11	1:A:1446:LYS:HG3	1.97	0.47
1:A:801:LEU:HD13	1:A:828:VAL:HB	1.97	0.47
1:A:1169:ILE:HD12	1:A:1202:ILE:HD11	1.97	0.47
1:A:1327:LEU:HD22	1:A:1348:VAL:HG12	1.96	0.47
1:A:1439:ASN:O	1:A:1443:ILE:HG13	2.15	0.47
1:A:1977:LYS:HD2	1:A:2006:MET:SD	2.55	0.47
1:A:2243:PHE:CE2	1:A:2249:MET:HG3	2.50	0.47
1:A:1156:ASP:OD1	1:A:1290:ASN:ND2	2.48	0.47
1:A:1167:CYS:HB2	1:A:1203:TYR:CD2	2.50	0.47
1:A:1458:LYS:HE3	1:A:1458:LYS:HB3	1.55	0.47
1:A:1973:ILE:HD13	1:A:1978:TYR:HD2	1.79	0.47
1:A:689:LYS:HD3	1:A:729:SER:HB2	1.97	0.47
1:A:970:GLU:C	1:A:972:ASN:H	2.23	0.47
1:A:1480:LYS:HG3	1:A:1500:PRO:HD3	1.97	0.47
1:A:1838:TYR:CE1	1:A:1843:LEU:HB2	2.50	0.47
1:A:270:ASP:HB3	1:A:469:SER:HB2	1.96	0.46
1:A:1691:LYS:NZ	1:A:1717:GLU:OE2	2.44	0.46
1:A:2242:TYR:HE1	1:A:2256:PHE:HB2	1.81	0.46
1:A:2264:ASN:HD21	1:A:2266:ASP:HB3	1.80	0.46
1:A:754:ILE:HG23	1:A:768:ILE:HG12	1.97	0.46
1:A:1354:ASN:N	1:A:1366:GLU:O	2.44	0.46
1:A:1371:ILE:HG22	1:A:1450:ILE:HD12	1.96	0.46
1:A:2113:ASP:OD2	1:A:2117:ILE:HB	2.16	0.46
1:A:2151:TYR:HB2	1:A:2172:PHE:CZ	2.51	0.46
1:A:1512:ASP:HA	1:A:1514:LYS:HZ2	1.78	0.46
1:A:822:THR:O	1:A:826:ILE:HD12	2.15	0.46
1:A:1380:ASN:HB3	1:A:1391:PHE:O	2.16	0.46
1:A:201:ILE:HD11	1:A:203:ASP:HB2	1.97	0.46
1:A:960:ASN:ND2	1:A:1652:ASN:HA	2.31	0.46
1:A:2360:LEU:HG	1:A:2362:VAL:HG13	1.97	0.46
1:A:1947:VAL:O	1:A:1948:GLU:O	2.33	0.46
1:A:2215:ASN:C	1:A:2217:THR:H	2.23	0.46
1:A:278:LYS:HD3	1:A:279:GLU:OE1	2.16	0.46
1:A:935:THR:O	1:A:947:LYS:HB3	2.16	0.46
1:A:2170:LYS:HE3	1:A:2186:ALA:HB1	1.98	0.46
1:A:1997:VAL:HB	1:A:2026:ARG:HB3	1.98	0.45
1:A:1310:LYS:HE2	1:A:1310:LYS:HB2	1.68	0.45
1:A:1396:ASN:N	1:A:1399:ASN:OD1	2.31	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1979:TYR:HD1	1:A:1987:GLN:HB2	1.81	0.45
1:A:243:LEU:HB3	1:A:245:LYS:H	1.81	0.45
1:A:262:ARG:HA	1:A:262:ARG:HD3	1.77	0.45
1:A:1452:PHE:HE1	1:A:1460:ILE:HD11	1.81	0.45
1:A:1741:TYR:CE1	1:A:1754:ALA:HB2	2.50	0.45
1:A:1750:LEU:HD12	1:A:1751:ILE:H	1.82	0.45
1:A:2142:TYR:OH	1:A:2167:ASP:OD2	2.21	0.45
1:A:2353:PHE:CZ	1:A:2360:LEU:HB2	2.51	0.45
1:A:324:LYS:C	1:A:325:GLU:HG2	2.42	0.45
1:A:1679:GLN:O	1:A:1712:ASN:ND2	2.47	0.45
1:A:2223:ASP:HB2	1:A:2230:TYR:CE2	2.49	0.45
1:A:1:MET:HE3	1:A:2:ASN:H	1.81	0.45
1:A:294:GLN:HG3	1:A:358:GLU:O	2.16	0.45
1:A:899:ARG:HB2	1:A:910:PHE:CE1	2.52	0.45
1:A:2095:THR:HG23	1:A:2097:GLU:HG3	1.99	0.45
1:A:2354:ASP:OD1	1:A:2355:PRO:HD2	2.17	0.45
1:A:554:ASN:OD1	1:A:586:GLY:HA3	2.17	0.45
1:A:1372:LEU:HD23	1:A:1450:ILE:HG21	1.99	0.45
1:A:610:LYS:HE3	1:A:674:GLU:OE2	2.17	0.45
1:A:873:LYS:HG2	1:A:878:LEU:HB2	1.99	0.45
1:A:1171:ARG:HG3	1:A:1194:THR:HB	1.98	0.45
1:A:1264:TRP:HB2	1:A:1275:ILE:HG13	1.99	0.45
1:A:1640:LYS:HE3	1:A:1661:SER:CB	2.47	0.45
1:A:1895:LEU:HD21	1:A:1921:GLY:HA3	1.97	0.45
1:A:1988:THR:HG21	1:A:2002:ASN:HA	1.98	0.45
1:A:1374:LYS:HD2	1:A:1385:ASN:H	1.82	0.45
1:A:1408:ILE:HD12	1:A:1409:LEU:HD12	1.99	0.45
1:A:1908:TYR:HE2	1:A:1932:ILE:HD11	1.82	0.45
1:A:2254:ILE:HB	1:A:2263:PHE:HE2	1.82	0.45
1:A:70:LYS:HG3	1:A:1698:LEU:HD11	1.98	0.45
1:A:374:LYS:HB2	1:A:388:ILE:HB	1.99	0.45
1:A:1230:PHE:CE2	1:A:1280:PRO:HB3	2.51	0.45
1:A:1655:ASN:HB3	1:A:1693:ILE:CD1	2.47	0.45
1:A:1959:PHE:HE1	1:A:1966:ALA:HB2	1.82	0.45
1:A:1993:ILE:O	1:A:1996:LYS:HB2	2.17	0.45
1:A:936:ILE:HG13	1:A:946:LYS:HG3	1.99	0.44
1:A:1885:LYS:HE3	1:A:1922:GLU:OE2	2.17	0.44
1:A:1296:ARG:O	1:A:1323:TYR:HA	2.18	0.44
1:A:1400:ARG:O	1:A:1420:LEU:HG	2.17	0.44
1:A:1432:ASN:O	1:A:1436:LEU:N	2.51	0.44
1:A:2090:TYR:O	1:A:2099:CYS:N	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:587:ASP:OD2	1:A:587:ASP:N	2.45	0.44
1:A:406:ARG:HG2	1:A:446:PHE:CE2	2.52	0.44
1:A:93:PRO:HA	1:A:366:ILE:O	2.17	0.44
1:A:2299:GLY:HA3	1:A:2338:ILE:HD12	1.99	0.44
1:A:540:GLU:HG2	1:A:541:GLY:N	2.32	0.44
1:A:936:ILE:HG13	1:A:946:LYS:CD	2.47	0.44
1:A:2092:ASP:N	1:A:2092:ASP:OD1	2.50	0.44
1:A:2185:GLN:NE2	1:A:2186:ALA:O	2.51	0.44
1:A:1113:LEU:O	1:A:1114:GLN:NE2	2.51	0.44
1:A:1155:ILE:HB	1:A:1289:ILE:HG23	1.99	0.44
1:A:1400:ARG:HA	1:A:1420:LEU:HD12	1.99	0.44
1:A:1533:LYS:O	1:A:1535:ASP:N	2.44	0.44
1:A:505:LYS:HB2	1:A:505:LYS:HE2	1.60	0.44
1:A:978:LEU:HD23	1:A:982:SER:HB2	2.00	0.44
1:A:1001:ILE:HG22	1:A:1007:VAL:HG23	1.99	0.44
1:A:1955:GLU:CG	1:A:1985:ILE:HD13	2.45	0.44
1:A:2195:VAL:HG12	1:A:2196:ASN:N	2.32	0.44
1:A:2329:LYS:HE3	1:A:2360:LEU:H	1.82	0.44
1:A:1164:LEU:HG	1:A:1203:TYR:CD2	2.53	0.44
1:A:1291:LEU:HD23	1:A:1323:TYR:CG	2.52	0.44
1:A:1513:LEU:HA	1:A:1513:LEU:HD12	1.72	0.44
1:A:1959:PHE:CE1	1:A:1966:ALA:HB2	2.53	0.44
1:A:2235:VAL:HG22	1:A:2240:LYS:HG3	2.00	0.44
1:A:570:MET:HE2	1:A:570:MET:HB2	1.83	0.43
1:A:1218:ASP:O	1:A:1296:ARG:HG3	2.18	0.43
1:A:1296:ARG:NH1	1:A:1296:ARG:HB2	2.33	0.43
1:A:1531:TYR:CD1	1:A:1594:ILE:HD13	2.53	0.43
1:A:1706:THR:HA	1:A:1707:PRO:HD3	1.83	0.43
1:A:2285:LYS:HD3	1:A:2285:LYS:HA	1.72	0.43
1:A:429:LYS:HA	1:A:429:LYS:HD2	1.81	0.43
1:A:622:SER:O	1:A:626:ALA:N	2.51	0.43
1:A:1405:THR:HG22	1:A:1415:ILE:HG23	1.99	0.43
1:A:2178:VAL:HG21	1:A:2189:TYR:HB2	2.00	0.43
1:A:2219:LYS:HE3	1:A:2249:MET:HB3	2.01	0.43
1:A:936:ILE:HG13	1:A:946:LYS:HD2	2.00	0.43
1:A:1089:PHE:HD2	1:A:1299:ILE:HD13	1.83	0.43
1:A:1145:MET:HB3	1:A:1145:MET:HE2	1.64	0.43
1:A:1316:PHE:N	1:A:1335:ASP:O	2.47	0.43
1:A:1949:TRP:CE3	1:A:1958:TYR:HB2	2.53	0.43
1:A:1957:TYR:CE1	1:A:1983:ASN:O	2.70	0.43
1:A:2050:GLU:N	1:A:2053:GLU:OE2	2.48	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1973:ILE:HB	1:A:1978:TYR:CE2	2.53	0.43
1:A:2142:TYR:CD2	1:A:2166:PRO:HD2	2.53	0.43
1:A:2226:THR:HG22	1:A:2228:LYS:HD3	2.00	0.43
1:A:2304:ALA:O	1:A:2315:GLY:N	2.52	0.43
1:A:1951:LEU:CD2	1:A:1956:THR:HA	2.48	0.43
1:A:2013:VAL:O	1:A:2016:LYS:HE2	2.18	0.43
1:A:277:LEU:HD23	1:A:277:LEU:HA	1.76	0.43
1:A:1171:ARG:NH1	1:A:1197:LYS:HD3	2.33	0.43
1:A:1413:ASN:OD1	1:A:1430:SER:HB2	2.18	0.43
1:A:87:LYS:HB3	1:A:87:LYS:HE3	1.75	0.43
1:A:333:LYS:H	1:A:333:LYS:HD2	1.84	0.43
1:A:569:SER:O	1:A:571:LYS:HD2	2.19	0.43
1:A:1166:LYS:HD3	1:A:1228:ARG:O	2.19	0.43
1:A:1368:ILE:HG13	1:A:1371:ILE:HB	2.00	0.43
1:A:1908:TYR:CE1	1:A:1910:ALA:HB2	2.54	0.43
1:A:2182:ILE:HB	1:A:2185:GLN:HB2	2.01	0.43
1:A:209:TYR:CZ	1:A:213:GLU:HG3	2.54	0.43
1:A:333:LYS:O	1:A:337:MET:HG3	2.19	0.43
1:A:794:LEU:HA	1:A:794:LEU:HD23	1.86	0.43
1:A:1025:LEU:HD23	1:A:1621:GLN:OE1	2.18	0.43
1:A:640:ILE:H	1:A:640:ILE:HG12	1.62	0.43
1:A:2177:THR:HG1	1:A:2181:ASN:HD21	1.61	0.43
1:A:1416:ILE:HD12	1:A:1427:ILE:HG13	2.01	0.43
1:A:1652:ASN:OD1	1:A:1652:ASN:N	2.52	0.43
1:A:706:SER:HB3	1:A:709:GLU:CG	2.49	0.42
1:A:1533:LYS:HG3	1:A:1590:ASN:HB2	2.01	0.42
1:A:1432:ASN:HA	1:A:1464:TYR:CE2	2.55	0.42
1:A:1679:GLN:O	1:A:1682:LEU:HB2	2.19	0.42
1:A:1952:LEU:N	1:A:1952:LEU:CD1	2.80	0.42
1:A:1909:PHE:HB3	1:A:1921:GLY:O	2.19	0.42
1:A:860:LYS:HA	1:A:860:LYS:HD3	1.69	0.42
1:A:2230:TYR:CD1	1:A:2234:ASN:HB3	2.53	0.42
1:A:2273:TYR:CE2	1:A:2280:MET:HB3	2.52	0.42
1:A:209:TYR:CE2	1:A:213:GLU:HG3	2.54	0.42
1:A:971:TYR:HH	1:A:1662:TYR:HD1	1.68	0.42
1:A:1299:ILE:HG13	1:A:1300:VAL:N	2.35	0.42
1:A:339:ASP:O	1:A:343:GLN:HG3	2.19	0.42
1:A:886:PHE:HB2	1:A:988:GLN:NE2	2.34	0.42
1:A:972:ASN:ND2	1:A:986:LYS:HD3	2.34	0.42
1:A:1515:ASP:HB3	1:A:1530:ASN:HD21	1.83	0.42
1:A:1729:LYS:HB2	1:A:1729:LYS:HE2	1.73	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2259:ASN:HB2	1:A:2261:TYR:CE2	2.55	0.42
1:A:548:ASN:OD1	1:A:548:ASN:N	2.53	0.42
1:A:1376:ASN:HB2	1:A:1383:ILE:HB	2.01	0.42
1:A:1415:ILE:O	1:A:1416:ILE:HD13	2.19	0.42
1:A:1912:ALA:N	1:A:1920:GLU:HB3	2.34	0.42
1:A:2243:PHE:HE2	1:A:2249:MET:HG3	1.85	0.42
1:A:444:MET:HE3	1:A:444:MET:HB3	1.71	0.42
1:A:1234:MET:H	1:A:1234:MET:HG2	1.62	0.42
1:A:1369:GLU:OE2	1:A:1370:ASN:HB2	2.20	0.42
1:A:1432:ASN:ND2	1:A:1464:TYR:OH	2.39	0.42
1:A:1253:ARG:HH11	1:A:1253:ARG:HG3	1.83	0.42
1:A:1359:SER:O	1:A:1359:SER:OG	2.36	0.42
1:A:601:ASP:OD2	1:A:604:SER:OG	2.38	0.42
1:A:1383:ILE:HA	1:A:1387:HIS:O	2.20	0.42
1:A:2174:PRO:HG2	1:A:2177:THR:HG21	2.02	0.42
1:A:2229:ALA:O	1:A:2231:LYS:HD2	2.20	0.42
1:A:566:ILE:HG23	1:A:571:LYS:NZ	2.35	0.41
1:A:905:THR:HG23	1:A:907:ASN:H	1.84	0.41
1:A:1025:LEU:HD12	1:A:1556:TYR:HE2	1.84	0.41
1:A:1224:ASN:N	1:A:1224:ASN:OD1	2.52	0.41
1:A:1230:PHE:HE2	1:A:1280:PRO:HB3	1.83	0.41
1:A:1352:VAL:HG21	1:A:1406:PHE:CD2	2.55	0.41
1:A:1876:SER:HB2	1:A:1880:ILE:HG13	2.00	0.41
1:A:1889:PHE:CE1	1:A:1895:LEU:HB2	2.55	0.41
1:A:711:TYR:HB3	1:A:712:PRO:HD3	2.02	0.41
1:A:955:GLU:CD	1:A:955:GLU:H	2.28	0.41
1:A:1407:SER:HA	1:A:1413:ASN:HA	2.03	0.41
1:A:6:LYS:HE3	1:A:28:LEU:HB3	2.02	0.41
1:A:244:GLU:CD	1:A:244:GLU:H	2.28	0.41
1:A:157:PHE:CD2	1:A:166:PHE:CE2	3.08	0.41
1:A:294:GLN:HG3	1:A:358:GLU:C	2.45	0.41
1:A:2242:TYR:HB2	1:A:2263:PHE:CE1	2.56	0.41
1:A:2342:GLY:HA2	1:A:2353:PHE:O	2.20	0.41
1:A:635:ARG:HH21	1:A:685:ASP:CG	2.28	0.41
1:A:1200:LEU:HD22	1:A:1258:TYR:CD1	2.56	0.41
1:A:1228:ARG:HB3	1:A:1282:TYR:CE1	2.55	0.41
1:A:2235:VAL:HG13	1:A:2240:LYS:HG3	2.02	0.41
1:A:2309:LEU:HD12	1:A:2309:LEU:HA	1.87	0.41
1:A:95:GLU:H	1:A:95:GLU:CD	2.27	0.41
1:A:339:ASP:HB2	1:A:342:VAL:HG22	2.03	0.41
1:A:557:LEU:HD23	1:A:619:TYR:CD1	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1335:ASP:HA	1:A:1390:ASN:O	2.19	0.41
1:A:1991:ILE:HD12	1:A:2000:PHE:CD2	2.56	0.41
1:A:2276:ILE:HB	1:A:2281:PHE:CE2	2.54	0.41
1:A:2340:ALA:HB3	1:A:2353:PHE:CG	2.55	0.41
1:A:218:LEU:HD23	1:A:218:LEU:HA	1.90	0.41
1:A:1556:TYR:OH	1:A:1616:SER:OG	2.30	0.41
1:A:1926:PHE:HE1	1:A:1930:LEU:HB2	1.86	0.41
1:A:98:LEU:HD21	1:A:363:LEU:HD11	2.02	0.41
1:A:1212:LYS:HD2	1:A:1212:LYS:HA	1.69	0.41
1:A:1423:LYS:HD3	1:A:1423:LYS:HA	1.87	0.41
1:A:1566:LEU:HD22	1:A:1684:GLY:HA3	2.02	0.41
1:A:1854:ILE:HD13	1:A:1854:ILE:HA	1.93	0.41
1:A:1999:TYR:CE1	1:A:2011:ILE:HG21	2.56	0.41
1:A:333:LYS:HD2	1:A:333:LYS:N	2.36	0.41
1:A:1102:GLY:HA3	1:A:1114:GLN:HE22	1.85	0.41
1:A:1241:ARG:HD3	1:A:1267:PHE:HZ	1.86	0.41
1:A:1316:PHE:CE2	1:A:1334:ILE:HD12	2.56	0.41
1:A:1464:TYR:CZ	1:A:1466:ASP:HB2	2.56	0.41
1:A:1491:GLU:HG2	1:A:1511:LYS:HA	2.03	0.41
1:A:2198:ASP:OD1	1:A:2198:ASP:N	2.48	0.41
1:A:921:TYR:O	1:A:925:ILE:HG23	2.21	0.41
1:A:1642:LYS:O	1:A:1643:GLU:HB2	2.20	0.41
1:A:589:ILE:HD11	1:A:757:HIS:HA	2.04	0.40
1:A:925:ILE:HG13	1:A:926:SER:N	2.35	0.40
1:A:1241:ARG:HE	1:A:1241:ARG:HB2	1.68	0.40
1:A:1296:ARG:HB2	1:A:1296:ARG:CZ	2.52	0.40
1:A:2090:TYR:CZ	1:A:2105:ILE:HG12	2.57	0.40
1:A:470:GLY:O	1:A:473:VAL:HG22	2.21	0.40
1:A:950:LEU:H	1:A:950:LEU:HD22	1.85	0.40
1:A:1973:ILE:HB	1:A:1978:TYR:HE2	1.86	0.40
1:A:331:THR:HB	1:A:333:LYS:HD2	2.03	0.40
1:A:435:LEU:HD23	1:A:435:LEU:HA	1.83	0.40
1:A:671:LEU:O	1:A:675:ILE:HG13	2.22	0.40
1:A:954:HIS:C	1:A:956:VAL:N	2.78	0.40
1:A:1184:ILE:HG12	1:A:1267:PHE:CD1	2.56	0.40
1:A:1353:LYS:HB3	1:A:1353:LYS:HE2	1.87	0.40
1:A:2006:MET:HE3	1:A:2024:GLY:CA	2.51	0.40
1:A:113:ASN:ND2	1:A:328:PRO:HD2	2.37	0.40
1:A:1143:ILE:HG12	1:A:1219:LEU:HD23	2.03	0.40
1:A:1938:TYR:CE2	1:A:1952:LEU:HD23	2.56	0.40
1:A:2016:LYS:HB3	1:A:2053:GLU:CD	2.46	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2291:ILE:HA	1:A:2303:PHE:O	2.21	0.40
1:A:59:TYR:CD1	1:A:59:TYR:C	3.00	0.40
1:A:925:ILE:O	1:A:929:ILE:HG13	2.22	0.40
1:A:955:GLU:O	1:A:958:THR:HB	2.21	0.40
1:A:1089:PHE:CE2	1:A:1299:ILE:HB	2.57	0.40
1:A:1196:ARG:H	1:A:1196:ARG:HG2	1.74	0.40
1:A:1958:TYR:HD1	1:A:1967:LEU:HD13	1.85	0.40
1:A:2008:VAL:HG23	1:A:2021:GLY:O	2.21	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	2295/2372 (97%)	2163 (94%)	128 (6%)	4 (0%)	44 64

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1948	GLU
1	A	633	LYS
1	A	2342	GLY
1	A	422	THR

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	2088/2146 (97%)	1901 (91%)	187 (9%)	8 16

All (187) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	25	VAL
1	A	40	SER
1	A	41	SER
1	A	42	VAL
1	A	74	LYS
1	A	94	VAL
1	A	106	GLN
1	A	161	LEU
1	A	195	GLU
1	A	201	ILE
1	A	223	LYS
1	A	245	LYS
1	A	251	LEU
1	A	272	LEU
1	A	275	SER
1	A	306	SER
1	A	325	GLU
1	A	332	SER
1	A	333	LYS
1	A	340	GLU
1	A	342	VAL
1	A	345	SER
1	A	348	SER
1	A	366	ILE
1	A	368	VAL
1	A	375	ILE
1	A	379	ASN
1	A	385	GLN
1	A	405	ASN
1	A	408	LYS
1	A	422	THR
1	A	439	SER
1	A	444	MET
1	A	448	ILE
1	A	450	ILE
1	A	469	SER
1	A	489	THR
1	A	508	ILE

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Mol	Chain	Res	Type
1	A	517	THR
1	A	518	SER
1	A	519	LEU
1	A	529	SER
1	A	532	GLU
1	A	548	ASN
1	A	564	LYS
1	A	567	LEU
1	A	570	MET
1	A	576	GLU
1	A	590	SER
1	A	604	SER
1	A	616	GLU
1	A	622	SER
1	A	628	ILE
1	A	632	ASP
1	A	640	ILE
1	A	644	ARG
1	A	657	GLU
1	A	662	THR
1	A	667	ASP
1	A	670	SER
1	A	686	ILE
1	A	692	GLU
1	A	738	SER
1	A	746	ILE
1	A	756	ASP
1	A	774	SER
1	A	786	LYS
1	A	800	LEU
1	A	817	LYS
1	A	825	GLU
1	A	826	ILE
1	A	830	SER
1	A	836	ILE
1	A	849	SER
1	A	860	LYS
1	A	865	ILE
1	A	890	SER
1	A	903	LYS
1	A	911	ILE
1	A	915	LYS

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Mol	Chain	Res	Type
1	A	920	GLU
1	A	932	ILE
1	A	937	PHE
1	A	945	VAL
1	A	947	LYS
1	A	948	VAL
1	A	950	LEU
1	A	968	LEU
1	A	971	TYR
1	A	978	LEU
1	A	979	SER
1	A	980	ASN
1	A	1002	THR
1	A	1005	SER
1	A	1006	LYS
1	A	1007	VAL
1	A	1025	LEU
1	A	1072	THR
1	A	1094	VAL
1	A	1116	LYS
1	A	1129	LEU
1	A	1138	LEU
1	A	1145	MET
1	A	1161	SER
1	A	1166	LYS
1	A	1167	CYS
1	A	1169	ILE
1	A	1181	THR
1	A	1197	LYS
1	A	1212	LYS
1	A	1214	ASP
1	A	1228	ARG
1	A	1243	LEU
1	A	1250	LEU
1	A	1251	LEU
1	A	1270	ILE
1	A	1299	ILE
1	A	1310	LYS
1	A	1327	LEU
1	A	1345	VAL
1	A	1356	THR
1	A	1362	ILE

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Mol	Chain	Res	Type
1	A	1390	ASN
1	A	1397	GLU
1	A	1403	SER
1	A	1407	SER
1	A	1409	LEU
1	A	1423	LYS
1	A	1434	MET
1	A	1435	LYS
1	A	1462	TYR
1	A	1465	ILE
1	A	1478	SER
1	A	1512	ASP
1	A	1516	ILE
1	A	1517	ARG
1	A	1524	VAL
1	A	1539	SER
1	A	1541	SER
1	A	1547	THR
1	A	1582	LEU
1	A	1583	MET
1	A	1588	SER
1	A	1591	ILE
1	A	1610	ASN
1	A	1614	SER
1	A	1616	SER
1	A	1618	SER
1	A	1641	ILE
1	A	1645	SER
1	A	1647	THR
1	A	1653	ARG
1	A	1662	TYR
1	A	1682	LEU
1	A	1698	LEU
1	A	1710	LYS
1	A	1714	ILE
1	A	1722	ASP
1	A	1748	SER
1	A	1758	GLU
1	A	1779	ASP
1	A	1782	SER
1	A	1801	SER
1	A	1836	LEU

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Mol	Chain	Res	Type
1	A	1841	ASP
1	A	1842	SER
1	A	1857	PHE
1	A	1877	ILE
1	A	1885	LYS
1	A	1887	TYR
1	A	1894	ILE
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	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 (45) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	2	ASN
1	A	5	ASN
1	A	58	ASN
1	A	106	GLN
1	A	117	GLN
1	A	302	ASN
1	A	380	ASN
1	A	419	ASN
1	A	487	ASN
1	A	553	GLN
1	A	579	HIS
1	A	639	GLN
1	A	699	ASN
1	A	741	GLN
1	A	757	HIS

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Mol	Chain	Res	Type
1	A	876	ASN
1	A	924	HIS
1	A	960	ASN
1	A	988	GLN
1	A	1114	GLN
1	A	1126	HIS
1	A	1178	HIS
1	A	1207	ASN
1	A	1257	HIS
1	A	1290	ASN
1	A	1333	ASN
1	A	1396	ASN
1	A	1444	GLN
1	A	1520	ASN
1	A	1530	ASN
1	A	1548	ASN
1	A	1598	ASN
1	A	1654	GLN
1	A	1663	HIS
1	A	1669	ASN
1	A	1676	ASN
1	A	1704	ASN
1	A	1727	ASN
1	A	1733	ASN
1	A	1763	GLN
1	A	1789	GLN
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.