



# wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 9, 2023 – 02:48 PM EDT

PDB ID : 7K17  
Title : Re-refined crystal structure of DNA-dependent protein kinase catalytic subunit complexed with Ku80 C-terminal helix  
Authors : Chen, X.; Gellert, M.; Yang, W.  
Deposited on : 2020-09-07  
Resolution : 4.30 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467  
Xtriage (Phenix) : 1.13  
EDS : 2.35.1  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.35.1

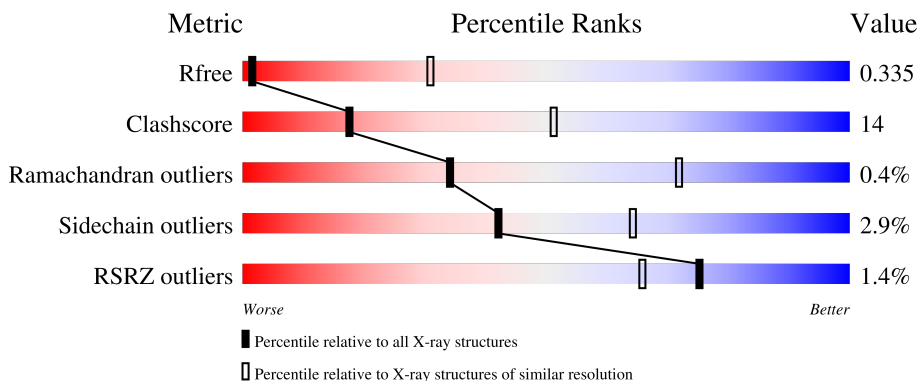
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 4.30 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)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	1014 (4.80-3.80)
Clashscore	141614	1077 (4.80-3.80)
Ramachandran outliers	138981	1029 (4.80-3.80)
Sidechain outliers	138945	1012 (4.80-3.80)
RSRZ outliers	127900	1075 (4.90-3.70)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	3986	 62% 28% 9%
1	B	3986	 62% 28% 9%
2	C	192	 95%
2	D	192	 95%

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 56895 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called DNA-dependent protein kinase catalytic subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	3629	28238	18117	4751	5184	186	0	0	0
1	B	3645	28521	18300	4815	5221	185	0	0	0

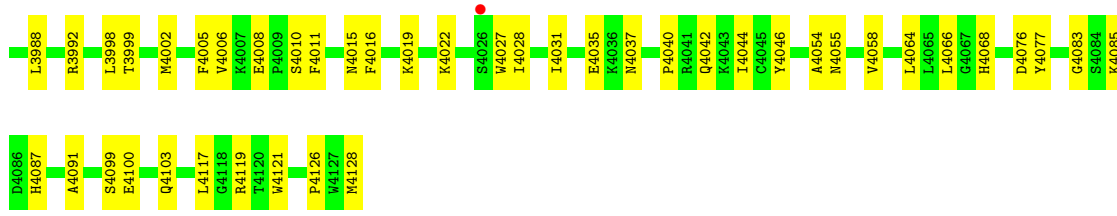
- Molecule 2 is a protein called X-ray repair cross-complementing protein 5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	D	9	68	43	9	15	1	0	0	0
2	C	9	68	43	9	15	1	0	0	0

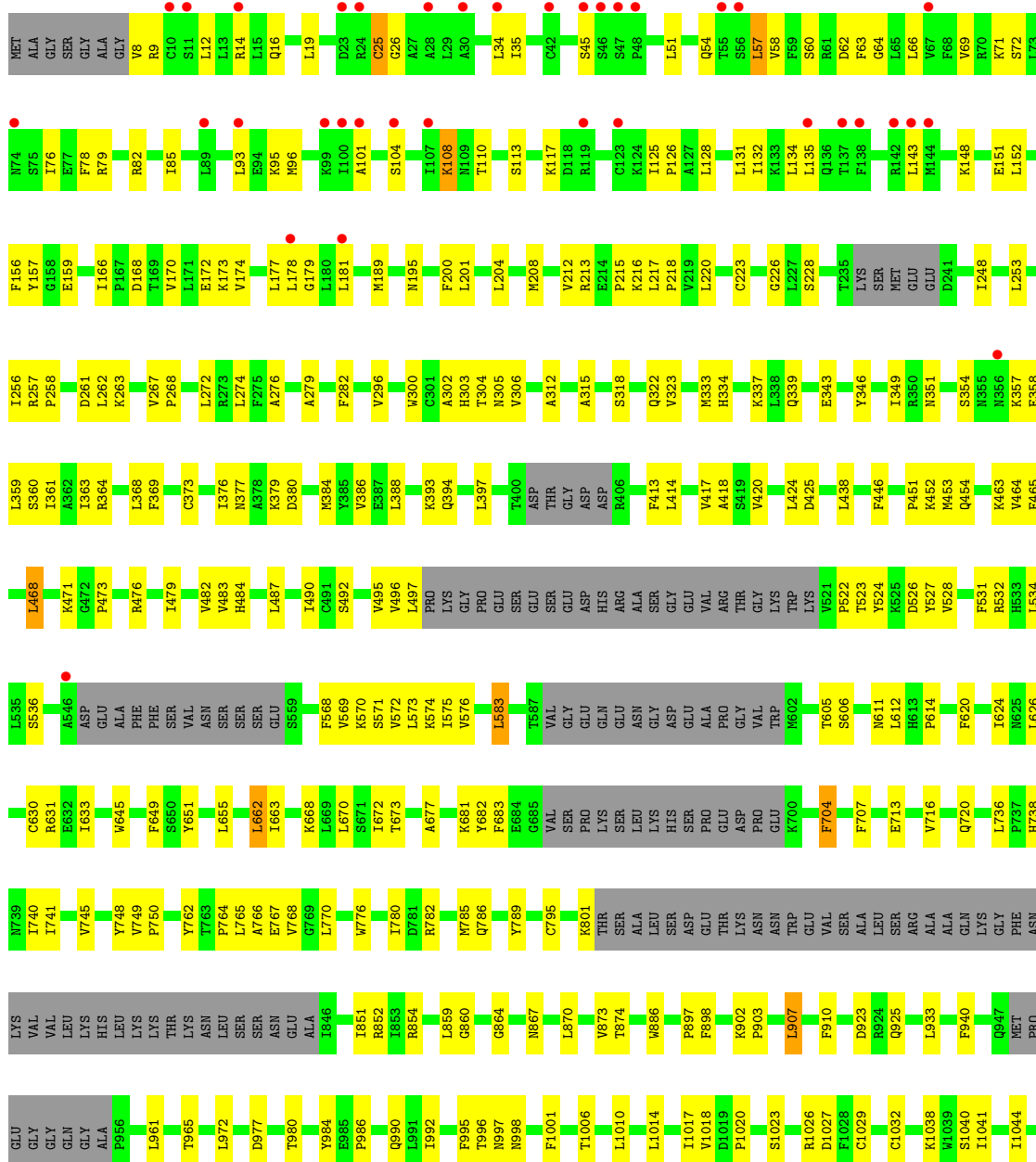


L2237	R2143	L2241	K2246	C2248	L2249	S2250	E2251	P2252	R2253	L2254	L2255	F2257	F2260	D2269	I2274	Q2275	L2276	L2277	V2280	M2281	D2284	L2285	P2286	F2287	Y2288	D2289	P2290	Q2291	C2292	G2293	I2294	Q2295	S2296	V2304	N2305	M2306	F2309	Y2312	V2315	A2318	E2321	V2322	I2326	L2327									
THR	GLY	PHE	ARG	ARG	ARG	ARG	GLU	MET	GLU	ARG	LYS	LYS	THR	VAL	HIS	ASP	ASP	VAL	LEU	E2082	L2083	E2084	M2085	L2088	M2089	R2090	H2091	GLY	ASP	ASP	ASP	GLY	PRO	GLN	GLY	T2035	L2036	G2048	VAL	GLN	GLN	TVR	TYR	TYR	G2131	N2135	P2136	I2137	V2138	P2139	L2140		
G1122	T1123	I1124	Q1125	L1134	I1137	I1138	E1139	K1140	K1141	K1038	H1037	V1039	C1029	C1032	K1142	H1041	L1040	L1041	L1042	S1052	R1151	F1154	R1155	G1156	F1157	C1164	L1165	L1166	R1178	P1179	Q1180	T1181	C1182	C1183	R1184	Y1192	K1193	F1194	V1195	P1196	L1197	S1203	P1204	L1208	L1212	K1213	L1220	F1224	G1228	G1229	L1230	GLN	
PRO	SER	GLY	ILE	LEU	ALA	GLN	PRO	THR	THR	LEU	LEU	TYR	LEU	ARG	GLY	PRO	GLY	GLY	GLY	Q1251	C1255	W1256	L1257	D1258	L1259	L1260	L1261	A1262	A1263	C1266	T1275	L1279	L1282	G1283	L1291	K1292	A1293	V1294	A1295	F1296	F1297	L1298	I1301	A1302	M1303	HIS	ASP	ILE	ILE	ALA	ALA	GLU	LYS
CYS	PHE	THR	GLY	ALA	ALA	GLY	ASN	THR	S1323	S1333	K1334	C1335	E1429	E1430	V1337	M1342	E1343	F1344	T1345	T1346	T1347	L1348	L1349	S1352	V1353	H1354	G1355	W1356	K1357	L1358	L1359	K1361	D1362	C1364	M1365	H1366	L1368	V1371	L1372	V1373	H1382	V1389	P1501	H1394	L1395	D1504	C1507	K1508					
L1406	Y1411	L1415	E1416	R1420	K1422	A1425	G1426	S1427	L1428	E1429	E1430	L1431	C1432	A1433	E1434	V1434	M1435	L1436	F1439	D1440	V1443	L1448	H1459	L1463	N1466	D1474	V1479	L1483	V1487	G1494	ASP	GLU	ARG	GLN	CYS	LEU	P1501	S1502	L1503	D1504	V1593	G1599											
Q1509	L1510	L1514	L1515	F1519	A1520	L1528	L1533	M1534	P1535	A1536	V1537	LEU	SER	THR	ALA	SER	VAL	ILE	HIS	PHE	SER	ASN	THR	H1665	Y1560	S1564	M1568	K1572	M1574	L1575	D1576	L1577	A1578	V1579	L1580	E1581	L1582	M1583	M1589	V1593	G1599												
H1800	L1601	D1602	Q1603	S1604	K1612	H1613	K1617	L1618	T1621	H1625	W1633	D1636	E1640	T1641	K1642	L1646	L1653	S1657	VAL	ILE	HIS	PHE	ASN	THR	H1665	G1666	S1667	P1669	T1674	V1675	I1676	L1679	A1680	D1681	T1682	K1683	L1686	L1687	A1692	L1695	L1696	P1697	F1698										
L1702	T1703	L1707	R1712	V1713	Q1716	L1717	I1718	H1721	F1722	P1723	M1724	Q1725	P1730	T1733	T1741	L1747	L1750	S1753	Q1754	S1755	L1758	L1759	E1760	E1764	V1765	L1766	C1767	R1768	E1769	H1772	Y1773	M1774	F1778	Q1779	R1783	R1787	R1788																
G1789	S1790	T1793	Q1794	L1797	V1801	Y1802	W1820	D1821	A1822	S1823	L1825	W1829	H1830	C1831	S1832	L1833	D1834	A1835	L1836	R1837	F1840	I1843	W1844	V1845	I1848	D1849	S1850	L1851	S1853	T1856	K1857	L1858	S1861	S1868	E1869	L1870	I1877	Y1878	D1878	Y1881	H1890	A1891	K1892										
K1895	I1896	V1899	E1893	V1994	T1906	M1909	E1910	L1911	L1912	K1913	T1914	L1915	L1916	A1917	L1918	C1919	Y1920	F1923	E1928	L1933	E1930	M1931	L1934	L1937	R1937	E1948	I1949	S1950	V1951	I1952	V1955	F1956	M1957	Y1962	F1967	S1968	E1969	L1976	I1977	E1979	M1980	L1981	I1982	D1983	L1984	R1987							
F1990	P1991	V1992	E1993	V1994	E1995	V1996	MET	GLU	ARG	LYS	LYS	LYS	TYR	ILE	ASP	ILE	LEU	ARG	LYS	E2082	L2083	E2084	M2085	L2088	M2089	R2090	H2091	GLY	ASP	ASP	ASP	GLY	PRO	GLN	GLY	T2035	L2036	G2048	VAL	GLN	GLN	TVR	TYR	TYR	G2131	N2135	P2136	I2137	V2138	P2139	L2140		
R2143	L2144	K2148	L2151	M2152	T2153	E2154	E2155	V2156	L2165	L2168	N2177	C2178	G2179	E2180	G2181	L2182	H2183	Y2184	W2185	V2186	L2187	E2188	L2189	L2190	A2191	T2192	I2193	D2288	P2290	Q2291	T2197	G2198	L2199	A2200	T2203	D2208	L2219	M2220	V2223	F2224	H2225	P2226	K2227	V2230	F2231	M2234							





● Molecule 1: DNA-dependent protein kinase catalytic subunit



T2240	Q1047	I1423	H1613	T1733	W1829	C1904	VAL	ARG	N2152	G2276	L2277	G2276	L2279	L2285	D2289	P2290	L2291	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
L2241	Q1048	T1424	Q1614	T1737	H1830	C1904	VAL	ARG	N2153	G2277	L2278	G2277	L2279	L2285	D2289	P2290	L2291	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
W2245	Q1049	A1425	G1615	N1738	S1831	T1905	PRO	ARG	E2154	E2154	G2178	G2178	L2179	L2183	P2265	D2264	P2265	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
K2246	S1052	A1426	L1616	Y1739	S1832	T1906	GLU	ARG	E2155	E2155	L1918	L1918	L1919	L2184	P2266	D2265	P2266	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
D2247	S1053	S1427	L1617	Y1739	L1833	L1906	GLN	ARG	W2156	W2156	L1919	L1919	L1920	L2185	P2267	D2266	P2267	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
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S2250	N1058	E1430	T1620	L1747	R1837	L1915	THR	THR	W2164	W2164	L1922	L1922	L1923	L2188	P2270	D2269	P2270	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
I2251	S1058	I1622	E1838	L1750	F1839	L1918	VAL	VAL	L2168	L2168	L1923	L1923	L1924	L2189	P2271	D2270	P2271	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
P2252	L1068	L1616	L1623	E1751	F1840	L1918	HIS	HIS	L2169	L2169	L1924	L1924	L1925	L2190	P2272	D2271	P2272	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
Y2253	H1069	L1617	L1624	L1752	S1841	L1923	ASP	ASP	L2170	L2170	L1925	L1925	L1926	L2191	P2273	D2272	P2273	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
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L2255	R1071	L1166	C1266	Y1267	W1844	V1845	VAL	VAL	L2172	L2172	L1927	L1927	L1928	L2193	P2275	D2274	P2275	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
I2256	R1075	D1167	E1267	Y1267	V1845	V1846	LEU	LEU	L2173	L2173	L1928	L1928	L1929	L2194	P2276	D2275	P2276	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
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D2264	F1082	L1194	F1202	T1275	E2082	L2083	ASN	ASN	L2175	L2175	L1930	L1930	L1931	L2196	P2278	D2277	P2278	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
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P2286	R1090	P1204	D1363	F1564	S1862	T1862	SER	SER	L2183	L2183	L1938	L1938	L1939	L2204	P2286	D2285	P2286	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
D2269	N1205	L1206	C1364	S1667	F1863	T1863	GLY	GLY	L2184	L2184	L1939	L1939	L1940	L2205	P2287	D2286	P2287	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
L2277	V1096	W1207	L1365	F1668	S1761	L1952	PRO	PRO	L2185	L2185	L1940	L1940	L1941	L2206	P2288	D2287	P2288	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
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I2279	V1100	D1210	K1361	E1570	Q1867	Q1867	THR	THR	L2187	L2187	L1942	L1942	L1943	L2208	P2290	D2289	P2290	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
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P2290	E1102	L1213	L1370	M1574	M1872	G1872	ASP	ASP	L2189	L2189	L1944	L1944	L1945	L2210	P2292	D2291	P2292	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
L2294	E1103	K1213	V1371	M1575	M1872	G1872	VAL	VAL	L2190	L2190	L1945	L1945	L1946	L2211	P2293	D2292	P2293	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
Q2301	L1104	L1220	H1303	D1576	K1875	L1875	GLN	GLN	L2191	L2191	L1946	L1946	L1947	L2212	P2294	D2293	P2294	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
W2304	V1105	L1220	H1303	D1576	L1876	L1876	VAL	VAL	L2192	L2192	L1947	L1947	L1948	L2213	P2295	D2294	P2295	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
N2306	L1113	G1229	G1230	ASP	L1877	L1877	GLN	GLN	L2193	L2193	L1948	L1948	L1949	L2214	P2296	D2295	P2296	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
F2309	L1121	GLN	GLN	ASP	L1878	L1878	SER	SER	L2194	L2194	L1949	L1949	L1950	L2215	P2297	D2296	P2297	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
V2310	G1122	PRO	PRO	ASP	L1879	L1879	THR	THR	L2195	L2195	L1950	L1950	L1951	L2216	P2298	D2297	P2298	T2201	V2205	P2206	K2207	D2208	A2212	L2219	V2223	F2309	V2310	R2311	Y2312	K2313	E2314	V2315	Y2316	A2320	E2321	I2326
R2311	T1123	SER	SER	ASP	L1880	L1880	ARG	ARG	L2196	L2196	L1951	L1951	L1952	L2217	P2299	D2298	P2299	T2201	V2205	P2206	K2207															







## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	169.12Å 132.64Å 296.59Å 90.00° 105.53° 90.00°	Depositor
Resolution (Å)	49.92 – 4.30 49.92 – 4.30	Depositor EDS
% Data completeness (in resolution range)	97.8 (49.92-4.30) 97.6 (49.92-4.30)	Depositor EDS
$R_{merge}$	0.16	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.33 (at 4.29Å)	Xtrriage
Refinement program	PHENIX 1.14_3260	Depositor
R, $R_{free}$	0.286 , 0.335 0.286 , 0.335	Depositor DCC
$R_{free}$ test set	2009 reflections (2.32%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	184.6	Xtrriage
Anisotropy	0.337	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.27 , 157.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	0.019 for h,-k,-h-l	Xtrriage
$F_o, F_c$ correlation	0.90	EDS
Total number of atoms	56895	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	217.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.76% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality i

### 5.1 Standard geometry i

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.29	0/28603	0.52	5/38757 (0.0%)
1	B	0.29	0/28898	0.51	8/39125 (0.0%)
2	C	0.25	0/67	0.43	0/90
2	D	0.28	0/67	0.50	0/90
All	All	0.29	0/57635	0.52	13/78062 (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
1	B	0	1
All	All	0	3

There are no bond length outliers.

The worst 5 of 13 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	3652	LEU	CB-CG-CD2	-7.00	99.10	111.00
1	A	2781	PRO	N-CA-CB	6.49	111.08	103.30
1	B	1858	LEU	CB-CG-CD1	-6.17	100.51	111.00
1	B	1752	LEU	CB-CG-CD1	-5.72	101.27	111.00
1	B	1752	LEU	CB-CG-CD2	5.72	120.72	111.00

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1994	VAL	Peptide
1	A	2120	ARG	Peptide

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Group
1	B	1202	ARG	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	28238	0	27963	774	0
1	B	28521	0	28367	774	0
2	C	68	0	64	1	0
2	D	68	0	64	1	0
All	All	56895	0	56458	1550	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.

The worst 5 of 1550 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:260:ILE:HG22	1:A:300:TRP:CZ2	1.96	1.00
1:B:3701:ILE:HD12	1:B:3740:ILE:HD11	1.50	0.94
1:A:645:TRP:O	1:A:649:PHE:HB2	1.71	0.91
1:A:1406:LEU:HB3	1:A:1415:LEU:HD11	1.51	0.89
1:B:2459:VAL:HB	1:B:2505:VAL:HG21	1.55	0.88

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 X-ray entries followed by that with respect to entries of similar resolution.

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	3544/3986 (89%)	3047 (86%)	482 (14%)	15 (0%)	34	72
1	B	3559/3986 (89%)	3069 (86%)	475 (13%)	15 (0%)	34	72
2	C	7/192 (4%)	7 (100%)	0	0	100	100
2	D	7/192 (4%)	7 (100%)	0	0	100	100
All	All	7117/8356 (85%)	6130 (86%)	957 (13%)	30 (0%)	34	72

5 of 30 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	2182	ILE
1	A	2250	SER
1	A	2410	GLU
1	A	2781	PRO
1	B	1613	HIS

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	3046/3515 (87%)	2953 (97%)	93 (3%)	40	63
1	B	3093/3515 (88%)	3005 (97%)	88 (3%)	43	65
2	C	8/165 (5%)	8 (100%)	0	100	100
2	D	8/165 (5%)	8 (100%)	0	100	100
All	All	6155/7360 (84%)	5974 (97%)	181 (3%)	42	64

5 of 181 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	1213	LYS
1	B	2269	ASP
1	B	1409	SER
1	B	1829	TRP
1	B	2404	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 13 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	1048	GLN
1	B	1049	GLN
1	B	3969	ASN
1	B	3278	GLN
1	B	3743	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

### 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

### 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

### 5.7 Other polymers [i](#)

There are no such residues in this entry.

### 5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	B	2
1	A	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	B	2614:UNK	C	2740:UNK	N	43.02
1	A	2614:UNK	C	2739:UNK	N	37.67
1	B	2765:UNK	C	2779:ASP	N	14.02
1	A	2765:UNK	C	2779:ASP	N	13.16



## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	3590/3986 (90%)	-0.14	46 (1%) 77 68	144, 217, 281, 339	0
1	B	3607/3986 (90%)	-0.11	55 (1%) 73 64	148, 210, 309, 413	0
2	C	9/192 (4%)	-0.39	0 100 100	217, 221, 227, 228	0
2	D	9/192 (4%)	-0.53	0 100 100	160, 169, 180, 182	0
All	All	7215/8356 (86%)	-0.13	101 (1%) 75 66	144, 213, 288, 413	0

The worst 5 of 101 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	47	SER	5.7
1	B	46	SER	5.2
1	A	3310	ASN	5.0
1	B	55	THR	4.6
1	B	1994	VAL	4.3

### 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

### 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 6.4 Ligands [i](#)

There are no ligands in this entry.

## 6.5 Other polymers [i](#)

There are no such residues in this entry.