Full wwPDB X-ray Structure Validation Report ⓘ

Sep 24, 2023 – 02:18 AM EDT

PDB ID	:	5TJG
Title	:	Thermus aquaticus delta1.1-sigmaA holoenzyme/downstream-fork promoter complex with an open clamp
Authors	:	Darst, S.A.; Bae, B.
Deposited on	:	2016-10-04
Resolution	:	2.60 Å(reported)

This is a Full wwPDB X-ray Structure 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/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.

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

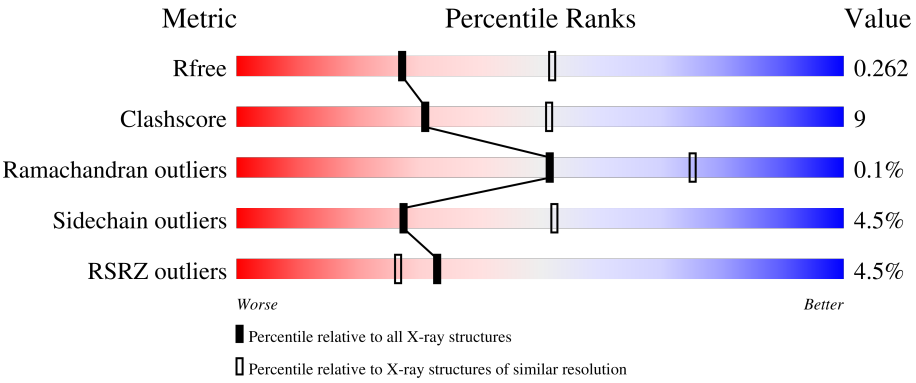
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation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

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.60 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.



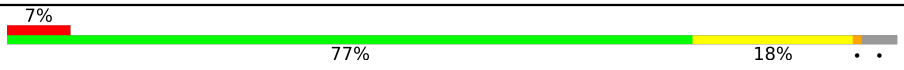
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3163 (2.60-2.60)
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)
RSRZ outliers	127900	3104 (2.60-2.60)

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 >=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% 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	314	% 53% 19% 28%
1	B	314	5% 54% 17% 28%
2	C	1119	4% 75% 23%
3	D	1524	4% 73% 23%
4	E	99	7% 68% 20% 10%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
5	F	347	
6	G	31	

2 Entry composition (i)

There are 9 unique types of molecules in this entry. The entry contains 27767 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-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	227	Total	C	N	O	S	0	0	0
			1777	1134	309	331	3			
1	B	227	Total	C	N	O	S	0	0	0
			1777	1134	309	331	3			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	14	ARG	THR	conflict	UNP Q9KWU8
A	18	ARG	ASP	conflict	UNP Q9KWU8
B	14	ARG	THR	conflict	UNP Q9KWU8
B	18	ARG	ASP	conflict	UNP Q9KWU8

- Molecule 2 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	1112	Total	C	N	O	S	0	0	0
			8739	5531	1553	1632	23			

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	D	1475	Total	C	N	O	S	0	0	0
			11657	7376	2066	2177	38			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	666	ILE	PHE	conflict	UNP Q9KWU6

- Molecule 4 is a protein called DNA-directed RNA polymerase subunit omega.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	E	89	Total	C	N	O	S	0	0	0
			730	464	129	133	4			

- Molecule 5 is a protein called RNA polymerase sigma factor SigA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	F	334	Total	C	N	O	S	0	0	0
			2700	1702	485	509	4			

- Molecule 6 is a DNA chain called DNA (5'-D(*TP*AP*TP*AP*AP*TP*GP*GP*GP*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	G	10	Total	C	N	O	P	0	0	0
			207	100	41	57	9			

- Molecule 7 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	D	2	Total	Zn	0	0
			2	2		

- Molecule 8 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	D	1	Total	Mg	0	0
			1	1		

- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	18	Total	O	0	0
			18	18		
9	B	10	Total	O	0	0
			10	10		
9	C	48	Total	O	0	0
			48	48		
9	D	77	Total	O	0	0
			77	77		
9	E	7	Total	O	0	0
			7	7		
9	F	14	Total	O	0	0
			14	14		

Continued on next page...

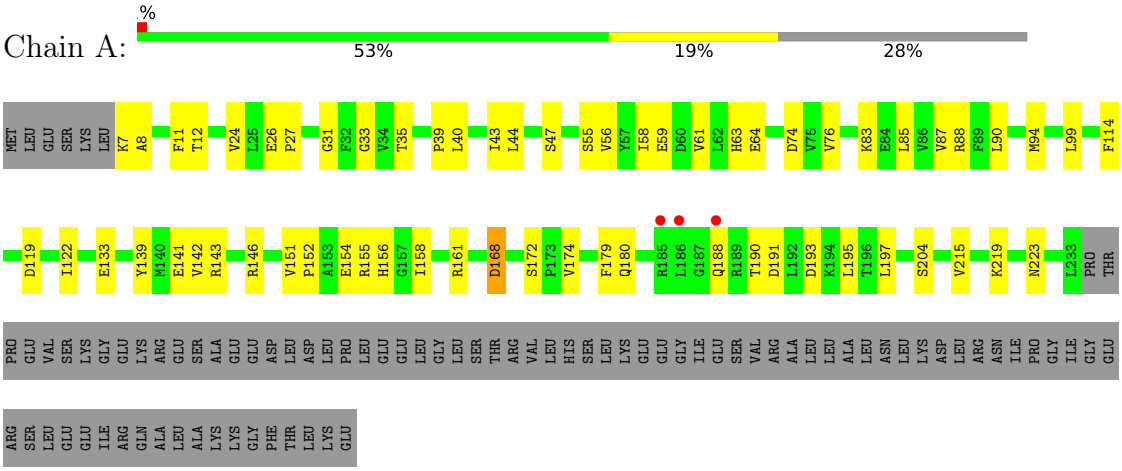
Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	G	3	Total O 3 3	0	0

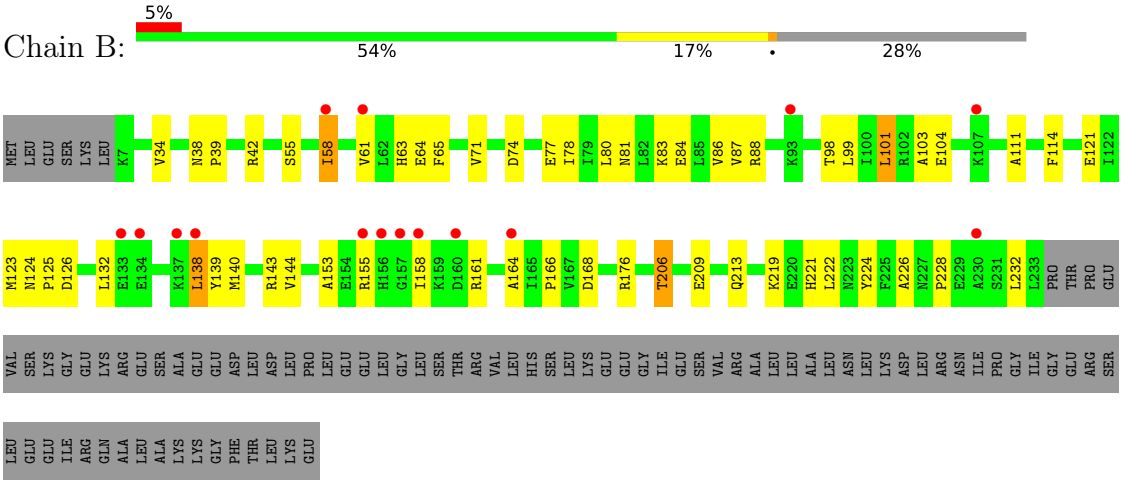
3 Residue-property plots (i)

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 and electron density. 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. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). 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.

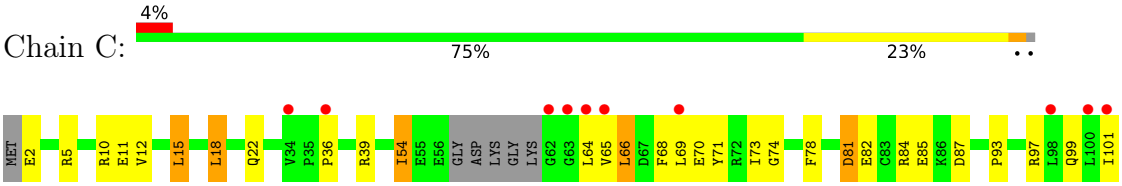
• Molecule 1: DNA-directed RNA polymerase subunit alpha

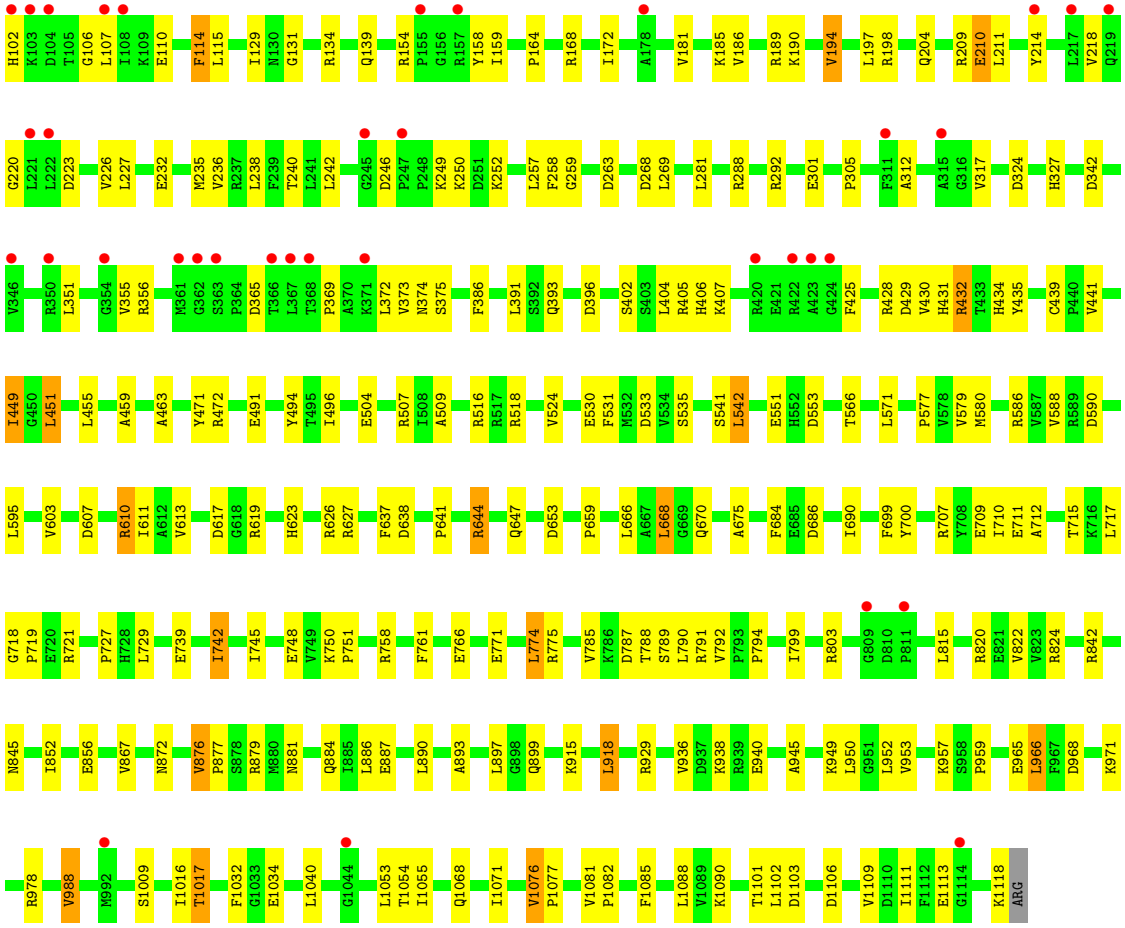


• Molecule 1: DNA-directed RNA polymerase subunit alpha



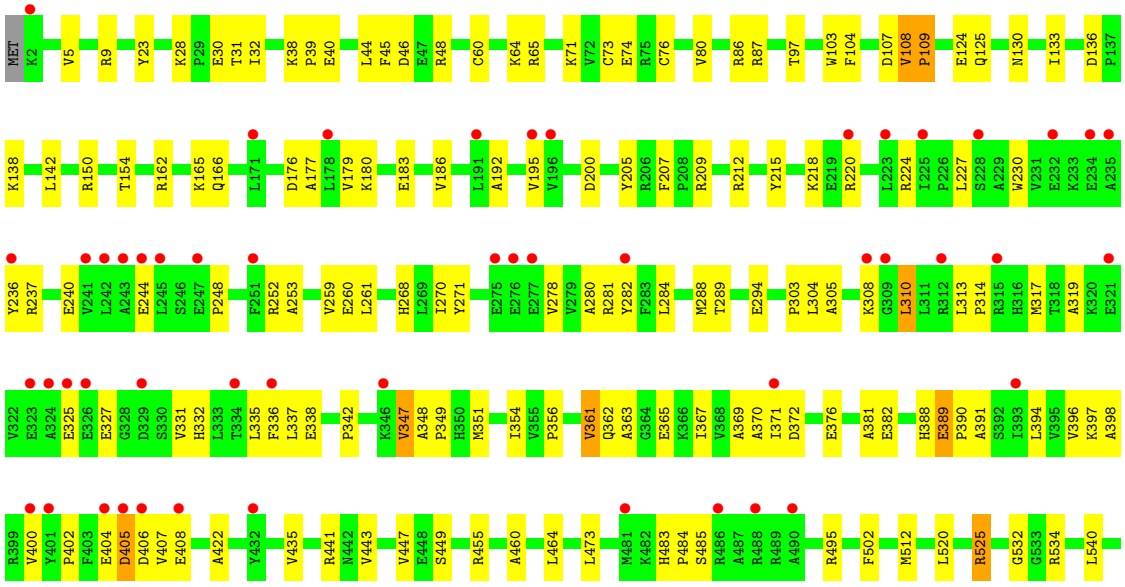
• Molecule 2: DNA-directed RNA polymerase subunit beta

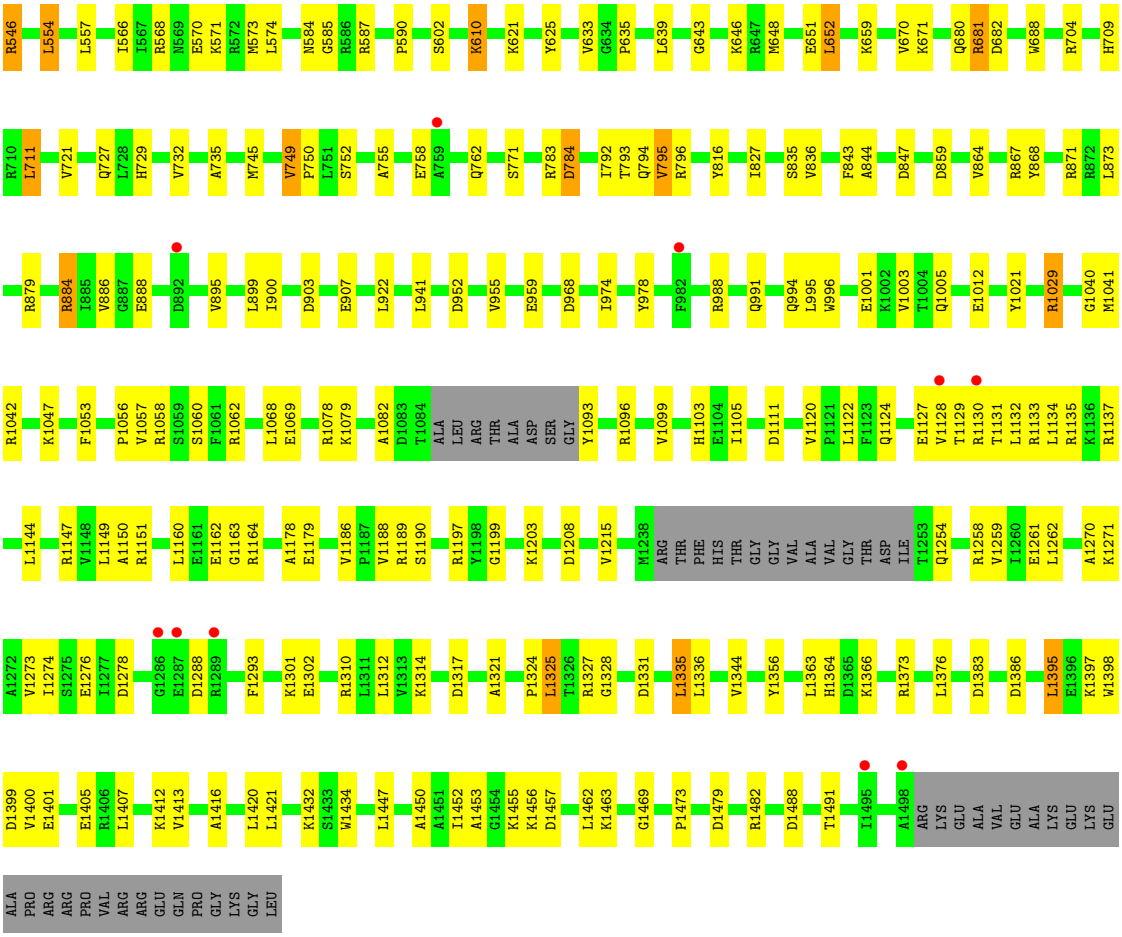




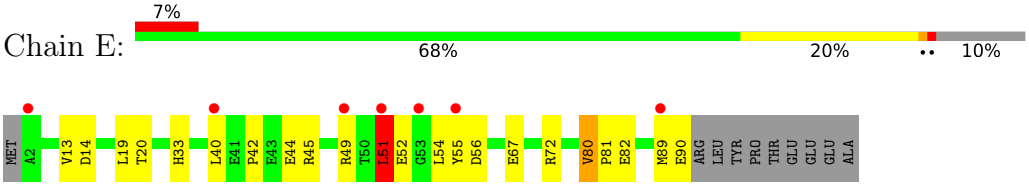
• Molecule 3: DNA-directed RNA polymerase subunit beta'

Chain D:

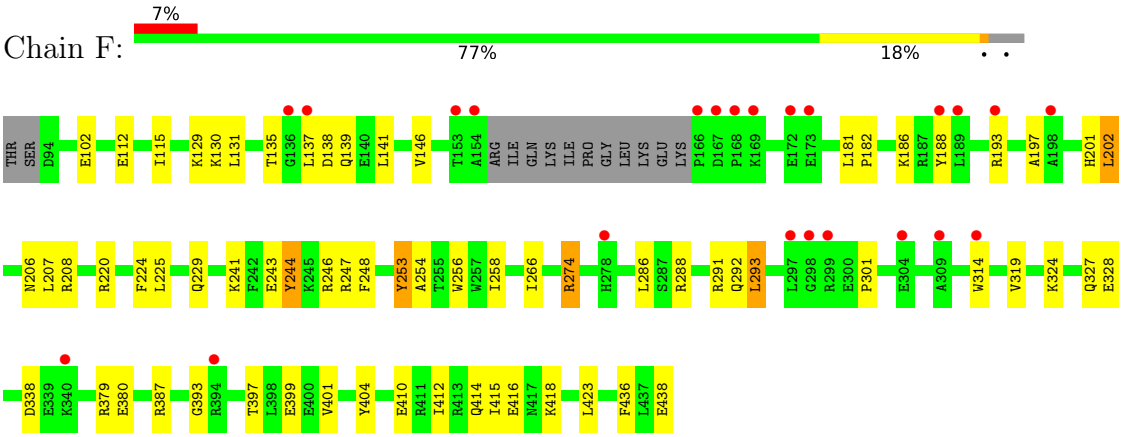




• Molecule 4: DNA-directed RNA polymerase subunit omega

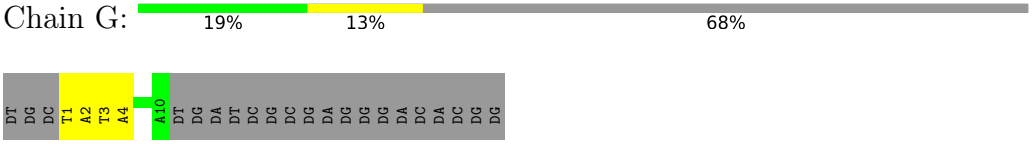


• Molecule 5: RNA polymerase sigma factor SigA



• Molecule 6: DNA (5'-D(*TP*AP*TP*AP*AP*TP*GP*GP*GP*A)-3')

Chain G:


19%
13%
68%
DT
DG
DC
T1
A2
T3
A4
A10
DT
DG
DA
DT
DC
DG
DC
DG
DA
DG
DG
DG
DA
DC
DA
DC
DG
DG

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	104.10Å 111.42Å 143.18Å 104.12° 99.66° 109.43°	Depositor
Resolution (Å)	38.63 – 2.60 38.63 – 2.60	Depositor EDS
% Data completeness (in resolution range)	97.4 (38.63-2.60) 84.7 (38.63-2.60)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	0.06	Depositor
$< I/\sigma(I) >$ [1]	0.90 (at 2.61Å)	Xtriage
Refinement program	PHENIX 1.10.1-2155-000	Depositor
R, R_{free}	0.224 , 0.262 0.224 , 0.262	Depositor DCC
R_{free} test set	8519 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	52.7	Xtriage
Anisotropy	0.209	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 54.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	27767	wwPDB-VP
Average B, all atoms (Å^2)	86.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.05% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MG, 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	0.26	0/1811	0.47	0/2462
1	B	0.26	0/1811	0.47	0/2462
2	C	0.25	0/8905	0.45	0/12040
3	D	0.25	0/11857	0.45	0/16021
4	E	0.23	0/743	0.44	1/999 (0.1%)
5	F	0.23	0/2740	0.41	0/3683
6	G	0.58	0/233	0.94	0/359
All	All	0.25	0/28100	0.45	1/38026 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	E	51	LEU	CA-CB-CG	5.18	127.22	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1777	0	1814	42	0
1	B	1777	0	1814	45	0
2	C	8739	0	8841	165	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	D	11657	0	11875	244	0
4	E	730	0	744	13	0
5	F	2700	0	2768	47	0
6	G	207	0	115	3	0
7	D	2	0	0	0	0
8	D	1	0	0	0	0
9	A	18	0	0	1	0
9	B	10	0	0	8	0
9	C	48	0	0	7	0
9	D	77	0	0	20	0
9	E	7	0	0	2	0
9	F	14	0	0	5	0
9	G	3	0	0	0	0
All	All	27767	0	27971	507	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 9.

All (507) 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)
3:D:124:GLU:OE2	3:D:587:ARG:NH2	2.06	0.88
3:D:260:GLU:HB3	3:D:271:TYR:HB2	1.57	0.84
3:D:1163:GLY:O	9:D:2102:HOH:O	1.96	0.82
3:D:1124:GLN:HG3	3:D:1135:ARG:HG2	1.61	0.81
3:D:1310:ARG:HG3	3:D:1327:ARG:HG3	1.62	0.81
1:B:58:ILE:HG13	1:B:61:VAL:HB	1.63	0.81
2:C:324:ASP:HB3	2:C:327:HIS:HB2	1.64	0.80
1:B:139:TYR:O	9:B:401:HOH:O	2.01	0.79
3:D:73:CYS:HB3	3:D:76:CYS:HB2	1.65	0.78
3:D:771:SER:OG	9:D:2103:HOH:O	2.02	0.78
3:D:680:GLN:HG3	3:D:682:ASP:H	1.48	0.78
5:F:293:LEU:HD11	5:F:301:PRO:HB3	1.65	0.77
3:D:1197:ARG:NH2	3:D:1405:GLU:OE2	2.16	0.76
2:C:65:VAL:HB	2:C:101:ILE:HB	1.68	0.76
2:C:684:PHE:HB3	3:D:633:VAL:HG21	1.68	0.76
3:D:1254:GLN:HB3	3:D:1258:ARG:HB2	1.68	0.76
3:D:376:GLU:OE2	9:D:2104:HOH:O	2.04	0.75
3:D:1164:ARG:O	9:D:2105:HOH:O	2.05	0.75
2:C:929:ARG:NH1	9:C:1205:HOH:O	2.17	0.74
3:D:520:LEU:O	3:D:525:ARG:NH1	2.20	0.74

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:1479:ASP:OD1	3:D:1482:ARG:NH2	2.20	0.74
4:E:56:ASP:OD2	9:E:101:HOH:O	2.06	0.73
3:D:473:LEU:HD11	3:D:495:ARG:HH12	1.54	0.73
3:D:793:THR:O	3:D:879:ARG:NH1	2.20	0.73
1:B:140:MET:HA	9:B:401:HOH:O	1.87	0.73
3:D:104:PHE:HB3	3:D:512:MET:HE2	1.69	0.73
2:C:463:ALA:N	9:C:1201:HOH:O	2.03	0.72
4:E:51:LEU:HD22	4:E:52:GLU:HG3	1.70	0.72
3:D:1147:ARG:HD3	3:D:1188:VAL:HG11	1.71	0.72
5:F:241:LYS:NZ	5:F:253:TYR:OH	2.22	0.72
3:D:1386:ASP:HB3	3:D:1412:LYS:HE3	1.70	0.72
5:F:208:ARG:NH2	9:F:504:HOH:O	2.23	0.72
3:D:150:ARG:NH1	9:D:2101:HOH:O	1.91	0.71
3:D:179:VAL:O	3:D:205:TYR:OH	2.08	0.71
1:A:180:GLN:HE22	2:C:929:ARG:HH21	1.37	0.71
2:C:595:LEU:HD21	2:C:623:HIS:HB3	1.70	0.71
5:F:397:THR:OG1	9:F:501:HOH:O	2.08	0.71
2:C:106:GLY:O	9:C:1202:HOH:O	2.10	0.70
3:D:704:ARG:O	9:D:2106:HOH:O	2.09	0.70
5:F:387:ARG:NH1	5:F:416:GLU:OE1	2.25	0.70
1:B:213:GLN:N	9:B:402:HOH:O	2.22	0.70
2:C:449:ILE:HD12	3:D:1082:ALA:HA	1.74	0.70
2:C:516:ARG:HD3	3:D:1068:LEU:HD21	1.74	0.70
3:D:44:LEU:O	3:D:525:ARG:NH2	2.24	0.70
2:C:15:LEU:O	2:C:586:ARG:NH2	2.25	0.70
2:C:54:ILE:HG22	2:C:66:LEU:HD11	1.75	0.69
1:B:209:GLU:O	9:B:402:HOH:O	2.11	0.69
3:D:314:PRO:HG2	3:D:317:MET:HB3	1.73	0.69
1:A:55:SER:HB3	1:A:143:ARG:HB3	1.76	0.68
3:D:166:GLN:HB2	3:D:394:LEU:HD11	1.75	0.68
2:C:711:GLU:HG2	2:C:822:VAL:HG12	1.76	0.68
2:C:1103:ASP:OD1	9:C:1203:HOH:O	2.11	0.67
2:C:715:THR:HG22	2:C:717:LEU:H	1.59	0.67
1:B:132:LEU:HD21	1:B:138:LEU:HD12	1.76	0.66
1:B:153:ALA:HB1	1:B:166:PRO:HB2	1.78	0.66
5:F:146:VAL:HG13	5:F:193:ARG:HD3	1.76	0.66
2:C:577:PRO:HG2	2:C:580:MET:HG2	1.76	0.66
3:D:133:ILE:HD11	3:D:460:ALA:HB1	1.77	0.66
3:D:1003:VAL:HG21	3:D:1041:MET:HG2	1.77	0.66
1:A:39:PRO:HG3	1:B:39:PRO:HG3	1.76	0.66
2:C:586:ARG:NH1	2:C:590:ASP:OD2	2.29	0.66

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:1120:VAL:N	9:D:2107:HOH:O	2.28	0.65
1:A:43:ILE:HG23	1:A:47:SER:HB2	1.77	0.65
3:D:1120:VAL:O	9:D:2107:HOH:O	2.13	0.65
1:B:88:ARG:NH2	1:B:121:GLU:OE1	2.30	0.65
2:C:670:GLN:HE21	2:C:700:TYR:H	1.45	0.65
2:C:425:PHE:HZ	3:D:1079:LYS:HA	1.60	0.65
2:C:787:ASP:OD2	2:C:791:ARG:NH2	2.30	0.64
3:D:209:ARG:N	3:D:389:GLU:O	2.29	0.64
3:D:371:ILE:HG21	5:F:247:ARG:HH12	1.62	0.64
3:D:325:GLU:HB2	3:D:332:HIS:HB3	1.79	0.64
3:D:280:ALA:O	9:D:2109:HOH:O	2.15	0.64
1:B:98:THR:OG1	1:B:143:ARG:NH1	2.31	0.64
3:D:259:VAL:HG23	3:D:270:ILE:HG23	1.81	0.63
3:D:794:GLN:HE21	3:D:795:VAL:H	1.45	0.63
2:C:66:LEU:HD21	2:C:355:VAL:HG11	1.80	0.63
2:C:139:GLN:HB2	2:C:391:LEU:HD21	1.80	0.63
5:F:138:ASP:HB2	5:F:141:LEU:HD13	1.81	0.63
2:C:259:GLY:HA2	2:C:263:ASP:HB2	1.81	0.62
2:C:292:ARG:NE	2:C:301:GLU:OE2	2.33	0.62
3:D:347:VAL:HG23	3:D:351:MET:HB2	1.82	0.61
2:C:1081:VAL:HG21	2:C:1111:ILE:HB	1.82	0.61
2:C:185:LYS:HG2	2:C:190:LYS:HG2	1.81	0.61
2:C:18:LEU:HD23	2:C:404:LEU:HD21	1.81	0.61
2:C:85:GLU:O	2:C:824:ARG:NH2	2.33	0.61
3:D:237:ARG:N	3:D:240:GLU:OE2	2.33	0.61
1:A:133:GLU:OE2	2:C:610:ARG:NH2	2.33	0.61
1:B:87:VAL:HG21	1:B:144:VAL:HG11	1.83	0.61
2:C:235:MET:HG3	2:C:257:LEU:HD12	1.82	0.61
2:C:396:ASP:H	2:C:406:HIS:HD1	1.49	0.61
1:B:34:VAL:HG11	2:C:978:ARG:HB3	1.81	0.61
3:D:60:CYS:N	3:D:76:CYS:SG	2.74	0.61
3:D:209:ARG:HB2	3:D:389:GLU:HB3	1.83	0.60
5:F:380:GLU:OE2	5:F:418:LYS:HE3	2.00	0.60
2:C:54:ILE:HD11	2:C:356:ARG:HH21	1.66	0.60
3:D:1122:LEU:HD23	3:D:1178:ALA:HB2	1.83	0.60
2:C:603:VAL:HA	2:C:613:VAL:HG12	1.82	0.60
3:D:1093:TYR:N	9:D:2122:HOH:O	2.33	0.60
2:C:54:ILE:HG13	2:C:356:ARG:HE	1.65	0.60
2:C:504:GLU:HG3	2:C:509:ALA:HB2	1.83	0.60
3:D:218:LYS:NZ	3:D:338:GLU:OE1	2.34	0.59
2:C:18:LEU:HB3	2:C:404:LEU:HD11	1.84	0.59

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:699:PHE:O	9:C:1204:HOH:O	2.17	0.59
1:A:11:PHE:HD2	1:B:228:PRO:HA	1.68	0.59
3:D:704:ARG:HB2	3:D:745:MET:HG2	1.84	0.59
3:D:388:HIS:O	3:D:390:PRO:HD3	2.02	0.59
3:D:1186:VAL:O	9:D:2107:HOH:O	2.16	0.59
2:C:236:VAL:HG21	2:C:250:LYS:HG2	1.84	0.58
3:D:1258:ARG:NH1	3:D:1261:GLU:OE1	2.36	0.58
2:C:99:GLN:HB3	2:C:110:GLU:HG2	1.85	0.58
3:D:406:ASP:OD1	3:D:407:VAL:N	2.34	0.58
4:E:42:PRO:HA	4:E:45:ARG:HD2	1.84	0.58
2:C:638:ASP:H	2:C:659:PRO:HG3	1.68	0.58
3:D:1149:LEU:N	9:D:2105:HOH:O	2.24	0.58
1:A:56:VAL:HG22	1:A:142:VAL:HG12	1.85	0.58
2:C:771:GLU:OE2	2:C:775:ARG:NH2	2.37	0.58
1:A:44:LEU:O	1:A:174:VAL:HG11	2.03	0.57
2:C:496:ILE:HG12	2:C:531:PHE:HB2	1.85	0.57
2:C:929:ARG:NH2	2:C:940:GLU:OE2	2.36	0.57
3:D:796:ARG:NH2	3:D:859:ASP:OD2	2.36	0.57
5:F:379:ARG:HD3	5:F:415:ILE:HD13	1.87	0.57
3:D:165:LYS:H	3:D:397:LYS:HE3	1.68	0.57
3:D:365:GLU:OE1	9:D:2110:HOH:O	2.17	0.57
5:F:197:ALA:O	5:F:201:HIS:ND1	2.37	0.57
1:A:94:MET:O	1:A:146:ARG:NH1	2.32	0.57
1:A:215:VAL:HG12	1:A:219:LYS:HE2	1.87	0.57
3:D:176:ASP:OD1	3:D:177:ALA:N	2.35	0.57
3:D:570:GLU:HG2	5:F:229:GLN:HE21	1.69	0.57
1:A:141:GLU:OE2	1:A:161:ARG:NH2	2.35	0.57
1:B:77:GLU:O	1:B:81:ASN:ND2	2.38	0.56
2:C:936:VAL:HG21	2:C:959:PRO:HB2	1.87	0.56
3:D:996:TRP:CD2	3:D:1056:PRO:HG3	2.41	0.56
2:C:198:ARG:HD3	2:C:227:LEU:HA	1.88	0.56
3:D:408:GLU:N	3:D:408:GLU:OE1	2.38	0.56
3:D:648:MET:HG2	3:D:652:LEU:HD22	1.87	0.56
3:D:1127:GLU:HG2	3:D:1312:LEU:HD22	1.87	0.56
2:C:719:PRO:HB3	2:C:820:ARG:HD2	1.87	0.56
2:C:742:ILE:HD11	2:C:803:ARG:HE	1.71	0.56
1:A:156:HIS:HD2	1:A:158:ILE:HG12	1.71	0.56
5:F:328:GLU:OE2	9:F:502:HOH:O	2.18	0.56
2:C:751:PRO:HB3	2:C:794:PRO:HA	1.86	0.55
5:F:399:GLU:OE1	5:F:399:GLU:N	2.37	0.55
3:D:711:LEU:HB3	3:D:735:ALA:HB1	1.88	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:193:ASP:OD1	2:C:938:LYS:NZ	2.30	0.55
1:B:104:GLU:HA	9:B:403:HOH:O	2.06	0.55
2:C:842:ARG:NH2	2:C:887:GLU:OE1	2.39	0.55
3:D:643:GLY:HA3	3:D:727:GLN:HB2	1.88	0.55
1:A:63:HIS:HB2	2:C:799:ILE:HD12	1.89	0.54
2:C:204:GLN:HB2	2:C:227:LEU:HD13	1.89	0.54
1:A:179:PHE:HB3	1:A:197:LEU:HD23	1.90	0.54
2:C:78:PHE:HB3	2:C:82:GLU:HG3	1.89	0.54
2:C:617:ASP:OD2	2:C:619:ARG:NH1	2.39	0.54
1:B:58:ILE:HA	9:B:401:HOH:O	2.06	0.54
2:C:428:ARG:HG2	2:C:451:LEU:HD13	1.89	0.54
3:D:625:TYR:HB3	3:D:749:VAL:HG13	1.88	0.54
1:A:154:GLU:OE1	1:A:154:GLU:N	2.40	0.54
3:D:1127:GLU:OE1	3:D:1127:GLU:N	2.37	0.54
5:F:314:TRP:O	9:F:503:HOH:O	2.19	0.54
1:A:64:GLU:HG2	1:A:76:VAL:HG22	1.90	0.53
3:D:192:ALA:HB3	3:D:195:VAL:HB	1.89	0.53
3:D:1397:LYS:O	3:D:1401:GLU:HG2	2.07	0.53
2:C:1076:VAL:HG22	3:D:752:SER:HB3	1.90	0.53
3:D:150:ARG:HD2	9:D:2101:HOH:O	2.08	0.53
5:F:254:ALA:O	5:F:258:ILE:HG12	2.09	0.53
2:C:644:ARG:HG3	2:C:647:GLN:HB2	1.89	0.53
3:D:847:ASP:OD1	3:D:884:ARG:NH2	2.42	0.53
3:D:1164:ARG:N	9:D:2105:HOH:O	2.41	0.53
2:C:471:TYR:OH	2:C:491:GLU:OE2	2.25	0.53
2:C:709:GLU:HG3	2:C:824:ARG:HG2	1.91	0.53
2:C:750:LYS:HD3	3:D:681:ARG:HH11	1.73	0.53
3:D:224:ARG:NH1	3:D:327:GLU:OE2	2.41	0.52
3:D:1057:VAL:HG12	3:D:1069:GLU:HG2	1.91	0.52
3:D:1144:LEU:HD21	3:D:1186:VAL:HG21	1.91	0.52
3:D:1488:ASP:OD1	3:D:1488:ASP:N	2.39	0.52
1:B:111:ALA:HB3	1:B:124:ASN:O	2.09	0.52
3:D:108:VAL:HG23	3:D:109:PRO:HD3	1.92	0.52
3:D:534:ARG:NH1	5:F:327:GLN:OE1	2.42	0.52
3:D:1197:ARG:HG2	3:D:1398:TRP:CD1	2.44	0.52
2:C:22:GLN:HG3	2:C:407:LYS:HB3	1.92	0.52
3:D:868:TYR:HB3	3:D:873:LEU:HD12	1.91	0.52
2:C:742:ILE:HD11	2:C:803:ARG:NE	2.25	0.52
3:D:133:ILE:HD13	3:D:464:LEU:HD11	1.91	0.52
2:C:68:PHE:HZ	2:C:71:TYR:HD2	1.57	0.52
3:D:44:LEU:HB3	3:D:525:ARG:NH2	2.25	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:87:ASP:HA	2:C:131:GLY:HA3	1.92	0.52
2:C:758:ARG:H	2:C:789:SER:HB3	1.75	0.52
2:C:1016:ILE:HG13	2:C:1017:THR:H	1.74	0.51
3:D:610:LYS:H	3:D:610:LYS:HD2	1.76	0.51
4:E:82:GLU:N	9:E:102:HOH:O	2.18	0.51
3:D:212:ARG:HD2	3:D:342:PRO:HB3	1.93	0.51
3:D:354:ILE:HD11	3:D:369:ALA:HB2	1.92	0.51
3:D:371:ILE:HG21	5:F:247:ARG:NH1	2.25	0.51
3:D:236:TYR:HB2	3:D:319:ALA:HB3	1.92	0.51
2:C:246:ASP:OD1	2:C:246:ASP:N	2.38	0.51
2:C:872:ASN:ND2	3:D:784:ASP:OD1	2.34	0.51
2:C:950:LEU:HD11	2:C:952:LEU:HB2	1.93	0.51
3:D:483:HIS:CD2	3:D:485:SER:H	2.28	0.51
3:D:271:TYR:HA	9:D:2109:HOH:O	2.10	0.51
3:D:758:GLU:HB3	4:E:20:THR:HG21	1.92	0.51
1:B:126:ASP:OD1	1:B:126:ASP:N	2.44	0.51
1:B:103:ALA:O	9:B:403:HOH:O	2.20	0.51
3:D:402:PRO:HA	3:D:443:VAL:HG23	1.93	0.51
2:C:351:LEU:HD11	2:C:373:VAL:HG13	1.93	0.51
2:C:172:ILE:HG12	2:C:186:VAL:HG22	1.94	0.50
3:D:270:ILE:HB	3:D:282:TYR:HB2	1.93	0.50
3:D:349:PRO:HB3	5:F:112:GLU:HG2	1.93	0.50
4:E:33:HIS:HE1	4:E:90:GLU:HG3	1.75	0.50
2:C:432:ARG:NH2	2:C:518:ARG:O	2.44	0.50
3:D:1199:GLY:O	3:D:1373:ARG:NH2	2.32	0.50
1:B:80:LEU:HG	3:D:844:ALA:HA	1.94	0.50
3:D:38:LYS:HG2	3:D:39:PRO:HD2	1.93	0.50
3:D:1130:ARG:O	9:D:2111:HOH:O	2.19	0.50
2:C:258:PHE:O	2:C:263:ASP:N	2.45	0.50
2:C:429:ASP:OD1	2:C:430:VAL:N	2.44	0.50
4:E:14:ASP:OD1	4:E:14:ASP:N	2.45	0.50
1:A:74:ASP:OD2	2:C:627:ARG:NH2	2.44	0.50
2:C:430:VAL:HG23	3:D:1078:ARG:HD2	1.94	0.50
3:D:1012:GLU:HG2	3:D:1021:TYR:OH	2.12	0.50
3:D:1328:GLY:N	9:D:2129:HOH:O	2.44	0.50
1:B:101:LEU:N	1:B:140:MET:O	2.28	0.50
3:D:968:ASP:OD1	3:D:1058:ARG:NH2	2.39	0.50
2:C:494:TYR:HB3	2:C:530:GLU:HG3	1.93	0.49
2:C:617:ASP:OD1	2:C:617:ASP:N	2.45	0.49
3:D:1103:HIS:CD2	3:D:1463:LYS:H	2.30	0.49
5:F:401:VAL:HG12	5:F:412:ILE:HD12	1.94	0.49

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:11:PHE:CD2	1:B:228:PRO:HA	2.47	0.49
1:B:138:LEU:N	9:B:403:HOH:O	2.45	0.49
3:D:125:GLN:HG2	3:D:130:ASN:HD22	1.77	0.49
3:D:253:ALA:HB2	3:D:304:LEU:HD11	1.94	0.49
3:D:554:LEU:HD12	3:D:574:LEU:HD22	1.93	0.49
3:D:1103:HIS:HD2	3:D:1462:LEU:H	1.58	0.49
2:C:129:ILE:HG12	2:C:386:PHE:HB3	1.94	0.49
3:D:1450:ALA:HA	3:D:1455:LYS:HD2	1.95	0.49
3:D:1462:LEU:HD23	3:D:1473:PRO:HD2	1.94	0.49
2:C:36:PRO:HA	2:C:39:ARG:HD2	1.93	0.49
2:C:281:LEU:HD13	2:C:305:PRO:HB2	1.94	0.49
2:C:971:LYS:HA	2:C:988:VAL:HA	1.94	0.49
3:D:1150:ALA:O	3:D:1151:ARG:HD3	2.13	0.49
4:E:13:VAL:HG21	4:E:19:LEU:HB2	1.94	0.49
2:C:402:SER:HA	2:C:566:THR:HG23	1.95	0.48
3:D:136:ASP:OD2	3:D:138:LYS:HE3	2.13	0.48
5:F:288:ARG:O	5:F:291:ARG:HG2	2.13	0.48
1:A:7:LYS:HG2	1:A:188:GLN:NE2	2.28	0.48
1:A:191:ASP:OD1	1:A:191:ASP:N	2.40	0.48
3:D:1147:ARG:HD3	3:D:1188:VAL:CG1	2.40	0.48
2:C:435:TYR:OH	2:C:533:ASP:OD2	2.25	0.48
2:C:504:GLU:N	2:C:507:ARG:O	2.42	0.48
3:D:407:VAL:O	5:F:186:LYS:NZ	2.34	0.48
1:B:84:GLU:OE2	3:D:867:ARG:NH2	2.44	0.48
2:C:194:VAL:HA	2:C:197:LEU:HB2	1.94	0.48
2:C:666:LEU:HG	2:C:668:LEU:HD13	1.96	0.48
1:A:168:ASP:OD1	1:A:168:ASP:N	2.46	0.48
2:C:718:GLY:HA3	2:C:761:PHE:CD2	2.49	0.48
3:D:215:TYR:HD2	3:D:381:ALA:HB3	1.79	0.48
3:D:991:GLN:HA	3:D:994:GLN:HG2	1.95	0.48
3:D:758:GLU:O	3:D:762:GLN:HG2	2.14	0.48
3:D:1271:LYS:HD2	3:D:1331:ASP:HB2	1.96	0.48
5:F:338:ASP:OD1	5:F:338:ASP:N	2.47	0.48
2:C:73:ILE:HG13	9:C:1218:HOH:O	2.12	0.48
2:C:181:VAL:HA	2:C:220:GLY:O	2.14	0.48
3:D:207:PHE:HB2	3:D:391:ALA:HB3	1.96	0.48
2:C:69:LEU:HB2	2:C:97:ARG:HB2	1.96	0.47
3:D:1278:ASP:OD1	3:D:1321:ALA:N	2.47	0.47
3:D:398:ALA:HB2	3:D:447:VAL:HG12	1.96	0.47
5:F:387:ARG:HD2	5:F:401:VAL:HG21	1.94	0.47
2:C:455:LEU:HG	2:C:459:ALA:HB3	1.95	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:1053:LEU:O	3:D:621:LYS:NZ	2.34	0.47
1:A:33:GLY:HA2	1:A:195:LEU:HD12	1.97	0.47
3:D:400:VAL:HG12	3:D:443:VAL:HG21	1.97	0.47
1:A:85:LEU:HD11	1:A:122:ILE:HD12	1.97	0.47
2:C:269:LEU:O	2:C:288:ARG:HB3	2.14	0.47
5:F:246:ARG:HB3	5:F:248:PHE:CE1	2.49	0.47
3:D:502:PHE:CZ	3:D:1452:ILE:HD12	2.49	0.47
3:D:784:ASP:OD2	3:D:784:ASP:N	2.48	0.47
3:D:568:ARG:NH2	5:F:102:GLU:OE2	2.47	0.47
3:D:1001:GLU:OE2	3:D:1005:GLN:NE2	2.46	0.47
3:D:1208:ASP:HB2	3:D:1215:VAL:HA	1.97	0.47
3:D:1336:LEU:HD22	3:D:1421:LEU:HB2	1.97	0.47
3:D:28:LYS:HB3	3:D:30:GLU:OE1	2.15	0.47
3:D:97:THR:HG21	3:D:571:LYS:HG2	1.97	0.47
5:F:131:LEU:O	5:F:135:THR:OG1	2.30	0.47
1:B:206:THR:HG22	1:B:209:GLU:HG2	1.96	0.47
2:C:369:PRO:HA	2:C:372:LEU:HB3	1.96	0.47
2:C:1009:SER:HB3	3:D:651:GLU:O	2.15	0.47
3:D:31:THR:OG1	3:D:32:ILE:N	2.48	0.46
2:C:11:GLU:HG3	2:C:535:SER:HB2	1.96	0.46
3:D:1399:ASP:OD2	3:D:1432:LYS:HD3	2.16	0.46
5:F:130:LYS:HD2	5:F:188:TYR:CE2	2.51	0.46
1:B:176:ARG:NH1	3:D:888:GLU:OE2	2.30	0.46
3:D:65:ARG:HA	3:D:65:ARG:HD2	1.75	0.46
3:D:1383:ASP:HB3	3:D:1416:ALA:HB3	1.96	0.46
2:C:758:ARG:HH21	2:C:788:THR:HB	1.79	0.46
3:D:260:GLU:HA	3:D:294:GLU:OE1	2.16	0.46
1:A:83:LYS:HE3	1:A:168:ASP:HB2	1.97	0.46
1:B:221:HIS:HA	1:B:224:TYR:CE2	2.51	0.46
3:D:1042:ARG:HB3	3:D:1057:VAL:CG2	2.46	0.46
1:A:215:VAL:HG13	1:B:222:LEU:HB3	1.98	0.46
2:C:1082:PRO:HG2	3:D:1469:GLY:O	2.16	0.46
3:D:356:PRO:HB3	3:D:441:ARG:HA	1.97	0.46
3:D:404:GLU:HG3	3:D:405:ASP:H	1.81	0.46
3:D:1040:GLY:O	3:D:1060:SER:HB3	2.16	0.46
3:D:1271:LYS:HB3	3:D:1271:LYS:HE2	1.78	0.46
1:A:11:PHE:CE2	1:B:228:PRO:HB3	2.51	0.46
2:C:102:HIS:NE2	2:C:365:ASP:O	2.48	0.46
2:C:626:ARG:HD2	2:C:637:PHE:CD2	2.50	0.46
2:C:710:ILE:HD12	2:C:790:LEU:HB2	1.99	0.45
3:D:230:TRP:CZ3	3:D:331:VAL:HG21	2.51	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:362:GLN:HA	3:D:382:GLU:HG2	1.98	0.45
1:B:55:SER:HB2	1:B:158:ILE:HG21	1.99	0.45
3:D:162:ARG:O	3:D:449:SER:HB3	2.17	0.45
3:D:843:PHE:CE1	3:D:864:VAL:HG11	2.50	0.45
3:D:74:GLU:OE1	3:D:74:GLU:N	2.49	0.45
2:C:154:ARG:NH2	9:C:1207:HOH:O	2.27	0.45
2:C:876:VAL:H	2:C:877:PRO:HD2	1.81	0.45
2:C:1113:GLU:OE1	2:C:1113:GLU:N	2.44	0.45
3:D:73:CYS:CB	3:D:76:CYS:HB2	2.43	0.45
1:A:58:ILE:HB	1:A:61:VAL:HB	1.98	0.45
2:C:168:ARG:HD2	2:C:268:ASP:HB3	1.98	0.45
3:D:363:ALA:HB2	3:D:381:ALA:HA	1.98	0.45
3:D:220:ARG:HG3	3:D:336:PHE:HD1	1.81	0.45
3:D:1491:THR:HG21	4:E:89:MET:HG3	1.98	0.45
5:F:181:LEU:HG	5:F:182:PRO:HD2	1.99	0.45
3:D:268:HIS:HB2	3:D:284:LEU:HB2	1.99	0.45
3:D:709:HIS:CD2	3:D:711:LEU:HB2	2.52	0.45
3:D:827:ILE:HG12	3:D:835:SER:HA	1.99	0.45
5:F:202:LEU:O	5:F:206:ASN:ND2	2.42	0.45
3:D:244:GLU:HG3	3:D:310:LEU:HB3	1.98	0.44
4:E:40:LEU:HG	4:E:67:GLU:HG2	1.99	0.44
2:C:54:ILE:HD12	2:C:54:ILE:HA	1.65	0.44
2:C:1071:ILE:HG23	3:D:670:VAL:HG21	1.99	0.44
3:D:1273:VAL:HG23	3:D:1325:LEU:HB2	1.99	0.44
2:C:611:ILE:HD11	2:C:641:PRO:HB3	1.99	0.44
2:C:748:GLU:HA	2:C:799:ILE:HG22	2.00	0.44
3:D:1276:GLU:HB2	3:D:1301:LYS:NZ	2.32	0.44
4:E:80:VAL:HG22	4:E:81:PRO:HD2	2.00	0.44
2:C:134:ARG:HD3	2:C:393:GLN:O	2.17	0.44
2:C:712:ALA:O	2:C:820:ARG:N	2.48	0.44
3:D:792:ILE:HG21	3:D:941:LEU:HD13	2.00	0.44
6:G:3:DT:H2'	6:G:4:DA:C8	2.51	0.44
2:C:5:ARG:HD3	2:C:10:ARG:NH1	2.32	0.44
2:C:551:GLU:H	2:C:551:GLU:CD	2.20	0.44
3:D:570:GLU:HG2	5:F:229:GLN:NE2	2.31	0.44
3:D:1130:ARG:HG2	3:D:1131:THR:HG23	1.99	0.44
1:B:63:HIS:CD2	1:B:64:GLU:H	2.36	0.44
1:B:206:THR:CG2	1:B:209:GLU:H	2.31	0.44
2:C:431:HIS:CE1	2:C:432:ARG:HD3	2.53	0.44
3:D:248:PRO:HG3	3:D:308:LYS:HD3	2.00	0.44
3:D:584:ASN:H	3:D:602:SER:HB3	1.82	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:1293:PHE:CE2	3:D:1302:GLU:HB2	2.53	0.44
2:C:12:VAL:HG21	2:C:472:ARG:HD3	1.99	0.44
2:C:223:ASP:OD2	2:C:226:VAL:HG23	2.17	0.44
2:C:428:ARG:O	3:D:1078:ARG:HD3	2.18	0.44
3:D:455:ARG:HB2	3:D:460:ALA:HB2	1.98	0.44
2:C:1034:GLU:OE2	3:D:1096:ARG:NH2	2.34	0.44
5:F:256:TRP:CZ2	6:G:1:DT:H4'	2.52	0.44
1:A:12:THR:HG22	9:A:405:HOH:O	2.18	0.44
1:A:223:ASN:OD1	1:B:219:LYS:NZ	2.43	0.44
2:C:211:LEU:HD12	2:C:214:TYR:HE2	1.82	0.44
3:D:46:ASP:OD2	3:D:48:ARG:HB2	2.17	0.44
5:F:410:GLU:O	5:F:414:GLN:HG2	2.18	0.44
1:B:161:ARG:HB2	1:B:164:ALA:HB2	2.00	0.43
2:C:185:LYS:HA	2:C:189:ARG:O	2.17	0.43
2:C:957:LYS:HD2	2:C:965:GLU:OE2	2.18	0.43
3:D:1335:LEU:HB3	3:D:1344:VAL:HG22	2.00	0.43
2:C:815:LEU:HD21	2:C:822:VAL:HG13	2.00	0.43
3:D:1111:ASP:HB2	3:D:1203:LYS:HE2	1.99	0.43
2:C:449:ILE:CD1	3:D:1082:ALA:HA	2.47	0.43
3:D:1314:LYS:N	3:D:1317:ASP:OD2	2.41	0.43
2:C:774:LEU:HD11	5:F:436:PHE:HB2	1.99	0.43
1:A:26:GLU:HA	1:A:27:PRO:HA	1.77	0.43
2:C:168:ARG:HG3	2:C:268:ASP:H	1.83	0.43
2:C:1101:THR:OG1	2:C:1109:VAL:O	2.36	0.43
3:D:252:ARG:HA	3:D:303:PRO:HA	2.01	0.43
1:A:59:GLU:HB2	1:A:139:TYR:HB2	2.00	0.43
2:C:249:LYS:HB2	2:C:252:LYS:HE2	2.00	0.43
3:D:64:LYS:HG3	5:F:393:GLY:HA3	2.00	0.43
1:B:38:ASN:O	1:B:42:ARG:HG3	2.18	0.43
2:C:745:ILE:HG13	2:C:803:ARG:HD3	2.00	0.43
3:D:45:PHE:O	3:D:86:ARG:NH2	2.52	0.43
3:D:278:VAL:HG11	3:D:281:ARG:HE	1.83	0.43
3:D:978:TYR:CG	3:D:988:ARG:HD3	2.53	0.43
3:D:1453:ALA:HB3	3:D:1455:LYS:HG3	2.00	0.43
1:A:12:THR:HG23	1:A:24:VAL:HB	2.00	0.43
1:A:40:LEU:HD23	1:A:40:LEU:HA	1.82	0.43
2:C:232:GLU:OE1	2:C:232:GLU:N	2.52	0.43
2:C:915:LYS:NZ	3:D:952:ASP:OD2	2.44	0.43
2:C:953:VAL:HG13	2:C:966:LEU:HD13	2.01	0.43
3:D:483:HIS:CG	3:D:484:PRO:HD2	2.54	0.43
3:D:646:LYS:HB3	3:D:688:TRP:CZ3	2.54	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:671:LYS:HE2	5:F:436:PHE:HA	2.01	0.43
3:D:871:ARG:HD2	3:D:873:LEU:HD21	2.01	0.43
5:F:286:LEU:HD22	5:F:319:VAL:HG23	2.00	0.43
2:C:675:ALA:HB2	2:C:867:VAL:HG11	2.01	0.43
2:C:1016:ILE:HG13	2:C:1017:THR:N	2.34	0.43
3:D:546:ARG:HE	3:D:546:ARG:HB3	1.58	0.43
4:E:44:GLU:OE2	4:E:72:ARG:NH2	2.52	0.43
1:A:88:ARG:HB3	1:A:204:SER:HA	2.01	0.42
2:C:1071:ILE:O	3:D:659:LYS:HD3	2.19	0.42
3:D:1134:LEU:HD11	3:D:1179:GLU:HB3	2.00	0.42
2:C:1113:GLU:O	2:C:1113:GLU:HG2	2.19	0.42
3:D:407:VAL:HG23	3:D:422:ALA:HB2	2.00	0.42
5:F:129:LYS:HA	5:F:139:GLN:OE1	2.19	0.42
1:A:99:LEU:HB3	1:A:114:PHE:CD2	2.54	0.42
2:C:1090:LYS:HA	2:C:1090:LYS:HD3	1.86	0.42
3:D:1276:GLU:HB2	3:D:1301:LYS:HZ3	1.84	0.42
1:B:63:HIS:CE1	1:B:65:PHE:HB2	2.54	0.42
2:C:18:LEU:HG	2:C:542:LEU:HD21	2.01	0.42
2:C:881:ASN:O	2:C:884:GLN:HG2	2.19	0.42
3:D:554:LEU:HG	3:D:570:GLU:HB3	2.01	0.42
3:D:566:ILE:HD11	5:F:207:LEU:HD21	2.00	0.42
3:D:750:PRO:HB2	3:D:755:ALA:HB1	2.01	0.42
3:D:1105:ILE:HG23	3:D:1199:GLY:HA2	2.01	0.42
3:D:30:GLU:OE1	3:D:30:GLU:N	2.53	0.42
3:D:532:GLY:O	5:F:324:LYS:NZ	2.28	0.42
3:D:1160:LEU:HD22	3:D:1164:ARG:HH11	1.85	0.42
2:C:893:ALA:HB2	2:C:918:LEU:HD13	2.02	0.42
2:C:966:LEU:HD12	2:C:966:LEU:HA	1.91	0.42
5:F:274:ARG:NH1	9:F:508:HOH:O	2.52	0.42
1:A:99:LEU:HB3	1:A:114:PHE:HD2	1.85	0.42
1:B:86:VAL:HG12	1:B:124:ASN:OD1	2.20	0.42
2:C:84:ARG:HA	2:C:131:GLY:HA2	2.02	0.42
3:D:186:VAL:HA	3:D:200:ASP:OD1	2.19	0.42
3:D:994:GLN:HG3	3:D:995:LEU:N	2.35	0.42
2:C:114:PHE:HD2	2:C:115:LEU:N	2.18	0.42
3:D:179:VAL:HG22	3:D:180:LYS:H	1.85	0.42
3:D:729:HIS:O	3:D:732:VAL:HG22	2.19	0.42
3:D:30:GLU:HB3	3:D:40:GLU:HG3	2.02	0.42
3:D:317:MET:SD	3:D:337:LEU:HD22	2.60	0.42
1:B:71:VAL:HG22	1:B:132:LEU:HD22	2.01	0.41
1:A:152:PRO:HD2	1:A:155:ARG:HD3	2.00	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:361:VAL:HG21	3:D:367:ILE:CD1	2.50	0.41
3:D:886:VAL:HB	3:D:900:ILE:HD11	2.02	0.41
3:D:1099:VAL:O	3:D:1103:HIS:HB3	2.20	0.41
3:D:585:GLY:HA2	3:D:590:PRO:HG3	2.03	0.41
3:D:633:VAL:HG13	3:D:635:PRO:HD3	2.00	0.41
3:D:843:PHE:HE1	3:D:864:VAL:HG11	1.85	0.41
3:D:1407:LEU:HD23	3:D:1413:VAL:O	2.20	0.41
1:A:39:PRO:HG3	1:B:39:PRO:CG	2.47	0.41
2:C:209:ARG:HG3	2:C:210:GLU:N	2.34	0.41
2:C:1071:ILE:HD13	2:C:1071:ILE:HA	1.88	0.41
3:D:9:ARG:HB2	3:D:1456:LYS:HG2	2.03	0.41
3:D:895:VAL:O	3:D:899:LEU:HG	2.21	0.41
3:D:1274:ILE:HG22	3:D:1324:PRO:HA	2.01	0.41
1:B:226:ALA:O	1:B:228:PRO:HD3	2.20	0.41
3:D:370:ALA:O	9:D:2113:HOH:O	2.21	0.41
3:D:1301:LYS:HB3	3:D:1301:LYS:HE3	1.84	0.41
3:D:1434:TRP:NE1	3:D:1457:ASP:HB2	2.36	0.41
5:F:293:LEU:HD21	5:F:301:PRO:HG3	2.03	0.41
1:B:83:LYS:HE3	1:B:168:ASP:HB2	2.03	0.41
5:F:115:ILE:HG23	5:F:244:TYR:HD2	1.86	0.41
2:C:439:CYS:HB2	2:C:541:SER:HB3	2.03	0.41
3:D:783:ARG:CZ	3:D:1029:ARG:HD3	2.50	0.41
3:D:1068:LEU:HD23	3:D:1068:LEU:HA	1.88	0.41
3:D:1254:GLN:CB	3:D:1258:ARG:HB2	2.46	0.41
5:F:246:ARG:HB3	5:F:248:PHE:CD1	2.56	0.41
1:A:90:LEU:HD12	1:A:119:ASP:HA	2.03	0.41
2:C:504:GLU:HB2	2:C:507:ARG:HG3	2.03	0.41
2:C:607:ASP:OD1	2:C:610:ARG:HG3	2.21	0.41
2:C:1118:LYS:HG3	3:D:23:TYR:CZ	2.56	0.41
3:D:71:LYS:O	3:D:80:VAL:HG13	2.21	0.41
3:D:625:TYR:HB3	3:D:749:VAL:CG1	2.51	0.41
3:D:1364:HIS:CD2	3:D:1366:LYS:HE2	2.56	0.41
3:D:1420:LEU:HD12	3:D:1420:LEU:HA	1.94	0.41
4:E:49:ARG:HD3	4:E:54:LEU:HD11	2.03	0.41
5:F:243:GLU:HG2	6:G:2:DA:H61	1.85	0.41
1:B:99:LEU:HB3	1:B:114:PHE:CD2	2.56	0.41
1:B:123:MET:C	1:B:125:PRO:HD3	2.42	0.41
2:C:81:ASP:OD1	2:C:81:ASP:N	2.53	0.41
2:C:709:GLU:OE2	2:C:824:ARG:NH1	2.53	0.41
2:C:945:ALA:O	2:C:949:LYS:HG2	2.21	0.41
3:D:44:LEU:HB3	3:D:525:ARG:HH21	1.84	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:103:TRP:O	3:D:107:ASP:HB2	2.21	0.41
3:D:1270:ALA:N	9:D:2135:HOH:O	2.54	0.41
1:A:7:LYS:HB3	1:A:8:ALA:H	1.72	0.41
2:C:168:ARG:HD3	2:C:168:ARG:HA	1.93	0.41
2:C:1054:THR:OG1	2:C:1055:ILE:N	2.54	0.41
3:D:212:ARG:HB3	3:D:388:HIS:HD2	1.86	0.41
3:D:903:ASP:OD1	3:D:903:ASP:N	2.46	0.41
3:D:974:ILE:HD13	3:D:991:GLN:HB3	2.03	0.41
2:C:1076:VAL:HA	2:C:1077:PRO:HD3	1.88	0.40
3:D:179:VAL:HG22	3:D:183:GLU:HB3	2.02	0.40
3:D:1259:VAL:HG21	3:D:1356:TYR:HE1	1.85	0.40
3:D:1395:LEU:HD11	3:D:1400:VAL:HB	2.02	0.40
2:C:312:ALA:HB1	2:C:317:VAL:HG11	2.03	0.40
3:D:278:VAL:HG11	3:D:281:ARG:NE	2.35	0.40
3:D:394:LEU:HG	3:D:396:VAL:HG23	2.03	0.40
3:D:816:TYR:CG	3:D:836:VAL:HG11	2.56	0.40
1:A:31:GLY:O	1:A:35:THR:OG1	2.33	0.40
1:B:221:HIS:HA	1:B:224:TYR:CD2	2.56	0.40
2:C:74:GLY:N	2:C:93:PRO:O	2.49	0.40
2:C:374:ASN:OD1	2:C:375:SER:N	2.53	0.40
2:C:690:ILE:HD11	2:C:852:ILE:HG12	2.03	0.40
2:C:918:LEU:HB3	2:C:968:ASP:HA	2.03	0.40
3:D:557:LEU:HD12	3:D:570:GLU:HG3	2.02	0.40
3:D:573:MET:SD	5:F:225:LEU:HB3	2.61	0.40
3:D:952:ASP:OD1	3:D:1062:ARG:NH2	2.54	0.40
3:D:1189:ARG:HH12	3:D:1203:LYS:HE3	1.87	0.40
1:B:74:ASP:O	1:B:78:ILE:HG12	2.21	0.40
2:C:211:LEU:HD12	2:C:214:TYR:CE2	2.56	0.40
2:C:686:ASP:OD1	2:C:879:ARG:NH1	2.53	0.40
3:D:288:MET:HG2	3:D:305:ALA:HB1	2.04	0.40
3:D:1150:ALA:O	3:D:1162:GLU:HG3	2.21	0.40
2:C:2:GLU:HG3	2:C:899:GLN:HB3	2.04	0.40
2:C:1032:PHE:HZ	2:C:1040:LEU:HD22	1.85	0.40
3:D:348:ALA:HB1	3:D:349:PRO:HD2	2.03	0.40
3:D:1047:LYS:HB3	3:D:1047:LYS:HE2	1.90	0.40
5:F:220:ARG:HD2	5:F:266:ILE:HD13	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	225/314 (72%)	218 (97%)	7 (3%)	0	100 100
1	B	225/314 (72%)	210 (93%)	15 (7%)	0	100 100
2	C	1108/1119 (99%)	1065 (96%)	40 (4%)	3 (0%)	41 64
3	D	1469/1524 (96%)	1416 (96%)	51 (4%)	2 (0%)	51 75
4	E	87/99 (88%)	84 (97%)	3 (3%)	0	100 100
5	F	330/347 (95%)	324 (98%)	6 (2%)	0	100 100
All	All	3444/3717 (93%)	3317 (96%)	122 (4%)	5 (0%)	51 75

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	D	1128	VAL
3	D	109	PRO
2	C	876	VAL
2	C	164	PRO
2	C	727	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 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	194/270 (72%)	189 (97%)	5 (3%)	46 72
1	B	194/270 (72%)	188 (97%)	6 (3%)	40 66
2	C	931/936 (100%)	873 (94%)	58 (6%)	18 37

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
3	D	1244/1281 (97%)	1194 (96%)	50 (4%)	31 57
4	E	79/88 (90%)	76 (96%)	3 (4%)	33 59
5	F	287/299 (96%)	276 (96%)	11 (4%)	33 59
All	All	2929/3144 (93%)	2796 (96%)	133 (4%)	27 52

All (133) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	87	VAL
1	A	151	VAL
1	A	168	ASP
1	A	172	SER
1	A	190	THR
1	B	58	ILE
1	B	101	LEU
1	B	138	LEU
1	B	155	ARG
1	B	206	THR
1	B	232	LEU
2	C	15	LEU
2	C	18	LEU
2	C	54	ILE
2	C	64	LEU
2	C	66	LEU
2	C	70	GLU
2	C	81	ASP
2	C	107	LEU
2	C	114	PHE
2	C	158	TYR
2	C	159	ILE
2	C	194	VAL
2	C	210	GLU
2	C	218	VAL
2	C	238	LEU
2	C	240	THR
2	C	242	LEU
2	C	342	ASP
2	C	405	ARG
2	C	432	ARG
2	C	434	HIS
2	C	441	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	C	449	ILE
2	C	451	LEU
2	C	524	VAL
2	C	542	LEU
2	C	553	ASP
2	C	571	LEU
2	C	579	VAL
2	C	588	VAL
2	C	610	ARG
2	C	644	ARG
2	C	653	ASP
2	C	668	LEU
2	C	707	ARG
2	C	721	ARG
2	C	729	LEU
2	C	739	GLU
2	C	742	ILE
2	C	766	GLU
2	C	774	LEU
2	C	785	VAL
2	C	792	VAL
2	C	845	ASN
2	C	856	GLU
2	C	886	LEU
2	C	890	LEU
2	C	897	LEU
2	C	918	LEU
2	C	966	LEU
2	C	988	VAL
2	C	1017	THR
2	C	1068	GLN
2	C	1076	VAL
2	C	1085	PHE
2	C	1088	LEU
2	C	1102	LEU
2	C	1106	ASP
3	D	5	VAL
3	D	87	ARG
3	D	108	VAL
3	D	142	LEU
3	D	154	THR
3	D	227	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
3	D	261	LEU
3	D	289	THR
3	D	310	LEU
3	D	313	LEU
3	D	335	LEU
3	D	347	VAL
3	D	361	VAL
3	D	372	ASP
3	D	389	GLU
3	D	405	ASP
3	D	435	VAL
3	D	525	ARG
3	D	540	LEU
3	D	546	ARG
3	D	554	LEU
3	D	610	LYS
3	D	639	LEU
3	D	652	LEU
3	D	681	ARG
3	D	711	LEU
3	D	721	VAL
3	D	749	VAL
3	D	784	ASP
3	D	795	VAL
3	D	884	ARG
3	D	907	GLU
3	D	922	LEU
3	D	955	VAL
3	D	959	GLU
3	D	1029	ARG
3	D	1053	PHE
3	D	1129	THR
3	D	1132	LEU
3	D	1133	ARG
3	D	1137	ARG
3	D	1190	SER
3	D	1262	LEU
3	D	1288	ASP
3	D	1325	LEU
3	D	1335	LEU
3	D	1363	LEU
3	D	1376	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
3	D	1395	LEU
3	D	1447	LEU
4	E	51	LEU
4	E	55	TYR
4	E	80	VAL
5	F	137	LEU
5	F	202	LEU
5	F	224	PHE
5	F	244	TYR
5	F	253	TYR
5	F	274	ARG
5	F	292	GLN
5	F	293	LEU
5	F	404	TYR
5	F	423	LEU
5	F	438	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (17) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	156	HIS
1	A	180	GLN
1	A	221	HIS
2	C	575	GLN
2	C	670	GLN
2	C	1050	GLN
3	D	130	ASN
3	D	388	HIS
3	D	483	HIS
3	D	680	GLN
3	D	794	GLN
3	D	917	GLN
3	D	1103	HIS
3	D	1364	HIS
3	D	1445	HIS
4	E	33	HIS
5	F	98	GLN

5.3.3 RNA

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)

Of 3 ligands modelled in this entry, 3 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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^{th} 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^2)	Q<0.9
1	A	227/314 (72%)	-0.24	3 (1%) 77 73	49, 70, 108, 133	0
1	B	227/314 (72%)	0.24	15 (6%) 18 13	60, 94, 142, 176	0
2	C	1112/1119 (99%)	0.10	46 (4%) 37 30	35, 77, 136, 170	0
3	D	1475/1524 (96%)	0.09	61 (4%) 37 30	36, 75, 136, 163	0
4	E	89/99 (89%)	0.19	7 (7%) 12 9	56, 85, 141, 147	0
5	F	334/347 (96%)	0.22	23 (6%) 16 12	49, 97, 145, 166	0
6	G	10/31 (32%)	-0.53	0 100 100	100, 109, 139, 151	0
All	All	3474/3748 (92%)	0.10	155 (4%) 33 26	35, 80, 137, 176	0

All (155) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
5	F	168	PRO	8.5
3	D	1495	ILE	7.7
2	C	64	LEU	7.4
2	C	100	LEU	7.2
1	B	155	ARG	7.1
2	C	103	LYS	6.3
1	B	156	HIS	6.1
5	F	167	ASP	5.4
2	C	362	GLY	5.2
2	C	98	LEU	4.9
2	C	62	GLY	4.8
2	C	361	MET	4.8
5	F	153	THR	4.8
3	D	191	LEU	4.8
5	F	154	ALA	4.8
3	D	404	GLU	4.7
2	C	367	LEU	4.5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	C	108	ILE	4.3
2	C	65	VAL	4.3
1	B	158	ILE	4.3
2	C	311	PHE	4.2
1	B	157	GLY	4.2
2	C	811	PRO	4.1
3	D	236	TYR	4.1
2	C	809	GLY	4.1
3	D	324	ALA	4.0
3	D	178	LEU	3.9
1	A	185	ARG	3.8
3	D	982	PHE	3.8
3	D	432	TYR	3.7
3	D	2	LYS	3.6
3	D	312	ARG	3.6
5	F	169	LYS	3.5
1	A	186	LEU	3.4
2	C	222	LEU	3.4
3	D	242	LEU	3.4
3	D	277	GLU	3.4
2	C	371	LYS	3.3
2	C	101	ILE	3.3
2	C	354	GLY	3.3
3	D	1286	GLY	3.2
3	D	400	VAL	3.2
3	D	241	VAL	3.2
3	D	1128	VAL	3.2
2	C	104	ASP	3.1
2	C	420	ARG	3.1
3	D	225	ILE	3.0
2	C	247	PRO	3.0
3	D	275	GLU	3.0
3	D	196	VAL	3.0
3	D	245	LEU	3.0
3	D	481	MET	2.9
2	C	69	LEU	2.9
1	B	134	GLU	2.9
2	C	107	LEU	2.9
3	D	336	PHE	2.8
1	B	61	VAL	2.8
2	C	423	ALA	2.8
2	C	63	GLY	2.8

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
2	C	424	GLY	2.8
3	D	195	VAL	2.8
5	F	309	ALA	2.8
2	C	214	TYR	2.8
5	F	394	ARG	2.8
3	D	1130	ARG	2.8
3	D	276	GLU	2.8
2	C	217	LEU	2.8
3	D	323	GLU	2.8
3	D	315	ARG	2.8
3	D	405	ASP	2.7
3	D	223	LEU	2.7
5	F	189	LEU	2.7
1	A	188	GLN	2.7
3	D	406	ASP	2.7
3	D	247	GLU	2.7
2	C	155	PRO	2.6
3	D	232	GLU	2.6
2	C	422	ARG	2.6
2	C	366	THR	2.6
3	D	308	LYS	2.6
1	B	107	LYS	2.6
1	B	160	ASP	2.6
5	F	340	LYS	2.6
5	F	166	PRO	2.5
3	D	1498	ALA	2.5
2	C	245	GLY	2.5
3	D	171	LEU	2.5
5	F	136	GLY	2.5
5	F	314	TRP	2.5
3	D	244	GLU	2.5
3	D	309	GLY	2.5
3	D	1289	ARG	2.5
3	D	393	ILE	2.5
4	E	2	ALA	2.5
5	F	297	LEU	2.5
2	C	36	PRO	2.4
2	C	219	GLN	2.4
5	F	137	LEU	2.4
2	C	221	LEU	2.4
1	B	138	LEU	2.4
5	F	188	TYR	2.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	D	490	ALA	2.4
5	F	278	HIS	2.4
3	D	408	GLU	2.4
3	D	334	THR	2.3
2	C	157	ARG	2.3
3	D	220	ARG	2.3
2	C	315	ALA	2.3
5	F	299	ARG	2.3
1	B	58	ILE	2.3
4	E	51	LEU	2.3
3	D	321	GLU	2.3
2	C	350	ARG	2.3
2	C	178	ALA	2.3
2	C	363	SER	2.3
5	F	298	GLY	2.2
2	C	102	HIS	2.2
2	C	368	THR	2.2
2	C	346	VAL	2.2
5	F	172	GLU	2.2
5	F	173	GLU	2.2
3	D	488	ARG	2.2
3	D	1287	GLU	2.2
4	E	55	TYR	2.2
4	E	89	MET	2.2
2	C	1114	GLY	2.2
3	D	326	GLU	2.2
3	D	243	ALA	2.2
4	E	40	LEU	2.2
3	D	329	ASP	2.2
3	D	759	ALA	2.2
1	B	93	LYS	2.1
4	E	53	GLY	2.1
1	B	164	ALA	2.1
3	D	346	LYS	2.1
3	D	401	TYR	2.1
3	D	325	GLU	2.1
3	D	282	TYR	2.1
3	D	234	GLU	2.1
3	D	228	SER	2.1
2	C	34	VAL	2.1
3	D	251	PHE	2.1
4	E	49	ARG	2.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
5	F	193	ARG	2.1
1	B	133	GLU	2.1
5	F	198	ALA	2.1
3	D	486	ARG	2.1
3	D	892	ASP	2.1
2	C	1044	GLY	2.1
3	D	371	ILE	2.0
1	B	230	ALA	2.0
3	D	235	ALA	2.0
1	B	137	LYS	2.0
2	C	992	MET	2.0
5	F	304	GLU	2.0

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)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
7	ZN	D	2002	1/1	0.67	0.36	216,216,216,216	0
7	ZN	D	2001	1/1	0.92	0.26	110,110,110,110	0
8	MG	D	2003	1/1	0.97	0.08	74,74,74,74	0

6.5 Other polymers (i)

There are no such residues in this entry.