Full wwPDB X-ray Structure Validation Report ⓘ

Nov 22, 2023 – 09:46 PM JST

PDB ID	:	7XAD
Title	:	Crystal strucutre of PD-L1 and DBL2_02 designed protein binder
Authors	:	Liu, K.F.; Xu, Z.P.; Han, P.; Pacesa, M.; Gao, G.F.; Chai, Y.; Tan, S.G.
Deposited on	:	2022-03-17
Resolution	:	3.00 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:

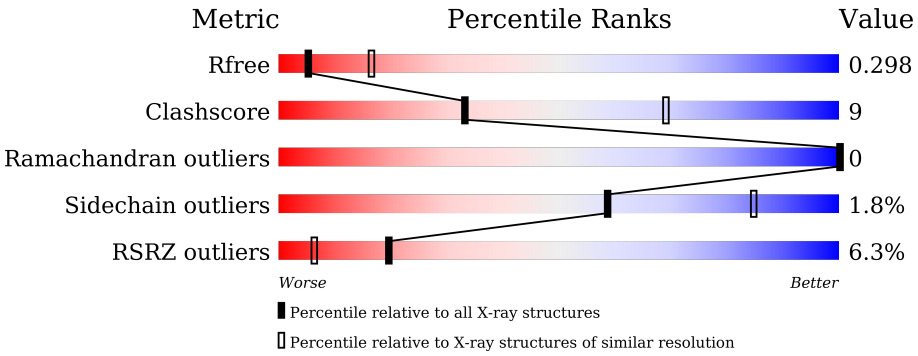
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 3.00 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.



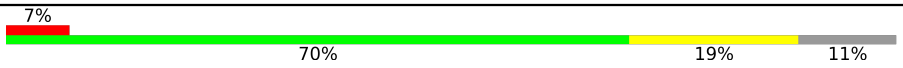
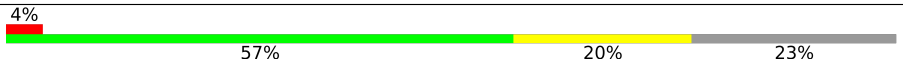
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

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	238	4% 68% 19% • 12%
1	D	238	9% 58% 27% 14%
1	F	238	7% 56% 12% • 31%
1	H	238	4% 69% 17% • 12%
2	C	105	2% 70% 21% 9%
2	E	105	3% 75% 16% 9%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
2	G	105	
2	I	105	

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 9316 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 Programmed cell death 1 ligand 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	210	Total	C	N	O	S	0	0	0
			1688	1067	287	327	7			
1	D	204	Total	C	N	O	S	0	0	0
			1640	1038	278	317	7			
1	F	164	Total	C	N	O	S	0	0	0
			1325	844	222	252	7			
1	H	209	Total	C	N	O	S	0	0	0
			1681	1062	286	326	7			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	216	GLU	PRO	conflict	UNP Q9NZQ7
A	217	PRO	GLU	conflict	UNP Q9NZQ7
D	216	GLU	PRO	conflict	UNP Q9NZQ7
D	217	PRO	GLU	conflict	UNP Q9NZQ7
F	216	GLU	PRO	conflict	UNP Q9NZQ7
F	217	PRO	GLU	conflict	UNP Q9NZQ7
H	216	GLU	PRO	conflict	UNP Q9NZQ7
H	217	PRO	GLU	conflict	UNP Q9NZQ7

- Molecule 2 is a protein called DBL2_02 binder.

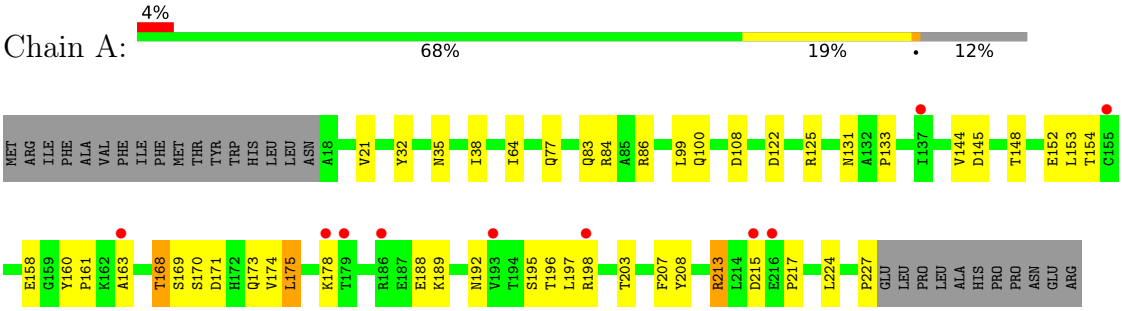
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	96	Total	C	N	O	S	0	0	0
			776	484	139	152	1			
2	E	96	Total	C	N	O	S	0	0	0
			776	484	139	152	1			
2	G	93	Total	C	N	O	S	0	0	0
			758	475	136	146	1			
2	I	81	Total	C	N	O	S	0	0	0
			672	424	120	127	1			

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 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.

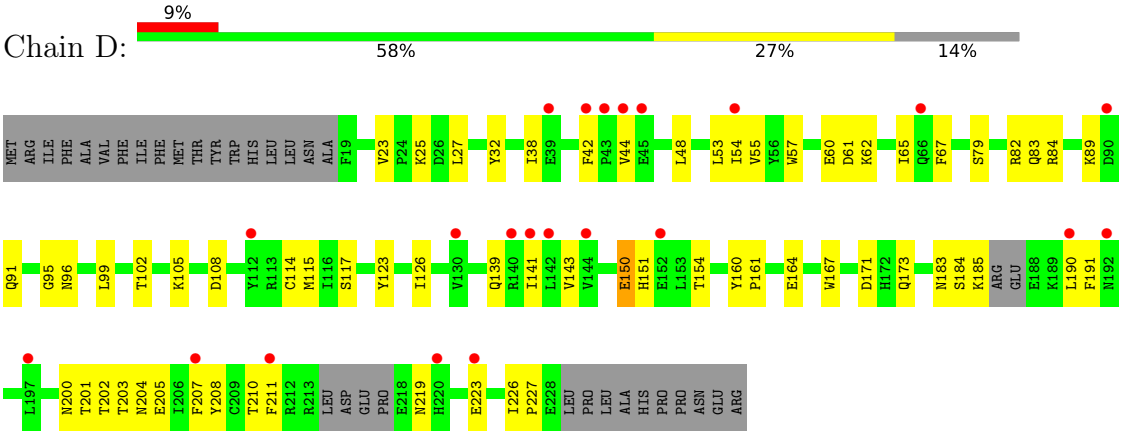
• Molecule 1: Programmed cell death 1 ligand 1

Chain A:



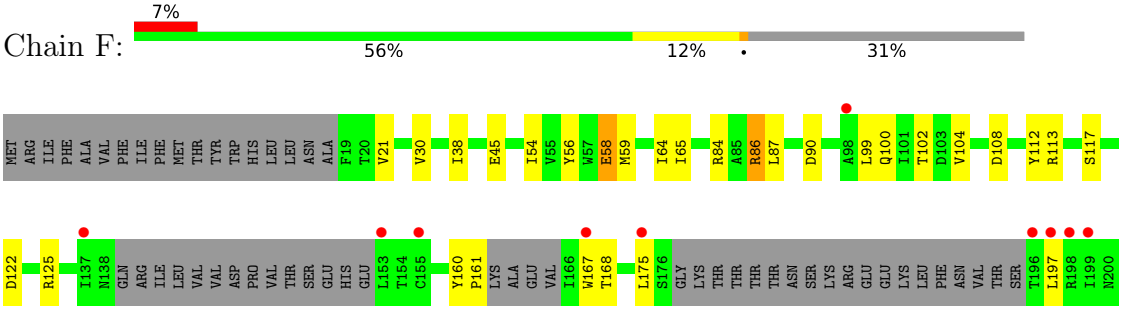
• Molecule 1: Programmed cell death 1 ligand 1

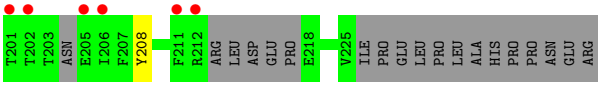
Chain D:



• Molecule 1: Programmed cell death 1 ligand 1

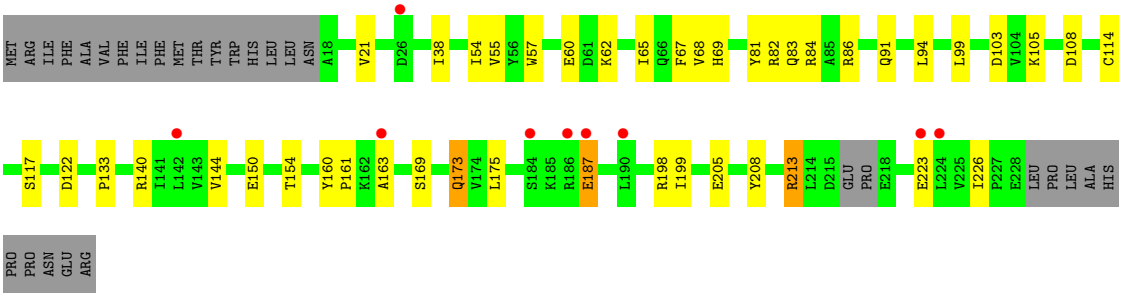
Chain F:





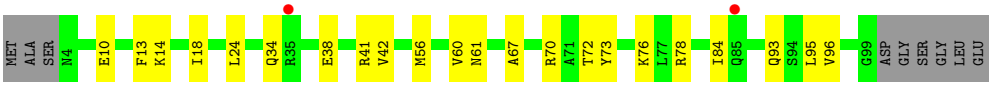
• Molecule 1: Programmed cell death 1 ligand 1

Chain H:



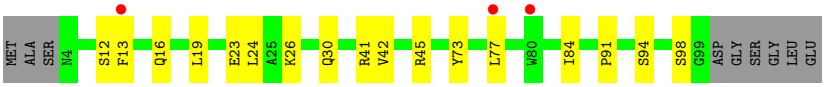
• Molecule 2: DBL2_02 binder

Chain C:



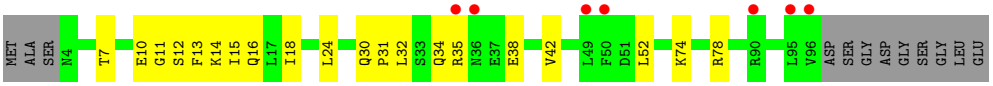
• Molecule 2: DBL2_02 binder

Chain E:



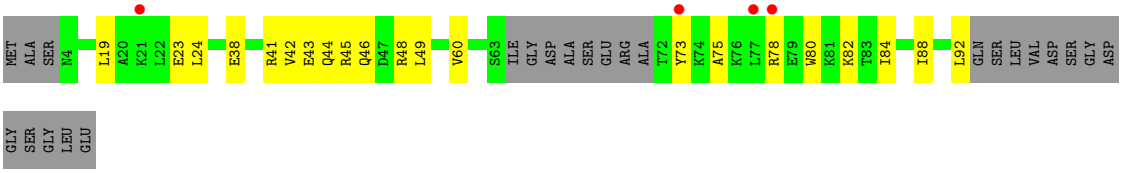
• Molecule 2: DBL2_02 binder

Chain G:



• Molecule 2: DBL2_02 binder

Chain I:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	85.41Å 116.08Å 149.60Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	43.06 – 3.00 43.06 – 3.00	Depositor EDS
% Data completeness (in resolution range)	99.4 (43.06-3.00) 99.4 (43.06-3.00)	Depositor EDS
R_{merge}	0.17	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.40 (at 3.01Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.268 , 0.294 0.269 , 0.298	Depositor DCC
R_{free} test set	1513 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	97.6	Xtriage
Anisotropy	0.533	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.28 , 69.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	9316	wwPDB-VP
Average B, all atoms (Å^2)	134.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.83% 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

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	0.28	0/1719	0.58	0/2333
1	D	0.26	0/1668	0.50	0/2260
1	F	0.25	0/1346	0.49	0/1818
1	H	0.28	0/1710	0.55	0/2318
2	C	0.32	0/784	0.53	0/1052
2	E	0.29	0/784	0.52	0/1052
2	G	0.31	0/766	0.56	0/1028
2	I	0.29	0/679	0.48	0/909
All	All	0.28	0/9456	0.53	0/12770

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1688	0	1678	36	0
1	D	1640	0	1630	40	0
1	F	1325	0	1305	19	0
1	H	1681	0	1670	29	0
2	C	776	0	797	13	0
2	E	776	0	797	11	0
2	G	758	0	785	12	0
2	I	672	0	699	13	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	9316	0	9361	161	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 (161) 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:H:62:LYS:HD3	1:H:81:TYR:HE2	1.47	0.79
1:A:133:PRO:HA	1:A:213:ARG:HH22	1.48	0.78
1:D:48:LEU:HD11	1:D:53:LEU:HD22	1.65	0.78
1:F:21:VAL:HG23	1:F:122:ASP:HB3	1.71	0.73
1:A:83:GLN:O	1:H:86:ARG:NH1	2.24	0.70
2:E:23:GLU:OE2	2:E:45:ARG:NH2	2.25	0.69
1:A:21:VAL:HG23	1:A:122:ASP:HB3	1.74	0.69
1:H:21:VAL:HG23	1:H:122:ASP:HB3	1.75	0.69
1:D:38:ILE:HD11	1:D:99:LEU:HD23	1.75	0.68
2:C:24:LEU:HD11	2:C:42:VAL:HG11	1.76	0.68
1:D:84:ARG:NH2	1:D:108:ASP:OD2	2.28	0.66
1:H:144:VAL:HB	1:H:150:GLU:HG2	1.76	0.66
1:D:54:ILE:HB	1:D:117:SER:HB3	1.76	0.65
2:G:12:SER:O	2:G:16:GLN:HG2	1.97	0.65
2:I:75:ALA:HA	2:I:78:ARG:HD2	1.79	0.63
1:D:204:ASN:HA	1:D:226:ILE:HB	1.80	0.63
1:A:163:ALA:HA	1:A:213:ARG:HA	1.81	0.62
1:A:213:ARG:HD2	1:A:217:PRO:HD2	1.81	0.62
1:A:144:VAL:HG11	1:A:198:ARG:NH2	2.16	0.61
2:E:13:PHE:HE1	2:E:84:ILE:HD11	1.65	0.61
1:F:65:ILE:HD13	1:F:87:LEU:HB2	1.83	0.61
1:A:161:PRO:HG2	1:A:213:ARG:HE	1.66	0.61
2:E:24:LEU:HD11	2:E:42:VAL:HG11	1.83	0.60
1:F:168:THR:HG23	1:F:208:TYR:HB2	1.83	0.60
1:F:84:ARG:NH2	1:F:108:ASP:OD2	2.34	0.59
1:H:91:GLN:HA	1:H:94:LEU:HD13	1.82	0.59
1:H:144:VAL:HG11	1:H:198:ARG:HH21	1.67	0.59
1:D:25:LYS:NZ	1:D:27:LEU:O	2.36	0.59
2:G:74:LYS:O	2:G:78:ARG:HG2	2.03	0.59
1:A:178:LYS:O	1:A:195:SER:HA	2.03	0.58
1:A:86:ARG:NH1	1:H:83:GLN:O	2.36	0.58
1:A:38:ILE:HD11	1:A:99:LEU:HD23	1.86	0.57
2:G:11:GLY:O	2:G:15:ILE:HG12	2.05	0.57

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:175:LEU:HD12	1:F:197:LEU:HD11	1.86	0.57
1:F:30:VAL:HG11	1:F:104:VAL:HG21	1.87	0.57
1:D:207:PHE:HD2	1:D:226:ILE:HD11	1.68	0.56
2:G:24:LEU:HD13	2:G:42:VAL:HG11	1.87	0.56
1:D:171:ASP:HB3	1:D:173:GLN:HG3	1.87	0.56
1:F:38:ILE:HD11	1:F:99:LEU:HD23	1.88	0.56
1:A:84:ARG:NH2	1:A:108:ASP:OD2	2.39	0.55
2:I:46:GLN:HB2	2:I:88:ILE:HG21	1.88	0.55
2:E:12:SER:O	2:E:16:GLN:HG2	2.07	0.55
2:I:23:GLU:OE2	2:I:45:ARG:NH1	2.40	0.55
2:E:24:LEU:HD23	2:E:91:PRO:HB2	1.87	0.54
1:D:139:GLN:HA	1:D:154:THR:O	2.07	0.54
1:D:150:GLU:HA	1:D:200:ASN:HA	1.89	0.54
1:H:60:GLU:O	2:I:41:ARG:NH2	2.41	0.54
1:D:202:THR:OG1	1:D:203:THR:N	2.41	0.54
1:H:133:PRO:HB3	1:H:213:ARG:NH2	2.23	0.54
1:H:38:ILE:HD11	1:H:99:LEU:HD23	1.91	0.53
2:I:46:GLN:HA	2:I:49:LEU:HD12	1.90	0.53
2:G:14:LYS:O	2:G:18:ILE:HG13	2.08	0.53
1:D:42:PHE:CE2	1:D:95:GLY:HA2	2.44	0.53
2:I:43:GLU:HG2	2:I:92:LEU:HD21	1.91	0.53
1:D:167:TRP:HA	1:D:208:TYR:O	2.09	0.52
2:I:19:LEU:HB3	2:I:45:ARG:HH11	1.75	0.52
1:A:170:SER:O	1:A:173:GLN:NE2	2.42	0.52
2:E:94:SER:O	2:E:98:SER:OG	2.28	0.52
1:H:68:VAL:O	1:H:69:HIS:ND1	2.43	0.52
1:H:84:ARG:NH2	1:H:108:ASP:OD2	2.43	0.51
1:A:86:ARG:HH21	1:H:86:ARG:HH21	1.59	0.51
2:C:13:PHE:HE1	2:C:84:ILE:HD11	1.76	0.51
1:A:125:ARG:NH2	2:C:34:GLN:OE1	2.44	0.51
2:E:26:LYS:O	2:E:30:GLN:HG3	2.11	0.51
1:D:160:TYR:HB3	1:D:161:PRO:HD3	1.93	0.51
1:F:59:MET:HB2	1:F:112:TYR:CE1	2.46	0.50
1:A:35:ASN:ND2	1:H:103:ASP:OD1	2.43	0.50
1:D:115:MET:HG3	2:E:19:LEU:HG	1.93	0.50
1:H:205:GLU:O	1:H:226:ILE:HG12	2.11	0.50
1:A:154:THR:HG23	1:A:196:THR:HG22	1.94	0.50
1:A:160:TYR:HB3	1:A:161:PRO:HD3	1.94	0.50
1:D:91:GLN:OE1	1:D:96:ASN:ND2	2.45	0.50
2:C:38:GLU:OE2	2:C:41:ARG:NH1	2.45	0.50
1:H:54:ILE:HB	1:H:117:SER:HB3	1.93	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:208:TYR:HE1	1:H:223:GLU:HG3	1.76	0.49
1:D:83:GLN:HB3	1:F:86:ARG:HD2	1.93	0.49
1:F:64:ILE:HG22	1:F:65:ILE:HG13	1.94	0.49
1:D:201:THR:HG22	1:D:202:THR:H	1.77	0.49
2:C:13:PHE:CE1	2:C:84:ILE:HD11	2.48	0.48
1:A:32:TYR:N	1:A:131:ASN:O	2.46	0.48
1:A:125:ARG:NH1	2:C:38:GLU:OE2	2.46	0.48
1:A:152:GLU:O	1:A:152:GLU:HG3	2.14	0.48
1:A:168:THR:HG23	1:A:208:TYR:HB2	1.93	0.48
1:A:175:LEU:HD13	1:A:197:LEU:HD11	1.95	0.48
2:C:72:THR:HG22	2:C:76:LYS:HE3	1.96	0.48
2:I:38:GLU:O	2:I:42:VAL:HG23	2.13	0.48
1:A:158:GLU:HG3	1:A:192:ASN:OD1	2.13	0.47
1:D:79:SER:HB2	1:D:82:ARG:HH21	1.79	0.47
2:C:14:LYS:O	2:C:18:ILE:HG13	2.13	0.47
1:D:184:SER:OG	1:D:185:LYS:N	2.46	0.47
1:D:207:PHE:CD2	1:D:226:ILE:HD11	2.48	0.47
1:D:32:TYR:CE1	1:D:105:LYS:HA	2.50	0.47
1:D:38:ILE:HG13	1:D:99:LEU:HB3	1.96	0.47
1:A:213:ARG:HD3	1:A:215:ASP:HB2	1.97	0.47
1:H:161:PRO:HB2	1:H:213:ARG:HB3	1.97	0.47
2:C:10:GLU:OE2	2:C:73:TYR:OH	2.25	0.47
1:D:208:TYR:HE1	1:D:223:GLU:HG3	1.80	0.47
2:I:82:LYS:HB3	2:I:82:LYS:HE2	1.75	0.46
1:F:160:TYR:HB3	1:F:161:PRO:HD3	1.97	0.46
1:H:57:TRP:HB2	1:H:65:ILE:HB	1.97	0.46
1:F:54:ILE:HB	1:F:117:SER:HB3	1.98	0.46
1:D:201:THR:HG22	1:D:226:ILE:HG21	1.98	0.46
1:A:175:LEU:HD21	1:A:207:PHE:HE1	1.81	0.46
2:C:67:ALA:HA	2:C:70:ARG:HB3	1.97	0.46
1:D:55:VAL:HB	1:D:67:PHE:HB3	1.98	0.46
1:A:64:ILE:O	1:A:77:GLN:NE2	2.40	0.46
1:F:58:GLU:HG3	1:F:113:ARG:HB2	1.97	0.46
1:A:133:PRO:CA	1:A:213:ARG:HH22	2.25	0.46
2:E:13:PHE:CE1	2:E:84:ILE:HD11	2.48	0.46
1:D:32:TYR:CZ	1:D:190:LEU:HD11	2.51	0.45
1:A:145:ASP:HB3	1:A:148:THR:HG22	1.97	0.45
1:D:67:PHE:HE2	1:D:89:LYS:HE2	1.81	0.45
2:G:7:THR:O	2:G:10:GLU:HG2	2.17	0.45
1:F:56:TYR:CD1	2:G:15:ILE:HG21	2.51	0.45
1:F:45:GLU:N	1:F:45:GLU:OE1	2.50	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:175:LEU:HD13	1:H:199:ILE:HD12	1.98	0.45
1:H:213:ARG:H	1:H:213:ARG:HG2	1.50	0.45
1:D:60:GLU:O	1:D:62:LYS:HG3	2.16	0.44
1:H:140:ARG:HG2	1:H:154:THR:HB	2.00	0.44
1:D:143:VAL:HG22	1:D:151:HIS:HD2	1.82	0.44
1:F:59:MET:HB2	1:F:112:TYR:CD1	2.52	0.44
1:D:102:THR:HG21	1:F:102:THR:HG21	2.00	0.44
1:A:203:THR:HG23	1:A:227:PRO:O	2.17	0.44
1:D:164:GLU:O	1:D:211:PHE:HA	2.17	0.44
1:D:210:THR:HG23	1:D:219:ASN:HB2	2.00	0.43
1:A:178:LYS:O	1:A:178:LYS:HG3	2.18	0.43
2:G:32:LEU:O	2:G:35:ARG:HB3	2.18	0.43
1:D:114:CYS:O	1:D:123:TYR:HA	2.19	0.43
1:F:125:ARG:NH1	2:G:38:GLU:OE2	2.52	0.43
1:A:213:ARG:NH1	1:A:217:PRO:HB2	2.33	0.43
1:H:169:SER:OG	1:H:173:GLN:HB3	2.18	0.43
1:A:178:LYS:HE2	1:A:196:THR:OG1	2.19	0.43
1:D:44:VAL:HG22	1:D:95:GLY:HA3	2.00	0.43
2:G:31:PRO:HD2	2:G:34:GLN:NE2	2.33	0.43
2:E:73:TYR:HE1	2:E:77:LEU:HD21	1.84	0.43
1:H:144:VAL:HG11	1:H:198:ARG:NH2	2.33	0.42
2:C:93:GLN:HA	2:C:96:VAL:HG22	2.01	0.42
1:D:141:ILE:HD13	1:D:227:PRO:HD3	2.00	0.42
2:G:13:PHE:HB2	2:G:52:LEU:HD13	2.02	0.42
2:C:56:MET:O	2:C:60:VAL:HG23	2.19	0.42
1:F:167:TRP:CE3	1:F:197:LEU:HD12	2.54	0.42
1:H:55:VAL:HB	1:H:67:PHE:HB3	2.01	0.42
2:I:60:VAL:HG21	2:I:73:TYR:CD1	2.55	0.42
1:H:105:LYS:HB3	1:H:187:GLU:OE1	2.19	0.42
2:I:80:TRP:O	2:I:84:ILE:HG13	2.20	0.42
1:H:163:ALA:HA	1:H:213:ARG:HA	2.00	0.42
2:I:44:GLN:O	2:I:48:ARG:HG3	2.20	0.41
2:E:73:TYR:O	2:E:77:LEU:HG	2.20	0.41
2:C:95:LEU:HD12	2:C:95:LEU:HA	1.95	0.41
1:D:23:VAL:HG11	1:D:126:ILE:HG12	2.03	0.41
1:D:57:TRP:HB2	1:D:65:ILE:HB	2.03	0.41
1:A:169:SER:HB3	1:A:207:PHE:CD1	2.56	0.41
2:I:24:LEU:HD11	2:I:42:VAL:HG11	2.02	0.41
1:A:86:ARG:NH1	1:A:100:GLN:OE1	2.54	0.40
1:D:160:TYR:O	1:D:191:PHE:HD2	2.03	0.40
1:D:205:GLU:HB2	1:D:226:ILE:HG13	2.02	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:30:GLN:OE1	2:G:38:GLU:HG3	2.20	0.40
1:H:82:ARG:HA	1:H:82:ARG:HD2	1.97	0.40
1:H:160:TYR:HB3	1:H:161:PRO:HD3	2.04	0.40
1:A:188:GLU:CD	1:A:189:LYS:H	2.23	0.40
1:A:153:LEU:HB3	1:A:224:LEU:HD22	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	208/238 (87%)	196 (94%)	12 (6%)	0	100	100
1	D	198/238 (83%)	187 (94%)	11 (6%)	0	100	100
1	F	152/238 (64%)	142 (93%)	10 (7%)	0	100	100
1	H	205/238 (86%)	197 (96%)	8 (4%)	0	100	100
2	C	94/105 (90%)	93 (99%)	1 (1%)	0	100	100
2	E	94/105 (90%)	93 (99%)	1 (1%)	0	100	100
2	G	91/105 (87%)	90 (99%)	1 (1%)	0	100	100
2	I	77/105 (73%)	77 (100%)	0	0	100	100
All	All	1119/1372 (82%)	1075 (96%)	44 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	190/216 (88%)	185 (97%)	5 (3%)	46	78
1	D	185/216 (86%)	182 (98%)	3 (2%)	62	86
1	F	147/216 (68%)	143 (97%)	4 (3%)	44	77
1	H	189/216 (88%)	185 (98%)	4 (2%)	53	82
2	C	87/93 (94%)	85 (98%)	2 (2%)	50	80
2	E	87/93 (94%)	86 (99%)	1 (1%)	73	90
2	G	85/93 (91%)	85 (100%)	0	100	100
2	I	76/93 (82%)	76 (100%)	0	100	100
All	All	1046/1236 (85%)	1027 (98%)	19 (2%)	59	85

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	168	THR
1	A	171	ASP
1	A	174	VAL
1	A	175	LEU
1	A	213	ARG
2	C	61	ASN
2	C	78	ARG
1	D	61	ASP
1	D	150	GLU
1	D	183	ASN
2	E	41	ARG
1	F	58	GLU
1	F	86	ARG
1	F	90	ASP
1	F	100	GLN
1	H	114	CYS
1	H	173	GLN
1	H	187	GLU
1	H	213	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
2	C	30	GLN
1	F	63	ASN
2	G	34	GLN
1	H	173	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

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

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

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	210/238 (88%)	0.21	10 (4%) 30 11	65, 112, 178, 219	0
1	D	204/238 (85%)	0.57	22 (10%) 5 2	101, 145, 190, 246	0
1	F	164/238 (68%)	0.54	16 (9%) 7 2	90, 136, 201, 243	0
1	H	209/238 (87%)	0.14	9 (4%) 35 13	78, 108, 146, 196	0
2	C	96/105 (91%)	0.06	2 (2%) 63 34	76, 123, 165, 180	0
2	E	96/105 (91%)	0.18	3 (3%) 49 21	104, 142, 177, 191	0
2	G	93/105 (88%)	0.68	7 (7%) 14 4	104, 147, 212, 271	0
2	I	81/105 (77%)	0.29	4 (4%) 29 11	93, 168, 205, 235	0
All	All	1153/1372 (84%)	0.34	73 (6%) 20 6	65, 131, 193, 271	0

All (73) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	212	ARG	4.9
1	A	198	ARG	4.9
1	F	205	GLU	4.9
2	I	77	LEU	4.7
1	F	153	LEU	4.7
1	A	216	GLU	4.4
1	D	223	GLU	4.4
2	G	35	ARG	4.1
1	D	44	VAL	4.0
1	D	142	LEU	4.0
1	A	163	ALA	3.9
1	F	197	LEU	3.7
2	I	73	TYR	3.5
1	D	54	ILE	3.4
1	H	190	LEU	3.4
1	D	207	PHE	3.4

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	F	202	THR	3.4
1	F	198	ARG	3.2
1	F	98	ALA	3.1
1	D	190	LEU	3.1
1	D	112	TYR	3.0
2	G	50	PHE	2.9
1	D	152	GLU	2.9
1	F	137	ILE	2.9
1	D	141	ILE	2.9
1	H	142	LEU	2.9
1	A	155	CYS	2.8
1	F	155	CYS	2.7
1	H	163	ALA	2.7
1	H	224	LEU	2.7
2	C	35	ARG	2.7
2	G	36	ASN	2.7
1	F	196	THR	2.6
1	F	167	TRP	2.5
1	F	175	LEU	2.5
1	D	192	ASN	2.4
1	D	42	PHE	2.4
1	D	45	GLU	2.4
2	I	78	ARG	2.4
2	G	95	LEU	2.4
1	F	199	ILE	2.4
1	A	186	ARG	2.3
1	F	211	PHE	2.3
1	D	43	PRO	2.3
1	H	184	SER	2.3
2	E	77	LEU	2.3
1	H	186	ARG	2.3
2	G	90	ARG	2.3
1	D	220	HIS	2.3
2	G	96	VAL	2.3
1	D	197	LEU	2.2
1	A	179	THR	2.2
1	A	137	ILE	2.2
1	D	39	GLU	2.2
1	A	215	ASP	2.2
1	D	90	ASP	2.2
1	A	193	VAL	2.2
1	D	66	GLN	2.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	178	LYS	2.2
2	E	80	TRP	2.2
1	H	187	GLU	2.2
1	D	144	VAL	2.1
1	F	201	THR	2.1
1	H	26	ASP	2.1
1	F	206	ILE	2.1
2	G	49	LEU	2.1
1	D	140	ARG	2.1
2	E	13	PHE	2.1
1	D	211	PHE	2.1
2	I	21	LYS	2.1
1	D	130	VAL	2.0
1	H	223	GLU	2.0
2	C	85	GLN	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)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.