Full wwPDB X-ray Structure Validation Report (i)

Sep 5, 2023 – 03:08 PM EDT

PDB ID	:	4E5X
Title	:	Crystal structure of a complex between the human adenovirus type 2 E3-19K protein and MHC class I molecule HLA-A2/Tax
Authors	:	Li, L.; Bouvier, M.
Deposited on	:	2012-03-14
Resolution	:	1.95 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 (i) 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 (1)) were used in the production of this report:

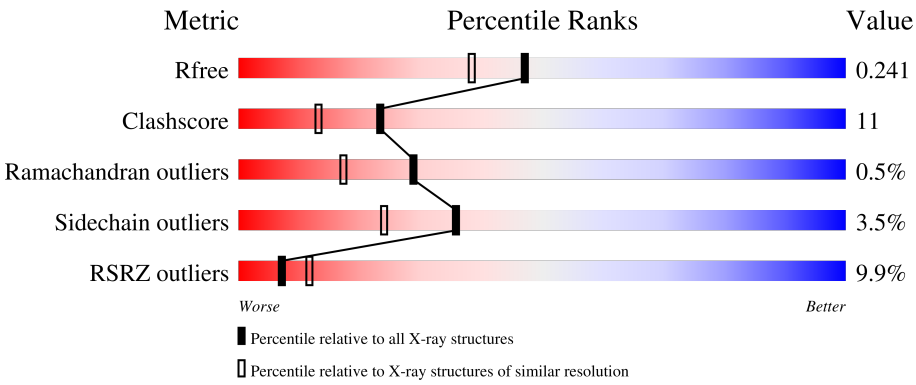
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

1 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 1.95 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	2580 (1.96-1.96)
Clashscore	141614	2705 (1.96-1.96)
Ramachandran outliers	138981	2678 (1.96-1.96)
Sidechain outliers	138945	2678 (1.96-1.96)
RSRZ outliers	127900	2539 (1.96-1.96)

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	275	8%, 80%, 18%, •
1	D	275	17%, 69%, 28%, •
2	B	100	9%, 81%, 19%
2	E	100	4%, 88%, 12%
3	C	9	11%, 78%, 22%

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Mol	Chain	Length	Quality of chain
3	F	9	78% 11% 11%
4	G	100	4% 88% 10%
4	H	100	6% 73% 23%

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 8439 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 HLA class I histocompatibility antigen, A-2 alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	275	2247	1403	409	426	9	0	0	0
1	D	275	2247	1403	409	426	9	0	0	0

- Molecule 2 is a protein called Beta-2-microglobulin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	100	837	533	141	159	4	0	0	0
2	E	100	837	533	141	159	4	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	0	MET	-	initiating methionine	UNP P61769
E	0	MET	-	initiating methionine	UNP P61769

- Molecule 3 is a protein called Protein Tax-1.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	C	9	77	56	9	12	0	0	0
3	F	9	77	56	9	12	0	0	0

- Molecule 4 is a protein called Early E3 18.5 kDa glycoprotein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	G	99	832	539	134	151	8	0	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	H	97	813	528	130	147	8	0	0	0

- Molecule 5 is water.

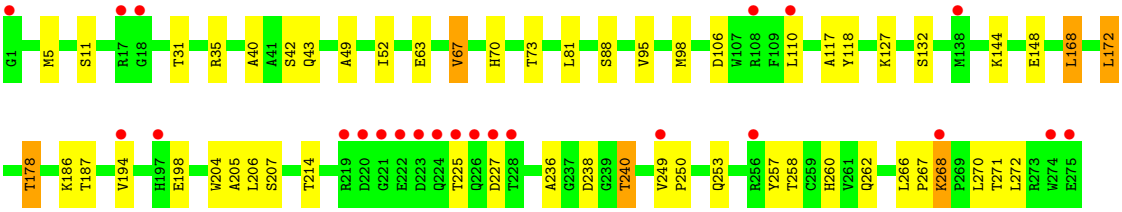
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
5	A	107	107	107	0	0
5	B	52	52	52	0	0
5	C	10	10	10	0	0
5	D	101	101	101	0	0
5	E	35	35	35	0	0
5	F	4	4	4	0	0
5	G	82	82	82	0	0
5	H	81	81	81	0	0

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.

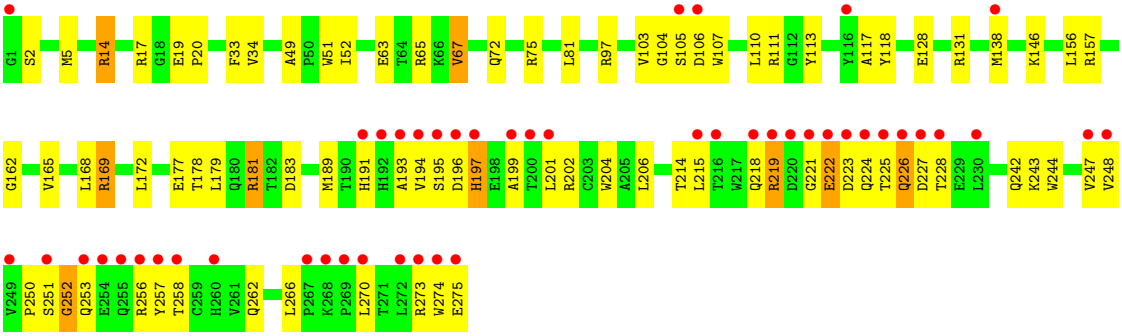
• Molecule 1: HLA class I histocompatibility antigen, A-2 alpha chain

Chain A:



• Molecule 1: HLA class I histocompatibility antigen, A-2 alpha chain

Chain D:

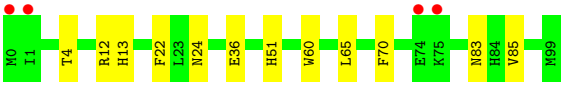


• Molecule 2: Beta-2-microglobulin

Chain B:

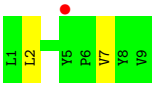
• Molecule 2: Beta-2-microglobulin

Chain E:



• Molecule 3: Protein Tax-1

Chain C:

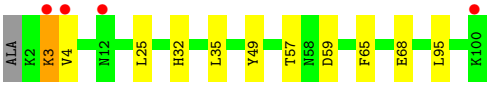


• Molecule 3: Protein Tax-1

Chain F:

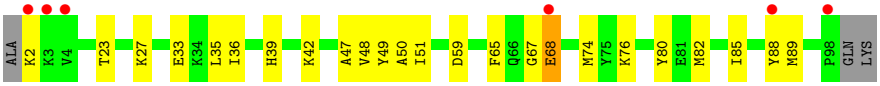
• Molecule 4: Early E3 18.5 kDa glycoprotein

Chain G:



• Molecule 4: Early E3 18.5 kDa glycoprotein

Chain H:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	I 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	113.19Å 133.67Å 196.72Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	37.06 – 1.95 49.18 – 1.95	Depositor EDS
% Data completeness (in resolution range)	94.9 (37.06-1.95) 94.5 (49.18-1.95)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.38 (at 1.95Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.210 , 0.241 0.210 , 0.241	Depositor DCC
R_{free} test set	10808 reflections (9.98%)	wwPDB-VP
Wilson B-factor (Å^2)	25.4	Xtriage
Anisotropy	0.497	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.39 , 51.2	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	0.95	EDS
Total number of atoms	8439	wwPDB-VP
Average B, all atoms (Å^2)	35.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.26% 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 (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	0.32	0/2312	0.59	0/3137
1	D	0.33	0/2312	0.61	0/3137
2	B	0.34	0/860	0.62	0/1162
2	E	0.32	0/860	0.59	0/1162
3	C	0.51	0/80	0.81	0/108
3	F	0.44	0/80	0.85	0/108
4	G	0.39	0/855	0.61	0/1150
4	H	0.37	0/836	0.57	0/1127
All	All	0.34	0/8195	0.61	0/11091

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
4	H	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	H	80	TYR	Sidechain

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	2247	0	2096	47	0
1	D	2247	0	2096	82	0
2	B	837	0	803	14	0
2	E	837	0	803	13	0
3	C	77	0	79	1	0
3	F	77	0	79	3	0
4	G	832	0	817	7	0
4	H	813	0	796	30	1
5	A	107	0	0	6	0
5	B	52	0	0	1	0
5	C	10	0	0	0	0
5	D	101	0	0	3	0
5	E	35	0	0	3	0
5	F	4	0	0	0	0
5	G	82	0	0	0	0
5	H	81	0	0	2	0
All	All	8439	0	7569	176	1

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 11.

All (176) 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:D:219:ARG:HE	1:D:224:GLN:NE2	1.59	1.00
1:D:63:GLU:O	1:D:67:VAL:HG23	1.61	0.99
1:A:63:GLU:O	1:A:67:VAL:HG23	1.72	0.89
1:D:14:ARG:HD2	1:D:19:GLU:O	1.76	0.84
1:A:266:LEU:HD13	1:A:270:LEU:HD13	1.59	0.82
2:B:73:THR:HG22	2:B:75:LYS:H	1.46	0.81
2:B:0:MET:HG2	2:B:1:ILE:H	1.47	0.79
1:D:228:THR:HG22	1:D:247:VAL:CG1	2.14	0.77
1:D:191:HIS:CE1	1:D:199:ALA:HB1	2.23	0.74
1:D:258:THR:HG22	1:D:273:ARG:HG2	1.68	0.73
1:A:168:LEU:HD22	1:A:172:LEU:HD22	1.72	0.72
2:E:85:VAL:HG13	5:E:101:HOH:O	1.88	0.72
1:A:187:THR:HG22	5:A:392:HOH:O	1.90	0.72
4:H:68:GLU:H	4:H:68:GLU:CD	1.94	0.71
1:D:228:THR:HG22	1:D:247:VAL:HG12	1.72	0.71
1:D:219:ARG:NE	1:D:224:GLN:NE2	2.36	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:63:GLU:O	1:A:67:VAL:CG2	2.38	0.70
1:A:127:LYS:HD2	1:A:132:SER:OG	1.91	0.70
1:D:20:PRO:HD2	1:D:75:ARG:HD3	1.75	0.69
1:D:65:ARG:HD2	5:D:401:HOH:O	1.93	0.69
1:D:63:GLU:O	1:D:67:VAL:CG2	2.41	0.68
1:D:226:GLN:O	1:D:227:ASP:HB2	1.94	0.67
1:D:67:VAL:HG22	3:F:2:LEU:HD21	1.75	0.67
1:D:67:VAL:HG22	3:F:2:LEU:CD2	2.24	0.67
1:A:194:VAL:CG2	1:A:198:GLU:HG3	2.26	0.66
1:A:238:ASP:OD1	1:A:240:THR:HG22	1.97	0.65
1:D:146:LYS:HE3	3:F:8:TYR:O	1.97	0.65
1:A:249:VAL:HG13	1:A:250:PRO:HD2	1.79	0.65
1:A:205:ALA:C	1:A:206:LEU:HD12	2.17	0.64
4:H:23:THR:HG22	5:H:204:HOH:O	1.98	0.64
1:D:215:LEU:HD13	1:D:243:LYS:HD3	1.80	0.64
4:H:35:LEU:O	4:H:36:ILE:HD12	1.99	0.63
2:B:0:MET:HG2	2:B:1:ILE:N	2.14	0.62
1:A:204:TRP:HB3	1:A:206:LEU:HD11	1.81	0.62
1:D:226:GLN:O	1:D:227:ASP:CB	2.47	0.62
5:E:106:HOH:O	4:H:89:MET:HE2	1.98	0.62
1:A:144:LYS:O	1:A:148:GLU:HG3	2.00	0.62
1:D:178:THR:HG23	4:H:51:ILE:HD11	1.82	0.62
4:H:76:LYS:HE3	5:H:261:HOH:O	2.00	0.62
1:D:107:TRP:HZ3	1:D:172:LEU:HD13	1.65	0.61
1:D:131:ARG:HD3	1:D:157:ARG:NH2	2.14	0.61
1:D:202:ARG:HD2	1:D:204:TRP:NE1	2.15	0.61
4:H:85:ILE:O	4:H:88:TYR:HD2	1.83	0.60
2:E:12:ARG:HD2	4:H:89:MET:CE	2.31	0.60
1:D:250:PRO:HB2	1:D:253:GLN:HG3	1.83	0.60
1:A:258:THR:HG23	1:A:260:HIS:NE2	2.18	0.59
2:B:4:THR:OG1	2:B:86:THR:HG21	2.02	0.59
4:H:35:LEU:C	4:H:36:ILE:HD12	2.23	0.59
1:A:225:THR:C	1:A:227:ASP:H	2.05	0.59
1:A:207:SER:HA	1:A:240:THR:HG21	1.84	0.58
1:D:219:ARG:HE	1:D:224:GLN:CD	2.08	0.57
1:A:5:MET:HB2	1:A:168:LEU:HG	1.86	0.57
1:D:162:GLY:O	1:D:165:VAL:HG22	2.05	0.57
1:D:219:ARG:HE	1:D:224:GLN:HE22	1.46	0.57
1:A:194:VAL:HG21	1:A:198:GLU:HG3	1.86	0.56
1:A:207:SER:HA	1:A:240:THR:CG2	2.35	0.56
1:D:49:ALA:O	1:D:52:ILE:HG22	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:24:ASN:HB3	2:E:65:LEU:HD11	1.88	0.56
4:H:68:GLU:CD	4:H:68:GLU:N	2.59	0.55
1:D:253:GLN:HB3	1:D:256:ARG:CD	2.36	0.55
1:D:5:MET:HB2	1:D:168:LEU:HD13	1.87	0.55
4:G:3:LYS:NZ	4:G:3:LYS:HB2	2.21	0.55
1:D:250:PRO:O	1:D:252:GLY:N	2.40	0.55
1:D:117:ALA:HB2	2:E:60:TRP:CE2	2.42	0.55
1:A:236:ALA:HB3	1:A:240:THR:HG22	1.90	0.54
1:D:202:ARG:HD2	1:D:204:TRP:CE2	2.42	0.54
2:E:13:HIS:NE2	4:H:89:MET:HE2	2.22	0.54
1:A:70:HIS:O	1:A:73:THR:HG22	2.08	0.54
4:G:57:THR:OG1	4:G:59:ASP:OD1	2.23	0.53
4:H:27:LYS:HG2	4:H:47:ALA:HB2	1.90	0.53
1:A:40:ALA:HB3	5:A:379:HOH:O	2.09	0.53
4:H:23:THR:HG23	4:H:49:TYR:CE1	2.43	0.53
1:A:168:LEU:HD22	1:A:172:LEU:CD2	2.39	0.53
2:E:22:PHE:HD2	4:H:89:MET:CE	2.23	0.52
1:D:266:LEU:HD13	1:D:270:LEU:HD13	1.90	0.52
1:A:49:ALA:O	1:A:52:ILE:HG22	2.08	0.52
1:A:258:THR:HG22	5:A:374:HOH:O	2.08	0.52
1:D:191:HIS:NE2	1:D:199:ALA:HB1	2.25	0.52
1:D:177:GLU:HB3	4:H:51:ILE:HD13	1.92	0.51
1:D:191:HIS:CE1	1:D:199:ALA:CB	2.93	0.51
2:E:12:ARG:HD2	4:H:89:MET:HE3	1.92	0.51
1:D:219:ARG:HA	1:D:256:ARG:O	2.10	0.51
1:A:117:ALA:HB2	2:B:60:TRP:CE2	2.46	0.50
1:D:105:SER:O	1:D:106:ASP:HB2	2.11	0.50
1:D:214:THR:HB	1:D:262:GLN:HB2	1.93	0.50
4:H:36:ILE:HD13	4:H:65:PHE:CE2	2.46	0.50
1:D:110:LEU:HB3	1:D:111:ARG:NH1	2.27	0.49
1:D:189:MET:HE3	1:D:201:LEU:HD22	1.95	0.49
1:D:191:HIS:HD2	1:D:201:LEU:HD21	1.77	0.49
1:D:253:GLN:HB3	1:D:256:ARG:HD2	1.93	0.49
1:D:17:ARG:HH11	1:D:17:ARG:HG3	1.77	0.48
1:A:249:VAL:HG13	1:A:257:TYR:CE2	2.48	0.48
1:A:214:THR:HB	1:A:262:GLN:HB2	1.95	0.48
1:D:202:ARG:NH1	1:D:244:TRP:CZ3	2.81	0.48
4:H:59:ASP:OD1	4:H:76:LYS:HG3	2.13	0.48
1:D:177:GLU:CB	4:H:51:ILE:HD13	2.43	0.48
2:B:5:PRO:HB3	2:B:30:PHE:HB3	1.96	0.48
1:D:138:MET:O	1:D:138:MET:HE2	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:104:GLY:O	1:D:106:ASP:O	2.32	0.48
1:D:224:GLN:NE2	1:D:224:GLN:HA	2.28	0.48
2:B:97:ARG:O	2:B:97:ARG:HG3	2.14	0.48
1:A:73:THR:HG21	5:A:310:HOH:O	2.14	0.47
1:A:204:TRP:HB3	1:A:206:LEU:CD1	2.43	0.47
1:D:97:ARG:NH2	5:D:361:HOH:O	2.39	0.47
4:H:82:MET:HA	4:H:85:ILE:HD12	1.96	0.47
1:A:266:LEU:HD22	1:A:270:LEU:HD11	1.95	0.47
4:G:3:LYS:HG3	4:G:4:VAL:N	2.30	0.47
2:B:73:THR:HG22	2:B:74:GLU:N	2.29	0.46
2:E:4:THR:HG22	5:E:103:HOH:O	2.15	0.46
4:H:2:LYS:HG2	4:H:2:LYS:O	2.16	0.46
1:D:177:GLU:OE2	4:H:42:LYS:HE3	2.16	0.46
2:E:22:PHE:HD2	4:H:89:MET:HE1	1.81	0.46
1:D:193:ALA:C	1:D:195:SER:H	2.19	0.46
1:D:274:TRP:O	1:D:275:GLU:HB2	2.15	0.46
1:D:107:TRP:CZ3	1:D:172:LEU:HD13	2.49	0.46
1:D:189:MET:HE1	1:D:274:TRP:HB2	1.98	0.46
1:D:202:ARG:HH11	1:D:202:ARG:HG3	1.80	0.46
2:E:51:HIS:HA	2:E:65:LEU:O	2.16	0.45
1:A:194:VAL:HG22	1:A:198:GLU:O	2.16	0.45
2:B:51:HIS:HA	2:B:65:LEU:O	2.17	0.45
1:D:221:GLY:O	1:D:222:GLU:HB2	2.16	0.45
1:D:266:LEU:HD22	1:D:270:LEU:CD1	2.45	0.45
1:A:81:LEU:HD13	1:A:118:TYR:CD1	2.51	0.45
1:D:107:TRP:CD1	1:D:169:ARG:NH2	2.85	0.45
1:D:218:GLN:O	1:D:257:TYR:HA	2.17	0.45
1:D:253:GLN:HB3	1:D:256:ARG:NE	2.31	0.45
1:A:11:SER:HB3	1:A:95:VAL:CG1	2.47	0.45
1:D:191:HIS:HD2	1:D:201:LEU:CD2	2.30	0.45
1:D:81:LEU:HD13	1:D:118:TYR:CD1	2.52	0.45
1:A:258:THR:OG1	1:A:271:THR:HG23	2.18	0.44
4:H:35:LEU:C	4:H:35:LEU:HD12	2.38	0.44
2:B:29:GLY:HA2	2:B:61:SER:HB2	1.99	0.44
1:D:224:GLN:O	1:D:226:GLN:N	2.50	0.44
1:A:272:LEU:HD22	1:A:272:LEU:N	2.32	0.44
2:B:9:VAL:HG13	5:B:114:HOH:O	2.17	0.44
1:D:248:VAL:O	1:D:248:VAL:HG13	2.18	0.44
2:B:73:THR:HG22	2:B:75:LYS:N	2.25	0.44
1:A:214:THR:HG22	5:A:339:HOH:O	2.17	0.44
2:B:31:HIS:ND1	2:B:32:PRO:HA	2.33	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:204:TRP:CZ3	2:B:99:MET:HB3	2.53	0.43
1:D:206:LEU:HD23	1:D:242:GLN:HB3	1.99	0.43
1:D:219:ARG:CG	1:D:224:GLN:OE1	2.67	0.43
1:A:42:SER:O	1:A:43:GLN:HB2	2.19	0.43
2:E:36:GLU:HB2	2:E:83:ASN:HB3	2.01	0.43
1:D:51:TRP:CZ2	1:D:179:LEU:HD11	2.54	0.43
1:A:225:THR:C	1:A:227:ASP:N	2.72	0.43
1:A:178:THR:CG2	4:G:49:TYR:OH	2.67	0.43
1:D:14:ARG:HG2	5:D:368:HOH:O	2.17	0.43
1:A:250:PRO:HG2	1:A:253:GLN:HB2	2.00	0.43
1:D:189:MET:CE	1:D:201:LEU:HD22	2.49	0.43
1:A:73:THR:OG1	3:C:7:VAL:O	2.24	0.42
1:D:189:MET:HE2	1:D:274:TRP:HE3	1.83	0.42
1:A:186:LYS:HE2	4:G:95:LEU:HD22	2.02	0.42
4:H:39:HIS:HB3	4:H:48:VAL:HG11	2.01	0.42
1:D:219:ARG:HG3	1:D:224:GLN:OE1	2.19	0.42
2:E:22:PHE:CD2	4:H:89:MET:HE1	2.54	0.42
1:D:177:GLU:OE2	4:H:50:ALA:HA	2.20	0.42
4:G:32:HIS:HB3	4:G:65:PHE:O	2.20	0.42
4:G:35:LEU:C	4:G:35:LEU:HD12	2.39	0.42
1:A:267:PRO:HB2	1:A:268:LYS:HE3	2.00	0.42
1:D:33:PHE:CD1	1:D:34:VAL:HG13	2.55	0.42
1:D:189:MET:CE	1:D:274:TRP:HB2	2.50	0.41
1:A:73:THR:HG23	5:A:377:HOH:O	2.19	0.41
1:A:206:LEU:HD12	1:A:206:LEU:N	2.35	0.41
1:D:181:ARG:NH1	1:D:183:ASP:OD2	2.45	0.41
1:D:191:HIS:NE2	1:D:199:ALA:CB	2.84	0.41
1:D:196:ASP:HB3	1:D:197:HIS:H	1.58	0.41
1:D:215:LEU:HD12	1:D:215:LEU:N	2.35	0.41
4:H:33:GLU:CD	4:H:67:GLY:H	2.24	0.41
1:D:193:ALA:HA	1:D:199:ALA:HA	2.02	0.41
4:H:23:THR:CG2	4:H:49:TYR:HE1	2.34	0.41
1:D:2:SER:HB2	1:D:103:VAL:O	2.21	0.40
1:D:253:GLN:NE2	1:D:256:ARG:NH1	2.69	0.40
1:A:88:SER:N	2:E:36:GLU:OE2	2.35	0.40
4:H:88:TYR:CD1	4:H:89:MET:N	2.90	0.40
1:D:111:ARG:HD2	1:D:113:TYR:OH	2.21	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:H:85:ILE:CD1	4:H:85:ILE:CD1[8_554]	2.18	0.02

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	273/275 (99%)	268 (98%)	5 (2%)	0	100	100
1	D	273/275 (99%)	257 (94%)	11 (4%)	5 (2%)	8	2
2	B	98/100 (98%)	96 (98%)	2 (2%)	0	100	100
2	E	98/100 (98%)	97 (99%)	1 (1%)	0	100	100
3	C	7/9 (78%)	7 (100%)	0	0	100	100
3	F	7/9 (78%)	7 (100%)	0	0	100	100
4	G	97/100 (97%)	94 (97%)	3 (3%)	0	100	100
4	H	95/100 (95%)	94 (99%)	1 (1%)	0	100	100
All	All	948/968 (98%)	920 (97%)	23 (2%)	5 (0%)	29	17

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	225	THR
1	D	251	SER
1	D	194	VAL
1	D	222	GLU
1	D	252	GLY

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	231/231 (100%)	220 (95%)	11 (5%)	25	12
1	D	231/231 (100%)	220 (95%)	11 (5%)	25	12
2	B	95/95 (100%)	95 (100%)	0	100	100
2	E	95/95 (100%)	94 (99%)	1 (1%)	73	71
3	C	8/8 (100%)	7 (88%)	1 (12%)	4	0
3	F	8/8 (100%)	7 (88%)	1 (12%)	4	0
4	G	92/92 (100%)	89 (97%)	3 (3%)	38	26
4	H	90/92 (98%)	88 (98%)	2 (2%)	52	44
All	All	850/852 (100%)	820 (96%)	30 (4%)	36	24

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	31	THR
1	A	35	ARG
1	A	67	VAL
1	A	98	MET
1	A	106	ASP
1	A	110	LEU
1	A	168	LEU
1	A	172	LEU
1	A	178	THR
1	A	240	THR
1	A	268	LYS
3	C	2	LEU
1	D	14	ARG
1	D	67	VAL
1	D	72	GLN
1	D	128	GLU
1	D	156	LEU
1	D	169	ARG
1	D	181	ARG
1	D	197	HIS
1	D	219	ARG
1	D	223	ASP
1	D	226	GLN
2	E	70	PHE

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Mol	Chain	Res	Type
3	F	2	LEU
4	G	3	LYS
4	G	25	LEU
4	G	68	GLU
4	H	68	GLU
4	H	74	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	141	GLN
1	A	218	GLN
1	D	72	GLN
1	D	191	HIS
1	D	218	GLN
1	D	224	GLN

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)

There are no chain breaks in this entry.

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, 95th 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	275/275 (100%)	0.43	23 (8%)	11	17	19, 33, 65, 96	0
1	D	275/275 (100%)	0.86	48 (17%)	1	1	17, 30, 83, 105	0
2	B	100/100 (100%)	0.44	9 (9%)	9	15	21, 33, 57, 87	1 (1%)
2	E	100/100 (100%)	0.30	4 (4%)	38	48	21, 36, 61, 81	0
3	C	9/9 (100%)	0.40	1 (11%)	5	8	25, 26, 29, 46	0
3	F	9/9 (100%)	0.86	0	100	100	20, 29, 40, 49	0
4	G	99/100 (99%)	0.28	4 (4%)	38	48	14, 24, 48, 81	2 (2%)
4	H	97/100 (97%)	0.43	6 (6%)	20	29	17, 26, 56, 100	1 (1%)
All	All	964/968 (99%)	0.53	95 (9%)	7	12	14, 30, 69, 105	4 (0%)

All (95) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	195	SER	11.1
1	D	225	THR	11.0
1	D	219	ARG	7.7
4	H	2	LYS	6.8
1	A	226	GLN	6.4
1	D	223	ASP	6.3
4	H	3	LYS	6.2
4	H	4	VAL	6.0
1	D	251	SER	5.9
1	D	275	GLU	5.7
1	D	196	ASP	5.3
1	D	194	VAL	5.0
1	D	226	GLN	5.0
1	D	193	ALA	4.8
1	D	274	TRP	4.8
1	A	220	ASP	4.7

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Mol	Chain	Res	Type	RSRZ
1	D	270	LEU	4.5
1	A	222	GLU	4.5
1	D	197	HIS	4.4
2	E	75	LYS	4.4
1	D	268	LYS	4.4
1	A	275	GLU	4.1
1	D	255	GLN	4.0
1	A	1	GLY	4.0
4	H	88	TYR	3.7
2	E	74	GLU	3.7
1	D	220	ASP	3.7
1	D	1	GLY	3.7
1	D	192	HIS	3.7
2	E	0	MET	3.6
1	D	227	ASP	3.6
1	D	272	LEU	3.6
1	D	222	GLU	3.6
1	D	228	THR	3.6
1	D	105	SER	3.6
1	D	267	PRO	3.5
2	B	0	MET	3.5
1	D	254	GLU	3.5
1	A	227	ASP	3.5
1	D	258	THR	3.5
1	A	268	LYS	3.4
1	A	138	MET	3.4
1	D	138	MET	3.4
1	D	201	LEU	3.3
1	A	197	HIS	3.3
1	D	273	ARG	3.3
1	D	191	HIS	3.3
1	A	221	GLY	3.3
1	D	257	TYR	3.2
1	A	108	ARG	3.2
1	A	228	THR	3.1
1	D	224	GLN	3.1
1	A	223	ASP	3.1
2	B	48	LYS	2.9
1	D	248	VAL	2.9
1	A	17	ARG	2.8
2	B	1	ILE	2.8
1	D	256	ARG	2.8

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Mol	Chain	Res	Type	RSRZ
2	E	1	ILE	2.8
4	G	3	LYS	2.8
1	A	219	ARG	2.8
1	A	225	THR	2.7
1	D	230	LEU	2.7
1	D	253	GLN	2.7
1	D	247	VAL	2.7
1	A	256	ARG	2.7
1	D	249	VAL	2.6
1	D	216	THR	2.6
1	A	18	GLY	2.6
1	D	215	LEU	2.6
3	C	5	TYR	2.5
1	D	260	HIS	2.5
4	G	4	VAL	2.5
2	B	44	GLU	2.5
1	D	106	ASP	2.4
1	D	221	GLY	2.4
1	D	218	GLN	2.4
2	B	47	GLU	2.4
1	D	116	TYR	2.4
2	B	89	GLN	2.3
1	D	269	PRO	2.2
1	A	274	TRP	2.2
2	B	88	SER	2.2
4	G	100	LYS	2.2
2	B	90	PRO	2.2
2	B	45	ARG	2.1
1	A	224	GLN	2.1
1	A	249	VAL	2.1
1	A	110	LEU	2.1
4	H	68	GLU	2.1
1	D	200	THR	2.0
4	G	12	ASN	2.0
4	H	98	PRO	2.0
1	A	194	VAL	2.0
1	D	199	ALA	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.