Full wwPDB X-ray Structure Validation Report ⓘ

May 29, 2020 – 01:44 am BST

PDB ID	:	2X6S
Title	:	Human foamy virus integrase - catalytic core. Magnesium-bound structure.
Authors	:	Rety, S.; Delelis, O.; Rezabkova, L.; Dubanchet, B.; Silhan, J.; Lewit-Bentley, A.
Deposited on	:	2010-02-19
Resolution	:	2.29 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 following versions of software and data (see references ⓘ) were used in the production of this report:

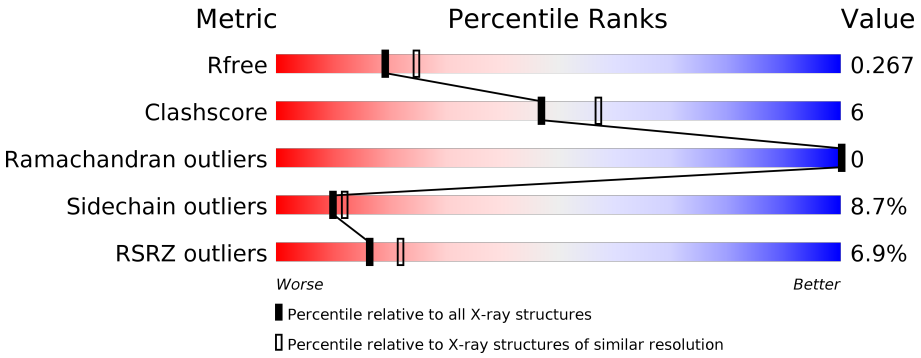
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.11
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

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 2.29 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	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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 on 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	200	6% 79% 13% • 6%
1	B	200	3% 75% 15% • 8%
1	C	200	3% 69% 16% • • 12%
1	D	200	6% 68% 18% • 13%
1	E	200	15% 78% 13% • 9%
1	F	200	6% 78% 12% • 10%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 9015 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 INTEGRASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	188	Total	C	N	O	S	0	4	0
			1525	988	251	282	4			
1	B	184	Total	C	N	O	S	0	2	0
			1482	960	244	274	4			
1	C	176	Total	C	N	O	S	0	1	0
			1411	916	232	259	4			
1	D	175	Total	C	N	O	S	0	1	0
			1404	911	229	260	4			
1	E	182	Total	C	N	O	S	0	3	0
			1460	944	242	270	4			
1	F	181	Total	C	N	O	S	0	1	0
			1460	948	240	268	4			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	127	MET	ILE	engineered mutation	UNP P14350
A	180	ARG	LYS	conflict	UNP P14350
A	227	MET	ILE	engineered mutation	UNP P14350
A	253	MET	LEU	engineered mutation	UNP P14350
B	127	MET	ILE	engineered mutation	UNP P14350
B	180	ARG	LYS	conflict	UNP P14350
B	227	MET	ILE	engineered mutation	UNP P14350
B	253	MET	LEU	engineered mutation	UNP P14350
C	127	MET	ILE	engineered mutation	UNP P14350
C	180	ARG	LYS	conflict	UNP P14350
C	227	MET	ILE	engineered mutation	UNP P14350
C	253	MET	LEU	engineered mutation	UNP P14350
D	127	MET	ILE	engineered mutation	UNP P14350
D	180	ARG	LYS	conflict	UNP P14350
D	227	MET	ILE	engineered mutation	UNP P14350
D	253	MET	LEU	engineered mutation	UNP P14350
E	127	MET	ILE	engineered mutation	UNP P14350

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Chain	Residue	Modelled	Actual	Comment	Reference
E	180	ARG	LYS	conflict	UNP P14350
E	227	MET	ILE	engineered mutation	UNP P14350
E	253	MET	LEU	engineered mutation	UNP P14350
F	127	MET	ILE	engineered mutation	UNP P14350
F	180	ARG	LYS	conflict	UNP P14350
F	227	MET	ILE	engineered mutation	UNP P14350
F	253	MET	LEU	engineered mutation	UNP P14350

- Molecule 2 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	D	1	Total Mg 1 1	0	0
2	E	1	Total Mg 1 1	0	0
2	B	1	Total Mg 1 1	0	0
2	C	1	Total Mg 1 1	0	0
2	A	1	Total Mg 1 1	0	0
2	F	1	Total Mg 1 1	0	0

- Molecule 3 is water.

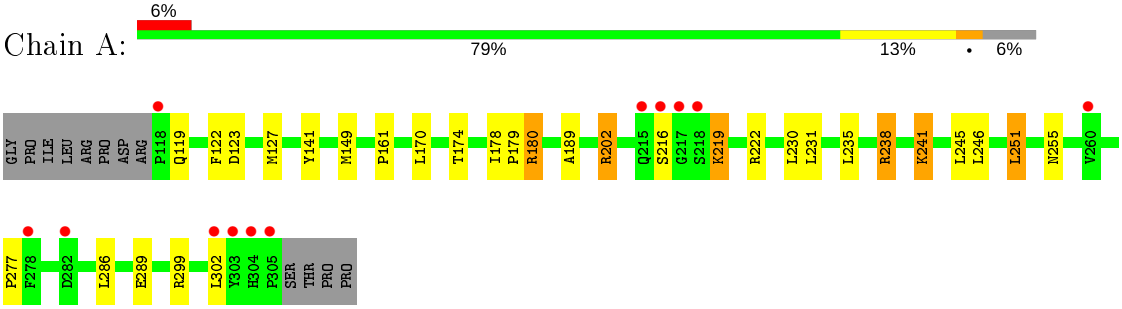
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	65	Total O 65 65	0	0
3	B	65	Total O 65 65	0	0
3	C	39	Total O 39 39	0	0
3	D	24	Total O 24 24	0	0
3	E	45	Total O 45 45	0	0
3	F	29	Total O 29 29	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA 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.

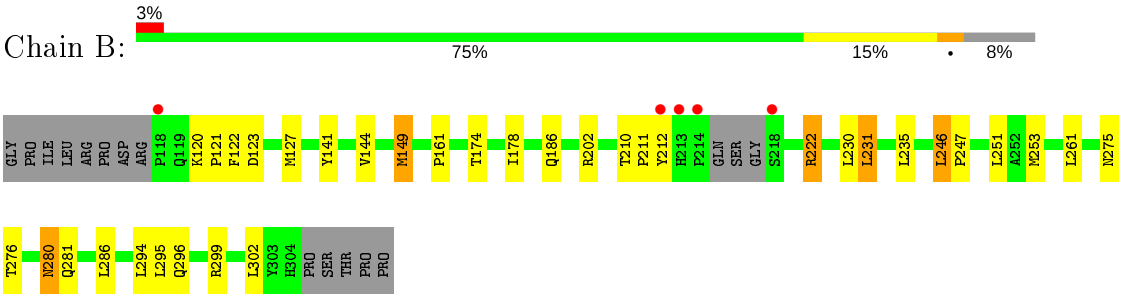
- Molecule 1: INTEGRASE

Chain A:



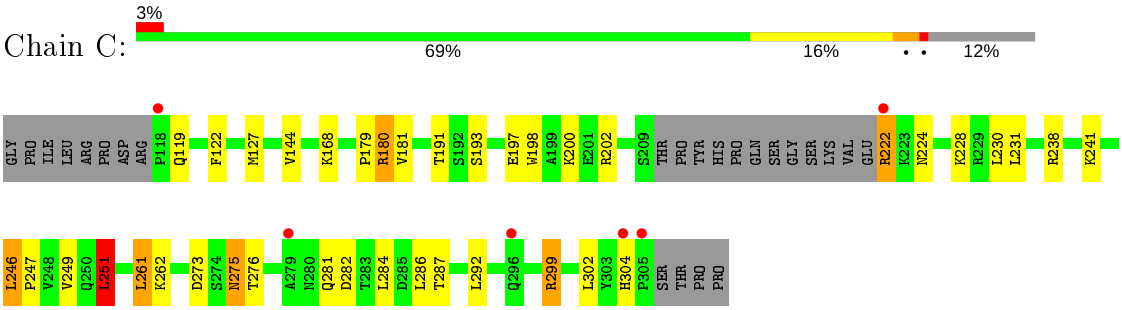
- Molecule 1: INTEGRASE

Chain B:



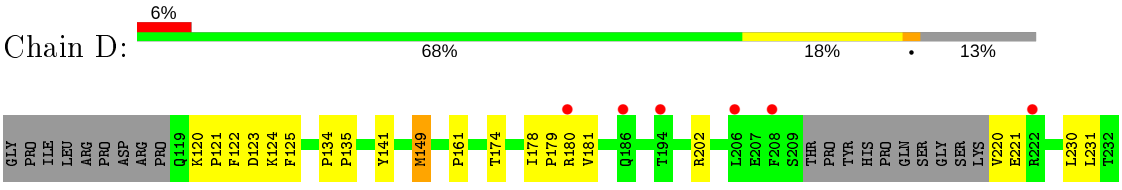
- Molecule 1: INTEGRASE

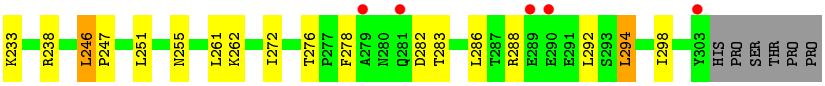
Chain C:



- Molecule 1: INTEGRASE

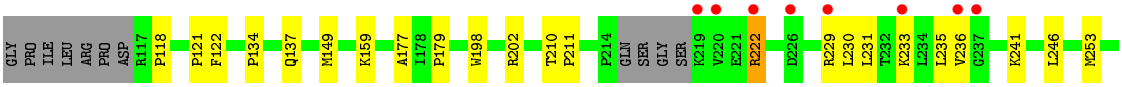
Chain D:

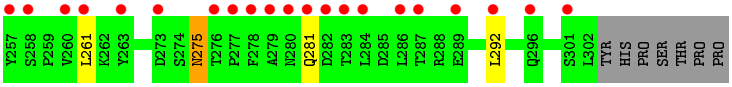




- Molecule 1: INTEGRASE

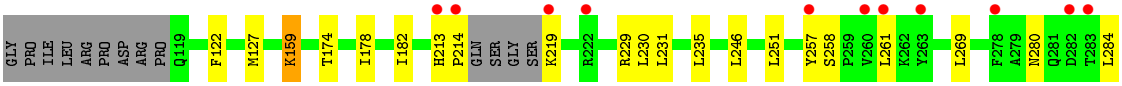
Chain E:

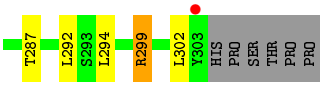




- Molecule 1: INTEGRASE

Chain F:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	84.35Å 89.19Å 177.23Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	44.60 – 2.29 44.59 – 2.29	Depositor EDS
% Data completeness (in resolution range)	97.2 (44.60-2.29) 97.2 (44.59-2.29)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.84 (at 2.29Å)	Xtriage
Refinement program	REFMAC 5.5.0088	Depositor
R, R_{free}	0.225 , 0.278 0.218 , 0.267	Depositor DCC
R_{free} test set	3009 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	43.0	Xtriage
Anisotropy	0.070	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 43.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	9015	wwPDB-VP
Average B, all atoms (Å^2)	48.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.07% 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

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	0.49	0/1589	0.65	0/2166
1	B	0.49	0/1534	0.62	0/2091
1	C	0.43	0/1458	0.59	1/1985 (0.1%)
1	D	0.40	0/1447	0.56	0/1969
1	E	0.46	0/1518	0.57	0/2070
1	F	0.43	0/1505	0.59	0/2050
All	All	0.45	0/9051	0.60	1/12331 (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})
1	C	251	LEU	CA-CB-CG	5.29	127.46	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	1525	0	1522	21	0
1	B	1482	0	1476	24	0
1	C	1411	0	1412	20	0
1	D	1404	0	1409	18	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	1460	0	1446	15	0
1	F	1460	0	1467	14	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
3	A	65	0	0	2	0
3	B	65	0	0	1	0
3	C	39	0	0	2	0
3	D	24	0	0	1	0
3	E	45	0	0	2	0
3	F	29	0	0	0	0
All	All	9015	0	8732	109	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 6.

All (109) 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:C:299:ARG:HH11	1:C:299:ARG:HG2	1.27	0.99
1:A:180[B]:ARG:HH11	1:A:180[B]:ARG:HB3	1.27	0.98
1:B:210:THR:HG22	1:B:212:TYR:H	1.35	0.92
1:F:299:ARG:HH11	1:F:299:ARG:HG2	1.38	0.87
1:A:180[B]:ARG:NH1	1:A:180[B]:ARG:HB3	1.90	0.86
1:C:299:ARG:HH11	1:C:299:ARG:CG	1.90	0.84
1:A:180[B]:ARG:HH11	1:A:180[B]:ARG:CB	1.93	0.82
1:E:275:ASN:H	1:E:275:ASN:HD22	1.23	0.81
1:A:241:LYS:HE2	1:A:241:LYS:H	1.44	0.81
1:B:178:ILE:HD11	1:B:202[A]:ARG:HH21	1.47	0.80
1:F:299:ARG:HH11	1:F:299:ARG:CG	2.02	0.73
1:D:276:THR:HG23	1:D:278:PHE:O	1.89	0.73
1:E:198:TRP:O	1:E:202[B]:ARG:HG2	1.90	0.72
1:F:159:LYS:HE3	1:F:159:LYS:N	2.05	0.72
1:B:210:THR:HG23	1:B:211:PRO:HD2	1.73	0.71
1:F:159:LYS:HE3	1:F:159:LYS:H	1.55	0.70
1:C:180:ARG:HG3	1:C:181:VAL:HG23	1.72	0.70
1:A:119[A]:GLN:HG3	3:A:2001:HOH:O	1.95	0.64
1:A:277:PRO:HD2	3:A:2053:HOH:O	1.97	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:127:MET:HE1	1:A:170:LEU:HD11	1.80	0.63
1:E:210:THR:HB	1:E:211:PRO:CD	2.28	0.63
1:C:224:ASN:HB3	1:C:228:LYS:HE2	1.81	0.61
1:E:122:PHE:O	1:E:179:PRO:HA	2.01	0.60
1:C:251:LEU:HD13	1:C:284:LEU:HD13	1.85	0.59
1:F:231:LEU:O	1:F:235:LEU:HG	2.02	0.58
1:A:122:PHE:O	1:A:179:PRO:HA	2.02	0.58
1:C:273:ASP:HB2	3:C:2035:HOH:O	2.04	0.58
1:E:275:ASN:H	1:E:275:ASN:ND2	1.98	0.58
1:B:210:THR:HG22	1:B:212:TYR:N	2.15	0.58
1:D:122:PHE:O	1:D:179:PRO:HA	2.03	0.57
1:E:231:LEU:O	1:E:235:LEU:HG	2.04	0.57
1:C:276:THR:HG21	1:C:281:GLN:HE22	1.70	0.57
1:B:141:TYR:CE1	1:B:161:PRO:HD3	2.40	0.57
1:C:299:ARG:NH1	1:C:299:ARG:HG2	2.07	0.56
1:B:174:THR:HB	1:B:178:ILE:HD13	1.87	0.55
1:C:261:LEU:O	1:C:262:LYS:HB2	2.06	0.55
1:C:299:ARG:NH1	1:C:299:ARG:CG	2.60	0.55
1:E:241:LYS:NZ	3:E:2045:HOH:O	2.41	0.54
1:B:186:GLN:NE2	1:D:149:MET:SD	2.81	0.53
1:D:120:LYS:HA	1:D:149:MET:HE2	1.91	0.53
1:F:258:SER:HB3	1:F:261:LEU:HB2	1.91	0.53
1:A:123:ASP:HA	1:A:180[A]:ARG:HE	1.73	0.53
1:F:174:THR:HB	1:F:178:ILE:HD13	1.90	0.53
1:A:251:LEU:HD22	1:A:255:ASN:ND2	2.24	0.53
1:B:212:TYR:HB3	1:D:220:VAL:HG22	1.91	0.52
1:C:193:SER:OG	1:F:229:ARG:HD2	2.09	0.51
1:B:120:LYS:HA	1:B:149:MET:HE1	1.91	0.51
1:A:238:ARG:HA	1:A:241:LYS:HE3	1.93	0.51
1:E:202[B]:ARG:NH1	3:E:2040:HOH:O	2.44	0.51
1:F:159:LYS:CE	1:F:159:LYS:H	2.21	0.51
1:B:120:LYS:O	1:B:123:ASP:HB2	2.11	0.50
1:A:174:THR:HB	1:A:178:ILE:HD13	1.93	0.50
1:B:210:THR:HG23	1:B:211:PRO:CD	2.41	0.50
1:B:121:PRO:HD3	1:B:149:MET:HE2	1.94	0.49
1:B:280:ASN:C	1:B:280:ASN:HD22	2.16	0.49
1:D:141:TYR:CE1	1:D:161:PRO:HD3	2.47	0.49
1:B:246:LEU:HB3	1:B:247:PRO:HD3	1.95	0.49
1:E:134:PRO:HD3	1:E:236:VAL:HG22	1.94	0.48
1:F:122:PHE:CE1	1:F:269:LEU:HD11	2.48	0.48
1:F:280:ASN:O	1:F:284:LEU:N	2.45	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:141:TYR:CE1	1:A:161:PRO:HD3	2.49	0.48
1:B:231:LEU:O	1:B:235:LEU:HG	2.14	0.48
1:E:210:THR:HB	1:E:211:PRO:HD3	1.96	0.47
1:E:275:ASN:HD22	1:E:275:ASN:N	2.02	0.47
1:D:251:LEU:HD22	1:D:255:ASN:ND2	2.29	0.47
1:B:127:MET:HA	1:B:144:VAL:O	2.15	0.47
1:C:222:ARG:HG3	3:C:2018:HOH:O	2.15	0.46
1:C:231:LEU:CD1	1:C:249:VAL:HG11	2.45	0.46
1:E:121:PRO:O	1:E:122:PHE:HB2	2.16	0.46
1:F:213:HIS:ND1	1:F:214:PRO:HD2	2.30	0.45
1:D:272:ILE:HD12	3:D:2021:HOH:O	2.15	0.45
1:B:120:LYS:HA	1:B:149:MET:CE	2.47	0.45
1:E:122:PHE:CD2	1:E:177:ALA:HB3	2.52	0.44
1:B:276:THR:OG1	1:B:281:GLN:NE2	2.51	0.44
1:A:251:LEU:HD22	1:A:255:ASN:HD22	1.83	0.44
1:C:127:MET:HA	1:C:144:VAL:O	2.19	0.43
1:A:231:LEU:O	1:A:235:LEU:HG	2.18	0.43
1:A:241:LYS:HE2	1:A:241:LYS:N	2.23	0.43
1:F:127:MET:HE3	1:F:182:ILE:CG2	2.48	0.43
1:A:161:PRO:O	1:A:189:ALA:HB2	2.19	0.43
1:D:134:PRO:HA	1:D:135:PRO:HD3	1.90	0.43
1:A:219:LYS:HG3	1:A:222:ARG:HH12	1.83	0.43
1:B:222:ARG:HH11	1:B:222:ARG:CG	2.32	0.43
1:B:231:LEU:HD21	1:B:253:MET:SD	2.58	0.43
1:D:121:PRO:O	1:D:122:PHE:HB2	2.19	0.43
1:F:127:MET:HE3	1:F:182:ILE:HG23	2.00	0.43
1:C:198:TRP:O	1:C:202:ARG:HG2	2.19	0.43
1:A:238:ARG:CA	1:A:241:LYS:HE3	2.49	0.43
1:B:121:PRO:O	1:B:122:PHE:HB2	2.20	0.42
1:A:202:ARG:HH21	1:A:202:ARG:HG2	1.85	0.42
1:E:222:ARG:HH12	1:E:229:ARG:HH22	1.68	0.42
1:B:222:ARG:HH11	1:B:222:ARG:HG2	1.83	0.42
1:C:122:PHE:O	1:C:179:PRO:HA	2.20	0.42
1:A:202:ARG:NH2	1:A:202:ARG:HG2	2.34	0.41
1:D:294:LEU:HD22	1:D:298:ILE:HD11	2.02	0.41
1:E:231:LEU:HD11	1:E:253:MET:SD	2.60	0.41
1:D:124:LYS:HA	1:D:181:VAL:O	2.20	0.41
1:B:299:ARG:NH1	3:B:2064:HOH:O	2.40	0.41
1:D:276:THR:C	1:D:278:PHE:H	2.23	0.41
1:D:174:THR:HB	1:D:178:ILE:HD13	2.03	0.41
1:C:197:GLU:HA	1:C:200:LYS:HG2	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:246:LEU:HB3	1:C:247:PRO:HD3	2.03	0.41
1:D:122:PHE:CD2	1:D:125:PHE:HZ	2.39	0.41
1:D:283:THR:O	1:D:286:LEU:HB2	2.21	0.41
1:D:231:LEU:HD12	1:D:231:LEU:HA	1.97	0.40
1:D:246:LEU:HB3	1:D:247:PRO:HD3	2.03	0.40
1:B:295:LEU:HD11	1:B:299:ARG:HE	1.86	0.40
1:C:197:GLU:HG3	1:C:200:LYS:HE2	2.03	0.40
1:C:275:ASN:HD22	1:C:275:ASN:HA	1.59	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	190/200 (95%)	186 (98%)	4 (2%)	0	100	100
1	B	182/200 (91%)	177 (97%)	5 (3%)	0	100	100
1	C	173/200 (86%)	169 (98%)	4 (2%)	0	100	100
1	D	172/200 (86%)	168 (98%)	4 (2%)	0	100	100
1	E	181/200 (90%)	172 (95%)	9 (5%)	0	100	100
1	F	178/200 (89%)	172 (97%)	6 (3%)	0	100	100
All	All	1076/1200 (90%)	1044 (97%)	32 (3%)	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	174/181 (96%)	158 (91%)	16 (9%)	9 11
1	B	168/181 (93%)	155 (92%)	13 (8%)	13 16
1	C	160/181 (88%)	140 (88%)	20 (12%)	4 5
1	D	159/181 (88%)	144 (91%)	15 (9%)	8 10
1	E	165/181 (91%)	153 (93%)	12 (7%)	14 18
1	F	165/181 (91%)	154 (93%)	11 (7%)	16 21
All	All	991/1086 (91%)	904 (91%)	87 (9%)	10 12

All (87) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	149	MET
1	A	180[A]	ARG
1	A	180[B]	ARG
1	A	202	ARG
1	A	216	SER
1	A	219	LYS
1	A	230	LEU
1	A	238	ARG
1	A	241	LYS
1	A	245	LEU
1	A	246	LEU
1	A	251	LEU
1	A	286	LEU
1	A	289	GLU
1	A	299	ARG
1	A	302	LEU
1	B	149	MET
1	B	222	ARG
1	B	230	LEU
1	B	231	LEU
1	B	246	LEU
1	B	251	LEU
1	B	261	LEU
1	B	275	ASN
1	B	280	ASN
1	B	286	LEU
1	B	294	LEU

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Mol	Chain	Res	Type
1	B	296	GLN
1	B	302	LEU
1	C	119	GLN
1	C	168[A]	LYS
1	C	168[B]	LYS
1	C	180	ARG
1	C	191	THR
1	C	222	ARG
1	C	230	LEU
1	C	238	ARG
1	C	241	LYS
1	C	246	LEU
1	C	251	LEU
1	C	261	LEU
1	C	275	ASN
1	C	282	ASP
1	C	286	LEU
1	C	287	THR
1	C	292	LEU
1	C	299	ARG
1	C	302	LEU
1	C	304	HIS
1	D	123	ASP
1	D	149	MET
1	D	180	ARG
1	D	202	ARG
1	D	221	GLU
1	D	230	LEU
1	D	233	LYS
1	D	238	ARG
1	D	246	LEU
1	D	261	LEU
1	D	262	LYS
1	D	282	ASP
1	D	288	ARG
1	D	292	LEU
1	D	294	LEU
1	E	118	PRO
1	E	137	GLN
1	E	149	MET
1	E	159	LYS
1	E	222	ARG

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Mol	Chain	Res	Type
1	E	230	LEU
1	E	233	LYS
1	E	246	LEU
1	E	261	LEU
1	E	275	ASN
1	E	281	GLN
1	E	292	LEU
1	F	159	LYS
1	F	219	LYS
1	F	230	LEU
1	F	246	LEU
1	F	251	LEU
1	F	257	TYR
1	F	287	THR
1	F	292	LEU
1	F	294	LEU
1	F	299	ARG
1	F	302	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	213	HIS
1	A	255	ASN
1	A	296	GLN
1	A	304	HIS
1	B	275	ASN
1	B	280	ASN
1	B	281	GLN
1	C	186	GLN
1	C	224	ASN
1	C	275	ASN
1	C	281	GLN
1	D	119	GLN
1	D	224	ASN
1	E	137	GLN
1	E	255	ASN
1	E	266	HIS
1	E	275	ASN
1	E	281	GLN
1	F	183	HIS
1	F	266	HIS

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 carbohydrates in this entry.

5.6 Ligand geometry

Of 6 ligands modelled in this entry, 6 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

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	188/200 (94%)	0.35	12 (6%) 19 25	19, 33, 69, 81	1 (0%)
1	B	184/200 (92%)	-0.00	5 (2%) 54 62	19, 37, 63, 83	0
1	C	176/200 (88%)	0.13	6 (3%) 45 52	28, 45, 70, 83	0
1	D	175/200 (87%)	0.51	11 (6%) 20 25	34, 63, 85, 90	0
1	E	182/200 (91%)	0.55	29 (15%) 1 2	22, 46, 94, 99	0
1	F	181/200 (90%)	0.37	12 (6%) 18 23	25, 48, 83, 94	0
All	All	1086/1200 (90%)	0.31	75 (6%) 16 22	19, 44, 83, 99	1 (0%)

All (75) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	305	PRO	6.4
1	C	222	ARG	5.3
1	E	286	LEU	5.0
1	A	216	SER	5.0
1	F	260	VAL	4.6
1	E	289	GLU	4.5
1	F	261	LEU	4.5
1	E	222	ARG	4.4
1	F	257	TYR	4.2
1	E	278	PHE	4.1
1	D	289	GLU	4.1
1	C	305	PRO	4.0
1	E	279	ALA	4.0
1	E	296	GLN	4.0
1	E	261	LEU	4.0
1	E	257	TYR	3.9
1	E	277	PRO	3.8
1	B	214	PRO	3.7
1	A	304	HIS	3.6

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Mol	Chain	Res	Type	RSRZ
1	E	260	VAL	3.5
1	D	279	ALA	3.5
1	A	303	TYR	3.5
1	D	208	PHE	3.5
1	D	186	GLN	3.4
1	F	213	HIS	3.4
1	E	273	ASP	3.3
1	A	282	ASP	3.2
1	A	217	GLY	3.2
1	E	229	ARG	3.1
1	E	220	VAL	3.1
1	A	278	PHE	3.1
1	F	282	ASP	3.1
1	B	118	PRO	3.1
1	E	282	ASP	3.0
1	B	218	SER	3.0
1	F	283	THR	3.0
1	F	214	PRO	2.9
1	D	206	LEU	2.9
1	A	218	SER	2.8
1	E	281	GLN	2.8
1	A	260	VAL	2.8
1	E	276	THR	2.8
1	E	226	ASP	2.7
1	C	118	PRO	2.7
1	F	263	TYR	2.7
1	A	118	PRO	2.7
1	D	180	ARG	2.7
1	F	278	PHE	2.7
1	F	222	ARG	2.6
1	E	280	ASN	2.6
1	E	219	LYS	2.6
1	D	303	TYR	2.5
1	C	304	HIS	2.5
1	D	290	GLU	2.5
1	E	233	LYS	2.5
1	F	219	LYS	2.4
1	D	281	GLN	2.3
1	E	292	LEU	2.3
1	E	283	THR	2.3
1	E	287	THR	2.3
1	A	215	GLN	2.3

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Mol	Chain	Res	Type	RSRZ
1	D	194	THR	2.3
1	A	302	LEU	2.2
1	E	236	VAL	2.2
1	B	212	TYR	2.2
1	E	301	SER	2.2
1	C	279	ALA	2.2
1	E	258	SER	2.1
1	C	296	GLN	2.1
1	E	284	LEU	2.1
1	D	222	ARG	2.1
1	E	237	GLY	2.1
1	E	263	TYR	2.1
1	F	303	TYR	2.1
1	B	213	HIS	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 carbohydrates 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
2	MG	F	1304	1/1	0.62	0.11	56,56,56,56	0
2	MG	C	1306	1/1	0.71	0.29	77,77,77,77	0
2	MG	E	1303	1/1	0.89	0.06	52,52,52,52	0
2	MG	B	1305	1/1	0.90	0.16	67,67,67,67	0
2	MG	D	1304	1/1	0.95	0.13	80,80,80,80	0
2	MG	A	1306	1/1	0.98	0.02	45,45,45,45	0

6.5 Other polymers (i)

There are no such residues in this entry.