



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 15, 2017 – 01:42 am GMT

PDB ID : 5K4A
Title : Structure of the amidase mutant E79A at 2.3 Angstrom resolution
Authors : Chowdhury, S.R.; Sen, U.
Deposited on : 2016-05-20
Resolution : 2.30 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

<http://wwpdb.org/validation/2016/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) : 1.9-1692
EDS : trunk28620
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : recalc28949

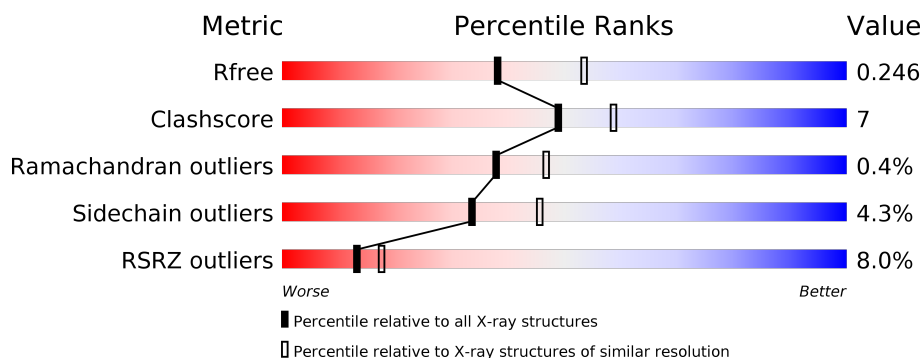
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	100719	4130 (2.30-2.30)
Clashscore	112137	4751 (2.30-2.30)
Ramachandran outliers	110173	4705 (2.30-2.30)
Sidechain outliers	110143	4704 (2.30-2.30)
RSRZ outliers	101464	4156 (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. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	288	<div> <div>5%</div> <div>88%</div> <div>9%</div> <div>..</div> </div>
1	B	288	<div> <div>3%</div> <div>88%</div> <div>8%</div> <div>..</div> </div>
1	C	288	<div> <div>5%</div> <div>83%</div> <div>14%</div> <div>.</div> </div>
1	D	288	<div> <div>7%</div> <div>75%</div> <div>22%</div> <div>..</div> </div>
1	E	288	<div> <div>8%</div> <div>77%</div> <div>20%</div> <div>..</div> </div>
1	F	288	<div> <div>19%</div> <div>70%</div> <div>24%</div> <div>..</div> </div>

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 13571 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 Intracellular protease/amidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	C	281	Total	C	N	O	S	0	0	0
			2164	1391	353	410	10			
1	F	281	Total	C	N	O	S	0	0	0
			2167	1393	353	410	11			
1	A	281	Total	C	N	O	S	0	0	0
			2167	1393	353	410	11			
1	B	281	Total	C	N	O	S	0	0	0
			2167	1393	353	410	11			
1	D	281	Total	C	N	O	S	0	0	0
			2167	1393	353	410	11			
1	E	281	Total	C	N	O	S	0	0	0
			2164	1391	353	410	10			

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-1	GLY	-	expression tag	UNP A0A0H3AFW5
C	0	SER	-	expression tag	UNP A0A0H3AFW5
C	79	ALA	GLU	engineered mutation	UNP A0A0H3AFW5
F	-1	GLY	-	expression tag	UNP A0A0H3AFW5
F	0	SER	-	expression tag	UNP A0A0H3AFW5
F	79	ALA	GLU	engineered mutation	UNP A0A0H3AFW5
A	-1	GLY	-	expression tag	UNP A0A0H3AFW5
A	0	SER	-	expression tag	UNP A0A0H3AFW5
A	79	ALA	GLU	engineered mutation	UNP A0A0H3AFW5
B	-1	GLY	-	expression tag	UNP A0A0H3AFW5
B	0	SER	-	expression tag	UNP A0A0H3AFW5
B	79	ALA	GLU	engineered mutation	UNP A0A0H3AFW5
D	-1	GLY	-	expression tag	UNP A0A0H3AFW5
D	0	SER	-	expression tag	UNP A0A0H3AFW5
D	79	ALA	GLU	engineered mutation	UNP A0A0H3AFW5
E	-1	GLY	-	expression tag	UNP A0A0H3AFW5
E	0	SER	-	expression tag	UNP A0A0H3AFW5

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Chain	Residue	Modelled	Actual	Comment	Reference
E	79	ALA	GLU	engineered mutation	UNP A0A0H3AFW5

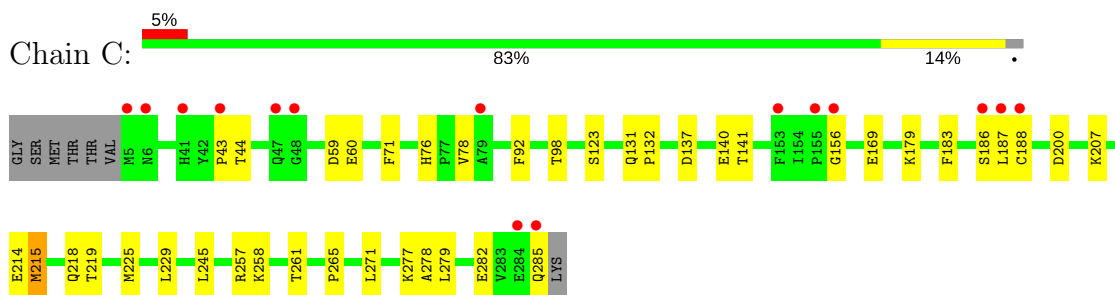
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	C	115	Total 115	O 115	0	0
2	F	41	Total 41	O 41	0	0
2	A	129	Total 129	O 129	0	0
2	B	142	Total 142	O 142	0	0
2	D	81	Total 81	O 81	0	0
2	E	67	Total 67	O 67	0	0

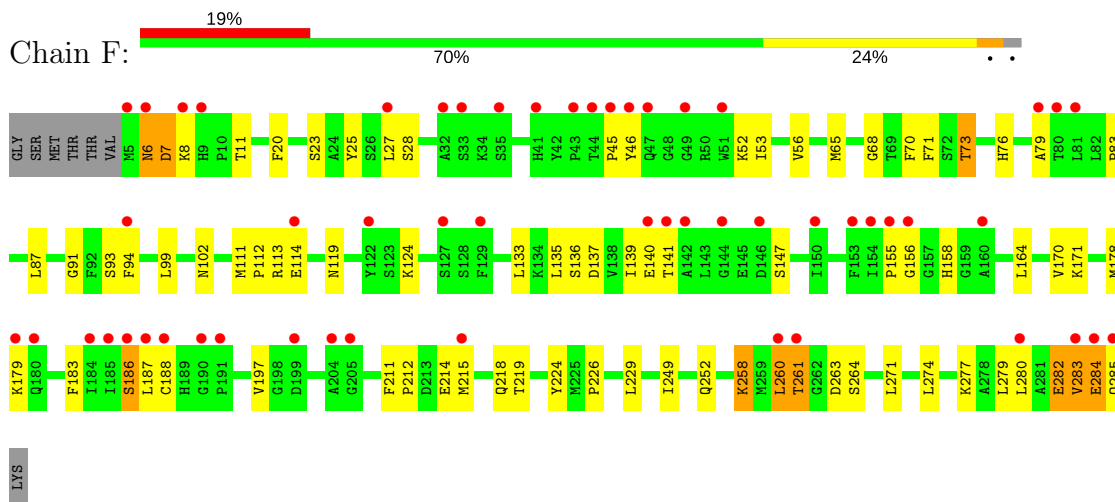
3 Residue-property plots

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.

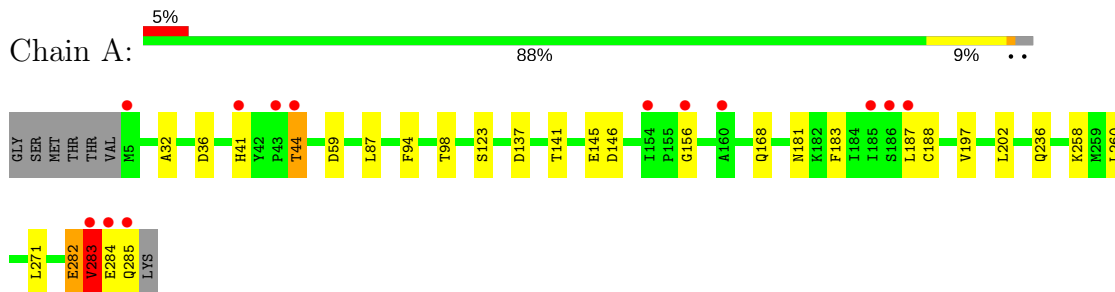
- Molecule 1: Intracellular protease/amidase



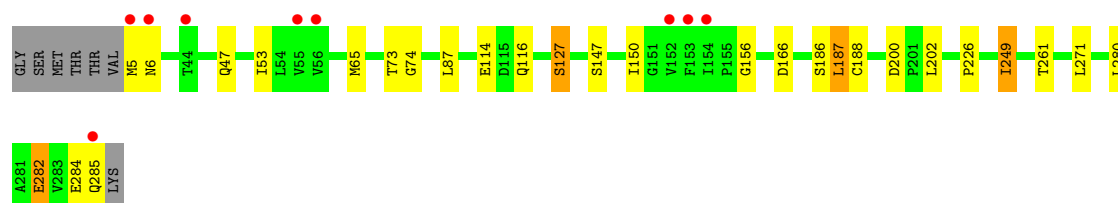
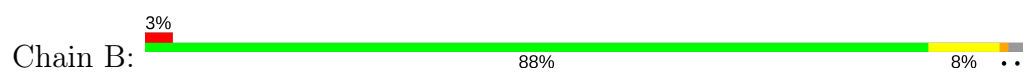
- Molecule 1: Intracellular protease/amidase



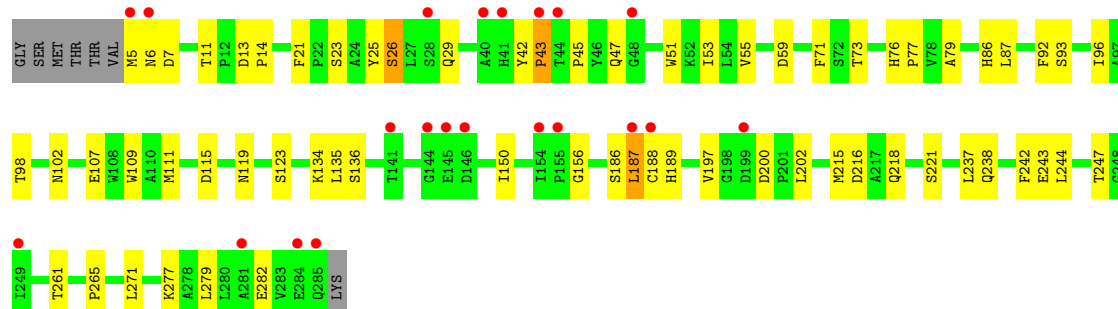
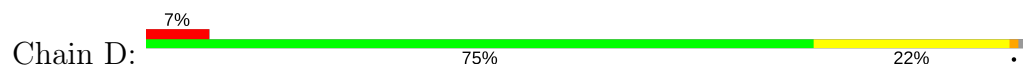
- Molecule 1: Intracellular protease/amidase



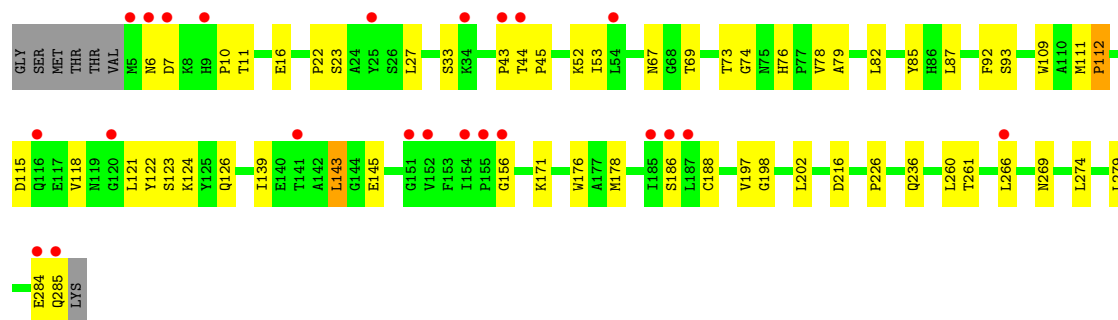
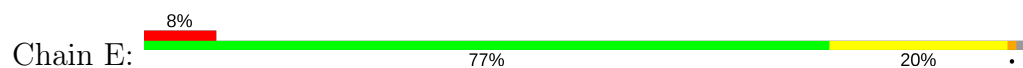
- Molecule 1: Intracellular protease/amidase



- Molecule 1: Intracellular protease/amidase



- Molecule 1: Intracellular protease/amidase



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	104.39Å 79.63Å 106.41Å 90.00° 107.84° 90.00°	Depositor
Resolution (Å)	24.73 – 2.30 25.64 – 2.29	Depositor EDS
% Data completeness (in resolution range)	92.2 (24.73-2.30) 89.4 (25.64-2.29)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.66 (at 2.29Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.8_1069)	Depositor
R, R_{free}	0.180 , 0.246 0.180 , 0.246	Depositor DCC
R_{free} test set	3438 reflections (5.03%)	DCC
Wilson B-factor (Å ²)	35.0	Xtriage
Anisotropy	0.473	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 42.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.019 for l,-k,h	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	13571	wwPDB-VP
Average B, all atoms (Å ²)	45.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.87% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.44	0/2229	0.59	1/3028 (0.0%)
1	B	0.43	0/2229	0.56	0/3028
1	C	0.40	0/2226	0.55	0/3025
1	D	0.40	0/2229	0.57	0/3028
1	E	0.35	0/2226	0.52	0/3025
1	F	0.38	0/2229	0.53	0/3028
All	All	0.40	0/13368	0.55	1/18162 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	283	VAL	N-CA-C	5.22	125.10	111.00

There are no chirality outliers.

There are no planarity outliers.

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	2167	0	2085	16	0
1	B	2167	0	2085	13	0
1	C	2164	0	2078	23	0
1	D	2167	0	2085	39	0
1	E	2164	0	2078	33	0
1	F	2167	0	2085	51	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	129	0	0	5	0
2	B	142	0	0	3	0
2	C	115	0	0	4	0
2	D	81	0	0	5	0
2	E	67	0	0	4	0
2	F	41	0	0	6	0
All	All	13571	0	12496	174	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 7.

All (174) 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:F:178:MET:SD	2:F:341:HOH:O	2.20	0.98
1:F:73:THR:HG21	1:F:158:HIS:HB2	1.51	0.92
1:C:140:GLU:HG2	1:C:141:THR:HG23	1.57	0.85
1:F:68:GLY:O	2:F:301:HOH:O	1.94	0.85
1:D:47:GLN:HB2	2:D:308:HOH:O	1.76	0.84
1:C:200:ASP:OD2	2:C:301:HOH:O	1.96	0.82
1:A:32:ALA:O	2:A:301:HOH:O	2.06	0.74
1:E:284:GLU:OE1	2:E:301:HOH:O	2.05	0.72
1:A:41:HIS:O	2:A:302:HOH:O	2.07	0.71
1:C:214:GLU:OE2	1:C:218:GLN:NE2	2.23	0.71
1:E:112:PRO:HG2	1:E:118:VAL:HG11	1.72	0.70
1:F:139:ILE:HG13	1:F:140:GLU:HG3	1.73	0.70
1:C:137:ASP:OD1	2:C:302:HOH:O	2.09	0.69
1:F:52:LYS:HG2	1:F:93:SER:HB3	1.72	0.69
1:A:137:ASP:OD1	2:A:303:HOH:O	2.12	0.68
1:A:183:PHE:HE2	1:A:283:VAL:HG12	1.57	0.67
1:F:252:GLN:N	1:F:263:ASP:OD1	2.28	0.67
1:F:102:ASN:OD1	2:F:302:HOH:O	2.11	0.67
1:C:131:GLN:NE2	1:C:132:PRO:O	2.29	0.66
1:A:168:GLN:CD	1:A:168:GLN:H	1.98	0.65
1:D:77:PRO:HB3	1:D:111:MET:HE1	1.77	0.65
1:F:171:LYS:HG3	1:F:197:VAL:HA	1.78	0.65
1:F:156:GLY:HA3	1:F:188:CYS:HB3	1.78	0.64
1:F:137:ASP:O	1:F:141:THR:OG1	2.13	0.64
1:D:53:ILE:HD13	1:D:87:LEU:HD23	1.80	0.64
1:B:156:GLY:HA3	1:B:188:CYS:HB3	1.80	0.64
1:D:243:GLU:OE1	2:D:301:HOH:O	2.15	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:44:THR:OG1	1:A:44:THR:O	2.10	0.63
1:C:278:ALA:O	2:C:303:HOH:O	2.16	0.62
1:E:115:ASP:HB3	1:E:118:VAL:HG12	1.80	0.62
1:F:83:PRO:O	1:F:87:LEU:HG	2.00	0.61
1:F:53:ILE:HD13	1:F:87:LEU:HD13	1.81	0.61
1:A:156:GLY:HA3	1:A:188:CYS:HB3	1.84	0.60
1:A:181:ASN:HD22	1:A:285:GLN:HA	1.65	0.60
1:B:147:SER:O	2:B:301:HOH:O	2.17	0.60
1:B:116:GLN:NE2	2:B:309:HOH:O	2.34	0.59
1:D:59:ASP:HB3	1:D:98:THR:HB	1.85	0.59
1:E:122:TYR:O	1:E:126:GLN:N	2.37	0.58
1:B:187:LEU:HG	1:B:271:LEU:HD22	1.85	0.58
1:D:119:ASN:OD1	2:D:302:HOH:O	2.17	0.58
1:F:99:LEU:HD21	1:F:170:VAL:HG23	1.85	0.58
1:A:181:ASN:ND2	1:A:284:GLU:O	2.36	0.57
1:E:156:GLY:HA3	1:E:188:CYS:HB3	1.86	0.57
1:F:284:GLU:HG2	1:F:285:GLN:N	2.18	0.57
1:A:197:VAL:HG11	1:A:202:LEU:HD21	1.86	0.57
1:A:236:GLN:NE2	2:A:308:HOH:O	2.33	0.57
1:F:87:LEU:HD22	1:F:279:LEU:HD12	1.86	0.57
1:F:6:ASN:OD1	1:F:6:ASN:N	2.35	0.57
1:E:171:LYS:HG3	1:E:197:VAL:HA	1.87	0.56
1:F:187:LEU:HB3	1:F:271:LEU:HD22	1.88	0.56
1:D:77:PRO:HB3	1:D:111:MET:CE	2.35	0.56
1:D:197:VAL:HB	1:D:200:ASP:HB3	1.88	0.55
1:E:53:ILE:HD13	1:E:87:LEU:HD13	1.88	0.55
1:F:280:LEU:O	1:F:283:VAL:HG22	2.07	0.55
1:D:123:SER:O	2:D:303:HOH:O	2.18	0.55
1:C:186:SER:O	1:C:261:THR:HA	2.07	0.54
1:D:156:GLY:HA3	1:D:188:CYS:HB3	1.89	0.54
1:D:76:HIS:HB3	1:D:79:ALA:HB3	1.90	0.53
1:E:16:GLU:OE1	2:E:302:HOH:O	2.18	0.53
1:F:219:THR:HB	1:F:224:TYR:HB3	1.90	0.53
1:E:216:ASP:OD2	2:E:303:HOH:O	2.19	0.53
1:B:73:THR:OG1	1:B:74:GLY:N	2.42	0.53
1:E:7:ASP:O	1:E:23:SER:OG	2.27	0.53
1:D:23:SER:OG	1:D:26:SER:HB3	2.09	0.53
1:F:183:PHE:CD1	1:F:258:LYS:HG3	2.43	0.53
1:D:186:SER:O	1:D:261:THR:HA	2.10	0.52
1:F:124:LYS:NZ	2:F:310:HOH:O	2.42	0.52
1:E:85:TYR:HB2	1:E:121:LEU:HD22	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:87:LEU:HD22	1:F:279:LEU:CD1	2.40	0.52
1:B:150:ILE:HD11	1:B:282:GLU:HG2	1.92	0.51
1:C:207:LYS:HB3	1:C:245:LEU:HD21	1.92	0.51
1:A:36:ASP:OD2	2:A:305:HOH:O	2.19	0.51
1:F:139:ILE:HG13	1:F:140:GLU:N	2.26	0.51
1:D:5:MET:HG3	1:D:7:ASP:HB2	1.92	0.50
1:D:238:GLN:HG3	1:D:244:LEU:HD13	1.93	0.50
1:B:186:SER:O	1:B:261:THR:HA	2.12	0.50
1:D:115:ASP:O	1:D:119:ASN:ND2	2.33	0.50
1:D:197:VAL:HG11	1:D:202:LEU:HD21	1.92	0.49
1:C:225:MET:HE1	1:C:229:LEU:HD21	1.94	0.49
1:C:43:PRO:HG2	1:C:44:THR:HG23	1.94	0.49
1:B:65:MET:HG3	1:B:226:PRO:HG2	1.96	0.48
1:D:11:THR:O	1:D:21:PHE:N	2.43	0.48
1:D:107:GLU:HB3	1:D:109:TRP:CE2	2.49	0.48
1:C:215:MET:O	1:C:219:THR:HG23	2.14	0.48
1:D:42:TYR:OH	1:D:86:HIS:HD2	1.97	0.48
1:F:137:ASP:HA	2:F:306:HOH:O	2.13	0.48
1:A:59:ASP:HB3	1:A:98:THR:HB	1.96	0.48
1:F:45:PRO:O	2:F:303:HOH:O	2.20	0.47
1:E:67:ASN:OD1	1:E:69:THR:HG22	2.14	0.47
1:F:99:LEU:HD23	1:F:135:LEU:HD13	1.96	0.47
1:F:87:LEU:HB2	1:F:94:PHE:HZ	1.80	0.47
1:C:183:PHE:CZ	1:C:258:LYS:HE3	2.50	0.47
1:D:43:PRO:O	1:D:45:PRO:HD3	2.15	0.47
1:E:87:LEU:HD22	1:E:279:LEU:HD12	1.96	0.46
1:F:135:LEU:O	1:F:139:ILE:HG23	2.15	0.46
1:F:65:MET:HE1	1:F:229:LEU:HD23	1.97	0.46
1:F:186:SER:O	1:F:261:THR:HA	2.15	0.46
1:F:111:MET:SD	1:F:112:PRO:HD2	2.56	0.46
1:E:73:THR:OG1	1:E:74:GLY:N	2.49	0.46
1:E:52:LYS:HD2	2:E:320:HOH:O	2.15	0.46
1:A:258:LYS:HZ1	1:A:283:VAL:HB	1.80	0.46
1:F:113:ARG:HD3	1:F:113:ARG:HA	1.74	0.45
1:D:189:HIS:NE2	1:D:216:ASP:OD2	2.36	0.45
1:E:44:THR:O	1:E:44:THR:OG1	2.17	0.45
1:F:215:MET:SD	1:F:249:ILE:HD12	2.57	0.45
1:D:188:CYS:SG	1:D:265:PRO:HD3	2.56	0.45
1:F:113:ARG:O	1:F:119:ASN:ND2	2.49	0.45
1:C:71:PHE:CD2	1:C:225:MET:HE2	2.52	0.44
1:D:42:TYR:HA	1:D:43:PRO:HD3	1.72	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:188:CYS:SG	1:C:265:PRO:HD3	2.58	0.44
1:F:283:VAL:HG23	1:F:284:GLU:N	2.33	0.44
1:D:51:TRP:HB3	1:D:150:ILE:HB	2.00	0.44
1:C:179:LYS:HE3	1:C:179:LYS:HB3	1.82	0.44
1:E:27:LEU:HD21	1:E:109:TRP:HB2	1.98	0.44
1:E:82:LEU:HD23	1:E:269:ASN:HB2	1.99	0.44
1:F:46:TYR:HB3	1:F:91:GLY:O	2.18	0.44
1:F:183:PHE:CE1	1:F:258:LYS:HE2	2.52	0.43
1:F:214:GLU:OE2	1:F:218:GLN:NE2	2.43	0.43
1:D:92:PHE:CE2	1:D:279:LEU:HB3	2.53	0.43
1:F:179:LYS:HE2	1:F:179:LYS:HB3	1.82	0.43
1:B:53:ILE:HD13	1:B:87:LEU:HD13	2.00	0.43
1:C:225:MET:HE1	1:C:229:LEU:CD2	2.47	0.43
1:C:76:HIS:CE1	1:C:78:VAL:HB	2.53	0.43
1:B:200:ASP:C	1:B:202:LEU:H	2.22	0.43
1:C:257:ARG:NH2	2:C:311:HOH:O	2.38	0.43
1:C:59:ASP:HB3	1:C:98:THR:HB	2.01	0.42
1:F:76:HIS:HB3	1:F:79:ALA:HB3	2.01	0.42
1:D:55:VAL:HG12	1:D:96:ILE:HA	2.00	0.42
1:A:87:LEU:HB2	1:A:94:PHE:HZ	1.84	0.42
1:D:218:GLN:O	1:D:221:SER:OG	2.32	0.42
1:E:52:LYS:HG2	1:E:93:SER:HB3	2.01	0.42
1:E:143:LEU:HG	1:E:176:TRP:CD2	2.54	0.42
1:E:111:MET:HA	1:E:112:PRO:HD2	1.88	0.42
1:C:60:GLU:OE1	1:D:102:ASN:HB3	2.19	0.42
1:E:22:PRO:HG2	1:E:109:TRP:CZ3	2.55	0.42
1:D:215:MET:HE1	2:D:305:HOH:O	2.19	0.42
1:F:136:SER:HA	1:F:139:ILE:HG12	2.02	0.42
1:E:76:HIS:HB3	1:E:79:ALA:HB3	2.02	0.41
1:F:260:LEU:HD21	1:F:274:LEU:HG	2.00	0.41
1:D:134:LYS:NZ	1:D:136:SER:OG	2.50	0.41
1:F:279:LEU:O	1:F:282:GLU:HB3	2.20	0.41
1:E:43:PRO:C	1:E:45:PRO:HD3	2.41	0.41
1:C:92:PHE:CZ	1:C:279:LEU:HB3	2.54	0.41
1:F:171:LYS:NZ	1:F:197:VAL:O	2.53	0.41
1:F:23:SER:O	1:F:27:LEU:HG	2.20	0.41
1:E:123:SER:O	1:E:126:GLN:HB3	2.21	0.41
1:E:186:SER:O	1:E:261:THR:HA	2.21	0.41
1:F:211:PHE:HA	1:F:212:PRO:HD3	1.93	0.41
1:F:56:VAL:O	1:F:155:PRO:HD2	2.20	0.41
1:D:25:TYR:O	1:D:29:GLN:HG2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:121:LEU:O	1:E:124:LYS:HB3	2.21	0.41
1:E:92:PHE:CZ	1:E:279:LEU:HB3	2.56	0.41
1:C:156:GLY:HA3	1:C:188:CYS:HB3	2.03	0.41
1:E:266:LEU:HD23	1:E:266:LEU:HA	1.79	0.41
1:D:200:ASP:OD1	1:D:202:LEU:HB3	2.21	0.41
1:E:115:ASP:HB3	1:E:118:VAL:CG1	2.49	0.41
1:F:20:PHE:HB2	1:F:226:PRO:HB3	2.02	0.41
1:D:13:ASP:HA	1:D:14:PRO:HD2	1.97	0.41
1:D:187:LEU:HB3	1:D:271:LEU:HD22	2.02	0.41
1:D:71:PHE:CE2	1:D:73:THR:HB	2.56	0.41
1:F:25:TYR:O	1:F:28:SER:OG	2.26	0.41
1:B:127:SER:HB3	2:B:402:HOH:O	2.21	0.41
1:D:237:LEU:O	1:D:242:PHE:HB2	2.21	0.41
1:E:178:MET:HG3	1:E:202:LEU:HD21	2.02	0.41
1:F:65:MET:HE2	1:F:71:PHE:HB2	2.03	0.41
1:C:187:LEU:HB3	1:C:271:LEU:HD22	2.02	0.40
1:D:135:LEU:HD12	1:D:135:LEU:HA	1.92	0.40
1:E:260:LEU:HD23	1:E:274:LEU:HG	2.03	0.40
1:B:249:ILE:HG12	1:B:249:ILE:O	2.21	0.40
1:D:5:MET:HG3	1:D:7:ASP:CB	2.51	0.40
1:B:280:LEU:HD23	1:B:280:LEU:HA	1.96	0.40
1:A:187:LEU:HB3	1:A:271:LEU:HD22	2.02	0.40
1:E:69:THR:HG23	1:E:226:PRO:HG2	2.03	0.40
1:F:7:ASP:N	1:F:7:ASP:OD2	2.54	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	279/288 (97%)	265 (95%)	12 (4%)	2 (1%)	25 30

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	279/288 (97%)	266 (95%)	13 (5%)	0	100	100
1	C	279/288 (97%)	267 (96%)	12 (4%)	0	100	100
1	D	279/288 (97%)	261 (94%)	17 (6%)	1 (0%)	38	47
1	E	279/288 (97%)	264 (95%)	12 (4%)	3 (1%)	17	18
1	F	279/288 (97%)	250 (90%)	28 (10%)	1 (0%)	38	47
All	All	1674/1728 (97%)	1573 (94%)	94 (6%)	7 (0%)	38	47

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	283	VAL
1	A	282	GLU
1	A	283	VAL
1	D	43	PRO
1	E	198	GLY
1	E	112	PRO
1	E	10	PRO

5.3.2 Protein sidechains ⓘ

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	227/233 (97%)	219 (96%)	8 (4%)	41	56
1	B	227/233 (97%)	216 (95%)	11 (5%)	30	40
1	C	226/233 (97%)	220 (97%)	6 (3%)	50	67
1	D	227/233 (97%)	220 (97%)	7 (3%)	45	61
1	E	226/233 (97%)	217 (96%)	9 (4%)	36	50
1	F	227/233 (97%)	209 (92%)	18 (8%)	14	18
All	All	1360/1398 (97%)	1301 (96%)	59 (4%)	33	45

All (59) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	123	SER
1	C	169	GLU
1	C	215	MET
1	C	277	LYS
1	C	282	GLU
1	C	285	GLN
1	F	6	ASN
1	F	7	ASP
1	F	8	LYS
1	F	11	THR
1	F	70	PHE
1	F	73	THR
1	F	114	GLU
1	F	133	LEU
1	F	147	SER
1	F	164	LEU
1	F	186	SER
1	F	258	LYS
1	F	260	LEU
1	F	261	THR
1	F	264	SER
1	F	277	LYS
1	F	282	GLU
1	F	284	GLU
1	A	44	THR
1	A	123	SER
1	A	141	THR
1	A	145	GLU
1	A	146	ASP
1	A	260	LEU
1	A	282	GLU
1	A	283	VAL
1	B	5	MET
1	B	6	ASN
1	B	47	GLN
1	B	114	GLU
1	B	127	SER
1	B	166	ASP
1	B	187	LEU
1	B	249	ILE
1	B	282	GLU
1	B	284	GLU
1	B	285	GLN

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Mol	Chain	Res	Type
1	D	6	ASN
1	D	26	SER
1	D	93	SER
1	D	187	LEU
1	D	247	THR
1	D	277	LYS
1	D	282	GLU
1	E	6	ASN
1	E	11	THR
1	E	33	SER
1	E	78	VAL
1	E	139	ILE
1	E	143	LEU
1	E	145	GLU
1	E	236	GLN
1	E	285	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	131	GLN
1	A	181	ASN
1	D	86	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no carbohydrates 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

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, 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	281/288 (97%)	-0.01	13 (4%)	33 40	18, 30, 49, 128	0
1	B	281/288 (97%)	0.00	9 (3%)	48 55	20, 32, 52, 93	0
1	C	281/288 (97%)	0.15	15 (5%)	27 34	21, 35, 57, 100	0
1	D	281/288 (97%)	0.30	21 (7%)	15 20	23, 46, 79, 124	0
1	E	281/288 (97%)	0.52	23 (8%)	12 17	27, 51, 78, 119	0
1	F	281/288 (97%)	1.06	54 (19%)	1 2	33, 62, 93, 134	0
All	All	1686/1728 (97%)	0.34	135 (8%)	13 17	18, 40, 82, 134	0

All (135) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	285	GLN	7.3
1	B	5	MET	7.1
1	E	5	MET	6.2
1	C	285	GLN	6.0
1	F	5	MET	5.9
1	D	40	ALA	5.5
1	B	285	GLN	5.4
1	C	5	MET	5.3
1	F	283	VAL	5.3
1	B	6	ASN	5.1
1	F	187	LEU	4.7
1	F	154	ILE	4.7
1	A	5	MET	4.6
1	A	283	VAL	4.6
1	F	284	GLU	4.6
1	F	141	THR	4.5
1	F	47	GLN	4.3
1	D	6	ASN	4.2
1	C	6	ASN	4.0

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Mol	Chain	Res	Type	RSRZ
1	F	43	PRO	4.0
1	E	6	ASN	4.0
1	A	285	GLN	4.0
1	F	49	GLY	3.9
1	A	284	GLU	3.9
1	F	155	PRO	3.9
1	D	5	MET	3.9
1	E	285	GLN	3.7
1	F	186	SER	3.7
1	B	44	THR	3.7
1	C	41	HIS	3.7
1	F	140	GLU	3.5
1	F	51	TRP	3.4
1	F	199	ASP	3.3
1	F	179	LYS	3.3
1	A	43	PRO	3.3
1	D	285	GLN	3.2
1	E	152	VAL	3.2
1	D	284	GLU	3.2
1	C	187	LEU	3.2
1	D	199	ASP	3.1
1	E	25	TYR	3.1
1	F	9	HIS	3.1
1	E	7	ASP	3.1
1	F	6	ASN	3.0
1	F	150	ILE	3.0
1	F	204	ALA	3.0
1	F	205	GLY	3.0
1	D	48	GLY	3.0
1	E	44	THR	2.9
1	F	180	GLN	2.9
1	E	185	ILE	2.9
1	F	260	LEU	2.9
1	D	144	GLY	2.9
1	F	144	GLY	2.9
1	F	156	GLY	2.8
1	D	146	ASP	2.8
1	F	153	PHE	2.8
1	C	188	CYS	2.8
1	F	27	LEU	2.8
1	D	281	ALA	2.8
1	F	45	PRO	2.8

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Mol	Chain	Res	Type	RSRZ
1	F	184	ILE	2.8
1	D	43	PRO	2.8
1	E	154	ILE	2.7
1	C	43	PRO	2.7
1	F	191	PRO	2.7
1	B	55	VAL	2.7
1	F	190	GLY	2.7
1	F	188	CYS	2.7
1	F	32	ALA	2.7
1	F	94	PHE	2.7
1	E	9	HIS	2.7
1	F	142	ALA	2.6
1	D	44	THR	2.6
1	F	129	PHE	2.6
1	E	266	LEU	2.6
1	F	8	LYS	2.6
1	C	284	GLU	2.6
1	F	81	LEU	2.6
1	A	187	LEU	2.6
1	F	80	THR	2.5
1	E	120	GLY	2.5
1	C	48	GLY	2.5
1	E	151	GLY	2.5
1	E	116	GLN	2.5
1	F	33	SER	2.5
1	A	160	ALA	2.5
1	D	154	ILE	2.5
1	E	141	THR	2.4
1	C	79	ALA	2.4
1	E	155	PRO	2.4
1	F	122	TYR	2.4
1	E	34	LYS	2.4
1	A	154	ILE	2.4
1	A	186	SER	2.4
1	F	280	LEU	2.4
1	E	186	SER	2.3
1	D	188	CYS	2.3
1	B	152	VAL	2.3
1	D	187	LEU	2.3
1	F	35	SER	2.3
1	D	155	PRO	2.3
1	F	127	SER	2.3

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Mol	Chain	Res	Type	RSRZ
1	E	187	LEU	2.2
1	F	46	TYR	2.2
1	F	79	ALA	2.2
1	F	185	ILE	2.2
1	F	44	THR	2.2
1	F	114	GLU	2.2
1	B	154	ILE	2.2
1	C	47	GLN	2.2
1	F	215	MET	2.2
1	C	156	GLY	2.2
1	C	155	PRO	2.2
1	C	186	SER	2.2
1	F	146	ASP	2.2
1	E	284	GLU	2.2
1	A	44	THR	2.1
1	D	141	THR	2.1
1	D	28	SER	2.1
1	E	156	GLY	2.1
1	A	185	ILE	2.1
1	E	43	PRO	2.1
1	D	249	ILE	2.1
1	D	41	HIS	2.1
1	B	56	VAL	2.1
1	C	153	PHE	2.1
1	B	153	PHE	2.1
1	D	145	GLU	2.0
1	F	41	HIS	2.0
1	A	41	HIS	2.0
1	F	160	ALA	2.0
1	A	156	GLY	2.0
1	E	54	LEU	2.0
1	F	261	THR	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates ⓘ

There are no carbohydrates 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.