



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 21, 2018 – 12:55 am GMT

PDB ID : 1YCP  
Title : THE CRYSTAL STRUCTURE OF FIBRINOGEN-AA PEPTIDE 1-23 (F8Y) BOUND TO BOVINE THROMBIN EXPLAINS WHY THE MUTATION OF PHE-8 TO TYROSINE STRONGLY INHIBITS NORMAL CLEAVAGE AT ARGININE-16  
Authors : Malkowski, M.G.; Edwards, B.F.P.  
Deposited on : 1997-05-01  
Resolution : 2.50 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](mailto: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.

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

MolProbity : 4.02b-467  
Xtrriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk30686

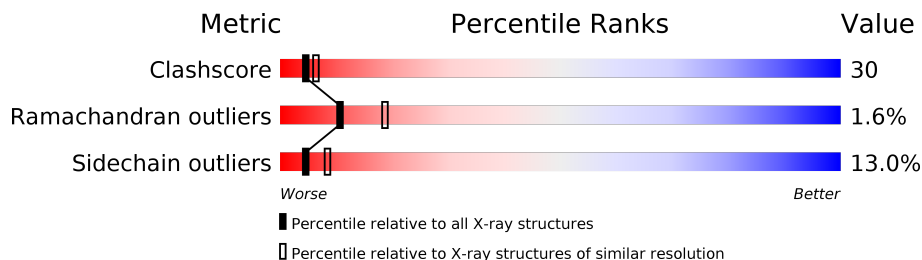
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.50 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))
Clashscore	122078	4826 (2.50-2.50)
Ramachandran outliers	120005	4734 (2.50-2.50)
Sidechain outliers	119972	4736 (2.50-2.50)

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  $\geq 3$ , 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.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	J	49	
1	L	49	
2	H	259	
3	F	23	
3	N	23	
4	K	150	
5	M	109	

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 4846 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 EPSILON THROMBIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	L	29	238	150	38	49	1	0	0	0
1	J	29	238	150	38	49	1	0	0	0

- Molecule 2 is a protein called ALPHA THROMBIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	H	247	2002	1281	360	349	12	0	0	0

- Molecule 3 is a protein called FIBRINOPEPTIDE A-ALPHA.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	F	6	45	29	9	7	0	0	0
3	N	6	45	29	9	7	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	308	TYR	PHE	ENGINEERED	UNP P02671
N	308	TYR	PHE	ENGINEERED	UNP P02671

- Molecule 4 is a protein called EPSILON THROMBIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	K	146	1199	770	217	207	5	0	0	0

- Molecule 5 is a protein called EPSILON THROMBIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	M	101	Total 803	C 511	N 143	O 142	S 7	0	0	0

- Molecule 6 is water.

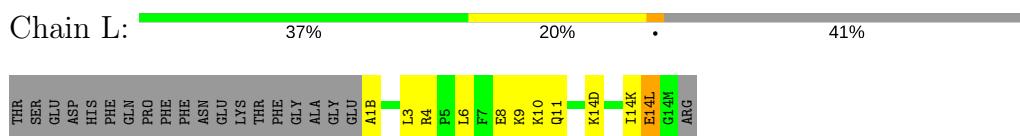
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	L	27	Total 27	O 27	0	0
6	H	148	Total 148	O 148	0	0
6	F	6	Total 6	O 6	0	0
6	J	11	Total 11	O 11	0	0
6	K	61	Total 61	O 61	0	0
6	M	23	Total 23	O 23	0	0

### 3 Residue-property plots i

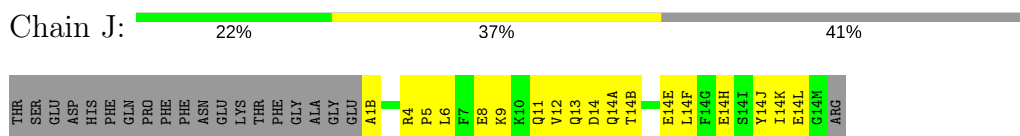
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are 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.

Note EDS was not executed.

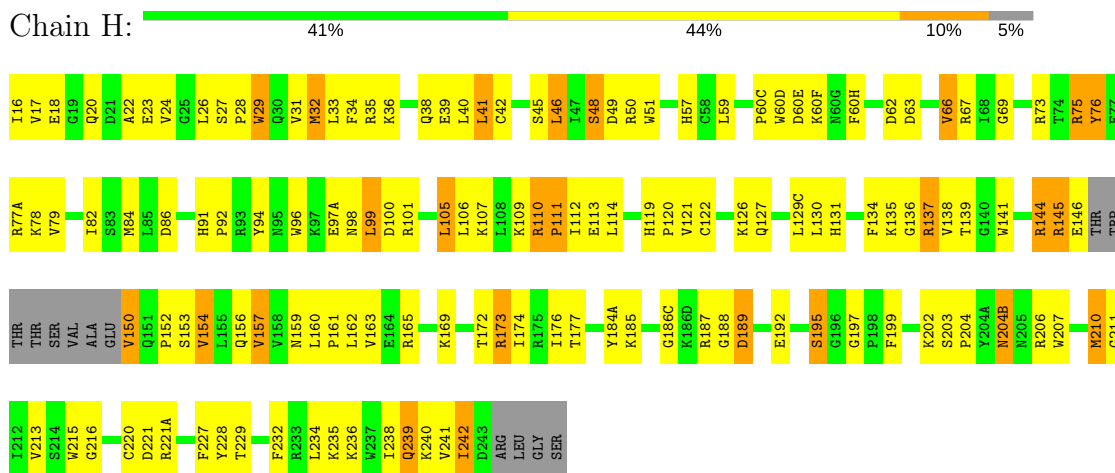
- Molecule 1: EPSILON THROMBIN



- Molecule 1: EPSILON THROMBIN



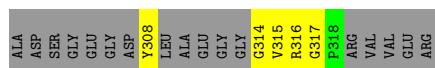
- Molecule 2: ALPHA THROMBIN



- Molecule 3: FIBRINOPEPTIDE A-ALPHA



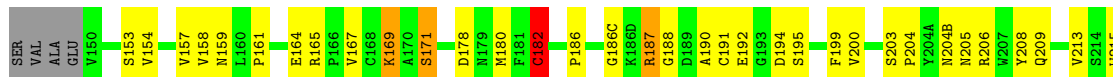
- Molecule 3: FIBRINOPEPTIDE A-ALPHA



• Molecule 4: EPSILON THROMBIN



• Molecule 5: EPSILON THROMBIN



## 4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	88.27Å 88.27Å 195.53Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	7.00 – 2.50	Depositor
% Data completeness (in resolution range)	(Not available) (7.00-2.50)	Depositor
$R_{merge}$	0.11	Depositor
$R_{sym}$	(Not available)	Depositor
Refinement program	X-PLOR	Depositor
R, $R_{free}$	0.183 , 0.245	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	4846	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	20.0	wwPDB-VP

## 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	J	0.49	0/241	0.73	0/321
1	L	0.57	0/241	0.78	0/321
2	H	0.58	0/2053	0.93	2/2774 (0.1%)
3	F	0.58	0/45	0.97	0/58
3	N	0.51	0/45	0.79	0/58
4	K	0.50	0/1229	0.91	2/1663 (0.1%)
5	M	0.58	0/824	0.91	2/1111 (0.2%)
All	All	0.56	0/4678	0.90	6/6306 (0.1%)

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	M	199	PHE	N-CA-C	-6.57	93.27	111.00
5	M	182	CYS	CA-CB-SG	6.20	125.15	114.00
2	H	189	ASP	CB-CG-OD1	5.72	123.45	118.30
4	K	41	LEU	CA-CB-CG	5.50	127.95	115.30
2	H	41	LEU	CA-CB-CG	5.28	127.44	115.30
4	K	75	ARG	N-CA-C	5.14	124.88	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	J	238	0	230	14	0
1	L	238	0	230	20	0
2	H	2002	0	2008	139	3
3	F	45	0	42	12	0
3	N	45	0	42	7	1
4	K	1199	0	1221	76	1
5	M	803	0	787	48	1
6	F	6	0	0	2	0
6	H	148	0	0	18	0
6	J	11	0	0	2	0
6	K	61	0	0	9	0
6	L	27	0	0	1	0
6	M	23	0	0	2	0
All	All	4846	0	4560	276	3

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 30.

All (276) 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)
2:H:192:GLU:HB3	3:F:318:PRO:HA	1.46	0.97
3:F:308:TYR:HH	3:F:314:GLY:N	1.64	0.94
4:K:66:VAL:HG21	4:K:85:LEU:HD21	1.51	0.93
2:H:76:TYR:HB3	6:H:575:HOH:O	1.69	0.93
5:M:213:VAL:HG22	5:M:228:TYR:HE1	1.34	0.91
4:K:86:ASP:HB3	4:K:107:LYS:HG2	1.60	0.83
2:H:67:ARG:HH12	2:H:76:TYR:HB2	1.46	0.81
4:K:65:LEU:HD23	4:K:84:MET:SD	2.23	0.79
2:H:235:LYS:O	2:H:239:GLN:HG2	1.83	0.78
2:H:213:VAL:HG22	2:H:228:TYR:CE2	2.20	0.76
2:H:137:ARG:HD3	2:H:157:VAL:HG12	1.67	0.76
2:H:173:ARG:HH11	2:H:173:ARG:HB2	1.51	0.76
2:H:187:ARG:HD3	2:H:221:ASP:OD2	1.85	0.75
2:H:213:VAL:HG22	2:H:228:TYR:HE2	1.51	0.75
2:H:32:MET:HE2	2:H:141:TRP:CZ3	2.23	0.74
4:K:35:ARG:O	4:K:38:GLN:HA	1.88	0.72
2:H:34:PHE:CE2	2:H:38:GLN:HB3	2.24	0.72
2:H:57:HIS:CD2	3:F:315:VAL:HG13	2.25	0.71
2:H:26:LEU:HD21	2:H:137:ARG:HH11	1.55	0.71
1:L:3:LEU:HB2	1:L:9:LYS:HE3	1.71	0.71
2:H:26:LEU:HD21	2:H:137:ARG:NH1	2.06	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:122:CYS:SG	2:H:206:ARG:HD3	2.32	0.69
1:L:1(B):ALA:HB1	2:H:206:ARG:NH2	2.07	0.68
5:M:213:VAL:HG22	5:M:228:TYR:CE1	2.22	0.68
2:H:35:ARG:HG2	2:H:39:GLU:HB3	1.74	0.68
5:M:204(B):ASN:O	5:M:206:ARG:N	2.26	0.67
4:K:89:TYR:HB2	4:K:105:LEU:HB2	1.74	0.67
2:H:67:ARG:NH1	2:H:76:TYR:HD2	1.91	0.67
1:J:14(K):ILE:HG13	1:J:14(L):GLU:N	2.08	0.67
2:H:213:VAL:HG21	6:H:549:HOH:O	1.96	0.66
4:K:75:ARG:HG2	4:K:76:TYR:N	2.09	0.66
4:K:70:LYS:HB3	4:K:70:LYS:NZ	2.10	0.66
5:M:190:ALA:O	5:M:191:CYS:HB2	1.96	0.66
4:K:113:GLU:HB3	6:K:607:HOH:O	1.95	0.65
5:M:165:ARG:HD3	6:M:611:HOH:O	1.96	0.65
2:H:73:ARG:HD3	2:H:141:TRP:HB3	1.78	0.65
4:K:125:ASP:OD1	4:K:127:GLN:HG3	1.97	0.65
1:J:6:LEU:HD12	4:K:25:GLY:HA3	1.79	0.64
1:L:14(K):ILE:O	1:L:14(K):ILE:HG13	1.96	0.64
2:H:197:GLY:HA3	6:H:401:HOH:O	1.98	0.64
2:H:204(B):ASN:C	2:H:204(B):ASN:HD22	2.00	0.64
5:M:195:SER:HB2	3:N:316:ARG:O	1.97	0.64
4:K:67:ARG:HD2	4:K:80:GLU:OE2	1.97	0.64
2:H:137:ARG:HD3	2:H:157:VAL:CG1	2.27	0.63
3:N:308:TYR:CE1	3:N:314:GLY:HA2	2.33	0.63
2:H:105:LEU:HD13	2:H:241:VAL:CG2	2.28	0.63
2:H:86:ASP:HB3	2:H:107:LYS:HG2	1.81	0.63
4:K:17:VAL:O	5:M:188:GLY:HA2	1.98	0.62
4:K:36:LYS:HB2	6:K:532:HOH:O	1.98	0.62
2:H:176:ILE:HD12	2:H:227:PHE:CE2	2.34	0.62
2:H:105:LEU:HD13	2:H:241:VAL:HG21	1.82	0.62
2:H:192:GLU:HG2	6:F:481:HOH:O	1.98	0.62
4:K:50:ARG:CZ	4:K:111:PRO:HB3	2.30	0.62
2:H:173:ARG:HD3	6:H:433:HOH:O	2.00	0.62
2:H:23:GLU:O	2:H:26:LEU:HB2	2.00	0.61
2:H:139:THR:HG22	2:H:157:VAL:HG13	1.81	0.61
2:H:165:ARG:O	2:H:169:LYS:HG3	2.00	0.61
1:L:14(D):LYS:HG2	6:L:641:HOH:O	2.01	0.61
2:H:60(F):LYS:HE2	2:H:60(H):PHE:HE2	1.66	0.60
4:K:110:ARG:HG2	6:K:454:HOH:O	2.01	0.60
2:H:145:ARG:HG2	2:H:146:GLU:N	2.15	0.60
4:K:68:ILE:HD13	4:K:112:ILE:HD12	1.82	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:M:216:GLY:O	3:N:314:GLY:N	2.34	0.60
2:H:172:THR:HG21	2:H:176:ILE:HD11	1.84	0.59
2:H:46:LEU:HD13	2:H:48:SER:O	2.01	0.59
6:K:442:HOH:O	3:N:315:VAL:HG11	2.02	0.59
5:M:204(B):ASN:O	5:M:204(B):ASN:ND2	2.35	0.59
2:H:145:ARG:NE	6:H:414:HOH:O	2.36	0.58
2:H:137:ARG:HB2	2:H:159:ASN:OD1	2.04	0.58
2:H:119:HIS:HB3	6:H:616:HOH:O	2.04	0.58
1:J:1(B):ALA:HA	6:J:590:HOH:O	2.03	0.58
1:J:11:GLN:HB2	6:J:573:HOH:O	2.04	0.57
4:K:35:ARG:HD2	4:K:41:LEU:HD21	1.87	0.57
2:H:131:HIS:O	2:H:134:PHE:HB2	2.04	0.57
4:K:66:VAL:CG2	4:K:85:LEU:HD21	2.30	0.57
4:K:47:ILE:HD11	5:M:242:ILE:HD11	1.87	0.57
2:H:34:PHE:CZ	2:H:38:GLN:HB3	2.39	0.56
4:K:84:MET:HB2	4:K:109:LYS:HD3	1.87	0.56
4:K:60(D):TRP:O	4:K:60(E):ASP:HB2	2.06	0.56
4:K:70:LYS:HG2	4:K:80:GLU:HG3	1.88	0.56
1:L:3:LEU:HD13	1:L:8:GLU:HG2	1.88	0.56
2:H:97(A):GLU:O	3:F:308:TYR:HA	2.05	0.55
2:H:69:GLY:HA2	6:H:406:HOH:O	2.06	0.55
2:H:99:LEU:HD11	3:F:315:VAL:HG22	1.88	0.55
4:K:55:ALA:O	4:K:58:CYS:HB2	2.07	0.55
2:H:41:LEU:O	3:F:318:PRO:HD3	2.07	0.55
2:H:28:PRO:HG2	6:H:616:HOH:O	2.07	0.54
2:H:78:LYS:HB3	6:H:569:HOH:O	2.08	0.54
2:H:163:VAL:HG13	2:H:185:LYS:HE2	1.90	0.54
4:K:103:ILE:HD11	5:M:238:ILE:HD11	1.89	0.54
4:K:51:TRP:HH2	4:K:89:TYR:CE1	2.25	0.54
4:K:18:GLU:HG3	5:M:187:ARG:HB2	1.89	0.53
4:K:32:MET:SD	4:K:34:PHE:HD1	2.32	0.53
2:H:16:ILE:HD11	2:H:138:VAL:HG12	1.91	0.53
4:K:85:LEU:HD22	4:K:106:LEU:HB3	1.91	0.53
1:J:14(B):THR:HB	5:M:159:ASN:HD21	1.73	0.53
1:L:3:LEU:CD2	2:H:206:ARG:HH11	2.21	0.53
2:H:17:VAL:O	2:H:188:GLY:HA2	2.09	0.52
2:H:135:LYS:HA	2:H:161:PRO:HA	1.92	0.52
2:H:22:ALA:HB1	2:H:26:LEU:HD13	1.92	0.52
1:L:1(B):ALA:HB1	2:H:206:ARG:HH22	1.73	0.52
2:H:51:TRP:NE1	2:H:242:ILE:HG23	2.24	0.52
2:H:145:ARG:HH11	2:H:145:ARG:CB	2.23	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:K:105:LEU:HD12	5:M:241:VAL:HG23	1.92	0.51
1:J:14(J):TYR:CE2	5:M:204:PRO:HG3	2.45	0.51
2:H:130:LEU:HD21	2:H:210:MET:HG3	1.92	0.51
5:M:236:LYS:H	5:M:236:LYS:HD2	1.74	0.51
1:L:3:LEU:CD2	2:H:206:ARG:NH1	2.74	0.51
5:M:237:TRP:O	5:M:241:VAL:HG22	2.11	0.51
4:K:127:GLN:HB2	4:K:129(B):LYS:NZ	2.25	0.51
3:F:316:ARG:HA	6:F:482:HOH:O	2.10	0.51
2:H:195:SER:HB2	3:F:316:ARG:O	2.11	0.51
2:H:75:ARG:HG2	2:H:75:ARG:O	2.09	0.51
2:H:78:LYS:HG3	2:H:78:LYS:O	2.11	0.51
4:K:88:ILE:HG22	4:K:90:ILE:HD12	1.92	0.51
5:M:237:TRP:O	5:M:240:LYS:HG2	2.11	0.51
2:H:76:TYR:CE1	2:H:77(A):ARG:HA	2.46	0.51
5:M:204(B):ASN:ND2	5:M:206:ARG:HB2	2.26	0.51
5:M:180:MET:HG2	5:M:227:PHE:HD2	1.76	0.51
4:K:26:LEU:HD23	4:K:27:SER:HB2	1.93	0.50
4:K:84:MET:H	4:K:109:LYS:HE2	1.75	0.50
4:K:48:SER:OG	4:K:49:ASP:N	2.45	0.50
4:K:57:HIS:O	4:K:60(F):LYS:HE2	2.11	0.50
2:H:50:ARG:HG2	2:H:111:PRO:HG3	1.93	0.50
2:H:176:ILE:HG21	6:H:531:HOH:O	2.10	0.50
4:K:29:TRP:O	4:K:45:SER:HA	2.12	0.50
5:M:215:TRP:HB2	3:N:314:GLY:N	2.27	0.50
4:K:50:ARG:O	4:K:108:LEU:HG	2.11	0.50
2:H:39:GLU:HG3	6:H:558:HOH:O	2.12	0.50
4:K:129(C):LEU:O	4:K:134:PHE:HD2	1.95	0.50
2:H:119:HIS:CB	6:H:616:HOH:O	2.59	0.49
2:H:173:ARG:HH11	2:H:173:ARG:CB	2.24	0.49
2:H:232:PHE:O	2:H:235:LYS:HB3	2.12	0.49
2:H:17:VAL:HG11	2:H:221:ASP:CB	2.42	0.49
4:K:57:HIS:CD2	3:N:315:VAL:HG13	2.46	0.49
1:L:3:LEU:HD22	1:L:3:LEU:N	2.28	0.49
1:J:14:ASP:HB2	4:K:23:GLU:OE2	2.11	0.49
1:L:4:ARG:HD3	1:L:8:GLU:OE1	2.13	0.49
4:K:129(B):LYS:O	4:K:131:HIS:CD2	2.65	0.49
4:K:84:MET:O	4:K:109:LYS:HG2	2.13	0.49
4:K:105:LEU:CD1	5:M:241:VAL:HG23	2.42	0.49
2:H:165:ARG:NH2	2:H:177:THR:O	2.44	0.49
2:H:35:ARG:CG	2:H:39:GLU:HB3	2.43	0.49
1:L:3:LEU:CD1	1:L:8:GLU:HG2	2.42	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:101:ARG:HG2	2:H:234:LEU:HD21	1.95	0.49
2:H:94:TYR:CZ	2:H:96:TRP:HB3	2.47	0.49
4:K:46:LEU:HD22	4:K:48:SER:O	2.12	0.49
2:H:41:LEU:O	2:H:42:CYS:SG	2.71	0.48
2:H:97(A):GLU:HG2	6:H:509:HOH:O	2.12	0.48
1:J:4:ARG:HD3	1:J:8:GLU:OE1	2.13	0.48
2:H:29:TRP:O	2:H:45:SER:HA	2.13	0.48
1:L:10:LYS:O	1:L:11:GLN:HB3	2.13	0.48
4:K:60(A):TYR:CE2	4:K:60(C):PRO:HB2	2.49	0.48
5:M:187:ARG:NH1	5:M:221:ASP:O	2.47	0.48
2:H:50:ARG:CG	2:H:111:PRO:HG3	2.44	0.48
2:H:211:GLY:HA2	2:H:229:THR:O	2.13	0.48
2:H:32:MET:HE2	2:H:141:TRP:CH2	2.48	0.48
2:H:46:LEU:O	2:H:120:PRO:HA	2.14	0.48
2:H:240:LYS:HE2	6:H:547:HOH:O	2.14	0.48
2:H:98:ASN:OD1	2:H:100:ASP:HB2	2.14	0.48
4:K:90:ILE:HG22	4:K:91:HIS:N	2.29	0.48
2:H:49:ASP:HB2	2:H:112:ILE:HG22	1.96	0.47
4:K:135:LYS:HE2	5:M:161:PRO:HG3	1.97	0.47
2:H:32:MET:HE2	2:H:32:MET:HB2	1.74	0.47
4:K:38:GLN:HG3	6:K:440:HOH:O	2.14	0.47
5:M:182:CYS:HA	5:M:226:GLY:O	2.14	0.47
2:H:138:VAL:HG13	6:H:549:HOH:O	2.14	0.47
2:H:150:VAL:N	6:H:438:HOH:O	2.48	0.47
2:H:73:ARG:HB2	2:H:141:TRP:CD1	2.50	0.47
4:K:41:LEU:HD11	4:K:64:LEU:CD2	2.45	0.47
2:H:216:GLY:HA3	3:F:316:ARG:NH2	2.30	0.47
5:M:238:ILE:O	5:M:242:ILE:HB	2.15	0.47
4:K:51:TRP:CH2	4:K:89:TYR:CE1	3.03	0.47
4:K:81:LYS:HG2	6:K:562:HOH:O	2.15	0.47
1:J:12:VAL:HG12	1:J:13:GLN:N	2.31	0.46
4:K:38:GLN:O	4:K:39:GLU:HB2	2.14	0.46
1:L:14(L):GLU:HA	1:L:14(L):GLU:OE1	2.14	0.46
2:H:105:LEU:HD11	2:H:238:ILE:HG23	1.98	0.46
2:H:139:THR:HA	2:H:156:GLN:O	2.16	0.46
4:K:68:ILE:HG22	4:K:69:GLY:N	2.31	0.46
2:H:188:GLY:O	2:H:189:ASP:HB2	2.16	0.46
2:H:94:TYR:HE1	2:H:99:LEU:HD22	1.80	0.45
4:K:71:HIS:O	5:M:154:VAL:HB	2.15	0.45
5:M:157:VAL:HG12	5:M:158:VAL:N	2.31	0.45
2:H:76:TYR:CE2	2:H:82:ILE:HD11	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:31:VAL:HG12	2:H:32:MET:N	2.32	0.45
4:K:81:LYS:HE2	4:K:82:ILE:H	1.82	0.45
4:K:90:ILE:CG2	4:K:91:HIS:N	2.80	0.45
4:K:70:LYS:HB3	4:K:70:LYS:HZ2	1.80	0.45
1:L:3:LEU:HD23	2:H:206:ARG:NH1	2.32	0.45
5:M:236:LYS:HB3	5:M:236:LYS:HZ2	1.82	0.45
4:K:146:GLU:OE2	5:M:221(A):ARG:NH1	2.50	0.45
5:M:192:GLU:HG3	3:N:317:GLY:O	2.16	0.45
1:L:3:LEU:CD2	2:H:206:ARG:HG2	2.47	0.45
4:K:76:TYR:HA	4:K:80:GLU:OE1	2.17	0.45
1:J:4:ARG:HA	1:J:5:PRO:HD2	1.85	0.44
4:K:115:SER:OG	4:K:116:ASP:N	2.50	0.44
4:K:93:ARG:O	4:K:101:ARG:HD2	2.18	0.44
5:M:187:ARG:HD3	5:M:221:ASP:OD2	2.17	0.44
2:H:110:ARG:HH11	2:H:110:ARG:HB3	1.83	0.44
2:H:136:GLY:HA3	2:H:199:PHE:CE1	2.52	0.44
4:K:101:ARG:NE	6:K:474:HOH:O	2.50	0.44
2:H:60(C):PRO:O	2:H:60(D):TRP:HD1	2.00	0.44
4:K:18:GLU:HG3	5:M:187:ARG:CB	2.48	0.44
1:J:6:LEU:HG	6:K:518:HOH:O	2.17	0.44
5:M:203:SER:HB2	5:M:208:TYR:CE2	2.52	0.44
2:H:16:ILE:CD1	2:H:138:VAL:HG12	2.46	0.44
2:H:204(B):ASN:ND2	2:H:206:ARG:H	2.15	0.44
2:H:49:ASP:HA	2:H:112:ILE:HG22	1.99	0.44
2:H:112:ILE:HG23	2:H:114:LEU:HD12	2.00	0.44
1:J:14(K):ILE:HG13	1:J:14(L):GLU:H	1.81	0.44
5:M:164:GLU:H	5:M:164:GLU:CD	2.21	0.44
2:H:42:CYS:HB3	2:H:195:SER:O	2.18	0.43
4:K:70:LYS:HB3	4:K:70:LYS:HZ3	1.82	0.43
1:L:6:LEU:HD12	6:H:462:HOH:O	2.18	0.43
2:H:84:MET:CE	2:H:109:LYS:HE3	2.47	0.43
2:H:60(F):LYS:HE3	6:H:473:HOH:O	2.18	0.43
5:M:187:ARG:HB3	5:M:221:ASP:OD2	2.19	0.43
2:H:35:ARG:CD	2:H:39:GLU:HB3	2.48	0.43
4:K:32:MET:SD	4:K:34:PHE:CD1	3.10	0.43
2:H:202:LYS:HG2	2:H:203:SER:N	2.33	0.43
1:L:4:ARG:N	1:L:8:GLU:HB2	2.33	0.43
4:K:71:HIS:CD2	5:M:154:VAL:HB	2.54	0.43
1:L:3:LEU:CB	1:L:9:LYS:HE3	2.42	0.43
2:H:134:PHE:O	2:H:162:LEU:HD12	2.18	0.43
2:H:31:VAL:CG1	2:H:32:MET:N	2.82	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:67:ARG:NH1	2:H:76:TYR:CD2	2.79	0.43
2:H:91:HIS:ND1	2:H:92:PRO:HD2	2.33	0.43
5:M:165:ARG:HG2	5:M:169:LYS:NZ	2.34	0.43
2:H:203:SER:HA	2:H:204:PRO:HD3	1.80	0.42
4:K:49:ASP:HA	6:K:441:HOH:O	2.19	0.42
1:L:4:ARG:HH11	2:H:207:TRP:HE1	1.66	0.42
2:H:101:ARG:HG2	2:H:234:LEU:CD2	2.49	0.42
2:H:41:LEU:O	3:F:318:PRO:CD	2.67	0.42
2:H:76:TYR:HE2	2:H:82:ILE:HD11	1.84	0.42
2:H:59:LEU:HD11	2:H:106:LEU:HD11	2.01	0.42
2:H:139:THR:CG2	2:H:157:VAL:HG13	2.47	0.42
1:J:14(H):GLU:O	1:J:14(L):GLU:HG3	2.19	0.42
5:M:164:GLU:O	5:M:167:VAL:HB	2.20	0.42
2:H:22:ALA:HB2	2:H:157:VAL:HG22	2.01	0.42
2:H:94:TYR:HB2	2:H:101:ARG:O	2.19	0.42
1:J:5:PRO:HA	1:J:9:LYS:HD2	2.01	0.42
5:M:178:ASP:O	5:M:233:ARG:NH1	2.52	0.42
2:H:152:PRO:HB2	2:H:154:VAL:O	2.20	0.42
4:K:109:LYS:HE3	4:K:110:ARG:HE	1.84	0.42
2:H:172:THR:CG2	2:H:176:ILE:HD11	2.50	0.42
2:H:204(B):ASN:C	2:H:204(B):ASN:ND2	2.71	0.42
4:K:75:ARG:HG2	4:K:76:TYR:O	2.20	0.42
5:M:203:SER:HA	5:M:204:PRO:HD3	1.84	0.42
2:H:29:TRP:CG	2:H:121:VAL:HB	2.55	0.41
2:H:215:TRP:HA	3:F:314:GLY:O	2.20	0.41
2:H:48:SER:OG	2:H:49:ASP:N	2.54	0.41
4:K:105:LEU:O	4:K:106:LEU:HD12	2.20	0.41
5:M:187:ARG:NH2	5:M:222:ASP:OD1	2.53	0.41
4:K:16:ILE:N	5:M:194:ASP:OD2	2.54	0.41
2:H:174:ILE:HD12	3:F:308:TYR:HE1	1.84	0.41
2:H:17:VAL:O	2:H:18:GLU:HB2	2.21	0.41
2:H:160:LEU:HD23	2:H:184(A):TYR:CE2	2.55	0.41
2:H:66:VAL:O	2:H:82:ILE:HA	2.20	0.41
4:K:82:ILE:HG22	4:K:83:SER:N	2.36	0.41
2:H:20:GLN:O	2:H:156:GLN:HA	2.21	0.41
2:H:17:VAL:HG21	2:H:220:CYS:HB3	2.03	0.41
2:H:35:ARG:HD3	2:H:39:GLU:OE1	2.21	0.41
2:H:34:PHE:HE2	2:H:38:GLN:HB3	1.81	0.41
4:K:49:ASP:OD2	4:K:111:PRO:HB2	2.21	0.41
2:H:16:ILE:O	2:H:144:ARG:HA	2.20	0.41
1:L:1(B):ALA:O	2:H:206:ARG:NH1	2.53	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:K:33:LEU:HD23	4:K:33:LEU:HA	1.96	0.40
5:M:200:VAL:HG12	5:M:209:GLN:HA	2.03	0.40
5:M:171:SER:HB2	5:M:225:TYR:HE2	1.85	0.40
2:H:35:ARG:O	2:H:38:GLN:HA	2.22	0.40
5:M:203:SER:HB2	5:M:208:TYR:HE2	1.86	0.40
2:H:17:VAL:HG11	2:H:221:ASP:HB2	2.03	0.40
4:K:86:ASP:HB3	4:K:107:LYS:CG	2.41	0.40
4:K:57:HIS:CE1	5:M:195:SER:OG	2.74	0.40
5:M:236:LYS:HE2	6:M:586:HOH:O	2.21	0.40

All (3) 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)
2:H:186(C):GLY:O	4:K:145:ARG:NH1[1_545]	1.97	0.23
2:H:145:ARG:NE	5:M:186(C):GLY:O[1_545]	2.05	0.15
2:H:60(D):TRP:NE1	3:N:308:TYR:N[8_655]	2.06	0.14

## 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	J	27/49 (55%)	22 (82%)	4 (15%)	1 (4%)	<b>4</b> <b>4</b>
1	L	27/49 (55%)	20 (74%)	7 (26%)	0	<b>100</b> <b>100</b>
2	H	243/259 (94%)	213 (88%)	26 (11%)	4 (2%)	<b>11</b> <b>19</b>
3	F	3/23 (13%)	1 (33%)	1 (33%)	1 (33%)	<b>0</b> <b>0</b>
3	N	3/23 (13%)	1 (33%)	2 (67%)	0	<b>100</b> <b>100</b>
4	K	144/150 (96%)	126 (88%)	16 (11%)	2 (1%)	<b>12</b> <b>22</b>
5	M	99/109 (91%)	86 (87%)	12 (12%)	1 (1%)	<b>17</b> <b>31</b>

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	546/662 (82%)	469 (86%)	68 (12%)	9 (2%)	11 19

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	H	111	PRO
5	M	205	ASN
2	H	79	VAL
3	F	316	ARG
4	K	77(A)	ARG
1	J	14(A)	GLN
4	K	130	LEU
2	H	29	TRP
2	H	242	ILE

### 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	J	26/43 (60%)	24 (92%)	2 (8%)	14 27
1	L	26/43 (60%)	25 (96%)	1 (4%)	36 62
2	H	216/226 (96%)	181 (84%)	35 (16%)	2 4
3	F	4/15 (27%)	4 (100%)	0	100 100
3	N	4/15 (27%)	4 (100%)	0	100 100
4	K	130/134 (97%)	114 (88%)	16 (12%)	5 10
5	M	86/92 (94%)	76 (88%)	10 (12%)	6 11
All	All	492/568 (87%)	428 (87%)	64 (13%)	4 8

All (64) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	L	14(L)	GLU
2	H	24	VAL

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	H	27	SER
2	H	32	MET
2	H	33	LEU
2	H	36	LYS
2	H	40	LEU
2	H	46	LEU
2	H	48	SER
2	H	60(E)	ASP
2	H	62	ASP
2	H	63	ASP
2	H	66	VAL
2	H	75	ARG
2	H	76	TYR
2	H	99	LEU
2	H	105	LEU
2	H	110	ARG
2	H	113	GLU
2	H	126	LYS
2	H	127	GLN
2	H	129(C)	LEU
2	H	137	ARG
2	H	144	ARG
2	H	145	ARG
2	H	150	VAL
2	H	153	SER
2	H	154	VAL
2	H	157	VAL
2	H	173	ARG
2	H	195	SER
2	H	204(B)	ASN
2	H	210	MET
2	H	221(A)	ARG
2	H	236	LYS
2	H	239	GLN
1	J	14(E)	GLU
1	J	14(F)	LEU
4	K	26	LEU
4	K	45	SER
4	K	48	SER
4	K	50	ARG
4	K	60(B)	PRO
4	K	60(F)	LYS

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Mol	Chain	Res	Type
4	K	62	ASP
4	K	74	THR
4	K	77(A)	ARG
4	K	81	LYS
4	K	84	MET
4	K	93	ARG
4	K	107	LYS
4	K	117	TYR
4	K	139	THR
4	K	145	ARG
5	M	153	SER
5	M	169	LYS
5	M	171	SER
5	M	182	CYS
5	M	186	PRO
5	M	187	ARG
5	M	233	ARG
5	M	236	LYS
5	M	239	GLN
5	M	242	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
2	H	38	GLN
2	H	71	HIS
2	H	98	ASN
2	H	127	GLN
2	H	143	ASN
2	H	204(B)	ASN
1	J	13	GLN
4	K	20	GLN
4	K	38	GLN
4	K	71	HIS
4	K	131	HIS
5	M	156	GLN
5	M	159	ASN
5	M	204(B)	ASN
5	M	239	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 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 [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

### 6.3 Carbohydrates [i](#)

EDS was not executed - this section is therefore empty.

### 6.4 Ligands [i](#)

EDS was not executed - this section is therefore empty.

### 6.5 Other polymers [i](#)

EDS was not executed - this section is therefore empty.