



# wwPDB X-ray Structure Validation Summary Report ⓘ

Feb 1, 2016 – 12:42 AM GMT

PDB ID : 2BDI  
Title : Human Kallikrein 4 complex with cobalt and p-aminobenzamidine  
Authors : Debela, M.; Bode, W.; Goettig, P.; Structural Proteomics in Europe (SPINE)  
Deposited on : 2005-10-20  
Resolution : 3.00 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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  
<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  
Mogul : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
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) : trunk26865

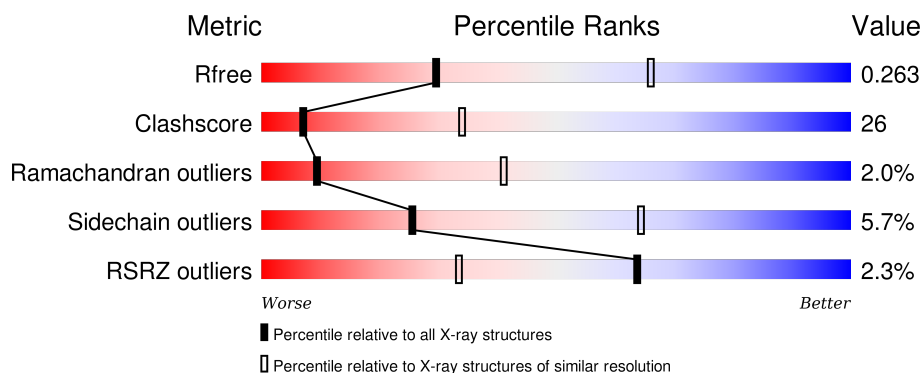
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 3.00 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	91344	1578 (3.00-3.00)
Clashscore	102246	1912 (3.00-3.00)
Ramachandran outliers	100387	1853 (3.00-3.00)
Sidechain outliers	100360	1856 (3.00-3.00)
RSRZ outliers	91569	1592 (3.00-3.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments 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.

Mol	Chain	Length	Quality of chain
1	A	223	<div> <div>3%</div> <div> <div></div> <div>51%</div> <div>44%</div> <div>•</div> </div> </div>
1	B	223	<div> <div>3%</div> <div> <div></div> <div>53%</div> <div>43%</div> <div>•</div> </div> </div>
1	C	223	<div> <div>3%</div> <div> <div></div> <div>51%</div> <div>42%</div> <div>6%</div> <div>•</div> </div> </div>
1	D	223	<div> <div>2%</div> <div> <div></div> <div>55%</div> <div>41%</div> <div>•</div> <div>•</div> </div> </div>
1	E	223	<div> <div>2%</div> <div> <div></div> <div>52%</div> <div>44%</div> <div>•</div> <div>•</div> </div> </div>

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Length	Quality of chain
1	F	223	
1	G	223	
1	H	223	
1	I	223	
1	J	223	
1	K	223	
1	L	223	
1	M	223	
1	N	223	
1	O	223	
1	P	223	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	PBZ	A	701	-	X	-	-
3	PBZ	D	704	-	-	X	-
3	PBZ	O	715	-	-	X	-
3	PBZ	P	716	-	-	X	-

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 27340 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.

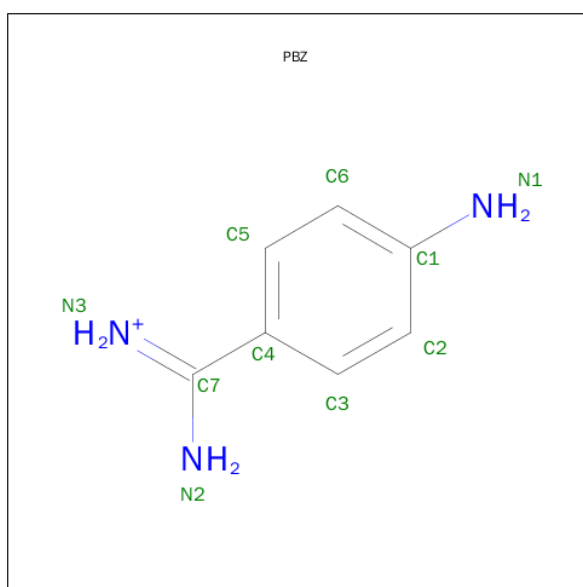
- Molecule 1 is a protein called Kallikrein-4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	223	Total	C	N	O	S	135	0	0
			1670	1043	281	329	17			
1	B	223	Total	C	N	O	S	80	0	0
			1670	1043	281	329	17			
1	C	223	Total	C	N	O	S	62	0	0
			1670	1043	281	329	17			
1	D	223	Total	C	N	O	S	91	0	0
			1670	1043	281	329	17			
1	E	223	Total	C	N	O	S	90	0	0
			1670	1043	281	329	17			
1	F	223	Total	C	N	O	S	54	0	0
			1670	1043	281	329	17			
1	G	223	Total	C	N	O	S	81	0	0
			1670	1043	281	329	17			
1	H	223	Total	C	N	O	S	120	0	0
			1670	1043	281	329	17			
1	I	223	Total	C	N	O	S	105	0	0
			1670	1043	281	329	17			
1	J	223	Total	C	N	O	S	56	0	0
			1670	1043	281	329	17			
1	K	223	Total	C	N	O	S	78	0	0
			1670	1043	281	329	17			
1	L	223	Total	C	N	O	S	73	0	0
			1670	1043	281	329	17			
1	M	223	Total	C	N	O	S	48	0	0
			1670	1043	281	329	17			
1	N	223	Total	C	N	O	S	63	0	0
			1670	1043	281	329	17			
1	O	223	Total	C	N	O	S	67	0	0
			1670	1043	281	329	17			
1	P	223	Total	C	N	O	S	86	0	0
			1670	1043	281	329	17			

- Molecule 2 is COBALT (II) ION (three-letter code: CO) (formula: Co).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	I	1	Total	Co	0	0
			1	1		
2	A	1	Total	Co	0	0
			1	1		
2	M	1	Total	Co	0	0
			1	1		
2	E	1	Total	Co	0	0
			1	1		

- Molecule 3 is P-AMINO BENZAMIDINE (three-letter code: PBZ) (formula: C<sub>7</sub>H<sub>10</sub>N<sub>3</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	N	0	0
			10	7	3		
3	B	1	Total	C	N	0	0
			10	7	3		
3	C	1	Total	C	N	0	0
			10	7	3		
3	D	1	Total	C	N	0	0
			10	7	3		
3	E	1	Total	C	N	0	0
			10	7	3		
3	F	1	Total	C	N	0	0
			10	7	3		
3	G	1	Total	C	N	0	0
			10	7	3		

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	H	1	Total	C	N	0	0
			10	7	3		
3	I	1	Total	C	N	0	0
			10	7	3		
3	J	1	Total	C	N	0	0
			10	7	3		
3	K	1	Total	C	N	0	0
			10	7	3		
3	L	1	Total	C	N	0	0
			10	7	3		
3	M	1	Total	C	N	0	0
			10	7	3		
3	N	1	Total	C	N	0	0
			10	7	3		
3	O	1	Total	C	N	0	0
			10	7	3		
3	P	1	Total	C	N	0	0
			10	7	3		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	26	Total	O	0	0
			26	26		
4	B	27	Total	O	0	0
			27	27		
4	C	30	Total	O	0	0
			30	30		
4	D	37	Total	O	0	0
			37	37		
4	E	26	Total	O	0	0
			26	26		
4	F	36	Total	O	0	0
			36	36		
4	G	25	Total	O	0	0
			25	25		
4	H	21	Total	O	0	0
			21	21		
4	I	20	Total	O	0	0
			20	20		
4	J	22	Total	O	0	0
			22	22		

*Continued on next page...*

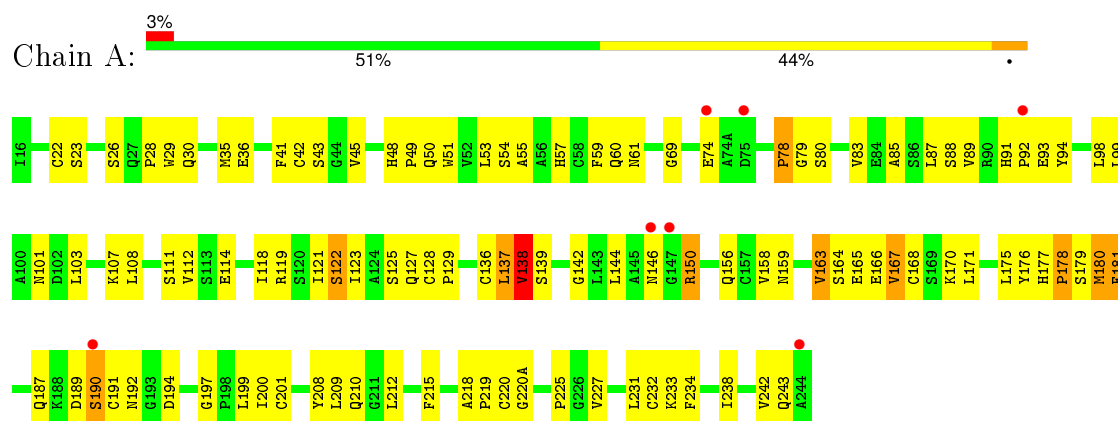
*Continued from previous page...*

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	K	21	Total 21	O 21	0	0
4	L	39	Total 39	O 39	0	0
4	M	37	Total 37	O 37	0	0
4	N	29	Total 29	O 29	0	0
4	O	28	Total 28	O 28	0	0
4	P	32	Total 32	O 32	0	0

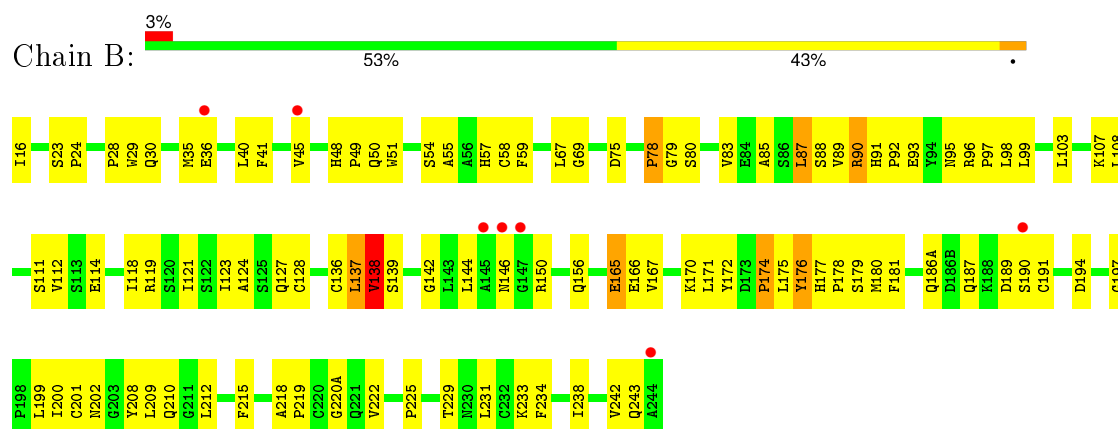
### 3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

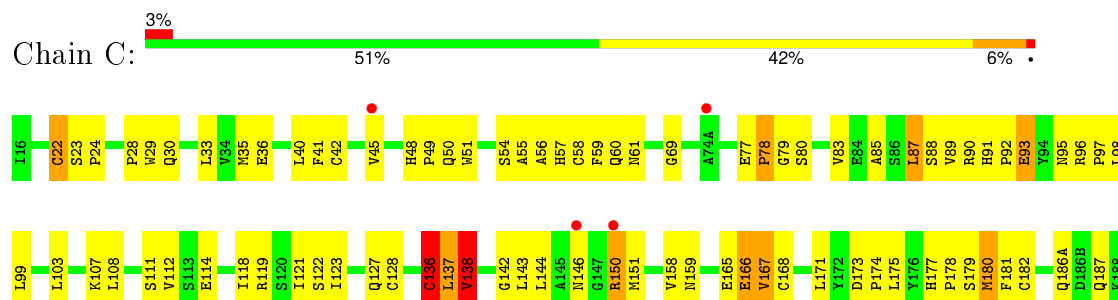
#### • Molecule 1: Kallikrein-4



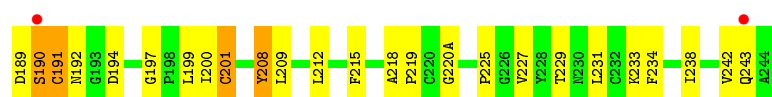
#### • Molecule 1: Kallikrein-4



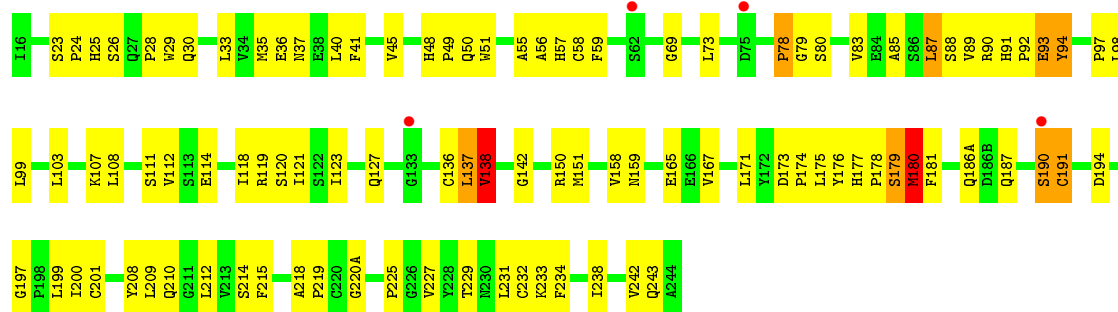
#### • Molecule 1: Kallikrein-4



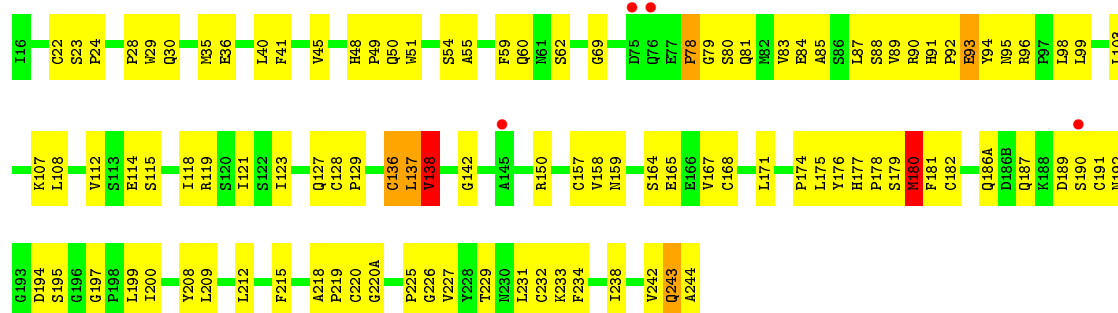




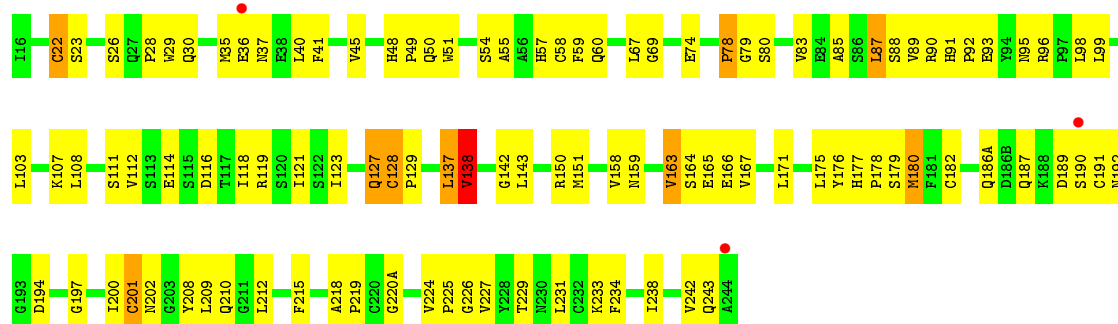
• Molecule 1: Kallikrein-4



• Molecule 1: Kallikrein-4

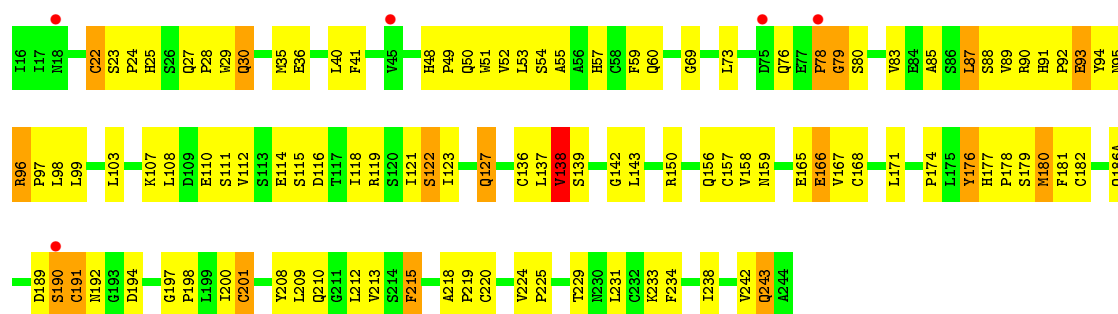


• Molecule 1: Kallikrein-4

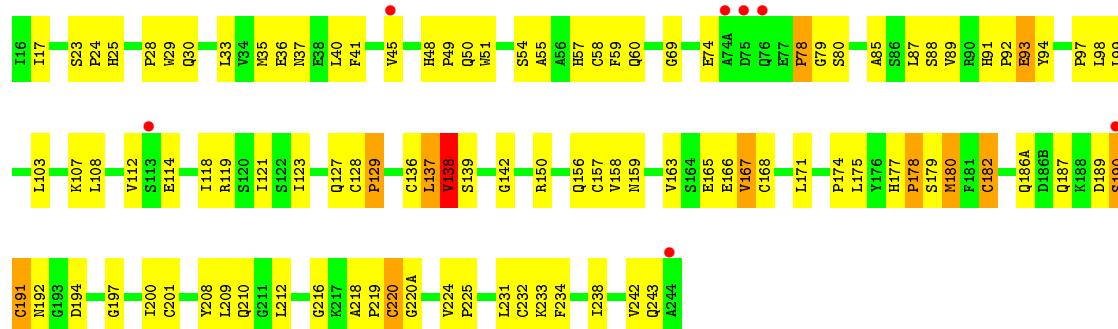


• Molecule 1: Kallikrein-4

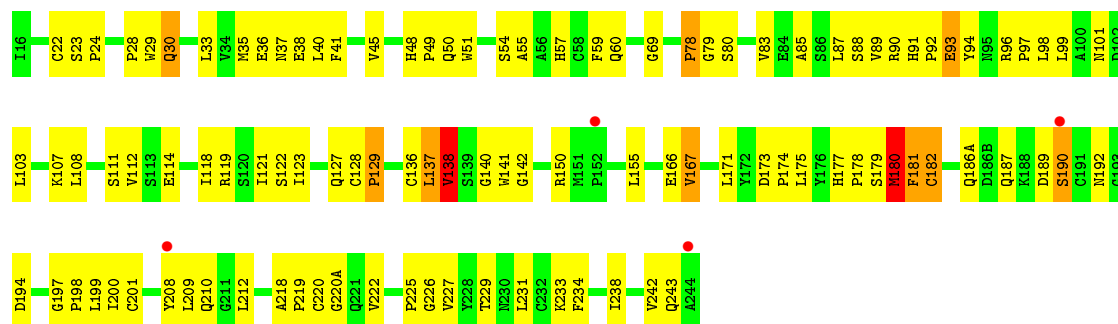




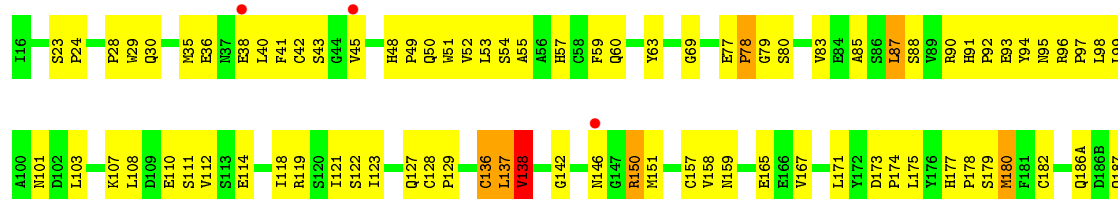
• Molecule 1: Kallikrein-4

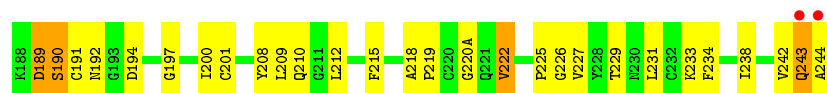


• Molecule 1: Kallikrein-4

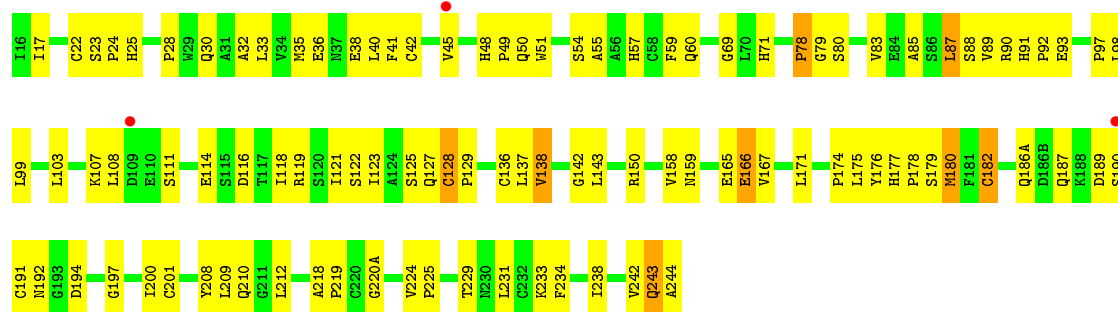


• Molecule 1: Kallikrein-4

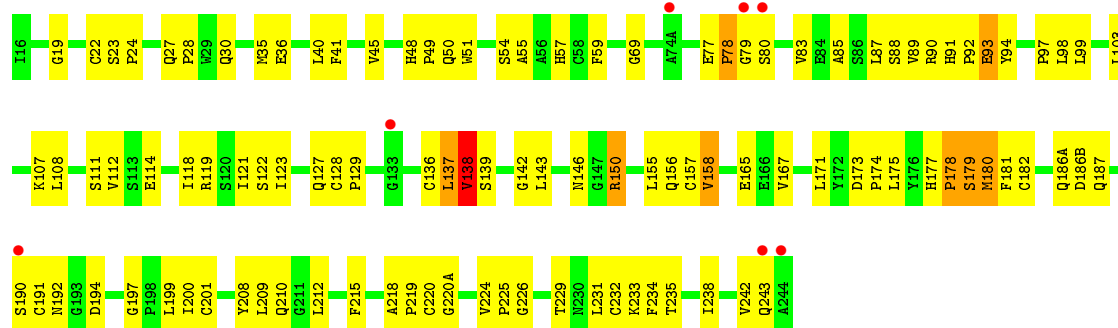




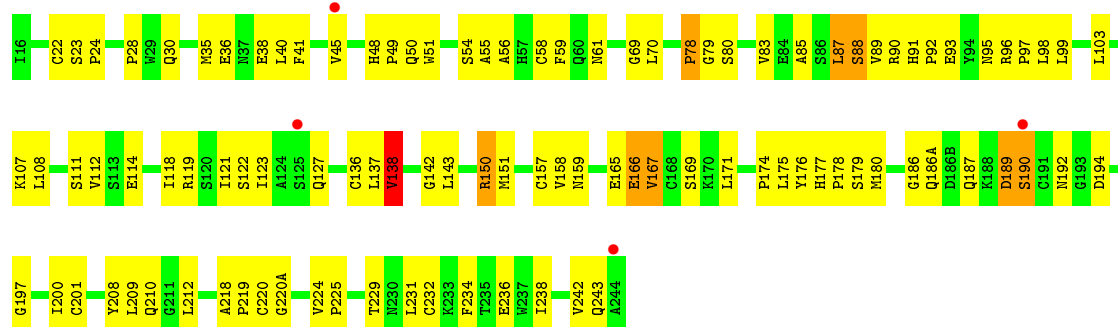
• Molecule 1: Kallikrein-4



• Molecule 1: Kallikrein-4

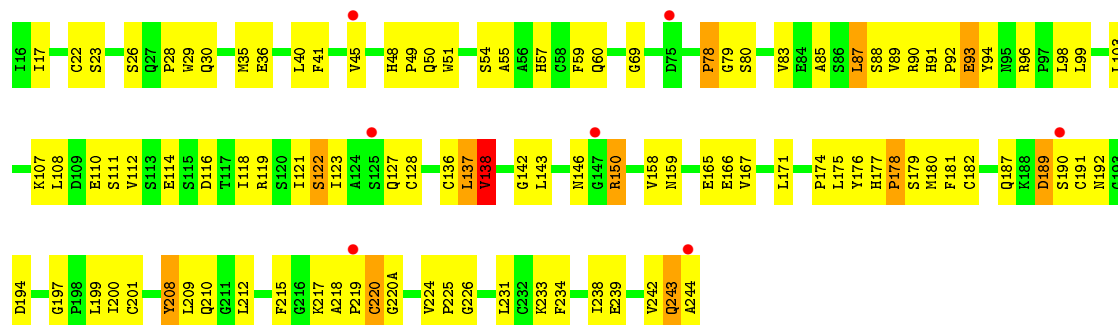


• Molecule 1: Kallikrein-4

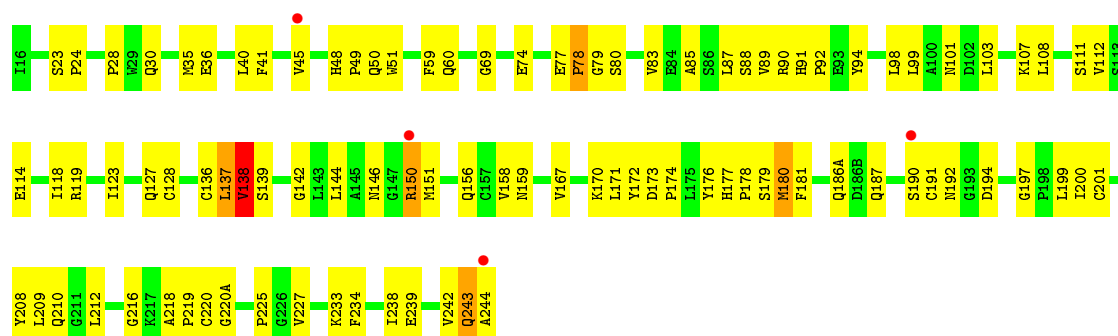


• Molecule 1: Kallikrein-4

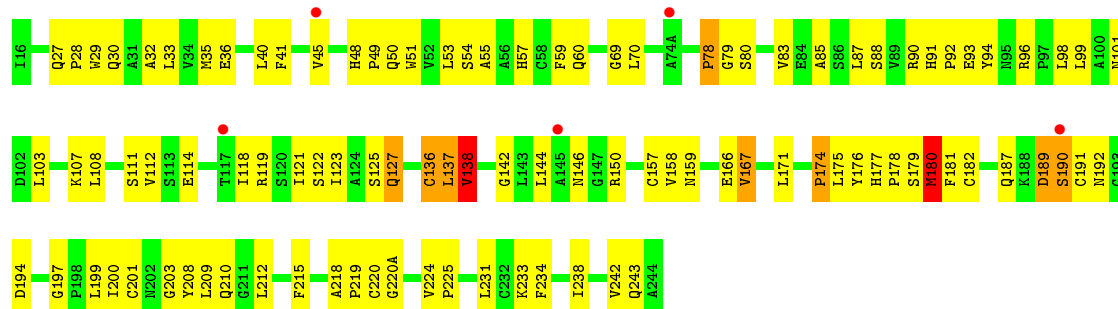




● Molecule 1: Kallikrein-4



● Molecule 1: Kallikrein-4



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	147.05Å 73.86Å 154.38Å 90.00° 102.41° 90.00°	Depositor
Resolution (Å)	19.90 – 3.00 19.88 – 3.00	Depositor EDS
% Data completeness (in resolution range)	96.6 (19.90-3.00) 96.6 (19.88-3.00)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.13	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.03 (at 2.98Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.258 , 0.296 0.259 , 0.263	Depositor DCC
$R_{free}$ test set	3199 reflections (5.08%)	DCC
Wilson B-factor (Å <sup>2</sup> )	42.6	Xtriage
Anisotropy	0.279	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 61.5	EDS
Estimated twinning fraction	0.000 for l,-k,h	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	1 of 62929 reflections (0.002%)	Xtriage
$F_o, F_c$ correlation	0.88	EDS
Total number of atoms	27340	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	31.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 46.08 % of the origin peak, indicating pseudo translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo translational symmetry is equal to 1.2048e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<sup>1</sup> Intensities estimated from amplitudes.

<sup>2</sup> Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.375 respectively for untwinned datasets, and 0.333, 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: CO, PBZ

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	1.34	5/1707 (0.3%)	1.06	3/2323 (0.1%)
1	B	1.38	8/1707 (0.5%)	1.03	5/2323 (0.2%)
1	C	1.35	10/1707 (0.6%)	1.05	7/2323 (0.3%)
1	D	1.41	12/1707 (0.7%)	1.04	3/2323 (0.1%)
1	E	1.37	6/1707 (0.4%)	1.05	4/2323 (0.2%)
1	F	1.43	7/1707 (0.4%)	1.04	5/2323 (0.2%)
1	G	1.43	17/1707 (1.0%)	1.09	6/2323 (0.3%)
1	H	1.37	11/1707 (0.6%)	1.08	7/2323 (0.3%)
1	I	1.31	4/1707 (0.2%)	1.04	4/2323 (0.2%)
1	J	1.35	5/1707 (0.3%)	1.02	5/2323 (0.2%)
1	K	1.34	8/1707 (0.5%)	1.03	3/2323 (0.1%)
1	L	1.36	9/1707 (0.5%)	1.05	5/2323 (0.2%)
1	M	1.43	9/1707 (0.5%)	1.02	3/2323 (0.1%)
1	N	1.41	10/1707 (0.6%)	1.04	4/2323 (0.2%)
1	O	1.34	4/1707 (0.2%)	1.02	3/2323 (0.1%)
1	P	1.38	6/1707 (0.4%)	1.06	4/2323 (0.2%)
All	All	1.38	131/27312 (0.5%)	1.05	71/37168 (0.2%)

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
1	A	0	1
1	B	0	1
1	G	0	1
1	I	0	1
1	K	0	1
1	N	0	1
1	P	0	1

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	#Chirality outliers	#Planarity outliers
All	All	0	7

The worst 5 of 131 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L	93	GLU	CD-OE1	9.43	1.36	1.25
1	G	201	CYS	CB-SG	9.03	1.97	1.82
1	J	167	VAL	CB-CG2	-8.77	1.34	1.52
1	C	167	VAL	CB-CG2	-8.74	1.34	1.52
1	B	167	VAL	CB-CG2	-8.60	1.34	1.52

The worst 5 of 71 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	P	157	CYS	CA-CB-SG	-10.44	95.21	114.00
1	G	22	CYS	CA-CB-SG	-9.62	96.67	114.00
1	A	22	CYS	CA-CB-SG	8.11	128.59	114.00
1	N	128	CYS	CA-CB-SG	-7.46	100.58	114.00
1	C	22	CYS	CA-CB-SG	-7.44	100.60	114.00

There are no chirality outliers.

5 of 7 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	181	PHE	Sidechain
1	B	176	TYR	Sidechain
1	G	181	PHE	Sidechain
1	I	181	PHE	Sidechain
1	K	176	TYR	Sidechain

## 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	1670	0	1598	87	0
1	B	1670	0	1598	81	3

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	1670	0	1598	90	3
1	D	1670	0	1598	85	0
1	E	1670	0	1600	80	1
1	F	1670	0	1598	86	1
1	G	1670	0	1602	112	1
1	H	1670	0	1598	72	2
1	I	1670	0	1598	83	1
1	J	1670	0	1598	95	0
1	K	1670	0	1598	86	0
1	L	1670	0	1598	80	0
1	M	1670	0	1598	81	0
1	N	1670	0	1600	88	1
1	O	1670	0	1598	76	1
1	P	1670	0	1598	95	0
2	A	1	0	0	0	0
2	E	1	0	0	0	0
2	I	1	0	0	0	0
2	M	1	0	0	0	0
3	A	10	0	10	2	0
3	B	10	0	10	2	0
3	C	10	0	10	0	0
3	D	10	0	10	7	0
3	E	10	0	10	2	0
3	F	10	0	10	1	0
3	G	10	0	10	2	0
3	H	10	0	8	5	0
3	I	10	0	10	2	0
3	J	10	0	10	2	0
3	K	10	0	10	0	0
3	L	10	0	10	1	0
3	M	10	0	10	2	0
3	N	10	0	10	2	0
3	O	10	0	10	8	0
3	P	10	0	10	6	0
4	A	26	0	0	7	0
4	B	27	0	0	5	0
4	C	30	0	0	3	1
4	D	37	0	0	6	0
4	E	26	0	0	6	0
4	F	36	0	0	8	1
4	G	25	0	0	11	0
4	H	21	0	0	4	0

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	I	20	0	0	7	0
4	J	22	0	0	6	0
4	K	21	0	0	2	1
4	L	39	0	0	8	1
4	M	37	0	0	5	0
4	N	29	0	0	6	0
4	O	28	0	0	1	0
4	P	32	0	0	15	0
All	All	27340	0	25734	1310	9

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 26.

The worst 5 of 1310 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:J:110:GLU:HA	4:J:731:HOH:O	1.31	1.21
1:B:136:CYS:HB3	1:B:200:ILE:O	1.40	1.20
1:I:96:ARG:NH1	4:I:719:HOH:O	1.91	1.02
1:G:116:ASP:HA	4:G:724:HOH:O	1.59	1.02
1:G:243:GLN:HG2	1:K:243:GLN:HB3	1.39	1.01

The worst 5 of 9 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)
1:H:119:ARG:NH1	4:F:731:HOH:O[1_565]	1.91	0.29
1:E:84:GLU:OE2	1:G:76:GLN:OE1[2_555]	2.01	0.19
1:B:75:ASP:O	1:C:146:ASN:CB[2_544]	2.02	0.18
1:N:239:GLU:CG	4:L:740:HOH:O[1_545]	2.09	0.11
1:I:37:ASN:OD1	4:K:720:HOH:O[2_454]	2.09	0.11

## 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	221/223 (99%)	194 (88%)	22 (10%)	5 (2%)	8	36
1	B	221/223 (99%)	195 (88%)	22 (10%)	4 (2%)	11	45
1	C	221/223 (99%)	192 (87%)	25 (11%)	4 (2%)	11	45
1	D	221/223 (99%)	196 (89%)	21 (10%)	4 (2%)	11	45
1	E	221/223 (99%)	195 (88%)	22 (10%)	4 (2%)	11	45
1	F	221/223 (99%)	198 (90%)	19 (9%)	4 (2%)	11	45
1	G	221/223 (99%)	193 (87%)	24 (11%)	4 (2%)	11	45
1	H	221/223 (99%)	196 (89%)	19 (9%)	6 (3%)	6	32
1	I	221/223 (99%)	196 (89%)	20 (9%)	5 (2%)	8	36
1	J	221/223 (99%)	195 (88%)	22 (10%)	4 (2%)	11	45
1	K	221/223 (99%)	194 (88%)	23 (10%)	4 (2%)	11	45
1	L	221/223 (99%)	194 (88%)	22 (10%)	5 (2%)	8	36
1	M	221/223 (99%)	194 (88%)	23 (10%)	4 (2%)	11	45
1	N	221/223 (99%)	195 (88%)	22 (10%)	4 (2%)	11	45
1	O	221/223 (99%)	194 (88%)	22 (10%)	5 (2%)	8	36
1	P	221/223 (99%)	194 (88%)	23 (10%)	4 (2%)	11	45
All	All	3536/3568 (99%)	3115 (88%)	351 (10%)	70 (2%)	9	41

5 of 70 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	78	PRO
1	B	78	PRO
1	C	78	PRO
1	D	78	PRO
1	E	78	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	189/189 (100%)	178 (94%)	11 (6%)	25	63
1	B	189/189 (100%)	178 (94%)	11 (6%)	25	63
1	C	189/189 (100%)	176 (93%)	13 (7%)	19	56
1	D	189/189 (100%)	178 (94%)	11 (6%)	25	63
1	E	189/189 (100%)	178 (94%)	11 (6%)	25	63
1	F	189/189 (100%)	178 (94%)	11 (6%)	25	63
1	G	189/189 (100%)	178 (94%)	11 (6%)	25	63
1	H	189/189 (100%)	178 (94%)	11 (6%)	25	63
1	I	189/189 (100%)	178 (94%)	11 (6%)	25	63
1	J	189/189 (100%)	179 (95%)	10 (5%)	28	67
1	K	189/189 (100%)	179 (95%)	10 (5%)	28	67
1	L	189/189 (100%)	178 (94%)	11 (6%)	25	63
1	M	189/189 (100%)	180 (95%)	9 (5%)	31	71
1	N	189/189 (100%)	177 (94%)	12 (6%)	22	60
1	O	189/189 (100%)	179 (95%)	10 (5%)	28	67
1	P	189/189 (100%)	179 (95%)	10 (5%)	28	67
All	All	3024/3024 (100%)	2851 (94%)	173 (6%)	25	64

5 of 173 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	G	190	SER
1	I	138	VAL
1	O	150	ARG
1	H	87	LEU
1	H	178	PRO

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 135 such sidechains are listed below:

Mol	Chain	Res	Type
1	H	18	ASN
1	J	18	ASN
1	O	177	HIS
1	H	30	GLN
1	I	18	ASN

### 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 20 ligands modelled in this entry, 4 are monoatomic - leaving 16 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the chemical component dictionary. The Link column lists molecule types, if any, to which the group is linked. 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  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z  > 2$	Counts	RMSZ	# $ Z  > 2$
3	PBZ	A	701	-	10,10,10	4.52	7 (70%)	11,13,13	2.59	7 (63%)
3	PBZ	B	702	-	10,10,10	2.99	3 (30%)	11,13,13	1.42	1 (9%)
3	PBZ	C	703	-	10,10,10	1.99	4 (40%)	11,13,13	1.61	2 (18%)
3	PBZ	D	704	-	10,10,10	2.34	3 (30%)	11,13,13	1.39	2 (18%)
3	PBZ	E	705	-	10,10,10	3.43	5 (50%)	11,13,13	1.28	1 (9%)
3	PBZ	F	706	-	10,10,10	1.54	2 (20%)	11,13,13	1.55	2 (18%)
3	PBZ	G	707	-	10,10,10	2.87	4 (40%)	11,13,13	1.77	4 (36%)
3	PBZ	H	708	-	10,10,10	2.92	6 (60%)	11,13,13	1.40	1 (9%)
3	PBZ	I	709	-	10,10,10	3.40	7 (70%)	11,13,13	0.71	0
3	PBZ	J	710	-	10,10,10	1.81	2 (20%)	11,13,13	0.93	1 (9%)
3	PBZ	K	711	-	10,10,10	1.91	2 (20%)	11,13,13	1.24	1 (9%)
3	PBZ	L	712	-	10,10,10	3.76	9 (90%)	11,13,13	0.73	0
3	PBZ	M	713	-	10,10,10	1.61	2 (20%)	11,13,13	1.67	3 (27%)
3	PBZ	N	714	-	10,10,10	3.26	5 (50%)	11,13,13	1.76	3 (27%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	PBZ	O	715	-	10,10,10	2.46	5 (50%)	11,13,13	1.79	4 (36%)
3	PBZ	P	716	-	10,10,10	3.60	7 (70%)	11,13,13	1.05	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the chemical component dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	PBZ	A	701	-	-	0/4/4/4	0/1/1/1
3	PBZ	B	702	-	-	0/4/4/4	0/1/1/1
3	PBZ	C	703	-	-	0/4/4/4	0/1/1/1
3	PBZ	D	704	-	-	0/4/4/4	0/1/1/1
3	PBZ	E	705	-	-	0/4/4/4	0/1/1/1
3	PBZ	F	706	-	-	0/4/4/4	0/1/1/1
3	PBZ	G	707	-	-	0/4/4/4	0/1/1/1
3	PBZ	H	708	-	-	0/4/4/4	0/1/1/1
3	PBZ	I	709	-	-	0/4/4/4	0/1/1/1
3	PBZ	J	710	-	-	0/4/4/4	0/1/1/1
3	PBZ	K	711	-	-	0/4/4/4	0/1/1/1
3	PBZ	L	712	-	-	0/4/4/4	0/1/1/1
3	PBZ	M	713	-	-	0/4/4/4	0/1/1/1
3	PBZ	N	714	-	-	0/4/4/4	0/1/1/1
3	PBZ	O	715	-	-	0/4/4/4	0/1/1/1
3	PBZ	P	716	-	-	0/4/4/4	0/1/1/1

The worst 5 of 73 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	H	708	PBZ	C7-N2	-4.24	1.23	1.33
3	F	706	PBZ	C6-C1	-3.23	1.32	1.39
3	K	711	PBZ	C5-C4	-3.22	1.33	1.39
3	O	715	PBZ	C6-C1	-3.18	1.32	1.39
3	O	715	PBZ	C3-C4	-3.03	1.34	1.39

The worst 5 of 32 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	701	PBZ	C2-C1-N1	-4.45	111.97	120.90
3	A	701	PBZ	C5-C6-C1	-3.87	115.34	120.66
3	F	706	PBZ	C2-C3-C4	-3.54	116.66	120.76
3	N	714	PBZ	C6-C5-C4	-3.40	116.82	120.76

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	M	713	PBZ	C6-C5-C4	-3.15	117.11	120.76

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

14 monomers are involved in 44 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	701	PBZ	2	0
3	B	702	PBZ	2	0
3	D	704	PBZ	7	0
3	E	705	PBZ	2	0
3	F	706	PBZ	1	0
3	G	707	PBZ	2	0
3	H	708	PBZ	5	0
3	I	709	PBZ	2	0
3	J	710	PBZ	2	0
3	L	712	PBZ	1	0
3	M	713	PBZ	2	0
3	N	714	PBZ	2	0
3	O	715	PBZ	8	0
3	P	716	PBZ	6	0

## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	220/223 (98%)	-0.04	7 (3%)	51	23	9, 32, 56, 68	28 (12%)
1	B	222/223 (99%)	-0.13	7 (3%)	51	23	7, 30, 56, 65	20 (9%)
1	C	223/223 (100%)	-0.19	6 (2%)	58	28	7, 31, 56, 69	18 (8%)
1	D	222/223 (99%)	-0.07	4 (1%)	71	43	6, 30, 58, 67	22 (9%)
1	E	223/223 (100%)	-0.23	4 (1%)	71	43	7, 30, 55, 65	24 (10%)
1	F	223/223 (100%)	-0.20	3 (1%)	79	53	4, 27, 54, 64	17 (7%)
1	G	223/223 (100%)	-0.01	5 (2%)	65	35	5, 31, 58, 67	20 (8%)
1	H	223/223 (100%)	-0.02	7 (3%)	52	24	9, 31, 56, 68	30 (13%)
1	I	223/223 (100%)	-0.00	4 (1%)	71	43	10, 32, 56, 65	30 (13%)
1	J	223/223 (100%)	-0.12	5 (2%)	65	35	7, 32, 58, 65	18 (8%)
1	K	222/223 (99%)	-0.08	3 (1%)	78	51	5, 31, 56, 64	22 (9%)
1	L	223/223 (100%)	-0.10	7 (3%)	52	24	5, 32, 57, 67	20 (8%)
1	M	223/223 (100%)	-0.27	4 (1%)	71	43	6, 27, 54, 62	16 (7%)
1	N	223/223 (100%)	-0.14	7 (3%)	52	24	4, 29, 56, 68	18 (8%)
1	O	223/223 (100%)	-0.26	4 (1%)	71	43	6, 27, 55, 63	19 (8%)
1	P	223/223 (100%)	0.02	5 (2%)	65	35	8, 32, 57, 65	23 (10%)
All	All	3562/3568 (99%)	-0.12	82 (2%)	64	33	4, 30, 57, 69	345 (9%)

The worst 5 of 82 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	K	190	SER	6.1
1	C	190	SER	4.6
1	J	244	ALA	4.4
1	H	190	SER	4.3
1	H	76	GLN	4.3

## 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> 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	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
3	PBZ	G	707	10/10	0.84	0.32	1.46	62,65,66,67	0
3	PBZ	B	702	10/10	0.88	0.27	0.90	40,47,50,53	0
3	PBZ	N	714	10/10	0.85	0.29	0.86	33,39,41,45	0
3	PBZ	P	716	10/10	0.88	0.25	0.79	25,33,34,36	0
3	PBZ	I	709	10/10	0.89	0.28	0.71	45,46,48,50	0
3	PBZ	E	705	10/10	0.88	0.23	0.55	14,30,31,32	0
3	PBZ	F	706	10/10	0.91	0.24	0.53	22,26,28,28	0
3	PBZ	M	713	10/10	0.87	0.23	0.50	24,26,28,33	0
3	PBZ	J	710	10/10	0.90	0.24	0.47	38,39,42,42	0
3	PBZ	O	715	10/10	0.92	0.23	0.36	37,39,46,48	0
3	PBZ	L	712	10/10	0.86	0.26	0.36	35,37,42,45	0
3	PBZ	K	711	10/10	0.91	0.24	0.02	32,36,39,42	0
3	PBZ	C	703	10/10	0.91	0.23	-0.02	34,39,41,42	0
3	PBZ	H	708	10/10	0.92	0.21	-0.03	27,31,34,36	0
3	PBZ	D	704	10/10	0.91	0.21	-0.05	17,21,22,24	0
3	PBZ	A	701	10/10	0.93	0.19	-0.13	14,19,26,33	0
2	CO	A	1	1/1	0.91	0.09	-2.76	62,62,62,62	0
2	CO	E	2	1/1	0.97	0.07	-5.07	35,35,35,35	0
2	CO	M	4	1/1	0.99	0.07	-5.51	28,28,28,28	0
2	CO	I	3	1/1	0.97	0.04	-	63,63,63,63	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.