



# Full wwPDB X-ray Structure Validation Report ⓘ

Sep 19, 2023 – 04:22 AM EDT

PDB ID : 5D1Y  
Title : Low resolution crystal structure of human ribonucleotide reductase alpha6 hexamer in complex with dATP  
Authors : Ando, N.; Li, H.; Brignole, E.J.; Thompson, S.; McLaughlin, M.I.; Page, J.; Asturias, F.; Stubbe, J.; Drennan, C.L.  
Deposited on : 2015-08-04  
Resolution : 9.01 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.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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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  
Xtriage (Phenix) : 1.13  
EDS : 2.35.1  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.35.1

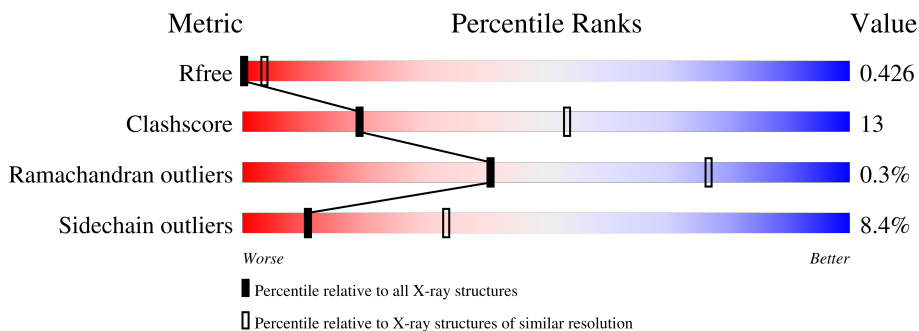
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 9.01 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	1005 (11.50-3.90)
Clashscore	141614	1070 (11.50-3.90)
Ramachandran outliers	138981	1003 (11.50-3.90)
Sidechain outliers	138945	1003 (11.50-3.86)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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  $\leq 5\%$ .

Mol	Chain	Length	Quality of chain
1	A	812	 70% 16% • 12%
1	B	812	 73% 16% • 9%

## 2 Entry composition i

There is only 1 type of molecule in this entry. The entry contains 11328 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 Ribonucleoside-diphosphate reductase large subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	714	Total	C	N	O	S	0	0	0
			5577	3567	926	1052	32			
1	B	738	Total	C	N	O	S	0	0	0
			5751	3669	968	1080	34			

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	initiating methionine	UNP P23921
A	-18	GLY	-	expression tag	UNP P23921
A	-17	SER	-	expression tag	UNP P23921
A	-16	SER	-	expression tag	UNP P23921
A	-15	HIS	-	expression tag	UNP P23921
A	-14	HIS	-	expression tag	UNP P23921
A	-13	HIS	-	expression tag	UNP P23921
A	-12	HIS	-	expression tag	UNP P23921
A	-11	HIS	-	expression tag	UNP P23921
A	-10	HIS	-	expression tag	UNP P23921
A	-9	SER	-	expression tag	UNP P23921
A	-8	SER	-	expression tag	UNP P23921
A	-7	GLY	-	expression tag	UNP P23921
A	-6	LEU	-	expression tag	UNP P23921
A	-5	VAL	-	expression tag	UNP P23921
A	-4	PRO	-	expression tag	UNP P23921
A	-3	ARG	-	expression tag	UNP P23921
A	-2	GLY	-	expression tag	UNP P23921
A	-1	SER	-	expression tag	UNP P23921
A	0	HIS	-	expression tag	UNP P23921
B	-19	MET	-	initiating methionine	UNP P23921
B	-18	GLY	-	expression tag	UNP P23921
B	-17	SER	-	expression tag	UNP P23921
B	-16	SER	-	expression tag	UNP P23921
B	-15	HIS	-	expression tag	UNP P23921

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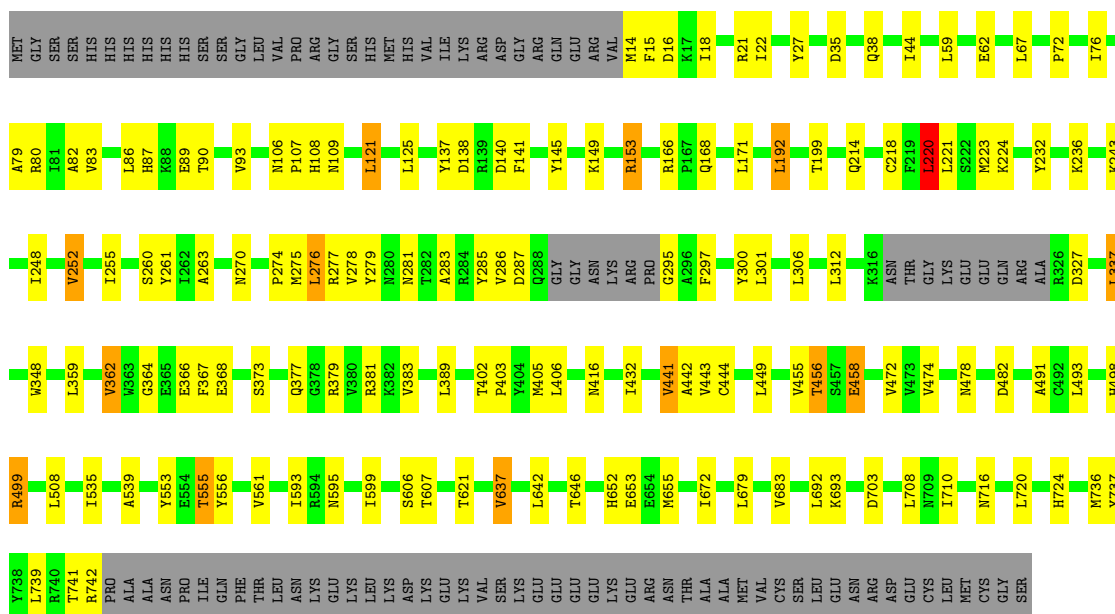
Chain	Residue	Modelled	Actual	Comment	Reference
B	-14	HIS	-	expression tag	UNP P23921
B	-13	HIS	-	expression tag	UNP P23921
B	-12	HIS	-	expression tag	UNP P23921
B	-11	HIS	-	expression tag	UNP P23921
B	-10	HIS	-	expression tag	UNP P23921
B	-9	SER	-	expression tag	UNP P23921
B	-8	SER	-	expression tag	UNP P23921
B	-7	GLY	-	expression tag	UNP P23921
B	-6	LEU	-	expression tag	UNP P23921
B	-5	VAL	-	expression tag	UNP P23921
B	-4	PRO	-	expression tag	UNP P23921
B	-3	ARG	-	expression tag	UNP P23921
B	-2	GLY	-	expression tag	UNP P23921
B	-1	SER	-	expression tag	UNP P23921
B	0	HIS	-	expression tag	UNP P23921

### 3 Residue-property plots

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

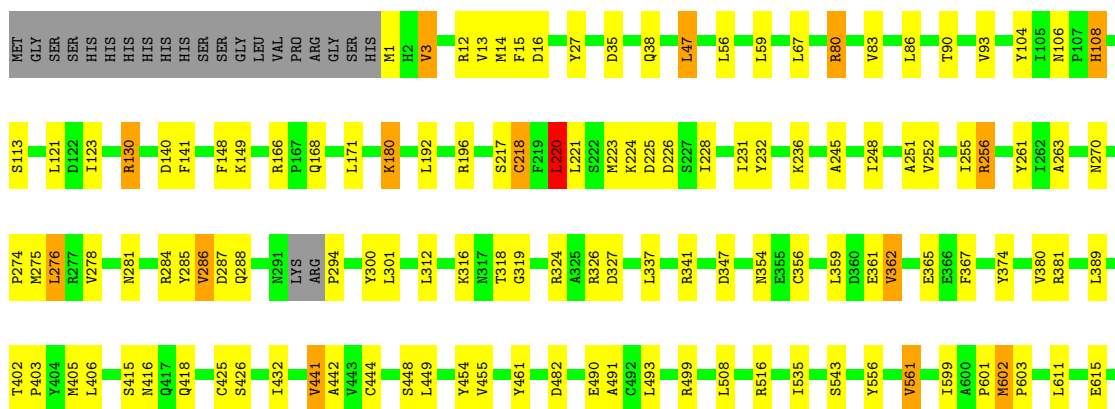
- Molecule 1: Ribonucleoside-diphosphate reductase large subunit

Chain A: 



- Molecule 1: Ribonucleoside-diphosphate reductase large subunit

Chain B: 



R627	R628	V629	LEU	SER	G632	I636	L645	R648	E671	I672	Q678	L679	L692	S707	L708	P715	M723	H724	L739	R740	T741	R742	PRO	ALA	ALA	ASN	ASN	PRO	ILE	GLN	PHE	THR	THR	LEU	ASN	LYS	GLU	LYS	LYS	LEU	LYS	LYS	ASP	LYS	GLU	LYS	VAL	SER	LYS	GLU	GLU	GLU
LYS	GLU	ARG	ASN	THR	ALA	ALA	MET	VAL	CYS	SER	LEU	GLU	ASN	ARG	ASP	GLU	CYS	LEU	MET	CYS	GLY	SER	LYS	GLU	ASN	ASN	PRO	ILE	GLN	PHE	THR	THR	LEU	ASN	LYS	GLU	LYS	LYS	LEU	LYS	LYS	ASP	LYS	GLU	LYS	VAL	SER	LYS	GLU	GLU	GLU	

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 41 3 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	356.01Å 356.01Å 356.01Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	75.90 – 9.01 75.90 – 8.55	Depositor EDS
% Data completeness (in resolution range)	99.9 (75.90-9.01) 85.6 (75.90-8.55)	Depositor EDS
$R_{merge}$	0.27	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	0.93 (at 8.40Å)	Xtrriage
Refinement program	PHENIX	Depositor
R, $R_{free}$	0.405 , 0.426 0.406 , 0.426	Depositor DCC
$R_{free}$ test set	707 reflections (10.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	407.3	Xtrriage
Anisotropy	0.000	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.62 , -10.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.44$ , $\langle L^2 \rangle = 0.27$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.83	EDS
Total number of atoms	11328	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	633.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.90% of the height of the origin peak. No significant pseudotranslation is detected.*

<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, 0.333 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	0.52	0/5699	0.63	3/7751 (0.0%)
1	B	0.45	0/5876	0.60	1/7986 (0.0%)
All	All	0.49	0/11575	0.61	4/15737 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	220	LEU	CA-CB-CG	7.02	131.46	115.30
1	A	499	ARG	NE-CZ-NH2	-6.56	117.02	120.30
1	A	220	LEU	CA-CB-CG	5.90	128.86	115.30
1	A	508	LEU	CA-CB-CG	5.29	127.48	115.30

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	5577	0	5412	199	28
1	B	5751	0	5584	185	14
All	All	11328	0	10996	288	28

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 13.

All (288) 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:A:261:TYR:HB2	1:B:108:HIS:CE1	1.10	1.62
1:B:83:VAL:CG1	1:B:141:PHE:HD1	1.16	1.59
1:B:86:LEU:HD13	1:B:148:PHE:CE1	1.39	1.54
1:A:281:ASN:CG	1:B:281:ASN:HB3	1.23	1.53
1:B:90:THR:CG2	1:B:140:ASP:OD1	1.63	1.43
1:A:261:TYR:CB	1:B:108:HIS:HE1	1.30	1.42
1:A:285:TYR:CD1	1:B:278:VAL:CG1	1.85	1.41
1:A:261:TYR:CB	1:B:108:HIS:CE1	2.03	1.38
1:A:106:ASN:HD22	1:B:263:ALA:CB	1.35	1.37
1:A:285:TYR:CE1	1:B:278:VAL:HG11	1.58	1.36
1:B:83:VAL:CG1	1:B:141:PHE:CD1	2.07	1.35
1:A:285:TYR:CD1	1:B:278:VAL:HG11	1.08	1.35
1:A:281:ASN:ND2	1:B:281:ASN:HB3	1.44	1.32
1:A:285:TYR:CE1	1:B:232:TYR:CZ	2.20	1.28
1:A:86:LEU:CD1	1:A:140:ASP:HB2	1.64	1.27
1:A:86:LEU:HD11	1:A:140:ASP:CB	1.67	1.25
1:A:90:THR:CB	1:A:137:TYR:CB	2.03	1.23
1:B:90:THR:HG23	1:B:166:ARG:CB	1.68	1.23
1:A:90:THR:CA	1:A:137:TYR:HB2	1.70	1.21
1:A:72:PRO:HG3	1:A:646:THR:CG2	1.70	1.21
1:A:281:ASN:CG	1:B:281:ASN:CB	2.09	1.20
1:B:90:THR:CG2	1:B:166:ARG:HD3	1.60	1.19
1:A:90:THR:HA	1:A:137:TYR:CB	1.72	1.18
1:A:232:TYR:OH	1:B:286:VAL:HB	1.05	1.18
1:A:89:GLU:O	1:A:166:ARG:NH1	1.78	1.17
1:A:90:THR:CA	1:A:137:TYR:CB	2.20	1.17
1:B:90:THR:HG22	1:B:166:ARG:HD3	1.17	1.16
1:B:83:VAL:HG12	1:B:141:PHE:HD1	1.04	1.15
1:A:236:LYS:HD2	1:B:236:LYS:HD2	1.18	1.14
1:A:232:TYR:OH	1:B:286:VAL:CB	1.95	1.13
1:B:86:LEU:CD1	1:B:148:PHE:CE1	2.31	1.12
1:A:232:TYR:CZ	1:B:286:VAL:HB	1.85	1.10
1:B:83:VAL:HG13	1:B:141:PHE:CD1	1.86	1.10
1:A:106:ASN:ND2	1:B:263:ALA:HB2	1.63	1.09
1:A:106:ASN:ND2	1:B:263:ALA:CB	2.12	1.09
1:A:236:LYS:HZ2	1:B:236:LYS:NZ	1.52	1.07
1:A:261:TYR:OH	1:B:104:TYR:HE2	1.38	1.07
1:A:281:ASN:CB	1:B:281:ASN:HB3	1.84	1.06
1:A:86:LEU:CD1	1:A:140:ASP:CB	2.28	1.06
1:B:123:ILE:CD1	1:B:180:LYS:HG2	1.86	1.05
1:A:236:LYS:NZ	1:B:236:LYS:HZ3	1.52	1.04

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:263:ALA:HB1	1:B:113:SER:HB3	1.40	1.04
1:A:72:PRO:HG3	1:A:646:THR:HG21	1.35	1.04
1:A:90:THR:HB	1:A:137:TYR:CB	1.83	1.04
1:B:83:VAL:HG12	1:B:141:PHE:CD1	1.79	1.02
1:A:90:THR:CB	1:A:137:TYR:HB2	1.79	1.02
1:A:263:ALA:HB1	1:B:113:SER:CB	1.90	1.01
1:B:90:THR:CG2	1:B:166:ARG:CD	2.40	0.99
1:B:90:THR:CG2	1:B:166:ARG:HB3	1.91	0.99
1:A:275:MET:O	1:B:285:TYR:CE2	2.16	0.98
1:A:261:TYR:OH	1:B:104:TYR:CE2	2.11	0.98
1:A:106:ASN:HD22	1:B:263:ALA:HB2	1.16	0.98
1:A:106:ASN:HD22	1:B:263:ALA:CA	1.77	0.97
1:A:90:THR:HA	1:A:137:TYR:HB3	1.43	0.97
1:B:83:VAL:HG13	1:B:141:PHE:HD1	1.22	0.97
1:A:86:LEU:HD11	1:A:140:ASP:HB2	0.98	0.97
1:A:285:TYR:CD1	1:B:232:TYR:OH	2.14	0.97
1:A:281:ASN:ND2	1:B:281:ASN:CB	2.25	0.96
1:A:285:TYR:CE1	1:B:232:TYR:OH	2.17	0.96
1:B:90:THR:HG23	1:B:166:ARG:HB3	0.95	0.95
1:A:106:ASN:ND2	1:B:263:ALA:CA	2.30	0.95
1:A:72:PRO:HG2	1:A:646:THR:HB	1.47	0.94
1:A:90:THR:HB	1:A:137:TYR:HB2	1.46	0.93
1:A:87:HIS:CD2	1:A:138:ASP:OD1	2.22	0.92
1:A:106:ASN:ND2	1:B:263:ALA:HA	1.84	0.92
1:A:90:THR:CA	1:A:137:TYR:HB3	1.90	0.91
1:A:72:PRO:CG	1:A:646:THR:HB	1.99	0.91
1:A:108:HIS:CB	1:B:261:TYR:CB	2.49	0.90
1:A:108:HIS:CB	1:B:261:TYR:CD1	2.53	0.90
1:B:86:LEU:HD13	1:B:148:PHE:CZ	2.07	0.89
1:B:90:THR:HG21	1:B:140:ASP:CG	1.91	0.89
1:A:275:MET:HA	1:B:285:TYR:HE2	1.37	0.87
1:A:285:TYR:CD1	1:B:278:VAL:HG13	2.10	0.87
1:A:108:HIS:CB	1:B:261:TYR:CG	2.57	0.87
1:A:236:LYS:HD2	1:B:236:LYS:CD	2.04	0.87
1:B:86:LEU:CD1	1:B:148:PHE:HE1	1.77	0.87
1:B:86:LEU:HD13	1:B:148:PHE:HE1	1.12	0.86
1:A:109:ASN:HD21	1:B:263:ALA:CB	1.88	0.86
1:A:277:ARG:HH12	1:B:284:ARG:CZ	1.88	0.86
1:A:86:LEU:HD21	1:A:138:ASP:O	1.77	0.85
1:A:285:TYR:CE1	1:B:232:TYR:CE2	2.66	0.84
1:A:236:LYS:NZ	1:B:236:LYS:NZ	2.15	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:275:MET:HA	1:B:285:TYR:CE2	2.14	0.82
1:A:72:PRO:HG3	1:A:646:THR:CB	2.09	0.82
1:B:90:THR:HG23	1:B:166:ARG:CG	2.08	0.82
1:A:285:TYR:HE1	1:B:232:TYR:CZ	1.97	0.81
1:A:275:MET:CA	1:B:285:TYR:HE2	1.93	0.81
1:B:90:THR:HG21	1:B:140:ASP:OD1	0.67	0.80
1:A:281:ASN:CB	1:B:281:ASN:CB	2.57	0.79
1:A:261:TYR:CD1	1:B:106:ASN:CB	2.67	0.77
1:A:86:LEU:HD11	1:A:140:ASP:CA	2.14	0.77
1:A:109:ASN:ND2	1:B:263:ALA:HB2	1.99	0.77
1:A:263:ALA:HB1	1:B:113:SER:OG	1.84	0.76
1:A:281:ASN:HB3	1:B:281:ASN:CB	2.16	0.75
1:B:223:MET:HG2	1:B:255:ILE:HD11	1.69	0.75
1:A:72:PRO:CG	1:A:646:THR:CB	2.63	0.75
1:A:62:GLU:CG	1:A:145:TYR:CE1	2.65	0.75
1:A:109:ASN:HD21	1:B:263:ALA:HB2	1.54	0.73
1:B:448:SER:HB3	1:B:602:MET:CE	2.17	0.73
1:B:196:ARG:HG2	1:B:611:LEU:HD22	1.71	0.73
1:B:83:VAL:HG11	1:B:141:PHE:HD1	1.46	0.72
1:A:106:ASN:HD22	1:B:263:ALA:HB1	1.51	0.72
1:A:86:LEU:CD2	1:A:138:ASP:O	2.37	0.72
1:B:123:ILE:HD13	1:B:180:LYS:HG2	1.70	0.72
1:A:261:TYR:CE1	1:B:106:ASN:CB	2.73	0.71
1:B:90:THR:CG2	1:B:166:ARG:CG	2.67	0.71
1:A:285:TYR:CD1	1:B:232:TYR:CZ	2.72	0.70
1:B:402:THR:HB	1:B:403:PRO:HA	1.74	0.68
1:A:108:HIS:CB	1:B:261:TYR:HB3	2.22	0.68
1:A:261:TYR:CB	1:B:108:HIS:ND1	2.57	0.67
1:B:448:SER:HB3	1:B:602:MET:HE1	1.75	0.66
1:A:279:TYR:HE2	1:B:285:TYR:HH	1.40	0.66
1:A:416:ASN:OD1	1:A:561:VAL:HG13	1.95	0.66
1:A:285:TYR:HE1	1:B:232:TYR:CE2	2.09	0.66
1:B:123:ILE:HD13	1:B:180:LYS:CG	2.26	0.66
1:A:478:ASN:HD22	1:A:499:ARG:HH11	1.44	0.65
1:A:285:TYR:CE1	1:B:278:VAL:CG1	2.50	0.65
1:A:281:ASN:HB3	1:B:281:ASN:HB2	1.77	0.64
1:B:123:ILE:HD11	1:B:180:LYS:HG2	1.80	0.64
1:A:87:HIS:HD2	1:A:138:ASP:OD1	1.76	0.63
1:A:223:MET:HG2	1:A:255:ILE:HD11	1.79	0.63
1:A:498:HIS:ND1	1:A:555:THR:HG21	2.14	0.63
1:A:285:TYR:HE2	1:B:275:MET:HA	1.64	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:270:ASN:HB3	1:B:274:PRO:HG2	1.80	0.62
1:A:283:ALA:HB1	1:A:295:GLY:O	2.00	0.62
1:B:218:CYS:HB3	1:B:444:CYS:SG	2.40	0.62
1:A:482:ASP:OD2	1:A:499:ARG:NH2	2.32	0.62
1:B:220:LEU:HG	1:B:442:ALA:HB3	1.82	0.61
1:A:285:TYR:OH	1:B:231:ILE:CG2	2.49	0.61
1:B:83:VAL:HG12	1:B:141:PHE:CE1	2.34	0.61
1:B:226:ASP:OD1	1:B:256:ARG:HD2	2.00	0.61
1:A:281:ASN:OD1	1:B:281:ASN:CG	2.39	0.60
1:A:90:THR:HA	1:A:137:TYR:HB2	1.46	0.60
1:B:645:LEU:HD21	1:B:672:ILE:HD12	1.83	0.60
1:B:123:ILE:CD1	1:B:180:LYS:CG	2.70	0.60
1:B:221:LEU:HD13	1:B:248:ILE:HG21	1.84	0.59
1:A:62:GLU:HG2	1:A:145:TYR:CE1	2.36	0.59
1:A:87:HIS:NE2	1:A:138:ASP:OD1	2.34	0.59
1:B:415:SER:O	1:B:418:GLN:HB2	2.02	0.59
1:A:86:LEU:CD1	1:A:140:ASP:HB3	2.28	0.59
1:A:153:ARG:HB2	1:A:153:ARG:HH11	1.66	0.59
1:A:277:ARG:HH12	1:B:284:ARG:NH2	2.00	0.59
1:A:90:THR:C	1:A:137:TYR:HB2	2.22	0.59
1:A:277:ARG:NH1	1:B:284:ARG:CZ	2.61	0.59
1:A:86:LEU:HD13	1:A:140:ASP:CB	2.29	0.59
1:B:245:ALA:HB2	1:B:288:GLN:OE1	2.03	0.58
1:A:281:ASN:CG	1:B:281:ASN:CG	2.62	0.58
1:A:72:PRO:CG	1:A:646:THR:CG2	2.62	0.57
1:A:236:LYS:HZ2	1:B:236:LYS:HZ3	0.70	0.57
1:A:456:THR:HG23	1:A:458:GLU:H	1.68	0.57
1:A:248:ILE:HD12	1:A:297:PHE:CE2	2.40	0.57
1:A:285:TYR:CB	1:B:278:VAL:HG13	2.34	0.57
1:A:72:PRO:CG	1:A:646:THR:HG21	2.22	0.57
1:A:456:THR:CG2	1:A:458:GLU:H	2.17	0.57
1:B:3:VAL:HG22	1:B:13:VAL:HG22	1.87	0.57
1:A:275:MET:C	1:B:285:TYR:HE2	2.07	0.57
1:B:535:ILE:HG22	1:B:599:ILE:HD12	1.86	0.57
1:A:82:ALA:O	1:A:141:PHE:CD1	2.59	0.56
1:B:324:ARG:HG3	1:B:326:ARG:NH2	2.20	0.56
1:A:478:ASN:ND2	1:A:499:ARG:HH11	2.04	0.56
1:A:637:VAL:HG22	1:A:642:LEU:HB2	1.88	0.56
1:A:86:LEU:CD1	1:A:140:ASP:C	2.73	0.55
1:A:108:HIS:CB	1:B:261:TYR:HB2	2.35	0.55
1:A:362:VAL:HG22	1:A:366:GLU:HB3	1.87	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:72:PRO:HG3	1:A:646:THR:HG22	1.78	0.55
1:A:263:ALA:CB	1:B:113:SER:OG	2.54	0.54
1:A:109:ASN:ND2	1:B:263:ALA:CB	2.59	0.53
1:A:637:VAL:HG13	1:A:642:LEU:HD22	1.90	0.53
1:A:261:TYR:CZ	1:B:104:TYR:HE2	2.24	0.53
1:A:285:TYR:CD1	1:B:232:TYR:CE2	2.97	0.53
1:B:221:LEU:HD13	1:B:248:ILE:CG2	2.38	0.53
1:A:275:MET:CE	1:A:276:LEU:HD13	2.38	0.53
1:A:402:THR:HB	1:A:403:PRO:HA	1.90	0.53
1:A:275:MET:CA	1:B:285:TYR:CE2	2.82	0.53
1:A:478:ASN:HD22	1:A:499:ARG:NH1	2.07	0.53
1:B:130:ARG:CG	1:B:130:ARG:HH11	2.22	0.53
1:A:153:ARG:HB2	1:A:153:ARG:NH1	2.23	0.52
1:A:86:LEU:HD13	1:A:140:ASP:C	2.29	0.52
1:A:27:TYR:O	1:A:80:ARG:NH2	2.39	0.52
1:A:655:MET:HE3	1:A:672:ILE:HD11	1.92	0.51
1:A:140:ASP:OD2	1:A:168:GLN:HG2	2.10	0.51
1:A:275:MET:HE2	1:A:276:LEU:HD13	1.91	0.51
1:B:223:MET:HE2	1:B:231:ILE:HG12	1.91	0.51
1:B:362:VAL:CG1	1:B:367:PHE:HA	2.40	0.51
1:A:655:MET:CE	1:A:672:ILE:HD11	2.41	0.51
1:B:482:ASP:OD2	1:B:499:ARG:NH2	2.44	0.51
1:A:281:ASN:ND2	1:B:281:ASN:CA	2.73	0.50
1:B:287:ASP:HB3	1:B:294:PRO:HA	1.94	0.50
1:B:441:VAL:O	1:B:491:ALA:HA	2.11	0.50
1:A:221:LEU:CD1	1:A:248:ILE:HG23	2.42	0.50
1:A:260:SER:OG	1:A:381:ARG:NH2	2.44	0.50
1:B:90:THR:HG22	1:B:166:ARG:CD	2.11	0.50
1:A:109:ASN:HD21	1:B:263:ALA:HB3	1.72	0.49
1:A:275:MET:C	1:B:285:TYR:CE2	2.81	0.49
1:A:232:TYR:CZ	1:B:286:VAL:CB	2.78	0.49
1:B:86:LEU:HD23	1:B:140:ASP:O	2.12	0.49
1:A:121:LEU:HD22	1:A:125:LEU:HG	1.93	0.49
1:A:261:TYR:HD1	1:B:106:ASN:CB	2.23	0.49
1:A:261:TYR:CG	1:B:108:HIS:CE1	2.95	0.49
1:A:553:TYR:CE1	1:A:555:THR:HG22	2.47	0.49
1:A:285:TYR:CE1	1:B:232:TYR:CE1	2.92	0.49
1:B:448:SER:HB3	1:B:602:MET:HE3	1.93	0.49
1:A:535:ILE:HG22	1:A:599:ILE:HD12	1.95	0.49
1:B:83:VAL:HG11	1:B:141:PHE:CD1	2.31	0.49
1:B:627:ARG:HB2	1:B:636:ILE:HD12	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:652:HIS:O	1:A:655:MET:HB3	2.12	0.49
1:A:86:LEU:HD13	1:A:140:ASP:HB3	1.94	0.48
1:A:621:THR:HA	1:A:683:VAL:HG12	1.95	0.48
1:B:27:TYR:O	1:B:80:ARG:NH2	2.46	0.48
1:A:416:ASN:CG	1:A:561:VAL:HG13	2.35	0.48
1:B:356:CYS:HB3	1:B:374:TYR:CD1	2.49	0.47
1:A:364:GLY:O	1:A:368:GLU:HG3	2.14	0.47
1:A:18:ILE:O	1:A:22:ILE:HG12	2.14	0.47
1:A:277:ARG:NH1	1:B:284:ARG:NH2	2.62	0.47
1:A:35:ASP:HB3	1:A:38:GLN:HG3	1.96	0.47
1:A:285:TYR:CZ	1:B:232:TYR:CZ	2.96	0.46
1:A:232:TYR:OH	1:B:286:VAL:CA	2.61	0.46
1:A:86:LEU:HD12	1:A:140:ASP:HB2	1.83	0.46
1:A:90:THR:OG1	1:A:138:ASP:N	2.47	0.46
1:B:627:ARG:HB2	1:B:636:ILE:CD1	2.46	0.46
1:A:86:LEU:CD1	1:A:140:ASP:CA	2.86	0.46
1:B:341:ARG:HD2	1:B:347:ASP:O	2.16	0.46
1:B:90:THR:HA	1:B:166:ARG:HG2	0.81	0.46
1:A:278:VAL:N	1:B:285:TYR:CD2	2.82	0.46
1:A:362:VAL:HG13	1:A:367:PHE:HA	1.98	0.46
1:B:1:MET:HE3	1:B:47:LEU:HD12	1.96	0.46
1:B:556:TYR:HE2	1:B:561:VAL:CG2	2.29	0.45
1:A:300:TYR:HE2	1:A:406:LEU:HD13	1.81	0.45
1:B:86:LEU:CD2	1:B:140:ASP:O	2.64	0.45
1:B:603:PRO:HD3	1:B:707:SER:OG	2.16	0.45
1:A:90:THR:HA	1:A:137:TYR:CG	2.47	0.45
1:B:319:GLY:HA3	1:B:324:ARG:NH1	2.32	0.45
1:B:406:LEU:HD22	1:B:426:SER:HB2	1.99	0.45
1:B:256:ARG:HG3	1:B:354:ASN:HB2	1.99	0.45
1:B:416:ASN:CG	1:B:561:VAL:HG13	2.36	0.45
1:A:106:ASN:HA	1:A:107:PRO:HD3	1.83	0.45
1:A:474:VAL:HG21	1:A:539:ALA:HA	1.99	0.45
1:A:76:ILE:O	1:A:80:ARG:HG3	2.18	0.44
1:A:218:CYS:SG	1:A:432:ILE:HG13	2.58	0.44
1:A:285:TYR:OH	1:B:231:ILE:HG22	2.18	0.44
1:B:275:MET:CE	1:B:276:LEU:HD13	2.47	0.44
1:B:284:ARG:HD2	1:B:327:ASP:OD2	2.17	0.44
1:B:715:PRO:HG3	1:B:741:THR:HG21	1.98	0.44
1:A:285:TYR:OH	1:B:231:ILE:HG21	2.16	0.44
1:B:140:ASP:OD2	1:B:168:GLN:HG2	2.18	0.44
1:B:454:TYR:HB2	1:B:461:TYR:CZ	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:251:ALA:HB2	1:B:425:CYS:HB3	1.99	0.44
1:B:432:ILE:HG13	1:B:444:CYS:SG	2.58	0.44
1:B:482:ASP:CG	1:B:499:ARG:HH22	2.20	0.44
1:B:90:THR:CB	1:B:166:ARG:CG	2.80	0.44
1:A:199:THR:HG21	1:A:607:THR:HB	2.00	0.43
1:B:221:LEU:CD1	1:B:248:ILE:CG2	2.95	0.43
1:A:278:VAL:HA	1:B:285:TYR:HB2	1.54	0.43
1:B:223:MET:HE3	1:B:231:ILE:HA	1.99	0.43
1:B:405:MET:HG3	1:B:724:HIS:CE1	2.53	0.43
1:A:270:ASN:HB3	1:A:274:PRO:HG3	2.01	0.42
1:A:62:GLU:HG3	1:A:145:TYR:CE1	2.50	0.42
1:A:261:TYR:CZ	1:B:104:TYR:CE2	3.02	0.42
1:A:362:VAL:CG1	1:A:367:PHE:HA	2.49	0.42
1:A:243:LYS:HD2	1:B:228:ILE:HG22	2.01	0.42
1:A:261:TYR:HB3	1:B:108:HIS:ND1	2.33	0.42
1:A:82:ALA:O	1:A:141:PHE:CE1	2.73	0.42
1:A:236:LYS:HZ3	1:B:236:LYS:NZ	2.11	0.42
1:B:300:TYR:HE2	1:B:406:LEU:HD13	1.84	0.42
1:A:220:LEU:HG	1:A:442:ALA:HB3	2.02	0.41
1:A:275:MET:O	1:B:285:TYR:HE2	1.77	0.41
1:A:306:LEU:HD22	1:A:381:ARG:HG2	2.02	0.41
1:A:593:ILE:HD12	1:A:595:ASN:O	2.20	0.41
1:A:441:VAL:HG22	1:A:491:ALA:HB2	2.01	0.41
1:A:405:MET:HG3	1:A:724:HIS:CE1	2.56	0.41
1:B:123:ILE:HD12	1:B:180:LYS:HG2	1.86	0.41
1:B:441:VAL:HG13	1:B:490:GLU:HB2	2.01	0.41
1:A:192:LEU:HD23	1:A:472:VAL:HG11	2.02	0.41
1:B:35:ASP:O	1:B:38:GLN:HB2	2.21	0.41
1:A:79:ALA:O	1:A:83:VAL:HG23	2.21	0.41
1:B:130:ARG:CG	1:B:130:ARG:NH1	2.82	0.41
1:A:337:LEU:HD13	1:A:348:TRP:HZ3	1.86	0.41
1:A:362:VAL:HG13	1:A:367:PHE:CA	2.50	0.41
1:A:553:TYR:HE1	1:A:555:THR:HG22	1.85	0.41
1:A:261:TYR:HH	1:B:104:TYR:HE2	0.56	0.41
1:A:710:ILE:HG12	1:A:736:MET:HG3	2.03	0.41
1:B:221:LEU:CD1	1:B:248:ILE:HG23	2.51	0.41
1:A:223:MET:CE	1:A:252:VAL:HG22	2.52	0.40
1:A:285:TYR:CE2	1:B:275:MET:HA	2.50	0.40
1:A:90:THR:HG22	1:A:137:TYR:HB3	1.08	0.40
1:B:196:ARG:HG2	1:B:611:LEU:CD2	2.46	0.40
1:A:373:SER:O	1:A:377:GLN:HG3	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:556:TYR:HE2	1:A:561:VAL:HG22	1.87	0.40

All (28) 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:A:27:TYR:CD1	1:A:27:TYR:CD1[22_554]	0.73	1.47
1:A:27:TYR:CG	1:A:27:TYR:CE1[22_554]	0.90	1.30
1:A:27:TYR:CE2	1:A:27:TYR:CZ[22_554]	1.07	1.13
1:A:27:TYR:CD2	1:A:27:TYR:CZ[22_554]	1.15	1.05
1:A:27:TYR:CD2	1:A:27:TYR:CE1[22_554]	1.27	0.93
1:A:27:TYR:CE2	1:A:27:TYR:CE2[22_554]	1.27	0.93
1:A:27:TYR:CG	1:A:27:TYR:CD1[22_554]	1.45	0.75
1:A:14:MET:CE	1:B:15:PHE:O[9_555]	1.67	0.53
1:A:27:TYR:CD2	1:A:27:TYR:OH[22_554]	1.67	0.53
1:A:14:MET:CE	1:B:15:PHE:C[9_555]	1.69	0.51
1:A:27:TYR:CD1	1:A:27:TYR:CE1[22_554]	1.69	0.51
1:A:27:TYR:CE2	1:A:27:TYR:OH[22_554]	1.78	0.42
1:A:16:ASP:CB	1:B:14:MET:CG[9_555]	1.79	0.41
1:A:14:MET:CG	1:B:15:PHE:CA[9_555]	1.82	0.38
1:A:14:MET:N	1:B:16:ASP:OD2[9_555]	1.84	0.36
1:A:14:MET:CG	1:B:15:PHE:CD2[9_555]	1.86	0.34
1:A:27:TYR:CZ	1:A:27:TYR:CZ[22_554]	1.93	0.27
1:A:14:MET:CB	1:B:15:PHE:C[9_555]	1.95	0.25
1:A:15:PHE:CD2	1:B:13:VAL:O[9_555]	1.96	0.24
1:A:14:MET:SD	1:B:15:PHE:CG[9_555]	2.03	0.17
1:A:14:MET:CG	1:B:15:PHE:C[9_555]	2.04	0.16
1:A:27:TYR:CG	1:A:27:TYR:CZ[22_554]	2.04	0.16
1:A:14:MET:SD	1:B:15:PHE:CA[9_555]	2.05	0.15
1:A:27:TYR:CB	1:A:27:TYR:CE1[22_554]	2.06	0.14
1:A:14:MET:N	1:B:16:ASP:CG[9_555]	2.08	0.12
1:A:14:MET:CB	1:B:15:PHE:CB[9_555]	2.09	0.11
1:A:14:MET:SD	1:B:15:PHE:CD2[9_555]	2.10	0.10
1:A:27:TYR:CE1	1:A:27:TYR:CE2[22_554]	2.12	0.08



## 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	706/812 (87%)	683 (97%)	21 (3%)	2 (0%)	41	77
1	B	730/812 (90%)	700 (96%)	28 (4%)	2 (0%)	41	77
All	All	1436/1624 (88%)	1383 (96%)	49 (3%)	4 (0%)	41	77

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	224	LYS
1	B	224	LYS
1	A	737	TYR
1	B	601	PRO

### 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	592/710 (83%)	545 (92%)	47 (8%)	12	35
1	B	607/710 (86%)	553 (91%)	54 (9%)	9	30
All	All	1199/1420 (84%)	1098 (92%)	101 (8%)	11	33

All (101) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	21	ARG
1	A	44	ILE

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	59	LEU
1	A	67	LEU
1	A	93	VAL
1	A	121	LEU
1	A	149	LYS
1	A	153	ARG
1	A	171	LEU
1	A	192	LEU
1	A	214	GLN
1	A	220	LEU
1	A	252	VAL
1	A	276	LEU
1	A	286	VAL
1	A	287	ASP
1	A	301	LEU
1	A	312	LEU
1	A	327	ASP
1	A	337	LEU
1	A	359	LEU
1	A	362	VAL
1	A	379	ARG
1	A	383	VAL
1	A	389	LEU
1	A	441	VAL
1	A	443	VAL
1	A	444	CYS
1	A	449	LEU
1	A	455	VAL
1	A	456	THR
1	A	458	GLU
1	A	493	LEU
1	A	555	THR
1	A	606	SER
1	A	637	VAL
1	A	653	GLU
1	A	679	LEU
1	A	692	LEU
1	A	693	LYS
1	A	703	ASP
1	A	708	LEU
1	A	716	ASN
1	A	720	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	739	LEU
1	A	741	THR
1	A	742	ARG
1	B	3	VAL
1	B	12	ARG
1	B	47	LEU
1	B	56	LEU
1	B	59	LEU
1	B	67	LEU
1	B	80	ARG
1	B	93	VAL
1	B	108	HIS
1	B	121	LEU
1	B	130	ARG
1	B	149	LYS
1	B	171	LEU
1	B	180	LYS
1	B	192	LEU
1	B	217	SER
1	B	218	CYS
1	B	220	LEU
1	B	225	ASP
1	B	252	VAL
1	B	256	ARG
1	B	276	LEU
1	B	286	VAL
1	B	301	LEU
1	B	312	LEU
1	B	316	LYS
1	B	318	THR
1	B	337	LEU
1	B	359	LEU
1	B	361	GLU
1	B	362	VAL
1	B	365	GLU
1	B	380	VAL
1	B	381	ARG
1	B	389	LEU
1	B	441	VAL
1	B	449	LEU
1	B	455	VAL
1	B	493	LEU

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Mol	Chain	Res	Type
1	B	508	LEU
1	B	516	ARG
1	B	543	SER
1	B	561	VAL
1	B	602	MET
1	B	615	GLU
1	B	627	ARG
1	B	648	ARG
1	B	671	GLU
1	B	678	GLN
1	B	679	LEU
1	B	692	LEU
1	B	708	LEU
1	B	723	MET
1	B	739	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	87	HIS
1	A	106	ASN
1	A	160	ASN
1	A	266	ASN
1	B	108	HIS
1	B	270	ASN
1	B	281	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	1
1	B	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	90:THR	C	91:LYS	N	11.08
1	B	90:THR	C	91:LYS	N	5.88

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

Unable to reproduce the depositors R factor - this section is therefore empty.

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

Unable to reproduce the depositors R factor - this section is therefore empty.

### 6.3 Carbohydrates

Unable to reproduce the depositors R factor - this section is therefore empty.

### 6.4 Ligands

Unable to reproduce the depositors R factor - this section is therefore empty.

### 6.5 Other polymers

Unable to reproduce the depositors R factor - this section is therefore empty.