



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 24, 2023 – 12:39 PM EDT

PDB ID : 3BUO  
Title : Crystal structure of c-Cbl-TKB domain complexed with its binding motif in EGF receptor'  
Authors : Ng, C.; Jackson, R.A.; Buschdorf, J.P.; Sun, Q.; Guy, G.R.; Sivaraman, J.  
Deposited on : 2008-01-03  
Resolution : 2.60 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  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
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) : 2.36

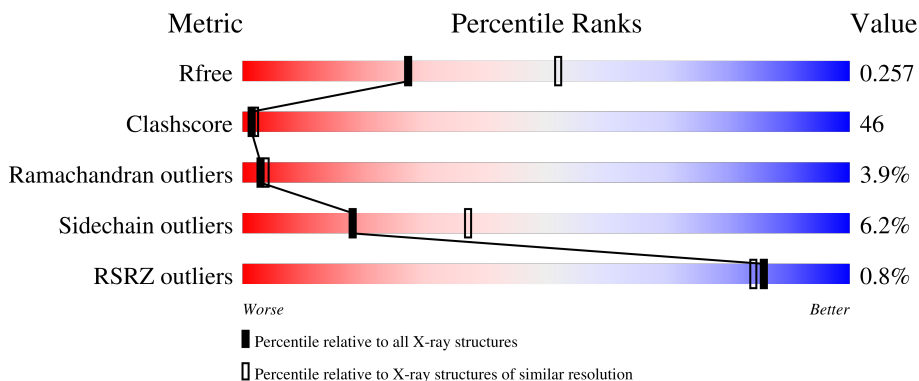
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.60 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	3163 (2.60-2.60)
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)
RSRZ outliers	127900	3104 (2.60-2.60)

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  $\leq 5\%$ . 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	13	
1	C	13	
2	B	329	
2	D	329	

## 2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 5405 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 13-meric peptide from Epidermal growth factor receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	A	11	95	57	15	22	1	0	0	0
1	C	11	95	57	15	22	1	0	0	0

- Molecule 2 is a protein called E3 ubiquitin-protein ligase CBL.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	304	2490	1612	424	441	13	0	0	0
2	D	304	2490	1612	424	441	13	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	24	SER	GLY	cloning artifact	UNP P22681
D	24	SER	GLY	cloning artifact	UNP P22681

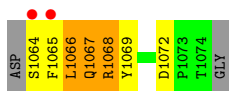
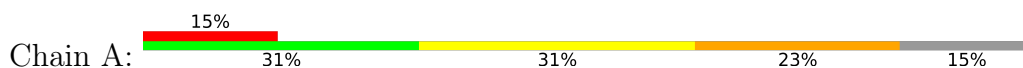
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	6	Total 6	O 6	0	0
3	B	111	Total 111	O 111	0	0
3	C	6	Total 6	O 6	0	0
3	D	112	Total 112	O 112	0	0

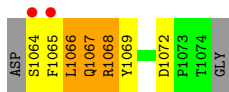
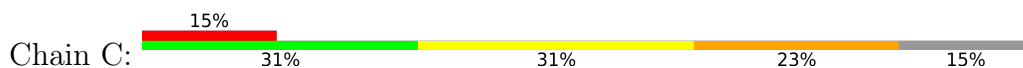
### 3 Residue-property plots i

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 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.

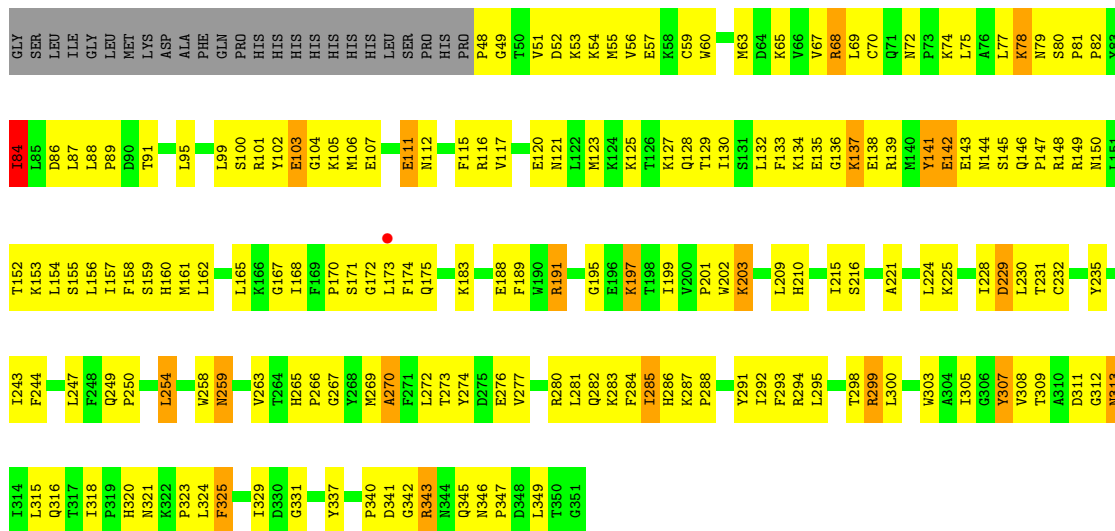
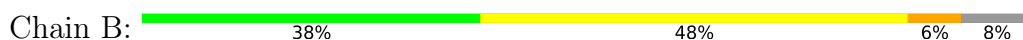
- Molecule 1: 13-meric peptide from Epidermal growth factor receptor



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- Molecule 2: E3 ubiquitin-protein ligase CBL



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GLY	Y83	T152	I243	D311	D312	D313	D314	D315	D316	D317	D318	D319	D320	D321	D322	D323	D324	D325	D329	D330	D331	D337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351
SER	L84	K153	F244	N313	G312	N314	L315	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351	
LEU	L85	L154	L247	L314	L315	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
ILE	D86	S155	L247	L314	L315	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
GLY	L87	L156	F248	L315	L316	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
LEU	L88	L157	Q249	L316	L317	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
MET	D89	F158	P250	L317	L318	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
LYS	D90	S159	P250	L317	L318	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
ASP	T91	H160	L254	L318	L319	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
ALA	H94	M161	L255	L319	L320	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
PHE	L95	L162	L256	L320	L321	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
GLN	L95	L162	L256	L320	L321	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
PRO	L99	L165	L257	L321	L322	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
HIS	S100	K166	L258	L322	L323	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
HIS	S101	G167	L259	L323	L324	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
HIS	R101	I168	L260	L324	L325	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
HIS	Y102	F169	L261	L325	L326	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
HIS	E103	T264	L263	L326	L327	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
HIS	G104	S171	H265	L327	L328	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
HIS	K105	P266	H266	L328	L329	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
LEU	M106	G267	G267	L329	L330	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
SER	E107	F174	Y268	L330	L331	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
PRO	E111	A270	L271	L331	L332	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
HIS	M112	F271	L272	L332	L333	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
PRO	M12	F271	L272	L332	L333	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
P48	F115	K183	T273	L333	L334	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
G49	R116	E188	Y274	L334	L335	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
T50	R117	F189	Y275	L335	L336	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
V51	V117	F189	D275	L336	L337	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
D52	D52	F190	E276	L337	L338	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
K53	E120	R191	V277	L338	L339	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
K54	M121	R191	V277	L339	L340	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
K56	L122	K183	Y280	L340	L341	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
V56	M123	K183	L281	L341	L342	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
E57	M123	K183	L281	L342	L343	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
K58	K127	E188	Q282	L343	L344	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
C59	Q128	F189	K283	L344	L345	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
M60	T129	G185	F284	L345	L346	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
K61	I130	V280	L285	L346	L347	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
L62	S131	P201	H286	L347	L348	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
M63	L132	W202	K287	L348	L349	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
D64	F133	K203	P288	L349	L350	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
K65	F134	L209	Y291	L350	L351	Q316	T317	I318	P319	H320	N321	K322	P323	L324	F325	I329	D330	G331	Y337	L338	F339	P340	D341	G342	R343	N344	Q345	N346	P347	D348	L349	T350	G351			
V66	K134	H210	L292	L351	L352	Q316	T317	I318	P319	H320	N321																									

## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	63.86Å 110.17Å 55.82Å 90.00° 89.94° 90.00°	Depositor
Resolution (Å)	20.00 – 2.60 39.29 – 2.60	Depositor EDS
% Data completeness (in resolution range)	51.8 (20.00-2.60) 91.3 (39.29-2.60)	Depositor EDS
$R_{merge}$	0.11	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.49 (at 2.61Å)	Xtrriage
Refinement program	CNS	Depositor
R, $R_{free}$	0.231 , 0.278 0.249 , 0.257	Depositor DCC
$R_{free}$ test set	2860 reflections (13.04%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	29.0	Xtrriage
Anisotropy	0.858	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.31 , 28.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.44$ , $\langle L^2 \rangle = 0.27$	Xtrriage
Estimated twinning fraction	0.458 for -h,-k,l	Xtrriage
$F_o, F_c$ correlation	0.90	EDS
Total number of atoms	5405	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	33.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.08% 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](#)

Bond lengths and bond angles in the following residue types are not validated in this section: PTR

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	0.68	0/79	0.96	0/104
1	C	0.65	0/79	0.95	0/104
2	B	0.52	0/2556	0.65	0/3449
2	D	0.51	0/2556	0.65	0/3449
All	All	0.52	0/5270	0.66	0/7106

There are no bond length outliers.

There are no bond angle outliers.

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	95	0	80	16	0
1	C	95	0	80	19	0
2	B	2490	0	2499	232	0
2	D	2490	0	2499	232	0
3	A	6	0	0	0	0
3	B	111	0	0	16	0
3	C	6	0	0	1	0
3	D	112	0	0	18	0
All	All	5405	0	5158	478	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 46.

All (478) 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:D:82:PRO:HG3	2:D:156:LEU:HD12	1.33	1.09
2:D:277:VAL:HG13	2:D:292:ILE:HD11	1.37	1.05
2:B:82:PRO:HG3	2:B:156:LEU:HD12	1.33	1.04
2:B:282:GLN:HE22	2:B:285:ILE:HD12	1.23	1.00
2:D:282:GLN:HE22	2:D:285:ILE:HD12	1.22	1.00
2:B:277:VAL:HG13	2:B:292:ILE:HD11	1.40	0.99
2:B:156:LEU:HD11	2:B:273:THR:HG22	1.46	0.98
2:D:156:LEU:HD11	2:D:273:THR:HG22	1.47	0.96
2:B:82:PRO:HG3	2:B:156:LEU:CD1	2.01	0.91
1:C:1068:ARG:HB3	2:D:274:TYR:CE2	2.06	0.90
2:B:331:GLY:HA3	2:B:337:TYR:CD2	2.06	0.90
2:D:331:GLY:HA3	2:D:337:TYR:CD2	2.06	0.90
1:A:1068:ARG:HB3	2:B:274:TYR:CE2	2.07	0.90
2:D:82:PRO:HG3	2:D:156:LEU:CD1	2.00	0.89
2:B:188:GLU:HA	2:B:191:ARG:NH1	1.92	0.84
1:A:1066:LEU:HD21	2:B:298:THR:HG21	1.59	0.84
2:D:188:GLU:HA	2:D:191:ARG:NH1	1.93	0.83
1:C:1066:LEU:O	1:C:1067:GLN:HG3	1.79	0.83
2:D:273:THR:O	2:D:277:VAL:HG23	1.77	0.82
2:D:277:VAL:HG13	2:D:292:ILE:CD1	2.09	0.82
2:B:149:ARG:HG3	2:B:149:ARG:HH11	1.45	0.81
2:B:273:THR:O	2:B:277:VAL:HG23	1.80	0.81
1:C:1066:LEU:HD21	2:D:298:THR:HG21	1.61	0.81
2:D:149:ARG:HG3	2:D:149:ARG:HH11	1.45	0.80
2:D:269:MET:HB3	2:D:272:LEU:HD12	1.62	0.80
1:A:1066:LEU:O	1:A:1067:GLN:HG3	1.81	0.80
2:B:153:LYS:HA	3:B:448:HOH:O	1.82	0.80
2:B:77:LEU:HA	2:B:78:LYS:NZ	1.98	0.79
2:B:272:LEU:HB2	3:B:373:HOH:O	1.81	0.79
2:B:202:TRP:HB3	2:B:203:LYS:HZ3	1.47	0.79
2:D:77:LEU:HA	2:D:78:LYS:NZ	1.97	0.79
2:B:269:MET:HB3	2:B:272:LEU:HD12	1.64	0.79
2:B:203:LYS:CD	2:B:203:LYS:H	1.96	0.79
1:C:1066:LEU:HA	3:C:17:HOH:O	1.82	0.79
2:B:149:ARG:HB3	3:B:359:HOH:O	1.81	0.79
2:B:283:LYS:HE2	2:B:284:PHE:CZ	2.19	0.78
2:D:202:TRP:HB3	2:D:203:LYS:HZ3	1.48	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:203:LYS:CD	2:D:203:LYS:H	1.97	0.78
2:B:340:PRO:HD3	2:B:346:ASN:ND2	1.99	0.77
2:D:283:LYS:HE2	2:D:284:PHE:CZ	2.18	0.77
2:D:49:GLY:O	2:D:116:ARG:HD2	1.85	0.77
2:B:277:VAL:HG13	2:B:292:ILE:CD1	2.13	0.77
2:B:49:GLY:O	2:B:116:ARG:HD2	1.85	0.76
2:D:91:THR:OG1	2:D:162:LEU:HD13	1.86	0.76
2:B:320:HIS:HA	3:B:406:HOH:O	1.86	0.75
2:D:229:ASP:OD1	2:D:232:CYS:HA	1.86	0.75
2:B:307:TYR:CE1	2:B:315:LEU:HB2	2.21	0.75
2:D:307:TYR:CE1	2:D:315:LEU:HB2	2.22	0.74
2:D:340:PRO:HD3	2:D:346:ASN:ND2	2.02	0.73
2:D:134:LYS:HA	3:D:397:HOH:O	1.88	0.73
2:B:229:ASP:OD1	2:B:232:CYS:HA	1.89	0.73
2:B:129:THR:OG1	2:B:154:LEU:HD23	1.89	0.72
2:B:228:ILE:HG12	2:B:244:PHE:CD1	2.24	0.72
2:D:188:GLU:HA	2:D:191:ARG:HH11	1.54	0.72
2:D:282:GLN:HE22	2:D:285:ILE:CD1	2.01	0.72
2:B:161:MET:HG2	2:B:231:THR:HG22	1.69	0.72
2:D:203:LYS:H	2:D:203:LYS:CE	2.03	0.72
2:D:129:THR:OG1	2:D:154:LEU:HD23	1.89	0.72
2:D:228:ILE:HG12	2:D:244:PHE:CD1	2.24	0.72
2:B:203:LYS:H	2:B:203:LYS:CE	2.02	0.72
2:D:78:LYS:NZ	2:D:78:LYS:H	1.88	0.71
2:D:86:ASP:O	2:D:89:PRO:HD2	1.90	0.71
2:B:282:GLN:HE22	2:B:285:ILE:CD1	2.00	0.71
1:C:1065:PHE:CD2	1:C:1066:LEU:N	2.57	0.71
2:D:225:LYS:HG2	3:D:417:HOH:O	1.89	0.71
2:B:78:LYS:NZ	2:B:78:LYS:H	1.89	0.71
2:D:68:ARG:HG3	2:D:69:LEU:H	1.56	0.71
2:B:84:ILE:HD13	2:B:84:ILE:C	2.11	0.70
2:B:340:PRO:HD3	2:B:346:ASN:HD22	1.53	0.70
2:D:65:LYS:HE2	2:D:69:LEU:HD11	1.72	0.70
1:A:1065:PHE:CD2	1:A:1066:LEU:N	2.58	0.70
2:D:84:ILE:HD13	2:D:84:ILE:C	2.12	0.70
2:B:88:LEU:HB2	2:B:89:PRO:HD3	1.73	0.70
2:D:161:MET:HG2	2:D:231:THR:HG22	1.72	0.70
2:D:199:ILE:HD11	2:D:235:TYR:HB3	1.72	0.70
2:B:188:GLU:HA	2:B:191:ARG:HH11	1.53	0.70
2:D:305:ILE:HG21	2:D:337:TYR:CE1	2.27	0.70
2:D:88:LEU:HB2	2:D:89:PRO:HD3	1.74	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:68:ARG:HG3	2:B:69:LEU:H	1.57	0.69
2:B:91:THR:OG1	2:B:162:LEU:HD13	1.93	0.69
2:B:305:ILE:HG21	2:B:337:TYR:CE1	2.28	0.69
1:C:1068:ARG:HB3	2:D:274:TYR:CZ	2.27	0.69
2:D:52:ASP:OD2	2:D:54:LYS:HB2	1.93	0.69
1:A:1068:ARG:HB3	2:B:274:TYR:CZ	2.27	0.68
2:B:101:ARG:HD3	2:B:173:LEU:CD1	2.23	0.68
2:D:101:ARG:HD3	2:D:173:LEU:CD1	2.23	0.68
2:B:52:ASP:OD2	2:B:54:LYS:HB2	1.93	0.68
2:B:144:ASN:HB3	2:B:149:ARG:HH21	1.59	0.68
2:D:272:LEU:HD22	2:D:276:GLU:HB3	1.76	0.68
2:B:56:VAL:HG12	2:B:60:TRP:NE1	2.09	0.67
2:B:86:ASP:O	2:B:89:PRO:HD2	1.94	0.67
2:B:199:ILE:HD11	2:B:235:TYR:HB3	1.75	0.67
1:A:1064:SER:HB3	2:B:79:ASN:ND2	2.09	0.67
2:B:282:GLN:NE2	2:B:285:ILE:HD12	2.05	0.67
2:D:203:LYS:H	2:D:203:LYS:HD3	1.59	0.67
2:B:203:LYS:H	2:B:203:LYS:HD3	1.58	0.67
2:D:144:ASN:HB3	2:D:149:ARG:HH21	1.59	0.67
2:D:340:PRO:HD3	2:D:346:ASN:HD22	1.56	0.67
1:C:1064:SER:HB3	2:D:79:ASN:ND2	2.10	0.66
2:B:68:ARG:HG3	2:B:69:LEU:N	2.10	0.66
2:B:272:LEU:HD22	2:B:276:GLU:HB3	1.77	0.66
2:D:280:ARG:HH21	2:D:341:ASP:CG	1.99	0.66
2:D:56:VAL:HG12	2:D:60:TRP:NE1	2.09	0.66
2:D:100:SER:O	2:D:103:GLU:HB2	1.96	0.65
2:B:65:LYS:HE2	2:B:69:LEU:HD11	1.76	0.65
2:D:123:MET:HG2	2:D:127:LYS:HE3	1.79	0.65
2:B:280:ARG:HH21	2:B:341:ASP:CG	2.00	0.65
2:D:68:ARG:HG3	2:D:69:LEU:N	2.10	0.65
2:B:132:LEU:HD21	2:B:147:PRO:O	1.96	0.64
2:B:188:GLU:HA	2:B:191:ARG:HD3	1.78	0.64
2:D:282:GLN:NE2	2:D:285:ILE:HD12	2.04	0.64
2:B:123:MET:HG2	2:B:127:LYS:HE3	1.79	0.64
2:B:243:ILE:HD13	2:B:300:LEU:HD22	1.79	0.63
1:C:1068:ARG:NH2	2:D:274:TYR:HB3	2.13	0.63
2:D:188:GLU:HA	2:D:191:ARG:HD3	1.79	0.63
2:D:132:LEU:HD21	2:D:147:PRO:O	1.99	0.63
2:B:72:ASN:HD21	2:B:74:LYS:HB2	1.63	0.63
2:B:188:GLU:CA	2:B:191:ARG:NH1	2.61	0.63
2:B:152:THR:HG21	2:B:276:GLU:CD	2.18	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:319:PRO:HA	3:D:367:HOH:O	1.98	0.63
2:D:152:THR:HG21	2:D:276:GLU:CD	2.20	0.62
2:D:188:GLU:CA	2:D:191:ARG:NH1	2.62	0.62
2:B:100:SER:O	2:B:103:GLU:HB2	2.00	0.62
2:D:191:ARG:O	2:D:195:GLY:HA2	1.99	0.62
2:D:282:GLN:O	2:D:285:ILE:HB	2.00	0.62
2:B:191:ARG:O	2:B:195:GLY:HA2	1.98	0.61
2:B:282:GLN:O	2:B:285:ILE:HB	2.00	0.61
1:A:1068:ARG:NH2	2:B:274:TYR:HB3	2.16	0.61
2:D:149:ARG:HG3	2:D:149:ARG:NH1	2.14	0.61
1:A:1068:ARG:NH2	2:B:80:SER:HB2	2.15	0.61
2:B:63:MET:O	2:B:67:VAL:HG23	2.01	0.61
2:B:149:ARG:HG3	2:B:149:ARG:NH1	2.15	0.60
2:D:269:MET:HE2	2:D:272:LEU:HD11	1.82	0.60
2:D:72:ASN:HD21	2:D:74:LYS:HB2	1.65	0.60
2:B:244:PHE:CE2	2:B:254:LEU:HD11	2.37	0.60
2:D:63:MET:O	2:D:67:VAL:HG23	2.02	0.60
2:B:346:ASN:ND2	2:B:347:PRO:HD2	2.16	0.59
2:D:303:TRP:CD2	2:D:324:LEU:HD22	2.37	0.59
2:D:144:ASN:HA	2:D:149:ARG:HE	1.68	0.59
2:D:244:PHE:CE2	2:D:254:LEU:HD11	2.38	0.59
2:B:81:PRO:HA	2:B:82:PRO:C	2.23	0.59
2:D:346:ASN:ND2	2:D:347:PRO:HD2	2.16	0.59
2:B:144:ASN:HA	2:B:149:ARG:HE	1.67	0.59
2:B:259:ASN:HA	2:B:263:VAL:CG2	2.32	0.59
2:D:57:GLU:HA	3:D:356:HOH:O	2.03	0.59
2:B:87:LEU:HD22	2:B:159:SER:HA	1.84	0.59
2:D:56:VAL:HG21	2:D:99:LEU:HD11	1.85	0.58
2:D:243:ILE:HD13	2:D:300:LEU:HD22	1.84	0.58
2:D:87:LEU:HD22	2:D:159:SER:HA	1.85	0.58
2:B:84:ILE:HG22	3:B:442:HOH:O	2.03	0.58
2:B:65:LYS:HD3	2:B:130:ILE:HD12	1.85	0.58
2:B:303:TRP:CD2	2:B:324:LEU:HD22	2.39	0.58
1:C:1068:ARG:NH1	2:D:81:PRO:HD2	2.18	0.58
2:D:259:ASN:HA	2:D:263:VAL:CG2	2.34	0.58
2:B:203:LYS:H	2:B:203:LYS:HE2	1.68	0.58
2:B:203:LYS:HD3	2:B:203:LYS:N	2.19	0.58
2:B:48:PRO:HB3	2:B:120:GLU:OE1	2.03	0.57
2:D:81:PRO:HA	2:D:82:PRO:C	2.23	0.57
2:D:229:ASP:OD1	2:D:232:CYS:CA	2.51	0.57
2:B:56:VAL:HG21	2:B:99:LEU:HD11	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:150:ASN:O	2:D:154:LEU:HD13	2.04	0.57
1:C:1068:ARG:NH2	2:D:80:SER:HB2	2.18	0.57
2:D:277:VAL:CG1	2:D:292:ILE:HD11	2.22	0.57
2:B:56:VAL:HG12	2:B:60:TRP:CE2	2.40	0.57
2:B:340:PRO:CD	2:B:346:ASN:HD22	2.18	0.57
2:B:52:ASP:O	2:B:55:MET:HB3	2.05	0.56
2:B:139:ARG:HA	2:B:142:GLU:OE2	2.04	0.56
2:B:343:ARG:NE	3:B:391:HOH:O	2.29	0.56
2:D:78:LYS:H	2:D:78:LYS:HZ3	1.52	0.56
2:D:139:ARG:HA	2:D:142:GLU:OE2	2.05	0.56
2:B:229:ASP:OD1	2:B:232:CYS:CA	2.53	0.56
2:D:56:VAL:HG12	2:D:60:TRP:CE2	2.40	0.56
2:D:104:GLY:C	2:D:106:MET:H	2.08	0.56
2:D:288:PRO:HG2	3:D:384:HOH:O	2.05	0.56
2:D:86:ASP:C	2:D:89:PRO:HD2	2.26	0.56
1:A:1066:LEU:N	1:A:1066:LEU:HD12	2.20	0.56
2:D:54:LYS:O	2:D:57:GLU:HB2	2.06	0.56
2:B:286:HIS:CD2	2:B:312:GLY:HA3	2.41	0.56
2:D:65:LYS:HD3	2:D:130:ILE:HD12	1.88	0.56
2:D:303:TRP:CD1	2:D:324:LEU:HB2	2.41	0.56
2:B:104:GLY:C	2:B:106:MET:H	2.09	0.56
2:B:294:ARG:HB2	3:B:364:HOH:O	2.07	0.55
2:D:325:PHE:O	2:D:329:ILE:HG12	2.06	0.55
2:D:48:PRO:HB3	2:D:120:GLU:OE1	2.07	0.55
2:D:203:LYS:HD3	2:D:203:LYS:N	2.21	0.55
2:B:54:LYS:O	2:B:57:GLU:HB2	2.06	0.55
2:B:101:ARG:HD3	2:B:173:LEU:HD13	1.87	0.55
2:D:202:TRP:CZ2	2:D:225:LYS:HB2	2.42	0.55
2:B:78:LYS:H	2:B:78:LYS:HZ3	1.54	0.55
2:D:228:ILE:O	2:D:230:LEU:HD13	2.07	0.55
2:B:277:VAL:CG1	2:B:292:ILE:HD11	2.26	0.55
2:D:286:HIS:CD2	2:D:312:GLY:HA3	2.42	0.55
1:A:1068:ARG:NH1	2:B:81:PRO:HD2	2.22	0.55
2:D:269:MET:O	2:D:270:ALA:O	2.25	0.55
2:B:86:ASP:C	2:B:89:PRO:HD2	2.27	0.55
2:B:303:TRP:CD1	2:B:324:LEU:HB2	2.42	0.55
2:D:52:ASP:O	2:D:55:MET:HB3	2.06	0.55
2:D:101:ARG:HD3	2:D:173:LEU:HD13	1.87	0.55
2:B:117:VAL:HG21	2:B:199:ILE:HD13	1.88	0.54
2:D:203:LYS:H	2:D:203:LYS:HE2	1.69	0.54
2:B:228:ILE:O	2:B:230:LEU:HD13	2.08	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:117:VAL:HG21	2:D:199:ILE:HD13	1.87	0.54
2:D:101:ARG:NH1	2:D:173:LEU:HD11	2.23	0.54
2:D:136:GLY:O	2:D:139:ARG:HB2	2.07	0.54
2:D:199:ILE:HD11	2:D:235:TYR:CB	2.38	0.54
2:B:210:HIS:CD2	2:B:215:ILE:H	2.26	0.54
2:B:138:GLU:HA	2:B:141:TYR:CE2	2.42	0.54
2:B:101:ARG:NH1	2:B:173:LEU:HD11	2.23	0.54
2:B:202:TRP:CZ2	2:B:225:LYS:HB2	2.42	0.54
1:C:1066:LEU:N	1:C:1066:LEU:HD12	2.24	0.53
2:D:138:GLU:HA	2:D:141:TYR:CE2	2.43	0.53
2:B:269:MET:O	2:B:270:ALA:O	2.26	0.53
2:D:294:ARG:NH1	3:D:357:HOH:O	2.41	0.53
2:B:60:TRP:HD1	2:B:63:MET:HE3	1.74	0.53
2:B:136:GLY:O	2:B:139:ARG:HB2	2.08	0.53
2:D:210:HIS:CD2	2:D:215:ILE:H	2.27	0.53
2:B:188:GLU:HA	2:B:191:ARG:CD	2.39	0.53
1:C:1072:ASP:HB2	3:D:367:HOH:O	2.09	0.52
2:B:269:MET:HE2	2:B:272:LEU:HD11	1.92	0.52
2:D:77:LEU:HA	2:D:78:LYS:HZ3	1.75	0.52
2:B:215:ILE:HG21	2:B:221:ALA:HB2	1.91	0.52
2:B:188:GLU:CA	2:B:191:ARG:HH11	2.22	0.52
2:D:224:LEU:HA	2:D:258:TRP:CZ2	2.45	0.52
2:D:60:TRP:HD1	2:D:63:MET:HE3	1.75	0.52
2:D:152:THR:O	2:D:155:SER:HB2	2.10	0.51
2:B:325:PHE:O	2:B:329:ILE:HG12	2.10	0.51
2:D:188:GLU:HA	2:D:191:ARG:CD	2.40	0.51
2:D:68:ARG:HH11	2:D:68:ARG:HG2	1.75	0.51
2:B:68:ARG:HG2	2:B:68:ARG:HH11	1.76	0.51
2:B:145:SER:O	2:B:146:GLN:C	2.49	0.51
2:D:329:ILE:HD11	2:D:349:LEU:HB2	1.92	0.51
2:B:188:GLU:HA	2:B:191:ARG:CZ	2.41	0.51
2:D:51:VAL:HG11	2:D:115:PHE:CE2	2.46	0.51
2:D:244:PHE:HE2	2:D:254:LEU:HD11	1.76	0.51
2:D:259:ASN:HB3	3:D:383:HOH:O	2.09	0.51
2:B:277:VAL:HG21	2:B:294:ARG:HD3	1.92	0.51
2:B:84:ILE:HD13	2:B:84:ILE:O	2.11	0.50
2:D:84:ILE:HD13	2:D:84:ILE:O	2.10	0.50
2:B:244:PHE:HE2	2:B:254:LEU:HD11	1.75	0.50
2:B:87:LEU:HD13	2:B:159:SER:N	2.26	0.50
2:B:145:SER:O	2:B:148:ARG:N	2.44	0.50
2:B:259:ASN:HA	2:B:263:VAL:HG23	1.92	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:144:ASN:HA	2:B:149:ARG:NE	2.27	0.50
2:B:150:ASN:O	2:B:154:LEU:HD13	2.11	0.50
2:D:277:VAL:HG21	2:D:294:ARG:HD3	1.93	0.50
2:D:285:ILE:HG12	2:D:285:ILE:O	2.10	0.50
2:B:199:ILE:HD11	2:B:235:TYR:CB	2.42	0.49
2:B:269:MET:HE1	3:B:452:HOH:O	2.11	0.49
2:B:152:THR:O	2:B:155:SER:HB2	2.12	0.49
2:B:51:VAL:HG11	2:B:115:PHE:CE2	2.47	0.49
2:B:197:LYS:HB3	2:B:197:LYS:HZ2	1.77	0.49
2:B:183:LYS:NZ	3:B:374:HOH:O	2.44	0.49
2:D:101:ARG:HD3	2:D:173:LEU:HD11	1.94	0.49
2:B:285:ILE:HG12	2:B:285:ILE:O	2.12	0.49
2:D:87:LEU:HD13	2:D:159:SER:N	2.28	0.49
2:D:215:ILE:HG21	2:D:221:ALA:HB2	1.95	0.49
2:D:247:LEU:HD13	2:D:295:LEU:HD11	1.95	0.49
2:D:65:LYS:HG2	2:D:69:LEU:HD13	1.95	0.49
2:D:145:SER:O	2:D:148:ARG:N	2.46	0.49
2:B:65:LYS:HG2	2:B:69:LEU:HD13	1.95	0.48
2:D:188:GLU:HA	2:D:191:ARG:CZ	2.42	0.48
2:D:340:PRO:CD	2:D:346:ASN:HD22	2.23	0.48
2:B:101:ARG:HD3	2:B:173:LEU:HD11	1.94	0.48
2:D:144:ASN:HA	2:D:149:ARG:NE	2.28	0.48
1:A:1068:ARG:CZ	2:B:80:SER:HB2	2.43	0.48
2:D:104:GLY:O	2:D:106:MET:N	2.42	0.48
2:D:143:GLU:HG3	2:D:144:ASN:CG	2.33	0.48
2:B:329:ILE:HD11	2:B:349:LEU:HB2	1.95	0.48
2:B:143:GLU:HG3	2:B:144:ASN:CG	2.33	0.48
2:D:168:ILE:HG22	2:D:168:ILE:O	2.13	0.48
2:D:197:LYS:HB3	2:D:197:LYS:HZ2	1.78	0.48
2:B:104:GLY:O	2:B:106:MET:N	2.45	0.48
2:D:145:SER:O	2:D:146:GLN:C	2.49	0.48
2:D:188:GLU:CA	2:D:191:ARG:HH11	2.23	0.48
2:D:308:VAL:HA	2:D:313:ASN:O	2.13	0.48
2:D:51:VAL:HG11	2:D:115:PHE:HE2	1.79	0.47
2:B:143:GLU:HG3	2:B:144:ASN:OD1	2.14	0.47
2:B:134:LYS:HG3	2:B:135:GLU:HG3	1.96	0.47
2:B:84:ILE:C	2:B:84:ILE:CD1	2.82	0.47
2:D:51:VAL:HG12	2:D:51:VAL:O	2.15	0.47
2:D:143:GLU:HG3	2:D:144:ASN:OD1	2.14	0.47
2:B:269:MET:HB2	3:B:373:HOH:O	2.14	0.47
1:C:1064:SER:CB	2:D:79:ASN:ND2	2.77	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:259:ASN:HA	2:D:263:VAL:HG23	1.95	0.47
2:B:89:PRO:HA	3:B:384:HOH:O	2.15	0.47
2:B:170:PRO:O	2:B:171:SER:HB2	2.15	0.47
2:D:167:GLY:O	2:D:170:PRO:HD3	2.13	0.47
2:D:170:PRO:O	2:D:171:SER:HB2	2.15	0.47
2:B:78:LYS:H	2:B:78:LYS:CD	2.28	0.47
2:B:167:GLY:O	2:B:170:PRO:HD3	2.15	0.47
2:B:168:ILE:O	2:B:168:ILE:HG22	2.15	0.47
2:D:65:LYS:HG2	2:D:69:LEU:CD1	2.45	0.47
2:D:303:TRP:O	2:D:318:ILE:HG23	2.15	0.47
2:D:343:ARG:NE	3:D:372:HOH:O	2.32	0.47
1:A:1065:PHE:HD2	1:A:1066:LEU:H	1.56	0.47
2:D:77:LEU:HD23	2:D:148:ARG:HH21	1.80	0.47
2:B:201:PRO:O	2:B:202:TRP:C	2.54	0.46
2:B:74:LYS:HB3	2:B:141:TYR:HB3	1.96	0.46
2:B:308:VAL:HA	2:B:313:ASN:O	2.15	0.46
2:D:101:ARG:HH11	2:D:173:LEU:HD11	1.80	0.46
2:D:201:PRO:O	2:D:202:TRP:C	2.53	0.46
1:A:1066:LEU:HD12	1:A:1066:LEU:H	1.80	0.46
2:B:158:PHE:HA	2:B:161:MET:CE	2.45	0.46
2:B:249:GLN:HB2	2:B:250:PRO:HA	1.97	0.46
2:D:158:PHE:HA	2:D:161:MET:CE	2.45	0.46
2:B:77:LEU:HA	2:B:78:LYS:HZ3	1.75	0.46
2:D:78:LYS:H	2:D:78:LYS:CD	2.27	0.46
2:D:202:TRP:N	2:D:203:LYS:NZ	2.64	0.46
2:B:65:LYS:HG2	2:B:69:LEU:CD1	2.45	0.46
2:B:77:LEU:HD23	2:B:148:ARG:HH21	1.80	0.46
2:B:224:LEU:HA	2:B:258:TRP:CZ2	2.50	0.46
2:D:154:LEU:HD12	2:D:154:LEU:N	2.30	0.46
2:D:291:TYR:CD1	2:D:337:TYR:HA	2.51	0.46
2:B:67:VAL:HG22	2:B:88:LEU:HD12	1.97	0.46
2:D:272:LEU:HD23	2:D:276:GLU:OE1	2.16	0.46
2:D:320:HIS:O	2:D:321:ASN:HB2	2.16	0.46
2:D:197:LYS:HA	2:D:197:LYS:HZ3	1.81	0.46
1:C:1068:ARG:CZ	2:D:80:SER:HB2	2.45	0.46
2:D:112:ASN:O	2:D:116:ARG:HG3	2.16	0.46
2:D:156:LEU:HD11	2:D:273:THR:CG2	2.32	0.46
2:D:249:GLN:HB2	2:D:250:PRO:HA	1.98	0.46
1:A:1064:SER:CB	2:B:79:ASN:ND2	2.76	0.46
2:B:323:PRO:HA	3:B:403:HOH:O	2.15	0.46
2:D:54:LYS:HB3	3:D:407:HOH:O	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:74:LYS:HB3	2:D:141:TYR:HB3	1.97	0.46
2:B:51:VAL:HG12	2:B:51:VAL:O	2.16	0.45
2:D:67:VAL:HG22	2:D:88:LEU:HD12	1.98	0.45
2:D:272:LEU:O	2:D:294:ARG:HD2	2.15	0.45
2:B:101:ARG:HH11	2:B:173:LEU:HD11	1.82	0.45
2:D:69:LEU:HD23	2:D:133:PHE:CD2	2.52	0.45
2:D:134:LYS:HG3	2:D:135:GLU:HG3	1.97	0.45
2:B:101:ARG:NE	2:B:173:LEU:HD21	2.32	0.45
2:B:189:PHE:CZ	2:B:209:LEU:HA	2.52	0.45
2:B:70:CYS:HA	2:B:75:LEU:CD1	2.47	0.45
2:B:107:GLU:O	2:B:111:GLU:HB2	2.17	0.45
2:D:89:PRO:HA	3:D:402:HOH:O	2.16	0.45
2:D:189:PHE:C	2:D:189:PHE:CD1	2.89	0.45
2:D:202:TRP:N	2:D:203:LYS:HZ1	2.15	0.45
2:B:272:LEU:O	2:B:294:ARG:HD2	2.16	0.45
2:B:272:LEU:HD23	2:B:276:GLU:OE1	2.17	0.45
2:B:284:PHE:O	2:B:286:HIS:N	2.50	0.45
2:B:293:PHE:CD1	2:B:293:PHE:N	2.84	0.45
2:B:305:ILE:O	2:B:316:GLN:HA	2.17	0.45
2:D:189:PHE:CZ	2:D:209:LEU:HA	2.52	0.45
2:D:299:ARG:HH11	2:D:299:ARG:CG	2.30	0.45
2:B:189:PHE:CD1	2:B:189:PHE:C	2.90	0.45
2:B:202:TRP:N	2:B:203:LYS:NZ	2.65	0.45
2:B:277:VAL:CG2	2:B:294:ARG:HD3	2.46	0.45
2:B:82:PRO:HD2	2:B:273:THR:HB	1.99	0.44
2:B:286:HIS:NE2	3:B:423:HOH:O	2.21	0.44
2:B:197:LYS:HZ3	2:B:197:LYS:HA	1.82	0.44
2:D:70:CYS:HA	2:D:75:LEU:CD1	2.47	0.44
2:B:320:HIS:O	2:B:321:ASN:HB2	2.17	0.44
2:B:51:VAL:HG11	2:B:115:PHE:HE2	1.82	0.44
2:B:65:LYS:HA	2:B:68:ARG:HG2	1.99	0.44
2:B:173:LEU:N	2:B:173:LEU:HD22	2.33	0.44
2:B:284:PHE:O	2:B:287:LYS:N	2.49	0.44
2:D:101:ARG:NE	2:D:173:LEU:HD21	2.32	0.44
2:D:61:LYS:NZ	3:D:381:HOH:O	2.50	0.44
2:B:267:GLY:HA3	2:B:293:PHE:CE1	2.53	0.44
2:B:291:TYR:CD1	2:B:337:TYR:HA	2.52	0.44
2:B:294:ARG:HB3	3:B:373:HOH:O	2.18	0.44
2:D:65:LYS:HA	2:D:68:ARG:HG2	1.99	0.44
2:D:154:LEU:H	2:D:154:LEU:CD1	2.30	0.44
2:D:265:HIS:CD2	2:D:347:PRO:HG2	2.53	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:305:ILE:O	2:D:316:GLN:HA	2.18	0.44
2:D:309:THR:O	2:D:312:GLY:N	2.49	0.44
2:B:156:LEU:HD11	2:B:273:THR:CG2	2.31	0.44
2:B:281:LEU:HD23	2:B:281:LEU:HA	1.80	0.44
2:B:299:ARG:HH11	2:B:299:ARG:CG	2.30	0.44
2:D:277:VAL:CG2	2:D:294:ARG:HD3	2.48	0.44
2:B:265:HIS:CD2	2:B:347:PRO:HG2	2.53	0.44
2:D:82:PRO:HD2	2:D:273:THR:HB	1.99	0.43
2:D:170:PRO:C	2:D:172:GLY:H	2.21	0.43
2:D:280:ARG:NH2	2:D:341:ASP:OD2	2.45	0.43
2:B:112:ASN:O	2:B:116:ARG:HG3	2.18	0.43
2:B:309:THR:O	2:B:312:GLY:N	2.51	0.43
2:B:154:LEU:O	2:B:155:SER:C	2.55	0.43
2:B:247:LEU:HD13	2:B:295:LEU:HD11	2.00	0.43
2:D:59:CYS:SG	2:D:123:MET:HB2	2.58	0.43
1:C:1065:PHE:HD2	1:C:1066:LEU:H	1.55	0.43
2:B:121:ASN:HA	3:B:397:HOH:O	2.17	0.43
2:B:134:LYS:O	2:B:137:LYS:HG3	2.18	0.43
2:B:265:HIS:HA	2:B:266:PRO:HD2	1.79	0.43
2:D:157:ILE:O	2:D:161:MET:HG3	2.18	0.43
2:D:182:THR:HG22	2:D:183:LYS:HD2	2.01	0.43
2:D:267:GLY:HA3	2:D:293:PHE:CE1	2.54	0.43
2:B:95:LEU:HD23	2:B:165:LEU:HD21	2.01	0.43
2:B:154:LEU:N	2:B:154:LEU:HD12	2.34	0.43
1:C:1072:ASP:OD1	1:C:1072:ASP:C	2.57	0.43
2:D:107:GLU:O	2:D:111:GLU:HB2	2.19	0.43
2:D:174:PHE:O	2:D:175:GLN:HG2	2.18	0.43
2:D:188:GLU:HG3	2:D:191:ARG:CZ	2.48	0.43
2:D:293:PHE:CD1	2:D:293:PHE:N	2.86	0.43
2:D:323:PRO:HA	3:D:354:HOH:O	2.19	0.43
1:A:1064:SER:CB	2:B:79:ASN:HD21	2.32	0.43
2:B:72:ASN:ND2	2:B:74:LYS:HB2	2.32	0.43
2:D:154:LEU:N	2:D:154:LEU:CD1	2.82	0.43
2:D:65:LYS:O	2:D:68:ARG:HG3	2.19	0.43
2:D:95:LEU:HD23	2:D:165:LEU:HD21	2.00	0.43
2:B:170:PRO:C	2:B:172:GLY:H	2.22	0.43
2:D:156:LEU:O	2:D:160:HIS:CD2	2.72	0.43
2:D:138:GLU:O	2:D:142:GLU:OE1	2.37	0.42
2:D:269:MET:HE2	2:D:272:LEU:CD1	2.49	0.42
2:D:340:PRO:O	2:D:343:ARG:HB2	2.19	0.42
2:B:340:PRO:O	2:B:343:ARG:HB2	2.18	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:65:LYS:O	2:B:68:ARG:HG3	2.19	0.42
2:B:345:GLN:NE2	2:B:345:GLN:HA	2.34	0.42
2:B:59:CYS:SG	2:B:123:MET:HB2	2.59	0.42
2:B:266:PRO:HG2	2:B:340:PRO:HB2	2.00	0.42
2:D:133:PHE:O	2:D:137:LYS:N	2.53	0.42
2:B:69:LEU:HD23	2:B:133:PHE:CG	2.55	0.42
2:B:303:TRP:CE2	2:B:324:LEU:HD22	2.54	0.42
2:D:69:LEU:HD23	2:D:133:PHE:CG	2.54	0.42
2:D:154:LEU:O	2:D:155:SER:C	2.58	0.42
2:D:266:PRO:HG2	2:D:340:PRO:HB2	2.00	0.42
2:B:87:LEU:HD11	2:B:159:SER:HB2	2.01	0.42
2:B:280:ARG:NH2	2:B:341:ASP:OD2	2.46	0.42
2:D:173:LEU:N	2:D:173:LEU:HD22	2.34	0.42
2:D:303:TRP:CE2	2:D:324:LEU:HD22	2.54	0.42
2:B:127:LYS:O	2:B:128:GLN:C	2.58	0.42
2:B:210:HIS:O	2:B:210:HIS:ND1	2.53	0.42
2:B:133:PHE:O	2:B:137:LYS:N	2.52	0.42
1:C:1066:LEU:HD12	1:C:1066:LEU:H	1.83	0.42
2:D:127:LYS:O	2:D:128:GLN:C	2.57	0.42
2:D:173:LEU:O	2:D:175:GLN:HG3	2.19	0.42
2:B:272:LEU:HD22	2:B:276:GLU:CB	2.48	0.42
2:D:153:LYS:O	2:D:154:LEU:C	2.58	0.42
2:D:256:ARG:NH2	3:D:457:HOH:O	2.51	0.42
2:B:69:LEU:HD23	2:B:133:PHE:CD2	2.54	0.42
2:B:173:LEU:O	2:B:175:GLN:HG3	2.20	0.42
2:D:229:ASP:HB3	3:D:417:HOH:O	2.20	0.42
2:B:68:ARG:HG3	2:B:69:LEU:HD12	2.02	0.41
2:D:78:LYS:NZ	2:D:78:LYS:N	2.63	0.41
2:B:125:LYS:NZ	2:B:232:CYS:O	2.44	0.41
2:B:153:LYS:O	2:B:154:LEU:C	2.58	0.41
2:B:174:PHE:O	2:B:175:GLN:HG2	2.19	0.41
1:C:1064:SER:CB	2:D:79:ASN:HD21	2.33	0.41
1:C:1068:ARG:HH21	2:D:274:TYR:HB3	1.85	0.41
2:D:121:ASN:HA	3:D:386:HOH:O	2.20	0.41
2:B:303:TRP:O	2:B:318:ILE:HG23	2.20	0.41
2:D:303:TRP:CG	2:D:324:LEU:HD22	2.56	0.41
2:D:127:LYS:O	2:D:130:ILE:N	2.53	0.41
2:D:318:ILE:O	2:D:320:HIS:CD2	2.74	0.41
2:B:269:MET:HB3	2:B:269:MET:HE3	1.78	0.41
2:D:134:LYS:O	2:D:137:LYS:HG3	2.20	0.41
2:D:149:ARG:NH1	2:D:149:ARG:CG	2.80	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:94:HIS:CD2	2:D:166:LYS:HG2	2.56	0.41
2:D:288:PRO:HB3	2:D:310:ALA:HA	2.03	0.41
2:B:188:GLU:HG3	2:B:191:ARG:CZ	2.50	0.41
2:D:210:HIS:ND1	2:D:210:HIS:O	2.54	0.41
2:D:272:LEU:HD22	2:D:276:GLU:CB	2.47	0.41
2:D:284:PHE:O	2:D:287:LYS:N	2.53	0.41
2:B:138:GLU:O	2:B:142:GLU:OE1	2.39	0.41
2:D:58:LYS:HE2	3:D:442:HOH:O	2.20	0.41
2:D:158:PHE:HA	2:D:161:MET:HE2	2.03	0.41
1:A:1072:ASP:OD1	1:A:1072:ASP:C	2.59	0.40
2:B:95:LEU:CD2	2:B:165:LEU:HD21	2.51	0.40
2:B:154:LEU:CD1	2:B:154:LEU:H	2.34	0.40
2:B:157:ILE:O	2:B:161:MET:HG3	2.21	0.40
2:B:158:PHE:HA	2:B:161:MET:HE2	2.03	0.40
2:B:345:GLN:CA	2:B:345:GLN:HE21	2.34	0.40
2:D:72:ASN:ND2	2:D:74:LYS:HB2	2.34	0.40
2:B:78:LYS:NZ	2:B:78:LYS:N	2.63	0.40
2:B:188:GLU:CB	2:B:191:ARG:NH1	2.85	0.40
2:B:321:ASN:N	3:B:393:HOH:O	2.54	0.40
2:D:339:PHE:HB3	2:D:343:ARG:O	2.22	0.40
2:B:102:TYR:O	2:B:104:GLY:N	2.54	0.40
2:B:144:ASN:O	2:B:149:ARG:NH2	2.54	0.40
2:B:156:LEU:O	2:B:160:HIS:CD2	2.74	0.40
2:B:331:GLY:HA3	2:B:337:TYR:HD2	1.74	0.40
2:D:84:ILE:HG22	3:D:404:HOH:O	2.21	0.40
2:D:209:LEU:HD12	2:D:209:LEU:O	2.20	0.40
2:D:342:GLY:O	2:D:343:ARG:C	2.60	0.40
2:D:345:GLN:HA	2:D:345:GLN:NE2	2.36	0.40
2:B:154:LEU:N	2:B:154:LEU:CD1	2.84	0.40
2:B:342:GLY:O	2:B:343:ARG:C	2.60	0.40
2:D:339:PHE:HA	2:D:340:PRO:HD2	1.95	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	8/13 (62%)	4 (50%)	2 (25%)	2 (25%)	0	0
1	C	8/13 (62%)	4 (50%)	2 (25%)	2 (25%)	0	0
2	B	302/329 (92%)	248 (82%)	44 (15%)	10 (3%)	4	6
2	D	302/329 (92%)	248 (82%)	44 (15%)	10 (3%)	4	6
All	All	620/684 (91%)	504 (81%)	92 (15%)	24 (4%)	3	4

All (24) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	103	GLU
2	B	270	ALA
2	B	285	ILE
2	D	103	GLU
2	D	270	ALA
2	D	285	ILE
1	A	1067	GLN
1	A	1068	ARG
2	B	137	LYS
1	C	1067	GLN
1	C	1068	ARG
2	D	137	LYS
2	B	105	LYS
2	B	216	SER
2	D	105	LYS
2	D	216	SER
2	B	229	ASP
2	B	254	LEU
2	D	229	ASP
2	D	254	LEU
2	B	84	ILE
2	B	288	PRO
2	D	84	ILE
2	D	288	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	10/11 (91%)	9 (90%)	1 (10%)	7	14
1	C	10/11 (91%)	9 (90%)	1 (10%)	7	14
2	B	271/293 (92%)	254 (94%)	17 (6%)	18	36
2	D	271/293 (92%)	255 (94%)	16 (6%)	19	39
All	All	562/608 (92%)	527 (94%)	35 (6%)	18	37

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1066	LEU
2	B	53	LYS
2	B	68	ARG
2	B	78	LYS
2	B	84	ILE
2	B	111	GLU
2	B	141	TYR
2	B	142	GLU
2	B	191	ARG
2	B	197	LYS
2	B	203	LYS
2	B	259	ASN
2	B	299	ARG
2	B	307	TYR
2	B	311	ASP
2	B	313	ASN
2	B	325	PHE
2	B	343	ARG
1	C	1066	LEU
2	D	53	LYS
2	D	68	ARG
2	D	78	LYS
2	D	84	ILE
2	D	111	GLU
2	D	141	TYR
2	D	142	GLU
2	D	191	ARG
2	D	197	LYS
2	D	203	LYS
2	D	259	ASN

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Mol	Chain	Res	Type
2	D	299	ARG
2	D	307	TYR
2	D	313	ASN
2	D	325	PHE
2	D	343	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	79	ASN
2	B	94	HIS
2	B	160	HIS
2	B	213	HIS
2	B	282	GLN
2	B	313	ASN
2	B	316	GLN
2	B	321	ASN
2	B	344	ASN
2	B	345	GLN
2	B	346	ASN
2	D	79	ASN
2	D	94	HIS
2	D	160	HIS
2	D	213	HIS
2	D	257	ASN
2	D	282	GLN
2	D	286	HIS
2	D	316	GLN
2	D	321	ASN
2	D	344	ASN
2	D	345	GLN
2	D	346	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](#)

2 non-standard protein/DNA/RNA residues are modelled in this entry.

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
1	PTR	C	1069	1	15,16,17	1.47	1 (6%)	19,22,24	0.98	0
1	PTR	A	1069	1	15,16,17	1.48	2 (13%)	19,22,24	0.99	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
1	PTR	C	1069	1	-	1/10/11/13	0/1/1/1
1	PTR	A	1069	1	-	1/10/11/13	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	1069	PTR	P-OH	3.43	1.64	1.59
1	C	1069	PTR	P-OH	3.37	1.64	1.59
1	A	1069	PTR	CE1-CD1	2.07	1.42	1.38

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	1069	PTR	O-C-CA-CB
1	C	1069	PTR	O-C-CA-CB

There are no ring outliers.

No monomer is involved in short contacts.

## 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](#)

There are no chain breaks in this entry.



## 6 Fit of model and data [i](#)

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

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	10/13 (76%)	0.12	2 (20%) 1 0	22, 32, 48, 51	0
1	C	10/13 (76%)	0.10	2 (20%) 1 0	22, 32, 48, 51	0
2	B	304/329 (92%)	-0.43	1 (0%) 94 93	16, 32, 52, 71	0
2	D	304/329 (92%)	-0.43	0 100 100	16, 32, 52, 71	0
All	All	628/684 (91%)	-0.42	5 (0%) 86 84	16, 32, 52, 71	0

All (5) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	1065	PHE	2.8
1	C	1064	SER	2.7
1	A	1064	SER	2.4
2	B	173	LEU	2.1
1	C	1065	PHE	2.0

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<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	B-factors(Å <sup>2</sup> )	Q<0.9
1	PTR	C	1069	16/17	0.96	0.14	27,28,29,30	0
1	PTR	A	1069	16/17	0.97	0.13	27,28,29,30	0

### 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands

There are no ligands in this entry.

## 6.5 Other polymers

There are no such residues in this entry.