



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 02:54 AM GMT

PDB ID : 2J9O  
Title : STRUCTURE OF PBP-A, L158E MUTANT  
Authors : Evrard, C.; Declercq, J.P.  
Deposited on : 2006-11-14  
Resolution : 1.50 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.  
We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)  
A user guide is available at  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
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

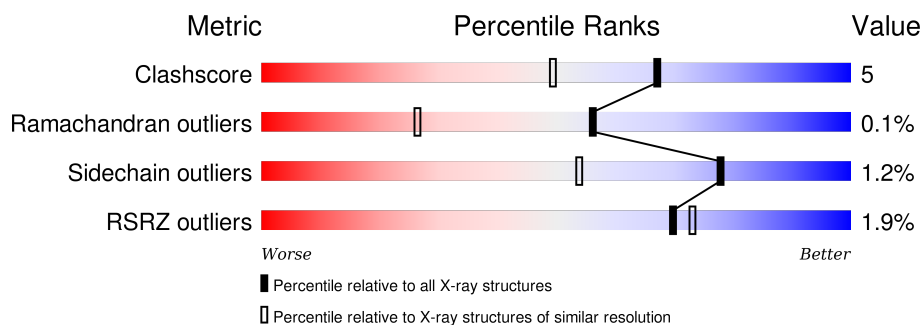
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 1.50 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	102246	2274 (1.50-1.50)
Ramachandran outliers	100387	2218 (1.50-1.50)
Sidechain outliers	100360	2216 (1.50-1.50)
RSRZ outliers	91569	2075 (1.50-1.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	298	
1	B	298	
1	C	298	
1	D	298	

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
2	GOL	B	1276	-	-	-	X
2	GOL	C	1275	-	-	X	X
2	GOL	D	1277	-	-	-	X

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 9778 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 TLL2115 PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	264	Total	C	N	O	S	0	0	0
			2035	1277	360	387	11			
1	B	266	Total	C	N	O	S	0	0	0
			2048	1284	362	391	11			
1	C	265	Total	C	N	O	S	0	0	0
			2042	1281	361	389	11			
1	D	275	Total	C	N	O	S	0	0	0
			2108	1322	371	404	11			

There are 92 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	EXPRESSION TAG	UNP Q8DH45
A	278	GLU	-	EXPRESSION TAG	UNP Q8DH45
A	279	GLN	-	EXPRESSION TAG	UNP Q8DH45
A	280	LYS	-	EXPRESSION TAG	UNP Q8DH45
A	281	LEU	-	EXPRESSION TAG	UNP Q8DH45
A	282	ILE	-	EXPRESSION TAG	UNP Q8DH45
A	283	SER	-	EXPRESSION TAG	UNP Q8DH45
A	284	GLU	-	EXPRESSION TAG	UNP Q8DH45
A	285	GLU	-	EXPRESSION TAG	UNP Q8DH45
A	286	ASP	-	EXPRESSION TAG	UNP Q8DH45
A	287	LEU	-	EXPRESSION TAG	UNP Q8DH45
A	288	ASN	-	EXPRESSION TAG	UNP Q8DH45
A	289	SER	-	EXPRESSION TAG	UNP Q8DH45
A	290	ALA	-	EXPRESSION TAG	UNP Q8DH45
A	291	VAL	-	EXPRESSION TAG	UNP Q8DH45
A	292	ASP	-	EXPRESSION TAG	UNP Q8DH45
A	293	HIS	-	EXPRESSION TAG	UNP Q8DH45
A	294	HIS	-	EXPRESSION TAG	UNP Q8DH45
A	295	HIS	-	EXPRESSION TAG	UNP Q8DH45
A	296	HIS	-	EXPRESSION TAG	UNP Q8DH45
A	297	HIS	-	EXPRESSION TAG	UNP Q8DH45

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Chain	Residue	Modelled	Actual	Comment	Reference
A	298	HIS	-	EXPRESSION TAG	UNP Q8DH45
A	158	GLU	LEU	ENGINEERED MUTATION	UNP Q8DH45
B	1	MET	-	EXPRESSION TAG	UNP Q8DH45
B	278	GLU	-	EXPRESSION TAG	UNP Q8DH45
B	279	GLN	-	EXPRESSION TAG	UNP Q8DH45
B	280	LYS	-	EXPRESSION TAG	UNP Q8DH45
B	281	LEU	-	EXPRESSION TAG	UNP Q8DH45
B	282	ILE	-	EXPRESSION TAG	UNP Q8DH45
B	283	SER	-	EXPRESSION TAG	UNP Q8DH45
B	284	GLU	-	EXPRESSION TAG	UNP Q8DH45
B	285	GLU	-	EXPRESSION TAG	UNP Q8DH45
B	286	ASP	-	EXPRESSION TAG	UNP Q8DH45
B	287	LEU	-	EXPRESSION TAG	UNP Q8DH45
B	288	ASN	-	EXPRESSION TAG	UNP Q8DH45
B	289	SER	-	EXPRESSION TAG	UNP Q8DH45
B	290	ALA	-	EXPRESSION TAG	UNP Q8DH45
B	291	VAL	-	EXPRESSION TAG	UNP Q8DH45
B	292	ASP	-	EXPRESSION TAG	UNP Q8DH45
B	293	HIS	-	EXPRESSION TAG	UNP Q8DH45
B	294	HIS	-	EXPRESSION TAG	UNP Q8DH45
B	295	HIS	-	EXPRESSION TAG	UNP Q8DH45
B	296	HIS	-	EXPRESSION TAG	UNP Q8DH45
B	297	HIS	-	EXPRESSION TAG	UNP Q8DH45
B	298	HIS	-	EXPRESSION TAG	UNP Q8DH45
B	158	GLU	LEU	ENGINEERED MUTATION	UNP Q8DH45
C	1	MET	-	EXPRESSION TAG	UNP Q8DH45
C	278	GLU	-	EXPRESSION TAG	UNP Q8DH45
C	279	GLN	-	EXPRESSION TAG	UNP Q8DH45
C	280	LYS	-	EXPRESSION TAG	UNP Q8DH45
C	281	LEU	-	EXPRESSION TAG	UNP Q8DH45
C	282	ILE	-	EXPRESSION TAG	UNP Q8DH45
C	283	SER	-	EXPRESSION TAG	UNP Q8DH45
C	284	GLU	-	EXPRESSION TAG	UNP Q8DH45
C	285	GLU	-	EXPRESSION TAG	UNP Q8DH45
C	286	ASP	-	EXPRESSION TAG	UNP Q8DH45
C	287	LEU	-	EXPRESSION TAG	UNP Q8DH45
C	288	ASN	-	EXPRESSION TAG	UNP Q8DH45
C	289	SER	-	EXPRESSION TAG	UNP Q8DH45
C	290	ALA	-	EXPRESSION TAG	UNP Q8DH45
C	291	VAL	-	EXPRESSION TAG	UNP Q8DH45
C	292	ASP	-	EXPRESSION TAG	UNP Q8DH45
C	293	HIS	-	EXPRESSION TAG	UNP Q8DH45

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Chain	Residue	Modelled	Actual	Comment	Reference
C	294	HIS	-	EXPRESSION TAG	UNP Q8DH45
C	295	HIS	-	EXPRESSION TAG	UNP Q8DH45
C	296	HIS	-	EXPRESSION TAG	UNP Q8DH45
C	297	HIS	-	EXPRESSION TAG	UNP Q8DH45
C	298	HIS	-	EXPRESSION TAG	UNP Q8DH45
C	158	GLU	LEU	ENGINEERED MUTATION	UNP Q8DH45
D	1	MET	-	EXPRESSION TAG	UNP Q8DH45
D	278	GLU	-	EXPRESSION TAG	UNP Q8DH45
D	279	GLN	-	EXPRESSION TAG	UNP Q8DH45
D	280	LYS	-	EXPRESSION TAG	UNP Q8DH45
D	281	LEU	-	EXPRESSION TAG	UNP Q8DH45
D	282	ILE	-	EXPRESSION TAG	UNP Q8DH45
D	283	SER	-	EXPRESSION TAG	UNP Q8DH45
D	284	GLU	-	EXPRESSION TAG	UNP Q8DH45
D	285	GLU	-	EXPRESSION TAG	UNP Q8DH45
D	286	ASP	-	EXPRESSION TAG	UNP Q8DH45
D	287	LEU	-	EXPRESSION TAG	UNP Q8DH45
D	288	ASN	-	EXPRESSION TAG	UNP Q8DH45
D	289	SER	-	EXPRESSION TAG	UNP Q8DH45
D	290	ALA	-	EXPRESSION TAG	UNP Q8DH45
D	291	VAL	-	EXPRESSION TAG	UNP Q8DH45
D	292	ASP	-	EXPRESSION TAG	UNP Q8DH45
D	293	HIS	-	EXPRESSION TAG	UNP Q8DH45
D	294	HIS	-	EXPRESSION TAG	UNP Q8DH45
D	295	HIS	-	EXPRESSION TAG	UNP Q8DH45
D	296	HIS	-	EXPRESSION TAG	UNP Q8DH45
D	297	HIS	-	EXPRESSION TAG	UNP Q8DH45
D	298	HIS	-	EXPRESSION TAG	UNP Q8DH45
D	158	GLU	LEU	ENGINEERED MUTATION	UNP Q8DH45

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total	C	O	0	0
			6	3	3		
2	C	1	Total	C	O	0	0
			6	3	3		
2	D	1	Total	C	O	0	0
			6	3	3		

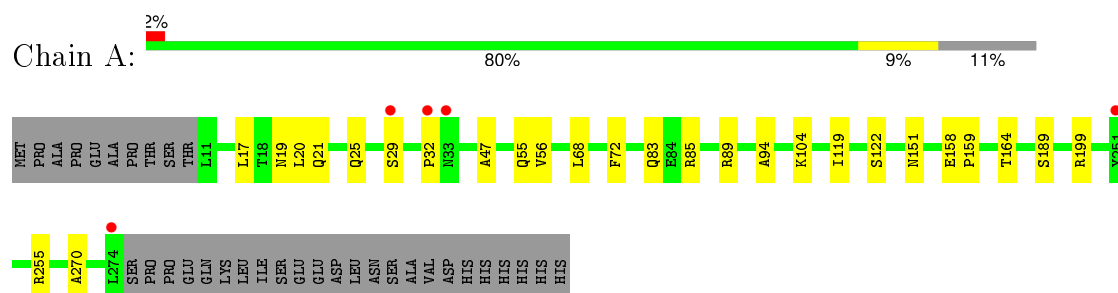
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	328	Total	O	0	0
			328	328		
3	B	382	Total	O	0	0
			382	382		
3	C	446	Total	O	0	0
			446	446		
3	D	371	Total	O	0	0
			371	371		

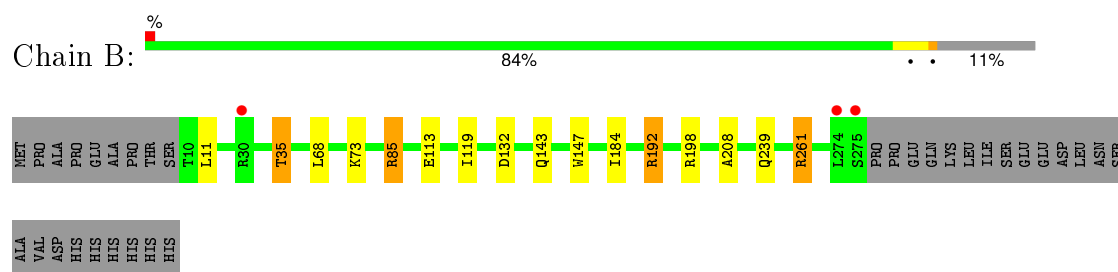
### 3 Residue-property plots [i](#)

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

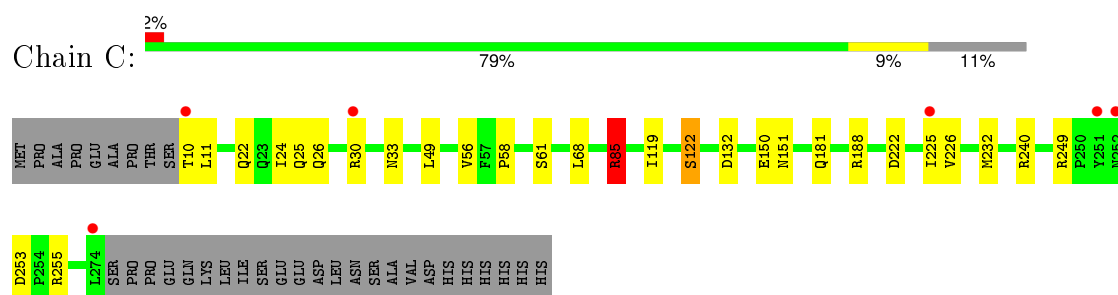
#### • Molecule 1: TLL2115 PROTEIN



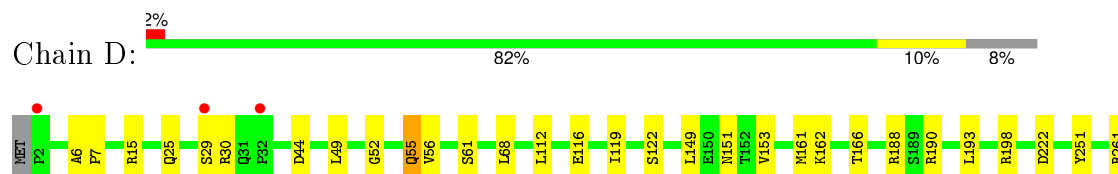
#### • Molecule 1: TLL2115 PROTEIN



#### • Molecule 1: TLL2115 PROTEIN



#### • Molecule 1: TLL2115 PROTEIN





V267			
L274			
S275			
P276			
PRO			
GLU			
GLN			
LYS			
LEU			
ILE			
SER			
GLU			
GLU			
ASP			
LEU			
ASN			
SER			
ALA			
VAL			
ASP			
HIS			
HIS			
HIS			
HIS			
HIS			

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	86.61Å 91.46Å 145.59Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	25.00 – 1.50 72.79 – 1.50	Depositor EDS
% Data completeness (in resolution range)	98.1 (25.00-1.50) 98.1 (72.79-1.50)	Depositor EDS
$R_{merge}$	0.04	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.43 (at 1.50Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, $R_{free}$	0.177 , 0.213 0.185 , (Not available)	Depositor DCC
$R_{free}$ test set	No test flags present.	DCC
Wilson B-factor (Å <sup>2</sup> )	18.5	Xtriage
Anisotropy	0.066	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 60.6	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 181249 reflections	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	9778	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	27.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.88% 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, 0.375 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: GOL

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	0.69	0/2068	0.82	3/2805 (0.1%)
1	B	0.78	0/2081	0.89	6/2823 (0.2%)
1	C	0.89	0/2075	0.95	4/2815 (0.1%)
1	D	0.73	0/2145	0.86	5/2914 (0.2%)
All	All	0.78	0/8369	0.88	18/11357 (0.2%)

There are no bond length outliers.

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	85	ARG	NE-CZ-NH2	-11.16	114.72	120.30
1	C	85	ARG	NE-CZ-NH1	9.55	125.07	120.30
1	D	198	ARG	NE-CZ-NH2	-8.33	116.13	120.30
1	D	188	ARG	NE-CZ-NH2	-6.87	116.86	120.30
1	B	261	ARG	NE-CZ-NH2	-6.82	116.89	120.30
1	D	261	ARG	NE-CZ-NH1	6.77	123.68	120.30
1	B	85	ARG	NE-CZ-NH2	-6.40	117.10	120.30
1	B	261	ARG	NE-CZ-NH1	6.13	123.36	120.30
1	B	132	ASP	CB-CG-OD2	-6.10	112.81	118.30
1	B	85	ARG	NE-CZ-NH1	5.76	123.18	120.30
1	D	44	ASP	CB-CG-OD2	5.75	123.47	118.30
1	C	188	ARG	NE-CZ-NH2	-5.69	117.45	120.30
1	C	132	ASP	CB-CG-OD2	-5.62	113.24	118.30
1	A	255	ARG	NE-CZ-NH1	5.29	122.94	120.30
1	D	190	ARG	NE-CZ-NH2	-5.11	117.74	120.30
1	A	89	ARG	NE-CZ-NH2	-5.11	117.75	120.30
1	A	199	ARG	NE-CZ-NH2	-5.03	117.78	120.30
1	B	192	ARG	NE-CZ-NH2	-5.02	117.79	120.30

There are no chirality outliers.

There are no planarity outliers.

## 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	2035	0	2066	12	0
1	B	2048	0	2078	12	0
1	C	2042	0	2073	32	0
1	D	2108	0	2135	26	0
2	B	6	0	7	0	0
2	C	6	0	7	7	0
2	D	6	0	8	3	0
3	A	328	0	0	4	0
3	B	382	0	0	7	0
3	C	446	0	0	7	0
3	D	371	0	0	5	0
All	All	9778	0	8374	80	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 5.

All (80) 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:B:85:ARG:HD2	3:B:2211:HOH:O	1.74	0.87
1:D:166:THR:HG21	3:D:2124:HOH:O	1.79	0.81
1:C:232:MET:SD	1:C:240:ARG:HD3	2.24	0.78
1:D:52:GLY:O	1:D:55:GLN:HG2	1.82	0.78
1:C:150:GLU:HG3	3:C:2289:HOH:O	1.87	0.74
1:A:19:ASN:HB2	3:A:2010:HOH:O	1.90	0.69
1:D:151:ASN:O	1:D:166:THR:HG23	1.94	0.68
1:C:24:ILE:CD1	1:C:49:LEU:HD21	2.23	0.68
1:D:56:VAL:CG2	1:D:166:THR:OG1	2.43	0.67
1:D:222:ASP:N	2:D:1277:GOL:O2	2.27	0.66
1:C:33:ASN:HB2	1:C:255:ARG:HH22	1.60	0.66
1:C:85:ARG:HD2	3:C:2205:HOH:O	1.95	0.65
1:C:56:VAL:HG22	1:C:151:ASN:CG	2.19	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:24:ILE:HD12	1:C:49:LEU:CD2	2.30	0.61
1:C:24:ILE:HD12	1:C:49:LEU:HD21	1.82	0.60
1:C:68:LEU:HD22	1:C:119:ILE:HG13	1.83	0.59
1:B:68:LEU:HD22	1:B:119:ILE:HG13	1.86	0.58
1:D:25:GLN:NE2	1:D:29:SER:OG	2.37	0.58
1:C:225:ILE:HG13	1:C:226:VAL:HG23	1.86	0.57
1:C:122:SER:OG	2:C:1275:GOL:C3	2.53	0.56
1:C:26:GLN:NE2	3:C:2043:HOH:O	2.37	0.56
1:C:222:ASP:N	2:C:1275:GOL:O2	2.40	0.55
1:B:35:THR:HG21	3:B:2064:HOH:O	2.08	0.54
1:C:22:GLN:O	1:C:26:GLN:HG2	2.07	0.54
1:C:24:ILE:HD13	1:C:49:LEU:HD21	1.88	0.54
1:C:122:SER:CB	2:C:1275:GOL:H32	2.38	0.54
1:B:11:LEU:CD2	3:B:2283:HOH:O	2.56	0.53
1:C:24:ILE:CD1	1:C:49:LEU:CD2	2.85	0.53
1:C:61:SER:CB	2:C:1275:GOL:H31	2.39	0.52
1:D:68:LEU:HD22	1:D:119:ILE:HG13	1.91	0.52
1:C:11:LEU:HB2	3:C:2002:HOH:O	2.09	0.52
1:A:164:THR:HG22	3:A:2244:HOH:O	2.10	0.52
1:D:7:PRO:HB2	3:D:2013:HOH:O	2.10	0.50
1:C:122:SER:OG	2:C:1275:GOL:H32	2.11	0.50
1:C:232:MET:SD	1:C:240:ARG:CD	2.96	0.50
1:B:73:LYS:NZ	1:B:143:GLN:HE22	2.09	0.49
1:A:158:GLU:HB3	1:A:159:PRO:HA	1.95	0.49
1:A:68:LEU:HD22	1:A:119:ILE:HG13	1.94	0.49
1:D:15:ARG:HH21	1:D:274:LEU:HD13	1.76	0.49
1:D:153:VAL:HB	1:D:166:THR:HG22	1.96	0.48
1:D:56:VAL:HG23	1:D:166:THR:OG1	2.11	0.48
1:B:147:TRP:NE1	1:B:184:ILE:HD12	2.28	0.48
1:C:56:VAL:HG23	3:C:2046:HOH:O	2.15	0.47
1:B:208:ALA:HB3	1:B:261:ARG:HG2	1.97	0.47
1:C:30:ARG:HD2	1:D:251:TYR:OH	2.15	0.47
1:D:6:ALA:O	3:D:2010:HOH:O	2.21	0.46
1:A:94:ALA:HB1	1:A:159:PRO:HD3	1.97	0.46
1:D:61:SER:HB2	2:D:1277:GOL:H2	1.98	0.46
1:C:11:LEU:HD13	1:C:181:GLN:NE2	2.31	0.45
1:C:61:SER:OG	2:C:1275:GOL:H31	2.17	0.45
1:D:56:VAL:HG22	1:D:166:THR:OG1	2.17	0.45
1:D:116:GLU:OE2	3:D:2220:HOH:O	2.21	0.44
1:D:15:ARG:O	1:D:15:ARG:HG2	2.17	0.44
1:B:239:GLN:HG2	3:B:2340:HOH:O	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:55:GLN:NE2	3:A:2072:HOH:O	2.51	0.44
1:A:17:LEU:HG	1:A:47:ALA:HB1	2.00	0.43
1:A:72:PHE:HB3	1:A:189:SER:HB3	2.00	0.43
1:D:222:ASP:N	2:D:1277:GOL:HO2	2.17	0.43
1:C:30:ARG:HD3	1:D:161:MET:CE	2.48	0.43
1:D:49:LEU:CD1	1:D:267:VAL:HG22	2.49	0.43
1:C:25:GLN:OE1	3:C:2040:HOH:O	2.21	0.43
1:C:225:ILE:HG12	3:C:2321:HOH:O	2.19	0.42
1:B:198:ARG:HD3	3:B:2300:HOH:O	2.18	0.42
1:C:33:ASN:HB2	1:C:255:ARG:NH2	2.32	0.42
1:B:113:GLU:OE1	3:B:2221:HOH:O	2.21	0.42
1:B:147:TRP:CD1	1:B:184:ILE:HD12	2.55	0.42
1:D:162:LYS:NZ	3:D:2270:HOH:O	2.53	0.42
1:C:249:ARG:NH1	1:C:253:ASP:O	2.53	0.42
1:D:52:GLY:O	1:D:55:GLN:CG	2.60	0.41
1:C:58:PRO:HB2	1:C:226:VAL:HG21	2.01	0.41
1:A:20:LEU:HD22	1:A:270:ALA:CB	2.49	0.41
1:D:49:LEU:HD13	1:D:267:VAL:HG22	2.02	0.41
1:A:83:GLN:HG2	3:A:2128:HOH:O	2.20	0.41
1:D:149:LEU:HD23	1:D:149:LEU:N	2.36	0.41
1:B:192:ARG:HD2	3:B:2295:HOH:O	2.20	0.40
1:C:61:SER:HB2	2:C:1275:GOL:H31	2.04	0.40
1:A:25:GLN:HE21	1:A:29:SER:HB3	1.86	0.40
1:D:30:ARG:HG2	1:D:30:ARG:O	2.22	0.40
1:D:112:LEU:O	1:D:116:GLU:HG3	2.22	0.40
1:A:56:VAL:HG22	1:A:151:ASN:HB3	2.03	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	262/298 (88%)	253 (97%)	8 (3%)	1 (0%)	39	14
1	B	264/298 (89%)	258 (98%)	6 (2%)	0	100	100
1	C	263/298 (88%)	254 (97%)	9 (3%)	0	100	100
1	D	273/298 (92%)	268 (98%)	5 (2%)	0	100	100
All	All	1062/1192 (89%)	1033 (97%)	28 (3%)	1 (0%)	56	26

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	32	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	221/252 (88%)	217 (98%)	4 (2%)	66	35
1	B	223/252 (88%)	222 (100%)	1 (0%)	93	84
1	C	222/252 (88%)	219 (99%)	3 (1%)	74	47
1	D	230/252 (91%)	227 (99%)	3 (1%)	76	50
All	All	896/1008 (89%)	885 (99%)	11 (1%)	78	54

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	21	GLN
1	A	85	ARG
1	A	104	LYS
1	A	122	SER
1	B	35	THR
1	C	10	THR
1	C	85	ARG
1	C	122	SER
1	D	55	GLN
1	D	122	SER

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Mol	Chain	Res	Type
1	D	193	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	55	GLN
1	A	106	ASN
1	B	143	GLN
1	C	25	GLN
1	C	55	GLN
1	C	181	GLN
1	C	252	ASN
1	D	25	GLN
1	D	145	GLN
1	D	269	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

3 ligands 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
2	GOL	B	1276	-	5,5,5	1.43	1 (20%)	5,5,5	0.96	0
2	GOL	C	1275	-	5,5,5	1.27	1 (20%)	5,5,5	0.77	0
2	GOL	D	1277	-	5,5,5	1.18	0	5,5,5	0.81	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
2	GOL	B	1276	-	-	0/4/4/4	0/0/0/0
2	GOL	C	1275	-	-	0/4/4/4	0/0/0/0
2	GOL	D	1277	-	-	0/4/4/4	0/0/0/0

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1276	GOL	O2-C2	-2.77	1.35	1.43
2	C	1275	GOL	O2-C2	-2.56	1.35	1.43

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	1275	GOL	7	0
2	D	1277	GOL	3	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	264/298 (88%)	-0.09	5 (1%) 70 73	13, 29, 49, 55	0
1	B	266/298 (89%)	-0.37	3 (1%) 82 85	14, 21, 34, 49	0
1	C	265/298 (88%)	-0.14	6 (2%) 64 67	11, 18, 38, 47	0
1	D	275/298 (92%)	-0.17	6 (2%) 65 68	13, 25, 39, 61	0
All	All	1070/1192 (89%)	-0.19	20 (1%) 70 73	11, 23, 42, 61	0

All (20) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	276	PRO	9.1
1	C	274	LEU	5.7
1	D	274	LEU	5.5
1	D	275	SER	5.4
1	A	274	LEU	5.0
1	C	251	TYR	4.8
1	D	32	PRO	3.7
1	A	32	PRO	3.3
1	D	2	PRO	3.3
1	C	10	THR	3.0
1	B	275	SER	3.0
1	C	252	ASN	2.5
1	A	251	TYR	2.5
1	A	33	ASN	2.4
1	B	30	ARG	2.4
1	C	30	ARG	2.4
1	A	29	SER	2.3
1	D	29	SER	2.2
1	B	274	LEU	2.2
1	C	225	ILE	2.0

## 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( $\text{\AA}^2$ )	Q<0.9
2	GOL	C	1275	6/6	0.91	0.19	9.16	26,30,32,38	0
2	GOL	D	1277	6/6	0.81	0.18	7.45	19,27,30,37	0
2	GOL	B	1276	6/6	0.79	0.18	5.42	24,26,31,32	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.