



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 08:54 PM GMT

PDB ID : 1MLV  
Title : Structure and Catalytic Mechanism of a SET Domain Protein Methyltransferase  
Authors : Trievel, R.C.; Beach, B.M.; Dirk, L.M.A.; Houtz, R.L.; Hurley, J.H.  
Deposited on : 2002-08-30  
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  
<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

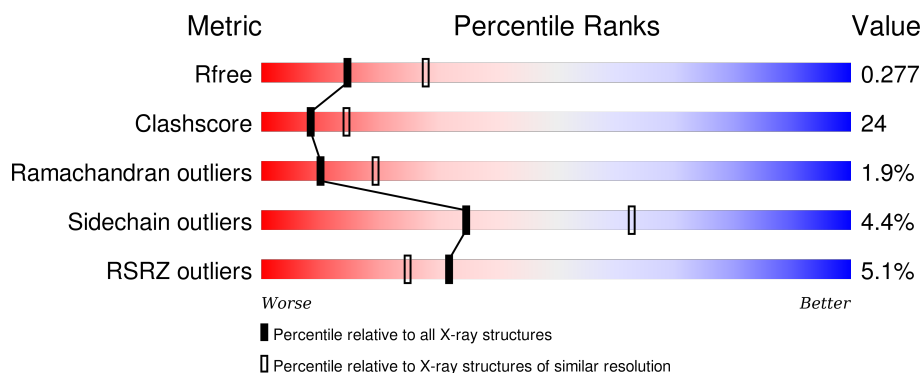
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 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))
$R_{free}$	91344	2328 (2.60-2.60)
Clashscore	102246	2679 (2.60-2.60)
Ramachandran outliers	100387	2635 (2.60-2.60)
Sidechain outliers	100360	2635 (2.60-2.60)
RSRZ outliers	91569	2334 (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 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	444	<div> <div>9%</div> <div>56%</div> <div>36%</div> <div>5%</div> </div>
1	B	444	<div> <div>4%</div> <div>62%</div> <div>33%</div> <div>•</div> </div>
1	C	444	<div> <div>3%</div> <div>64%</div> <div>30%</div> <div>5%</div> </div>

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 11270 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.

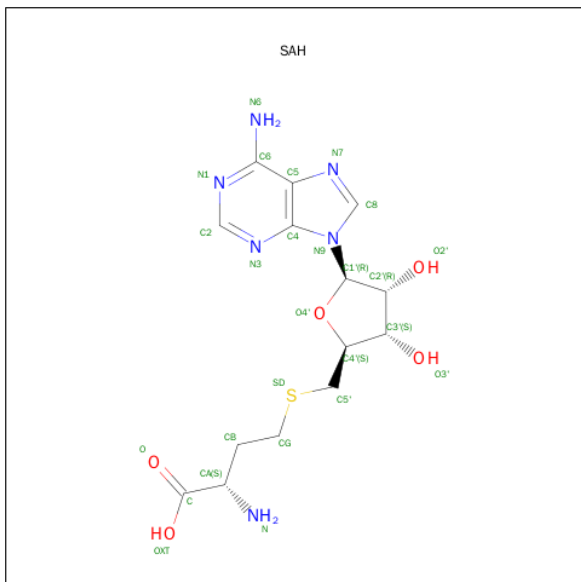
- Molecule 1 is a protein called Ribulose-1,5 biphosphate carboxylase/oxygenase large subunit N-methyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	424	Total	C	N	O	S	0	0	0
			3413	2189	562	655	7			
1	B	440	Total	C	N	O	S	0	0	0
			3542	2270	585	680	7			
1	C	438	Total	C	N	O	S	0	0	0
			3526	2262	582	675	7			

There are 21 discrepancies between the modelled and reference sequences:

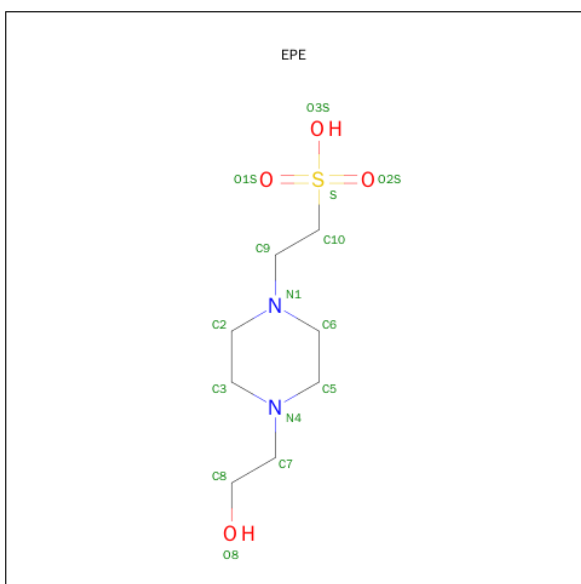
Chain	Residue	Modelled	Actual	Comment	Reference
A	45	MET	-	INITIATING MET	UNP Q43088
A	483	GLU	-	ENGINEERED	UNP Q43088
A	484	ASN	-	ENGINEERED	UNP Q43088
A	485	LEU	-	ENGINEERED	UNP Q43088
A	486	TYR	-	ENGINEERED	UNP Q43088
A	487	PHE	-	ENGINEERED	UNP Q43088
A	488	GLN	-	ENGINEERED	UNP Q43088
B	45	MET	-	INITIATING MET	UNP Q43088
B	483	GLU	-	ENGINEERED	UNP Q43088
B	484	ASN	-	ENGINEERED	UNP Q43088
B	485	LEU	-	ENGINEERED	UNP Q43088
B	486	TYR	-	ENGINEERED	UNP Q43088
B	487	PHE	-	ENGINEERED	UNP Q43088
B	488	GLN	-	ENGINEERED	UNP Q43088
C	45	MET	-	INITIATING MET	UNP Q43088
C	483	GLU	-	ENGINEERED	UNP Q43088
C	484	ASN	-	ENGINEERED	UNP Q43088
C	485	LEU	-	ENGINEERED	UNP Q43088
C	486	TYR	-	ENGINEERED	UNP Q43088
C	487	PHE	-	ENGINEERED	UNP Q43088
C	488	GLN	-	ENGINEERED	UNP Q43088

- Molecule 2 is S-ADENOSYL-L-HOMOCYSTEINE (three-letter code: SAH) (formula:  $C_{14}H_{20}N_6O_5S$ ).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			26	14	6	5	1		
2	B	1	Total	C	N	O	S	0	0
			26	14	6	5	1		
2	C	1	Total	C	N	O	S	0	0
			26	14	6	5	1		

- Molecule 3 is 4-(2-HYDROXYETHYL)-1-PIPERAZINE ETHANESULFONIC ACID (three-letter code: EPE) (formula:  $C_8H_{18}N_2O_4S$ ).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			15	8	2	4	1		
3	B	1	Total	C	N	O	S	0	0
			15	8	2	4	1		
3	C	1	Total	C	N	O	S	0	0
			15	8	2	4	1		

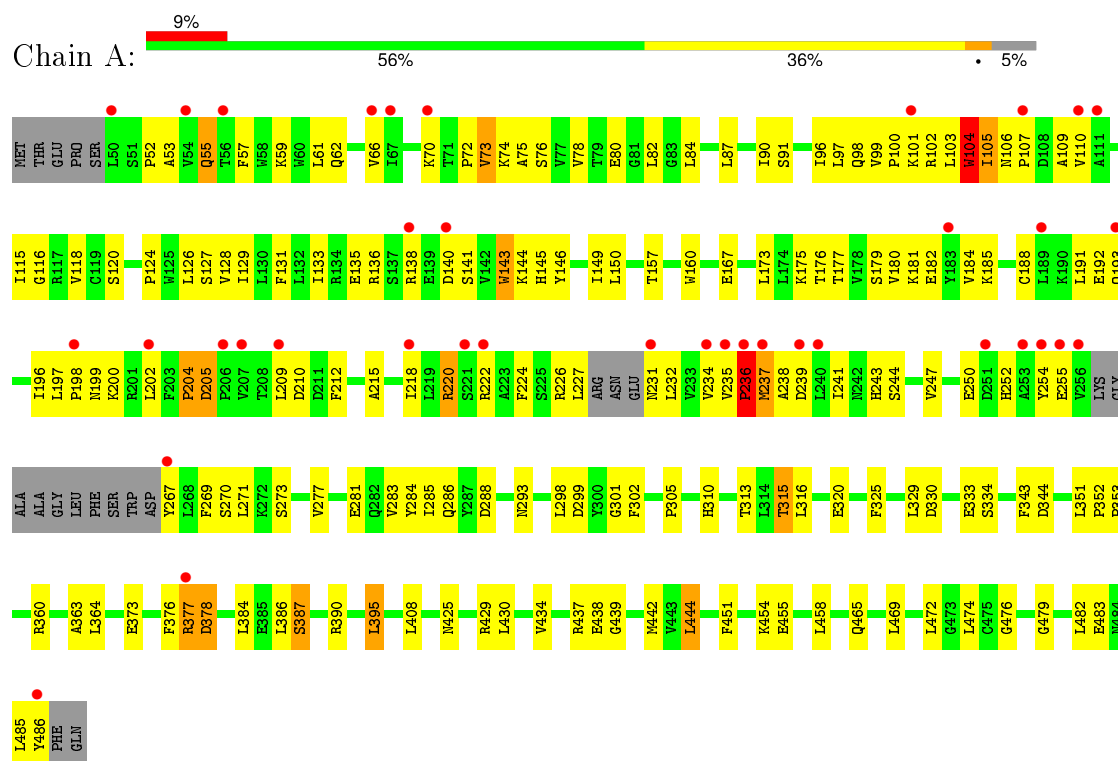
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	220	Total	O	0	0
			220	220		
4	B	228	Total	O	0	0
			228	228		
4	C	218	Total	O	0	0
			218	218		

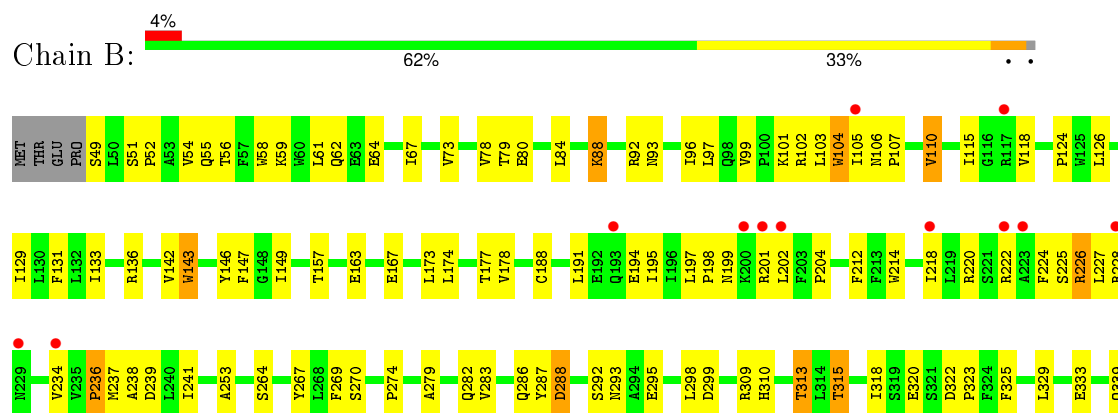
### 3 Residue-property plots

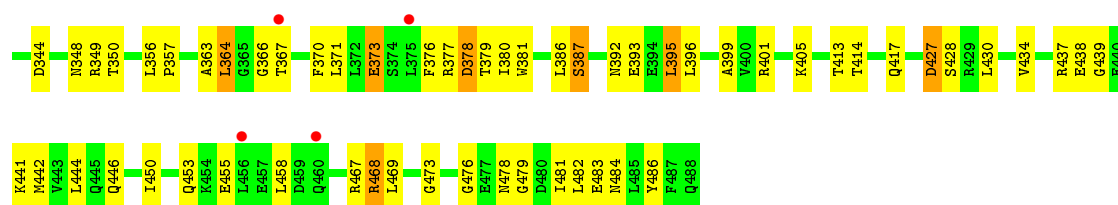
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Ribulose-1,5 biphosphate carboxylase/oxygenase large subunit N-methyltransferase

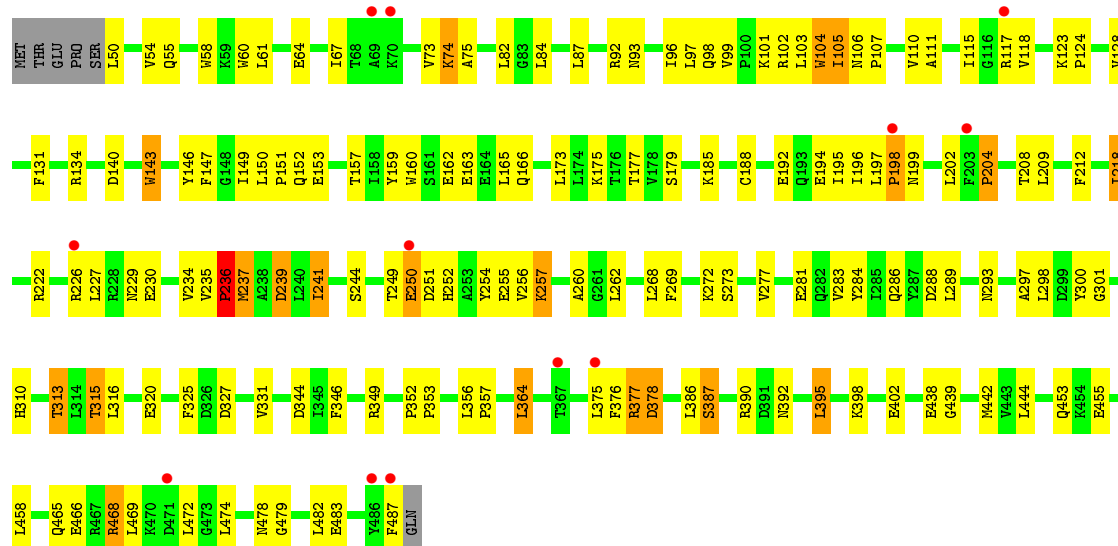


- Molecule 1: Ribulose-1,5 biphosphate carboxylase/oxygenase large subunit N-methyltransferase





- Molecule 1: Ribulose-1,5 biphosphate carboxylase/oxygenase large subunit N-methyltransferase



## 4 Data and refinement statistics

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	132.16 Å   156.68 Å   268.44 Å 90.00°   90.00°   90.00°	Depositor
Resolution (Å)	30.78 – 2.60 30.78 – 2.60	Depositor EDS
% Data completeness (in resolution range)	87.4 (30.78-2.60) 87.5 (30.78-2.60)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.05	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.73 (at 2.61 Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.232   ,   0.277 0.232   ,   0.277	Depositor DCC
$R_{free}$ test set	3836 reflections (5.12%)	DCC
Wilson B-factor (Å <sup>2</sup> )	55.0	Xtriage
Anisotropy	0.626	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 53.2	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	0 of 83954 reflections	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	11270	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	69.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.74% 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 [i](#)

### 5.1 Standard geometry [i](#)

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

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	0.42	0/3482	0.58	0/4723
1	B	0.41	0/3617	0.61	0/4906
1	C	0.39	0/3601	0.60	0/4886
All	All	0.41	0/10700	0.60	0/14515

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	3413	0	3384	190	0
1	B	3542	0	3501	162	0
1	C	3526	0	3488	180	0
2	A	26	0	19	1	0
2	B	26	0	19	1	0
2	C	26	0	19	2	0
3	A	15	0	18	3	0
3	B	15	0	17	5	0
3	C	15	0	18	3	0
4	A	220	0	0	23	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	228	0	0	21	0
4	C	218	0	0	22	0
All	All	11270	0	10483	510	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 24.

All (510) 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:C:50:LEU:HD22	1:C:54:VAL:HG11	1.42	1.02
1:B:468:ARG:HB3	1:B:468:ARG:HH11	1.22	1.00
1:A:74:LYS:HB3	1:A:87:LEU:HD21	1.44	0.98
1:B:364:LEU:HB3	4:B:947:HOH:O	1.66	0.95
1:A:469:LEU:HD12	1:C:395:LEU:HD22	1.51	0.93
1:C:177:THR:HB	4:C:851:HOH:O	1.71	0.91
1:B:173:LEU:O	1:B:177:THR:HG23	1.72	0.89
1:A:97:LEU:HD22	1:A:237:MET:HG3	1.51	0.89
1:C:249:THR:HG22	1:C:251:ASP:HB2	1.53	0.89
1:B:438:GLU:HG2	1:B:442:MET:HE2	1.57	0.87
1:A:84:LEU:HD12	1:A:241:ILE:HG23	1.59	0.84
1:C:104:TRP:HH2	1:C:269:PHE:H	1.26	0.84
1:C:222:ARG:HA	3:C:802:EPE:H71	1.59	0.84
1:A:97:LEU:HD11	1:A:238:ALA:HB2	1.60	0.82
1:B:67:ILE:HD11	1:B:237:MET:SD	2.20	0.82
1:A:395:LEU:HD22	1:B:469:LEU:HD12	1.61	0.81
1:C:315:THR:HG22	4:C:804:HOH:O	1.81	0.81
1:B:78:VAL:HG11	1:B:282:GLN:HE22	1.46	0.81
1:B:367:THR:HA	4:B:892:HOH:O	1.78	0.80
1:C:237:MET:N	4:C:951:HOH:O	2.10	0.80
1:A:199:ASN:HB3	1:A:202:LEU:HD13	1.65	0.79
1:A:472:LEU:HD13	1:A:474:LEU:HD21	1.65	0.79
1:B:468:ARG:CB	1:B:468:ARG:HH11	1.96	0.79
1:B:222:ARG:HA	3:B:801:EPE:H71	1.66	0.78
1:B:84:LEU:HD12	1:B:241:ILE:HG23	1.65	0.78
1:B:286:GLN:HE21	1:B:288:ASP:H	1.32	0.78
1:A:101:LYS:HB2	1:A:267:TYR:HB2	1.65	0.78
1:C:226:ARG:HB3	1:C:252:HIS:NE2	1.99	0.77
1:A:101:LYS:HA	1:A:104:TRP:CD2	2.20	0.77
1:A:226:ARG:O	1:A:227:LEU:HD22	1.86	0.76
1:B:395:LEU:HD22	1:C:469:LEU:HD12	1.68	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:428:SER:HB2	4:B:851:HOH:O	1.85	0.75
1:B:96:ILE:HD11	1:B:283:VAL:HG11	1.67	0.74
1:A:101:LYS:HA	1:A:104:TRP:CE2	2.22	0.74
1:B:110:VAL:HG13	1:B:131:PHE:HB2	1.68	0.74
1:B:315:THR:HG22	4:C:806:HOH:O	1.89	0.73
1:C:104:TRP:CH2	1:C:269:PHE:HB2	2.24	0.73
1:B:107:PRO:O	1:B:110:VAL:HG23	1.89	0.72
1:A:59:LYS:HD3	1:A:62:GLN:OE1	1.89	0.72
1:C:146:TYR:CE1	1:C:236:PRO:HA	2.25	0.72
1:C:468:ARG:HH11	1:C:468:ARG:HB3	1.55	0.71
1:A:73:VAL:H	1:A:87:LEU:HD12	1.54	0.71
1:A:150:LEU:HD13	1:A:218:ILE:CD1	2.21	0.71
1:C:173:LEU:O	1:C:177:THR:HG23	1.91	0.71
1:B:199:ASN:HB3	1:B:202:LEU:HD13	1.73	0.71
1:C:286:GLN:HE21	1:C:288:ASP:N	1.88	0.70
1:B:329:LEU:O	1:B:333:GLU:HG3	1.90	0.70
1:C:107:PRO:O	1:C:110:VAL:HG22	1.90	0.70
1:C:67:ILE:HD11	1:C:237:MET:SD	2.32	0.70
1:B:99:VAL:O	1:B:104:TRP:HH2	1.73	0.70
1:C:286:GLN:HE21	1:C:288:ASP:H	1.41	0.69
1:C:74:LYS:HD2	1:C:75:ALA:O	1.92	0.69
1:A:177:THR:HG22	1:A:298:LEU:HD12	1.73	0.69
1:C:54:VAL:HA	1:C:149:ILE:HD11	1.74	0.69
1:C:286:GLN:NE2	1:C:288:ASP:H	1.91	0.69
1:C:479:GLY:O	1:C:483:GLU:HG2	1.92	0.69
1:C:97:LEU:HD22	1:C:237:MET:SD	2.34	0.68
1:B:478:ASN:ND2	1:B:481:ILE:HG13	2.07	0.68
1:A:239:ASP:HB3	4:A:994:HOH:O	1.93	0.68
1:A:97:LEU:HD22	1:A:237:MET:CG	2.24	0.67
1:B:99:VAL:O	1:B:104:TRP:CH2	2.46	0.67
1:B:286:GLN:NE2	1:B:288:ASP:H	1.92	0.67
1:A:124:PRO:HA	4:A:1001:HOH:O	1.94	0.67
1:B:313:THR:HG21	1:C:478:ASN:CG	2.15	0.67
1:A:197:LEU:HB2	1:A:198:PRO:HD3	1.77	0.67
1:C:188:CYS:HB3	1:C:212:PHE:CD2	2.29	0.67
1:A:124:PRO:O	1:A:128:VAL:HG23	1.96	0.66
1:A:202:LEU:H	1:A:202:LEU:HD12	1.61	0.66
1:B:174:LEU:O	1:B:178:VAL:HG23	1.95	0.66
1:C:99:VAL:O	1:C:104:TRP:HH2	1.79	0.66
1:B:97:LEU:HD22	1:B:237:MET:SD	2.36	0.65
1:A:241:ILE:HD12	1:A:241:ILE:O	1.96	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:99:VAL:O	1:A:104:TRP:HH2	1.80	0.65
1:A:286:GLN:HE21	1:A:288:ASP:C	2.00	0.65
1:A:131:PHE:CE2	1:A:135:GLU:HG3	2.32	0.65
1:A:247:VAL:HG11	4:A:920:HOH:O	1.97	0.65
1:B:439:GLY:HA2	1:B:442:MET:HE3	1.79	0.64
1:C:97:LEU:HD22	1:C:237:MET:CE	2.26	0.64
1:C:250:GLU:C	1:C:252:HIS:H	2.00	0.64
1:A:202:LEU:O	1:A:204:PRO:HD3	1.98	0.64
1:B:226:ARG:HD3	4:B:1004:HOH:O	1.96	0.64
1:A:109:ALA:HB2	4:A:827:HOH:O	1.97	0.64
1:A:98:GLN:HA	1:A:269:PHE:O	1.98	0.64
1:B:101:LYS:HA	1:B:104:TRP:CD2	2.33	0.63
1:C:96:ILE:HD11	1:C:273:SER:HB2	1.81	0.63
1:A:73:VAL:CG2	1:A:84:LEU:HB3	2.29	0.62
1:B:399:ALA:HB1	1:C:472:LEU:HD12	1.81	0.62
1:B:241:ILE:O	1:B:241:ILE:HD12	1.99	0.62
1:C:250:GLU:HG3	1:C:250:GLU:O	1.98	0.62
1:C:61:LEU:HB3	1:C:67:ILE:HG12	1.82	0.62
1:C:149:ILE:HG22	4:C:944:HOH:O	1.98	0.62
1:C:73:VAL:HG21	1:C:84:LEU:HB3	1.82	0.62
1:A:97:LEU:CD1	1:A:238:ALA:HB2	2.30	0.61
1:A:286:GLN:NE2	1:A:288:ASP:H	1.97	0.61
1:B:78:VAL:HG12	1:B:80:GLU:H	1.65	0.61
1:C:150:LEU:HD13	1:C:218:ILE:CD1	2.31	0.61
1:B:142:VAL:HG23	4:B:914:HOH:O	2.00	0.61
1:A:110:VAL:HG12	1:A:131:PHE:HB2	1.82	0.61
1:B:286:GLN:HE21	1:B:288:ASP:N	1.99	0.61
1:A:286:GLN:HE21	1:A:288:ASP:N	1.97	0.61
1:A:74:LYS:HB3	1:A:87:LEU:CD2	2.28	0.60
1:B:414:THR:HG23	1:B:417:GLN:OE1	2.01	0.60
1:A:192:GLU:HA	1:A:196:ILE:HB	1.83	0.60
1:C:124:PRO:O	1:C:128:VAL:HG23	2.01	0.60
1:A:96:ILE:HD11	1:A:273:SER:HB2	1.83	0.60
1:B:202:LEU:N	1:B:202:LEU:HD12	2.17	0.60
1:B:483:GLU:HA	1:B:486:TYR:CD2	2.37	0.60
1:C:466:GLU:HB2	4:C:836:HOH:O	2.02	0.60
1:B:118:VAL:HG22	4:B:992:HOH:O	2.02	0.59
1:B:228:ARG:HA	4:B:994:HOH:O	2.00	0.59
1:A:286:GLN:HE21	1:A:288:ASP:H	1.50	0.59
1:C:468:ARG:CB	1:C:468:ARG:HH11	2.14	0.59
1:B:484:ASN:HB2	4:B:874:HOH:O	2.01	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:320:GLU:HA	1:B:325:PHE:CD1	2.38	0.59
1:B:78:VAL:CG1	1:B:80:GLU:OE2	2.51	0.59
1:C:239:ASP:O	3:C:802:EPE:O8	2.21	0.59
1:C:202:LEU:O	1:C:204:PRO:HD3	2.03	0.59
1:C:99:VAL:O	1:C:104:TRP:CH2	2.56	0.59
1:C:320:GLU:HA	1:C:325:PHE:CD1	2.38	0.59
1:C:208:THR:HB	4:C:967:HOH:O	2.03	0.58
1:B:202:LEU:O	1:B:204:PRO:HD3	2.03	0.58
1:A:210:ASP:HB3	4:A:998:HOH:O	2.02	0.58
1:B:286:GLN:HE21	1:B:288:ASP:C	2.07	0.58
1:B:104:TRP:CH2	1:B:269:PHE:HB2	2.38	0.58
1:C:227:LEU:HD11	1:C:256:VAL:HG23	1.84	0.58
1:B:163:GLU:HG2	4:B:1011:HOH:O	2.03	0.58
1:A:395:LEU:CD2	1:B:469:LEU:HD12	2.33	0.58
1:A:185:LYS:HG3	1:A:209:LEU:HD21	1.86	0.58
1:A:99:VAL:O	1:A:104:TRP:CH2	2.56	0.58
1:A:110:VAL:HG12	1:A:131:PHE:CG	2.39	0.58
1:C:103:LEU:O	1:C:143:TRP:CZ3	2.57	0.58
1:B:197:LEU:HB2	1:B:198:PRO:HD3	1.85	0.58
1:A:330:ASP:O	1:A:334:SER:HB2	2.04	0.58
1:A:110:VAL:HG12	1:A:131:PHE:CB	2.34	0.57
1:B:124:PRO:HG2	4:B:949:HOH:O	2.03	0.57
1:A:150:LEU:HD13	1:A:218:ILE:HD13	1.84	0.57
1:A:222:ARG:NH1	1:A:239:ASP:OD2	2.34	0.57
1:C:386:LEU:HB3	4:C:1016:HOH:O	2.05	0.57
1:C:185:LYS:HG3	1:C:209:LEU:HD21	1.86	0.57
1:A:227:LEU:HD12	1:A:255:GLU:OE1	2.04	0.57
1:B:395:LEU:CD2	1:C:469:LEU:HD12	2.35	0.57
1:A:57:PHE:O	1:A:61:LEU:HG	2.05	0.57
1:A:439:GLY:HA2	1:A:442:MET:HE3	1.87	0.56
1:A:104:TRP:CH2	1:A:269:PHE:HB2	2.40	0.56
1:C:110:VAL:HG12	1:C:131:PHE:CG	2.39	0.56
1:B:286:GLN:HE22	1:B:309:ARG:HH22	1.54	0.56
1:B:376:PHE:O	1:B:378:ASP:N	2.37	0.56
1:B:467:ARG:HD2	4:B:1021:HOH:O	2.05	0.56
1:B:61:LEU:HB3	1:B:67:ILE:HG12	1.87	0.56
1:B:376:PHE:C	1:B:378:ASP:H	2.09	0.56
1:A:454:LYS:HB3	1:A:454:LYS:NZ	2.20	0.56
1:A:173:LEU:O	1:A:177:THR:HG23	2.05	0.56
1:C:92:ARG:HB2	1:C:92:ARG:HH11	1.71	0.56
1:A:465:GLN:HB3	1:C:395:LEU:HD11	1.87	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:110:VAL:CG1	1:B:131:PHE:HB2	2.34	0.56
1:A:320:GLU:HA	1:A:325:PHE:CD1	2.41	0.56
1:C:157:THR:OG1	1:C:177:THR:HG21	2.06	0.56
1:A:118:VAL:HG22	4:A:812:HOH:O	2.06	0.56
1:B:367:THR:HG23	4:B:892:HOH:O	2.06	0.55
1:A:115:ILE:HA	4:A:812:HOH:O	2.06	0.55
1:B:92:ARG:O	1:B:93:ASN:HB2	2.04	0.55
1:C:188:CYS:HB3	1:C:212:PHE:CE2	2.41	0.55
1:A:181:LYS:HD2	4:A:956:HOH:O	2.05	0.55
1:B:222:ARG:O	3:B:801:EPE:H32	2.07	0.55
1:B:313:THR:HB	1:B:344:ASP:OD1	2.07	0.55
1:A:192:GLU:O	1:A:197:LEU:HG	2.07	0.55
1:A:100:PRO:HD2	1:A:103:LEU:HD12	1.87	0.54
1:B:446:GLN:O	1:B:450:ILE:HG13	2.08	0.54
1:A:202:LEU:HD12	1:A:202:LEU:N	2.21	0.54
1:A:167:GLU:HG3	1:A:437:ARG:NH1	2.22	0.54
1:C:286:GLN:HE21	1:C:288:ASP:C	2.10	0.54
1:B:386:LEU:O	1:B:387:SER:CB	2.55	0.54
1:B:386:LEU:O	1:B:387:SER:HB3	2.06	0.54
1:A:313:THR:HB	1:A:344:ASP:OD1	2.07	0.54
1:B:78:VAL:HG11	1:B:282:GLN:NE2	2.17	0.54
1:A:315:THR:HG22	4:B:893:HOH:O	2.06	0.54
1:A:182:GLU:HG3	4:A:1014:HOH:O	2.08	0.54
1:A:438:GLU:HG2	1:A:442:MET:HE2	1.90	0.54
1:C:250:GLU:HG2	1:C:289:LEU:CD1	2.37	0.54
1:C:222:ARG:NH2	2:C:702:SAH:O	2.41	0.54
1:C:97:LEU:HD22	1:C:237:MET:HE3	1.90	0.54
1:A:474:LEU:HD22	1:C:316:LEU:CD2	2.37	0.54
1:A:160:TRP:CD1	1:A:429:ARG:HD3	2.43	0.54
1:C:455:GLU:O	1:C:458:LEU:HB2	2.07	0.53
1:B:118:VAL:HG13	4:B:992:HOH:O	2.08	0.53
1:A:301:GLY:HA3	4:A:805:HOH:O	2.08	0.53
1:A:479:GLY:O	1:A:483:GLU:HG2	2.08	0.53
1:C:99:VAL:O	1:C:268:LEU:HB2	2.09	0.53
1:B:239:ASP:HB2	3:B:801:EPE:O8	2.08	0.53
1:A:386:LEU:O	1:A:387:SER:CB	2.56	0.53
1:A:238:ALA:HB1	1:A:271:LEU:HD22	1.90	0.53
1:A:224:PHE:HA	3:A:800:EPE:H101	1.89	0.53
1:C:313:THR:HB	1:C:344:ASP:OD1	2.08	0.53
1:B:103:LEU:O	1:B:143:TRP:HZ3	1.92	0.53
1:C:61:LEU:CD1	1:C:237:MET:HB2	2.39	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:202:LEU:N	1:C:202:LEU:HD12	2.24	0.53
1:C:160:TRP:HB2	1:C:165:LEU:HD21	1.91	0.53
1:A:110:VAL:HG12	1:A:131:PHE:CD1	2.44	0.53
1:B:88:LYS:HA	1:B:279:ALA:HB2	1.91	0.53
1:C:96:ILE:HD13	1:C:283:VAL:HG11	1.91	0.52
1:A:255:GLU:HG3	1:A:255:GLU:O	2.09	0.52
1:C:293:ASN:HD22	1:C:310:HIS:CD2	2.27	0.52
1:B:202:LEU:H	1:B:202:LEU:HD12	1.75	0.52
1:C:92:ARG:NH1	1:C:92:ARG:HB2	2.25	0.52
1:C:140:ASP:HA	4:C:882:HOH:O	2.09	0.52
1:C:74:LYS:HG2	1:C:87:LEU:HD21	1.91	0.52
1:B:427:ASP:HB3	4:B:977:HOH:O	2.08	0.52
1:A:116:GLY:HA2	4:A:943:HOH:O	2.09	0.52
1:A:145:HIS:HA	4:A:829:HOH:O	2.08	0.52
1:C:84:LEU:HD12	1:C:241:ILE:HG23	1.92	0.52
1:C:301:GLY:HA3	4:C:812:HOH:O	2.10	0.52
1:C:96:ILE:CD1	1:C:283:VAL:HG11	2.40	0.52
1:B:349:ARG:NH2	4:B:941:HOH:O	2.42	0.52
1:A:430:LEU:O	1:A:434:VAL:HG23	2.10	0.52
1:A:73:VAL:HG23	1:A:84:LEU:HB3	1.92	0.52
1:B:363:ALA:O	1:B:364:LEU:C	2.48	0.51
1:C:229:ASN:O	1:C:230:GLU:HG2	2.10	0.51
1:A:120:SER:HA	4:A:826:HOH:O	2.10	0.51
1:A:150:LEU:HD13	1:A:218:ILE:HD12	1.93	0.51
1:B:348:ASN:H	1:B:446:GLN:HE22	1.59	0.51
1:C:376:PHE:C	1:C:378:ASP:H	2.14	0.51
1:A:286:GLN:NE2	1:A:288:ASP:C	2.64	0.51
1:A:106:ASN:HB2	1:A:107:PRO:HD2	1.92	0.51
1:C:194:GLU:C	1:C:195:ILE:HD12	2.31	0.51
1:C:104:TRP:CH2	1:C:269:PHE:N	2.78	0.51
1:B:202:LEU:C	1:B:204:PRO:HD3	2.32	0.51
1:B:264:SER:HA	1:B:267:TYR:CZ	2.46	0.51
1:A:222:ARG:HA	3:A:800:EPE:H71	1.91	0.51
1:C:97:LEU:C	1:C:97:LEU:HD12	2.32	0.51
1:B:287:TYR:O	1:B:288:ASP:HB2	2.10	0.51
1:C:386:LEU:O	1:C:387:SER:CB	2.58	0.51
1:A:232:LEU:N	1:A:232:LEU:HD12	2.25	0.51
1:B:224:PHE:CD2	3:B:801:EPE:H22	2.47	0.50
1:B:103:LEU:O	1:B:143:TRP:CZ3	2.63	0.50
1:B:49:SER:O	1:B:52:PRO:HG2	2.11	0.50
1:B:310:HIS:HE1	4:B:993:HOH:O	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:192:GLU:HA	1:C:196:ILE:HD12	1.93	0.50
1:A:72:PRO:HA	1:A:87:LEU:HB2	1.94	0.50
1:A:90:ILE:HG22	1:A:91:SER:N	2.26	0.50
1:A:110:VAL:HG21	1:A:127:SER:HB3	1.94	0.50
1:B:430:LEU:O	1:B:434:VAL:HG23	2.11	0.50
1:A:99:VAL:HG12	1:A:104:TRP:HZ3	1.77	0.50
1:C:153:GLU:HG2	1:C:159:TYR:CD1	2.46	0.50
1:A:136:ARG:NH1	4:A:803:HOH:O	2.45	0.50
1:B:323:PRO:HB3	1:C:375:LEU:HD21	1.93	0.50
1:C:101:LYS:HA	1:C:104:TRP:CD2	2.47	0.50
1:B:51:SER:N	1:B:52:PRO:HD2	2.27	0.50
1:A:53:ALA:C	1:A:149:ILE:HD11	2.32	0.50
1:A:486:TYR:HA	1:C:123:LYS:HD2	1.94	0.50
1:A:72:PRO:O	1:A:73:VAL:HB	2.12	0.49
1:B:293:ASN:HD22	1:B:310:HIS:CD2	2.30	0.49
1:A:220:ARG:HD3	1:A:299:ASP:OD1	2.10	0.49
1:B:227:LEU:HD21	1:B:269:PHE:HE1	1.76	0.49
1:A:78:VAL:HG23	1:A:80:GLU:HG2	1.94	0.49
1:A:376:PHE:C	1:A:378:ASP:H	2.15	0.49
1:A:188:CYS:SG	1:A:212:PHE:CD2	3.05	0.49
1:C:106:ASN:HB2	1:C:107:PRO:HD2	1.93	0.49
1:B:177:THR:HG22	1:B:298:LEU:HD12	1.94	0.49
1:B:238:ALA:O	1:B:241:ILE:HG13	2.12	0.49
1:B:92:ARG:HG3	1:B:274:PRO:O	2.11	0.49
1:B:380:ILE:HG23	1:B:381:TRP:N	2.27	0.49
1:C:249:THR:CG2	1:C:251:ASP:HB2	2.35	0.49
1:B:414:THR:OG1	1:B:417:GLN:HG3	2.12	0.49
1:C:277:VAL:HG13	1:C:281:GLU:HB2	1.93	0.49
1:C:218:ILE:O	1:C:222:ARG:HB2	2.13	0.49
1:B:167:GLU:HG3	1:B:437:ARG:NH1	2.28	0.49
1:C:117:ARG:HG3	4:C:945:HOH:O	2.11	0.49
1:C:227:LEU:HB2	4:C:835:HOH:O	2.13	0.48
1:B:220:ARG:NH1	1:B:299:ASP:OD1	2.45	0.48
1:C:222:ARG:NH1	1:C:239:ASP:CG	2.67	0.48
1:A:454:LYS:HB3	1:A:454:LYS:HZ2	1.78	0.48
1:B:455:GLU:O	1:B:458:LEU:HB2	2.13	0.48
1:B:370:PHE:CZ	1:B:371:LEU:HG	2.48	0.48
1:B:106:ASN:HB2	1:B:107:PRO:HD2	1.94	0.48
1:A:167:GLU:HG3	1:A:437:ARG:HH12	1.76	0.48
1:B:195:ILE:HD12	1:B:195:ILE:N	2.28	0.48
1:C:235:VAL:HG12	4:C:951:HOH:O	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:96:ILE:CD1	1:B:283:VAL:HG11	2.39	0.48
1:A:474:LEU:HD22	1:C:316:LEU:HD23	1.96	0.48
1:A:126:LEU:HD22	1:A:191:LEU:HD11	1.94	0.48
1:C:105:ILE:HB	1:C:234:VAL:HB	1.95	0.48
1:B:227:LEU:HD21	1:B:269:PHE:CE1	2.49	0.48
1:A:105:ILE:O	1:A:105:ILE:HG22	2.12	0.48
1:A:76:SER:HB2	4:A:984:HOH:O	2.14	0.48
1:B:64:GLU:OE1	1:B:102:ARG:NH1	2.47	0.48
1:C:250:GLU:HG2	1:C:289:LEU:HD12	1.95	0.48
1:B:348:ASN:N	1:B:446:GLN:HE22	2.12	0.48
1:B:56:THR:HA	1:B:59:LYS:HE3	1.96	0.48
1:A:482:LEU:HD11	1:C:179:SER:OG	2.14	0.48
1:C:376:PHE:O	1:C:378:ASP:N	2.47	0.47
1:B:350:THR:HA	4:B:1003:HOH:O	2.14	0.47
1:A:469:LEU:HD12	1:C:395:LEU:CD2	2.35	0.47
1:C:97:LEU:HB2	1:C:237:MET:HE1	1.96	0.47
1:C:146:TYR:CE2	1:C:150:LEU:HD11	2.48	0.47
1:A:235:VAL:O	1:A:237:MET:N	2.48	0.47
1:C:115:ILE:HG22	1:C:202:LEU:HD23	1.95	0.47
1:C:468:ARG:CG	1:C:468:ARG:HH11	2.28	0.47
1:A:316:LEU:HD12	1:A:343:PHE:CE1	2.50	0.47
1:C:202:LEU:H	1:C:202:LEU:HD12	1.79	0.47
1:B:364:LEU:HA	1:B:392:ASN:ND2	2.29	0.47
1:A:82:LEU:HB2	2:A:700:SAH:OXT	2.15	0.47
1:B:136:ARG:HD2	1:B:214:TRP:CZ3	2.49	0.47
1:C:286:GLN:HG2	1:C:289:LEU:HG	1.96	0.47
1:C:58:TRP:CZ2	1:C:74:LYS:HA	2.50	0.47
1:A:193:GLN:HA	1:A:197:LEU:HD12	1.97	0.47
1:C:327:ASP:O	1:C:331:VAL:HG23	2.15	0.47
1:C:222:ARG:HH11	1:C:239:ASP:CG	2.18	0.46
1:C:241:ILE:O	1:C:241:ILE:HD12	2.15	0.46
1:C:162:GLU:O	1:C:166:GLN:HG3	2.15	0.46
1:A:73:VAL:H	1:A:87:LEU:CD1	2.26	0.46
1:A:101:LYS:HA	1:A:104:TRP:CE3	2.50	0.46
1:B:96:ILE:HG22	1:B:97:LEU:HG	1.97	0.46
1:A:157:THR:OG1	1:A:177:THR:HG21	2.16	0.46
1:C:110:VAL:HG12	1:C:131:PHE:HB2	1.97	0.46
1:A:192:GLU:HA	1:A:196:ILE:HD12	1.98	0.46
1:B:194:GLU:C	1:B:195:ILE:HD12	2.35	0.46
1:A:180:VAL:O	1:A:184:VAL:HG23	2.15	0.46
1:A:106:ASN:HB2	1:A:107:PRO:CD	2.44	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:98:GLN:HE21	1:A:270:SER:HB2	1.79	0.46
1:B:367:THR:CA	4:B:892:HOH:O	2.52	0.46
1:A:277:VAL:HG13	1:A:281:GLU:HB2	1.97	0.46
1:A:241:ILE:HD13	1:A:285:ILE:HD11	1.96	0.46
1:C:82:LEU:O	2:C:702:SAH:N	2.49	0.46
1:B:222:ARG:HH11	1:B:239:ASP:CG	2.18	0.46
1:C:61:LEU:HD11	1:C:237:MET:HB2	1.96	0.46
1:A:390:ARG:HG2	4:A:925:HOH:O	2.14	0.46
1:B:292:SER:OG	1:B:295:GLU:HG3	2.15	0.46
1:C:98:GLN:HB3	1:C:268:LEU:HD13	1.98	0.46
1:B:401:ARG:O	1:B:405:LYS:HG3	2.15	0.46
1:B:101:LYS:HA	1:B:104:TRP:CE2	2.51	0.46
1:B:157:THR:OG1	1:B:177:THR:HG21	2.15	0.45
1:C:92:ARG:O	1:C:93:ASN:HB2	2.15	0.45
1:B:393:GLU:O	1:B:396:LEU:HG	2.16	0.45
1:A:73:VAL:O	1:A:73:VAL:HG13	2.16	0.45
1:C:286:GLN:NE2	1:C:288:ASP:C	2.69	0.45
1:B:106:ASN:HB2	1:B:107:PRO:CD	2.46	0.45
1:C:106:ASN:HB2	1:C:107:PRO:CD	2.46	0.45
1:B:188:CYS:HB3	1:B:212:PHE:CD1	2.51	0.45
1:C:143:TRP:O	1:C:147:PHE:CD1	2.70	0.45
1:B:437:ARG:O	1:B:441:LYS:HG3	2.17	0.45
1:A:144:LYS:NZ	4:A:821:HOH:O	2.49	0.45
1:B:78:VAL:CG1	1:B:79:THR:N	2.79	0.45
1:B:104:TRP:CZ2	1:B:269:PHE:HB2	2.52	0.45
1:C:438:GLU:HG2	1:C:442:MET:CE	2.46	0.45
1:A:425:ASN:HA	4:A:1017:HOH:O	2.16	0.45
1:A:243:HIS:HA	1:A:285:ILE:O	2.16	0.45
1:A:104:TRP:HE3	1:A:104:TRP:N	2.15	0.45
1:A:254:TYR:CD2	1:A:255:GLU:N	2.85	0.45
1:C:110:VAL:HG12	1:C:131:PHE:CB	2.46	0.45
1:C:188:CYS:SG	1:C:212:PHE:CG	3.10	0.45
1:A:133:ILE:HD11	1:A:212:PHE:HA	1.99	0.45
1:C:398:LYS:O	1:C:402:GLU:HG2	2.16	0.45
1:A:226:ARG:HH11	1:A:226:ARG:HG3	1.81	0.45
1:C:101:LYS:HA	1:C:104:TRP:CE2	2.51	0.45
1:C:257:LYS:HD2	1:C:268:LEU:HD11	1.98	0.45
1:C:104:TRP:CZ2	1:C:269:PHE:HB2	2.52	0.45
1:A:286:GLN:HE21	1:A:288:ASP:CA	2.30	0.45
1:C:199:ASN:HB3	1:C:202:LEU:HD13	1.99	0.45
1:B:376:PHE:C	1:B:378:ASP:N	2.70	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:310:HIS:CD2	1:B:439:GLY:HA3	2.51	0.45
1:A:244:SER:HB2	1:A:284:TYR:CG	2.51	0.45
1:A:241:ILE:HD13	1:A:285:ILE:CD1	2.46	0.45
1:A:485:LEU:O	1:A:486:TYR:HB3	2.16	0.45
1:A:376:PHE:O	1:A:378:ASP:N	2.49	0.45
1:B:318:ILE:O	1:B:339:GLN:NE2	2.49	0.45
1:A:101:LYS:HG3	1:A:104:TRP:CD1	2.52	0.45
1:A:146:TYR:CD1	1:A:236:PRO:HG3	2.52	0.45
1:C:73:VAL:HG22	1:C:74:LYS:N	2.32	0.44
1:C:438:GLU:HG2	1:C:442:MET:HE3	2.00	0.44
1:C:260:ALA:O	1:C:262:LEU:HD22	2.16	0.44
1:C:157:THR:OG1	1:C:177:THR:CG2	2.65	0.44
1:A:239:ASP:C	3:A:800:EPE:O8	2.55	0.44
1:C:163:GLU:O	1:C:166:GLN:HB2	2.17	0.44
1:A:176:THR:O	1:A:180:VAL:HG23	2.17	0.44
1:C:197:LEU:C	1:C:199:ASN:H	2.21	0.44
1:A:386:LEU:O	1:A:387:SER:HB3	2.17	0.44
1:A:175:LYS:HD2	1:B:476:GLY:O	2.17	0.44
1:A:293:ASN:HD22	1:A:310:HIS:CD2	2.35	0.44
1:C:346:PHE:HB2	1:C:349:ARG:HD2	1.99	0.44
1:A:103:LEU:HA	1:A:143:TRP:CH2	2.53	0.44
1:C:252:HIS:C	1:C:254:TYR:H	2.21	0.44
1:C:104:TRP:CH2	1:C:269:PHE:CB	2.99	0.44
1:B:58:TRP:O	1:B:62:GLN:HG3	2.17	0.44
1:C:222:ARG:O	3:C:802:EPE:H32	2.18	0.44
1:B:54:VAL:HA	1:B:149:ILE:HD11	1.99	0.44
1:A:99:VAL:HG21	1:A:237:MET:HB3	2.00	0.44
1:A:363:ALA:HB1	1:A:395:LEU:HD13	2.00	0.44
1:A:315:THR:HG23	1:B:473:GLY:O	2.18	0.44
1:A:70:LYS:HG3	4:A:913:HOH:O	2.16	0.44
1:A:141:SER:HB3	4:A:806:HOH:O	2.17	0.44
1:C:244:SER:HB2	1:C:284:TYR:CG	2.53	0.44
1:A:74:LYS:HG3	1:A:75:ALA:N	2.33	0.43
1:C:98:GLN:HA	1:C:269:PHE:O	2.18	0.43
1:B:379:THR:HB	4:B:809:HOH:O	2.18	0.43
1:C:104:TRP:CZ2	4:C:895:HOH:O	2.71	0.43
1:A:486:TYR:HA	1:C:123:LYS:CD	2.48	0.43
1:B:167:GLU:HG3	1:B:437:ARG:HH12	1.83	0.43
1:B:356:LEU:N	1:B:357:PRO:HD2	2.33	0.43
1:B:105:ILE:HB	1:B:234:VAL:HB	1.98	0.43
1:B:110:VAL:HG13	1:B:131:PHE:CB	2.43	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:392:ASN:HA	4:C:927:HOH:O	2.18	0.43
1:A:103:LEU:HA	1:A:143:TRP:CZ3	2.54	0.43
1:A:202:LEU:C	1:A:204:PRO:HD3	2.38	0.43
1:C:110:VAL:HG23	1:C:111:ALA:N	2.32	0.43
1:C:197:LEU:HB2	1:C:198:PRO:CD	2.49	0.43
1:A:100:PRO:C	1:A:102:ARG:N	2.72	0.43
1:C:150:LEU:HA	1:C:151:PRO:HD3	1.85	0.43
1:A:99:VAL:HA	1:A:100:PRO:HD3	1.73	0.43
1:A:98:GLN:HG2	1:A:270:SER:HA	2.01	0.43
1:C:50:LEU:HD22	1:C:54:VAL:CG1	2.30	0.43
1:A:104:TRP:CE3	1:A:104:TRP:N	2.86	0.43
1:B:222:ARG:NH2	2:B:701:SAH:O	2.51	0.43
1:C:352:PRO:HA	1:C:353:PRO:HD3	1.93	0.43
1:B:199:ASN:C	1:B:201:ARG:H	2.22	0.43
1:A:97:LEU:HD12	1:A:97:LEU:C	2.39	0.43
1:B:78:VAL:CG1	1:B:282:GLN:HE22	2.25	0.43
1:B:225:SER:O	1:B:226:ARG:C	2.56	0.43
1:A:234:VAL:HG12	1:A:236:PRO:HD3	2.01	0.43
1:B:92:ARG:O	1:B:93:ASN:CB	2.67	0.43
1:B:380:ILE:HG23	1:B:381:TRP:H	1.84	0.42
1:B:468:ARG:CG	1:B:468:ARG:HH11	2.31	0.42
1:A:143:TRP:NE1	4:A:802:HOH:O	2.28	0.42
1:C:222:ARG:NH1	1:C:239:ASP:OD2	2.45	0.42
1:C:118:VAL:HG22	4:C:911:HOH:O	2.18	0.42
1:B:349:ARG:HG2	4:B:1015:HOH:O	2.18	0.42
1:B:264:SER:HA	1:B:267:TYR:CE2	2.54	0.42
1:A:78:VAL:CG2	1:A:80:GLU:HG2	2.49	0.42
1:A:277:VAL:CG1	1:A:281:GLU:HB2	2.49	0.42
1:A:451:PHE:O	1:A:455:GLU:HG3	2.20	0.42
1:A:351:LEU:HD23	1:A:351:LEU:HA	1.83	0.42
1:C:64:GLU:OE1	1:C:102:ARG:NH1	2.52	0.42
1:B:313:THR:HG21	1:C:478:ASN:ND2	2.34	0.42
1:C:390:ARG:HH11	1:C:390:ARG:HG2	1.85	0.42
1:A:157:THR:OG1	1:A:177:THR:CG2	2.68	0.42
1:B:366:GLY:H	1:C:465:GLN:HE22	1.68	0.42
1:C:157:THR:HA	1:C:160:TRP:CD1	2.54	0.42
1:B:126:LEU:HD22	1:B:191:LEU:HD11	2.02	0.42
1:A:138:ARG:C	1:A:140:ASP:H	2.22	0.42
1:A:305:PRO:HA	4:A:859:HOH:O	2.18	0.42
1:B:286:GLN:NE2	1:B:288:ASP:C	2.72	0.41
1:B:107:PRO:HA	1:B:110:VAL:HG23	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:222:ARG:NH1	1:B:239:ASP:CG	2.73	0.41
1:B:225:SER:O	1:B:227:LEU:HG	2.20	0.41
1:C:115:ILE:HD13	1:C:134:ARG:HD3	2.02	0.41
1:B:413:THR:O	1:B:441:LYS:HE2	2.20	0.41
1:C:377:ARG:HD3	1:C:377:ARG:HA	1.88	0.41
1:A:129:ILE:HG23	1:A:215:ALA:HB3	2.01	0.41
1:A:101:LYS:HE3	4:A:846:HOH:O	2.20	0.41
1:C:67:ILE:CD1	1:C:237:MET:SD	3.05	0.41
1:B:239:ASP:O	3:B:801:EPE:O8	2.37	0.41
1:C:472:LEU:HD13	1:C:474:LEU:HD21	2.02	0.41
1:A:205:ASP:OD1	1:A:205:ASP:N	2.53	0.41
1:C:104:TRP:CE3	1:C:104:TRP:N	2.88	0.41
1:C:236:PRO:N	4:C:951:HOH:O	2.52	0.41
1:C:202:LEU:C	1:C:204:PRO:HD3	2.41	0.41
1:C:356:LEU:HD23	1:C:356:LEU:HA	1.85	0.41
1:B:373:GLU:HA	1:B:373:GLU:OE1	2.20	0.41
1:C:316:LEU:HA	4:C:908:HOH:O	2.19	0.41
1:B:218:ILE:O	1:B:222:ARG:HB2	2.21	0.41
1:C:487:PHE:HB3	4:C:838:HOH:O	2.20	0.41
1:A:455:GLU:O	1:A:458:LEU:HB2	2.20	0.41
1:A:100:PRO:O	1:A:104:TRP:CZ3	2.74	0.41
1:C:61:LEU:HD13	1:C:237:MET:HB2	2.03	0.41
1:B:241:ILE:HG13	1:B:241:ILE:H	1.66	0.41
1:A:55:GLN:HE21	1:A:55:GLN:HB2	1.51	0.41
1:C:364:LEU:HD12	1:C:364:LEU:HA	1.85	0.41
1:B:439:GLY:HA2	1:B:442:MET:CE	2.50	0.41
1:A:57:PHE:CE1	1:A:146:TYR:HA	2.55	0.41
1:B:143:TRP:O	1:B:147:PHE:CD1	2.74	0.41
1:C:60:TRP:O	1:C:64:GLU:HG2	2.21	0.41
1:C:173:LEU:HD12	1:C:173:LEU:O	2.21	0.41
1:A:202:LEU:CD1	1:A:202:LEU:H	2.30	0.41
1:A:179:SER:OG	1:B:482:LEU:HD12	2.20	0.41
1:B:129:ILE:O	1:B:133:ILE:HG13	2.21	0.41
1:C:297:ALA:O	1:C:300:TYR:O	2.38	0.41
1:A:101:LYS:HA	1:A:104:TRP:CZ2	2.56	0.41
1:C:97:LEU:HD12	1:C:97:LEU:O	2.21	0.41
1:C:241:ILE:N	1:C:241:ILE:HD12	2.36	0.41
1:A:298:LEU:HD23	1:A:298:LEU:C	2.41	0.41
1:A:110:VAL:CG1	1:A:131:PHE:HB2	2.49	0.41
1:A:146:TYR:CE1	1:A:236:PRO:HA	2.56	0.41
1:C:153:GLU:HG2	1:C:159:TYR:CG	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:377:ARG:HA	1:A:377:ARG:HD3	1.86	0.41
1:C:250:GLU:HB3	1:C:286:GLN:CG	2.51	0.40
1:C:251:ASP:O	1:C:252:HIS:HB2	2.21	0.40
1:B:315:THR:HG21	4:C:906:HOH:O	2.19	0.40
1:A:59:LYS:HD3	1:A:59:LYS:HA	1.92	0.40
1:B:115:ILE:HG22	1:B:202:LEU:HD23	2.03	0.40
1:C:192:GLU:O	1:C:197:LEU:HG	2.21	0.40
1:C:310:HIS:CD2	1:C:439:GLY:HA3	2.56	0.40
1:A:231:ASN:C	1:A:232:LEU:HD12	2.40	0.40
1:A:408:LEU:HD21	1:A:444:LEU:HB3	2.03	0.40
1:A:352:PRO:HA	1:A:353:PRO:HD3	1.96	0.40
1:A:329:LEU:O	1:A:333:GLU:HG3	2.21	0.40
1:A:250:GLU:HG3	1:A:252:HIS:HE1	1.86	0.40
1:C:286:GLN:HE21	1:C:288:ASP:CA	2.33	0.40
1:C:236:PRO:CA	4:C:951:HOH:O	2.69	0.40
1:A:360:ARG:HD2	1:A:384:LEU:O	2.21	0.40
1:A:476:GLY:O	1:C:175:LYS:HD2	2.21	0.40
1:C:104:TRP:O	1:C:143:TRP:CH2	2.75	0.40
1:C:272:LYS:HD2	4:C:983:HOH:O	2.21	0.40
1:A:376:PHE:C	1:A:378:ASP:N	2.74	0.40
1:B:253:ALA:HA	1:B:270:SER:O	2.22	0.40
1:A:302:PHE:CD1	1:A:302:PHE:C	2.95	0.40
1:A:96:ILE:HD13	1:A:283:VAL:HG11	2.03	0.40
1:A:434:VAL:O	1:A:437:ARG:HG2	2.21	0.40
1:B:322:ASP:HA	1:B:323:PRO:HD2	1.95	0.40
1:B:323:PRO:CB	1:C:375:LEU:HD21	2.51	0.40
1:C:356:LEU:N	1:C:357:PRO:HD2	2.37	0.40
1:B:146:TYR:CE1	1:B:236:PRO:HA	2.57	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles ⓘ

### 5.3.1 Protein backbone ⓘ

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	418/444 (94%)	369 (88%)	38 (9%)	11 (3%)	7	11
1	B	438/444 (99%)	404 (92%)	28 (6%)	6 (1%)	14	28
1	C	436/444 (98%)	396 (91%)	33 (8%)	7 (2%)	12	24
All	All	1292/1332 (97%)	1169 (90%)	99 (8%)	24 (2%)	10	19

All (24) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	66	VAL
1	A	73	VAL
1	A	236	PRO
1	A	387	SER
1	B	364	LEU
1	B	377	ARG
1	B	387	SER
1	C	364	LEU
1	C	387	SER
1	A	104	TRP
1	A	105	ILE
1	B	226	ARG
1	C	377	ARG
1	A	377	ARG
1	B	288	ASP
1	C	105	ILE
1	C	236	PRO
1	A	204	PRO
1	A	364	LEU
1	C	204	PRO
1	A	200	LYS
1	C	198	PRO
1	A	52	PRO
1	B	479	GLY

### 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	374/390 (96%)	362 (97%)	12 (3%)	46	74
1	B	386/390 (99%)	370 (96%)	16 (4%)	37	66
1	C	384/390 (98%)	362 (94%)	22 (6%)	25	49
All	All	1144/1170 (98%)	1094 (96%)	50 (4%)	35	63

All (50) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	55	GLN
1	A	104	TRP
1	A	143	TRP
1	A	205	ASP
1	A	220	ARG
1	A	236	PRO
1	A	237	MET
1	A	315	THR
1	A	373	GLU
1	A	378	ASP
1	A	395	LEU
1	A	444	LEU
1	B	55	GLN
1	B	73	VAL
1	B	88	LYS
1	B	104	TRP
1	B	110	VAL
1	B	143	TRP
1	B	236	PRO
1	B	313	THR
1	B	315	THR
1	B	373	GLU
1	B	378	ASP
1	B	395	LEU
1	B	427	ASP
1	B	444	LEU
1	B	453	GLN
1	B	468	ARG
1	C	55	GLN
1	C	74	LYS
1	C	104	TRP
1	C	143	TRP
1	C	152	GLN
1	C	218	ILE

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Mol	Chain	Res	Type
1	C	236	PRO
1	C	237	MET
1	C	239	ASP
1	C	241	ILE
1	C	250	GLU
1	C	255	GLU
1	C	257	LYS
1	C	298	LEU
1	C	313	THR
1	C	315	THR
1	C	378	ASP
1	C	395	LEU
1	C	444	LEU
1	C	453	GLN
1	C	468	ARG
1	C	482	LEU

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

Mol	Chain	Res	Type
1	A	55	GLN
1	A	93	ASN
1	A	98	GLN
1	A	169	GLN
1	A	286	GLN
1	A	310	HIS
1	B	55	GLN
1	B	152	GLN
1	B	169	GLN
1	B	286	GLN
1	B	310	HIS
1	B	412	HIS
1	B	453	GLN
1	B	478	ASN
1	B	484	ASN
1	B	488	GLN
1	C	55	GLN
1	C	98	GLN
1	C	145	HIS
1	C	166	GLN
1	C	169	GLN
1	C	286	GLN

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Mol	Chain	Res	Type
1	C	310	HIS

### 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](#)

6 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	SAH	A	700	-	20,28,28	1.04	3 (15%)	19,40,40	0.93	0
3	EPE	A	800	-	14,15,15	2.37	3 (21%)	18,20,20	1.66	3 (16%)
2	SAH	B	701	-	20,28,28	0.96	1 (5%)	19,40,40	0.80	0
3	EPE	B	801	-	14,15,15	2.30	2 (14%)	18,20,20	1.74	4 (22%)
2	SAH	C	702	-	20,28,28	0.92	1 (5%)	19,40,40	0.81	0
3	EPE	C	802	-	14,15,15	2.25	2 (14%)	18,20,20	1.89	4 (22%)

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	SAH	A	700	-	-	0/7/31/31	0/3/3/3
3	EPE	A	800	-	-	0/9/19/19	0/1/1/1
2	SAH	B	701	-	-	0/7/31/31	0/3/3/3
3	EPE	B	801	-	-	0/9/19/19	0/1/1/1
2	SAH	C	702	-	-	0/7/31/31	0/3/3/3
3	EPE	C	802	-	-	0/9/19/19	0/1/1/1

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	700	SAH	C8-N7	-2.02	1.30	1.34
3	A	800	EPE	C3-N4	2.03	1.52	1.46
2	A	700	SAH	C4-N3	2.08	1.38	1.35
3	C	802	EPE	C3-N4	2.12	1.52	1.46
3	A	800	EPE	C5-N4	2.23	1.53	1.46
2	B	701	SAH	C2-N3	2.24	1.36	1.32
2	C	702	SAH	C2-N3	2.25	1.36	1.32
3	B	801	EPE	C5-N4	2.33	1.53	1.46
2	A	700	SAH	C2-N3	2.56	1.36	1.32
3	C	802	EPE	O3S-S	7.63	1.66	1.46
3	B	801	EPE	O3S-S	7.75	1.66	1.46
3	A	800	EPE	O3S-S	7.80	1.66	1.46

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	802	EPE	O1S-S-C10	-4.94	102.69	106.91
3	B	801	EPE	O1S-S-C10	-4.62	102.96	106.91
3	A	800	EPE	O1S-S-C10	-3.63	103.81	106.91
3	C	802	EPE	O3S-S-O1S	-2.68	105.37	111.61
3	A	800	EPE	O3S-S-O1S	-2.54	105.71	111.61
3	B	801	EPE	O3S-S-O1S	-2.36	106.12	111.61
3	B	801	EPE	C6-N1-C2	2.40	114.09	108.90
3	C	802	EPE	C6-N1-C2	2.63	114.60	108.90
3	B	801	EPE	O2S-S-C10	3.80	110.15	106.91
3	C	802	EPE	O2S-S-C10	3.99	110.31	106.91
3	A	800	EPE	O2S-S-C10	4.24	110.53	106.91

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

6 monomers are involved in 15 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	700	SAH	1	0
3	A	800	EPE	3	0
2	B	701	SAH	1	0
3	B	801	EPE	5	0
2	C	702	SAH	2	0
3	C	802	EPE	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	424/444 (95%)	0.24	38 (8%) 12 8	47, 69, 122, 135	0
1	B	440/444 (99%)	-0.01	16 (3%) 46 38	38, 63, 95, 115	0
1	C	438/444 (98%)	-0.09	12 (2%) 58 51	44, 65, 95, 112	0
All	All	1302/1332 (97%)	0.05	66 (5%) 32 25	38, 65, 103, 135	0

All (66) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	267	TYR	7.1
1	B	229	ASN	4.9
1	A	111	ALA	4.9
1	B	228	ARG	4.2
1	A	253	ALA	4.0
1	A	207	VAL	4.0
1	A	254	TYR	3.9
1	B	456	LEU	3.8
1	A	107	PRO	3.7
1	A	222	ARG	3.7
1	A	193	GLN	3.5
1	C	487	PHE	3.5
1	A	189	LEU	3.5
1	A	221	SER	3.4
1	A	66	VAL	3.4
1	A	235	VAL	3.3
1	B	201	ARG	3.2
1	B	200	LYS	3.1
1	A	486	TYR	3.1
1	C	486	TYR	3.1
1	A	239	ASP	3.0
1	A	234	VAL	3.0
1	A	209	LEU	2.9

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Mol	Chain	Res	Type	RSRZ
1	A	56	THR	2.9
1	A	206	PRO	2.9
1	A	140	ASP	2.8
1	A	110	VAL	2.8
1	A	202	LEU	2.8
1	B	202	LEU	2.8
1	A	240	LEU	2.7
1	A	237	MET	2.7
1	A	218	ILE	2.7
1	C	471	ASP	2.7
1	A	255	GLU	2.7
1	B	223	ALA	2.5
1	A	377	ARG	2.5
1	B	234	VAL	2.5
1	A	236	PRO	2.5
1	B	460	GLN	2.5
1	A	198	PRO	2.5
1	A	101	LYS	2.4
1	B	105	ILE	2.4
1	A	70	LYS	2.4
1	C	117	ARG	2.4
1	B	375	LEU	2.3
1	B	117	ARG	2.3
1	B	193	GLN	2.3
1	B	367	THR	2.3
1	C	69	ALA	2.3
1	A	251	ASP	2.2
1	A	231	ASN	2.2
1	A	67	ILE	2.2
1	C	198	PRO	2.2
1	C	226	ARG	2.2
1	C	367	THR	2.2
1	A	183	TYR	2.2
1	A	54	VAL	2.1
1	A	138	ARG	2.1
1	C	250	GLU	2.1
1	B	222	ARG	2.1
1	A	256	VAL	2.1
1	A	50	LEU	2.1
1	C	70	LYS	2.0
1	B	218	ILE	2.0
1	C	375	LEU	2.0

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Mol	Chain	Res	Type	RSRZ
1	C	203	PHE	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(Å <sup>2</sup> )	Q<0.9
3	EPE	B	801	15/15	0.83	0.35	1.59	71,73,85,86	0
3	EPE	A	800	15/15	0.84	0.40	1.07	80,82,95,96	0
3	EPE	C	802	15/15	0.88	0.30	0.97	66,68,73,73	0
2	SAH	A	700	26/26	0.90	0.25	0.20	67,71,77,78	0
2	SAH	C	702	26/26	0.95	0.17	-0.07	57,63,66,66	0
2	SAH	B	701	26/26	0.94	0.20	-0.12	46,48,52,53	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.