



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 09:26 PM GMT

PDB ID : 1OZ0  
Title : CRYSTAL STRUCTURE OF THE HOMODIMERIC BIFUNCTIONAL TRANSFORMYLASE AND CYCLOHYDROLASE ENZYME AVIAN ATIC IN COMPLEX WITH A MULTISUBSTRATE ADDUCT INHIBITOR BETA-DADF.  
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Deposited on : 2003-04-07  
Resolution : 2.50 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

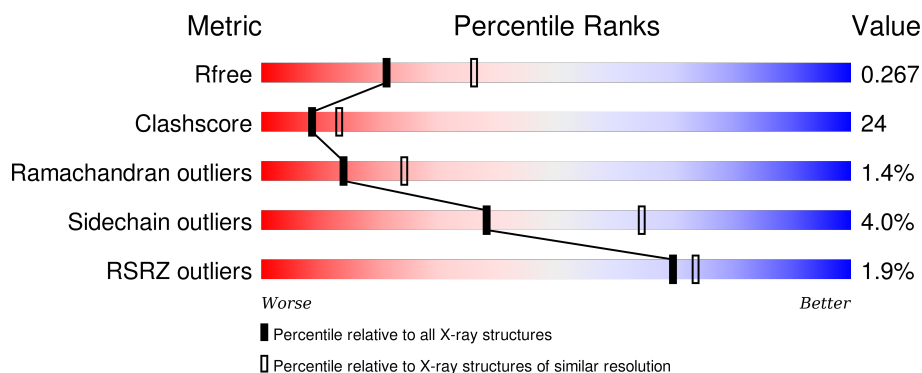
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.50 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))
$R_{free}$	91344	3553 (2.50-2.50)
Clashscore	102246	4242 (2.50-2.50)
Ramachandran outliers	100387	4156 (2.50-2.50)
Sidechain outliers	100360	4158 (2.50-2.50)
RSRZ outliers	91569	3562 (2.50-2.50)

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	613	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red 1%, orange 1%, yellow 54%, green 40%, grey 5%);"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> <span>%</span> <span>54%</span> <span>40%</span> <span>• •</span> </div> </div>
1	B	613	<div> <div style="width: 100%; height: 10px; background: linear-gradient(to right, red 2%, orange 2%, yellow 58%, green 35%, grey 5%);"></div> <div style="display: flex; justify-content: space-between; width: 100%;"> <span>2%</span> <span>58%</span> <span>35%</span> <span>• •</span> </div> </div>

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 9526 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 Bifunctional purine biosynthesis protein PURH.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	590	Total	C	N	O	S	0	0	0
			4511	2843	800	849	19			
1	B	590	Total	C	N	O	S	4	0	0
			4511	2843	800	849	19			

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	EXPRESSION TAG	UNP P31335
A	-18	GLY	-	EXPRESSION TAG	UNP P31335
A	-17	SER	-	EXPRESSION TAG	UNP P31335
A	-16	SER	-	EXPRESSION TAG	UNP P31335
A	-15	HIS	-	EXPRESSION TAG	UNP P31335
A	-14	HIS	-	EXPRESSION TAG	UNP P31335
A	-13	HIS	-	EXPRESSION TAG	UNP P31335
A	-12	HIS	-	EXPRESSION TAG	UNP P31335
A	-11	HIS	-	EXPRESSION TAG	UNP P31335
A	-10	HIS	-	EXPRESSION TAG	UNP P31335
A	-9	SER	-	EXPRESSION TAG	UNP P31335
A	-8	SER	-	EXPRESSION TAG	UNP P31335
A	-7	GLY	-	EXPRESSION TAG	UNP P31335
A	-6	LEU	-	EXPRESSION TAG	UNP P31335
A	-5	VAL	-	EXPRESSION TAG	UNP P31335
A	-4	PRO	-	EXPRESSION TAG	UNP P31335
A	-3	ARG	-	EXPRESSION TAG	UNP P31335
A	-2	GLY	-	EXPRESSION TAG	UNP P31335
A	-1	SER	-	EXPRESSION TAG	UNP P31335
A	0	HIS	-	EXPRESSION TAG	UNP P31335
B	-19	MET	-	EXPRESSION TAG	UNP P31335
B	-18	GLY	-	EXPRESSION TAG	UNP P31335
B	-17	SER	-	EXPRESSION TAG	UNP P31335
B	-16	SER	-	EXPRESSION TAG	UNP P31335
B	-15	HIS	-	EXPRESSION TAG	UNP P31335

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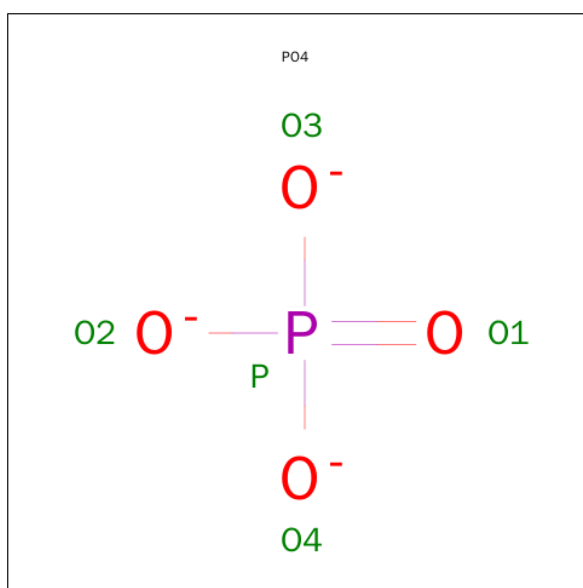
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Chain	Residue	Modelled	Actual	Comment	Reference
B	-14	HIS	-	EXPRESSION TAG	UNP P31335
B	-13	HIS	-	EXPRESSION TAG	UNP P31335
B	-12	HIS	-	EXPRESSION TAG	UNP P31335
B	-11	HIS	-	EXPRESSION TAG	UNP P31335
B	-10	HIS	-	EXPRESSION TAG	UNP P31335
B	-9	SER	-	EXPRESSION TAG	UNP P31335
B	-8	SER	-	EXPRESSION TAG	UNP P31335
B	-7	GLY	-	EXPRESSION TAG	UNP P31335
B	-6	LEU	-	EXPRESSION TAG	UNP P31335
B	-5	VAL	-	EXPRESSION TAG	UNP P31335
B	-4	PRO	-	EXPRESSION TAG	UNP P31335
B	-3	ARG	-	EXPRESSION TAG	UNP P31335
B	-2	GLY	-	EXPRESSION TAG	UNP P31335
B	-1	SER	-	EXPRESSION TAG	UNP P31335
B	0	HIS	-	EXPRESSION TAG	UNP P31335

- Molecule 2 is POTASSIUM ION (three-letter code: K) (formula: K).

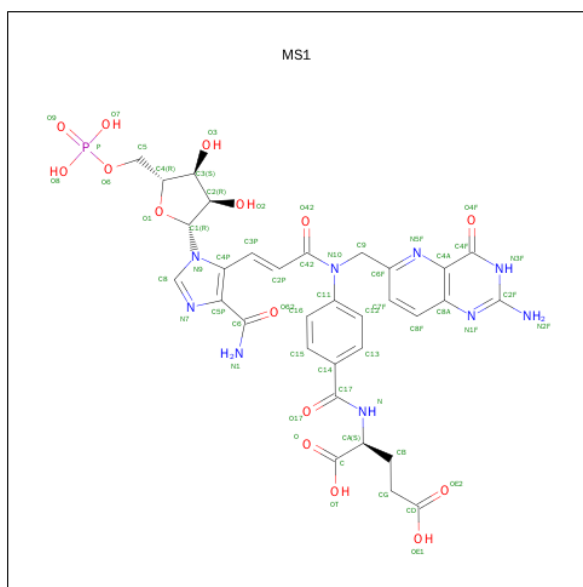
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	1	Total K 1 1	0	0
2	A	1	Total K 1 1	0	0

- Molecule 3 is PHOSPHATE ION (three-letter code: PO4) (formula: O<sub>4</sub>P).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total O P 5 4 1	0	0
3	B	1	Total O P 5 4 1	0	0

- Molecule 4 is 2-[4-((2-AMINO-4-OXO-3,4-DIHYDRO-PYRIDO[3,2-D]PYRIMIDIN-6-YLM ETHYL)-{3-[5-CARBAMOYL-3-(3,4- DIHYDROXY-5-PHOSPHONOOXYMETHYL-TE TRAHYDRO-FURAN-2-YL)-3H-IMIDAZOL-4-YL]-ACRYLOYL}-AMINO)-BENZOYLAMINO]- PENTANEDIOIC ACID (three-letter code: MS1) (formula: C<sub>32</sub>H<sub>34</sub>N<sub>9</sub>O<sub>15</sub>P).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total C N O P 57 32 9 15 1	0	0
4	A	1	Total C N O P 57 32 9 15 1	0	0

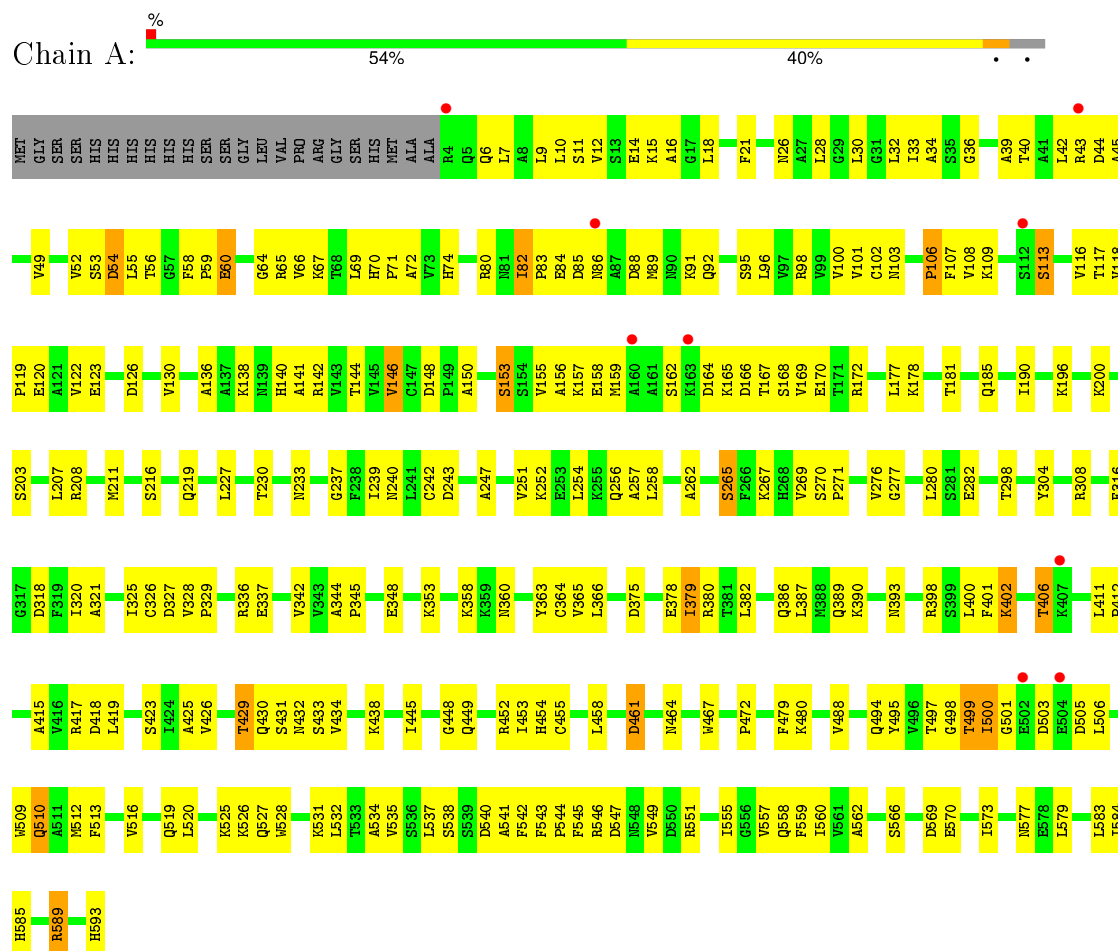
- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	204	Total O 204 204	0	0
5	B	174	Total O 174 174	0	0

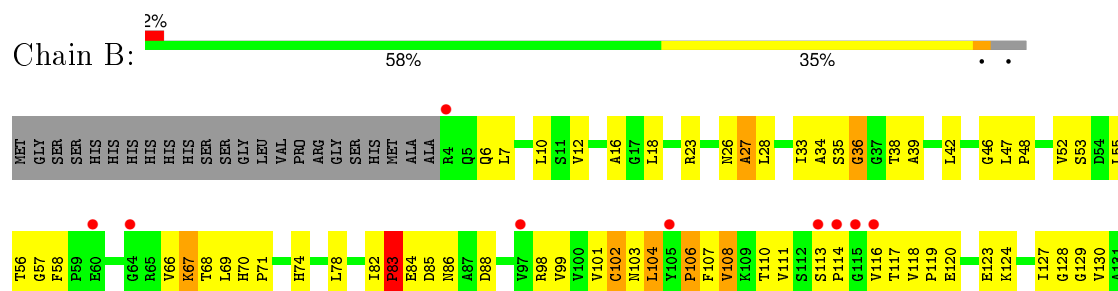
### 3 Residue-property plots

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

- Molecule 1: Bifunctional purine biosynthesis protein PURH



- Molecule 1: Bifunctional purine biosynthesis protein PURH



A552	C455	V342	T222	L132
R553	N464	V343	P225	L133
R554	A344	A344	K226	R134
I555	R469	P345	L227	A135
G556	E349	E349	P228	A136
V557	F474	E350	L229	A137
Q558	M477	N360	N233	K138
F559	K478	V365	G234	N139
I560	F479	L366	S235	V143
V561	K480	I379	G237	T144
S564	A481	L382	F238	V145
G565	G482	Q386	I239	V146
S566	V483	L387	N240	C147
D569	K484	Q388	L241	D148
I573	E487	Q389	C242	Y152
E574	V488	K390	D243	A156
A575	N490	N393	R253	K157
L579	Q494	A394	K254	E158
L583	Y495	F401	Q256	M159
I584	V496	T406	A262	A160
H585	T497	K407	F266	A161
L588	I500	M408	V269	S162
F591	G501	K409	G277	K163
H592	E502	T410	I278	D164
H593	D503	L411	L280	K165
		A415	E283	S168
		V416	H294	V169
		R417	L297	E170
		D418	S302	T171
		P517	A303	R172
		T521	Y304	R173
		E524	D311	H174
		V535	F316	L175
		S536	I320	A176
		L537	A321	L177
		D540	D327	K178
		A541	V328	T181
		F542	P229	Q185
		F543		R195
		R546		S199
		D547		K200
		I548		S203
		V549		L207
		D550		M211
		R551		N212
				S216
				Q219

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	54.41Å 108.10Å 102.36Å 90.00° 91.92° 90.00°	Depositor
Resolution (Å)	50.00 – 2.50 24.20 – 2.33	Depositor EDS
% Data completeness (in resolution range)	92.1 (50.00-2.50) 89.5 (24.20-2.33)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.06	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	0.00 (at 2.33Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.217 , 0.269 0.215 , 0.267	Depositor DCC
$R_{free}$ test set	3554 reflections (9.33%)	DCC
Wilson B-factor (Å <sup>2</sup> )	36.6	Xtriage
Anisotropy	0.507	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 50.0	EDS
Estimated twinning fraction	0.060 for h,-k,-l	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.45$ , $\langle L^2 \rangle = 0.28$	Xtriage
Outliers	0 of 46810 reflections	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	9526	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.70% 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: K, PO4, MS1

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	0.40	0/4595	0.64	0/6230
1	B	0.40	0/4595	0.64	1/6230 (0.0%)
All	All	0.40	0/9190	0.64	1/12460 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	537	LEU	CA-CB-CG	6.04	129.20	115.30

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4511	0	4561	242	0
1	B	4511	0	4561	208	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	5	0	0	0	0
3	B	5	0	0	0	0
4	A	57	0	31	6	0
4	B	57	0	31	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	A	204	0	0	29	0
5	B	174	0	0	22	0
All	All	9526	0	9184	435	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 (435) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:501:GLY:HA3	1:A:505:ASP:HB2	1.45	0.97
1:A:401:PHE:HB3	1:A:584:ILE:HD13	1.48	0.94
1:B:350:GLU:HB2	5:B:1125:HOH:O	1.70	0.90
1:B:283:GLU:HG3	5:B:1067:HOH:O	1.69	0.89
1:A:64:GLY:HA3	1:A:67:LYS:HE3	1.55	0.88
1:A:426:VAL:HA	1:A:429:THR:CG2	2.02	0.88
1:B:464:ASN:OD1	1:B:555:ILE:HD13	1.74	0.86
1:A:7:LEU:HD13	1:A:33:ILE:HD11	1.59	0.84
1:A:12:VAL:HB	1:A:103:ASN:ND2	1.91	0.83
1:A:411:LEU:HB3	5:A:1137:HOH:O	1.78	0.83
1:B:104:LEU:HD21	1:B:133:LEU:HD12	1.60	0.81
1:A:32:LEU:HD11	1:A:49:VAL:HG22	1.63	0.81
1:A:138:LYS:HD2	1:B:127:ILE:HD11	1.64	0.80
1:B:406:THR:HG23	1:B:583:LEU:HB3	1.64	0.80
1:A:200:LYS:HE2	5:A:1094:HOH:O	1.83	0.77
1:A:495:TYR:HA	1:A:500:ILE:HD11	1.67	0.76
1:A:510:GLN:OE1	1:A:516:VAL:HG11	1.85	0.76
1:A:98:ARG:HA	5:A:1199:HOH:O	1.86	0.76
1:A:88:ASP:HA	1:A:91:LYS:HE3	1.69	0.75
1:B:207:LEU:HD23	1:B:219:GLN:HA	1.69	0.75
1:B:452:ARG:NH2	1:B:541:ALA:HB3	2.03	0.74
1:A:118:VAL:HB	1:A:119:PRO:HD3	1.70	0.74
1:B:113:SER:HB2	1:B:114:PRO:HD2	1.68	0.73
1:A:379:ILE:HG22	5:B:1077:HOH:O	1.88	0.72
1:B:128:GLY:O	1:B:132:LEU:HG	1.89	0.72
1:B:200:LYS:NZ	5:B:1114:HOH:O	2.22	0.72
1:B:211:MET:HE2	1:B:239:ILE:HG12	1.71	0.72
1:A:537:LEU:HD23	1:A:538:SER:N	2.05	0.71
1:B:118:VAL:HB	1:B:119:PRO:HD3	1.73	0.70
1:A:208:ARG:NH2	4:B:1001:MS1:O8	2.24	0.69
1:B:48:PRO:HD2	5:B:1096:HOH:O	1.92	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:138:LYS:CD	1:B:127:ILE:HD11	2.23	0.69
1:B:130:VAL:O	1:B:134:ARG:HG3	1.92	0.68
1:A:32:LEU:HG	5:A:1012:HOH:O	1.94	0.68
1:B:110:THR:CG2	1:B:124:LYS:HD2	2.24	0.68
1:A:9:LEU:HD12	1:A:33:ILE:O	1.95	0.67
1:B:7:LEU:HB3	1:B:33:ILE:HD11	1.77	0.67
1:B:207:LEU:HD11	1:B:241:LEU:HD11	1.76	0.67
1:A:558:GLN:HB3	5:A:1158:HOH:O	1.94	0.67
1:A:452:ARG:NH2	1:A:541:ALA:HB3	2.09	0.67
1:B:113:SER:OG	1:B:116:VAL:HB	1.95	0.66
1:A:336:ARG:HG3	5:A:1173:HOH:O	1.95	0.66
1:B:46:GLY:O	1:B:47:LEU:HG	1.94	0.66
1:B:484:LYS:HB3	5:B:1178:HOH:O	1.96	0.66
1:B:6:GLN:OE1	1:B:98:ARG:NH1	2.28	0.66
1:A:12:VAL:HG23	1:A:15:LYS:HG3	1.79	0.65
1:A:181:THR:O	1:A:185:GLN:HG3	1.96	0.65
1:B:27:ALA:HB2	5:B:1123:HOH:O	1.95	0.65
1:B:479:PHE:CE2	1:B:488:VAL:HG13	2.31	0.64
1:A:7:LEU:HD13	1:A:33:ILE:CD1	2.28	0.64
1:A:82:ILE:H	1:A:82:ILE:HD13	1.61	0.64
1:A:83:PRO:HG2	1:A:84:GLU:OE1	1.97	0.64
1:A:401:PHE:HB3	1:A:584:ILE:CD1	2.26	0.64
1:B:110:THR:HG21	1:B:124:LYS:HD2	1.78	0.64
4:A:1002:MS1:C2P	4:A:1002:MS1:C12	2.74	0.64
1:B:7:LEU:HB3	1:B:33:ILE:CD1	2.27	0.63
1:B:389:GLN:HG3	1:B:390:LYS:O	1.99	0.63
1:A:526:LYS:HB3	1:A:526:LYS:NZ	2.14	0.63
1:B:104:LEU:HD21	1:B:133:LEU:CD1	2.29	0.63
1:B:33:ILE:N	1:B:33:ILE:HD12	2.13	0.63
1:A:434:VAL:HG13	1:A:537:LEU:HD21	1.80	0.62
1:A:402:LYS:NZ	1:A:402:LYS:HA	2.14	0.62
1:A:98:ARG:CB	5:A:1199:HOH:O	2.47	0.62
1:B:226:LYS:HB2	1:B:226:LYS:NZ	2.14	0.62
1:A:153:SER:O	1:A:157:LYS:HG3	2.00	0.62
1:A:10:LEU:HD22	1:A:42:LEU:HD21	1.80	0.61
1:B:252:LYS:O	1:B:256:GLN:HG3	1.99	0.61
1:B:521:THR:HG23	1:B:524:GLU:OE1	1.99	0.61
1:A:65:ARG:NH2	1:A:123:GLU:OE1	2.27	0.61
1:B:120:GLU:O	1:B:124:LYS:HG3	2.00	0.61
1:B:280:LEU:CD1	1:B:302:SER:HB3	2.30	0.61
1:A:247:ALA:HB1	1:A:321:ALA:HB2	1.81	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:325:ILE:H	1:A:325:ILE:HD12	1.66	0.61
1:B:34:ALA:HB3	1:B:39:ALA:HB2	1.81	0.61
1:B:426:VAL:CG1	1:B:540:ASP:HB3	2.31	0.61
1:A:400:LEU:HB2	5:A:1038:HOH:O	2.00	0.61
4:A:1002:MS1:C2P	4:A:1002:MS1:H12	2.31	0.60
1:B:18:LEU:HG	1:B:42:LEU:HD21	1.83	0.60
1:A:282:GLU:N	1:A:282:GLU:OE1	2.33	0.60
1:B:252:LYS:HG2	1:B:256:GLN:HE21	1.65	0.60
1:B:181:THR:HG22	1:B:185:GLN:HE21	1.66	0.60
1:A:159:MET:O	1:A:162:SER:HB3	2.01	0.60
4:A:1002:MS1:H52	1:B:239:ILE:HB	1.83	0.60
1:B:34:ALA:O	1:B:52:VAL:HG23	2.02	0.59
1:A:498:GLY:C	1:A:500:ILE:H	2.05	0.59
1:B:474:VAL:O	1:B:477:MET:HG3	2.01	0.59
1:A:316:PHE:CG	4:B:1001:MS1:H7F	2.38	0.59
1:B:453:ILE:HD13	1:B:547:ASP:CG	2.23	0.59
1:A:117:THR:O	1:A:120:GLU:HB2	2.02	0.59
1:A:458:LEU:HD12	5:A:1046:HOH:O	2.03	0.59
1:A:33:ILE:HD13	1:A:55:LEU:HD22	1.82	0.59
1:B:379:ILE:HD13	1:B:379:ILE:C	2.23	0.59
1:B:408:ASN:HB3	5:B:1156:HOH:O	2.03	0.59
1:A:80:ARG:HB2	1:A:82:ILE:HD12	1.85	0.59
1:B:386:GLN:NE2	5:B:1030:HOH:O	2.36	0.58
1:A:393:ASN:ND2	5:A:1131:HOH:O	2.36	0.58
1:A:159:MET:O	1:A:165:LYS:HA	2.03	0.58
1:A:454:HIS:ND1	5:A:1081:HOH:O	2.32	0.58
1:A:549:VAL:HG12	1:A:579:LEU:HD12	1.86	0.58
1:A:230:THR:HG23	5:A:1024:HOH:O	2.01	0.58
1:A:242:CYS:HA	1:B:382:LEU:HD21	1.84	0.58
1:A:82:ILE:HD13	1:A:85:ASP:HB2	1.86	0.58
1:A:426:VAL:HA	1:A:429:THR:HG21	1.85	0.57
1:A:32:LEU:CD1	1:A:49:VAL:HG22	2.33	0.57
1:A:82:ILE:CD1	1:A:85:ASP:HB2	2.35	0.57
1:A:169:VAL:HG23	1:A:170:GLU:H	1.67	0.57
1:A:380:ARG:HB2	5:B:1113:HOH:O	2.04	0.57
1:B:28:LEU:HB3	1:B:165:LYS:HD3	1.87	0.57
1:B:129:GLY:HA2	1:B:132:LEU:HD12	1.87	0.56
1:B:379:ILE:HD11	1:B:386:GLN:OE1	2.05	0.56
1:B:453:ILE:HD13	1:B:547:ASP:OD1	2.05	0.56
1:A:52:VAL:C	1:A:54:ASP:H	2.07	0.56
1:A:433:SER:HA	1:A:455:CYS:SG	2.45	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:425:ALA:O	1:A:429:THR:HG22	2.05	0.56
1:B:252:LYS:HG2	1:B:256:GLN:NE2	2.20	0.56
1:A:64:GLY:HA3	1:A:67:LYS:CE	2.32	0.56
1:A:98:ARG:CA	5:A:1199:HOH:O	2.51	0.56
1:B:480:LYS:O	1:B:483:VAL:HG23	2.05	0.56
1:B:82:ILE:HG23	1:B:83:PRO:HD2	1.88	0.56
1:A:431:SER:O	1:A:448:GLY:HA2	2.05	0.56
1:A:589:ARG:HD3	5:A:1130:HOH:O	2.05	0.56
1:A:526:LYS:HZ3	1:A:526:LYS:HB3	1.70	0.56
1:B:542:PHE:CD1	1:B:566:SER:HB2	2.41	0.56
1:A:122:VAL:O	1:B:138:LYS:HE3	2.06	0.56
1:B:211:MET:HE2	1:B:239:ILE:CG1	2.35	0.56
1:A:402:LYS:HA	1:A:402:LYS:HZ3	1.72	0.55
1:A:169:VAL:HG23	1:A:170:GLU:N	2.21	0.55
1:A:382:LEU:HD21	1:B:242:CYS:HA	1.89	0.55
1:B:229:LEU:HD11	1:B:366:LEU:HB3	1.88	0.55
1:B:452:ARG:HH21	1:B:541:ALA:HB3	1.71	0.55
1:A:271:PRO:HG2	1:A:445:ILE:CD1	2.36	0.55
1:A:265:SER:OG	1:A:318:ASP:OD2	2.24	0.55
1:B:82:ILE:HG22	1:B:84:GLU:OE1	2.06	0.55
1:B:145:VAL:HG12	5:B:1022:HOH:O	2.06	0.55
1:A:12:VAL:O	1:A:15:LYS:HE3	2.06	0.55
1:B:509:TRP:HH2	1:B:517:PRO:HG2	1.70	0.55
1:A:32:LEU:HD12	1:A:49:VAL:HA	1.89	0.55
1:B:575:ALA:O	1:B:579:LEU:HG	2.07	0.55
1:B:477:MET:HE2	1:B:517:PRO:HG3	1.89	0.55
1:B:139:ASN:ND2	1:B:143:VAL:HG23	2.22	0.55
1:B:12:VAL:HG12	1:B:102:CYS:HA	1.89	0.55
1:A:43:ARG:HE	1:A:49:VAL:HB	1.72	0.55
1:B:136:ALA:HB1	1:B:145:VAL:HB	1.89	0.55
1:B:127:ILE:HD12	1:B:127:ILE:N	2.22	0.54
1:B:211:MET:CE	1:B:239:ILE:HG12	2.35	0.54
1:B:552:ALA:O	1:B:555:ILE:HG22	2.07	0.54
1:B:123:GLU:HG2	5:B:1079:HOH:O	2.07	0.54
1:B:394:ALA:CB	1:B:588:LEU:HD11	2.37	0.54
1:A:390:LYS:HG3	1:B:216:SER:O	2.08	0.54
1:A:64:GLY:HA2	5:A:1133:HOH:O	2.07	0.54
1:B:143:VAL:O	1:B:172:ARG:HD2	2.07	0.54
1:B:454:HIS:HB3	5:B:1102:HOH:O	2.08	0.54
1:A:501:GLY:HA3	1:A:505:ASP:CB	2.31	0.53
1:B:102:CYS:O	1:B:147:CYS:HA	2.09	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:11:SER:O	1:A:102:CYS:HA	2.07	0.53
1:A:398:ARG:HB2	1:A:398:ARG:NH1	2.23	0.53
1:A:252:LYS:O	1:A:256:GLN:HG3	2.08	0.53
1:A:461:ASP:HA	1:A:464:ASN:ND2	2.24	0.53
1:A:432:ASN:ND2	1:A:449:GLN:O	2.42	0.53
1:B:174:HIS:C	1:B:174:HIS:CD2	2.82	0.53
1:A:426:VAL:HA	1:A:429:THR:HG22	1.90	0.53
1:A:32:LEU:CD1	1:A:49:VAL:HA	2.39	0.53
1:B:551:ARG:HD3	1:B:554:ARG:HH21	1.74	0.53
1:A:555:ILE:O	1:A:555:ILE:HG13	2.08	0.53
1:A:438:LYS:NZ	1:A:534:ALA:HB3	2.24	0.52
1:B:203:SER:HA	1:B:227:LEU:HG	1.90	0.52
1:A:379:ILE:HD11	1:A:386:GLN:HG3	1.91	0.52
1:B:67:LYS:HE3	5:B:1088:HOH:O	2.09	0.52
1:B:207:LEU:HD11	1:B:241:LEU:CD1	2.39	0.52
1:A:498:GLY:O	1:A:500:ILE:N	2.43	0.52
1:B:111:VAL:HA	1:B:116:VAL:HG11	1.90	0.52
1:B:304:TYR:CE1	1:B:320:ILE:HG12	2.45	0.52
1:A:382:LEU:CD2	1:B:242:CYS:HA	2.40	0.52
1:A:544:PRO:HB2	1:A:545:PHE:CD2	2.45	0.52
1:B:207:LEU:HD23	1:B:219:GLN:CA	2.39	0.52
1:A:28:LEU:HD22	1:A:165:LYS:HB3	1.91	0.52
1:A:542:PHE:CD1	1:A:566:SER:HB2	2.45	0.52
1:A:106:PRO:C	1:A:108:VAL:N	2.64	0.52
1:B:394:ALA:HB1	1:B:588:LEU:HD11	1.92	0.51
1:A:242:CYS:HA	1:B:382:LEU:CD2	2.40	0.51
1:A:168:SER:HB3	5:A:1103:HOH:O	2.09	0.51
1:A:426:VAL:O	1:A:429:THR:HG23	2.10	0.51
1:A:15:LYS:HA	5:A:1075:HOH:O	2.10	0.51
1:B:280:LEU:N	1:B:280:LEU:HD12	2.24	0.51
1:A:98:ARG:HB2	5:A:1199:HOH:O	2.10	0.51
1:A:452:ARG:NH1	1:A:540:ASP:OD1	2.43	0.51
1:A:401:PHE:HA	1:A:584:ILE:HG21	1.93	0.51
1:B:10:LEU:O	1:B:38:THR:HG21	2.11	0.51
1:B:431:SER:O	1:B:448:GLY:HA2	2.10	0.51
1:B:117:THR:HG23	1:B:120:GLU:OE1	2.10	0.51
1:B:23:ARG:HG2	1:B:47:LEU:HD21	1.93	0.51
1:B:546:ARG:O	1:B:549:VAL:HG13	2.10	0.51
1:A:546:ARG:HG2	5:A:1090:HOH:O	2.11	0.51
1:A:569:ASP:O	1:A:573:ILE:HG13	2.11	0.51
1:B:549:VAL:HG22	1:B:579:LEU:HD12	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:178:LYS:HE2	1:B:225:PRO:HG3	1.93	0.51
1:B:211:MET:HE3	1:B:238:PHE:CD1	2.45	0.50
1:B:411:LEU:HD12	1:B:415:ALA:HB3	1.93	0.50
1:B:480:LYS:HD2	1:B:481:ALA:H	1.76	0.50
1:A:494:GLN:HB3	1:A:500:ILE:HA	1.93	0.50
1:A:88:ASP:O	1:A:91:LYS:HB3	2.12	0.50
1:B:541:ALA:HB2	1:B:591:PHE:CE1	2.47	0.50
1:B:487:GLU:HB3	1:B:512:MET:CE	2.41	0.50
1:B:226:LYS:HZ2	1:B:226:LYS:HB2	1.75	0.50
1:A:431:SER:HB2	1:A:593:HIS:CE1	2.45	0.50
1:A:527:GLN:NE2	5:A:1207:HOH:O	2.45	0.50
1:A:537:LEU:C	1:A:537:LEU:HD23	2.33	0.49
1:B:418:ASP:OD2	1:B:438:LYS:HA	2.12	0.49
1:A:144:THR:HG21	1:A:167:THR:HG21	1.93	0.49
1:A:308:ARG:CZ	1:A:337:GLU:HB3	2.41	0.49
1:B:394:ALA:HA	5:B:1074:HOH:O	2.13	0.49
1:A:237:GLY:H	1:A:240:ASN:HB2	1.78	0.49
1:A:21:PHE:CE1	1:A:156:ALA:HB2	2.46	0.49
1:A:500:ILE:HG13	1:A:519:GLN:OE1	2.12	0.49
1:A:558:GLN:NE2	5:A:1158:HOH:O	2.45	0.49
1:B:431:SER:CB	1:B:432:ASN:HA	2.41	0.49
5:A:1203:HOH:O	1:B:239:ILE:HG13	2.12	0.49
1:A:56:THR:HG22	1:A:72:ALA:HB3	1.94	0.49
4:A:1002:MS1:H7F	1:B:316:PHE:CG	2.47	0.49
1:A:528:TRP:O	1:A:531:LYS:HB2	2.13	0.49
1:A:12:VAL:HB	1:A:103:ASN:HD21	1.73	0.48
1:B:107:PHE:CE2	1:B:111:VAL:HG11	2.48	0.48
1:A:74:HIS:HB3	1:B:69:LEU:HD13	1.95	0.48
1:B:496:VAL:HG23	1:B:497:THR:HG23	1.95	0.48
1:A:84:GLU:OE1	1:A:84:GLU:N	2.36	0.48
1:B:247:ALA:HB1	1:B:321:ALA:HB2	1.96	0.48
1:A:430:GLN:HG3	5:B:1103:HOH:O	2.12	0.48
1:B:549:VAL:CG2	1:B:579:LEU:HD12	2.44	0.48
1:A:418:ASP:OD2	1:A:438:LYS:HA	2.13	0.48
1:A:267:LYS:HG2	1:B:450:GLN:HB3	1.94	0.48
1:A:89:MET:HE2	1:A:96:LEU:HD23	1.96	0.48
1:B:344:ALA:HB1	1:B:345:PRO:HD2	1.94	0.48
1:B:207:LEU:HD22	1:B:207:LEU:N	2.29	0.48
1:B:469:ARG:NH1	5:B:1041:HOH:O	2.40	0.48
1:A:66:VAL:HA	1:A:69:LEU:HD12	1.95	0.48
1:A:141:ALA:HB2	5:A:1088:HOH:O	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:82:ILE:HD11	1:A:85:ASP:CG	2.33	0.48
1:B:106:PRO:HB3	1:B:108:VAL:HG23	1.96	0.48
1:A:247:ALA:CB	1:A:321:ALA:HB2	2.42	0.48
1:A:406:THR:HG22	1:A:577:ASN:OD1	2.14	0.48
1:B:500:ILE:HD11	1:B:509:TRP:CG	2.49	0.48
1:A:562:ALA:O	1:A:585:HIS:HA	2.14	0.48
1:B:233:ASN:HB3	1:B:365:VAL:HG23	1.95	0.48
1:A:326:CYS:O	1:A:348:GLU:HG3	2.13	0.47
1:B:26:ASN:C	1:B:28:LEU:H	2.16	0.47
1:A:344:ALA:HB1	1:A:345:PRO:HD2	1.95	0.47
1:A:251:VAL:HG23	1:A:252:LYS:N	2.29	0.47
1:A:34:ALA:C	1:A:39:ALA:HB2	2.34	0.47
1:A:98:ARG:HG3	5:A:1190:HOH:O	2.14	0.47
1:A:358:LYS:HB2	1:A:363:TYR:HB2	1.97	0.47
1:B:327:ASP:OD1	1:B:329:PRO:HD2	2.14	0.47
1:B:583:LEU:HD12	1:B:584:ILE:N	2.30	0.47
1:B:342:VAL:HG22	1:B:343:VAL:N	2.30	0.47
1:B:56:THR:HB	1:B:70:HIS:CD2	2.49	0.47
1:B:254:LEU:HD23	1:B:262:ALA:HB1	1.96	0.47
1:A:196:LYS:HE2	1:A:219:GLN:NE2	2.30	0.47
1:A:258:LEU:HD13	1:A:417:ARG:HG3	1.96	0.47
1:A:80:ARG:HB2	1:A:82:ILE:CD1	2.44	0.47
1:B:535:VAL:HB	1:B:557:VAL:HA	1.97	0.47
1:A:500:ILE:HG22	1:A:501:GLY:N	2.30	0.47
1:A:177:LEU:HD21	1:B:195:ARG:HG2	1.97	0.47
1:A:520:LEU:HB2	1:A:525:LYS:HE3	1.97	0.47
1:A:70:HIS:ND1	1:A:71:PRO:HD2	2.30	0.47
1:B:70:HIS:CG	1:B:71:PRO:HD2	2.50	0.47
1:A:375:ASP:HB3	5:A:1204:HOH:O	2.15	0.47
1:A:583:LEU:HD12	1:A:584:ILE:H	1.80	0.46
1:B:401:PHE:HE2	1:B:420:ILE:HG13	1.80	0.46
1:B:547:ASP:OD1	1:B:548:ASN:N	2.47	0.46
1:A:589:ARG:HB3	1:B:212:ASN:OD1	2.15	0.46
1:A:106:PRO:C	1:A:108:VAL:H	2.18	0.46
1:B:393:ASN:HA	5:B:1019:HOH:O	2.15	0.46
1:A:254:LEU:HD23	1:A:262:ALA:HB1	1.97	0.46
1:A:316:PHE:CD1	4:B:1001:MS1:H7F	2.51	0.46
1:A:364:CYS:SG	1:A:366:LEU:HD21	2.55	0.46
1:A:243:ASP:OD1	1:A:269:VAL:N	2.46	0.46
1:A:257:ALA:HB2	5:A:1051:HOH:O	2.16	0.46
1:A:423:SER:O	1:A:426:VAL:HG22	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:99:VAL:HG22	1:B:144:THR:HB	1.96	0.46
1:A:480:LYS:HE3	1:A:513:PHE:O	2.15	0.46
1:A:80:ARG:CB	1:A:82:ILE:HD12	2.46	0.46
1:A:10:LEU:HD23	1:A:18:LEU:HD11	1.97	0.45
1:B:148:ASP:CB	1:B:178:LYS:HE2	2.46	0.45
1:A:40:THR:HG22	1:A:44:ASP:OD2	2.16	0.45
1:B:558:GLN:O	1:B:558:GLN:HG2	2.16	0.45
1:B:278:ILE:HD11	1:B:417:ARG:CZ	2.46	0.45
1:A:7:LEU:HD11	1:A:95:SER:HB2	1.97	0.45
1:A:320:ILE:O	1:A:342:VAL:HA	2.17	0.45
4:A:1002:MS1:C12	4:A:1002:MS1:H2P	2.46	0.45
1:A:316:PHE:HB3	4:B:1001:MS1:H7F	1.97	0.45
1:B:247:ALA:HA	1:B:266:PHE:CE1	2.52	0.45
1:A:233:ASN:HB3	1:A:365:VAL:HG23	1.97	0.45
1:B:478:LYS:HB2	1:B:515:GLU:HB3	1.98	0.45
1:A:52:VAL:C	1:A:54:ASP:N	2.69	0.45
1:B:490:ASN:O	1:B:494:GLN:HG2	2.17	0.45
1:B:74:HIS:O	1:B:78:LEU:N	2.42	0.45
1:B:108:VAL:HA	1:B:111:VAL:HG22	1.99	0.45
1:B:139:ASN:HD22	1:B:143:VAL:HG23	1.81	0.45
1:B:35:SER:O	1:B:36:GLY:C	2.55	0.45
1:A:570:GLU:HB2	5:A:1079:HOH:O	2.16	0.45
1:A:401:PHE:CB	1:A:584:ILE:HD13	2.34	0.45
1:B:172:ARG:HG3	1:B:172:ARG:HH11	1.82	0.45
1:A:86:ASN:N	1:A:86:ASN:HD22	2.13	0.45
1:A:126:ASP:OD1	1:A:130:VAL:HG23	2.17	0.45
1:B:7:LEU:HD13	1:B:33:ILE:HD11	1.97	0.45
1:A:148:ASP:OD2	1:A:150:ALA:HB3	2.16	0.45
1:A:159:MET:CE	1:A:166:ASP:HA	2.47	0.45
1:A:304:TYR:OH	1:A:308:ARG:NH1	2.49	0.45
1:B:406:THR:CG2	1:B:583:LEU:HB3	2.43	0.45
1:B:320:ILE:HG22	1:B:342:VAL:HG23	1.99	0.44
1:A:130:VAL:HG21	1:B:134:ARG:NH1	2.32	0.44
1:B:484:LYS:HB2	1:B:487:GLU:OE1	2.18	0.44
1:A:14:GLU:OE2	1:A:16:ALA:HB2	2.17	0.44
1:A:162:SER:C	1:A:164:ASP:H	2.20	0.44
1:A:56:THR:HB	1:A:70:HIS:CD2	2.53	0.44
1:B:543:PHE:HE2	1:B:560:ILE:HG21	1.83	0.44
1:A:328:VAL:N	1:A:329:PRO:HD2	2.32	0.44
1:A:82:ILE:HD13	1:A:82:ILE:N	2.29	0.44
1:A:258:LEU:HD12	1:A:276:VAL:HG11	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:278:ILE:HD11	1:B:417:ARG:NH1	2.33	0.44
1:A:327:ASP:HB2	1:A:329:PRO:HD2	1.99	0.44
1:B:173:ARG:O	1:B:176:ALA:HB3	2.17	0.44
1:B:407:LYS:O	1:B:409:LYS:HG3	2.18	0.44
1:B:401:PHE:HB3	1:B:584:ILE:HD13	1.99	0.44
1:B:159:MET:C	1:B:161:ALA:H	2.20	0.44
1:A:43:ARG:C	1:A:45:ALA:N	2.71	0.44
1:A:452:ARG:HH21	1:A:541:ALA:HB3	1.79	0.44
1:B:158:GLU:OE2	1:B:168:SER:N	2.50	0.44
1:B:53:SER:O	1:B:57:GLY:N	2.46	0.44
1:A:271:PRO:HG2	1:A:445:ILE:HD13	2.00	0.44
1:A:140:HIS:C	1:A:142:ARG:N	2.72	0.44
1:A:389:GLN:HB3	1:B:238:PHE:CE2	2.53	0.44
1:B:555:ILE:O	1:B:555:ILE:HG13	2.18	0.43
1:B:537:LEU:HB3	1:B:560:ILE:HG12	1.99	0.43
1:A:64:GLY:CA	1:A:67:LYS:HG3	2.48	0.43
1:B:16:ALA:O	1:B:152:TYR:HE2	2.01	0.43
1:A:431:SER:HB3	1:A:432:ASN:HA	1.98	0.43
1:A:464:ASN:HD21	1:A:551:ARG:HH22	1.67	0.43
1:A:69:LEU:O	1:B:71:PRO:HD3	2.19	0.43
1:B:26:ASN:O	1:B:28:LEU:N	2.51	0.43
1:A:535:VAL:HB	1:A:557:VAL:HA	2.01	0.43
1:A:498:GLY:C	1:A:500:ILE:N	2.71	0.43
1:B:379:ILE:HA	1:B:387:LEU:O	2.19	0.43
1:A:9:LEU:HD12	1:A:10:LEU:N	2.34	0.43
1:B:67:LYS:HE2	5:B:1139:HOH:O	2.19	0.43
4:A:1002:MS1:H7F	1:B:316:PHE:CD1	2.54	0.43
1:B:82:ILE:C	1:B:86:ASN:ND2	2.72	0.43
1:A:168:SER:O	1:A:172:ARG:HG3	2.19	0.43
1:A:426:VAL:CA	1:A:429:THR:CG2	2.87	0.43
1:A:12:VAL:HB	1:A:103:ASN:HD22	1.79	0.43
1:A:58:PHE:CD1	1:A:59:PRO:HD2	2.54	0.43
1:B:104:LEU:CD2	1:B:133:LEU:HD12	2.42	0.43
1:A:378:GLU:OE2	1:A:389:GLN:NE2	2.49	0.43
1:A:320:ILE:HB	1:A:342:VAL:HB	2.00	0.43
1:B:311:ASP:HB3	5:B:1111:HOH:O	2.19	0.43
1:A:64:GLY:O	1:A:67:LYS:HG3	2.19	0.42
1:B:222:THR:HG22	1:B:227:LEU:HD23	2.00	0.42
1:A:230:THR:CG2	5:A:1024:HOH:O	2.63	0.42
1:B:433:SER:HA	1:B:455:CYS:SG	2.59	0.42
1:A:101:VAL:HG22	1:A:146:VAL:HG13	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:107:PHE:CE2	1:A:190:ILE:HA	2.54	0.42
1:B:431:SER:HB3	1:B:432:ASN:HA	2.01	0.42
1:A:207:LEU:HG	1:A:219:GLN:HA	2.01	0.42
1:A:91:LYS:NZ	1:A:92:GLN:HG2	2.35	0.42
1:B:10:LEU:HD23	1:B:18:LEU:HD11	2.01	0.42
1:A:177:LEU:O	1:A:177:LEU:HD12	2.20	0.42
1:B:564:SER:HB3	1:B:585:HIS:CG	2.54	0.42
1:A:52:VAL:O	1:A:54:ASP:N	2.52	0.42
1:A:60:GLU:OE2	1:A:67:LYS:HE2	2.19	0.42
1:B:203:SER:HB3	1:B:226:LYS:HA	2.00	0.42
1:A:113:SER:O	1:A:116:VAL:HG12	2.19	0.42
1:A:239:ILE:HB	4:B:1001:MS1:H51	2.01	0.42
1:B:99:VAL:HG12	1:B:101:VAL:HG23	2.02	0.42
1:A:431:SER:CB	1:A:432:ASN:HA	2.49	0.42
1:A:467:TRP:NE1	1:A:532:LEU:HB2	2.35	0.42
1:A:510:GLN:HE21	1:A:510:GLN:HB2	1.50	0.42
1:B:500:ILE:HA	1:B:500:ILE:HD12	1.92	0.42
1:B:164:ASP:O	1:B:165:LYS:C	2.58	0.42
1:B:170:GLU:O	1:B:173:ARG:N	2.52	0.42
1:A:415:ALA:O	1:A:419:LEU:HG	2.19	0.42
4:B:1001:MS1:H3P	4:B:1001:MS1:H1	1.75	0.41
1:B:387:LEU:HD23	1:B:387:LEU:HA	1.91	0.41
1:A:461:ASP:HA	1:A:464:ASN:HD22	1.85	0.41
1:A:438:LYS:HZ3	1:A:534:ALA:HB3	1.83	0.41
1:B:510:GLN:HG2	1:B:516:VAL:HG11	2.02	0.41
1:A:6:GLN:O	1:A:30:LEU:HD23	2.19	0.41
1:A:74:HIS:CB	1:B:69:LEU:HD13	2.50	0.41
1:B:569:ASP:O	1:B:573:ILE:HG13	2.21	0.41
1:B:247:ALA:CB	1:B:321:ALA:HB2	2.50	0.41
1:A:479:PHE:CE2	1:A:488:VAL:HG13	2.55	0.41
1:A:203:SER:HA	1:A:227:LEU:HG	2.03	0.41
1:A:106:PRO:HB2	1:A:109:LYS:HG3	2.03	0.41
1:A:14:GLU:O	1:A:14:GLU:HG3	2.20	0.41
1:B:294:HIS:HA	1:B:297:LEU:HD12	2.01	0.41
1:B:436:TYR:CE2	1:B:555:ILE:HG21	2.55	0.41
1:A:7:LEU:CD1	1:A:33:ILE:HD11	2.40	0.41
1:A:506:LEU:O	1:A:510:GLN:HB2	2.20	0.41
1:B:103:ASN:HB3	1:B:147:CYS:O	2.20	0.41
1:B:247:ALA:HB2	1:B:266:PHE:CD1	2.54	0.41
1:A:379:ILE:CG2	5:B:1077:HOH:O	2.60	0.41
1:A:211:MET:N	1:B:389:GLN:OE1	2.52	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:320:ILE:O	1:B:342:VAL:HA	2.21	0.41
1:A:509:TRP:CZ2	1:A:513:PHE:CZ	3.08	0.41
1:B:66:VAL:O	1:B:68:THR:N	2.53	0.41
1:A:497:THR:C	1:A:499:THR:H	2.23	0.41
1:A:528:TRP:HH2	5:A:1196:HOH:O	2.03	0.41
1:B:278:ILE:CD1	1:B:417:ARG:CZ	2.99	0.41
1:B:78:LEU:HD21	1:B:135:ALA:HB1	2.03	0.41
1:B:83:PRO:O	1:B:84:GLU:C	2.57	0.41
1:A:555:ILE:O	1:A:555:ILE:CG1	2.69	0.41
1:A:542:PHE:C	1:A:542:PHE:CD1	2.94	0.41
1:B:156:ALA:C	1:B:158:GLU:H	2.24	0.41
1:B:68:THR:OG1	5:B:1086:HOH:O	2.22	0.41
1:B:349:GLU:OE1	1:B:349:GLU:N	2.54	0.41
1:A:100:VAL:HG21	1:A:136:ALA:HB2	2.01	0.41
1:A:583:LEU:HD12	1:A:584:ILE:N	2.36	0.41
1:B:28:LEU:CB	1:B:165:LYS:HD3	2.51	0.41
1:B:26:ASN:C	1:B:28:LEU:N	2.75	0.41
1:A:219:GLN:HE21	1:B:388:MET:CE	2.34	0.41
1:B:494:GLN:H	1:B:494:GLN:HG2	1.73	0.41
1:A:543:PHE:HE2	1:A:560:ILE:HG21	1.86	0.41
1:A:353:LYS:HE3	1:A:353:LYS:HB2	1.95	0.41
1:B:561:VAL:O	1:B:561:VAL:HG13	2.21	0.41
1:B:47:LEU:HA	1:B:48:PRO:HD3	1.85	0.40
1:B:243:ASP:OD1	1:B:269:VAL:N	2.49	0.40
1:A:453:ILE:HD13	1:A:547:ASP:CG	2.42	0.40
1:A:155:VAL:O	1:A:158:GLU:N	2.52	0.40
1:B:113:SER:CB	1:B:114:PRO:HD2	2.45	0.40
1:A:316:PHE:CB	4:B:1001:MS1:H7F	2.51	0.40
1:B:34:ALA:C	1:B:52:VAL:HG23	2.42	0.40
1:A:472:PRO:HD3	1:A:528:TRP:CZ3	2.56	0.40
1:A:86:ASN:N	1:A:86:ASN:ND2	2.69	0.40
1:B:237:GLY:H	1:B:240:ASN:HB2	1.85	0.40
1:A:379:ILE:HA	1:A:387:LEU:O	2.21	0.40
1:A:298:THR:HG23	1:A:329:PRO:HG3	2.04	0.40
1:A:412:PRO:HD2	1:A:559:PHE:CE2	2.56	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	588/613 (96%)	542 (92%)	39 (7%)	7 (1%)	16	29
1	B	588/613 (96%)	541 (92%)	38 (6%)	9 (2%)	13	22
All	All	1176/1226 (96%)	1083 (92%)	77 (6%)	16 (1%)	14	24

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	67	LYS
1	A	36	GLY
1	A	53	SER
1	A	499	THR
1	A	500	ILE
1	B	27	ALA
1	B	36	GLY
1	A	277	GLY
1	A	512	MET
1	B	157	LYS
1	B	515	GLU
1	B	83	PRO
1	B	106	PRO
1	B	165	LYS
1	A	106	PRO
1	B	277	GLY

### 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	484/502 (96%)	464 (96%)	20 (4%)	37	63
1	B	484/502 (96%)	465 (96%)	19 (4%)	39	66
All	All	968/1004 (96%)	929 (96%)	39 (4%)	38	64

All (39) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	26	ASN
1	A	54	ASP
1	A	60	GLU
1	A	82	ILE
1	A	113	SER
1	A	146	VAL
1	A	153	SER
1	A	216	SER
1	A	265	SER
1	A	270	SER
1	A	280	LEU
1	A	360	ASN
1	A	379	ILE
1	A	402	LYS
1	A	406	THR
1	A	429	THR
1	A	461	ASP
1	A	503	ASP
1	A	510	GLN
1	A	589	ARG
1	B	55	LEU
1	B	58	PHE
1	B	83	PRO
1	B	85	ASP
1	B	88	ASP
1	B	102	CYS
1	B	104	LEU
1	B	108	VAL
1	B	174	HIS
1	B	177	LEU
1	B	199	SER
1	B	211	MET
1	B	226	LYS
1	B	235	SER
1	B	360	ASN

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Mol	Chain	Res	Type
1	B	379	ILE
1	B	494	GLN
1	B	537	LEU
1	B	549	VAL

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	5	GLN
1	A	26	ASN
1	A	81	ASN
1	A	86	ASN
1	A	139	ASN
1	A	219	GLN
1	A	510	GLN
1	A	527	GLN
1	B	5	GLN
1	B	81	ASN
1	B	86	ASN
1	B	139	ASN
1	B	174	HIS
1	B	185	GLN
1	B	256	GLN
1	B	408	ASN
1	B	494	GLN
1	B	510	GLN
1	B	558	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry

Of 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z  > 2$	Counts	RMSZ	# $ Z  > 2$
4	MS1	A	1002	-	48,61,61	2.63	17 (35%)	60,89,89	4.01	23 (38%)
3	PO4	A	1005	-	4,4,4	1.10	0	6,6,6	0.27	0
4	MS1	B	1001	-	48,61,61	2.55	19 (39%)	60,89,89	3.81	29 (48%)
3	PO4	B	1006	-	4,4,4	1.11	0	6,6,6	0.27	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
4	MS1	A	1002	-	-	0/32/64/64	0/5/5/5
3	PO4	A	1005	-	-	0/0/0/0	0/0/0/0
4	MS1	B	1001	-	-	0/32/64/64	0/5/5/5
3	PO4	B	1006	-	-	0/0/0/0	0/0/0/0

All (36) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1002	MS1	C17-N	-2.12	1.29	1.34
4	B	1001	MS1	C4A-C8A	2.23	1.47	1.43
4	B	1001	MS1	C15-C16	2.29	1.42	1.38
4	B	1001	MS1	C12-C13	2.44	1.43	1.38
4	A	1002	MS1	C2P-C3P	2.45	1.39	1.32
4	B	1001	MS1	C9-N10	2.46	1.52	1.47
4	B	1001	MS1	CA-N	2.47	1.50	1.46
4	A	1002	MS1	O1-C1	2.49	1.44	1.41
4	B	1001	MS1	C2P-C3P	2.52	1.39	1.32
4	B	1001	MS1	C7F-C6F	2.56	1.44	1.38
4	A	1002	MS1	C15-C14	2.65	1.43	1.39
4	B	1001	MS1	C4F-N3F	2.70	1.38	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1002	MS1	CB-CA	2.70	1.57	1.53
4	B	1001	MS1	C12-C11	2.74	1.44	1.39
4	A	1002	MS1	C15-C16	2.86	1.43	1.38
4	B	1001	MS1	P-O9	3.00	1.61	1.51
4	B	1001	MS1	C8F-C7F	3.09	1.43	1.36
4	A	1002	MS1	C9-N10	3.10	1.53	1.47
4	A	1002	MS1	P-O9	3.12	1.61	1.51
4	A	1002	MS1	C12-C13	3.25	1.44	1.38
4	B	1001	MS1	C2P-C42	3.31	1.53	1.48
4	A	1002	MS1	C8A-N1F	3.38	1.43	1.37
4	B	1001	MS1	C15-C14	3.43	1.45	1.39
4	B	1001	MS1	C16-C11	3.65	1.46	1.39
4	B	1001	MS1	CB-CA	3.77	1.58	1.53
4	A	1002	MS1	C16-C11	3.88	1.46	1.39
4	A	1002	MS1	C12-C11	4.29	1.47	1.39
4	A	1002	MS1	C13-C14	4.40	1.46	1.39
4	B	1001	MS1	C8A-N1F	5.05	1.46	1.37
4	A	1002	MS1	C2P-C42	5.63	1.56	1.48
4	B	1001	MS1	C11-N10	6.11	1.57	1.43
4	A	1002	MS1	C2F-N3F	6.34	1.46	1.35
4	B	1001	MS1	C2F-N3F	6.35	1.46	1.35
4	A	1002	MS1	C4F-C4A	6.49	1.54	1.41
4	A	1002	MS1	C11-N10	7.22	1.60	1.43
4	B	1001	MS1	C4F-C4A	7.34	1.55	1.41

All (52) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	1001	MS1	C4-O1-C1	-8.51	100.37	109.72
4	A	1002	MS1	C11-N10-C42	-6.81	115.72	123.77
4	A	1002	MS1	C4-O1-C1	-6.37	102.72	109.72
4	B	1001	MS1	C2-C1-N9	-5.44	104.53	114.17
4	A	1002	MS1	C4A-C4F-N3F	-5.33	116.30	123.59
4	B	1001	MS1	C4F-C4A-C8A	-5.33	116.13	119.88
4	B	1001	MS1	O42-C42-C2P	-5.09	112.22	122.15
4	A	1002	MS1	O42-C42-C2P	-5.04	112.34	122.15
4	A	1002	MS1	C2-C1-N9	-4.63	105.95	114.17
4	B	1001	MS1	C4A-C4F-N3F	-4.53	117.40	123.59
4	A	1002	MS1	C8-N9-C4P	-4.30	96.51	105.62
4	A	1002	MS1	O62-C6-N1	-4.29	116.55	122.59
4	B	1001	MS1	O62-C6-N1	-4.25	116.61	122.59
4	B	1001	MS1	N1F-C2F-N3F	-3.82	121.63	127.44

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	1002	MS1	N1F-C2F-N3F	-3.79	121.68	127.44
4	B	1001	MS1	C5-C4-C3	-2.93	103.58	115.21
4	A	1002	MS1	C4A-C8A-N1F	-2.88	119.32	121.63
4	B	1001	MS1	C16-C11-C12	-2.76	113.39	119.13
4	A	1002	MS1	C4F-C4A-C8A	-2.59	118.06	119.88
4	B	1001	MS1	C8-N9-C4P	-2.52	100.28	105.62
4	B	1001	MS1	C8F-C8A-C4A	-2.46	117.82	120.03
4	B	1001	MS1	O17-C17-N	-2.23	118.40	122.44
4	B	1001	MS1	C8F-C8A-N1F	2.01	121.91	118.73
4	A	1002	MS1	C6F-N5F-C4A	2.03	120.92	118.41
4	B	1001	MS1	C2-C3-C4	2.21	107.16	102.61
4	A	1002	MS1	C15-C16-C11	2.23	123.25	120.36
4	A	1002	MS1	C12-C13-C14	2.25	123.38	120.76
4	A	1002	MS1	O1-C4-C3	2.28	109.74	105.15
4	B	1001	MS1	C11-N10-C42	2.33	126.54	123.77
4	A	1002	MS1	O1-C1-N9	2.35	113.06	108.09
4	B	1001	MS1	O1-C4-C3	2.43	110.05	105.15
4	B	1001	MS1	C13-C12-C11	2.44	123.52	120.36
4	B	1001	MS1	C14-C17-N	2.48	121.35	116.93
4	A	1002	MS1	O2-C2-C3	2.65	120.43	111.83
4	B	1001	MS1	C15-C16-C11	2.65	123.79	120.36
4	B	1001	MS1	O2-C2-C3	2.69	120.57	111.83
4	B	1001	MS1	C2P-C42-N10	2.85	120.84	117.93
4	B	1001	MS1	C6F-N5F-C4A	2.91	122.01	118.41
4	A	1002	MS1	C4F-C4A-N5F	3.02	122.39	118.72
4	A	1002	MS1	C5P-C6-N1	3.06	121.14	115.90
4	B	1001	MS1	C4F-C4A-N5F	3.18	122.58	118.72
4	B	1001	MS1	C5P-C6-N1	3.25	121.46	115.90
4	B	1001	MS1	C6F-C9-N10	3.57	118.33	113.11
4	B	1001	MS1	C16-C11-N10	3.64	125.55	120.17
4	A	1002	MS1	C16-C11-N10	3.72	125.66	120.17
4	A	1002	MS1	C6F-C9-N10	4.54	119.76	113.11
4	B	1001	MS1	C4F-N3F-C2F	5.03	122.93	115.94
4	B	1001	MS1	CG-CB-CA	5.04	123.23	112.99
4	A	1002	MS1	C4F-N3F-C2F	5.16	123.09	115.94
4	A	1002	MS1	C2P-C42-N10	11.57	129.74	117.93
4	B	1001	MS1	C3P-C2P-C42	20.92	151.57	120.79
4	A	1002	MS1	C3P-C2P-C42	21.11	151.85	120.79

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1002	MS1	6	0
4	B	1001	MS1	7	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	590/613 (96%)	-0.14	9 (1%) 76 79	21, 40, 70, 87	0
1	B	590/613 (96%)	-0.17	13 (2%) 65 69	21, 40, 68, 82	1 (0%)
All	All	1180/1226 (96%)	-0.16	22 (1%) 70 73	21, 40, 69, 87	1 (0%)

All (22) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	4	ARG	3.9
1	B	114	PRO	3.7
1	B	115	GLY	3.5
1	B	503	ASP	3.3
1	B	502	GLU	3.2
1	A	502	GLU	3.0
1	A	112	SER	2.9
1	B	116	VAL	2.8
1	B	4	ARG	2.8
1	A	160	ALA	2.8
1	B	113	SER	2.6
1	A	504	GLU	2.5
1	B	64	GLY	2.5
1	B	500	ILE	2.4
1	B	163	LYS	2.4
1	A	43	ARG	2.4
1	A	86	ASN	2.2
1	B	60	GLU	2.1
1	B	105	TYR	2.1
1	A	407	LYS	2.0
1	B	97	VAL	2.0
1	A	163	LYS	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
4	MS1	B	1001	57/57	0.87	0.19	1.62	47,57,65,66	0
4	MS1	A	1002	57/57	0.91	0.14	0.60	38,50,58,58	0
2	K	A	1004	1/1	0.92	0.14	0.32	42,42,42,42	0
3	PO4	B	1006	5/5	0.90	0.15	-0.61	81,81,81,82	0
2	K	B	1003	1/1	0.98	0.09	-1.67	35,35,35,35	0
3	PO4	A	1005	5/5	0.94	0.12	-1.83	97,97,97,98	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.