



# Full wwPDB X-ray Structure Validation Report ⓘ

May 22, 2020 – 03:51 pm BST

PDB ID : 1AXS  
Title : MATURE OXY-COPE CATALYTIC ANTIBODY WITH HAPTEN  
Authors : Mundorff, E.C.; Ulrich, H.D.; Stevens, R.C.  
Deposited on : 1997-10-20  
Resolution : 2.60 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.11  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.11

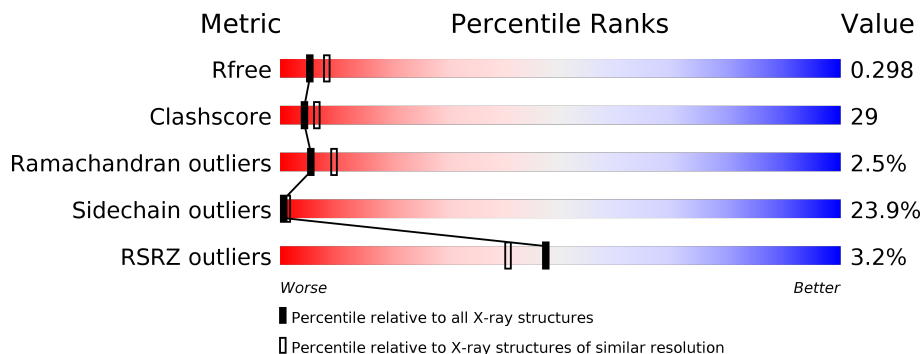
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.60 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	3163 (2.60-2.60)
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)
RSRZ outliers	127900	3104 (2.60-2.60)

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

Mol	Chain	Length	Quality of chain
1	A	211	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 43%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 43%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 14%; height: 10px; background-color: orange;"></div> </div> <p style="font-size: small; margin-top: 5px;">2%      43%      43%      14%</p>
1	L	211	<div style="display: flex; align-items: center;"> <div style="width: 0%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 46%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 41%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 13%; height: 10px; background-color: orange;"></div> </div> <p style="font-size: small; margin-top: 5px;">%      46%      41%      13%</p>
2	B	221	<div style="display: flex; align-items: center;"> <div style="width: 4%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 47%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 38%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 14%; height: 10px; background-color: orange;"></div> </div> <p style="font-size: small; margin-top: 5px;">4%      47%      38%      14%</p>
2	H	221	<div style="display: flex; align-items: center;"> <div style="width: 6%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 46%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 44%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 9%; height: 10px; background-color: orange;"></div> </div> <p style="font-size: small; margin-top: 5px;">6%      46%      44%      9%</p>

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 6887 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 OXY-COPE CATALYTIC ANTIBODY.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	L	211	1655	1041	272	336	6	0	0	0
1	A	211	1655	1041	272	336	6	0	0	0

There are 60 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	11	MET	LEU	CONFLICT	GB 243868
L	12	TYR	SER	CONFLICT	GB 243868
L	15	LEU	VAL	CONFLICT	GB 243868
L	17	GLU	ASP	CONFLICT	GB 243868
L	28	ASP	ASN	CONFLICT	GB 243868
L	30	ASN	ASP	CONFLICT	GB 243868
L	31	SER	LYS	CONFLICT	GB 243868
L	36	PHE	TYR	CONFLICT	GB 243868
L	43	SER	ALA	CONFLICT	GB 243868
L	46	THR	LEU	CONFLICT	GB 243868
L	50	ARG	ASN	CONFLICT	GB 243868
L	53	ARG	ASN	CONFLICT	GB 243868
L	55	VAL	GLN	CONFLICT	GB 243868
L	56	ASP	THR	CONFLICT	GB 243868
L	69	GLN	THR	CONFLICT	GB 243868
L	71	TYR	PHE	CONFLICT	GB 243868
L	72	SER	THR	CONFLICT	GB 243868
L	73	LEU	PHE	CONFLICT	GB 243868
L	79	GLU	GLN	CONFLICT	GB 243868
L	80	TYR	PRO	CONFLICT	GB 243868
L	83	MET	ILE	CONFLICT	GB 243868
L	84	GLY	ALA	CONFLICT	GB 243868
L	85	ILE	THR	CONFLICT	GB 243868
L	91	TYR	HIS	CONFLICT	GB 243868
L	92	ASP	ILE	CONFLICT	GB 243868

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Chain	Residue	Modelled	Actual	Comment	Reference
L	93	GLU	SER	CONFLICT	GB 243868
L	94	PHE	ARG	CONFLICT	GB 243868
L	96	TYR	ARG	CONFLICT	GB 243868
L	100	SER	GLN	CONFLICT	GB 243868
L	104	LEU	VAL	CONFLICT	GB 243868
A	11	MET	LEU	CONFLICT	GB 243868
A	12	TYR	SER	CONFLICT	GB 243868
A	15	LEU	VAL	CONFLICT	GB 243868
A	17	GLU	ASP	CONFLICT	GB 243868
A	28	ASP	ASN	CONFLICT	GB 243868
A	30	ASN	ASP	CONFLICT	GB 243868
A	31	SER	LYS	CONFLICT	GB 243868
A	36	PHE	TYR	CONFLICT	GB 243868
A	43	SER	ALA	CONFLICT	GB 243868
A	46	THR	LEU	CONFLICT	GB 243868
A	50	ARG	ASN	CONFLICT	GB 243868
A	53	ARG	ASN	CONFLICT	GB 243868
A	55	VAL	GLN	CONFLICT	GB 243868
A	56	ASP	THR	CONFLICT	GB 243868
A	69	GLN	THR	CONFLICT	GB 243868
A	71	TYR	PHE	CONFLICT	GB 243868
A	72	SER	THR	CONFLICT	GB 243868
A	73	LEU	PHE	CONFLICT	GB 243868
A	79	GLU	GLN	CONFLICT	GB 243868
A	80	TYR	PRO	CONFLICT	GB 243868
A	83	MET	ILE	CONFLICT	GB 243868
A	84	GLY	ALA	CONFLICT	GB 243868
A	85	ILE	THR	CONFLICT	GB 243868
A	91	TYR	HIS	CONFLICT	GB 243868
A	92	ASP	ILE	CONFLICT	GB 243868
A	93	GLU	SER	CONFLICT	GB 243868
A	94	PHE	ARG	CONFLICT	GB 243868
A	96	TYR	ARG	CONFLICT	GB 243868
A	100	SER	GLN	CONFLICT	GB 243868
A	104	LEU	VAL	CONFLICT	GB 243868

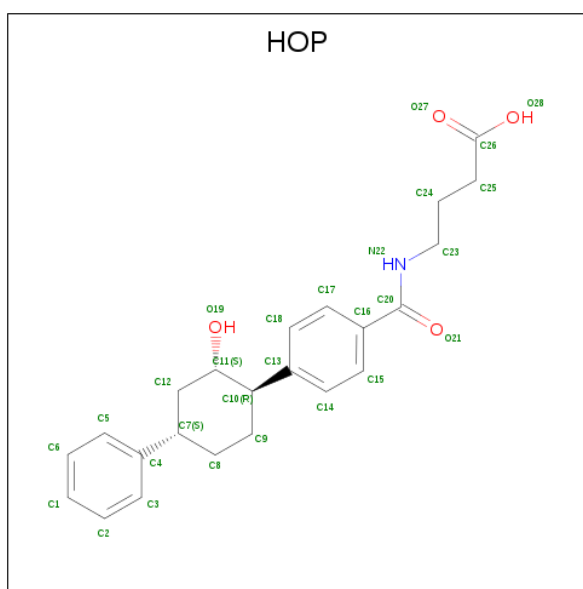
- Molecule 2 is a protein called OXY-COPE CATALYTIC ANTIBODY.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	H	221	Total	C	N	O	S	0	0	0
			1664	1057	271	330	6			
2	B	221	Total	C	N	O	S	0	0	0
			1664	1057	271	330	6			

- Molecule 3 is CADMIUM ION (three-letter code: CD) (formula: Cd).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	H	2	Total	Cd	0	0
			2	2		
3	A	3	Total	Cd	0	0
			3	3		
3	L	3	Total	Cd	0	0
			3	3		

- Molecule 4 is (1S,2S,5S)2-(4-GLUTARIDYLBENZYL)-5-PHENYL-1-CYCLOHEXANOL (three-letter code: HOP) (formula: C<sub>23</sub>H<sub>27</sub>NO<sub>4</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	H	1	Total	C	N	O	0	0
			28	23	1	4		
4	B	1	Total	C	N	O	0	0
			28	23	1	4		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	L	56	Total	O	0	0
			56	56		
5	H	45	Total	O	0	0
			45	45		
5	A	47	Total	O	0	0
			47	47		

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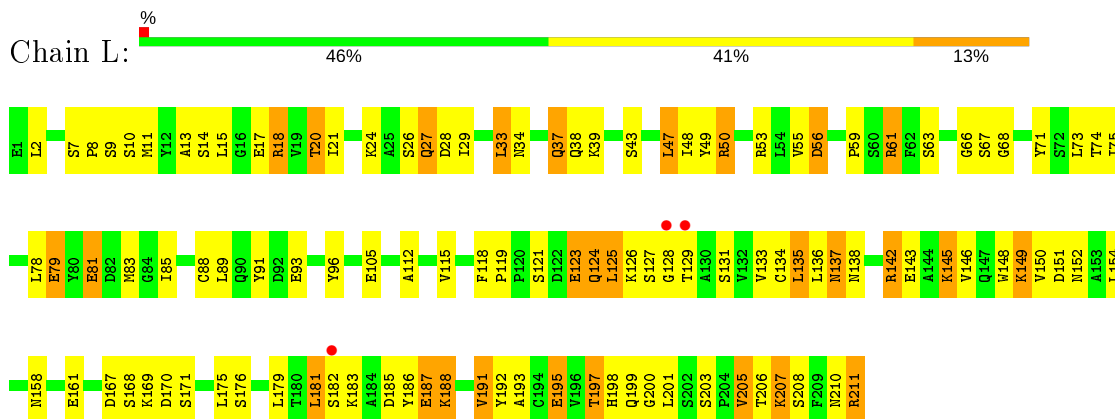
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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
5	B	37	Total	O	0	0
			37	37		

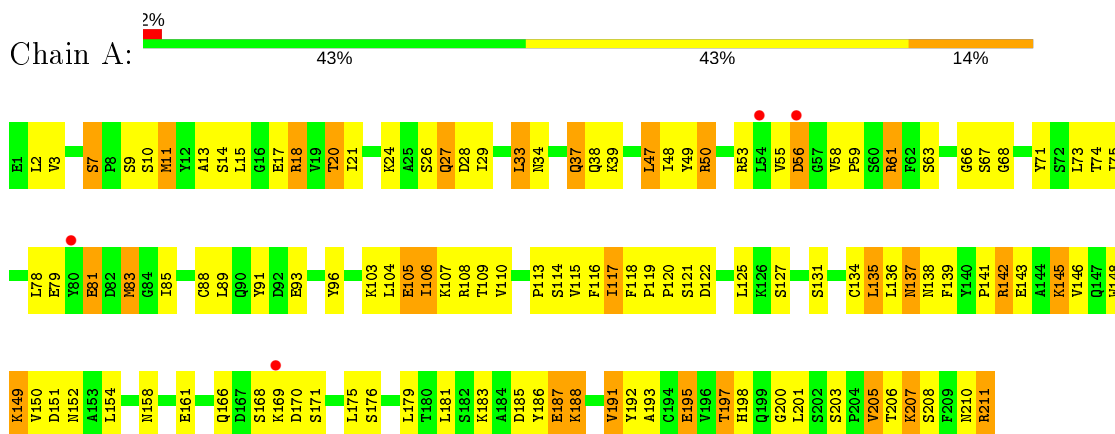
### 3 Residue-property plots

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

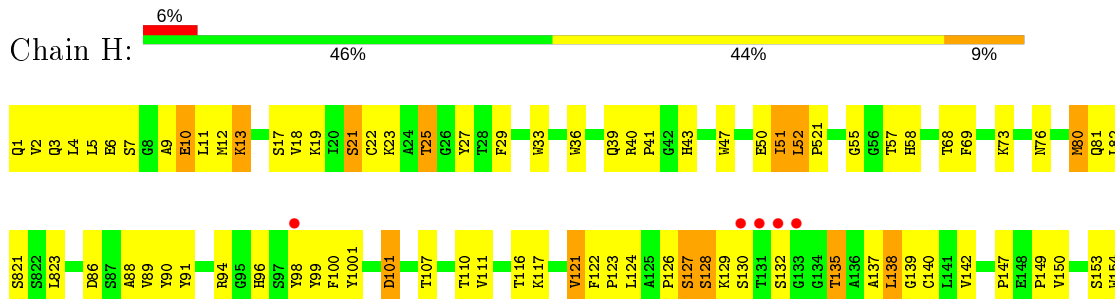
- Molecule 1: OXY-COPE CATALYTIC ANTIBODY



- Molecule 1: OXY-COPE CATALYTIC ANTIBODY

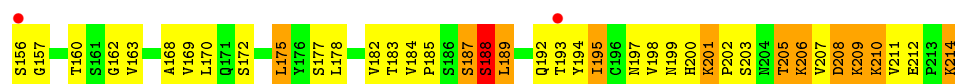
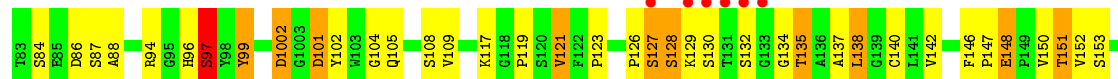
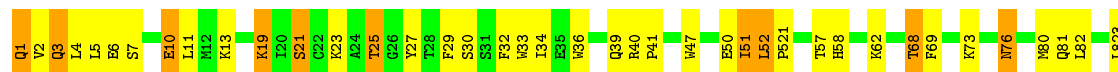


- Molecule 2: OXY-COPE CATALYTIC ANTIBODY





• Molecule 2: OXY-COPE CATALYTIC ANTIBODY





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	42.78Å 81.50Å 128.20Å 90.00° 93.43° 90.00°	Depositor
Resolution (Å)	20.00 – 2.60 37.79 – 2.60	Depositor EDS
% Data completeness (in resolution range)	91.1 (20.00-2.60) 90.2 (37.79-2.60)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	0.06	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	6.17 (at 2.61Å)	Xtrriage
Refinement program	X-PLOR 3.851	Depositor
R, $R_{free}$	0.200 , 0.305 0.201 , 0.298	Depositor DCC
$R_{free}$ test set	2455 reflections (9.91%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	34.0	Xtrriage
Anisotropy	0.405	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 72.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	6887	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	36.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.83% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

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

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

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	0.39	0/1691	0.61	0/2291
1	L	0.45	1/1691 (0.1%)	0.64	0/2291
2	B	0.41	0/1710	0.66	2/2325 (0.1%)
2	H	0.41	0/1710	0.64	0/2325
All	All	0.41	1/6802 (0.0%)	0.64	2/9232 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L	79	GLU	CB-CG	5.48	1.62	1.52

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	148	GLU	N-CA-C	5.73	126.48	111.00
2	B	97	SER	N-CA-C	-5.22	96.91	111.00

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	1655	0	1607	116	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	L	1655	0	1607	96	0
2	B	1664	0	1610	103	0
2	H	1664	0	1610	83	0
3	A	3	0	0	0	0
3	H	2	0	0	0	0
3	L	3	0	0	0	0
4	B	28	0	27	4	0
4	H	28	0	27	4	0
5	A	47	0	0	11	0
5	B	37	0	0	12	0
5	H	45	0	0	5	0
5	L	56	0	0	6	0
All	All	6887	0	6488	384	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 29.

All (384) 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:L:38:GLN:HE22	2:H:39:GLN:HE22	1.04	1.00
1:L:137:ASN:HD22	1:L:138:ASN:N	1.60	0.99
1:A:58:VAL:HG21	5:A:215:HOH:O	1.63	0.99
2:B:33:TRP:HB3	5:B:1017:HOH:O	1.63	0.97
1:A:137:ASN:HD22	1:A:138:ASN:N	1.62	0.97
1:L:105:GLU:HG3	5:L:227:HOH:O	1.62	0.97
1:L:38:GLN:NE2	2:H:39:GLN:HE22	1.65	0.95
1:A:38:GLN:HE22	2:B:39:GLN:HE22	1.07	0.95
1:L:129:THR:HG22	1:L:182:SER:HA	1.50	0.93
1:A:15:LEU:HD11	1:A:108:ARG:HH22	1.30	0.93
2:B:50:GLU:HB2	5:B:1017:HOH:O	1.72	0.90
1:A:47:LEU:HA	5:A:215:HOH:O	1.71	0.89
1:A:38:GLN:NE2	2:B:39:GLN:HE22	1.72	0.86
1:A:55:VAL:HB	5:A:215:HOH:O	1.77	0.84
2:B:200:HIS:HB3	2:B:205:THR:HG23	1.60	0.84
1:L:38:GLN:HE22	2:H:39:GLN:NE2	1.74	0.84
1:A:210:ASN:O	1:A:211:ARG:HB2	1.77	0.83
2:B:135:THR:HG22	2:B:185:PRO:HA	1.60	0.83
1:L:210:ASN:O	1:L:211:ARG:HB2	1.77	0.83
2:B:156:SER:HA	2:B:197:ASN:HD21	1.44	0.82
2:B:156:SER:HA	2:B:197:ASN:ND2	1.95	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:135:THR:HG22	2:H:185:PRO:HA	1.60	0.81
2:B:156:SER:CA	2:B:197:ASN:HD21	1.97	0.77
1:A:38:GLN:HE22	2:B:39:GLN:NE2	1.82	0.76
1:L:137:ASN:HD22	1:L:138:ASN:H	1.30	0.76
1:A:137:ASN:HD22	1:A:138:ASN:H	1.32	0.75
2:B:1:GLN:HA	2:B:1:GLN:HE21	1.50	0.75
2:B:36:TRP:HE1	2:B:51:ILE:HD11	1.51	0.75
1:A:50:ARG:HG3	1:A:50:ARG:O	1.86	0.74
2:H:36:TRP:HE1	2:H:51:ILE:HD11	1.53	0.74
1:L:201:LEU:HD13	1:L:205:VAL:HG12	1.69	0.74
1:A:21:ILE:HB	5:A:247:HOH:O	1.88	0.73
1:L:50:ARG:HG3	1:L:50:ARG:O	1.87	0.72
1:A:201:LEU:HD13	1:A:205:VAL:HG12	1.70	0.72
1:A:20:THR:HB	1:A:74:THR:OG1	1.90	0.72
1:A:61:ARG:HD2	1:A:75:ILE:CG2	2.20	0.71
2:B:156:SER:N	2:B:197:ASN:HD21	1.88	0.71
2:H:201:LYS:O	2:H:203:SER:N	2.25	0.70
1:A:33:LEU:HD11	1:A:88:CYS:HB2	1.73	0.69
1:L:61:ARG:HD2	1:L:75:ILE:CG2	2.21	0.69
2:B:156:SER:H	2:B:197:ASN:HD21	1.40	0.69
2:B:195:ILE:HA	2:B:210:LYS:HA	1.75	0.68
1:L:20:THR:HB	1:L:74:THR:OG1	1.93	0.67
1:L:8:PRO:HD2	5:L:233:HOH:O	1.95	0.67
1:A:79:GLU:HG3	5:A:235:HOH:O	1.95	0.66
1:L:91:TYR:CD1	4:H:1006:HOP:H92	2.30	0.66
2:B:160:THR:O	2:B:163:VAL:HG23	1.96	0.66
1:L:161:GLU:OE2	1:L:175:LEU:HD11	1.96	0.66
1:A:28:ASP:OD2	5:A:258:HOH:O	2.13	0.66
1:L:145:LYS:HB3	1:L:197:THR:HG23	1.78	0.66
2:B:147:PRO:HD2	2:B:202:PRO:CB	2.25	0.65
1:A:158:ASN:ND2	1:A:179:LEU:HD11	2.11	0.65
1:A:91:TYR:CD1	4:B:1004:HOP:H92	2.32	0.65
1:L:158:ASN:ND2	1:L:179:LEU:HD11	2.11	0.64
1:A:161:GLU:OE2	1:A:175:LEU:HD11	1.97	0.64
2:B:198:VAL:C	2:B:199:ASN:HD22	2.02	0.64
1:A:145:LYS:HB3	1:A:197:THR:HG23	1.79	0.63
1:L:33:LEU:HD11	1:L:88:CYS:HB2	1.80	0.63
2:H:40:ARG:HG2	2:H:88:ALA:HB2	1.80	0.63
1:A:48:ILE:HD12	1:A:73:LEU:HD13	1.81	0.63
1:L:48:ILE:HD12	1:L:73:LEU:HD13	1.82	0.62
2:B:101:ASP:CG	4:B:1004:HOP:H3	2.20	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:195:ILE:HG13	2:B:195:ILE:O	2.00	0.62
1:A:15:LEU:HD12	1:A:108:ARG:HH12	1.64	0.62
2:B:168:ALA:HA	2:B:178:LEU:HB3	1.80	0.62
2:B:32:PHE:CE1	2:B:97:SER:HB3	2.34	0.62
1:L:201:LEU:HD13	1:L:205:VAL:CG1	2.29	0.62
2:H:195:ILE:HD12	2:H:197:ASN:HD21	1.65	0.61
1:L:136:LEU:HD13	1:L:175:LEU:HD22	1.82	0.61
2:B:51:ILE:HG12	2:B:69:PHE:CB	2.30	0.61
1:A:183:LYS:O	1:A:187:GLU:HG2	2.01	0.61
1:L:50:ARG:CG	1:L:50:ARG:HH11	2.12	0.61
1:L:81:GLU:OE2	5:L:268:HOH:O	2.15	0.61
1:A:50:ARG:HH11	1:A:50:ARG:CG	2.12	0.61
1:L:21:ILE:HD11	1:L:73:LEU:HD23	1.82	0.61
1:A:61:ARG:HG2	1:A:61:ARG:NH1	2.15	0.61
2:H:51:ILE:HG12	2:H:69:PHE:CB	2.31	0.60
1:L:14:SER:OG	1:L:17:GLU:HG3	2.02	0.60
2:H:51:ILE:HG23	2:H:57:THR:HG22	1.83	0.60
2:H:4:LEU:HD23	2:H:22:CYS:SG	2.42	0.60
2:B:40:ARG:HG2	2:B:88:ALA:HB2	1.83	0.60
2:H:168:ALA:HA	2:H:178:LEU:HB3	1.84	0.60
1:L:183:LYS:O	1:L:187:GLU:HG2	2.02	0.60
1:A:106:ILE:HG13	1:A:171:SER:CB	2.31	0.59
1:A:106:ILE:HG13	1:A:171:SER:HB3	1.84	0.59
1:L:123:GLU:O	1:L:126:LYS:HG2	2.03	0.59
1:L:55:VAL:HG12	1:L:56:ASP:N	2.18	0.59
1:L:61:ARG:NH1	1:L:61:ARG:HG2	2.17	0.59
1:A:91:TYR:CG	4:B:1004:HOP:H92	2.38	0.59
1:A:106:ILE:HG13	1:A:171:SER:OG	2.03	0.59
1:A:21:ILE:HD11	1:A:73:LEU:HD23	1.84	0.59
2:H:153:SER:O	2:H:196:CYS:HA	2.02	0.59
1:A:201:LEU:HD13	1:A:205:VAL:CG1	2.32	0.58
1:A:28:ASP:OD1	1:A:68:GLY:HA2	2.02	0.58
2:B:29:PHE:CE2	2:B:521:PRO:HB3	2.37	0.58
2:H:201:LYS:HG3	2:H:202:PRO:N	2.17	0.58
2:B:206:LYS:HG2	2:B:208:ASP:OD1	2.04	0.58
2:H:116:THR:HG23	5:H:1021:HOH:O	2.02	0.58
2:H:123:PRO:HB2	2:H:211:VAL:HG13	1.83	0.58
1:L:18:ARG:HH11	1:L:18:ARG:HB2	1.68	0.58
2:H:9:ALA:C	2:H:10:GLU:HG2	2.22	0.58
1:A:18:ARG:HB2	1:A:18:ARG:HH11	1.68	0.58
1:L:125:LEU:CD2	1:L:183:LYS:HG3	2.33	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:36:TRP:NE1	2:H:51:ILE:HD11	2.19	0.57
1:L:15:LEU:HA	1:L:78:LEU:O	2.03	0.57
2:H:29:PHE:O	2:H:521:PRO:HG2	2.03	0.57
2:B:193:THR:HG22	2:B:194:TYR:H	1.69	0.57
2:B:51:ILE:HG23	2:B:57:THR:HG22	1.85	0.57
2:H:13:LYS:HG2	5:H:1051:HOH:O	2.05	0.57
1:A:15:LEU:HD21	1:A:106:ILE:HG21	1.86	0.57
1:A:55:VAL:HG12	1:A:56:ASP:N	2.20	0.57
1:A:14:SER:OG	1:A:17:GLU:HG3	2.05	0.57
2:B:36:TRP:NE1	2:B:51:ILE:HD11	2.19	0.57
1:A:106:ILE:HG12	1:A:166:GLN:NE2	2.20	0.56
1:A:15:LEU:HD11	1:A:108:ARG:NH2	2.11	0.56
1:L:28:ASP:OD1	1:L:68:GLY:HA2	2.05	0.56
1:L:91:TYR:CG	4:H:1006:HOP:H92	2.41	0.56
1:A:136:LEU:HD13	1:A:175:LEU:HD22	1.86	0.56
2:H:127:SER:O	2:H:129:LYS:N	2.38	0.56
1:L:66:GLY:HA3	1:L:71:TYR:HA	1.88	0.56
1:A:61:ARG:HG2	1:A:61:ARG:HH11	1.70	0.56
1:A:149:LYS:HB2	1:A:193:ALA:HB3	1.88	0.56
2:B:127:SER:O	2:B:129:LYS:N	2.39	0.56
1:A:50:ARG:CG	1:A:50:ARG:O	2.53	0.55
1:A:15:LEU:CD1	1:A:108:ARG:HH22	2.11	0.55
1:L:38:GLN:CD	2:H:39:GLN:HE22	2.09	0.55
1:A:210:ASN:O	1:A:211:ARG:HD2	2.06	0.55
2:H:184:VAL:HG11	2:H:194:TYR:CE2	2.42	0.55
1:A:66:GLY:HA3	1:A:71:TYR:HA	1.89	0.55
2:B:11:LEU:HB2	2:B:147:PRO:HG3	1.88	0.55
2:H:94:ARG:O	2:H:101:ASP:HB3	2.07	0.55
1:L:151:ASP:O	1:L:152:ASN:HB2	2.07	0.54
1:L:50:ARG:CG	1:L:50:ARG:O	2.55	0.54
1:L:149:LYS:HB2	1:L:193:ALA:HB3	1.89	0.54
2:H:82:LEU:HB2	2:H:823:LEU:HD21	1.89	0.54
1:A:15:LEU:HA	1:A:78:LEU:O	2.07	0.54
2:B:823:LEU:HA	2:B:86:ASP:OD2	2.08	0.54
1:L:61:ARG:HG2	1:L:61:ARG:HH11	1.72	0.54
2:H:33:TRP:CE2	2:H:52:LEU:HG	2.43	0.53
1:L:198:HIS:CD2	1:L:200:GLY:H	2.26	0.53
1:L:121:SER:OG	1:L:124:GLN:HB3	2.07	0.53
2:B:137:ALA:HB2	2:B:183:THR:HG22	1.91	0.53
2:B:36:TRP:HE1	2:B:51:ILE:CD1	2.21	0.53
2:B:33:TRP:CE2	2:B:52:LEU:HG	2.43	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:185:ASP:HA	1:L:188:LYS:HD3	1.90	0.53
1:L:91:TYR:HA	1:L:96:TYR:CD1	2.44	0.53
1:L:210:ASN:O	1:L:211:ARG:HD2	2.09	0.53
1:A:91:TYR:HA	1:A:96:TYR:CD1	2.43	0.53
2:H:36:TRP:HE1	2:H:51:ILE:CD1	2.21	0.53
1:L:136:LEU:HD13	1:L:175:LEU:CD2	2.38	0.53
1:A:185:ASP:HA	1:A:188:LYS:HD3	1.90	0.52
2:H:194:TYR:N	2:H:194:TYR:CD1	2.77	0.52
1:L:79:GLU:HB3	1:L:81:GLU:OE2	2.10	0.52
2:H:11:LEU:HD12	2:H:110:THR:O	2.09	0.52
1:A:198:HIS:CD2	1:A:200:GLY:H	2.27	0.52
2:B:147:PRO:HD2	2:B:202:PRO:HB3	1.91	0.52
2:B:6:GLU:O	2:B:7:SER:HB2	2.08	0.52
1:L:27:GLN:O	1:L:29:ILE:HG23	2.09	0.52
2:B:6:GLU:OE2	2:B:104:GLY:HA3	2.09	0.52
1:L:151:ASP:OD1	1:L:191:VAL:HG23	2.10	0.52
1:A:79:GLU:HG2	5:A:260:HOH:O	2.09	0.52
1:L:112:ALA:HB1	1:L:201:LEU:CD2	2.40	0.52
1:L:50:ARG:CG	1:L:50:ARG:NH1	2.71	0.52
1:A:210:ASN:O	1:A:211:ARG:CB	2.54	0.52
2:H:11:LEU:HD22	2:H:147:PRO:HG3	1.91	0.52
2:H:200:HIS:CE1	2:H:202:PRO:HB2	2.45	0.52
2:B:150:VAL:HG22	2:B:151:THR:N	2.24	0.51
2:H:126:PRO:HB3	2:H:138:LEU:HB3	1.92	0.51
2:H:137:ALA:HB2	2:H:183:THR:HG22	1.92	0.51
1:L:193:ALA:HA	1:L:208:SER:HB3	1.91	0.51
1:A:106:ILE:HG12	1:A:166:GLN:HE22	1.74	0.51
2:B:214:LYS:HG3	5:B:1030:HOH:O	2.10	0.51
2:H:139:GLY:HA2	2:H:154:TRP:CH2	2.46	0.51
2:H:96:HIS:HB2	2:H:1001:TYR:HB2	1.92	0.51
1:A:146:VAL:HA	1:A:195:GLU:O	2.10	0.51
2:B:1:GLN:HA	2:B:1:GLN:NE2	2.22	0.51
1:A:108:ARG:HG2	1:A:109:THR:H	1.75	0.51
2:B:200:HIS:HB3	2:B:205:THR:CG2	2.34	0.51
2:H:139:GLY:C	2:H:154:TRP:HH2	2.14	0.51
1:A:108:ARG:HE	1:A:171:SER:HB2	1.76	0.51
1:A:192:TYR:O	1:A:208:SER:HA	2.11	0.51
1:A:50:ARG:CG	1:A:50:ARG:NH1	2.72	0.51
1:A:83:MET:HE3	1:A:105:GLU:HA	1.92	0.51
2:B:82:LEU:HB2	2:B:823:LEU:HD21	1.92	0.51
1:A:27:GLN:O	1:A:29:ILE:HG23	2.10	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:47:TRP:HZ2	2:B:50:GLU:HG2	1.75	0.51
2:H:147:PRO:HD2	2:H:202:PRO:HB3	1.93	0.51
1:A:151:ASP:O	1:A:152:ASN:HB2	2.11	0.51
1:A:151:ASP:OD1	1:A:191:VAL:HG23	2.11	0.51
2:B:1:GLN:HE21	2:B:1:GLN:CA	2.16	0.51
2:H:98:TYR:CE1	2:H:99:TYR:HD1	2.29	0.51
2:H:147:PRO:HD2	2:H:202:PRO:CB	2.41	0.50
1:A:15:LEU:CD1	1:A:108:ARG:HH12	2.24	0.50
1:A:61:ARG:CG	1:A:61:ARG:HH11	2.25	0.50
2:B:203:SER:OG	2:B:205:THR:HG22	2.11	0.50
2:H:210:LYS:HE3	2:H:212:GLU:OE2	2.12	0.50
1:A:136:LEU:HD13	1:A:175:LEU:CD2	2.41	0.50
1:L:133:VAL:HG23	5:L:228:HOH:O	2.11	0.50
1:A:193:ALA:HA	1:A:208:SER:HB3	1.93	0.50
2:H:101:ASP:CG	4:H:1006:HOP:H3	2.32	0.50
1:L:112:ALA:HB1	1:L:201:LEU:HD21	1.94	0.49
2:B:126:PRO:HB3	2:B:138:LEU:HB3	1.93	0.49
1:L:146:VAL:HA	1:L:195:GLU:O	2.12	0.49
1:A:170:ASP:O	1:A:171:SER:HB2	2.12	0.49
2:B:200:HIS:HD2	2:B:203:SER:OG	1.95	0.49
1:A:14:SER:HB2	5:A:221:HOH:O	2.12	0.49
1:L:192:TYR:O	1:L:208:SER:HA	2.13	0.49
2:B:178:LEU:C	2:B:178:LEU:HD12	2.32	0.49
1:A:135:LEU:HD22	1:A:136:LEU:N	2.28	0.49
1:A:121:SER:HB2	2:B:123:PRO:HD2	1.94	0.49
2:B:169:VAL:HG12	2:B:177:SER:O	2.13	0.49
2:H:126:PRO:HD3	2:H:138:LEU:HB2	1.93	0.49
2:B:10:GLU:HG3	5:B:1032:HOH:O	2.12	0.49
2:H:29:PHE:CE2	2:H:521:PRO:HB3	2.48	0.49
1:A:125:LEU:O	1:A:127:SER:O	2.31	0.49
1:A:108:ARG:NE	1:A:171:SER:HB2	2.28	0.49
1:A:134:CYS:HB2	1:A:148:TRP:CZ2	2.48	0.49
2:H:47:TRP:HZ2	2:H:50:GLU:HG2	1.78	0.49
2:H:154:TRP:O	2:H:155:ASN:HB2	2.13	0.48
1:A:79:GLU:HB3	1:A:81:GLU:OE2	2.13	0.48
1:L:170:ASP:O	1:L:171:SER:HB2	2.13	0.48
2:H:178:LEU:C	2:H:178:LEU:HD12	2.33	0.48
2:B:153:SER:OG	2:B:197:ASN:HB2	2.14	0.48
2:B:3:GLN:HB2	2:B:25:THR:HG22	1.96	0.48
1:L:135:LEU:HD22	1:L:136:LEU:N	2.28	0.48
1:A:61:ARG:HD2	1:A:75:ILE:HG23	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:61:ARG:CG	1:L:61:ARG:HH11	2.27	0.48
2:B:126:PRO:HD3	2:B:138:LEU:HB2	1.95	0.48
2:B:6:GLU:HA	2:B:21:SER:O	2.14	0.48
2:B:193:THR:HG22	2:B:194:TYR:N	2.29	0.47
2:H:43:HIS:HB2	5:H:1019:HOH:O	2.13	0.47
1:L:61:ARG:HD2	1:L:75:ILE:HG23	1.96	0.47
1:A:113:PRO:HB3	1:A:139:PHE:HB3	1.96	0.47
2:B:1:GLN:CA	2:B:1:GLN:NE2	2.78	0.47
2:B:76:ASN:ND2	5:B:1027:HOH:O	2.40	0.47
1:A:116:PHE:HA	2:B:129:LYS:NZ	2.30	0.47
2:B:84:SER:HA	5:B:1028:HOH:O	2.13	0.47
1:L:134:CYS:HB2	1:L:148:TRP:CZ2	2.49	0.47
2:B:27:TYR:CE2	2:B:94:ARG:HD2	2.50	0.47
1:L:50:ARG:HG2	1:L:53:ARG:CG	2.45	0.47
1:A:142:ARG:HG3	1:A:143:GLU:N	2.29	0.47
1:L:55:VAL:CG1	1:L:56:ASP:N	2.77	0.47
2:B:201:LYS:HB3	2:B:202:PRO:HD3	1.97	0.47
2:B:30:SER:HA	2:B:521:PRO:HB2	1.95	0.47
2:H:187:SER:O	2:H:189:LEU:N	2.48	0.47
1:L:37:GLN:HB3	1:L:47:LEU:HD22	1.96	0.47
1:L:124:GLN:HB2	2:H:122:PHE:CE2	2.50	0.47
2:H:150:VAL:HG12	5:H:1014:HOH:O	2.14	0.47
2:H:51:ILE:CD1	2:H:69:PHE:HB3	2.45	0.47
1:A:154:LEU:O	1:A:154:LEU:HD23	2.14	0.46
2:H:52:LEU:HD23	2:H:52:LEU:HA	1.82	0.46
1:L:142:ARG:HG3	1:L:143:GLU:N	2.30	0.46
2:H:121:VAL:CG1	2:H:207:VAL:HG11	2.45	0.46
1:L:154:LEU:HD23	1:L:154:LEU:O	2.14	0.46
1:L:129:THR:HB	1:L:181:LEU:O	2.15	0.46
1:L:61:ARG:O	1:L:75:ILE:HA	2.15	0.46
2:H:823:LEU:HA	2:H:86:ASP:OD2	2.15	0.46
1:A:55:VAL:CG1	1:A:56:ASP:N	2.78	0.46
1:L:137:ASN:ND2	1:L:138:ASN:N	2.44	0.46
2:B:184:VAL:HG11	2:B:194:TYR:CZ	2.51	0.46
1:A:119:PRO:O	1:A:120:PRO:C	2.54	0.46
1:L:210:ASN:O	1:L:211:ARG:CB	2.55	0.46
2:B:187:SER:O	2:B:189:LEU:N	2.48	0.46
2:H:7:SER:HB3	2:H:21:SER:OG	2.15	0.46
1:A:61:ARG:O	1:A:75:ILE:HA	2.16	0.46
1:L:175:LEU:C	1:L:175:LEU:HD23	2.36	0.46
1:A:11:MET:HB3	1:A:104:LEU:CD1	2.45	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:11:LEU:HD23	2:H:116:THR:HG22	1.98	0.45
2:H:206:LYS:HE3	2:H:206:LYS:HB2	1.61	0.45
1:A:37:GLN:HB3	1:A:47:LEU:HD22	1.97	0.45
1:A:107:LYS:HE3	5:A:240:HOH:O	2.14	0.45
2:B:121:VAL:CG1	2:B:207:VAL:HG11	2.46	0.45
2:H:27:TYR:CE2	2:H:94:ARG:HD2	2.51	0.45
1:L:48:ILE:HD12	1:L:73:LEU:CD1	2.46	0.45
1:A:175:LEU:HD23	1:A:175:LEU:C	2.36	0.45
2:B:68:THR:HG22	5:B:1024:HOH:O	2.15	0.45
1:A:26:SER:O	1:A:27:GLN:HB3	2.15	0.45
2:H:199:ASN:OD1	2:H:206:LYS:HG3	2.16	0.45
1:L:34:ASN:OD1	1:L:49:TYR:HA	2.15	0.45
2:B:123:PRO:HB2	2:B:211:VAL:HG13	1.99	0.45
2:B:195:ILE:HD11	2:B:197:ASN:OD1	2.16	0.45
1:A:38:GLN:CD	2:B:39:GLN:HE22	2.19	0.45
2:B:51:ILE:CD1	2:B:69:PHE:HB3	2.47	0.45
1:L:13:ALA:HB3	1:L:78:LEU:HD22	1.97	0.45
1:A:50:ARG:HG2	1:A:53:ARG:CG	2.46	0.45
2:B:146:PHE:HB2	2:B:175:LEU:HD12	1.98	0.45
2:B:47:TRP:CZ2	2:B:50:GLU:HG2	2.52	0.44
2:H:169:VAL:HG12	2:H:177:SER:O	2.16	0.44
1:L:150:VAL:HG22	1:L:192:TYR:CD1	2.53	0.44
2:H:13:LYS:HG2	2:H:13:LYS:H	1.42	0.44
1:A:50:ARG:HH11	1:A:50:ARG:HG2	1.81	0.44
1:L:50:ARG:HG3	1:L:50:ARG:NH1	2.31	0.44
1:A:117:ILE:HG13	1:A:118:PHE:N	2.33	0.44
1:L:183:LYS:O	1:L:186:TYR:HB3	2.18	0.44
1:L:50:ARG:HG2	1:L:53:ARG:HG3	2.00	0.44
2:H:142:VAL:CG2	2:H:198:VAL:HG21	2.48	0.44
1:A:137:ASN:ND2	1:A:138:ASN:N	2.46	0.44
2:H:2:VAL:HA	2:H:25:THR:O	2.18	0.44
1:A:113:PRO:HB3	1:A:139:PHE:CG	2.53	0.44
2:B:2:VAL:HA	2:B:25:THR:O	2.17	0.44
2:H:101:ASP:OD1	4:H:1006:HOP:H7	2.17	0.44
2:B:34:ILE:N	5:B:1017:HOH:O	2.51	0.43
1:A:150:VAL:HG22	1:A:192:TYR:CD1	2.53	0.43
1:A:193:ALA:CB	1:A:208:SER:HB3	2.49	0.43
2:B:152:VAL:HA	2:B:197:ASN:O	2.17	0.43
2:B:19:LYS:HB2	2:B:19:LYS:HE3	1.59	0.43
2:H:51:ILE:HG12	2:H:69:PHE:CG	2.53	0.43
1:L:27:GLN:O	1:L:28:ASP:C	2.56	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:185:PRO:C	2:B:187:SER:N	2.71	0.43
2:H:185:PRO:C	2:H:187:SER:N	2.71	0.43
1:L:26:SER:O	1:L:27:GLN:HB3	2.18	0.43
1:A:110:VAL:HG22	1:A:141:PRO:HD3	2.00	0.43
2:B:13:LYS:HG3	5:B:1006:HOH:O	2.17	0.43
2:B:187:SER:OG	2:B:188:SER:N	2.52	0.43
2:B:2:VAL:HB	2:B:102:TYR:CD2	2.53	0.43
2:H:123:PRO:CB	2:H:211:VAL:HG13	2.49	0.43
1:A:206:THR:O	1:A:207:LYS:HD2	2.19	0.43
2:B:200:HIS:CD2	2:B:203:SER:OG	2.72	0.43
2:B:209:LYS:HD2	2:B:210:LYS:N	2.33	0.43
2:B:51:ILE:HG12	2:B:69:PHE:CG	2.54	0.43
2:H:124:LEU:HB2	2:H:139:GLY:C	2.39	0.43
2:H:201:LYS:C	2:H:203:SER:H	2.22	0.43
1:A:48:ILE:HD12	1:A:73:LEU:CD1	2.46	0.42
1:A:61:ARG:HD2	1:A:75:ILE:HG22	1.98	0.42
2:B:207:VAL:HG12	2:B:207:VAL:O	2.19	0.42
1:L:112:ALA:HB2	1:L:200:GLY:O	2.18	0.42
1:L:115:VAL:HA	1:L:135:LEU:O	2.20	0.42
1:L:193:ALA:CA	1:L:208:SER:HB3	2.49	0.42
1:A:34:ASN:OD1	1:A:49:TYR:HA	2.19	0.42
2:B:184:VAL:HG11	2:B:194:TYR:CE2	2.54	0.42
2:B:62:LYS:HG3	5:B:1018:HOH:O	2.19	0.42
2:B:147:PRO:O	2:B:200:HIS:HE1	2.01	0.42
1:L:61:ARG:HD2	1:L:75:ILE:HG22	2.00	0.42
1:A:50:ARG:HG3	1:A:50:ARG:NH1	2.33	0.42
1:A:7:SER:HB3	5:A:250:HOH:O	2.19	0.42
2:H:12:MET:O	2:H:111:VAL:HA	2.19	0.42
1:L:187:GLU:HG2	1:L:187:GLU:H	1.50	0.42
1:A:49:TYR:CE1	2:B:1002:ASP:O	2.73	0.42
2:H:3:GLN:HG2	5:H:1010:HOH:O	2.19	0.42
1:A:113:PRO:HB3	1:A:139:PHE:CB	2.50	0.42
1:A:13:ALA:HB3	1:A:78:LEU:HD22	2.00	0.42
1:A:193:ALA:CA	1:A:208:SER:HB3	2.49	0.42
2:B:119:PRO:HB2	2:B:142:VAL:HG13	2.02	0.42
1:L:50:ARG:HH11	1:L:50:ARG:HG2	1.83	0.42
2:B:193:THR:HB	5:B:1007:HOH:O	2.20	0.42
2:H:100:PHE:CG	2:H:1001:TYR:N	2.89	0.41
1:L:206:THR:O	1:L:207:LYS:HD2	2.20	0.41
1:A:113:PRO:CA	1:A:139:PHE:HB3	2.49	0.41
2:B:207:VAL:O	2:B:209:LYS:N	2.53	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:154:TRP:HA	2:H:195:ILE:O	2.21	0.41
2:H:69:PHE:CD1	2:H:80:MET:HG3	2.56	0.41
2:H:89:VAL:HA	2:H:107:THR:O	2.20	0.41
1:L:43:SER:HB2	2:H:91:TYR:CE1	2.55	0.41
1:A:183:LYS:O	1:A:186:TYR:HB3	2.20	0.41
1:A:113:PRO:HD3	1:A:198:HIS:CD2	2.55	0.41
1:A:3:VAL:HA	5:A:242:HOH:O	2.19	0.41
2:B:87:SER:HA	2:B:109:VAL:O	2.20	0.41
1:L:124:GLN:NE2	1:L:129:THR:O	2.54	0.41
1:A:193:ALA:HB2	1:A:208:SER:HB3	2.02	0.41
2:B:163:VAL:HG22	2:B:182:VAL:HG23	2.02	0.41
2:H:187:SER:OG	2:H:188:SER:N	2.53	0.41
2:B:1:GLN:HG3	2:B:2:VAL:O	2.20	0.41
2:H:47:TRP:CZ2	2:H:50:GLU:HG2	2.55	0.41
2:H:52:LEU:O	2:H:55:GLY:N	2.50	0.41
1:A:50:ARG:HG2	1:A:53:ARG:HG3	2.03	0.41
2:B:1002:ASP:N	5:B:1019:HOH:O	2.53	0.41
1:L:118:PHE:HA	1:L:119:PRO:HD3	1.81	0.41
2:B:99:TYR:C	2:B:99:TYR:CD1	2.94	0.41
1:L:150:VAL:O	1:L:151:ASP:HB2	2.21	0.41
2:B:96:HIS:ND1	4:B:1004:HOP:O19	2.41	0.41
1:L:193:ALA:CB	1:L:208:SER:HB3	2.50	0.41
2:H:50:GLU:HG3	2:H:58:HIS:HB2	2.03	0.41
2:B:162:GLY:O	2:B:182:VAL:HA	2.21	0.41
2:H:164:HIS:HB2	2:H:181:VAL:CG2	2.51	0.41
1:L:37:GLN:HG2	5:L:223:HOH:O	2.21	0.41
2:B:195:ILE:HG22	2:B:210:LYS:HB2	2.03	0.40
1:L:167:ASP:O	1:L:171:SER:N	2.49	0.40
1:A:121:SER:CB	2:B:123:PRO:HD2	2.52	0.40
1:A:115:VAL:HA	1:A:135:LEU:O	2.21	0.40
2:H:18:VAL:HB	2:H:823:LEU:HD11	2.04	0.40
1:L:61:ARG:HB3	5:L:218:HOH:O	2.21	0.40
2:B:50:GLU:HG3	2:B:58:HIS:HB2	2.02	0.40
2:H:6:GLU:OE1	2:H:90:TYR:O	2.39	0.40
1:A:83:MET:HG3	1:A:106:ILE:CD1	2.52	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	209/211 (99%)	191 (91%)	17 (8%)	1 (0%)	29	52
1	L	209/211 (99%)	191 (91%)	15 (7%)	3 (1%)	11	22
2	B	219/221 (99%)	187 (85%)	23 (10%)	9 (4%)	3	3
2	H	219/221 (99%)	190 (87%)	21 (10%)	8 (4%)	3	4
All	All	856/864 (99%)	759 (89%)	76 (9%)	21 (2%)	5	9

All (21) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	H	188	SER
2	H	202	PRO
2	H	213	PRO
1	L	128	GLY
2	H	128	SER
2	B	128	SER
2	B	188	SER
2	H	187	SER
2	B	187	SER
2	H	132	SER
2	B	132	SER
2	B	208	ASP
2	H	41	PRO
2	B	41	PRO
2	B	157	GLY
1	L	199	GLN
2	B	99	TYR
2	H	149	PRO
1	A	59	PRO
1	L	59	PRO
2	B	134	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	190/190 (100%)	142 (75%)	48 (25%)	0	1
1	L	190/190 (100%)	144 (76%)	46 (24%)	0	1
2	B	185/185 (100%)	140 (76%)	45 (24%)	0	1
2	H	185/185 (100%)	145 (78%)	40 (22%)	1	1
All	All	750/750 (100%)	571 (76%)	179 (24%)	0	1

All (179) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	L	2	LEU
1	L	7	SER
1	L	9	SER
1	L	10	SER
1	L	11	MET
1	L	18	ARG
1	L	20	THR
1	L	24	LYS
1	L	27	GLN
1	L	33	LEU
1	L	37	GLN
1	L	39	LYS
1	L	47	LEU
1	L	50	ARG
1	L	56	ASP
1	L	61	ARG
1	L	63	SER
1	L	67	SER
1	L	81	GLU
1	L	83	MET
1	L	85	ILE
1	L	89	LEU
1	L	93	GLU
1	L	123	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	L	124	GLN
1	L	125	LEU
1	L	127	SER
1	L	131	SER
1	L	135	LEU
1	L	137	ASN
1	L	142	ARG
1	L	145	LYS
1	L	149	LYS
1	L	168	SER
1	L	169	LYS
1	L	176	SER
1	L	181	LEU
1	L	187	GLU
1	L	188	LYS
1	L	191	VAL
1	L	195	GLU
1	L	197	THR
1	L	203	SER
1	L	205	VAL
1	L	207	LYS
1	L	211	ARG
2	H	1	GLN
2	H	5	LEU
2	H	10	GLU
2	H	13	LYS
2	H	17	SER
2	H	19	LYS
2	H	21	SER
2	H	23	LYS
2	H	25	THR
2	H	51	ILE
2	H	52	LEU
2	H	68	THR
2	H	73	LYS
2	H	76	ASN
2	H	80	MET
2	H	81	GLN
2	H	821	SER
2	H	101	ASP
2	H	117	LYS
2	H	121	VAL

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	H	127	SER
2	H	128	SER
2	H	130	SER
2	H	135	THR
2	H	138	LEU
2	H	140	CYS
2	H	161	SER
2	H	167	PRO
2	H	170	LEU
2	H	175	LEU
2	H	188	SER
2	H	189	LEU
2	H	192	GLN
2	H	194	TYR
2	H	195	ILE
2	H	201	LYS
2	H	205	THR
2	H	209	LYS
2	H	211	VAL
2	H	214	LYS
1	A	2	LEU
1	A	7	SER
1	A	9	SER
1	A	10	SER
1	A	11	MET
1	A	18	ARG
1	A	20	THR
1	A	24	LYS
1	A	27	GLN
1	A	33	LEU
1	A	37	GLN
1	A	39	LYS
1	A	47	LEU
1	A	50	ARG
1	A	56	ASP
1	A	61	ARG
1	A	63	SER
1	A	67	SER
1	A	81	GLU
1	A	83	MET
1	A	85	ILE
1	A	89	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	93	GLU
1	A	103	LYS
1	A	105	GLU
1	A	106	ILE
1	A	114	SER
1	A	117	ILE
1	A	122	ASP
1	A	131	SER
1	A	135	LEU
1	A	137	ASN
1	A	142	ARG
1	A	145	LYS
1	A	149	LYS
1	A	168	SER
1	A	169	LYS
1	A	176	SER
1	A	181	LEU
1	A	187	GLU
1	A	188	LYS
1	A	191	VAL
1	A	195	GLU
1	A	197	THR
1	A	203	SER
1	A	205	VAL
1	A	207	LYS
1	A	211	ARG
2	B	1	GLN
2	B	3	GLN
2	B	4	LEU
2	B	5	LEU
2	B	10	GLU
2	B	19	LYS
2	B	21	SER
2	B	23	LYS
2	B	25	THR
2	B	51	ILE
2	B	52	LEU
2	B	68	THR
2	B	73	LYS
2	B	76	ASN
2	B	80	MET
2	B	81	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	B	97	SER
2	B	1002	ASP
2	B	101	ASP
2	B	105	GLN
2	B	108	SER
2	B	117	LYS
2	B	121	VAL
2	B	127	SER
2	B	128	SER
2	B	130	SER
2	B	135	THR
2	B	138	LEU
2	B	140	CYS
2	B	148	GLU
2	B	151	THR
2	B	170	LEU
2	B	172	SER
2	B	175	LEU
2	B	188	SER
2	B	189	LEU
2	B	192	GLN
2	B	195	ILE
2	B	201	LYS
2	B	205	THR
2	B	206	LYS
2	B	209	LYS
2	B	210	LYS
2	B	212	GLU
2	B	214	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	L	37	GLN
1	L	69	GLN
1	L	124	GLN
1	L	137	ASN
1	L	198	HIS
2	H	39	GLN
2	H	43	HIS
2	H	58	HIS
1	A	37	GLN

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Mol	Chain	Res	Type
1	A	69	GLN
1	A	137	ASN
1	A	198	HIS
2	B	1	GLN
2	B	3	GLN
2	B	39	GLN
2	B	43	HIS
2	B	58	HIS
2	B	197	ASN
2	B	199	ASN
2	B	200	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](#)

Of 10 ligands modelled in this entry, 8 are monoatomic - leaving 2 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	HOP	H	1006	-	26,30,30	2.32	14 (53%)	35,40,40	0.86	1 (2%)
4	HOP	B	1004	-	26,30,30	2.02	9 (34%)	35,40,40	0.60	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	HOP	H	1006	-	-	1/17/32/32	0/3/3/3
4	HOP	B	1004	-	-	6/17/32/32	0/3/3/3

All (23) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	1004	HOP	C13-C10	4.03	1.57	1.51
4	H	1006	HOP	C13-C10	3.97	1.57	1.51
4	H	1006	HOP	C15-C16	3.62	1.45	1.39
4	H	1006	HOP	C12-C7	3.46	1.57	1.53
4	H	1006	HOP	C5-C4	3.46	1.44	1.39
4	B	1004	HOP	C5-C4	3.31	1.44	1.39
4	H	1006	HOP	C14-C13	3.12	1.44	1.39
4	H	1006	HOP	C15-C14	3.08	1.44	1.38
4	H	1006	HOP	C9-C10	2.86	1.57	1.53
4	B	1004	HOP	C18-C13	2.79	1.43	1.39
4	B	1004	HOP	C15-C16	2.74	1.44	1.39
4	B	1004	HOP	C17-C16	2.73	1.44	1.39
4	B	1004	HOP	C12-C7	2.66	1.56	1.53
4	B	1004	HOP	C3-C4	2.54	1.43	1.39
4	B	1004	HOP	C14-C13	2.50	1.43	1.39
4	H	1006	HOP	C18-C13	2.50	1.43	1.39
4	H	1006	HOP	C12-C11	2.46	1.57	1.52
4	B	1004	HOP	C9-C10	2.46	1.57	1.53
4	H	1006	HOP	C17-C16	2.27	1.43	1.39
4	H	1006	HOP	C16-C20	2.23	1.54	1.50
4	H	1006	HOP	C3-C4	2.18	1.42	1.39
4	H	1006	HOP	C4-C7	2.13	1.56	1.52
4	H	1006	HOP	C20-N22	2.04	1.38	1.33

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	H	1006	HOP	C18-C13-C10	-2.37	116.59	121.08

There are no chirality outliers.

All (7) torsion outliers are listed below:

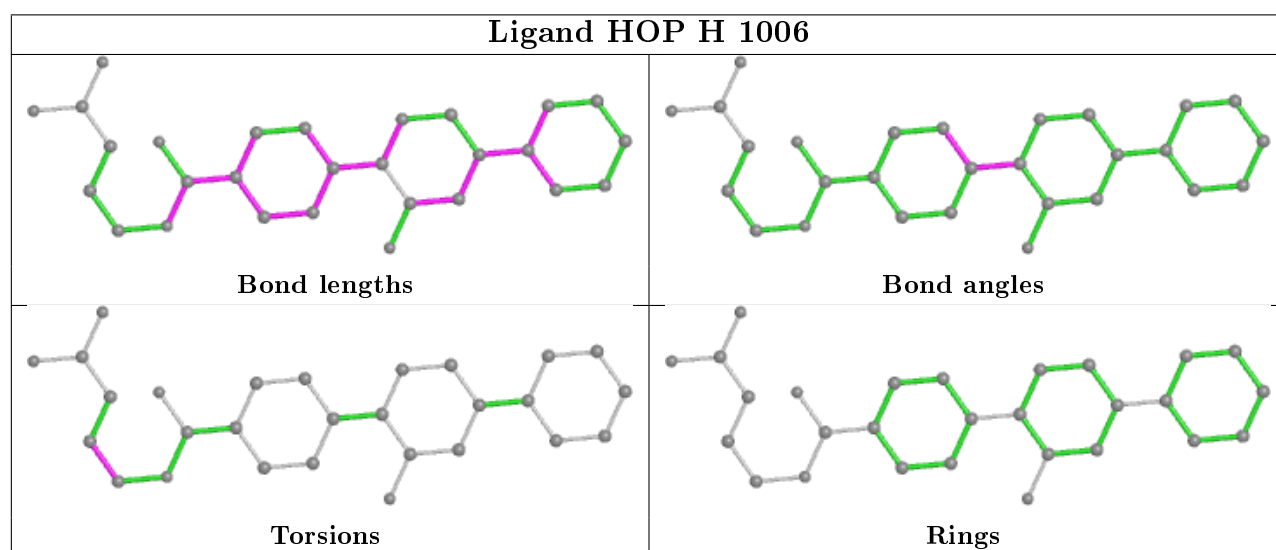
Mol	Chain	Res	Type	Atoms
4	B	1004	HOP	C17-C16-C20-O21
4	B	1004	HOP	C17-C16-C20-N22
4	B	1004	HOP	C15-C16-C20-O21
4	B	1004	HOP	C15-C16-C20-N22
4	H	1006	HOP	N22-C23-C24-C25
4	B	1004	HOP	C23-C24-C25-C26
4	B	1004	HOP	N22-C23-C24-C25

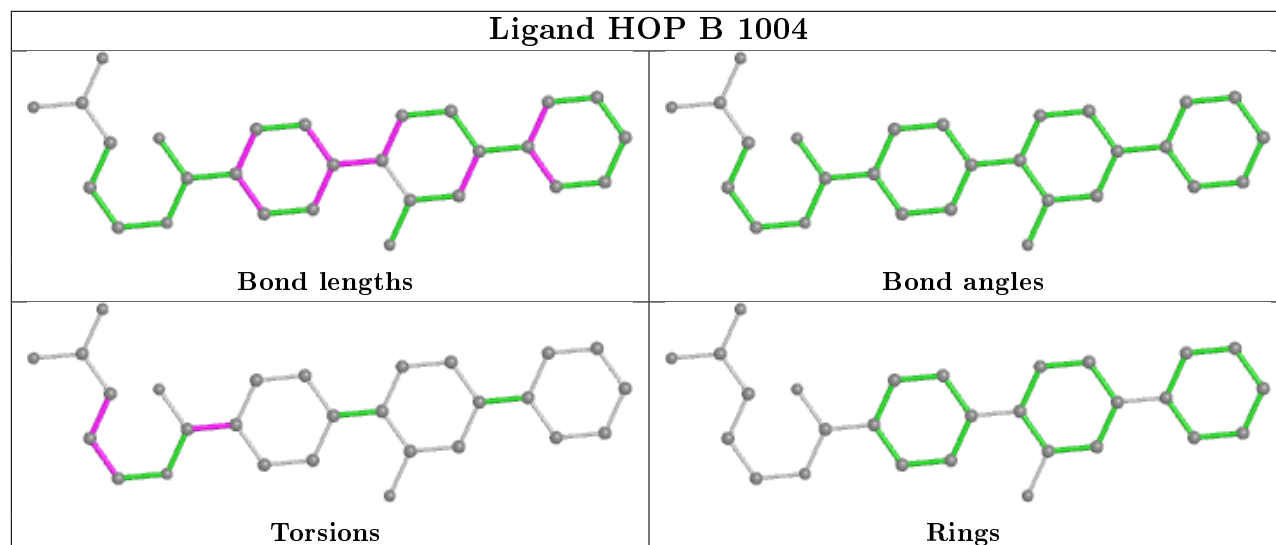
There are no ring outliers.

2 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	H	1006	HOP	4	0
4	B	1004	HOP	4	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





## 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	211/211 (100%)	-0.04	4 (1%) 66 62	20, 42, 67, 87	0
1	L	211/211 (100%)	-0.28	3 (1%) 75 71	8, 27, 57, 71	0
2	B	221/221 (100%)	-0.03	8 (3%) 42 35	9, 33, 82, 99	0
2	H	221/221 (100%)	0.01	13 (5%) 22 17	9, 31, 79, 100	0
All	All	864/864 (100%)	-0.08	28 (3%) 47 40	8, 33, 72, 100	0

All (28) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	H	131	THR	7.0
2	H	130	SER	6.3
2	B	127	SER	4.6
2	H	133	GLY	4.4
2	H	161	SER	4.3
2	H	132	SER	4.1
2	H	191	THR	4.0
2	B	133	GLY	3.7
2	H	193	THR	3.4
2	H	159	LEU	3.4
2	H	187	SER	3.2
1	A	169	LYS	3.0
1	L	129	THR	3.0
2	H	190	GLY	2.9
1	A	54	LEU	2.9
2	B	131	THR	2.8
2	H	172	SER	2.6
2	B	193	THR	2.6
2	B	130	SER	2.5
2	B	132	SER	2.5
1	L	128	GLY	2.4

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Mol	Chain	Res	Type	RSRZ
2	B	129	LYS	2.4
1	A	56	ASP	2.3
1	L	182	SER	2.2
2	B	156	SER	2.2
2	H	188	SER	2.1
1	A	80	TYR	2.1
2	H	98	TYR	2.1

## 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. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

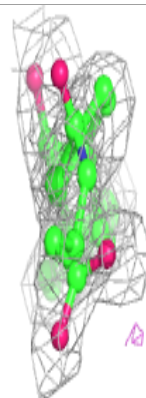
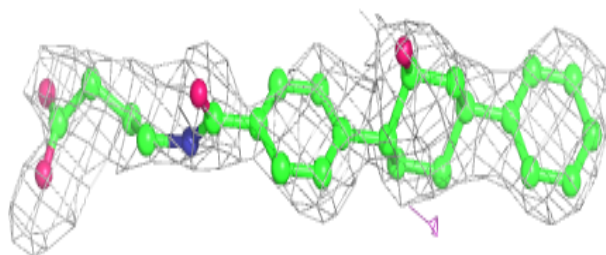
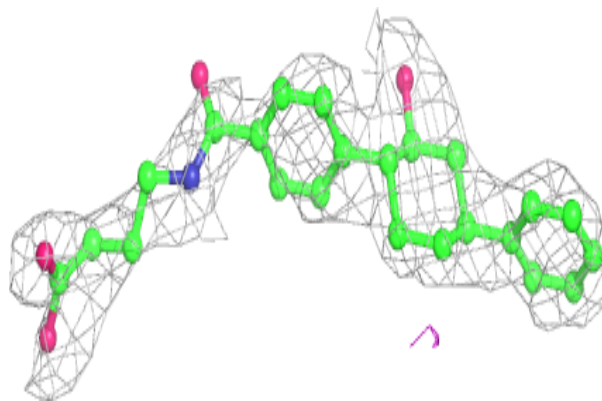
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	HOP	B	1004	28/28	0.89	0.22	26,50,71,82	0
4	HOP	H	1006	28/28	0.90	0.21	12,30,63,66	0
3	CD	H	1005	1/1	0.95	0.07	85,85,85,85	0
3	CD	A	212	1/1	0.96	0.12	47,47,47,47	1
3	CD	A	213	1/1	0.96	0.09	55,55,55,55	1
3	CD	H	1004	1/1	0.98	0.05	50,50,50,50	1
3	CD	L	212	1/1	0.98	0.14	39,39,39,39	1
3	CD	L	213	1/1	0.98	0.06	57,57,57,57	0
3	CD	A	214	1/1	1.00	0.07	46,46,46,46	0
3	CD	L	214	1/1	1.00	0.13	27,27,27,27	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

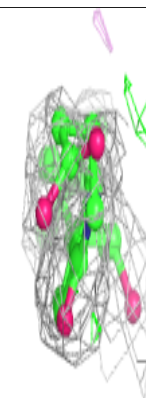
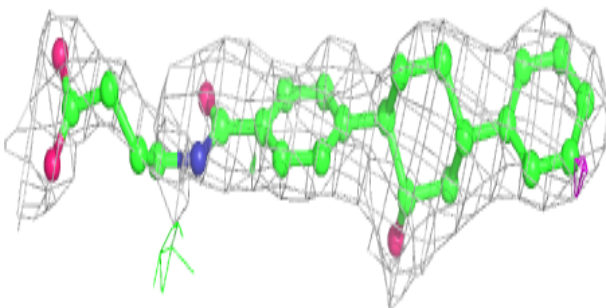
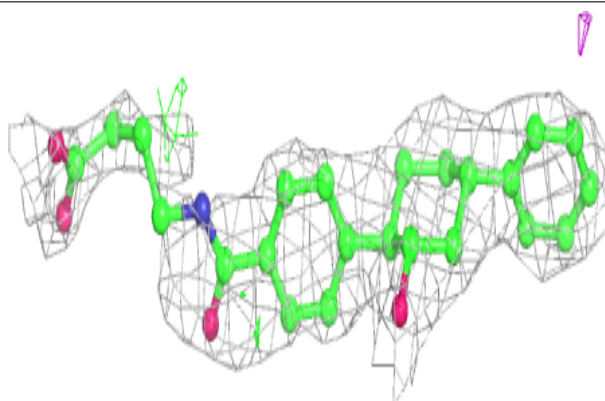


**Electron density around HOP B 1004:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around HOP H 1006:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



## 6.5 Other polymers

There are no such residues in this entry.