



# Full wwPDB X-ray Structure Validation Report ⓘ

May 15, 2020 – 02:12 pm BST

PDB ID : 2CH4  
Title : Complex between Bacterial Chemotaxis histidine kinase CheA domains P4 and P5 and receptor-adaptor protein CheW  
Authors : Park, S.Y.; Bilwes, A.M.; Crane, B.R.  
Deposited on : 2006-03-10  
Resolution : 3.50 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

<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

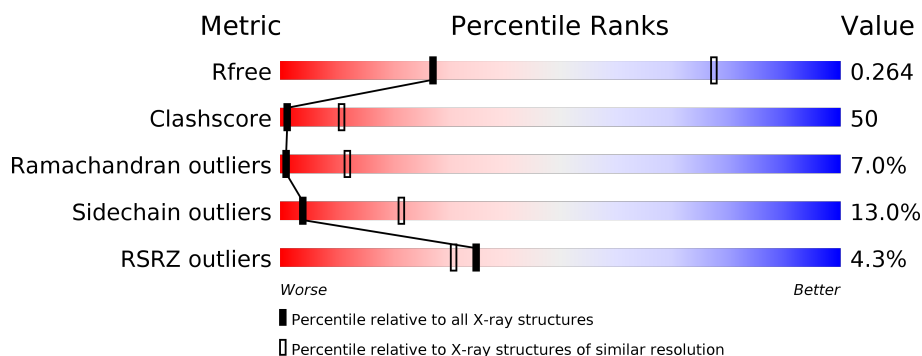
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.50 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))
$R_{free}$	130704	1659 (3.60-3.40)
Clashscore	141614	1036 (3.58-3.42)
Ramachandran outliers	138981	1005 (3.58-3.42)
Sidechain outliers	138945	1006 (3.58-3.42)
RSRZ outliers	127900	1559 (3.60-3.40)

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	320	<div> <div></div> <div>37% 49% 13%</div> </div>
1	B	320	<div> <div>11%</div> <div>38% 48% 8% • 5%</div> </div>
2	W	151	<div> <div>%</div> <div>35% 42% 15% 8%</div> </div>
2	Y	151	<div> <div>%</div> <div>28% 46% 18% • 7%</div> </div>

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	ANP	B	1672	-	-	X	-

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 7130 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.

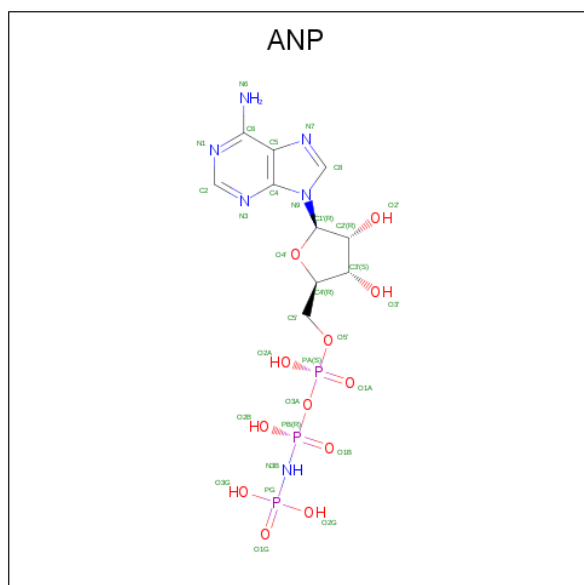
- Molecule 1 is a protein called CHEMOTAXIS PROTEIN CHEA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	320	Total	C	N	O	S	0	0	0
			2464	1562	427	469	6			
1	B	305	Total	C	N	O	S	0	0	0
			2378	1511	409	452	6			

- Molecule 2 is a protein called CHEMOTAXIS PROTEIN CHEW.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	W	139	Total	C	N	O	S	0	0	0
			1101	709	182	208	2			
2	Y	140	Total	C	N	O	S	0	0	0
			1112	716	184	210	2			

- Molecule 3 is PHOSPHOAMINOPHOSPHONIC ACID-ADENYLATE ESTER (three-letter code: ANP) (formula:  $C_{10}H_{17}N_6O_{12}P_3$ ).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			31	10	6	12	3		
3	B	1	Total	C	N	O	P	0	0
			31	10	6	12	3		

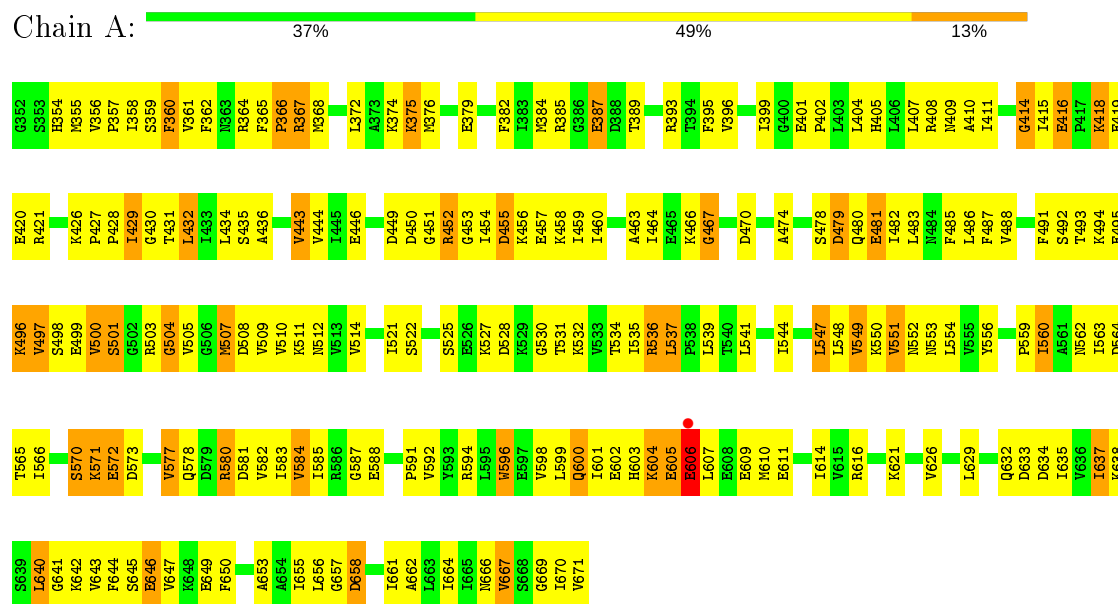
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	6	Total	O	0	0
			6	6		
4	B	7	Total	O	0	0
			7	7		

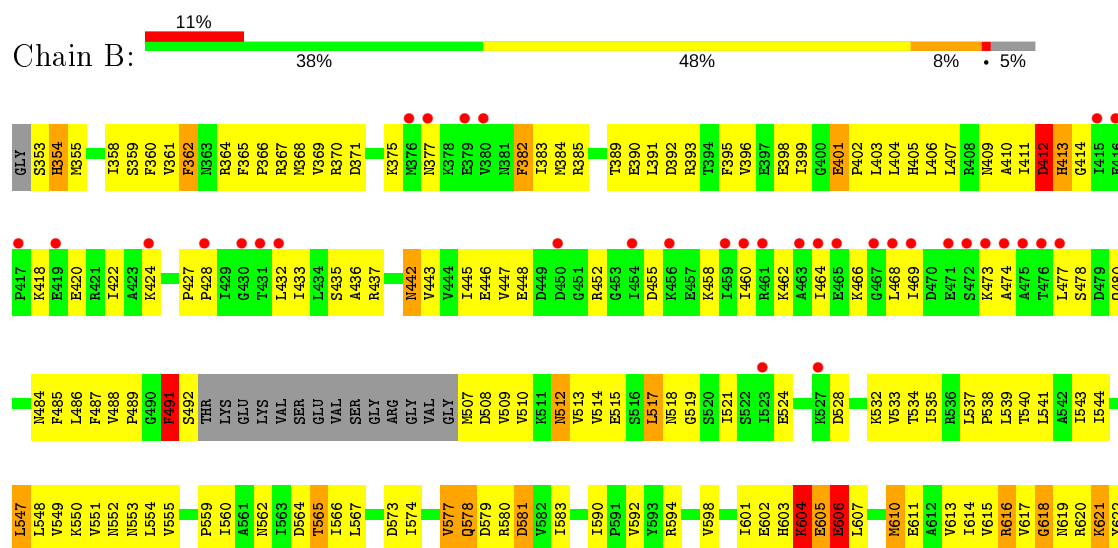
### 3 Residue-property plots

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: CHEMOTAXIS PROTEIN CHEA

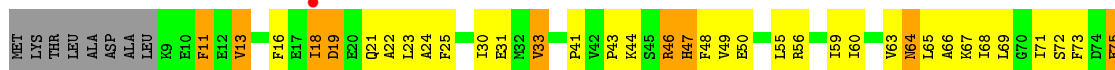


#### • Molecule 1: CHEMOTAXIS PROTEIN CHEA

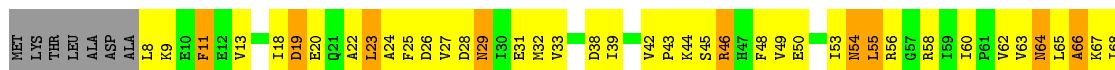




• Molecule 2: CHEMOTAXIS PROTEIN CHEW



• Molecule 2: CHEMOTAXIS PROTEIN CHEW



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 41 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	136.60 Å   136.60 Å   231.30 Å 90.00°   90.00°   90.00°	Depositor
Resolution (Å)	30.00 – 3.50 48.30 – 3.49	Depositor EDS
% Data completeness (in resolution range)	99.8 (30.00-3.50) 98.3 (48.30-3.49)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	8.92 (at 3.48 Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.255   ,   0.295 0.223   ,   0.264	Depositor DCC
$R_{free}$ test set	2809 reflections (9.88%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	110.7	Xtriage
Anisotropy	0.068	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.28 , 69.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.90	EDS
Total number of atoms	7130	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	117.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.71% 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: ANP

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	0.50	0/2493	0.78	1/3357 (0.0%)
1	B	0.40	0/2405	0.69	2/3243 (0.1%)
2	W	0.41	0/1112	0.74	1/1497 (0.1%)
2	Y	0.45	0/1123	0.80	1/1512 (0.1%)
All	All	0.45	0/7133	0.75	5/9609 (0.1%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	Y	112	THR	N-CA-C	-7.10	91.83	111.00
2	W	112	THR	N-CA-C	-5.49	96.19	111.00
1	B	354	HIS	N-CA-C	5.25	125.17	111.00
1	B	581	ASP	N-CA-C	-5.17	97.04	111.00
1	A	443	VAL	N-CA-C	-5.11	97.20	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	2464	0	2540	233	0
1	B	2378	0	2467	239	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	W	1101	0	1162	135	0
2	Y	1112	0	1177	141	0
3	A	31	0	13	5	0
3	B	31	0	13	9	0
4	A	6	0	0	0	0
4	B	7	0	0	0	0
All	All	7130	0	7372	726	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 50.

All (726) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:410:ALA:HA	3:B:1672:ANP:N6	1.69	1.08
1:B:577:VAL:HG12	1:B:578:GLN:H	1.19	1.06
2:W:86:THR:HG22	2:W:87:LYS:H	1.16	1.03
1:B:579:ASP:CG	1:B:580:ARG:H	1.64	1.00
2:Y:122:SER:HA	2:Y:136:LEU:HA	1.47	0.96
1:A:415:ILE:HD12	1:A:430:GLY:HA3	1.50	0.93
1:A:596:TRP:HE3	1:A:596:TRP:N	1.68	0.92
2:W:46:ARG:HE	2:W:48:PHE:HE1	1.19	0.91
1:A:460:ILE:HD11	1:A:482:ILE:HG12	1.52	0.91
2:W:48:PHE:HZ	2:W:145:ILE:HG23	1.36	0.90
1:A:577:VAL:HG12	1:A:578:GLN:H	1.36	0.89
1:A:455:ASP:OD1	1:A:457:GLU:HG2	1.73	0.89
2:W:23:LEU:HB3	2:W:136:LEU:HD21	1.53	0.89
1:B:620:ARG:HH12	1:B:622:TYR:HD1	1.19	0.88
2:Y:65:LEU:O	2:Y:68:ILE:HG22	1.73	0.87
2:Y:111:LEU:HD21	2:Y:124:GLY:HA3	1.56	0.87
1:A:596:TRP:HE3	1:A:596:TRP:H	0.88	0.86
1:B:446:GLU:HG2	1:B:534:THR:HG23	1.57	0.86
1:B:637:ILE:HD12	1:B:637:ILE:H	1.38	0.86
1:A:521:ILE:HG22	1:A:535:ILE:HA	1.56	0.86
1:B:358:ILE:O	1:B:361:VAL:HG12	1.77	0.84
2:W:123:LYS:HB2	2:W:135:TYR:HD1	1.40	0.84
1:A:507:MET:HG2	3:A:1672:ANP:O1A	1.77	0.84
2:W:137:ASP:O	2:W:141:ILE:HG22	1.77	0.84
2:W:105:THR:O	2:W:108:GLN:HG2	1.77	0.84
1:A:577:VAL:HG12	1:A:578:GLN:N	1.87	0.83
2:W:78:MET:HB3	2:W:94:LEU:HD22	1.59	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:W:111:LEU:HD23	2:W:124:GLY:HA3	1.57	0.83
2:W:13:VAL:CG2	2:W:24:ALA:HB1	2.09	0.83
1:A:611:GLU:HG2	1:A:629:LEU:HD13	1.59	0.82
1:B:395:PHE:HE1	1:B:541:LEU:HD23	1.44	0.82
1:B:580:ARG:NH1	1:B:581:ASP:H	1.78	0.81
2:W:106:GLU:HA	2:W:109:LEU:HG	1.62	0.81
2:Y:78:MET:HB3	2:Y:94:LEU:HD22	1.62	0.81
1:B:640:LEU:H	1:B:640:LEU:HD23	1.44	0.81
1:A:454:ILE:HG21	1:A:483:LEU:HD21	1.61	0.81
2:W:13:VAL:HG23	2:W:25:PHE:O	1.81	0.81
1:B:362:PHE:HA	1:B:365:PHE:CD2	2.16	0.81
1:A:452:ARG:NH1	1:A:452:ARG:HB3	1.94	0.81
2:W:78:MET:HA	2:W:96:ASP:HA	1.63	0.81
2:W:86:THR:HG22	2:W:87:LYS:N	1.96	0.81
2:W:65:LEU:HA	2:W:68:ILE:HG22	1.63	0.81
1:A:596:TRP:N	1:A:596:TRP:CE3	2.46	0.80
1:B:574:ILE:HD12	1:B:592:VAL:HG21	1.63	0.80
1:B:577:VAL:HG12	1:B:578:GLN:N	1.94	0.80
2:W:23:LEU:HD23	2:W:136:LEU:HD21	1.64	0.79
1:A:514:VAL:HG21	1:A:521:ILE:HG23	1.65	0.78
1:A:450:ASP:HA	1:A:530:GLY:HA3	1.66	0.78
1:B:383:ILE:HG21	1:B:385:ARG:HH21	1.46	0.78
2:W:48:PHE:CZ	2:W:145:ILE:HG23	2.19	0.77
1:A:606:GLU:HG3	1:A:607:LEU:O	1.83	0.76
2:Y:63:VAL:HG11	2:Y:68:ILE:HD12	1.66	0.76
2:Y:106:GLU:HA	2:Y:109:LEU:HG	1.68	0.76
1:B:435:SER:HB2	1:B:446:GLU:HB2	1.68	0.76
2:Y:106:GLU:O	2:Y:109:LEU:HG	1.87	0.75
1:A:525:SER:HB2	1:A:531:THR:HG23	1.67	0.75
2:W:109:LEU:O	2:W:109:LEU:HD12	1.85	0.75
2:W:141:ILE:HD13	2:W:141:ILE:C	2.06	0.75
1:B:574:ILE:CD1	1:B:592:VAL:HG21	2.17	0.74
2:Y:25:PHE:CD1	2:Y:138:ILE:HB	2.22	0.74
1:A:541:LEU:N	1:A:541:LEU:HD12	2.00	0.74
1:B:670:ILE:O	1:B:671:VAL:HG12	1.88	0.74
1:B:362:PHE:HA	1:B:365:PHE:HD2	1.53	0.74
2:Y:104:ILE:HG22	2:Y:105:THR:H	1.52	0.74
1:B:365:PHE:O	1:B:369:VAL:HG23	1.88	0.73
1:B:598:VAL:HG11	1:B:670:ILE:HG23	1.70	0.73
1:A:594:ARG:HD3	1:A:596:TRP:CZ2	2.24	0.73
2:Y:46:ARG:HD2	2:Y:48:PHE:CE1	2.23	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:W:120:LYS:HB3	2:W:140:LYS:NZ	2.04	0.73
2:W:18:ILE:HG21	2:W:71:ILE:HD11	1.71	0.73
2:Y:18:ILE:HD11	2:Y:95:VAL:HG12	1.69	0.73
1:B:547:LEU:HD12	1:B:549:VAL:HG23	1.71	0.72
2:Y:105:THR:HG22	2:Y:108:GLN:OE1	1.89	0.72
2:Y:85:ARG:HG3	2:Y:90:GLU:HG2	1.71	0.72
2:Y:112:THR:HG22	2:Y:115:SER:HB2	1.71	0.72
2:Y:132:LEU:HD12	2:Y:132:LEU:N	2.04	0.72
1:B:358:ILE:HG22	1:B:389:THR:H	1.55	0.72
1:A:382:PHE:HD2	1:A:432:LEU:HB3	1.55	0.72
1:A:429:ILE:HD12	1:A:429:ILE:H	1.55	0.72
1:A:451:GLY:H	1:A:530:GLY:HA2	1.54	0.72
1:B:637:ILE:CD1	1:B:637:ILE:H	1.96	0.72
1:A:402:PRO:HB3	1:A:510:VAL:HG13	1.70	0.71
1:B:642:LYS:HZ3	1:B:642:LYS:HB2	1.55	0.71
1:B:404:LEU:HD12	1:B:407:LEU:HD12	1.70	0.71
1:B:606:GLU:OE2	1:B:610:MET:SD	2.49	0.71
1:A:452:ARG:HB3	1:A:452:ARG:HH11	1.54	0.70
2:W:105:THR:HG22	2:W:108:GLN:CD	2.11	0.70
1:A:599:LEU:HB3	2:W:43:PRO:HB3	1.73	0.70
1:B:410:ALA:HA	3:B:1672:ANP:HN61	1.57	0.70
1:B:637:ILE:HD12	1:B:637:ILE:N	2.06	0.70
2:Y:65:LEU:HA	2:Y:68:ILE:HG22	1.74	0.70
1:A:571:LYS:CB	1:A:606:GLU:OE2	2.40	0.70
2:W:125:LEU:HD23	2:W:134:ILE:HG13	1.72	0.69
2:Y:132:LEU:H	2:Y:132:LEU:HD12	1.57	0.69
1:B:649:GLU:H	1:B:649:GLU:CD	1.95	0.69
2:Y:106:GLU:CA	2:Y:109:LEU:HG	2.21	0.69
1:B:480:GLN:O	1:B:484:ASN:HB2	1.93	0.69
2:W:86:THR:CG2	2:W:87:LYS:H	2.01	0.69
2:Y:89:VAL:HG11	2:Y:146:THR:CG2	2.23	0.69
2:W:112:THR:O	2:W:115:SER:HB2	1.92	0.69
2:W:120:LYS:HB3	2:W:140:LYS:HZ3	1.58	0.69
1:A:415:ILE:CD1	1:A:430:GLY:HA3	2.23	0.68
1:A:584:VAL:HG23	1:A:587:GLY:O	1.93	0.68
1:B:410:ALA:HA	3:B:1672:ANP:HN62	1.56	0.68
1:A:596:TRP:CD1	1:A:603:HIS:ND1	2.61	0.68
1:B:643:VAL:HG23	2:Y:46:ARG:HH12	1.58	0.68
2:W:23:LEU:HB3	2:W:136:LEU:CD2	2.24	0.68
1:A:375:LYS:O	1:A:376:MET:HG3	1.94	0.68
1:A:521:ILE:HG21	1:A:535:ILE:HG12	1.75	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:Y:138:ILE:HA	2:Y:141:ILE:HG23	1.75	0.68
1:B:393:ARG:HA	1:B:396:VAL:HG13	1.74	0.68
2:W:23:LEU:HD23	2:W:136:LEU:HD11	1.74	0.68
1:A:547:LEU:HD21	1:A:629:LEU:HG	1.75	0.68
1:A:646:GLU:HG2	1:A:647:VAL:N	2.09	0.68
2:W:132:LEU:H	2:W:132:LEU:HD12	1.59	0.68
1:B:580:ARG:HG3	1:B:581:ASP:O	1.94	0.67
1:B:540:THR:HG22	1:B:541:LEU:N	2.09	0.67
2:W:136:LEU:HD22	2:W:136:LEU:H	1.59	0.67
2:W:123:LYS:HB2	2:W:135:TYR:CD1	2.26	0.67
1:B:406:LEU:HD22	1:B:533:VAL:HG21	1.75	0.67
1:A:521:ILE:CG2	1:A:535:ILE:HG12	2.23	0.67
2:W:64:ASN:HD22	2:W:64:ASN:C	1.95	0.67
2:Y:104:ILE:HG22	2:Y:105:THR:N	2.09	0.67
2:Y:18:ILE:O	2:Y:18:ILE:HG22	1.95	0.67
1:A:446:GLU:HG2	1:A:534:THR:HG23	1.77	0.67
1:B:358:ILE:HG12	1:B:362:PHE:CZ	2.30	0.67
2:W:13:VAL:HG21	2:W:24:ALA:HB1	1.77	0.67
1:A:507:MET:CG	3:A:1672:ANP:O1A	2.41	0.67
1:B:577:VAL:CG1	1:B:578:GLN:H	2.03	0.67
1:B:606:GLU:HG3	1:B:607:LEU:O	1.95	0.67
1:B:579:ASP:CG	1:B:580:ARG:N	2.43	0.66
2:Y:123:LYS:HD2	2:Y:135:TYR:CE1	2.30	0.66
2:W:105:THR:HG22	2:W:108:GLN:NE2	2.10	0.66
2:W:138:ILE:HG22	2:W:139:ASP:N	2.10	0.66
1:A:404:LEU:HG	1:A:408:ARG:NH1	2.11	0.66
1:A:372:LEU:CD1	1:A:408:ARG:HG2	2.26	0.65
1:B:401:GLU:HB3	1:B:402:PRO:HD3	1.77	0.65
1:B:510:VAL:O	1:B:514:VAL:HG22	1.97	0.65
2:Y:11:PHE:CE2	2:Y:104:ILE:HB	2.31	0.65
2:W:91:VAL:HG12	2:W:92:GLY:N	2.12	0.65
2:Y:22:ALA:O	2:Y:134:ILE:HD12	1.97	0.65
2:Y:64:ASN:HD21	2:Y:66:ALA:HB3	1.62	0.65
2:W:64:ASN:HD22	2:W:65:LEU:N	1.94	0.64
1:B:617:VAL:O	1:B:618:GLY:C	2.35	0.64
2:Y:111:LEU:HD21	2:Y:124:GLY:CA	2.26	0.64
2:Y:86:THR:O	2:Y:88:ASP:N	2.29	0.64
2:W:89:VAL:HG21	2:W:146:THR:HG21	1.79	0.64
1:A:364:ARG:O	1:A:368:MET:HG3	1.97	0.64
1:B:510:VAL:HG12	1:B:521:ILE:HD13	1.78	0.64
2:Y:106:GLU:HA	2:Y:109:LEU:CG	2.27	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:358:ILE:HG23	1:B:362:PHE:HE1	1.62	0.64
1:B:509:VAL:O	1:B:513:VAL:HG23	1.98	0.64
2:W:134:ILE:HD12	2:W:134:ILE:H	1.63	0.64
1:A:452:ARG:CB	1:A:452:ARG:HH11	2.11	0.64
1:A:550:LYS:HG2	1:A:551:VAL:N	2.11	0.64
1:A:577:VAL:CG1	1:A:578:GLN:N	2.59	0.64
1:A:480:GLN:HE21	1:A:522:SER:HB2	1.63	0.64
1:A:460:ILE:O	1:A:464:ILE:HG13	1.98	0.63
1:B:671:VAL:HG13	1:B:671:VAL:O	1.97	0.63
1:A:454:ILE:CG2	1:A:483:LEU:HD21	2.28	0.63
2:W:65:LEU:HA	2:W:68:ILE:CG2	2.28	0.63
2:Y:65:LEU:HD12	2:Y:68:ILE:CG2	2.29	0.63
1:A:603:HIS:HD2	1:A:605:GLU:N	1.97	0.63
2:W:125:LEU:CD2	2:W:134:ILE:HG13	2.29	0.63
2:Y:106:GLU:HA	2:Y:109:LEU:CD2	2.29	0.63
1:B:367:ARG:O	1:B:370:ARG:HG2	2.00	0.62
2:Y:65:LEU:HA	2:Y:68:ILE:CG2	2.29	0.62
1:A:431:THR:O	1:A:449:ASP:HA	1.98	0.62
2:Y:111:LEU:CD2	2:Y:124:GLY:HA3	2.29	0.62
1:B:663:LEU:HD11	2:Y:42:VAL:HG12	1.80	0.62
1:A:456:LYS:HB3	1:A:482:ILE:HG21	1.81	0.62
2:W:16:PHE:HA	2:W:99:LEU:HD22	1.81	0.62
1:A:551:VAL:O	1:A:551:VAL:HG12	1.99	0.62
2:W:105:THR:H	2:W:108:GLN:CG	2.12	0.62
1:B:358:ILE:HG23	1:B:362:PHE:CE1	2.35	0.62
1:B:544:ILE:HD11	1:B:635:ILE:HG13	1.81	0.62
1:A:666:ASN:O	1:A:669:GLY:N	2.32	0.62
1:B:383:ILE:HD13	1:B:385:ARG:HH21	1.65	0.62
1:A:606:GLU:CD	1:A:610:MET:CE	2.68	0.62
2:W:18:ILE:HG21	2:W:71:ILE:CD1	2.30	0.61
2:Y:106:GLU:C	2:Y:109:LEU:HG	2.21	0.61
1:B:642:LYS:HB2	1:B:642:LYS:NZ	2.15	0.61
1:A:446:GLU:CG	1:A:534:THR:HG23	2.31	0.61
2:Y:18:ILE:HG21	2:Y:71:ILE:HD11	1.83	0.61
1:A:554:LEU:HB3	1:A:556:TYR:CE1	2.34	0.61
1:B:650:PHE:CZ	2:Y:43:PRO:HD2	2.36	0.61
2:Y:110:ASP:HB3	2:Y:125:LEU:O	2.01	0.60
1:B:514:VAL:HA	1:B:517:LEU:HD12	1.84	0.60
1:A:510:VAL:O	1:A:514:VAL:HG13	2.02	0.60
1:A:548:LEU:HD11	1:A:656:LEU:HD11	1.83	0.60
1:A:606:GLU:CD	1:A:610:MET:HE1	2.21	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:Y:46:ARG:HD2	2:Y:48:PHE:HE1	1.66	0.60
1:A:487:PHE:O	1:A:508:ASP:HB3	2.01	0.60
2:W:78:MET:HB3	2:W:94:LEU:CD2	2.31	0.60
1:A:427:PRO:HB2	1:A:429:ILE:CD1	2.32	0.60
1:B:487:PHE:CD2	1:B:507:MET:HG3	2.37	0.60
1:A:536:ARG:HD2	1:A:536:ARG:O	2.02	0.60
1:A:531:THR:HG22	1:A:532:LYS:N	2.16	0.59
1:A:541:LEU:CD1	1:A:541:LEU:N	2.65	0.59
1:A:554:LEU:HB3	1:A:556:TYR:HE1	1.65	0.59
2:W:132:LEU:N	2:W:132:LEU:HD12	2.16	0.59
2:Y:39:ILE:HD13	2:Y:62:VAL:HG21	1.83	0.59
1:B:605:GLU:O	1:B:606:GLU:HB3	2.00	0.59
1:A:549:VAL:HG22	1:A:626:VAL:HG21	1.84	0.59
1:B:393:ARG:O	1:B:396:VAL:HG22	2.02	0.59
1:A:357:PRO:HG2	1:A:360:PHE:CD1	2.37	0.59
1:B:524:GLU:HB2	1:B:532:LYS:HG2	1.84	0.59
1:B:640:LEU:CD2	1:B:640:LEU:H	2.16	0.59
1:B:669:GLY:O	1:B:671:VAL:N	2.36	0.59
2:Y:134:ILE:HD12	2:Y:134:ILE:H	1.67	0.59
2:Y:89:VAL:O	2:Y:91:VAL:HG23	2.03	0.59
2:Y:86:THR:CG2	2:Y:89:VAL:HB	2.33	0.59
1:B:442:ASN:HB3	1:B:537:LEU:O	2.03	0.59
2:W:49:VAL:HA	2:W:63:VAL:HA	1.84	0.59
1:A:566:ILE:HB	1:B:355:MET:HE2	1.84	0.59
1:B:579:ASP:OD2	1:B:580:ARG:N	2.34	0.59
1:A:483:LEU:O	1:A:486:LEU:HB2	2.02	0.58
1:A:670:ILE:HG22	1:A:671:VAL:N	2.16	0.58
2:Y:136:LEU:HD12	2:Y:136:LEU:H	1.67	0.58
1:B:644:PHE:CE1	2:Y:42:VAL:HG21	2.38	0.58
2:Y:89:VAL:HG11	2:Y:146:THR:HG21	1.83	0.58
1:B:383:ILE:HD13	1:B:385:ARG:NH2	2.19	0.58
2:W:23:LEU:CB	2:W:136:LEU:HD21	2.31	0.58
1:B:540:THR:HG22	1:B:541:LEU:H	1.67	0.58
2:W:106:GLU:HA	2:W:109:LEU:CG	2.33	0.58
2:Y:19:ASP:OD1	2:Y:72:SER:HB3	2.03	0.58
1:B:644:PHE:CE1	2:Y:49:VAL:HG11	2.39	0.58
2:Y:66:ALA:HB1	2:Y:73:PHE:HB2	1.86	0.58
1:A:372:LEU:HD13	1:A:408:ARG:HG2	1.85	0.58
2:Y:18:ILE:CG2	2:Y:71:ILE:HD11	2.34	0.58
1:A:633:ASP:OD1	1:A:634:ASP:N	2.37	0.58
1:B:617:VAL:HG12	1:B:620:ARG:HB2	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:Y:128:THR:O	2:Y:128:THR:HG23	2.04	0.58
2:Y:58:ARG:HH21	2:Y:90:GLU:CD	2.07	0.58
1:A:365:PHE:O	1:A:367:ARG:N	2.37	0.58
1:A:640:LEU:H	1:A:640:LEU:HD23	1.69	0.58
1:A:637:ILE:HG23	1:A:664:ILE:CD1	2.33	0.58
2:W:136:LEU:HD22	2:W:136:LEU:N	2.18	0.58
2:Y:65:LEU:C	2:Y:68:ILE:HG22	2.24	0.58
1:B:437:ARG:HG2	1:B:437:ARG:HH11	1.69	0.57
1:B:460:ILE:HG23	1:B:474:ALA:HB1	1.85	0.57
2:W:65:LEU:CA	2:W:68:ILE:HG22	2.33	0.57
1:A:429:ILE:HD12	1:A:429:ILE:N	2.18	0.57
2:W:50:GLU:OE2	2:W:75:GLU:OE1	2.22	0.57
1:A:492:SER:O	1:A:494:LYS:N	2.37	0.57
2:W:111:LEU:HD23	2:W:124:GLY:CA	2.32	0.57
2:Y:137:ASP:OD2	2:Y:140:LYS:N	2.36	0.57
2:Y:89:VAL:HG11	2:Y:146:THR:HG22	1.86	0.57
1:B:382:PHE:HB2	1:B:432:LEU:HB3	1.86	0.57
1:B:489:PRO:HB3	1:B:508:ASP:OD2	2.05	0.57
1:B:550:LYS:HE2	1:B:555:VAL:HG22	1.87	0.57
2:W:105:THR:H	2:W:108:GLN:HG2	1.69	0.57
2:W:112:THR:HB	2:W:115:SER:HB2	1.87	0.57
1:A:583:ILE:HG12	1:A:592:VAL:HG11	1.86	0.57
1:A:499:GLU:O	1:A:501:SER:N	2.38	0.57
1:B:391:LEU:H	1:B:391:LEU:HD23	1.69	0.56
1:B:448:GLU:HG2	1:B:532:LYS:HB2	1.86	0.56
2:Y:86:THR:OG1	2:Y:87:LYS:N	2.38	0.56
1:A:571:LYS:HB2	1:A:606:GLU:OE2	2.03	0.56
2:W:136:LEU:H	2:W:136:LEU:CD2	2.19	0.56
1:A:374:LYS:C	1:A:376:MET:H	2.09	0.56
2:W:138:ILE:O	2:W:140:LYS:N	2.38	0.56
1:A:637:ILE:HG23	1:A:664:ILE:HD12	1.86	0.56
1:B:665:ILE:HG22	1:B:666:ASN:N	2.21	0.56
2:Y:138:ILE:HG23	2:Y:139:ASP:N	2.21	0.56
2:Y:65:LEU:CA	2:Y:68:ILE:HG22	2.36	0.56
2:Y:8:LEU:CD2	2:Y:9:LYS:HE3	2.35	0.56
1:B:466:LYS:HB2	1:B:468:LEU:HD23	1.87	0.56
2:Y:48:PHE:HD2	2:Y:63:VAL:HG13	1.70	0.56
1:A:379:GLU:HG2	1:A:429:ILE:HG22	1.87	0.55
1:A:379:GLU:HB2	1:A:418:LYS:NZ	2.21	0.55
2:Y:13:VAL:HA	2:Y:27:VAL:HG23	1.86	0.55
2:Y:45:SER:O	2:Y:46:ARG:C	2.45	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:544:ILE:O	1:B:544:ILE:HD12	2.06	0.55
1:A:599:LEU:HB3	2:W:43:PRO:CB	2.35	0.55
1:A:428:PRO:HG2	1:A:429:ILE:HG13	1.89	0.55
2:W:102:LEU:HG	2:W:104:ILE:HD13	1.89	0.55
1:A:455:ASP:OD1	1:A:458:LYS:HG2	2.06	0.55
1:A:566:ILE:HB	1:B:355:MET:CE	2.37	0.55
2:Y:117:LYS:H	2:Y:117:LYS:CE	2.20	0.55
1:A:649:GLU:H	1:A:649:GLU:CD	2.10	0.55
1:A:361:VAL:HG13	1:A:362:PHE:HD1	1.72	0.55
1:A:509:VAL:HG13	1:A:510:VAL:H	1.70	0.55
1:B:375:LYS:C	1:B:377:ASN:H	2.09	0.55
1:B:649:GLU:N	1:B:649:GLU:OE1	2.32	0.55
1:B:413:HIS:CG	3:B:1672:ANP:H2'	2.41	0.54
2:Y:64:ASN:OD1	2:Y:73:PHE:HE2	1.90	0.54
1:A:564:ASP:HB3	1:A:614:ILE:O	2.06	0.54
2:Y:117:LYS:HE2	2:Y:117:LYS:H	1.71	0.54
1:A:464:ILE:O	1:A:467:GLY:N	2.40	0.54
2:W:64:ASN:ND2	2:W:64:ASN:C	2.60	0.54
2:Y:65:LEU:HD12	2:Y:68:ILE:HG21	1.88	0.54
1:A:399:ILE:HD13	1:A:537:LEU:HD21	1.88	0.54
1:A:562:ASN:ND2	1:A:667:VAL:HG21	2.22	0.54
1:B:458:LYS:HE2	1:B:462:LYS:HE3	1.89	0.54
2:W:46:ARG:NE	2:W:48:PHE:HE1	1.97	0.54
2:Y:83:VAL:HA	2:Y:92:GLY:HA2	1.88	0.54
2:Y:65:LEU:HG	2:Y:69:LEU:CD2	2.38	0.54
1:A:548:LEU:HD12	1:B:543:ILE:HD12	1.90	0.54
1:B:392:ASP:O	1:B:395:PHE:HB2	2.06	0.54
1:B:524:GLU:HB2	1:B:532:LYS:CG	2.37	0.54
1:B:514:VAL:HA	1:B:517:LEU:CD1	2.38	0.53
1:A:399:ILE:CD1	1:A:537:LEU:HD21	2.38	0.53
2:W:65:LEU:O	2:W:68:ILE:HG22	2.07	0.53
1:A:356:VAL:HG13	1:A:360:PHE:CD1	2.44	0.53
1:A:379:GLU:HG2	1:A:429:ILE:CG2	2.38	0.53
1:A:643:VAL:HG12	1:A:643:VAL:O	2.08	0.53
2:W:138:ILE:HA	2:W:141:ILE:CG2	2.39	0.53
2:Y:78:MET:HA	2:Y:96:ASP:HA	1.90	0.53
2:Y:99:LEU:N	2:Y:99:LEU:HD22	2.23	0.53
1:A:554:LEU:HD11	2:W:41:PRO:HG2	1.90	0.53
1:A:661:ILE:HG22	1:A:662:ALA:N	2.23	0.53
1:B:401:GLU:CB	1:B:402:PRO:HD3	2.38	0.53
1:A:354:HIS:O	1:A:393:ARG:HB2	2.08	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:416:GLU:CG	1:A:421:ARG:HG3	2.38	0.53
1:B:616:ARG:HA	1:B:621:LYS:HA	1.88	0.53
1:B:663:LEU:CD1	2:Y:42:VAL:HG12	2.38	0.53
2:Y:105:THR:CG2	2:Y:108:GLN:OE1	2.57	0.53
1:B:364:ARG:HH21	1:B:368:MET:CE	2.22	0.53
1:B:487:PHE:O	1:B:508:ASP:HB3	2.08	0.53
1:B:478:SER:CB	1:B:480:GLN:HE22	2.21	0.53
2:W:25:PHE:CD1	2:W:138:ILE:HG12	2.43	0.53
2:Y:123:LYS:HD2	2:Y:135:TYR:CZ	2.44	0.53
2:Y:141:ILE:HG13	2:Y:141:ILE:O	2.08	0.53
1:A:421:ARG:HD3	1:A:428:PRO:O	2.09	0.53
1:A:449:ASP:O	1:A:530:GLY:HA3	2.09	0.53
1:B:544:ILE:CD1	1:B:635:ILE:HG13	2.39	0.53
2:W:128:THR:HG23	2:W:129:ASP:OD2	2.09	0.53
2:Y:71:ILE:HG13	2:Y:72:SER:O	2.09	0.53
2:Y:42:VAL:O	2:Y:42:VAL:HG23	2.09	0.53
1:A:382:PHE:CD2	1:A:432:LEU:HB3	2.41	0.52
2:Y:64:ASN:HD22	2:Y:64:ASN:C	2.12	0.52
1:A:527:LYS:O	1:A:528:ASP:HB2	2.08	0.52
1:A:549:VAL:HG11	1:A:626:VAL:HG11	1.90	0.52
2:Y:55:LEU:HD12	2:Y:60:ILE:HD13	1.91	0.52
2:Y:66:ALA:HB3	2:Y:73:PHE:HD2	1.74	0.52
1:B:535:ILE:HG22	1:B:537:LEU:HD22	1.90	0.52
1:A:536:ARG:CD	1:A:536:ARG:O	2.58	0.52
1:B:469:ILE:HD13	1:B:477:LEU:HD11	1.91	0.52
1:B:517:LEU:HD13	1:B:537:LEU:HD11	1.90	0.52
1:B:577:VAL:CG1	1:B:578:GLN:N	2.65	0.52
2:Y:109:LEU:O	2:Y:109:LEU:HD12	2.08	0.52
1:A:570:SER:C	1:A:572:GLU:H	2.13	0.52
2:Y:11:PHE:HE2	2:Y:104:ILE:HB	1.74	0.52
1:B:399:ILE:O	1:B:399:ILE:HG23	2.08	0.52
2:Y:63:VAL:HG12	2:Y:64:ASN:N	2.24	0.52
1:B:513:VAL:O	1:B:517:LEU:HG	2.10	0.52
1:A:491:PHE:CD1	1:A:491:PHE:O	2.62	0.52
1:B:407:LEU:O	1:B:411:ILE:HD13	2.09	0.52
1:A:361:VAL:HG13	1:A:362:PHE:CD1	2.45	0.52
1:A:372:LEU:HD11	1:A:408:ARG:HG2	1.90	0.52
1:A:429:ILE:H	1:A:429:ILE:CD1	2.07	0.52
2:W:102:LEU:HG	2:W:104:ILE:CD1	2.40	0.52
1:A:616:ARG:HG2	1:A:621:LYS:CB	2.40	0.51
1:A:649:GLU:N	1:A:649:GLU:OE2	2.33	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:W:18:ILE:O	2:W:18:ILE:HG22	2.09	0.51
2:W:86:THR:HG22	2:W:87:LYS:HD3	1.92	0.51
1:B:383:ILE:HB	1:B:433:ILE:HG12	1.92	0.51
1:B:620:ARG:NH1	1:B:620:ARG:HB3	2.26	0.51
2:W:23:LEU:HD23	2:W:136:LEU:CD2	2.36	0.51
1:B:603:HIS:HE1	1:B:627:ASP:OD2	1.94	0.51
1:B:649:GLU:OE2	2:Y:44:LYS:HE2	2.11	0.51
2:Y:110:ASP:OD2	2:Y:110:ASP:C	2.48	0.51
2:Y:64:ASN:OD1	2:Y:73:PHE:CE2	2.64	0.51
2:W:16:PHE:CD1	2:W:16:PHE:N	2.78	0.51
1:A:560:ILE:HG13	1:B:539:LEU:HD21	1.92	0.51
1:A:616:ARG:HG2	1:A:621:LYS:HB2	1.91	0.51
1:B:389:THR:HG22	1:B:390:GLU:H	1.76	0.51
1:B:565:THR:HG22	1:B:566:ILE:H	1.76	0.51
2:W:125:LEU:HD22	2:W:134:ILE:HA	1.93	0.51
2:W:125:LEU:C	2:W:125:LEU:HD13	2.31	0.51
2:W:67:LYS:HB2	2:W:73:PHE:HE2	1.75	0.51
2:W:111:LEU:CD2	2:W:124:GLY:HA3	2.34	0.51
2:W:134:ILE:HD12	2:W:134:ILE:N	2.26	0.51
2:Y:31:GLU:O	2:Y:32:MET:HB3	2.10	0.51
1:B:404:LEU:HA	1:B:407:LEU:HD12	1.92	0.50
2:Y:123:LYS:N	2:Y:135:TYR:O	2.44	0.50
1:A:499:GLU:O	1:A:500:VAL:C	2.49	0.50
1:B:460:ILE:O	1:B:464:ILE:HG13	2.11	0.50
1:A:460:ILE:O	1:A:463:ALA:HB3	2.10	0.50
2:W:23:LEU:CD2	2:W:136:LEU:HD21	2.36	0.50
1:A:416:GLU:HG2	1:A:421:ARG:HH11	1.75	0.50
2:Y:63:VAL:CG1	2:Y:64:ASN:N	2.75	0.50
1:A:507:MET:HA	1:A:510:VAL:HG23	1.93	0.50
1:A:548:LEU:CD1	1:A:656:LEU:HD11	2.42	0.50
2:W:75:GLU:C	2:W:77:LYS:H	2.15	0.50
1:A:504:GLY:O	1:A:505:VAL:HG23	2.11	0.50
1:B:418:LYS:O	1:B:422:ILE:HG13	2.12	0.50
2:W:93:PHE:CE2	2:W:141:ILE:HD12	2.47	0.50
2:Y:111:LEU:HD21	2:Y:123:LYS:O	2.12	0.50
1:B:517:LEU:CD1	1:B:537:LEU:HD11	2.42	0.50
2:Y:77:LYS:O	2:Y:79:LYS:HG3	2.11	0.50
1:A:365:PHE:O	1:A:366:PRO:C	2.51	0.49
1:B:622:TYR:HE2	1:B:624:ILE:HD11	1.76	0.49
1:A:566:ILE:HD12	1:B:355:MET:HE2	1.92	0.49
1:B:362:PHE:O	1:B:366:PRO:HD2	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:1672:ANP:H5'2	3:A:1672:ANP:O2B	2.12	0.49
1:A:496:LYS:O	1:A:500:VAL:N	2.34	0.49
1:A:521:ILE:HG22	1:A:535:ILE:CA	2.36	0.49
2:W:106:GLU:CA	2:W:109:LEU:HG	2.38	0.49
1:A:571:LYS:HB3	1:A:606:GLU:OE2	2.12	0.49
1:B:413:HIS:O	3:B:1672:ANP:H2	2.12	0.49
1:B:448:GLU:HG2	1:B:532:LYS:CB	2.43	0.49
1:B:605:GLU:O	1:B:606:GLU:CB	2.60	0.49
1:A:357:PRO:HG2	1:A:360:PHE:HD1	1.77	0.49
2:W:110:ASP:OD2	2:W:111:LEU:N	2.44	0.49
2:W:141:ILE:HD13	2:W:141:ILE:O	2.13	0.49
2:W:68:ILE:HD12	2:W:145:ILE:HD11	1.95	0.49
1:B:399:ILE:O	1:B:403:LEU:HD12	2.13	0.49
2:W:22:ALA:C	2:W:23:LEU:HD12	2.32	0.49
1:A:603:HIS:CD2	1:A:605:GLU:N	2.80	0.49
2:W:65:LEU:HD13	2:W:93:PHE:HD2	1.77	0.49
1:A:583:ILE:HG12	1:A:592:VAL:CG1	2.42	0.49
1:B:452:ARG:O	1:B:528:ASP:HA	2.13	0.49
2:Y:134:ILE:HD12	2:Y:134:ILE:N	2.28	0.49
1:A:485:PHE:HA	1:A:488:VAL:HG23	1.95	0.48
1:A:405:HIS:O	1:A:408:ARG:HB2	2.13	0.48
1:B:410:ALA:O	1:B:414:GLY:HA3	2.13	0.48
1:B:524:GLU:HB2	1:B:532:LYS:CD	2.43	0.48
1:B:615:VAL:HG23	1:B:615:VAL:O	2.12	0.48
2:W:21:GLN:OE1	2:W:134:ILE:HD11	2.13	0.48
2:Y:138:ILE:CG2	2:Y:139:ASP:N	2.76	0.48
1:B:383:ILE:HG21	1:B:385:ARG:NH2	2.22	0.48
1:B:478:SER:HB2	1:B:480:GLN:HE22	1.77	0.48
1:B:535:ILE:HG22	1:B:537:LEU:CD2	2.43	0.48
2:W:106:GLU:O	2:W:109:LEU:HG	2.12	0.48
2:Y:19:ASP:O	2:Y:20:GLU:HB2	2.13	0.48
1:B:614:ILE:HD13	1:B:614:ILE:N	2.28	0.48
2:W:23:LEU:HD23	2:W:136:LEU:CD1	2.43	0.48
2:W:18:ILE:HD12	2:W:66:ALA:HB2	1.95	0.48
2:Y:104:ILE:HD12	2:Y:126:VAL:HG11	1.95	0.48
1:A:421:ARG:NH2	1:A:430:GLY:HA2	2.28	0.48
1:A:649:GLU:OE1	2:W:44:LYS:HD3	2.13	0.48
1:B:620:ARG:O	1:B:621:LYS:HB2	2.14	0.48
2:Y:73:PHE:CD1	2:Y:73:PHE:C	2.87	0.48
1:B:366:PRO:HB3	1:B:382:PHE:HZ	1.78	0.48
1:A:650:PHE:CZ	2:W:43:PRO:HD2	2.49	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:365:PHE:N	1:B:366:PRO:HD2	2.29	0.48
2:W:46:ARG:NH2	2:W:145:ILE:O	2.44	0.48
2:W:13:VAL:HG22	2:W:24:ALA:HB1	1.95	0.48
2:Y:64:ASN:ND2	2:Y:66:ALA:HB3	2.28	0.48
2:Y:129:ASP:O	2:Y:129:ASP:OD1	2.32	0.48
1:A:427:PRO:HB2	1:A:429:ILE:HD12	1.95	0.48
1:B:411:ILE:N	1:B:411:ILE:HD12	2.29	0.48
2:W:105:THR:H	2:W:108:GLN:HG3	1.77	0.48
2:Y:105:THR:OG1	2:Y:106:GLU:N	2.46	0.48
2:Y:8:LEU:HD22	2:Y:9:LYS:HG2	1.96	0.48
1:B:559:PRO:HB2	1:B:562:ASN:HD22	1.78	0.47
2:Y:89:VAL:HG12	2:Y:89:VAL:O	2.14	0.47
1:A:414:GLY:O	1:A:415:ILE:C	2.53	0.47
1:A:670:ILE:CG2	1:A:671:VAL:N	2.77	0.47
1:B:437:ARG:HG2	1:B:437:ARG:NH1	2.29	0.47
1:B:620:ARG:CB	1:B:620:ARG:HH11	2.27	0.47
1:B:590:ILE:HG23	1:B:621:LYS:O	2.14	0.47
2:W:49:VAL:O	2:W:49:VAL:CG2	2.62	0.47
1:A:653:ALA:HB3	2:W:59:ILE:HD13	1.96	0.47
2:Y:132:LEU:H	2:Y:132:LEU:CD1	2.23	0.47
1:A:374:LYS:O	1:A:376:MET:N	2.46	0.47
1:A:366:PRO:HB3	1:A:384:MET:HE2	1.96	0.47
1:A:553:ASN:OD1	1:A:553:ASN:O	2.32	0.47
2:W:91:VAL:CG1	2:W:92:GLY:N	2.76	0.47
2:Y:58:ARG:NH2	2:Y:90:GLU:OE2	2.48	0.47
1:A:577:VAL:CG1	1:A:578:GLN:H	2.09	0.47
1:B:488:VAL:HA	1:B:489:PRO:HD2	1.66	0.47
1:A:479:ASP:OD1	1:A:479:ASP:C	2.53	0.47
1:A:656:LEU:HD23	1:A:662:ALA:HB2	1.97	0.47
1:B:405:HIS:CE1	1:B:409:ASN:ND2	2.83	0.47
1:B:629:LEU:HA	1:B:629:LEU:HD12	1.60	0.47
2:W:55:LEU:HD23	2:W:60:ILE:HD12	1.95	0.47
1:A:426:LYS:O	1:A:427:PRO:C	2.50	0.47
1:B:413:HIS:O	1:B:452:ARG:CD	2.62	0.47
1:B:515:GLU:HG2	1:B:519:GLY:O	2.15	0.47
1:B:604:LYS:O	1:B:605:GLU:HG3	2.15	0.47
1:A:507:MET:O	1:A:508:ASP:C	2.52	0.47
1:B:617:VAL:CG1	1:B:620:ARG:HB2	2.44	0.47
1:B:405:HIS:HE1	3:B:1672:ANP:O1A	1.98	0.47
1:B:515:GLU:HA	1:B:519:GLY:H	1.79	0.47
2:W:33:VAL:HG12	2:W:82:ILE:HG12	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:Y:112:THR:CG2	2:Y:115:SER:HB2	2.42	0.47
1:A:531:THR:HG22	1:A:532:LYS:H	1.80	0.47
1:A:594:ARG:O	1:A:598:VAL:HG23	2.14	0.47
1:B:361:VAL:HG22	1:B:365:PHE:HE2	1.79	0.47
1:B:367:ARG:HH11	1:B:367:ARG:HG3	1.78	0.47
1:B:362:PHE:HB3	1:B:384:MET:HE1	1.97	0.47
1:B:540:THR:CG2	1:B:541:LEU:N	2.78	0.47
2:W:81:ILE:HA	2:W:93:PHE:O	2.15	0.46
1:A:416:GLU:HG3	1:A:421:ARG:HG3	1.96	0.46
1:A:509:VAL:O	1:A:510:VAL:C	2.54	0.46
1:A:640:LEU:H	1:A:640:LEU:CD2	2.27	0.46
1:A:393:ARG:O	1:A:396:VAL:HG22	2.15	0.46
1:A:454:ILE:HG13	1:A:459:ILE:HD11	1.98	0.46
1:A:508:ASP:OD2	1:A:509:VAL:N	2.48	0.46
1:A:603:HIS:O	1:A:604:LYS:C	2.53	0.46
1:A:365:PHE:N	1:A:366:PRO:HD2	2.30	0.46
1:A:416:GLU:HG2	1:A:421:ARG:HG3	1.98	0.46
1:A:580:ARG:HG3	1:A:580:ARG:HH11	1.81	0.46
1:B:375:LYS:C	1:B:377:ASN:N	2.68	0.46
2:W:65:LEU:HD12	2:W:68:ILE:CG2	2.45	0.46
1:B:468:LEU:N	1:B:468:LEU:HD22	2.31	0.46
2:W:63:VAL:HG21	2:W:145:ILE:HD13	1.98	0.46
1:A:384:MET:HG2	1:A:434:LEU:HB3	1.96	0.46
1:A:570:SER:O	1:A:572:GLU:N	2.47	0.46
1:B:583:ILE:HG12	1:B:592:VAL:CG1	2.46	0.46
2:W:49:VAL:O	2:W:49:VAL:HG23	2.16	0.46
1:A:421:ARG:HG3	1:A:421:ARG:HH11	1.80	0.46
1:A:638:LYS:HD3	1:A:638:LYS:HA	1.81	0.46
1:B:413:HIS:O	1:B:452:ARG:HD2	2.16	0.46
1:B:491:PHE:O	1:B:492:SER:C	2.54	0.46
1:B:560:ILE:C	1:B:562:ASN:H	2.19	0.46
2:W:120:LYS:HB3	2:W:140:LYS:CE	2.45	0.46
1:A:582:VAL:HG12	1:A:591:PRO:HA	1.98	0.46
1:B:412:ASP:C	1:B:414:GLY:H	2.19	0.46
1:B:420:GLU:O	1:B:424:LYS:HG3	2.16	0.46
1:A:601:ILE:O	1:A:602:GLU:C	2.54	0.46
1:B:413:HIS:O	1:B:452:ARG:CG	2.64	0.46
1:B:478:SER:HB2	1:B:480:GLN:NE2	2.31	0.46
1:B:580:ARG:HG3	1:B:581:ASP:N	2.31	0.46
1:B:620:ARG:CB	1:B:620:ARG:NH1	2.79	0.46
1:A:450:ASP:HA	1:A:530:GLY:CA	2.43	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:551:VAL:O	1:A:554:LEU:HB2	2.16	0.46
1:A:635:ILE:HD12	1:A:664:ILE:HD11	1.97	0.46
1:B:644:PHE:HE1	2:Y:49:VAL:HG11	1.81	0.46
1:A:544:ILE:CG2	1:A:637:ILE:HD11	2.47	0.45
1:B:574:ILE:HD13	1:B:583:ILE:CG2	2.46	0.45
1:B:403:LEU:O	1:B:407:LEU:HG	2.17	0.45
1:B:539:LEU:HD12	1:B:540:THR:OG1	2.17	0.45
2:Y:123:LYS:CD	2:Y:135:TYR:CE1	3.00	0.45
1:A:644:PHE:O	1:A:645:SER:C	2.55	0.45
2:Y:67:LYS:HG2	2:Y:73:PHE:CE2	2.50	0.45
1:A:599:LEU:O	1:A:600:GLN:C	2.54	0.45
1:A:603:HIS:CD2	1:A:604:LYS:N	2.84	0.45
1:B:604:LYS:HD2	1:B:605:GLU:H	1.81	0.45
2:W:87:LYS:H	2:W:87:LYS:HD3	1.80	0.45
1:A:507:MET:C	1:A:509:VAL:N	2.69	0.45
1:B:364:ARG:HE	1:B:368:MET:HE3	1.82	0.45
1:B:455:ASP:OD1	1:B:458:LYS:HB2	2.16	0.45
2:W:55:LEU:HD23	2:W:60:ILE:CD1	2.46	0.45
1:B:666:ASN:O	1:B:667:VAL:C	2.55	0.45
2:W:114:VAL:O	2:W:114:VAL:HG12	2.16	0.45
2:W:93:PHE:HE2	2:W:141:ILE:HD12	1.80	0.45
1:A:479:ASP:O	1:A:482:ILE:HB	2.16	0.45
1:B:551:VAL:O	1:B:552:ASN:HB2	2.16	0.45
2:Y:86:THR:HG23	2:Y:89:VAL:HB	1.99	0.45
1:A:611:GLU:OE2	1:B:353:SER:HB3	2.17	0.45
1:B:361:VAL:HG13	1:B:362:PHE:N	2.32	0.45
2:W:22:ALA:O	2:W:134:ILE:HD12	2.17	0.45
1:B:409:ASN:HB3	3:B:1672:ANP:N7	2.32	0.44
1:B:395:PHE:HE2	1:B:538:PRO:HD2	1.82	0.44
1:B:665:ILE:CG2	1:B:666:ASN:N	2.80	0.44
2:W:89:VAL:HG12	2:W:90:GLU:N	2.32	0.44
1:A:436:ALA:HA	1:A:444:VAL:O	2.16	0.44
1:A:487:PHE:CD2	1:A:511:LYS:HD2	2.53	0.44
1:B:573:ASP:O	1:B:583:ILE:HG22	2.17	0.44
1:A:509:VAL:HG13	1:A:510:VAL:N	2.32	0.44
1:B:617:VAL:HG22	1:B:618:GLY:N	2.31	0.44
1:A:507:MET:HE2	3:A:1672:ANP:O1A	2.17	0.44
1:A:365:PHE:C	1:A:367:ARG:N	2.71	0.44
1:B:512:ASN:O	1:B:515:GLU:N	2.51	0.44
1:B:647:VAL:HG13	1:B:649:GLU:OE1	2.17	0.44
1:B:640:LEU:HD22	1:B:652:GLY:HA2	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:Y:104:ILE:CG2	2:Y:105:THR:H	2.26	0.44
2:Y:22:ALA:O	2:Y:134:ILE:CD1	2.65	0.44
2:Y:71:ILE:HG13	2:Y:72:SER:N	2.31	0.44
1:A:379:GLU:HB2	1:A:418:LYS:HZ1	1.81	0.44
1:A:487:PHE:O	1:A:488:VAL:C	2.55	0.44
1:A:596:TRP:CD1	1:A:603:HIS:CG	3.05	0.44
1:B:473:LYS:O	1:B:477:LEU:HG	2.18	0.44
1:B:564:ASP:O	1:B:565:THR:OG1	2.34	0.44
1:A:478:SER:O	1:A:479:ASP:C	2.55	0.44
1:A:573:ASP:O	1:A:583:ILE:HG22	2.18	0.44
1:B:361:VAL:HG22	1:B:365:PHE:CE2	2.53	0.44
2:W:132:LEU:O	2:W:134:ILE:HD12	2.18	0.44
1:A:356:VAL:HG13	1:A:357:PRO:HD2	2.00	0.44
1:B:399:ILE:HG13	1:B:403:LEU:HG	1.98	0.44
2:W:23:LEU:HD23	2:W:136:LEU:CG	2.48	0.44
2:W:13:VAL:O	2:W:101:VAL:HA	2.17	0.44
1:B:517:LEU:O	1:B:518:ASN:HB3	2.18	0.44
1:B:562:ASN:HB3	1:B:667:VAL:HG21	1.99	0.44
2:Y:118:PHE:O	2:Y:119:GLY:O	2.36	0.44
1:A:358:ILE:HB	1:A:389:THR:O	2.18	0.44
1:A:459:ILE:HD13	1:A:486:LEU:HD13	2.00	0.44
1:A:507:MET:O	1:A:510:VAL:N	2.51	0.44
1:B:460:ILE:CG2	1:B:474:ALA:HB1	2.47	0.44
1:B:640:LEU:O	1:B:644:PHE:HD2	2.01	0.44
2:W:48:PHE:CD2	2:W:63:VAL:HG13	2.52	0.44
1:B:395:PHE:HE1	1:B:541:LEU:CD2	2.23	0.43
1:B:485:PHE:O	1:B:488:VAL:HG22	2.17	0.43
1:B:447:VAL:HB	1:B:533:VAL:CG2	2.48	0.43
1:B:521:ILE:HA	1:B:534:THR:O	2.17	0.43
1:B:395:PHE:CE2	1:B:538:PRO:HD2	2.53	0.43
1:B:604:LYS:H	1:B:604:LYS:HG3	1.49	0.43
1:B:550:LYS:NZ	1:B:630:LEU:HD21	2.33	0.43
2:W:55:LEU:O	2:W:56:ARG:C	2.56	0.43
1:B:650:PHE:CE2	2:Y:43:PRO:HD2	2.53	0.43
2:Y:78:MET:HB3	2:Y:94:LEU:CD2	2.40	0.43
1:A:594:ARG:HB3	1:A:596:TRP:CZ3	2.54	0.43
1:A:605:GLU:O	1:A:606:GLU:CB	2.66	0.43
1:B:510:VAL:O	1:B:514:VAL:HG13	2.16	0.43
2:Y:53:ILE:HD11	2:Y:60:ILE:HD11	1.99	0.43
2:Y:11:PHE:HD2	2:Y:11:PHE:H	1.66	0.43
1:A:544:ILE:HG21	1:A:637:ILE:HD11	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:Y:136:LEU:HD12	2:Y:136:LEU:N	2.29	0.43
1:A:450:ASP:OD1	1:A:450:ASP:N	2.50	0.43
1:B:420:GLU:HG2	1:B:424:LYS:HE3	1.99	0.43
1:B:553:ASN:C	1:B:554:LEU:HD23	2.39	0.43
1:B:640:LEU:CD2	1:B:640:LEU:N	2.81	0.43
2:Y:55:LEU:HA	2:Y:55:LEU:HD23	1.72	0.43
1:A:466:LYS:O	1:A:467:GLY:C	2.56	0.43
2:Y:106:GLU:HA	2:Y:109:LEU:HD21	1.99	0.43
2:Y:137:ASP:CG	2:Y:140:LYS:HE2	2.38	0.43
1:B:491:PHE:HB3	1:B:492:SER:H	1.68	0.43
1:B:577:VAL:HG12	1:B:578:GLN:HG2	2.01	0.43
2:Y:104:ILE:CG2	2:Y:105:THR:N	2.79	0.43
2:Y:11:PHE:N	2:Y:11:PHE:CD2	2.86	0.43
1:A:599:LEU:HB2	1:A:601:ILE:HD11	2.01	0.43
1:B:553:ASN:O	1:B:554:LEU:HD23	2.19	0.43
1:B:613:VAL:HG12	1:B:615:VAL:CG1	2.49	0.43
1:B:543:ILE:HG12	1:B:636:VAL:HG13	1.99	0.43
2:W:124:GLY:O	2:W:135:TYR:HB3	2.19	0.43
1:A:401:GLU:N	1:A:402:PRO:CD	2.82	0.43
1:B:398:GLU:O	1:B:402:PRO:HD2	2.19	0.43
1:B:532:LYS:O	1:B:532:LYS:CG	2.66	0.43
1:B:594:ARG:O	1:B:598:VAL:HG23	2.19	0.43
2:Y:8:LEU:N	2:Y:106:GLU:HB2	2.34	0.43
1:B:443:VAL:HG23	1:B:539:LEU:HA	2.01	0.42
1:B:395:PHE:CE1	1:B:541:LEU:HD23	2.36	0.42
2:W:138:ILE:C	2:W:140:LYS:N	2.72	0.42
1:A:387:GLU:H	1:A:387:GLU:HG2	1.47	0.42
1:A:507:MET:O	1:A:509:VAL:N	2.52	0.42
1:B:646:GLU:HG2	1:B:647:VAL:N	2.34	0.42
2:W:93:PHE:HE2	2:W:141:ILE:CD1	2.31	0.42
1:B:650:PHE:HZ	2:Y:43:PRO:HD2	1.82	0.42
1:A:453:GLY:HA3	1:A:527:LYS:HA	2.01	0.42
1:B:657:GLY:C	1:B:659:GLY:N	2.69	0.42
2:W:141:ILE:CD1	2:W:141:ILE:C	2.80	0.42
1:B:413:HIS:CE1	3:B:1672:ANP:H3'	2.54	0.42
1:B:601:ILE:O	1:B:602:GLU:C	2.56	0.42
2:W:69:LEU:HD23	2:W:121:LYS:CD	2.49	0.42
1:A:408:ARG:O	1:A:409:ASN:C	2.58	0.42
1:A:606:GLU:CG	1:A:610:MET:HE3	2.50	0.42
2:W:46:ARG:HH21	2:W:48:PHE:HZ	1.68	0.42
1:A:416:GLU:OE1	1:A:421:ARG:NH1	2.53	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:571:LYS:HB2	1:A:606:GLU:CD	2.40	0.42
1:A:511:LYS:O	1:A:512:ASN:C	2.58	0.42
1:B:365:PHE:HE1	1:B:404:LEU:HB2	1.85	0.42
2:Y:54:ASN:HD22	2:Y:55:LEU:N	2.18	0.42
1:A:384:MET:HA	1:A:434:LEU:O	2.20	0.42
1:A:547:LEU:HD12	1:A:563:ILE:CD1	2.49	0.42
1:A:584:VAL:O	1:A:585:ILE:HD13	2.20	0.42
1:B:617:VAL:O	1:B:619:ASN:N	2.53	0.42
2:W:104:ILE:CG2	2:W:105:THR:N	2.82	0.42
2:W:65:LEU:HD13	2:W:93:PHE:CD2	2.55	0.42
1:A:416:GLU:OE1	1:A:451:GLY:HA2	2.20	0.41
1:A:531:THR:CG2	1:A:532:LYS:N	2.82	0.41
1:A:666:ASN:O	1:A:667:VAL:C	2.58	0.41
1:B:364:ARG:HH21	1:B:368:MET:HE1	1.85	0.41
1:B:552:ASN:O	1:B:553:ASN:HB2	2.19	0.41
1:B:560:ILE:C	1:B:562:ASN:N	2.73	0.41
1:B:646:GLU:OE2	2:Y:46:ARG:HG3	2.20	0.41
1:A:443:VAL:HG22	1:A:539:LEU:HD13	2.02	0.41
2:Y:111:LEU:CD2	2:Y:124:GLY:CA	2.94	0.41
1:A:485:PHE:O	1:A:487:PHE:N	2.53	0.41
1:A:656:LEU:O	1:A:657:GLY:C	2.58	0.41
1:A:661:ILE:CG2	1:A:662:ALA:N	2.83	0.41
2:W:109:LEU:C	2:W:109:LEU:HD12	2.40	0.41
2:Y:29:ASN:HD22	2:Y:29:ASN:HA	1.65	0.41
1:A:357:PRO:HG2	1:A:360:PHE:CE1	2.54	0.41
2:W:25:PHE:CE1	2:W:138:ILE:HD11	2.55	0.41
2:Y:108:GLN:HG2	2:Y:128:THR:HB	2.01	0.41
2:Y:93:PHE:CE2	2:Y:141:ILE:HD11	2.54	0.41
1:A:451:GLY:H	1:A:530:GLY:CA	2.29	0.41
2:W:77:LYS:O	2:W:79:LYS:HG3	2.20	0.41
2:Y:73:PHE:CD1	2:Y:74:ASP:N	2.88	0.41
1:A:362:PHE:CE2	1:A:434:LEU:HG	2.55	0.41
1:B:359:SER:O	1:B:361:VAL:N	2.54	0.41
1:B:392:ASP:HB3	1:B:395:PHE:CD1	2.55	0.41
1:B:427:PRO:HA	1:B:428:PRO:HD3	1.96	0.41
2:Y:23:LEU:HD12	2:Y:23:LEU:N	2.34	0.41
2:Y:80:SER:O	2:Y:94:LEU:HD23	2.21	0.41
1:A:385:ARG:O	1:A:435:SER:HA	2.20	0.41
1:B:580:ARG:HH11	1:B:580:ARG:HG3	1.84	0.41
2:W:19:ASP:HB2	2:W:72:SER:HB2	2.01	0.41
1:A:642:LYS:C	1:A:644:PHE:H	2.23	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:517:LEU:HG	1:B:517:LEU:H	1.63	0.41
2:W:67:LYS:HB2	2:W:73:PHE:CE2	2.55	0.41
2:Y:48:PHE:CZ	2:Y:145:ILE:HG23	2.56	0.41
2:Y:73:PHE:O	2:Y:74:ASP:HB2	2.20	0.41
1:A:407:LEU:O	1:A:411:ILE:HG13	2.19	0.41
1:A:478:SER:H	1:A:481:GLU:CG	2.34	0.41
1:A:497:VAL:C	1:A:499:GLU:N	2.74	0.41
1:B:670:ILE:O	1:B:671:VAL:CG1	2.63	0.41
2:W:99:LEU:H	2:W:99:LEU:HD22	1.85	0.41
2:Y:102:LEU:HD12	2:Y:102:LEU:HA	1.88	0.41
1:A:482:ILE:O	1:A:485:PHE:HD2	2.03	0.41
1:A:609:GLU:C	1:A:610:MET:HG3	2.40	0.41
1:A:404:LEU:HG	1:A:408:ARG:HH12	1.85	0.41
1:A:497:VAL:O	1:A:498:SER:C	2.59	0.41
2:Y:67:LYS:HG2	2:Y:73:PHE:CD2	2.56	0.41
1:A:632:GLN:HE21	1:A:632:GLN:HB2	1.65	0.40
2:Y:132:LEU:N	2:Y:132:LEU:CD1	2.74	0.40
1:B:368:MET:HG2	1:B:368:MET:H	1.68	0.40
1:B:486:LEU:O	1:B:486:LEU:HD23	2.21	0.40
1:B:614:ILE:HA	1:B:623:GLY:HA2	2.03	0.40
1:B:620:ARG:HH11	1:B:620:ARG:HB2	1.86	0.40
2:W:69:LEU:HD23	2:W:121:LYS:HD3	2.03	0.40
2:Y:24:ALA:O	2:Y:136:LEU:HD12	2.20	0.40
1:A:505:VAL:HG13	3:A:1672:ANP:HNB1	1.86	0.40
1:A:456:LYS:H	1:A:456:LYS:HG3	1.60	0.40
1:A:606:GLU:OE2	1:A:610:MET:SD	2.79	0.40
1:B:574:ILE:CG2	1:B:581:ASP:HB3	2.51	0.40
1:A:399:ILE:HD12	1:A:399:ILE:HA	1.81	0.40
1:B:391:LEU:N	1:B:391:LEU:HD23	2.36	0.40
1:B:409:ASN:ND2	3:B:1672:ANP:O1A	2.54	0.40
1:B:403:LEU:HD21	1:B:445:ILE:HG21	2.02	0.40
2:W:106:GLU:HA	2:W:109:LEU:CD2	2.51	0.40
2:W:30:ILE:HD12	2:W:82:ILE:CG2	2.52	0.40
2:Y:137:ASP:O	2:Y:141:ILE:CG2	2.70	0.40
1:A:409:ASN:O	1:A:410:ALA:C	2.60	0.40
1:A:456:LYS:HD3	1:A:479:ASP:HB2	2.03	0.40
1:B:358:ILE:HG12	1:B:362:PHE:CE1	2.57	0.40
1:B:383:ILE:N	1:B:432:LEU:O	2.50	0.40
1:B:544:ILE:CD1	1:B:635:ILE:CG1	2.99	0.40
1:B:669:GLY:O	1:B:670:ILE:C	2.60	0.40
2:W:11:PHE:HB2	2:W:104:ILE:HG22	2.04	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:W:94:LEU:HD23	2:W:95:VAL:N	2.37	0.40
2:Y:106:GLU:O	2:Y:107:ASN:O	2.39	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	318/320 (99%)	247 (78%)	41 (13%)	30 (9%)	0	8
1	B	301/320 (94%)	246 (82%)	43 (14%)	12 (4%)	3	24
2	W	137/151 (91%)	109 (80%)	19 (14%)	9 (7%)	1	13
2	Y	138/151 (91%)	101 (73%)	25 (18%)	12 (9%)	1	9
All	All	894/942 (95%)	703 (79%)	128 (14%)	63 (7%)	1	12

All (63) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	493	THR
1	A	495	GLU
1	A	500	VAL
1	A	577	VAL
1	B	412	ASP
1	B	491	PHE
1	B	621	LYS
1	B	670	ILE
2	W	119	GLY
2	Y	119	GLY
1	A	375	LYS
1	A	395	PHE
1	A	414	GLY

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Mol	Chain	Res	Type
1	A	496	LYS
1	A	501	SER
1	A	504	GLY
1	A	571	LYS
1	A	604	LYS
1	A	606	GLU
1	A	641	GLY
1	A	667	VAL
1	B	360	PHE
1	B	604	LYS
1	B	606	GLU
1	B	618	GLY
2	W	47	HIS
2	W	76	GLN
2	W	139	ASP
2	Y	28	ASP
2	Y	75	GLU
2	Y	107	ASN
1	A	419	GLU
1	A	455	ASP
1	A	588	GLU
1	B	436	ALA
1	B	577	VAL
2	W	46	ARG
2	W	123	LYS
2	W	146	THR
2	Y	50	GLU
2	Y	56	ARG
2	Y	66	ALA
2	Y	74	ASP
1	A	418	LYS
1	A	605	GLU
1	A	658	ASP
2	W	18	ILE
2	W	138	ILE
2	Y	46	ARG
2	Y	87	LYS
2	Y	89	VAL
2	Y	112	THR
1	A	360	PHE
1	A	420	GLU
1	A	497	VAL

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Mol	Chain	Res	Type
1	A	580	ARG
1	B	641	GLY
1	A	474	ALA
1	A	600	GLN
1	B	605	GLU
1	A	366	PRO
1	A	467	GLY
1	A	551	VAL

### 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	271/280 (97%)	239 (88%)	32 (12%)	5	25
1	B	265/280 (95%)	238 (90%)	27 (10%)	7	32
2	W	126/136 (93%)	108 (86%)	18 (14%)	3	19
2	Y	128/136 (94%)	102 (80%)	26 (20%)	1	6
All	All	790/832 (95%)	687 (87%)	103 (13%)	4	21

All (103) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	355	MET
1	A	359	SER
1	A	367	ARG
1	A	387	GLU
1	A	416	GLU
1	A	429	ILE
1	A	432	LEU
1	A	452	ARG
1	A	470	ASP
1	A	479	ASP
1	A	481	GLU
1	A	503	ARG
1	A	507	MET

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Mol	Chain	Res	Type
1	A	536	ARG
1	A	537	LEU
1	A	547	LEU
1	A	549	VAL
1	A	552	ASN
1	A	559	PRO
1	A	560	ILE
1	A	565	THR
1	A	570	SER
1	A	572	GLU
1	A	581	ASP
1	A	584	VAL
1	A	596	TRP
1	A	606	GLU
1	A	637	ILE
1	A	640	LEU
1	A	646	GLU
1	A	655	ILE
1	A	658	ASP
1	B	354	HIS
1	B	362	PHE
1	B	371	ASP
1	B	382	PHE
1	B	401	GLU
1	B	412	ASP
1	B	413	HIS
1	B	442	ASN
1	B	491	PHE
1	B	512	ASN
1	B	517	LEU
1	B	547	LEU
1	B	548	LEU
1	B	565	THR
1	B	567	LEU
1	B	578	GLN
1	B	604	LYS
1	B	606	GLU
1	B	610	MET
1	B	611	GLU
1	B	616	ARG
1	B	629	LEU
1	B	636	VAL

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Mol	Chain	Res	Type
1	B	637	ILE
1	B	640	LEU
1	B	642	LYS
1	B	643	VAL
2	W	11	PHE
2	W	13	VAL
2	W	19	ASP
2	W	31	GLU
2	W	33	VAL
2	W	47	HIS
2	W	64	ASN
2	W	75	GLU
2	W	76	GLN
2	W	94	LEU
2	W	101	VAL
2	W	108	GLN
2	W	115	SER
2	W	117	LYS
2	W	118	PHE
2	W	132	LEU
2	W	136	LEU
2	W	141	ILE
2	Y	11	PHE
2	Y	19	ASP
2	Y	23	LEU
2	Y	26	ASP
2	Y	29	ASN
2	Y	33	VAL
2	Y	38	ASP
2	Y	54	ASN
2	Y	55	LEU
2	Y	64	ASN
2	Y	69	LEU
2	Y	73	PHE
2	Y	88	ASP
2	Y	94	LEU
2	Y	107	ASN
2	Y	110	ASP
2	Y	115	SER
2	Y	117	LYS
2	Y	118	PHE
2	Y	121	LYS

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Mol	Chain	Res	Type
2	Y	125	LEU
2	Y	132	LEU
2	Y	136	LEU
2	Y	139	ASP
2	Y	141	ILE
2	Y	145	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	381	ASN
1	A	405	HIS
1	A	413	HIS
1	A	441	ASN
1	A	480	GLN
1	A	484	ASN
1	A	512	ASN
1	A	553	ASN
1	A	562	ASN
1	A	600	GLN
1	A	632	GLN
1	B	405	HIS
1	B	441	ASN
1	B	480	GLN
1	B	552	ASN
1	B	553	ASN
1	B	562	ASN
1	B	575	GLN
1	B	603	HIS
2	W	29	ASN
2	W	64	ASN
2	Y	29	ASN
2	Y	54	ASN
2	Y	64	ASN

### 5.3.3 RNA ⓘ

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](#)

2 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$
3	ANP	B	1672	-	29,33,33	2.71	11 (37%)	31,52,52	2.58	10 (32%)
3	ANP	A	1672	-	29,33,33	2.51	10 (34%)	31,52,52	2.54	10 (32%)

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
3	ANP	B	1672	-	-	5/14/38/38	0/3/3/3
3	ANP	A	1672	-	-	3/14/38/38	0/3/3/3

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	1672	ANP	PB-O1B	7.52	1.58	1.46
3	A	1672	ANP	PG-O1G	7.05	1.57	1.46
3	B	1672	ANP	PG-O1G	6.42	1.56	1.46
3	A	1672	ANP	PB-O2B	-5.78	1.41	1.56
3	A	1672	ANP	PB-O1B	5.64	1.55	1.46
3	B	1672	ANP	PB-O3A	5.13	1.65	1.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	1672	ANP	PB-O2B	-4.40	1.44	1.56
3	B	1672	ANP	C2'-C1'	-4.06	1.47	1.53
3	A	1672	ANP	C2'-C1'	-3.87	1.47	1.53
3	B	1672	ANP	PG-O2G	-3.74	1.46	1.56
3	A	1672	ANP	PG-O2G	-3.05	1.48	1.56
3	A	1672	ANP	PG-N3B	2.83	1.70	1.63
3	B	1672	ANP	PG-N3B	2.73	1.70	1.63
3	A	1672	ANP	O4'-C4'	-2.53	1.39	1.45
3	B	1672	ANP	C4-N3	-2.22	1.32	1.35
3	A	1672	ANP	C2-N3	2.21	1.35	1.32
3	B	1672	ANP	O4'-C4'	-2.10	1.40	1.45
3	A	1672	ANP	PB-N3B	-2.08	1.57	1.63
3	A	1672	ANP	PG-O3G	-2.07	1.51	1.56
3	B	1672	ANP	C5-N7	-2.05	1.32	1.39
3	B	1672	ANP	C2-N3	2.00	1.35	1.32

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1672	ANP	C5'-C4'-C3'	-6.12	92.23	115.18
3	B	1672	ANP	C5'-C4'-C3'	-6.11	92.28	115.18
3	A	1672	ANP	O5'-C5'-C4'	5.86	129.16	108.99
3	B	1672	ANP	O5'-C5'-C4'	5.71	128.64	108.99
3	B	1672	ANP	O1B-PB-N3B	-5.67	103.42	111.77
3	A	1672	ANP	O1B-PB-N3B	-5.15	104.18	111.77
3	A	1672	ANP	O3G-PG-O2G	4.68	120.10	107.64
3	B	1672	ANP	O3G-PG-O2G	4.55	119.74	107.64
3	B	1672	ANP	O3A-PB-N3B	3.82	117.20	106.59
3	A	1672	ANP	O3A-PB-N3B	3.80	117.12	106.59
3	B	1672	ANP	PA-O3A-PB	3.39	144.54	132.62
3	B	1672	ANP	N3-C2-N1	-3.28	123.56	128.68
3	A	1672	ANP	N3-C2-N1	-3.18	123.71	128.68
3	B	1672	ANP	C4-C5-N7	3.07	112.60	109.40
3	A	1672	ANP	O2A-PA-O5'	2.92	121.31	107.75
3	A	1672	ANP	O4'-C1'-C2'	2.92	111.19	106.93
3	B	1672	ANP	O2A-PA-O5'	2.84	120.92	107.75
3	A	1672	ANP	C4-C5-N7	2.76	112.28	109.40
3	A	1672	ANP	PA-O3A-PB	2.72	142.18	132.62
3	B	1672	ANP	O4'-C1'-C2'	2.57	110.68	106.93

There are no chirality outliers.

All (8) torsion outliers are listed below:

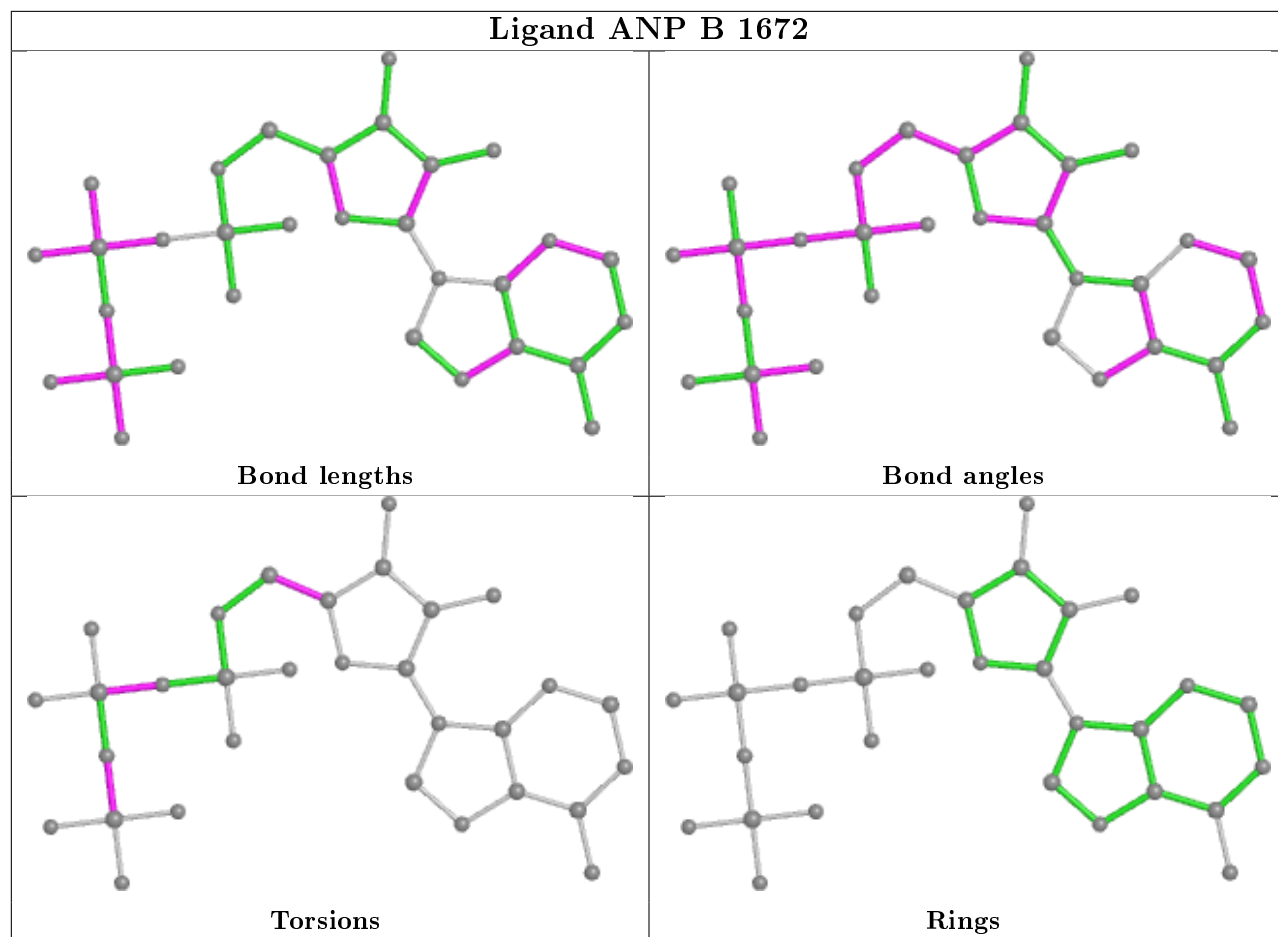
Mol	Chain	Res	Type	Atoms
3	B	1672	ANP	PB-N3B-PG-O1G
3	B	1672	ANP	PA-O3A-PB-O1B
3	B	1672	ANP	PA-O3A-PB-O2B
3	B	1672	ANP	O4'-C4'-C5'-O5'
3	A	1672	ANP	PG-N3B-PB-O1B
3	A	1672	ANP	O4'-C4'-C5'-O5'
3	A	1672	ANP	C3'-C4'-C5'-O5'
3	B	1672	ANP	C3'-C4'-C5'-O5'

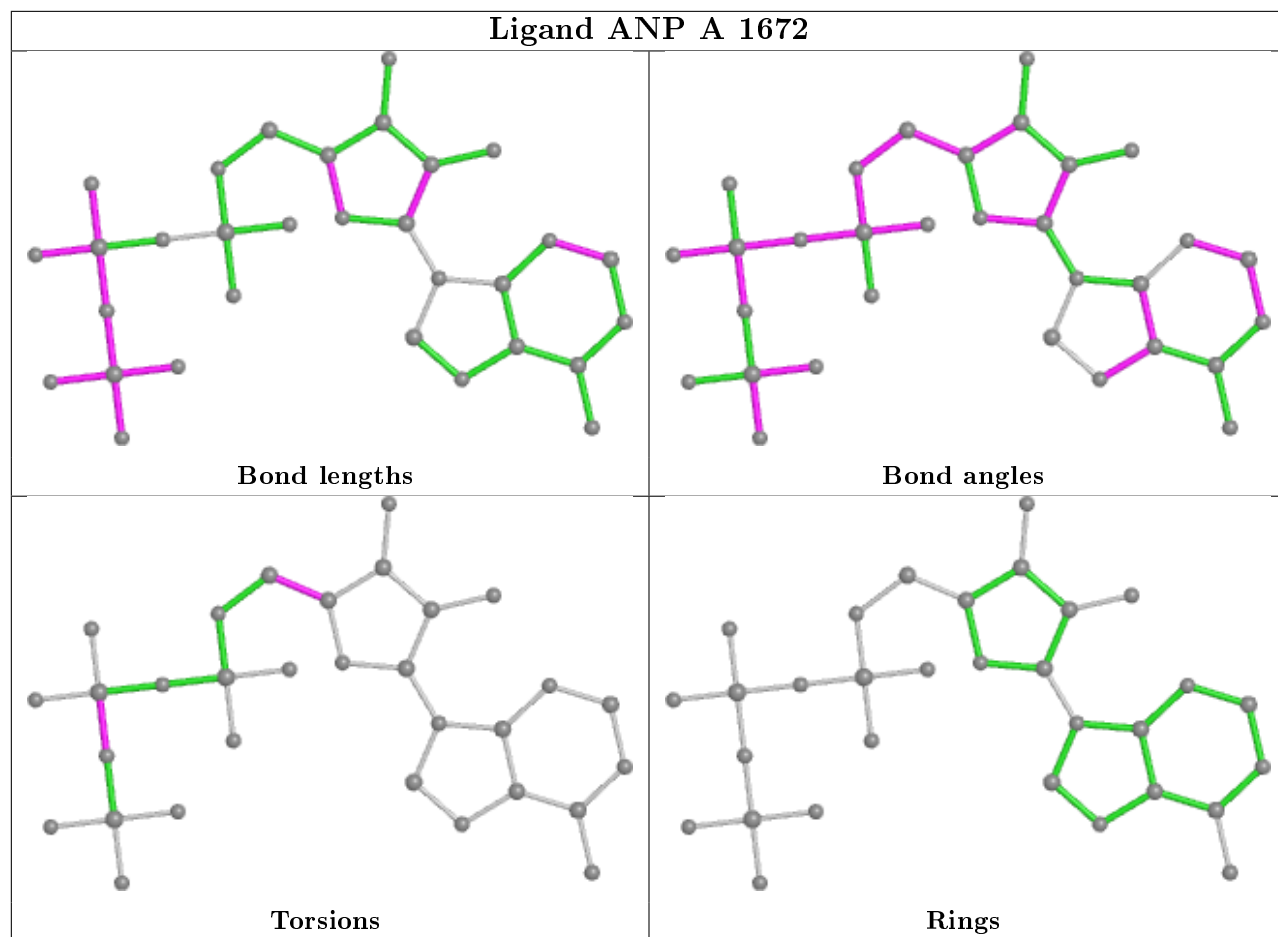
There are no ring outliers.

2 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	1672	ANP	9	0
3	A	1672	ANP	5	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	320/320 (100%)	-0.48	1 (0%) 94 91	47, 85, 157, 194	0
1	B	305/320 (95%)	0.26	34 (11%) 5 6	48, 143, 253, 261	0
2	W	139/151 (92%)	-0.07	2 (1%) 75 69	53, 106, 188, 205	0
2	Y	140/151 (92%)	-0.25	2 (1%) 75 69	60, 97, 164, 203	0
All	All	904/942 (95%)	-0.13	39 (4%) 35 31	47, 97, 243, 261	0

All (39) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	475	ALA	6.8
1	B	472	SER	5.7
1	B	460	ILE	4.6
1	B	471	GLU	4.4
1	B	477	LEU	4.3
1	B	415	ILE	4.2
1	B	476	THR	4.1
1	B	377	ASN	3.6
1	B	474	ALA	3.5
1	B	456	LYS	3.5
1	B	380	VAL	3.4
1	B	527	LYS	3.3
1	B	419	GLU	3.2
1	B	459	ILE	3.2
1	B	430	GLY	3.1
1	B	431	THR	3.0
1	B	424	LYS	3.0
1	B	465	GLU	3.0
1	B	467	GLY	2.8
1	B	417	PRO	2.7
1	B	464	ILE	2.6

*Continued on next page...*

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Mol	Chain	Res	Type	RSRZ
1	B	428	PRO	2.6
1	B	379	GLU	2.6
2	Y	113	ASN	2.5
2	W	113	ASN	2.5
1	B	432	LEU	2.5
1	B	376	MET	2.4
2	W	18	ILE	2.3
1	B	461	ARG	2.2
1	B	454	ILE	2.2
1	B	473	LYS	2.2
1	A	606	GLU	2.1
1	B	463	ALA	2.1
1	B	416	GLU	2.1
1	B	523	ILE	2.1
1	B	468	LEU	2.1
2	Y	114	VAL	2.1
1	B	469	ILE	2.1
1	B	450	ASP	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. 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.

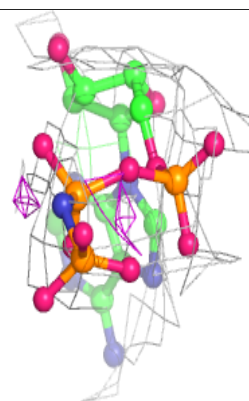
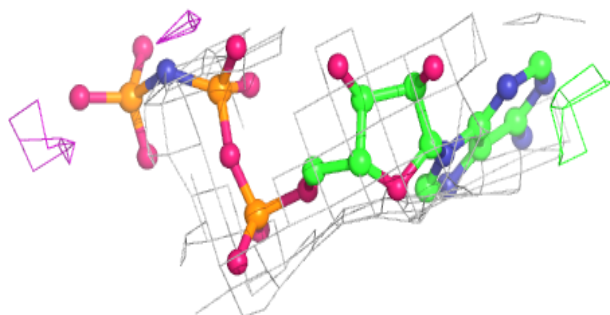
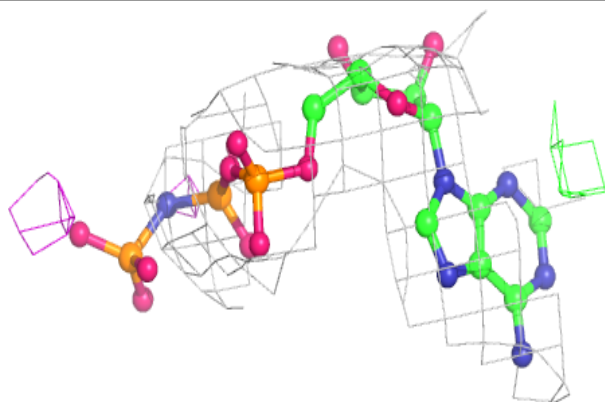
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
3	ANP	B	1672	31/31	0.83	0.31	254,267,284,285	0
3	ANP	A	1672	31/31	0.92	0.23	90,100,164,165	0

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.

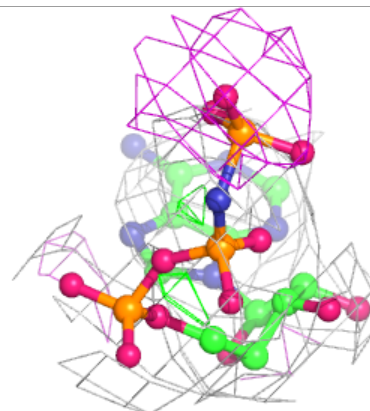
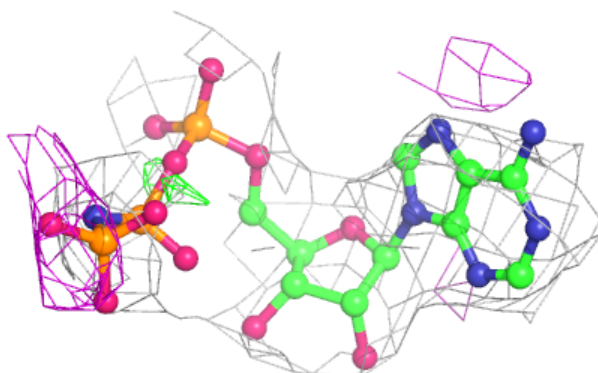
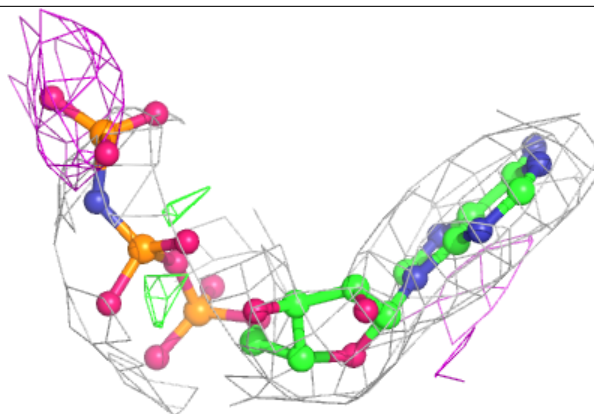
**Electron density around ANP B 1672:**

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



**Electron density around ANP A 1672:**

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



## 6.5 Other polymers [i](#)

There are no such residues in this entry.