



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 12, 2026 – 11:12 AM UTC

PDB ID : 1MMA / pdb\_00001mma  
Title : X-RAY STRUCTURES OF THE MGADP, MGATPGAMMAS, AND  
MGAMPPNP COMPLEXES OF THE DICTYOSTELIUM DISCOIDEUM  
MYOSIN MOTOR DOMAIN  
Authors : Gulick, A.M.; Bauer, C.B.; Thoden, J.B.; Rayment, I.  
Deposited on : 1997-07-18  
Resolution : 2.10 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.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtrriage (Phenix)	:	<b>NOT EXECUTED</b>
EDS	:	<b>NOT EXECUTED</b>
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

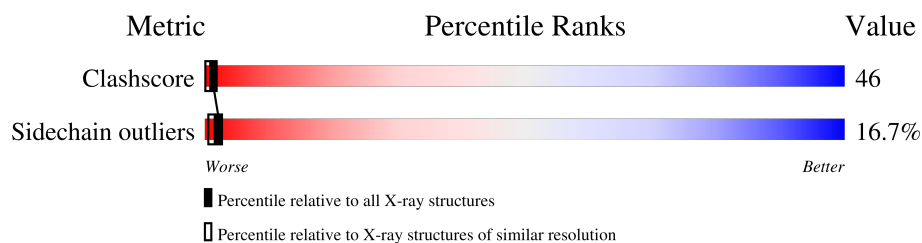
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.10 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	190562	7164 (2.10-2.10)
Sidechain outliers	187428	7100 (2.10-2.10)

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 of 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  $\leq 5\%$ .

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	762	

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 6139 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 MYOSIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	719	Total	C	N	O	S	0	0	0
			5687	3601	981	1089	16			

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	65	SER	VAL	conflict	UNP P08799
A	312	CYS	TYR	conflict	UNP P08799
A	737	PHE	TYR	conflict	UNP P08799

- Molecule 2 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Mg	0	0
			1	1		

- Molecule 3 is ADENOSINE-5'-DIPHOSPHATE (CCD ID: ADP) (formula: C<sub>10</sub>H<sub>15</sub>N<sub>5</sub>O<sub>10</sub>P<sub>2</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			27	10	5	10	2		

- Molecule 4 is water.

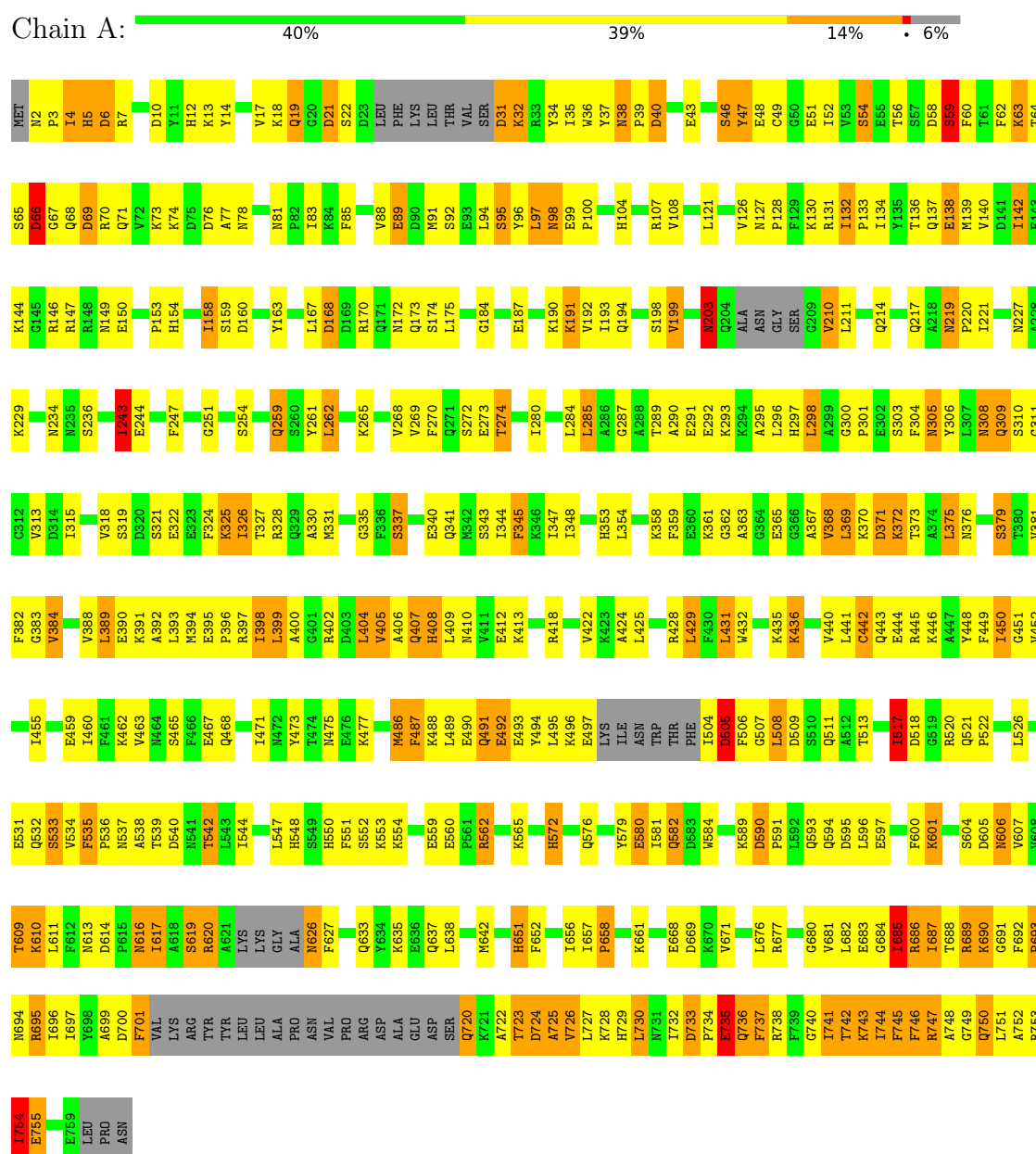
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	424	Total	O	0	0
			424	424		

### 3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide 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. 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. 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.

Note EDS was not executed.

#### • Molecule 1: MYOSIN



## 4 Data and refinement statistics

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	103.60Å 179.00Å 53.90Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.10	Depositor
% Data completeness (in resolution range)	96.2 (20.00-2.10)	Depositor
$R_{merge}$	0.05	Depositor
$R_{sym}$	(Not available)	Depositor
Refinement program	TNT	Depositor
R, $R_{free}$	0.219 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	6139	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	47.0	wwPDB-VP

## 5 Model quality

### 5.1 Standard geometry

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

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	1.39	19/5791 (0.3%)	1.79	98/7818 (1.3%)

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	695	ARG	C-O	-15.43	1.04	1.24
1	A	736	GLN	N-CA	-7.88	1.36	1.46
1	A	126	VAL	CA-CB	-7.53	1.45	1.54
1	A	735	GLU	N-CA	-6.86	1.37	1.46
1	A	132	ILE	CA-CB	-6.63	1.45	1.54
1	A	590	ASP	CA-C	-5.90	1.49	1.53
1	A	671	VAL	CA-CB	-5.82	1.47	1.54
1	A	747	ARG	N-CA	-5.65	1.39	1.46
1	A	243	ILE	C-O	5.42	1.30	1.24
1	A	658	PRO	CA-C	5.41	1.60	1.52
1	A	733	ASP	CG-OD1	-5.40	1.15	1.25
1	A	735	GLU	CD-OE2	5.40	1.35	1.25
1	A	326	ILE	CA-CB	-5.30	1.47	1.54
1	A	551	PHE	CA-C	-5.23	1.45	1.52
1	A	755	GLU	CD-OE2	5.22	1.35	1.25
1	A	735	GLU	CA-C	-5.09	1.46	1.52
1	A	493	GLU	CD-OE2	5.05	1.34	1.25
1	A	517	ILE	CA-C	-5.03	1.46	1.52
1	A	737	PHE	CA-C	5.01	1.59	1.52

All (98) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	402	ARG	N-CA-C	-9.87	101.36	113.50
1	A	450	ILE	CA-C-N	-9.57	113.52	122.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	450	ILE	C-N-CA	-9.57	113.52	122.80
1	A	724	ASP	N-CA-C	-9.37	102.66	114.56
1	A	98	ASN	CA-CB-CG	8.93	121.53	112.60
1	A	17	VAL	CB-CA-C	-8.74	100.86	111.08
1	A	742	THR	N-CA-CB	8.62	125.06	110.49
1	A	505	ASP	CA-CB-CG	8.51	121.11	112.60
1	A	538	ALA	N-CA-C	8.42	122.10	108.63
1	A	724	ASP	CA-CB-CG	8.28	120.88	112.60
1	A	445	ARG	N-CA-C	-8.17	102.07	114.16
1	A	511	GLN	N-CA-C	8.15	119.79	111.07
1	A	262	LEU	CB-CA-C	-8.09	99.36	112.06
1	A	745	PHE	CB-CA-C	8.09	126.52	110.42
1	A	254	SER	CA-C-N	-7.74	111.07	120.51
1	A	254	SER	C-N-CA	-7.74	111.07	120.51
1	A	444	GLU	N-CA-CB	7.40	122.99	110.49
1	A	535	PHE	CA-C-N	7.40	129.09	119.84
1	A	535	PHE	C-N-CA	7.40	129.09	119.84
1	A	651	HIS	CA-CB-CG	-7.27	106.53	113.80
1	A	107	ARG	O-C-N	7.16	129.48	122.03
1	A	353	HIS	CA-CB-CG	-7.15	106.65	113.80
1	A	59	SER	N-CA-C	6.64	116.81	108.45
1	A	700	ASP	CA-C-N	6.61	133.60	121.70
1	A	700	ASP	C-N-CA	6.61	133.60	121.70
1	A	735	GLU	CG-CD-OE1	6.53	133.41	118.40
1	A	736	GLN	CB-CG-CD	6.51	123.67	112.60
1	A	616	ASN	CA-CB-CG	-6.38	106.22	112.60
1	A	681	VAL	N-CA-C	-6.31	104.12	111.00
1	A	652	PHE	N-CA-C	6.21	118.52	108.41
1	A	40	ASP	CA-CB-CG	-6.19	106.41	112.60
1	A	509	ASP	CA-CB-CG	-6.19	106.41	112.60
1	A	746	PHE	CA-C-N	6.18	130.99	122.77
1	A	746	PHE	C-N-CA	6.18	130.99	122.77
1	A	6	ASP	CA-CB-CG	-6.17	106.43	112.60
1	A	158	ILE	N-CA-CB	6.12	118.86	110.54
1	A	309	GLN	N-CA-C	6.07	120.89	112.45
1	A	408	HIS	CA-CB-CG	-6.05	107.75	113.80
1	A	754	ILE	CA-CB-CG2	6.03	120.75	110.50
1	A	606	ASN	CA-CB-CG	-5.99	106.61	112.60
1	A	442	CYS	N-CA-C	5.98	119.14	110.28
1	A	736	GLN	N-CA-CB	5.96	120.57	110.49
1	A	18	LYS	N-CA-C	5.96	119.12	110.42
1	A	459	GLU	CA-C-N	5.92	130.09	122.93

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	459	GLU	C-N-CA	5.92	130.09	122.93
1	A	475	ASN	CA-CB-CG	-5.90	106.70	112.60
1	A	345	PHE	CA-CB-CG	-5.87	107.94	113.80
1	A	462	LYS	N-CA-C	-5.87	104.07	111.11
1	A	626	ASN	CA-CB-CG	5.86	118.46	112.60
1	A	132	ILE	CA-CB-CG1	-5.85	100.45	110.40
1	A	685	ILE	N-CA-C	5.81	116.02	110.74
1	A	559	GLU	N-CA-C	5.77	117.84	108.26
1	A	700	ASP	N-CA-C	5.75	118.03	108.99
1	A	657	ILE	CB-CA-C	5.74	116.28	110.94
1	A	693	PRO	N-CA-C	-5.70	100.73	112.47
1	A	620	ARG	N-CA-C	-5.66	102.92	110.55
1	A	734	PRO	N-CA-CB	5.65	108.36	103.27
1	A	138	GLU	CB-CA-C	-5.63	101.45	110.79
1	A	54	SER	N-CA-C	5.62	116.69	108.14
1	A	95	SER	N-CA-C	-5.55	104.08	111.24
1	A	54	SER	N-CA-CB	5.54	120.88	111.57
1	A	600	PHE	CA-CB-CG	-5.54	108.26	113.80
1	A	526	LEU	N-CA-C	5.53	117.31	111.28
1	A	460	ILE	N-CA-CB	-5.51	105.95	112.40
1	A	747	ARG	N-CA-C	5.51	117.70	108.73
1	A	535	PHE	CA-CB-CG	5.50	119.30	113.80
1	A	737	PHE	CA-CB-CG	5.48	119.28	113.80
1	A	335	GLY	CA-C-N	-5.45	113.13	120.87
1	A	335	GLY	C-N-CA	-5.45	113.13	120.87
1	A	736	GLN	O-C-N	-5.41	115.40	122.59
1	A	172	ASN	CA-CB-CG	-5.38	107.22	112.60
1	A	619	SER	N-CA-C	5.38	117.44	108.99
1	A	695	ARG	N-CA-C	-5.36	99.39	110.80
1	A	735	GLU	CG-CD-OE2	-5.34	106.13	118.40
1	A	725	ALA	N-CA-C	-5.32	105.38	111.07
1	A	550	HIS	CA-C-N	-5.28	113.95	122.24
1	A	550	HIS	C-N-CA	-5.28	113.95	122.24
1	A	547	LEU	N-CA-CB	5.27	117.65	110.01
1	A	389	LEU	O-C-N	5.25	127.48	122.07
1	A	66	ASP	CA-CB-CG	-5.25	107.36	112.60
1	A	221	ILE	CB-CA-C	-5.24	104.98	112.22
1	A	389	LEU	N-CA-C	-5.24	105.46	111.07
1	A	562	ARG	NE-CZ-NH1	5.24	126.74	121.50
1	A	595	ASP	N-CA-C	-5.24	105.57	111.28
1	A	203	ASN	O-C-N	5.22	126.48	120.58
1	A	193	ILE	CB-CA-C	5.22	119.42	112.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	534	VAL	CB-CA-C	-5.21	105.09	111.92
1	A	635	LYS	CA-C-N	5.17	127.47	120.44
1	A	635	LYS	C-N-CA	5.17	127.47	120.44
1	A	168	ASP	N-CA-CB	5.16	117.88	110.20
1	A	219	ASN	N-CA-CB	5.11	117.92	110.30
1	A	534	VAL	N-CA-C	-5.08	106.72	111.45
1	A	5	HIS	CA-CB-CG	-5.08	108.72	113.80
1	A	572	HIS	CA-CB-CG	5.06	118.86	113.80
1	A	21	ASP	N-CA-C	5.06	116.44	109.15
1	A	210	VAL	N-CA-C	5.04	115.71	110.82
1	A	78	ASN	CA-CB-CG	5.02	117.62	112.60
1	A	371	ASP	CA-CB-CG	-5.00	107.60	112.60

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	5687	0	5544	517	0
2	A	1	0	0	0	0
3	A	27	0	12	6	0
4	A	424	0	0	22	0
All	All	6139	0	5556	518	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 46.

All (518) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:730:LEU:HB3	1:A:732:ILE:HD11	1.19	1.14
1:A:397:ARG:HD2	1:A:404:LEU:HD21	1.29	1.13
1:A:98:ASN:HD22	1:A:100:PRO:HD2	1.10	1.08
1:A:327:THR:HG22	1:A:331:MET:HE3	1.33	1.07

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:736:GLN:CD	1:A:747:ARG:HD3	1.81	1.05
1:A:736:GLN:O	1:A:747:ARG:HD2	1.57	1.04
1:A:4:ILE:HD11	1:A:142:ILE:HG23	1.35	1.03
1:A:362:GLY:HA3	1:A:368:VAL:HG11	1.42	1.01
1:A:689:ARG:HH11	1:A:689:ARG:HB2	1.27	0.98
1:A:432:TRP:CZ2	1:A:436:LYS:HD2	1.99	0.98
1:A:744:ILE:HD11	1:A:746:PHE:HB2	1.45	0.96
1:A:34:TYR:CE1	1:A:51:GLU:HG2	2.01	0.94
1:A:98:ASN:HD22	1:A:100:PRO:CD	1.80	0.93
1:A:685:ILE:HG22	1:A:686:ARG:HD3	1.51	0.93
1:A:322:GLU:HA	1:A:325:LYS:HE2	1.50	0.92
1:A:695:ARG:HH21	1:A:748:ALA:HA	1.34	0.91
1:A:308:ASN:ND2	1:A:309:GLN:HG2	1.86	0.91
1:A:736:GLN:HB3	1:A:747:ARG:HG2	1.56	0.88
1:A:730:LEU:HB3	1:A:732:ILE:CD1	2.02	0.88
1:A:535:PHE:HE1	1:A:537:ASN:HB3	1.38	0.87
1:A:273:GLU:O	1:A:274:THR:HG23	1.76	0.86
1:A:504:ILE:HG23	1:A:506:PHE:CZ	2.11	0.86
1:A:695:ARG:O	1:A:745:PHE:HA	1.75	0.85
1:A:158:ILE:HD12	1:A:159:SER:N	1.92	0.85
1:A:687:ILE:HD13	1:A:691:GLY:H	1.41	0.84
1:A:701:PHE:HD1	1:A:701:PHE:H	1.25	0.84
1:A:686:ARG:HA	1:A:689:ARG:HD3	1.60	0.83
1:A:32:LYS:HZ3	1:A:51:GLU:HB3	1.43	0.83
1:A:397:ARG:HD2	1:A:404:LEU:CD2	2.07	0.83
1:A:593:GLN:HB2	1:A:596:LEU:HD12	1.59	0.83
1:A:465:SER:H	1:A:468:GLN:HE21	1.23	0.82
1:A:4:ILE:HD11	1:A:142:ILE:CG2	2.10	0.82
1:A:744:ILE:HG13	1:A:745:PHE:N	1.94	0.82
1:A:34:TYR:HE1	1:A:51:GLU:HG2	1.44	0.81
1:A:432:TRP:CE2	1:A:436:LYS:HD2	2.16	0.80
1:A:98:ASN:ND2	1:A:100:PRO:HD2	1.93	0.79
1:A:695:ARG:NH2	1:A:748:ALA:HA	1.97	0.79
1:A:735:GLU:HA	1:A:735:GLU:OE1	1.83	0.78
1:A:548:HIS:CE1	1:A:560:GLU:HG3	2.19	0.77
1:A:99:GLU:HG3	1:A:686:ARG:NH2	2.00	0.77
1:A:504:ILE:HG23	1:A:506:PHE:CE1	2.20	0.77
1:A:95:SER:HA	1:A:695:ARG:NH2	2.00	0.77
1:A:397:ARG:CD	1:A:404:LEU:HD21	2.12	0.77
1:A:63:LYS:HG2	1:A:67:GLY:HA2	1.68	0.76
1:A:467:GLU:O	1:A:471:ILE:HD12	1.85	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:147:ARG:HB2	1:A:149:ASN:OD1	1.85	0.76
1:A:32:LYS:NZ	1:A:51:GLU:HB3	2.01	0.75
1:A:372:LYS:CD	1:A:376:ASN:HD21	2.00	0.75
1:A:737:PHE:HB3	1:A:746:PHE:CE1	2.21	0.74
1:A:340:GLU:O	1:A:344:ILE:HG13	1.88	0.74
1:A:691:GLY:O	1:A:693:PRO:HD3	1.87	0.74
1:A:746:PHE:CD2	1:A:751:LEU:HD11	2.22	0.74
1:A:505:ASP:HB2	1:A:508:LEU:CG	2.18	0.74
1:A:147:ARG:HG3	1:A:150:GLU:CD	2.12	0.74
1:A:582:GLN:N	1:A:582:GLN:OE1	2.20	0.73
1:A:273:GLU:C	1:A:274:THR:HG23	2.14	0.73
1:A:580:GLU:HB2	1:A:582:GLN:HE22	1.53	0.73
1:A:4:ILE:CD1	1:A:142:ILE:HG23	2.15	0.72
1:A:746:PHE:CD2	1:A:751:LEU:HD21	2.25	0.72
1:A:372:LYS:HD2	1:A:376:ASN:HD21	1.54	0.72
1:A:736:GLN:C	1:A:747:ARG:HD2	2.13	0.72
1:A:133:PRO:HA	4:A:8275:HOH:O	1.91	0.71
1:A:397:ARG:HA	1:A:406:ALA:HA	1.72	0.71
1:A:505:ASP:HB2	1:A:508:LEU:HG	1.71	0.71
1:A:696:ILE:HA	1:A:744:ILE:CG1	2.20	0.71
1:A:487:PHE:HB2	1:A:506:PHE:CE2	2.25	0.71
1:A:287:GLY:HA3	1:A:324:PHE:CD2	2.26	0.71
1:A:138:GLU:O	1:A:142:ILE:HG13	1.90	0.70
1:A:593:GLN:O	1:A:596:LEU:HB2	1.91	0.70
1:A:81:ASN:ND2	1:A:94:LEU:HB3	2.06	0.70
1:A:362:GLY:HA3	1:A:368:VAL:CG1	2.19	0.70
1:A:368:VAL:HG23	1:A:370:LYS:HG3	1.72	0.70
1:A:701:PHE:CD1	1:A:701:PHE:N	2.60	0.70
1:A:81:ASN:HD21	1:A:94:LEU:HB3	1.57	0.70
1:A:368:VAL:HG21	1:A:370:LYS:HE2	1.73	0.70
1:A:382:PHE:HB2	1:A:384:VAL:HG22	1.74	0.70
1:A:203:ASN:N	1:A:203:ASN:OD1	2.24	0.69
1:A:343:SER:O	1:A:347:ILE:HG13	1.92	0.69
1:A:99:GLU:HG2	1:A:682:LEU:CD1	2.21	0.69
1:A:508:LEU:N	1:A:508:LEU:HD23	2.07	0.69
1:A:131:ARG:NH1	4:A:8127:HOH:O	2.26	0.69
1:A:327:THR:CG2	1:A:331:MET:HE3	2.18	0.69
1:A:455:ILE:O	1:A:455:ILE:HG13	1.91	0.69
1:A:292:GLU:O	1:A:295:ALA:HB3	1.93	0.69
1:A:397:ARG:CB	1:A:404:LEU:HD21	2.23	0.69
1:A:382:PHE:CB	1:A:384:VAL:HG22	2.23	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:750:GLN:HE21	1:A:754:ILE:HG13	1.58	0.68
1:A:491:GLN:HE21	1:A:491:GLN:HA	1.59	0.68
1:A:695:ARG:O	1:A:745:PHE:CA	2.42	0.68
1:A:687:ILE:HD13	1:A:691:GLY:N	2.10	0.67
1:A:732:ILE:HD12	1:A:732:ILE:N	2.09	0.67
1:A:397:ARG:HB2	1:A:404:LEU:HD11	1.76	0.67
1:A:689:ARG:HB2	1:A:689:ARG:NH1	2.04	0.67
1:A:99:GLU:HG2	1:A:682:LEU:HD11	1.77	0.67
1:A:701:PHE:HE2	1:A:754:ILE:HG22	1.59	0.67
1:A:372:LYS:HG3	1:A:376:ASN:HD21	1.58	0.67
1:A:554:LYS:NZ	4:A:8105:HOH:O	2.28	0.67
1:A:746:PHE:CD1	1:A:747:ARG:N	2.60	0.67
1:A:127:ASN:HD21	3:A:999:ADP:C1'	2.08	0.67
1:A:308:ASN:HD22	1:A:309:GLN:N	1.93	0.66
1:A:99:GLU:OE2	1:A:686:ARG:NH2	2.28	0.66
1:A:305:ASN:HA	1:A:308:ASN:OD1	1.95	0.66
1:A:582:GLN:CD	1:A:582:GLN:H	2.01	0.66
1:A:581:ILE:N	1:A:582:GLN:OE1	2.28	0.66
1:A:696:ILE:CA	1:A:744:ILE:HG23	2.26	0.66
1:A:697:ILE:H	1:A:744:ILE:HG12	1.59	0.66
1:A:701:PHE:HD1	1:A:701:PHE:N	1.92	0.66
1:A:751:LEU:HD23	1:A:754:ILE:HG21	1.77	0.66
1:A:750:GLN:NE2	1:A:754:ILE:HG13	2.11	0.66
1:A:397:ARG:HB3	1:A:404:LEU:HD21	1.77	0.65
1:A:43:GLU:HB2	4:A:8300:HOH:O	1.96	0.65
1:A:693:PRO:CG	1:A:694:ASN:H	2.08	0.65
1:A:496:LYS:HG2	1:A:497:GLU:H	1.62	0.65
1:A:693:PRO:CD	1:A:694:ASN:H	2.10	0.65
1:A:308:ASN:HD22	1:A:309:GLN:HG2	1.61	0.65
1:A:35:ILE:O	1:A:49:CYS:HA	1.95	0.65
1:A:687:ILE:CD1	1:A:691:GLY:HA3	2.27	0.65
1:A:83:ILE:HD12	1:A:83:ILE:N	2.11	0.65
1:A:750:GLN:HB3	1:A:754:ILE:CD1	2.27	0.65
1:A:321:SER:OG	1:A:322:GLU:N	2.29	0.64
1:A:372:LYS:CG	1:A:376:ASN:HD21	2.10	0.64
1:A:365:GLU:OE1	1:A:365:GLU:HA	1.98	0.64
1:A:685:ILE:HG22	1:A:686:ARG:CD	2.26	0.64
1:A:319:SER:OG	1:A:322:GLU:HG3	1.98	0.64
1:A:505:ASP:CG	1:A:508:LEU:HD11	2.24	0.63
1:A:722:ALA:O	1:A:725:ALA:HB3	1.99	0.63
1:A:292:GLU:O	1:A:296:LEU:N	2.31	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:285:LEU:CD1	1:A:298:LEU:HD13	2.29	0.63
1:A:747:ARG:HA	1:A:747:ARG:NE	2.12	0.63
1:A:7:ARG:HH22	1:A:21:ASP:HB2	1.63	0.63
1:A:98:ASN:ND2	1:A:100:PRO:HG2	2.13	0.63
1:A:693:PRO:C	1:A:695:ARG:H	2.07	0.63
1:A:492:GLU:C	1:A:494:TYR:H	2.05	0.62
1:A:685:ILE:O	1:A:688:THR:N	2.33	0.62
1:A:37:TYR:OH	1:A:65:SER:N	2.33	0.62
1:A:696:ILE:HA	1:A:744:ILE:HG23	1.80	0.62
1:A:308:ASN:HD22	1:A:308:ASN:C	2.08	0.62
1:A:684:GLY:O	1:A:687:ILE:HG22	1.99	0.62
1:A:741:ILE:C	1:A:743:LYS:H	2.06	0.61
1:A:685:ILE:HG22	1:A:686:ARG:N	2.15	0.61
1:A:83:ILE:HD12	1:A:83:ILE:H	1.65	0.61
1:A:477:LYS:NZ	4:A:8025:HOH:O	2.33	0.61
1:A:746:PHE:HB3	1:A:751:LEU:HD11	1.82	0.61
1:A:308:ASN:HD21	1:A:309:GLN:HG2	1.64	0.61
1:A:319:SER:HG	1:A:321:SER:HG	1.49	0.61
1:A:158:ILE:HD13	1:A:175:LEU:CD2	2.30	0.61
1:A:695:ARG:HH21	1:A:748:ALA:CA	2.10	0.61
1:A:2:ASN:C	1:A:2:ASN:HD22	2.08	0.60
1:A:686:ARG:O	1:A:689:ARG:NH1	2.34	0.60
1:A:736:GLN:HB3	1:A:747:ARG:CG	2.31	0.60
1:A:372:LYS:HG3	1:A:376:ASN:ND2	2.15	0.60
1:A:722:ALA:HA	1:A:725:ALA:HB2	1.84	0.60
1:A:89:GLU:HG3	4:A:8063:HOH:O	1.99	0.60
1:A:265:LYS:O	1:A:268:VAL:HG23	2.01	0.60
1:A:305:ASN:O	1:A:308:ASN:ND2	2.34	0.60
1:A:535:PHE:CE1	1:A:537:ASN:HB3	2.30	0.60
1:A:37:TYR:O	1:A:48:GLU:N	2.33	0.60
1:A:130:LYS:HE2	4:A:8044:HOH:O	2.01	0.60
1:A:680:GLY:HA2	4:A:8198:HOH:O	2.01	0.60
1:A:337:SER:O	1:A:341:GLN:HG3	2.02	0.60
1:A:372:LYS:HD2	1:A:376:ASN:ND2	2.16	0.60
1:A:720:GLN:OE1	1:A:742:THR:HA	2.01	0.60
1:A:2:ASN:O	1:A:6:ASP:N	2.35	0.59
1:A:158:ILE:HD13	1:A:175:LEU:HD23	1.83	0.59
1:A:132:ILE:HG22	1:A:134:ILE:HG23	1.85	0.59
1:A:210:VAL:O	1:A:214:GLN:HG3	2.03	0.59
1:A:399:LEU:HD23	1:A:400:ALA:N	2.18	0.59
1:A:344:ILE:HD11	1:A:432:TRP:HZ3	1.67	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:690:LYS:O	1:A:692:PHE:N	2.36	0.59
1:A:687:ILE:C	1:A:689:ARG:H	2.10	0.59
1:A:507:GLY:HA2	4:A:8221:HOH:O	2.01	0.59
1:A:412:GLU:HG2	1:A:413:LYS:N	2.18	0.59
1:A:687:ILE:O	1:A:689:ARG:N	2.36	0.59
1:A:63:LYS:CG	1:A:67:GLY:HA2	2.33	0.58
1:A:695:ARG:O	1:A:744:ILE:HG13	2.03	0.58
1:A:737:PHE:HA	1:A:746:PHE:HD1	1.68	0.58
1:A:487:PHE:HB2	1:A:506:PHE:CD2	2.38	0.58
1:A:488:LYS:O	1:A:492:GLU:HG3	2.02	0.58
1:A:521:GLN:NE2	4:A:8333:HOH:O	2.23	0.58
1:A:747:ARG:O	1:A:751:LEU:HB2	2.03	0.58
1:A:532:GLN:HE22	1:A:542:THR:HB	1.69	0.58
1:A:290:ALA:N	4:A:8381:HOH:O	2.35	0.58
1:A:686:ARG:O	1:A:689:ARG:HB2	2.03	0.58
1:A:190:LYS:HB3	1:A:194:GLN:NE2	2.17	0.58
1:A:285:LEU:HD12	1:A:298:LEU:HD13	1.85	0.58
1:A:43:GLU:OE1	1:A:43:GLU:HA	2.03	0.58
1:A:362:GLY:CA	1:A:368:VAL:HG11	2.27	0.58
1:A:552:SER:O	1:A:553:LYS:HB2	2.04	0.57
1:A:494:TYR:O	1:A:496:LYS:N	2.37	0.57
1:A:601:LYS:HD2	1:A:613:ASN:HD21	1.69	0.57
1:A:32:LYS:HA	1:A:32:LYS:HE2	1.85	0.57
1:A:301:PRO:HA	1:A:304:PHE:HD2	1.70	0.57
1:A:375:LEU:C	1:A:375:LEU:HD12	2.29	0.57
1:A:732:ILE:HD12	1:A:732:ILE:H	1.70	0.57
1:A:35:ILE:HG22	1:A:36:TRP:N	2.18	0.57
1:A:158:ILE:HD12	1:A:158:ILE:C	2.28	0.57
1:A:741:ILE:O	1:A:743:LYS:HG3	2.05	0.57
1:A:308:ASN:ND2	1:A:309:GLN:HE21	2.03	0.57
1:A:322:GLU:O	1:A:325:LYS:HB2	2.05	0.57
1:A:404:LEU:HD23	1:A:404:LEU:O	2.05	0.57
1:A:656:ILE:CD1	1:A:676:LEU:HD21	2.35	0.57
1:A:696:ILE:HA	1:A:744:ILE:HG12	1.86	0.56
1:A:392:ALA:HB1	1:A:596:LEU:HG	1.86	0.56
1:A:184:GLY:HA2	3:A:999:ADP:O1A	2.05	0.56
1:A:750:GLN:O	1:A:754:ILE:HB	2.05	0.56
1:A:2:ASN:OD1	1:A:5:HIS:ND1	2.38	0.56
1:A:98:ASN:HD22	1:A:100:PRO:CG	2.19	0.56
1:A:40:ASP:O	1:A:43:GLU:N	2.29	0.56
1:A:147:ARG:HG3	1:A:150:GLU:OE1	2.06	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:619:SER:CB	1:A:627:PHE:HE2	2.18	0.56
1:A:744:ILE:HD11	1:A:746:PHE:CB	2.28	0.56
1:A:150:GLU:HG2	4:A:8374:HOH:O	2.06	0.56
1:A:744:ILE:CG1	1:A:745:PHE:N	2.68	0.56
1:A:746:PHE:CG	1:A:751:LEU:HD11	2.41	0.56
1:A:147:ARG:NE	1:A:150:GLU:OE2	2.37	0.56
1:A:368:VAL:CG2	1:A:370:LYS:HE2	2.35	0.56
1:A:382:PHE:HB2	1:A:384:VAL:CG2	2.36	0.56
1:A:580:GLU:HG3	1:A:582:GLN:CD	2.31	0.56
1:A:752:ALA:O	1:A:753:ARG:HG3	2.06	0.56
1:A:730:LEU:O	1:A:730:LEU:HD23	2.07	0.55
1:A:735:GLU:OE1	1:A:737:PHE:O	2.24	0.55
1:A:7:ARG:NH2	1:A:21:ASP:HB2	2.20	0.55
1:A:535:PHE:CG	1:A:536:PRO:HD2	2.42	0.55
1:A:687:ILE:O	1:A:691:GLY:N	2.39	0.55
1:A:619:SER:HB3	1:A:627:PHE:HE2	1.71	0.55
1:A:750:GLN:O	1:A:754:ILE:N	2.39	0.55
1:A:170:ARG:O	1:A:448:TYR:HE2	1.90	0.55
1:A:398:ILE:N	1:A:405:VAL:O	2.31	0.55
1:A:291:GLU:O	1:A:295:ALA:HB2	2.07	0.55
3:A:999:ADP:O3B	4:A:9951:HOH:O	2.18	0.55
1:A:397:ARG:HB3	1:A:404:LEU:CD2	2.37	0.54
1:A:736:GLN:CD	1:A:747:ARG:CD	2.70	0.54
1:A:746:PHE:CE2	1:A:751:LEU:HD21	2.42	0.54
1:A:32:LYS:HE2	1:A:32:LYS:CA	2.37	0.54
1:A:174:SER:O	1:A:651:HIS:HD2	1.89	0.54
1:A:31:ASP:O	1:A:32:LYS:HG2	2.07	0.54
1:A:95:SER:CB	1:A:752:ALA:HB2	2.38	0.54
1:A:39:PRO:HD2	1:A:46:SER:O	2.07	0.54
1:A:375:LEU:HD12	1:A:375:LEU:O	2.08	0.54
1:A:691:GLY:C	1:A:693:PRO:HD3	2.32	0.54
1:A:693:PRO:CD	1:A:694:ASN:N	2.71	0.54
1:A:97:LEU:HG	1:A:685:ILE:HG23	1.88	0.54
1:A:173:GLN:HB2	1:A:450:ILE:HG12	1.90	0.54
1:A:605:ASP:O	1:A:609:THR:OG1	2.26	0.53
1:A:99:GLU:CG	1:A:682:LEU:HD13	2.38	0.53
1:A:513:THR:O	1:A:517:ILE:HD12	2.07	0.53
1:A:81:ASN:OD1	1:A:95:SER:HB2	2.09	0.53
1:A:289:THR:O	1:A:291:GLU:N	2.42	0.53
1:A:395:GLU:HA	1:A:407:GLN:O	2.08	0.53
1:A:473:TYR:OH	1:A:518:ASP:OD2	2.25	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:424:ALA:O	1:A:428:ARG:HG3	2.08	0.53
1:A:432:TRP:HE1	1:A:610:LYS:HZ1	1.55	0.53
1:A:284:LEU:HD13	1:A:345:PHE:CD1	2.44	0.53
1:A:696:ILE:HA	1:A:744:ILE:CG2	2.39	0.53
1:A:540:ASP:HB3	1:A:581:ILE:HD13	1.90	0.53
1:A:614:ASP:O	1:A:617:ILE:N	2.33	0.53
1:A:677:ARG:HG2	1:A:682:LEU:HD12	1.91	0.53
1:A:725:ALA:O	1:A:729:HIS:N	2.40	0.53
1:A:4:ILE:HD13	1:A:146:ARG:HH21	1.73	0.53
1:A:144:LYS:HE2	1:A:199:VAL:HG12	1.90	0.53
1:A:737:PHE:HA	1:A:746:PHE:CD1	2.44	0.53
1:A:35:ILE:HD11	1:A:52:ILE:HD11	1.92	0.52
1:A:311:GLY:N	4:A:8215:HOH:O	2.31	0.52
1:A:548:HIS:ND1	1:A:560:GLU:HG3	2.24	0.52
1:A:677:ARG:CG	1:A:682:LEU:HD12	2.39	0.52
1:A:344:ILE:O	1:A:348:ILE:HG12	2.09	0.52
1:A:410:ASN:OD1	1:A:413:LYS:HB2	2.08	0.52
1:A:362:GLY:H	1:A:368:VAL:HG13	1.73	0.52
1:A:60:PHE:O	1:A:71:GLN:HB2	2.08	0.52
1:A:720:GLN:O	1:A:723:THR:HG22	2.10	0.52
1:A:62:PHE:O	1:A:69:ASP:HB3	2.09	0.52
1:A:590:ASP:N	1:A:591:PRO:HD3	2.24	0.52
1:A:47:TYR:CD1	1:A:47:TYR:N	2.78	0.52
1:A:619:SER:HG	1:A:627:PHE:HE2	1.53	0.52
1:A:38:ASN:OD1	1:A:38:ASN:N	2.42	0.52
1:A:95:SER:HA	1:A:695:ARG:HH22	1.71	0.52
1:A:229:LYS:HG3	1:A:234:ASN:HD22	1.74	0.52
1:A:158:ILE:CD1	1:A:175:LEU:CD2	2.88	0.52
1:A:227:ASN:HA	1:A:236:SER:O	2.10	0.52
1:A:736:GLN:CG	1:A:747:ARG:HD3	2.40	0.52
1:A:737:PHE:HB3	1:A:746:PHE:HE1	1.74	0.52
1:A:743:LYS:C	1:A:744:ILE:HG22	2.34	0.52
1:A:535:PHE:CD1	1:A:536:PRO:HD2	2.45	0.52
1:A:594:GLN:O	1:A:597:GLU:HB2	2.10	0.52
1:A:724:ASP:O	1:A:728:LYS:N	2.43	0.52
1:A:273:GLU:C	1:A:274:THR:CG2	2.83	0.51
1:A:747:ARG:O	1:A:751:LEU:HD12	2.10	0.51
1:A:322:GLU:HA	1:A:325:LYS:CE	2.32	0.51
1:A:487:PHE:HB2	1:A:506:PHE:HE2	1.73	0.51
1:A:489:LEU:O	1:A:492:GLU:HG3	2.09	0.51
1:A:601:LYS:HD3	1:A:613:ASN:ND2	2.25	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:83:ILE:H	1:A:83:ILE:CD1	2.22	0.51
1:A:99:GLU:HG2	1:A:682:LEU:HD13	1.93	0.51
1:A:359:PHE:HB3	1:A:367:ALA:HB1	1.93	0.51
1:A:379:SER:HA	1:A:384:VAL:HG23	1.93	0.51
1:A:121:LEU:HD12	1:A:486:MET:HG3	1.92	0.51
1:A:633:GLN:O	1:A:637:GLN:HG3	2.11	0.51
1:A:127:ASN:O	1:A:658:PRO:HG3	2.10	0.51
1:A:390:GLU:HG2	1:A:394:MET:HE3	1.93	0.50
1:A:219:ASN:N	1:A:220:PRO:HD2	2.25	0.50
1:A:687:ILE:C	1:A:689:ARG:N	2.69	0.50
1:A:160:ASP:OD1	4:A:8014:HOH:O	2.19	0.50
1:A:580:GLU:OE1	1:A:582:GLN:NE2	2.44	0.50
1:A:37:TYR:OH	1:A:65:SER:HB2	2.11	0.50
1:A:504:ILE:HG23	1:A:504:ILE:O	2.11	0.50
1:A:601:LYS:CD	1:A:613:ASN:ND2	2.75	0.50
1:A:532:GLN:O	1:A:535:PHE:HB3	2.12	0.50
1:A:38:ASN:C	1:A:40:ASP:H	2.20	0.50
1:A:432:TRP:HE1	1:A:610:LYS:NZ	2.09	0.50
1:A:686:ARG:HD3	1:A:686:ARG:N	2.26	0.50
1:A:98:ASN:ND2	1:A:100:PRO:CG	2.75	0.50
1:A:362:GLY:O	1:A:363:ALA:HB2	2.12	0.50
1:A:746:PHE:HD2	1:A:751:LEU:HD21	1.75	0.50
1:A:331:MET:HE1	1:A:345:PHE:HZ	1.77	0.49
1:A:687:ILE:HD13	1:A:691:GLY:CA	2.41	0.49
1:A:289:THR:O	1:A:292:GLU:N	2.45	0.49
1:A:62:PHE:CD1	1:A:62:PHE:N	2.80	0.49
1:A:289:THR:C	1:A:291:GLU:N	2.69	0.49
1:A:382:PHE:HB3	1:A:384:VAL:HG22	1.95	0.49
1:A:576:GLN:HB2	4:A:8164:HOH:O	2.13	0.49
1:A:747:ARG:C	1:A:749:GLY:H	2.19	0.49
1:A:755:GLU:O	1:A:755:GLU:HG3	2.11	0.49
1:A:210:VAL:HG23	1:A:211:LEU:N	2.27	0.49
1:A:211:LEU:HA	1:A:214:GLN:OE1	2.12	0.49
1:A:7:ARG:HA	1:A:12:HIS:CG	2.47	0.49
1:A:490:GLU:O	1:A:494:TYR:CD1	2.66	0.49
1:A:752:ALA:C	1:A:753:ARG:HG3	2.38	0.49
1:A:192:VAL:HG11	1:A:452:VAL:HG21	1.94	0.49
1:A:293:LYS:O	1:A:297:HIS:N	2.46	0.49
1:A:71:GLN:O	1:A:71:GLN:HG3	2.13	0.49
1:A:37:TYR:O	1:A:47:TYR:HA	2.13	0.48
1:A:243:ILE:O	1:A:451:GLY:HA2	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:399:LEU:HD23	1:A:400:ALA:H	1.78	0.48
1:A:163:TYR:OH	1:A:251:GLY:O	2.29	0.48
1:A:63:LYS:HD3	1:A:64:THR:O	2.13	0.48
1:A:687:ILE:HD13	1:A:691:GLY:HA3	1.94	0.48
1:A:274:THR:N	1:A:310:SER:O	2.36	0.48
1:A:285:LEU:HD11	1:A:298:LEU:HD13	1.96	0.48
1:A:3:PRO:HA	1:A:6:ASP:HB3	1.96	0.48
1:A:2:ASN:HD21	1:A:4:ILE:HB	1.78	0.48
1:A:572:HIS:NE2	1:A:579:TYR:OH	2.45	0.48
1:A:722:ALA:HA	1:A:725:ALA:CB	2.43	0.48
1:A:285:LEU:HD21	1:A:304:PHE:CD2	2.48	0.47
1:A:581:ILE:HD12	1:A:581:ILE:C	2.39	0.47
1:A:262:LEU:HA	4:A:8077:HOH:O	2.14	0.47
1:A:408:HIS:HD2	1:A:409:LEU:N	2.12	0.47
1:A:701:PHE:HE2	1:A:754:ILE:CG2	2.26	0.47
1:A:99:GLU:N	1:A:100:PRO:CD	2.77	0.47
1:A:127:ASN:OD1	1:A:128:PRO:HD2	2.14	0.47
1:A:532:GLN:HE22	1:A:542:THR:CB	2.27	0.47
1:A:582:GLN:HG2	4:A:8240:HOH:O	2.14	0.47
1:A:37:TYR:CZ	1:A:48:GLU:HB2	2.50	0.47
1:A:47:TYR:H	1:A:47:TYR:HD1	1.63	0.47
1:A:81:ASN:HA	1:A:96:TYR:HD2	1.79	0.47
1:A:85:PHE:O	1:A:88:VAL:HG13	2.14	0.47
1:A:97:LEU:HD12	1:A:685:ILE:HG21	1.96	0.47
1:A:486:MET:HB3	1:A:486:MET:HE3	1.47	0.47
1:A:285:LEU:O	1:A:293:LYS:HE2	2.15	0.47
1:A:305:ASN:HA	1:A:308:ASN:CG	2.39	0.47
1:A:308:ASN:ND2	1:A:308:ASN:C	2.72	0.47
1:A:321:SER:HG	1:A:322:GLU:H	1.62	0.47
1:A:505:ASP:HB2	1:A:508:LEU:CD1	2.44	0.47
1:A:10:ASP:OD2	1:A:14:TYR:HE2	1.97	0.47
1:A:741:ILE:C	1:A:743:LYS:N	2.73	0.47
1:A:616:ASN:HD22	1:A:616:ASN:N	2.13	0.46
1:A:187:GLU:HG2	3:A:999:ADP:O1A	2.15	0.46
1:A:369:LEU:HB2	1:A:394:MET:HE1	1.98	0.46
1:A:605:ASP:OD1	1:A:607:VAL:N	2.44	0.46
1:A:686:ARG:HA	1:A:689:ARG:CD	2.40	0.46
1:A:410:ASN:ND2	4:A:8354:HOH:O	2.27	0.46
1:A:496:LYS:CG	1:A:497:GLU:H	2.28	0.46
1:A:217:GLN:C	1:A:220:PRO:HD2	2.40	0.46
1:A:746:PHE:CD2	1:A:751:LEU:CD1	2.96	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2:ASN:CG	1:A:5:HIS:ND1	2.74	0.46
1:A:580:GLU:HB2	1:A:582:GLN:NE2	2.26	0.46
1:A:66:ASP:OD1	1:A:66:ASP:N	2.47	0.46
1:A:184:GLY:HA2	3:A:999:ADP:PA	2.55	0.46
1:A:272:SER:O	1:A:310:SER:HB2	2.15	0.46
1:A:638:LEU:O	1:A:642:MET:HG2	2.15	0.46
1:A:701:PHE:CE2	1:A:754:ILE:CG2	2.99	0.46
1:A:74:LYS:O	1:A:77:ALA:HB3	2.16	0.46
1:A:737:PHE:CB	1:A:746:PHE:CE1	2.97	0.46
1:A:331:MET:HE1	1:A:345:PHE:CZ	2.50	0.45
1:A:371:ASP:OD2	1:A:373:THR:OG1	2.26	0.45
1:A:217:GLN:HE21	1:A:330:ALA:HA	1.81	0.45
1:A:741:ILE:O	1:A:741:ILE:HG22	2.15	0.45
1:A:142:ILE:O	1:A:142:ILE:HG22	2.16	0.45
1:A:533:SER:HB3	1:A:589:LYS:HD2	1.98	0.45
1:A:601:LYS:CD	1:A:613:ASN:HD21	2.30	0.45
1:A:726:VAL:CG1	1:A:727:LEU:N	2.79	0.45
1:A:730:LEU:C	1:A:732:ILE:HD12	2.42	0.45
1:A:35:ILE:CG2	1:A:36:TRP:N	2.80	0.45
1:A:140:VAL:HG11	1:A:198:SER:OG	2.16	0.45
1:A:219:ASN:N	1:A:220:PRO:CD	2.79	0.45
1:A:492:GLU:C	1:A:494:TYR:N	2.74	0.45
1:A:158:ILE:CD1	1:A:175:LEU:HD21	2.47	0.45
1:A:289:THR:C	1:A:291:GLU:H	2.23	0.45
1:A:97:LEU:HD12	1:A:685:ILE:CG2	2.46	0.45
1:A:379:SER:O	1:A:383:GLY:N	2.48	0.45
1:A:369:LEU:HB2	1:A:394:MET:CE	2.47	0.45
1:A:137:GLN:NE2	1:A:140:VAL:HB	2.32	0.45
1:A:191:LYS:HD3	1:A:191:LYS:HA	1.74	0.45
1:A:693:PRO:HD2	1:A:694:ASN:H	1.82	0.45
1:A:388:VAL:HG12	1:A:388:VAL:O	2.16	0.45
1:A:491:GLN:O	1:A:494:TYR:HB2	2.16	0.45
1:A:306:TYR:OH	1:A:422:VAL:HG21	2.17	0.44
1:A:81:ASN:HA	1:A:96:TYR:CD2	2.52	0.44
1:A:300:GLY:O	1:A:303:SER:OG	2.27	0.44
1:A:396:PRO:HD2	1:A:407:GLN:O	2.17	0.44
1:A:656:ILE:HD11	1:A:676:LEU:CD2	2.47	0.44
1:A:746:PHE:CD2	1:A:751:LEU:CD2	2.98	0.44
1:A:32:LYS:HD3	1:A:51:GLU:OE1	2.18	0.44
1:A:686:ARG:O	1:A:689:ARG:HD3	2.18	0.44
1:A:697:ILE:O	1:A:699:ALA:N	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:747:ARG:HE	1:A:748:ALA:H	1.66	0.44
1:A:270:PHE:CD2	1:A:270:PHE:C	2.94	0.44
1:A:584:TRP:CD1	1:A:584:TRP:N	2.84	0.44
1:A:701:PHE:CE2	1:A:754:ILE:HG22	2.46	0.44
1:A:736:GLN:OE1	1:A:747:ARG:HD3	2.14	0.44
1:A:368:VAL:CG2	1:A:370:LYS:HG3	2.43	0.44
1:A:491:GLN:HE21	1:A:491:GLN:CA	2.27	0.44
1:A:693:PRO:O	1:A:695:ARG:N	2.49	0.44
1:A:697:ILE:C	1:A:699:ALA:N	2.75	0.44
1:A:37:TYR:CE1	1:A:48:GLU:CB	3.01	0.43
1:A:687:ILE:CD1	1:A:691:GLY:CA	2.95	0.43
1:A:685:ILE:CG2	1:A:686:ARG:N	2.79	0.43
1:A:539:THR:H	1:A:542:THR:HG1	1.66	0.43
1:A:293:LYS:HA	1:A:298:LEU:HB2	2.01	0.43
1:A:565:LYS:NZ	4:A:8097:HOH:O	2.51	0.43
1:A:580:GLU:CG	1:A:582:GLN:NE2	2.81	0.43
1:A:273:GLU:O	1:A:274:THR:CG2	2.58	0.43
1:A:544:ILE:O	1:A:544:ILE:HG13	2.19	0.43
1:A:98:ASN:C	1:A:100:PRO:HD2	2.44	0.43
1:A:158:ILE:HD13	1:A:175:LEU:HD21	2.00	0.43
1:A:619:SER:OG	1:A:627:PHE:HE2	2.01	0.43
1:A:389:LEU:O	1:A:392:ALA:HB3	2.18	0.43
1:A:505:ASP:HB2	1:A:508:LEU:HD11	2.00	0.43
1:A:746:PHE:CD2	1:A:751:LEU:CG	3.01	0.43
1:A:98:ASN:ND2	1:A:100:PRO:CD	2.64	0.43
1:A:280:ILE:HD11	1:A:345:PHE:HE1	1.84	0.43
1:A:210:VAL:HG23	1:A:211:LEU:H	1.84	0.43
1:A:243:ILE:O	1:A:452:VAL:N	2.40	0.43
1:A:687:ILE:HD13	1:A:687:ILE:O	2.18	0.43
1:A:2:ASN:HD22	1:A:3:PRO:N	2.16	0.43
1:A:685:ILE:HG13	4:A:8197:HOH:O	2.18	0.43
1:A:732:ILE:CD1	1:A:732:ILE:H	2.32	0.43
1:A:693:PRO:CG	1:A:694:ASN:N	2.79	0.42
1:A:746:PHE:CE2	1:A:751:LEU:CD2	3.01	0.42
1:A:582:GLN:N	1:A:582:GLN:CD	2.72	0.42
1:A:354:LEU:O	1:A:418:ARG:NH1	2.50	0.42
1:A:685:ILE:O	1:A:688:THR:HB	2.19	0.42
1:A:158:ILE:CD1	1:A:175:LEU:HD23	2.47	0.42
1:A:315:ILE:O	1:A:318:VAL:HB	2.19	0.42
1:A:590:ASP:N	1:A:591:PRO:CD	2.82	0.42
1:A:736:GLN:O	1:A:747:ARG:HB2	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:35:ILE:CG1	1:A:52:ILE:HD11	2.50	0.42
1:A:136:THR:O	1:A:139:MET:N	2.52	0.42
1:A:521:GLN:HA	1:A:522:PRO:C	2.45	0.42
1:A:732:ILE:CD1	1:A:732:ILE:N	2.78	0.42
1:A:121:LEU:CD1	1:A:486:MET:HG3	2.49	0.42
1:A:693:PRO:HG2	1:A:694:ASN:H	1.82	0.42
1:A:751:LEU:HD23	1:A:751:LEU:HA	1.71	0.42
1:A:614:ASP:C	1:A:616:ASN:N	2.75	0.42
1:A:70:ARG:O	1:A:71:GLN:HB3	2.19	0.42
1:A:97:LEU:HD13	1:A:97:LEU:HA	1.79	0.42
1:A:285:LEU:HD12	1:A:298:LEU:CD1	2.48	0.42
1:A:361:LYS:NZ	1:A:363:ALA:C	2.78	0.42
1:A:369:LEU:CB	1:A:394:MET:HE1	2.49	0.42
1:A:697:ILE:N	1:A:744:ILE:HG21	2.34	0.42
1:A:390:GLU:HG2	1:A:394:MET:CE	2.48	0.42
1:A:747:ARG:C	1:A:749:GLY:N	2.78	0.42
1:A:362:GLY:CA	1:A:368:VAL:CG1	2.95	0.41
1:A:746:PHE:CB	1:A:751:LEU:HD11	2.46	0.41
1:A:292:GLU:C	1:A:295:ALA:HB3	2.44	0.41
1:A:505:ASP:HB2	1:A:508:LEU:CD2	2.50	0.41
1:A:247:PHE:N	1:A:247:PHE:CD1	2.88	0.41
1:A:425:LEU:O	1:A:429:LEU:HB2	2.20	0.41
1:A:521:GLN:HA	1:A:522:PRO:HA	1.86	0.41
1:A:285:LEU:HD12	1:A:285:LEU:HA	1.58	0.41
1:A:676:LEU:O	1:A:682:LEU:HG	2.20	0.41
1:A:683:GLU:O	1:A:685:ILE:N	2.54	0.41
1:A:37:TYR:CE1	1:A:48:GLU:HB3	2.56	0.41
1:A:136:THR:O	1:A:139:MET:HB2	2.21	0.41
1:A:442:CYS:SG	1:A:443:GLN:N	2.94	0.41
1:A:227:ASN:CA	1:A:236:SER:O	2.69	0.41
1:A:687:ILE:HD12	1:A:691:GLY:HA3	2.00	0.41
1:A:389:LEU:O	1:A:393:LEU:N	2.49	0.41
1:A:431:LEU:HG	4:A:8413:HOH:O	2.20	0.41
1:A:682:LEU:HD23	1:A:682:LEU:HA	1.62	0.41
1:A:56:THR:O	1:A:58:ASP:N	2.54	0.41
1:A:104:HIS:O	1:A:108:VAL:HG23	2.21	0.41
1:A:167:LEU:HD21	1:A:251:GLY:HA3	2.02	0.41
1:A:440:VAL:HG12	1:A:441:LEU:HD23	2.03	0.41
1:A:754:ILE:HG21	1:A:754:ILE:HD13	1.65	0.41
1:A:19:GLN:HB3	1:A:21:ASP:OD1	2.20	0.41
1:A:435:LYS:HZ2	1:A:435:LYS:HG2	1.72	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:535:PHE:HA	1:A:536:PRO:HD3	1.58	0.41
1:A:683:GLU:C	1:A:685:ILE:N	2.76	0.41
1:A:138:GLU:CD	1:A:138:GLU:H	2.29	0.41
1:A:609:THR:O	1:A:613:ASN:N	2.50	0.41
1:A:696:ILE:CB	1:A:744:ILE:HG23	2.50	0.41
1:A:720:GLN:N	1:A:723:THR:HB	2.36	0.41
1:A:259:GLN:HG2	1:A:261:TYR:CZ	2.56	0.40
1:A:319:SER:OG	1:A:321:SER:OG	2.27	0.40
1:A:354:LEU:O	1:A:418:ARG:HD3	2.20	0.40
1:A:504:ILE:HA	1:A:504:ILE:HD12	1.80	0.40
1:A:740:GLY:O	1:A:741:ILE:HG12	2.21	0.40
1:A:59:SER:HB3	1:A:73:LYS:HA	2.02	0.40
1:A:127:ASN:ND2	3:A:999:ADP:O4'	2.38	0.40
1:A:153:PRO:O	1:A:154:HIS:HB2	2.20	0.40
1:A:259:GLN:HG2	1:A:261:TYR:OH	2.21	0.40
1:A:428:ARG:HD3	1:A:611:LEU:O	2.20	0.40
1:A:687:ILE:CG2	1:A:688:THR:N	2.83	0.40
1:A:2:ASN:C	1:A:2:ASN:ND2	2.78	0.40
1:A:449:PHE:CD1	1:A:449:PHE:C	3.00	0.40
1:A:743:LYS:H	1:A:743:LYS:HG3	1.69	0.40
1:A:372:LYS:HD2	1:A:376:ASN:CG	2.47	0.40
1:A:722:ALA:C	1:A:724:ASP:H	2.28	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

There are no protein backbone outliers to report in this entry.

### 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	609/666 (91%)	507 (83%)	102 (17%)	<b>2</b> <b>1</b>

All (102) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	ILE
1	A	13	LYS
1	A	19	GLN
1	A	22	SER
1	A	31	ASP
1	A	32	LYS
1	A	38	ASN
1	A	46	SER
1	A	47	TYR
1	A	54	SER
1	A	59	SER
1	A	63	LYS
1	A	66	ASP
1	A	68	GLN
1	A	69	ASP
1	A	76	ASP
1	A	89	GLU
1	A	91	MET
1	A	92	SER
1	A	97	LEU
1	A	142	ILE
1	A	168	ASP
1	A	191	LYS
1	A	199	VAL
1	A	203	ASN
1	A	243	ILE
1	A	244	GLU
1	A	259	GLN
1	A	269	VAL
1	A	274	THR
1	A	285	LEU
1	A	298	LEU
1	A	305	ASN
1	A	308	ASN
1	A	313	VAL
1	A	325	LYS
1	A	326	ILE
1	A	328	ARG

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Mol	Chain	Res	Type
1	A	337	SER
1	A	358	LYS
1	A	368	VAL
1	A	369	LEU
1	A	372	LYS
1	A	375	LEU
1	A	379	SER
1	A	381	VAL
1	A	384	VAL
1	A	391	LYS
1	A	398	ILE
1	A	399	LEU
1	A	404	LEU
1	A	405	VAL
1	A	407	GLN
1	A	429	LEU
1	A	431	LEU
1	A	436	LYS
1	A	446	LYS
1	A	463	VAL
1	A	486	MET
1	A	487	PHE
1	A	491	GLN
1	A	492	GLU
1	A	495	LEU
1	A	505	ASP
1	A	508	LEU
1	A	517	ILE
1	A	520	ARG
1	A	531	GLU
1	A	533	SER
1	A	542	THR
1	A	562	ARG
1	A	580	GLU
1	A	582	GLN
1	A	601	LYS
1	A	604	SER
1	A	606	ASN
1	A	609	THR
1	A	610	LYS
1	A	617	ILE
1	A	620	ARG

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Mol	Chain	Res	Type
1	A	626	ASN
1	A	661	LYS
1	A	668	GLU
1	A	669	ASP
1	A	685	ILE
1	A	686	ARG
1	A	687	ILE
1	A	689	ARG
1	A	690	LYS
1	A	701	PHE
1	A	720	GLN
1	A	723	THR
1	A	726	VAL
1	A	730	LEU
1	A	733	ASP
1	A	735	GLU
1	A	738	ARG
1	A	741	ILE
1	A	743	LYS
1	A	744	ILE
1	A	750	GLN
1	A	754	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (26) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	2	ASN
1	A	68	GLN
1	A	79	GLN
1	A	98	ASN
1	A	217	GLN
1	A	234	ASN
1	A	259	GLN
1	A	283	GLN
1	A	308	ASN
1	A	309	GLN
1	A	329	GLN
1	A	338	GLN
1	A	376	ASN
1	A	439	ASN
1	A	468	GLN
1	A	483	ASN

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Mol	Chain	Res	Type
1	A	491	GLN
1	A	521	GLN
1	A	532	GLN
1	A	613	ASN
1	A	616	ASN
1	A	649	ASN
1	A	651	HIS
1	A	694	ASN
1	A	736	GLN
1	A	750	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry ⓘ

Of 2 ligands modelled in this entry, 1 is monoatomic - leaving 1 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	$\# Z  > 2$
3	ADP	A	999	2	28,29,29	1.42	2 (7%)	43,45,45	1.46	10 (23%)

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	ADP	A	999	2	-	2/16/32/32	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	999	ADP	C6-N6	-3.60	1.25	1.34
3	A	999	ADP	C2-N1	3.27	1.39	1.33

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	999	ADP	C2-N1-C6	3.02	123.69	118.73
3	A	999	ADP	O4'-C1'-N9	2.88	113.62	108.09
3	A	999	ADP	C1'-N9-C8	2.73	133.15	127.09
3	A	999	ADP	O3B-PB-O3A	2.69	113.64	104.64
3	A	999	ADP	C5-C6-N6	2.32	129.03	123.29
3	A	999	ADP	N3-C2-N1	-2.31	125.08	128.58
3	A	999	ADP	O3'-C3'-C2'	2.29	119.17	111.82
3	A	999	ADP	C4-N9-C1'	-2.22	121.45	126.63
3	A	999	ADP	O4'-C4'-C3'	-2.05	101.09	105.15
3	A	999	ADP	O3A-PB-O1B	-2.01	100.46	111.04

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	999	ADP	PA-O3A-PB-O2B
3	A	999	ADP	PA-O3A-PB-O1B

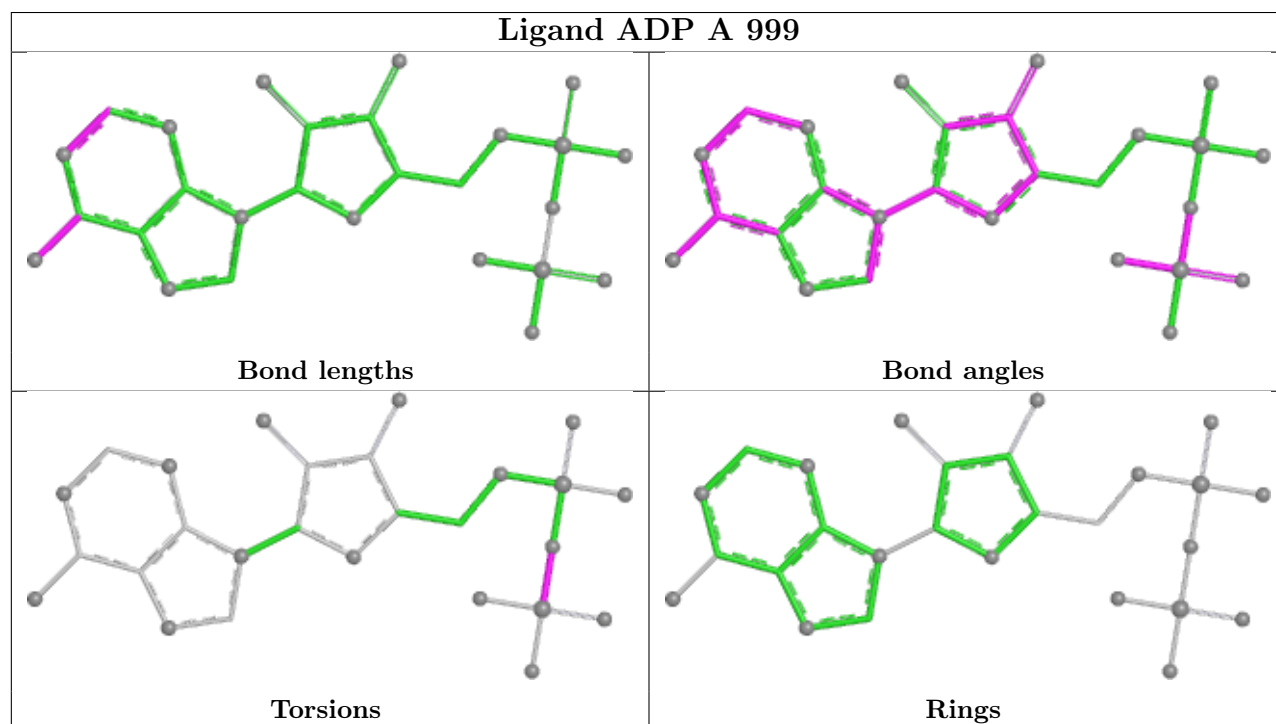
There are no ring outliers.

1 monomer is involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	999	ADP	6	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

EDS was not executed - this section is therefore empty.

### 6.2 Non-standard residues in protein, DNA, RNA chains

EDS was not executed - this section is therefore empty.

### 6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

### 6.4 Ligands

EDS was not executed - this section is therefore empty.

### 6.5 Other polymers

EDS was not executed - this section is therefore empty.