



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 04:28 PM UTC

PDB ID : 2OTG / pdb_00002otg
Title : Rigor-like structures of muscle myosins reveal key mechanical elements in the transduction pathways of this allosteric motor
Authors : Yang, Y.; Gourinath, S.; Kovacs, M.; Nyitray, L.; Reutzel, R.; Himmel, D.M.; O'Neill-Hennessey, E.; Reshetnikova, L.; Szent-Gyorgyi, A.G.; Brown, J.H.; Cohen, C.
Deposited on : 2007-02-08
Resolution : 3.12 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

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>.

The following versions of software and data (see [references](#) ①) were used in the production of this report:

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

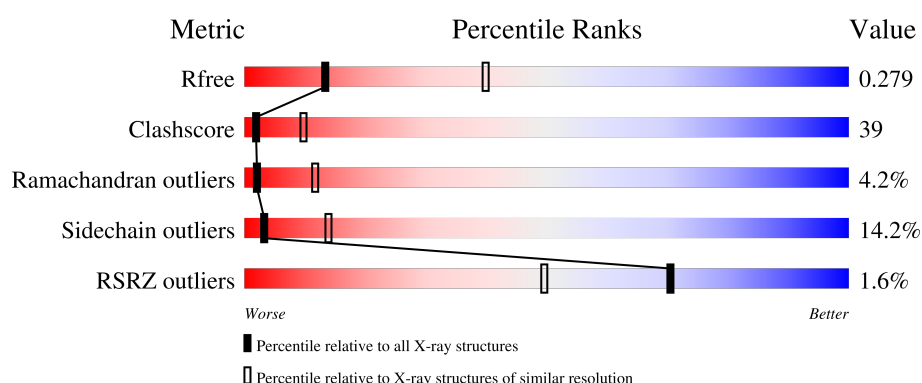
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.12 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}	180053	1816 (3.14-3.10)
Clashscore	190562	1906 (3.14-3.10)
Ramachandran outliers	187476	1802 (3.14-3.10)
Sidechain outliers	187428	1802 (3.14-3.10)
RSRZ outliers	180081	1816 (3.14-3.10)

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 ≥ 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	840	7% 42% 40% 12% 5%
2	B	157	7% 29% 38% 20% 10%
3	C	157	46% 45% 6% 2%

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 8821 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 heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	800	Total	C	N	O	S	0	0	0
			6440	4096	1115	1192	37			

- Molecule 2 is a protein called Myosin regulatory light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	141	Total	C	N	O	S	0	0	0
			1119	704	180	225	10			

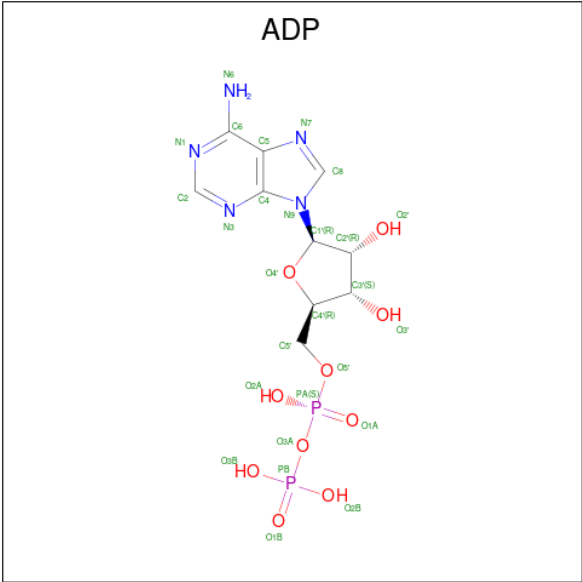
- Molecule 3 is a protein called Myosin essential light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	155	Total	C	N	O	S	0	0	0
			1232	778	195	252	7			

- Molecule 4 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Mg	0	0
			1	1		
4	B	1	Total	Mg	0	0
			1	1		

- Molecule 5 is ADENOSINE-5'-DIPHOSPHATE (CCD ID: ADP) (formula: C₁₀H₁₅N₅O₁₀P₂).



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

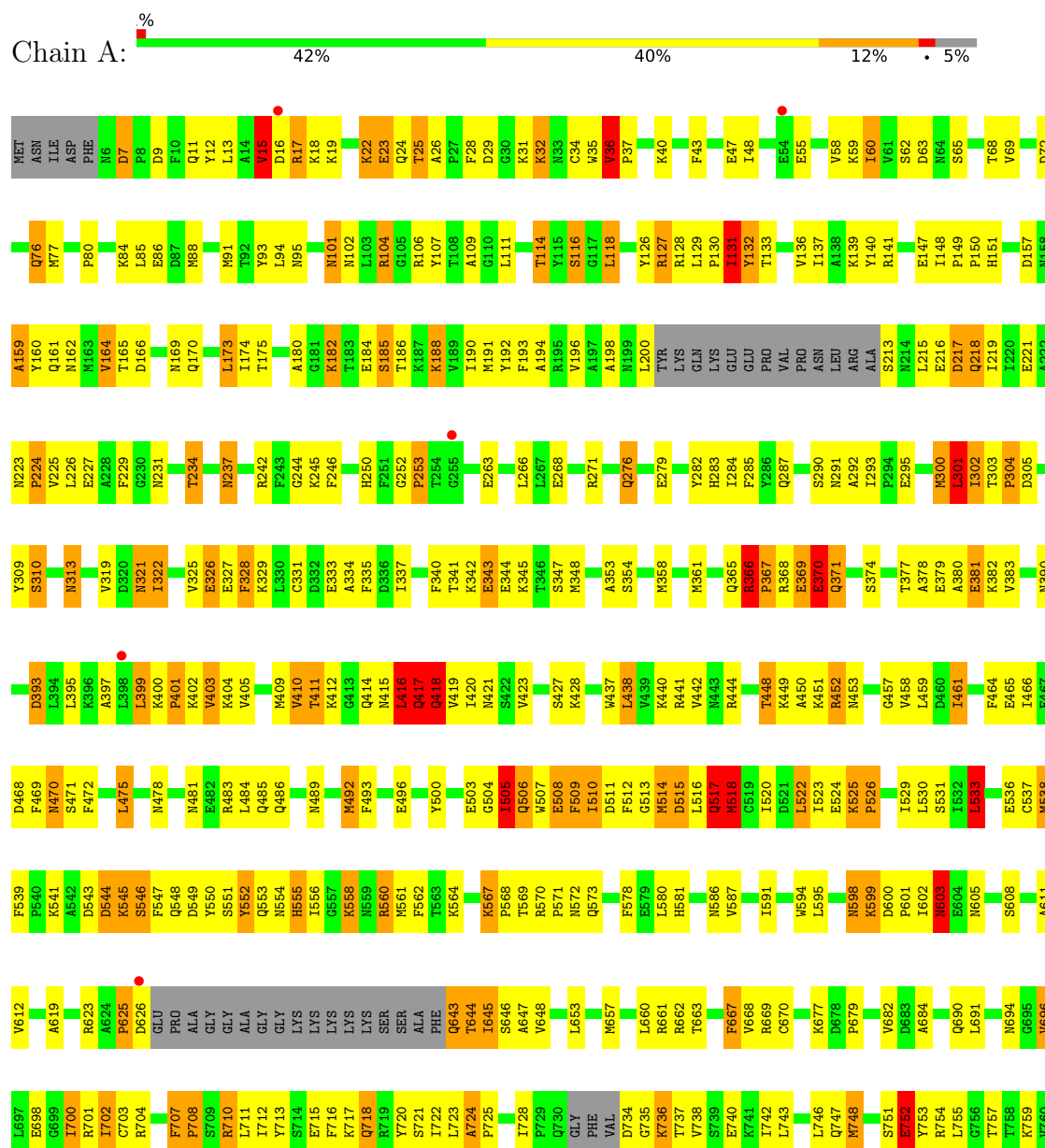
- Molecule 6 is CALCIUM ION (CCD ID: CA) (formula: Ca).

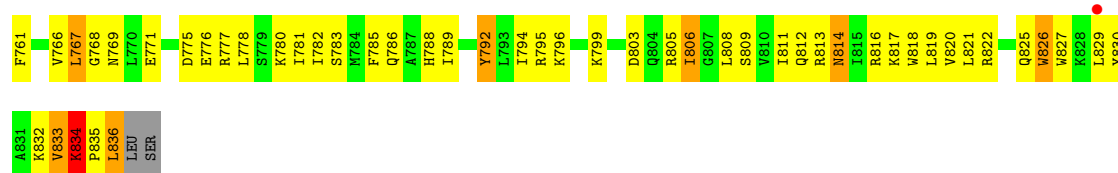
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	C	1	Total	Ca	0	0
			1	1		

3 Residue-property plots

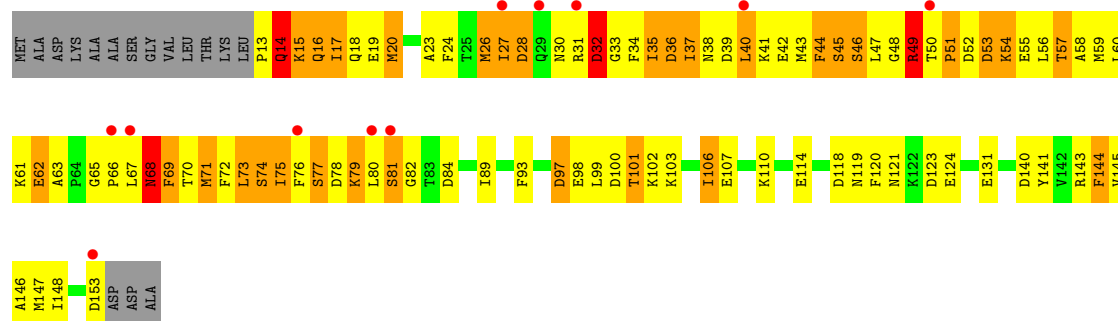
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Myosin heavy chain

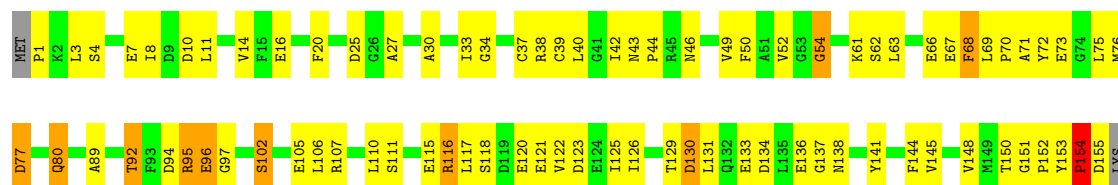




• Molecule 2: Myosin regulatory light chain



• Molecule 3: Myosin essential light chain



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	87.09Å 51.69Å 159.90Å 90.00° 100.77° 90.00°	Depositor
Resolution (Å)	19.97 – 3.12 19.97 – 3.12	Depositor EDS
% Data completeness (in resolution range)	84.1 (19.97-3.12) 83.9 (19.97-3.12)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	9.80	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.10 (at 3.12Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.276 , 0.304 0.274 , 0.279	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	83.4	Xtriage
Anisotropy	0.350	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.27 , 61.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	8821	wwPDB-VP
Average B, all atoms (Å ²)	87.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.69% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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

5.1 Standard geometry

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

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	0.66	2/6570 (0.0%)	1.16	63/8855 (0.7%)
2	B	0.70	0/1136	1.22	12/1518 (0.8%)
3	C	0.57	0/1257	1.07	7/1692 (0.4%)
All	All	0.65	2/8963 (0.0%)	1.16	82/12065 (0.7%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	518	MET	SD-CE	-7.69	1.60	1.79
1	A	416	LEU	C-O	5.35	1.30	1.24

All (82) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	509	PHE	N-CA-C	13.05	138.60	110.80
1	A	370	GLU	N-CA-C	12.61	127.02	110.88
1	A	707	PHE	CA-C-N	9.11	131.23	119.84
1	A	707	PHE	C-N-CA	9.11	131.23	119.84
2	B	15	LYS	N-CA-C	-8.73	101.89	112.54
1	A	644	THR	N-CA-C	8.43	121.47	110.43
1	A	552	TYR	N-CA-C	-8.40	102.62	113.12
3	C	3	LEU	N-CA-C	8.29	121.74	110.55

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	23	GLU	N-CA-C	-8.21	101.56	112.72
1	A	508	GLU	CA-C-N	-7.89	106.48	121.54
1	A	508	GLU	C-N-CA	-7.89	106.48	121.54
1	A	417	GLN	N-CA-CB	-7.74	97.41	110.49
3	C	153	TYR	CA-C-N	7.55	129.28	119.84
3	C	153	TYR	C-N-CA	7.55	129.28	119.84
2	B	14	GLN	N-CA-C	7.42	126.59	110.80
1	A	509	PHE	N-CA-CB	-7.32	98.12	110.49
1	A	546	SER	N-CA-C	-7.27	103.29	111.07
1	A	736	LYS	N-CA-C	-7.12	103.58	112.90
1	A	370	GLU	N-CA-CB	-7.04	101.10	111.51
1	A	778	LEU	N-CA-C	-7.03	103.69	111.36
3	C	151	GLY	CA-C-N	6.92	126.16	118.97
3	C	151	GLY	C-N-CA	6.92	126.16	118.97
1	A	266	LEU	N-CA-C	6.91	120.91	111.17
1	A	533	LEU	N-CA-C	-6.81	103.78	111.07
3	C	154	PRO	N-CA-C	6.77	126.42	112.47
1	A	808	LEU	N-CA-C	-6.76	103.71	112.23
2	B	26	MET	N-CA-C	-6.73	103.87	111.14
1	A	700	ILE	N-CA-C	-6.66	105.35	111.67
1	A	523	ILE	N-CA-C	6.58	116.73	110.74
1	A	544	ASP	N-CA-C	-6.58	104.36	112.38
2	B	65	GLY	CA-C-N	6.49	127.95	119.84
2	B	65	GLY	C-N-CA	6.49	127.95	119.84
1	A	252	GLY	CA-C-N	6.48	127.94	119.84
1	A	252	GLY	C-N-CA	6.48	127.94	119.84
1	A	468	ASP	N-CA-C	-6.48	104.15	111.14
1	A	159	ALA	N-CA-C	-6.45	104.33	111.82
1	A	724	ALA	CA-C-N	6.38	126.30	119.28
1	A	724	ALA	C-N-CA	6.38	126.30	119.28
1	A	95	ASN	N-CA-C	6.34	117.81	108.86
1	A	300	MET	N-CA-C	-6.22	106.22	113.88
1	A	369	GLU	N-CA-C	6.18	123.96	110.80
2	B	68	ASN	N-CA-C	-6.16	98.49	108.41
1	A	524	GLU	N-CA-C	6.11	120.73	113.28
1	A	417	GLN	CB-CG-CD	-6.06	102.30	112.60
2	B	106	ILE	N-CA-C	6.01	116.67	110.36
1	A	505	ILE	N-CA-C	-5.99	96.88	109.34
1	A	7	ASP	N-CA-C	5.99	119.57	109.87
1	A	448	THR	N-CA-C	-5.86	99.59	108.67
1	A	131	ILE	N-CA-C	5.77	118.31	111.09
1	A	245	LYS	N-CA-C	5.77	118.51	108.76

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	416	LEU	O-C-N	5.68	130.14	122.59
1	A	416	LEU	N-CA-CB	-5.65	100.94	110.49
1	A	555	HIS	N-CA-C	5.63	122.79	110.80
1	A	814	ASN	N-CA-C	5.62	117.49	111.36
1	A	684	ALA	N-CA-C	5.56	117.80	111.02
1	A	525	LYS	CA-C-N	5.53	126.75	119.84
1	A	525	LYS	C-N-CA	5.53	126.75	119.84
2	B	114	GLU	N-CA-C	5.48	120.07	112.90
1	A	587	VAL	N-CA-C	5.46	113.88	107.77
1	A	513	GLY	N-CA-C	-5.45	100.28	113.18
2	B	97	ASP	CA-C-N	5.42	128.09	120.28
2	B	97	ASP	C-N-CA	5.42	128.09	120.28
1	A	104	ARG	N-CA-C	-5.40	104.63	111.11
2	B	57	THR	N-CA-C	-5.38	105.05	111.03
1	A	539	PHE	CA-C-N	5.35	124.53	118.97
1	A	539	PHE	C-N-CA	5.35	124.53	118.97
1	A	517	GLN	N-CA-C	5.33	116.78	111.07
1	A	185	SER	N-CA-C	-5.33	105.13	111.69
1	A	302	ILE	N-CA-C	5.18	116.77	108.89
2	B	120	PHE	N-CA-C	-5.17	103.57	110.55
1	A	175	THR	N-CA-C	5.16	115.10	108.34
3	C	110	LEU	N-CA-C	5.13	117.78	111.82
1	A	328	PHE	N-CA-C	-5.09	105.81	111.36
1	A	423	VAL	N-CA-C	-5.09	105.88	110.82
1	A	276	GLN	N-CA-C	-5.09	102.99	110.52
1	A	101	ASN	N-CA-C	5.08	116.51	111.07
1	A	667	PHE	N-CA-C	5.07	117.66	109.40
1	A	36	VAL	CA-C-N	5.07	125.86	119.98
1	A	36	VAL	C-N-CA	5.07	125.86	119.98
1	A	118	LEU	N-CA-C	-5.05	106.97	113.23
1	A	310	SER	N-CA-C	5.03	118.52	112.38
1	A	76	GLN	N-CA-C	5.01	117.49	110.23

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	550	TYR	Sidechain

5.2 Too-close contacts ⓘ

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	6440	0	6436	458	0
2	B	1119	0	1088	189	0
3	C	1232	0	1155	58	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
5	A	27	0	12	2	0
6	C	1	0	0	0	0
All	All	8821	0	8691	683	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 39.

All (683) 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)
2:B:37:ILE:HD12	2:B:60:LEU:HD13	1.30	1.12
3:C:52:VAL:HG21	3:C:75:LEU:HD21	1.17	1.12
2:B:37:ILE:HG22	2:B:41:LYS:HD2	1.26	1.10
1:A:643:GLN:HA	1:A:643:GLN:HE21	1.21	1.05
2:B:71:MET:O	2:B:75:ILE:HG13	1.61	1.00
1:A:11:GLN:HE21	1:A:12:TYR:HE1	1.02	0.99
2:B:14:GLN:HE21	2:B:14:GLN:HA	1.27	0.99
1:A:319:VAL:HB	1:A:322:ILE:HB	1.45	0.98
1:A:552:TYR:HD2	1:A:556:ILE:HG21	1.27	0.98
2:B:69:PHE:CE1	2:B:73:LEU:HG	1.99	0.97
1:A:229:PHE:CE2	1:A:284:ILE:HG12	2.00	0.96
2:B:74:SER:O	2:B:78:ASP:HB2	1.65	0.96
2:B:40:LEU:CD1	2:B:60:LEU:HD21	1.94	0.96
1:A:17:ARG:H	1:A:17:ARG:HD3	1.28	0.96
3:C:95:ARG:H	3:C:95:ARG:HD2	1.32	0.95
2:B:37:ILE:HG22	2:B:41:LYS:CD	1.96	0.95
1:A:365:GLN:HG3	1:A:365:GLN:O	1.63	0.94
2:B:57:THR:HG22	2:B:61:LYS:HD2	1.48	0.93
1:A:514:MET:HG2	1:A:515:ASP:H	1.35	0.92
1:A:508:GLU:O	1:A:508:GLU:HG2	1.70	0.92

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:321:ASN:H	1:A:321:ASN:ND2	1.66	0.92
1:A:518:MET:HE3	1:A:560:ARG:CZ	2.00	0.91
2:B:27:ILE:HG22	2:B:35:ILE:CG1	2.00	0.91
1:A:369:GLU:C	1:A:370:GLU:HG2	1.94	0.91
2:B:38:ASN:O	2:B:42:GLU:HG2	1.70	0.91
1:A:17:ARG:HD3	1:A:17:ARG:N	1.85	0.90
1:A:321:ASN:HD22	1:A:321:ASN:N	1.66	0.90
2:B:46:SER:O	2:B:47:LEU:HD23	1.71	0.90
2:B:24:PHE:CE2	2:B:69:PHE:HA	2.07	0.90
2:B:57:THR:HG22	2:B:61:LYS:CD	2.02	0.89
2:B:14:GLN:HA	2:B:14:GLN:NE2	1.85	0.89
2:B:31:ARG:C	2:B:33:GLY:H	1.80	0.88
2:B:40:LEU:HD13	2:B:60:LEU:HD21	1.53	0.88
2:B:45:SER:O	2:B:47:LEU:N	2.06	0.88
2:B:45:SER:C	2:B:47:LEU:H	1.78	0.87
1:A:319:VAL:HG11	1:A:322:ILE:HG13	1.56	0.87
2:B:57:THR:HG22	2:B:61:LYS:HG3	1.57	0.87
3:C:52:VAL:HG21	3:C:75:LEU:CD2	2.02	0.87
2:B:27:ILE:CG2	2:B:35:ILE:HG12	2.05	0.86
2:B:30:ASN:ND2	2:B:32:ASP:HB3	1.91	0.86
1:A:13:LEU:HD21	1:A:131:ILE:CG2	2.06	0.85
1:A:556:ILE:HD11	1:A:564:LYS:HE2	1.56	0.84
1:A:321:ASN:H	1:A:321:ASN:HD22	0.87	0.84
2:B:57:THR:HG22	2:B:61:LYS:CG	2.08	0.84
1:A:173:LEU:HD12	1:A:173:LEU:N	1.93	0.84
1:A:822:ARG:HH11	1:A:822:ARG:HB3	1.42	0.83
2:B:35:ILE:HG21	2:B:40:LEU:HD21	1.58	0.83
1:A:441:ARG:HA	1:A:444:ARG:HD2	1.59	0.83
1:A:410:VAL:HG12	1:A:411:THR:H	1.43	0.83
2:B:35:ILE:CG2	2:B:40:LEU:HG	2.09	0.83
2:B:77:SER:O	2:B:81:SER:HB3	1.77	0.83
1:A:728:ILE:HD12	1:A:738:VAL:HG13	1.61	0.82
1:A:509:PHE:CE2	1:A:510:ILE:HG13	2.14	0.82
2:B:57:THR:CG2	2:B:61:LYS:HD2	2.09	0.82
2:B:23:ALA:O	2:B:27:ILE:HD13	1.78	0.82
1:A:814:ASN:OD1	2:B:89:ILE:HD11	1.80	0.81
1:A:746:LEU:O	1:A:747:GLN:HG2	1.79	0.81
1:A:403:VAL:O	1:A:409:MET:HB2	1.80	0.80
2:B:27:ILE:HG22	2:B:35:ILE:HG12	1.62	0.80
2:B:37:ILE:HD12	2:B:60:LEU:CD1	2.09	0.80
1:A:186:THR:HG23	1:A:458:VAL:HG11	1.64	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:794:ILE:HD12	3:C:38:ARG:HD2	1.64	0.79
2:B:26:MET:HG3	2:B:43:MET:HE1	1.65	0.79
2:B:13:PRO:O	2:B:17:ILE:HG13	1.82	0.78
1:A:507:TRP:NE1	1:A:509:PHE:H	1.82	0.78
2:B:27:ILE:HG22	2:B:35:ILE:HG13	1.64	0.78
1:A:549:ASP:O	1:A:553:GLN:HG3	1.83	0.78
1:A:368:ARG:HE	1:A:368:ARG:HA	1.47	0.78
1:A:13:LEU:HD21	1:A:131:ILE:HG23	1.65	0.78
1:A:507:TRP:CD1	1:A:509:PHE:H	2.02	0.77
2:B:69:PHE:CZ	2:B:73:LEU:HG	2.20	0.77
1:A:173:LEU:HD12	1:A:173:LEU:H	1.51	0.76
2:B:26:MET:O	2:B:43:MET:CE	2.33	0.76
2:B:31:ARG:O	2:B:33:GLY:N	2.17	0.76
1:A:22:LYS:HA	1:A:22:LYS:NZ	2.01	0.76
2:B:35:ILE:HG21	2:B:40:LEU:CD2	2.15	0.76
1:A:514:MET:HE3	1:A:701:ARG:HH22	1.51	0.76
2:B:13:PRO:HB2	2:B:16:GLN:CB	2.14	0.76
2:B:99:LEU:O	2:B:100:ASP:HB2	1.85	0.76
3:C:118:SER:OG	3:C:121:GLU:HG3	1.87	0.75
2:B:17:ILE:O	2:B:20:MET:HG2	1.85	0.75
2:B:68:ASN:ND2	2:B:68:ASN:O	2.18	0.75
2:B:40:LEU:HD11	2:B:60:LEU:HD21	1.67	0.75
1:A:290:SER:HB2	1:A:325:VAL:HG22	1.68	0.75
1:A:345:LYS:O	1:A:348:MET:HB2	1.88	0.74
1:A:561:MET:C	1:A:581:HIS:HD2	1.95	0.74
2:B:45:SER:C	2:B:47:LEU:N	2.41	0.74
1:A:822:ARG:HB3	1:A:822:ARG:NH1	2.01	0.74
1:A:402:LYS:HB3	1:A:605:ASN:ND2	2.02	0.74
1:A:509:PHE:CD2	1:A:510:ILE:HG13	2.21	0.74
1:A:518:MET:CE	1:A:560:ARG:CZ	2.65	0.74
1:A:510:ILE:HG22	1:A:511:ASP:N	2.01	0.73
1:A:415:ASN:HB2	1:A:418:GLN:OE1	1.86	0.73
1:A:48:ILE:HA	1:A:58:VAL:HG12	1.70	0.73
1:A:818:TRP:HB2	2:B:148:ILE:HG23	1.69	0.73
2:B:54:LYS:HE3	2:B:54:LYS:HA	1.71	0.73
2:B:26:MET:CG	2:B:43:MET:HE1	2.18	0.73
1:A:560:ARG:HD2	1:A:561:MET:HE2	1.71	0.73
1:A:437:TRP:CD1	1:A:440:LYS:HE2	2.23	0.73
1:A:834:LYS:N	1:A:835:PRO:CD	2.52	0.72
1:A:500:TYR:HB3	1:A:506:GLN:O	1.89	0.72
2:B:37:ILE:HD13	2:B:37:ILE:H	1.54	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:552:TYR:CD2	1:A:556:ILE:HG21	2.18	0.72
1:A:644:THR:O	1:A:648:VAL:HG23	1.89	0.72
1:A:11:GLN:HG2	1:A:12:TYR:CE1	2.24	0.72
1:A:581:HIS:CE1	1:A:586:ASN:HD21	2.08	0.72
1:A:15:VAL:CG2	1:A:111:LEU:HD11	2.20	0.72
1:A:598:ASN:ND2	1:A:645:ILE:HB	2.05	0.71
3:C:144:PHE:O	3:C:148:VAL:HG23	1.89	0.71
2:B:24:PHE:CZ	2:B:69:PHE:HA	2.26	0.71
1:A:237:ASN:HD21	5:A:999:ADP:H4'	1.56	0.71
1:A:504:GLY:C	1:A:505:ILE:O	2.32	0.71
1:A:814:ASN:CG	2:B:89:ILE:HD11	2.16	0.71
1:A:625:PRO:O	1:A:626:ASP:OD1	2.08	0.70
3:C:52:VAL:CG2	3:C:75:LEU:HD21	2.10	0.70
2:B:13:PRO:HB2	2:B:16:GLN:HB3	1.73	0.70
1:A:361:MET:HE2	1:A:380:ALA:HA	1.73	0.70
2:B:97:ASP:OD2	2:B:101:THR:N	2.25	0.70
2:B:31:ARG:C	2:B:33:GLY:N	2.44	0.69
2:B:15:LYS:O	2:B:19:GLU:HG2	1.91	0.69
2:B:28:ASP:OD2	2:B:31:ARG:HA	1.92	0.69
1:A:291:ASN:HB2	1:A:304:PRO:HB3	1.74	0.69
1:A:452:ARG:HH11	1:A:452:ARG:CG	2.06	0.69
1:A:785:PHE:O	1:A:789:ILE:HG13	1.93	0.69
1:A:812:GLN:HE22	2:B:118:ASP:H	1.41	0.69
1:A:310:SER:HA	1:A:313:ASN:ND2	2.08	0.69
1:A:788:HIS:CE1	3:C:80:GLN:HE22	2.11	0.69
2:B:26:MET:C	2:B:28:ASP:H	2.01	0.69
1:A:794:ILE:HG22	3:C:39:CYS:SG	2.33	0.68
1:A:22:LYS:HA	1:A:22:LYS:HZ3	1.57	0.68
1:A:368:ARG:HA	1:A:368:ARG:NE	2.07	0.68
1:A:694:ASN:HD22	1:A:696:VAL:HG22	1.59	0.68
1:A:22:LYS:HZ3	1:A:24:GLN:HG3	1.58	0.68
1:A:598:ASN:HD22	1:A:645:ILE:HB	1.58	0.68
1:A:834:LYS:N	1:A:835:PRO:HD3	2.08	0.68
2:B:35:ILE:N	2:B:35:ILE:HD12	2.09	0.68
1:A:60:ILE:N	1:A:60:ILE:HD13	2.08	0.68
1:A:182:LYS:HG3	5:A:999:ADP:O1B	1.93	0.67
1:A:417:GLN:O	1:A:420:ILE:N	2.27	0.67
1:A:34:CYS:O	1:A:77:MET:HE3	1.94	0.67
1:A:198:ALA:O	1:A:200:LEU:HG	1.94	0.67
1:A:118:LEU:HD11	1:A:492:MET:HE2	1.74	0.67
1:A:643:GLN:HA	1:A:643:GLN:NE2	2.03	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:143:ARG:O	2:B:146:ALA:N	2.27	0.67
1:A:15:VAL:HG22	1:A:111:LEU:HD11	1.75	0.66
1:A:552:TYR:HD2	1:A:556:ILE:CG2	2.07	0.66
1:A:598:ASN:HD21	1:A:646:SER:H	1.43	0.66
1:A:736:LYS:O	1:A:740:GLU:HG3	1.95	0.66
1:A:796:LYS:HD3	3:C:152:PRO:HB3	1.77	0.66
2:B:35:ILE:HG22	2:B:40:LEU:HG	1.77	0.66
1:A:229:PHE:HE2	1:A:284:ILE:HG12	1.58	0.66
1:A:118:LEU:CD1	1:A:492:MET:HE2	2.26	0.66
1:A:581:HIS:CE1	1:A:586:ASN:ND2	2.64	0.66
1:A:556:ILE:HD11	1:A:564:LYS:CE	2.25	0.66
1:A:11:GLN:NE2	1:A:12:TYR:HE1	1.84	0.65
2:B:37:ILE:CD1	2:B:60:LEU:HD13	2.18	0.65
2:B:35:ILE:CG2	2:B:40:LEU:CG	2.75	0.65
2:B:13:PRO:HD2	2:B:17:ILE:HD11	1.77	0.65
2:B:27:ILE:HG22	2:B:27:ILE:O	1.95	0.65
1:A:560:ARG:CD	1:A:561:MET:HE2	2.27	0.65
1:A:415:ASN:CB	1:A:418:GLN:OE1	2.44	0.65
1:A:736:LYS:HZ3	1:A:755:LEU:HB3	1.62	0.65
1:A:736:LYS:NZ	1:A:755:LEU:HB3	2.13	0.65
2:B:41:LYS:HE2	2:B:56:LEU:HD13	1.78	0.65
2:B:43:MET:O	2:B:46:SER:N	2.29	0.65
3:C:95:ARG:H	3:C:95:ARG:CD	2.09	0.65
1:A:11:GLN:HG2	1:A:12:TYR:CD1	2.31	0.64
1:A:287:GLN:HB3	1:A:328:PHE:HB2	1.79	0.64
2:B:68:ASN:ND2	2:B:71:MET:HB2	2.12	0.64
3:C:111:SER:O	3:C:116:ARG:HG2	1.98	0.64
1:A:34:CYS:HA	1:A:77:MET:HB2	1.79	0.64
1:A:399:LEU:O	1:A:401:PRO:HD3	1.96	0.64
1:A:378:ALA:O	1:A:382:LYS:HG3	1.96	0.64
1:A:450:ALA:O	1:A:452:ARG:HD3	1.96	0.64
2:B:24:PHE:HE2	2:B:72:PHE:HB2	1.62	0.64
1:A:440:LYS:O	1:A:444:ARG:HG3	1.98	0.64
2:B:14:GLN:NE2	2:B:14:GLN:CA	2.59	0.64
2:B:68:ASN:O	2:B:69:PHE:C	2.41	0.64
1:A:292:ALA:HB2	1:A:325:VAL:HG13	1.80	0.63
1:A:470:ASN:N	1:A:470:ASN:HD22	1.96	0.63
1:A:812:GLN:NE2	2:B:118:ASP:H	1.95	0.63
2:B:26:MET:O	2:B:28:ASP:N	2.31	0.63
2:B:37:ILE:HG22	2:B:41:LYS:CE	2.28	0.63
2:B:99:LEU:O	2:B:99:LEU:HG	1.98	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:184:GLU:O	1:A:188:LYS:HD2	1.99	0.63
1:A:397:ALA:O	1:A:401:PRO:HG3	1.99	0.63
1:A:514:MET:HG2	1:A:515:ASP:N	2.12	0.63
1:A:469:PHE:C	1:A:470:ASN:HD22	2.06	0.63
3:C:73:GLU:HA	3:C:76:MET:HE2	1.81	0.63
1:A:36:VAL:HG12	1:A:37:PRO:HD2	1.81	0.63
1:A:302:ILE:HD11	1:A:353:ALA:HB1	1.81	0.63
3:C:42:ILE:HD11	3:C:76:MET:HG2	1.80	0.63
1:A:365:GLN:O	1:A:366:ARG:O	2.16	0.63
1:A:552:TYR:O	1:A:556:ILE:HG22	1.97	0.62
1:A:595:LEU:N	1:A:595:LEU:HD12	2.14	0.62
1:A:818:TRP:CB	2:B:148:ILE:HG23	2.28	0.62
1:A:441:ARG:O	1:A:444:ARG:HB2	1.99	0.62
1:A:23:GLU:O	1:A:23:GLU:HG2	1.98	0.62
1:A:55:GLU:OE1	1:A:68:THR:HG21	1.99	0.62
1:A:341:THR:HB	1:A:344:GLU:HG3	1.80	0.62
1:A:489:ASN:HB3	1:A:512:PHE:CB	2.29	0.62
1:A:722:ILE:HG12	1:A:722:ILE:O	1.99	0.62
2:B:33:GLY:C	2:B:34:PHE:CD1	2.78	0.62
3:C:154:PRO:O	3:C:155:ASP:HB2	2.00	0.62
1:A:465:GLU:H	1:A:478:ASN:HD21	1.47	0.61
1:A:303:THR:O	1:A:305:ASP:N	2.28	0.61
1:A:724:ALA:N	1:A:725:PRO:HD3	2.15	0.61
3:C:122:VAL:O	3:C:125:ILE:HG22	2.00	0.61
1:A:400:LYS:HG3	1:A:412:LYS:O	2.01	0.61
1:A:223:ASN:HB2	1:A:224:PRO:HD3	1.82	0.61
1:A:571:PRO:O	1:A:572:ASN:HB3	1.98	0.61
1:A:365:GLN:O	1:A:365:GLN:CG	2.46	0.61
1:A:834:LYS:H	1:A:835:PRO:HD3	1.63	0.61
2:B:24:PHE:CZ	2:B:69:PHE:CA	2.83	0.61
1:A:268:GLU:OE2	1:A:271:ARG:NH1	2.34	0.61
1:A:561:MET:HA	1:A:581:HIS:CD2	2.36	0.61
1:A:792:TYR:CD1	1:A:792:TYR:C	2.78	0.61
1:A:215:LEU:HD21	1:A:448:THR:HG21	1.82	0.60
3:C:141:TYR:O	3:C:145:VAL:HG23	2.00	0.60
1:A:690:GLN:O	1:A:694:ASN:N	2.34	0.60
1:A:696:VAL:O	1:A:700:ILE:HG13	2.02	0.60
1:A:504:GLY:O	1:A:505:ILE:O	2.20	0.60
1:A:88:MET:HG2	1:A:102:ASN:HD22	1.66	0.60
1:A:452:ARG:NH1	1:A:452:ARG:HG3	2.16	0.60
1:A:137:ILE:HG23	1:A:192:TYR:CE2	2.37	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:147:GLU:O	1:A:148:ILE:HB	2.01	0.60
1:A:525:LYS:HB3	1:A:526:PRO:HD2	1.83	0.60
1:A:310:SER:HA	1:A:313:ASN:HD21	1.65	0.60
2:B:26:MET:HG3	2:B:43:MET:CE	2.31	0.60
1:A:489:ASN:HB3	1:A:512:PHE:HB2	1.84	0.59
1:A:186:THR:O	1:A:190:ILE:HG12	2.01	0.59
1:A:31:LYS:C	1:A:32:LYS:HE2	2.28	0.59
1:A:448:THR:O	1:A:450:ALA:N	2.35	0.59
1:A:509:PHE:CE2	1:A:510:ILE:CG1	2.84	0.59
2:B:38:ASN:HB3	2:B:42:GLU:OE2	2.02	0.59
1:A:390:ASN:HB3	1:A:393:ASP:HB2	1.83	0.59
1:A:403:VAL:HG22	1:A:404:LYS:H	1.67	0.59
2:B:37:ILE:O	2:B:41:LYS:HB2	2.03	0.59
3:C:11:LEU:HD22	3:C:72:TYR:CD2	2.38	0.59
1:A:22:LYS:C	1:A:24:GLN:H	2.10	0.59
1:A:459:LEU:HD21	1:A:461:ILE:HD11	1.85	0.59
1:A:169:ASN:HB3	1:A:663:THR:HG22	1.84	0.58
1:A:193:PHE:HA	1:A:196:VAL:HG22	1.85	0.58
1:A:390:ASN:HD22	1:A:393:ASP:H	1.50	0.58
1:A:493:PHE:HB2	1:A:512:PHE:CD2	2.39	0.58
3:C:71:ALA:O	3:C:75:LEU:HD23	2.03	0.58
1:A:417:GLN:O	1:A:418:GLN:C	2.46	0.58
1:A:645:ILE:HG22	1:A:646:SER:N	2.17	0.58
2:B:141:TYR:O	2:B:145:VAL:HG23	2.03	0.58
1:A:452:ARG:HH11	1:A:452:ARG:HG3	1.67	0.58
2:B:41:LYS:CE	2:B:56:LEU:HD13	2.33	0.58
2:B:30:ASN:OD1	2:B:32:ASP:N	2.36	0.58
3:C:37:CYS:HG	3:C:72:TYR:HD1	1.52	0.58
1:A:720:TYR:HB3	1:A:723:LEU:HD12	1.86	0.58
2:B:37:ILE:CG2	2:B:41:LYS:HD2	2.18	0.58
1:A:319:VAL:CG1	1:A:322:ILE:HG13	2.32	0.58
2:B:30:ASN:CG	2:B:32:ASP:HB3	2.27	0.58
2:B:37:ILE:HD13	2:B:37:ILE:N	2.19	0.58
2:B:140:ASP:CG	2:B:143:ARG:HG3	2.29	0.58
2:B:101:THR:O	2:B:102:LYS:HB2	2.03	0.57
3:C:11:LEU:HD13	3:C:40:LEU:HD11	1.85	0.57
2:B:71:MET:O	2:B:75:ILE:CG1	2.45	0.57
1:A:132:TYR:CE2	1:A:188:LYS:HG2	2.39	0.57
1:A:509:PHE:CE2	1:A:510:ILE:CD1	2.87	0.57
1:A:813:ARG:NH1	2:B:84:ASP:OD2	2.37	0.57
2:B:35:ILE:HG22	2:B:40:LEU:CG	2.34	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:49:ARG:CG	2:B:49:ARG:O	2.52	0.57
1:A:182:LYS:HE3	1:A:461:ILE:O	2.04	0.57
1:A:284:ILE:HG23	1:A:285:PHE:N	2.19	0.57
1:A:619:ALA:O	1:A:623:ARG:HG3	2.05	0.57
2:B:57:THR:O	2:B:58:ALA:C	2.47	0.57
1:A:25:THR:HG22	1:A:26:ALA:N	2.20	0.57
2:B:61:LYS:C	2:B:63:ALA:H	2.11	0.57
2:B:61:LYS:C	2:B:63:ALA:N	2.60	0.57
1:A:173:LEU:N	1:A:173:LEU:CD1	2.64	0.57
1:A:302:ILE:HD11	1:A:353:ALA:CB	2.35	0.57
1:A:341:THR:HG21	1:A:343:GLU:HG2	1.86	0.57
1:A:244:GLY:HA3	1:A:461:ILE:HG23	1.85	0.57
1:A:483:ARG:HB3	1:A:657:MET:HE2	1.85	0.57
1:A:514:MET:CG	1:A:515:ASP:H	2.12	0.57
2:B:26:MET:O	2:B:43:MET:HE1	2.05	0.57
1:A:377:THR:HG21	1:A:381:GLU:OE2	2.05	0.56
1:A:522:LEU:HD11	1:A:562:PHE:HB2	1.87	0.56
2:B:27:ILE:CG2	2:B:27:ILE:O	2.53	0.56
2:B:77:SER:O	2:B:81:SER:CB	2.51	0.56
1:A:242:ARG:HD2	1:A:271:ARG:NH1	2.20	0.56
2:B:38:ASN:C	2:B:42:GLU:HG2	2.30	0.56
1:A:35:TRP:NE1	1:A:77:MET:HG3	2.21	0.56
1:A:128:ARG:NH1	1:A:184:GLU:OE2	2.38	0.56
1:A:505:ILE:HG12	1:A:506:GLN:H	1.69	0.56
2:B:28:ASP:OD1	2:B:30:ASN:OD1	2.24	0.56
3:C:107:ARG:NH1	3:C:123:ASP:OD2	2.38	0.56
1:A:743:LEU:HD13	1:A:753:TYR:CD2	2.41	0.56
2:B:37:ILE:CG2	2:B:41:LYS:CE	2.83	0.56
1:A:738:VAL:O	1:A:742:ILE:HG13	2.06	0.56
1:A:836:LEU:N	1:A:836:LEU:HD23	2.21	0.56
3:C:133:GLU:OE1	3:C:137:GLY:HA2	2.06	0.56
1:A:438:LEU:O	1:A:442:VAL:HG23	2.06	0.55
2:B:37:ILE:CD1	2:B:37:ILE:N	2.69	0.55
1:A:518:MET:HE1	1:A:560:ARG:NE	2.21	0.55
1:A:794:ILE:CG2	3:C:39:CYS:SG	2.94	0.55
1:A:537:CYS:HB3	1:A:599:LYS:HE2	1.87	0.55
2:B:43:MET:O	2:B:44:PHE:C	2.49	0.55
3:C:125:ILE:O	3:C:129:THR:HG23	2.05	0.55
1:A:343:GLU:HG3	1:A:344:GLU:H	1.71	0.55
1:A:36:VAL:CG1	1:A:69:VAL:HG11	2.37	0.55
1:A:287:GLN:NE2	1:A:327:GLU:HG3	2.20	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:493:PHE:CD2	1:A:511:ASP:HA	2.41	0.55
2:B:68:ASN:H	2:B:68:ASN:HD22	1.54	0.55
2:B:72:PHE:CZ	2:B:76:PHE:HE1	2.24	0.55
1:A:250:HIS:HB3	1:A:452:ARG:HB3	1.88	0.55
2:B:78:ASP:O	2:B:81:SER:OG	2.25	0.55
1:A:711:LEU:O	1:A:759:LYS:HB2	2.07	0.55
1:A:767:LEU:O	1:A:771:GLU:HG2	2.07	0.55
1:A:833:VAL:O	1:A:833:VAL:CG1	2.55	0.55
1:A:690:GLN:O	1:A:694:ASN:HB2	2.07	0.55
2:B:35:ILE:CG2	2:B:40:LEU:CD2	2.83	0.55
1:A:29:ASP:OD2	1:A:32:LYS:HD2	2.06	0.54
1:A:15:VAL:HG12	1:A:16:ASP:H	1.70	0.54
1:A:361:MET:CE	1:A:383:VAL:HG21	2.37	0.54
1:A:518:MET:CE	1:A:560:ARG:NE	2.71	0.54
1:A:536:GLU:O	1:A:536:GLU:HG3	2.06	0.54
1:A:591:ILE:HA	1:A:594:TRP:NE1	2.22	0.54
1:A:169:ASN:CB	1:A:663:THR:HG22	2.38	0.54
1:A:313:ASN:C	1:A:313:ASN:HD22	2.15	0.54
2:B:106:ILE:HG23	2:B:107:GLU:N	2.23	0.54
1:A:173:LEU:H	1:A:173:LEU:CD1	2.19	0.54
1:A:341:THR:HB	1:A:343:GLU:HG3	1.90	0.54
1:A:548:GLN:HG2	1:A:552:TYR:CE1	2.43	0.54
1:A:107:TYR:C	1:A:109:ALA:H	2.16	0.54
1:A:644:THR:HG23	1:A:647:ALA:HB3	1.90	0.54
2:B:17:ILE:O	2:B:18:GLN:C	2.50	0.54
1:A:331:CYS:O	1:A:334:ALA:HB3	2.08	0.54
2:B:17:ILE:O	2:B:20:MET:CG	2.54	0.54
1:A:414:GLN:OE1	1:A:414:GLN:HA	2.08	0.53
2:B:121:ASN:ND2	2:B:124:GLU:OE1	2.41	0.53
2:B:32:ASP:O	2:B:34:PHE:HD1	1.91	0.53
2:B:106:ILE:O	2:B:110:LYS:HG3	2.08	0.53
1:A:253:PRO:HD3	1:A:453:ASN:ND2	2.23	0.53
2:B:61:LYS:O	2:B:63:ALA:N	2.41	0.53
1:A:17:ARG:H	1:A:17:ARG:CD	2.10	0.53
1:A:326:GLU:O	1:A:329:LYS:HB2	2.08	0.53
2:B:26:MET:C	2:B:28:ASP:N	2.67	0.53
1:A:581:HIS:ND1	1:A:586:ASN:ND2	2.56	0.53
1:A:591:ILE:C	1:A:591:ILE:HD12	2.34	0.53
1:A:734:ASP:HB3	1:A:737:THR:CB	2.38	0.53
1:A:734:ASP:HB3	1:A:737:THR:HB	1.91	0.53
2:B:48:GLY:O	2:B:50:THR:N	2.42	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:97:ASP:OD1	2:B:101:THR:OG1	2.26	0.53
1:A:215:LEU:O	1:A:219:ILE:HG13	2.09	0.53
1:A:792:TYR:C	1:A:792:TYR:HD1	2.16	0.52
2:B:69:PHE:O	2:B:72:PHE:N	2.41	0.52
1:A:341:THR:CG2	1:A:343:GLU:HG2	2.40	0.52
2:B:68:ASN:O	2:B:70:THR:N	2.42	0.52
3:C:52:VAL:HG11	3:C:75:LEU:HD22	1.92	0.52
1:A:556:ILE:HB	1:A:562:PHE:HE2	1.75	0.52
1:A:792:TYR:CD1	1:A:792:TYR:O	2.61	0.52
1:A:817:LYS:NZ	2:B:79:LYS:O	2.21	0.52
2:B:52:ASP:O	2:B:53:ASP:C	2.51	0.52
1:A:194:ALA:O	1:A:198:ALA:HB2	2.10	0.52
1:A:221:GLU:O	1:A:224:PRO:HD2	2.09	0.52
1:A:514:MET:CE	1:A:701:ARG:HH22	2.19	0.52
1:A:452:ARG:CG	1:A:452:ARG:NH1	2.69	0.52
1:A:826:TRP:CZ3	2:B:59:MET:HE3	2.45	0.52
2:B:51:PRO:HG2	2:B:56:LEU:HG	1.92	0.52
1:A:496:GLU:HG3	1:A:500:TYR:CE2	2.44	0.52
2:B:38:ASN:HA	2:B:41:LYS:HB2	1.91	0.52
1:A:63:ASP:OD1	1:A:65:SER:OG	2.26	0.52
1:A:645:ILE:O	1:A:648:VAL:N	2.42	0.52
1:A:399:LEU:O	1:A:414:GLN:HG2	2.09	0.52
3:C:94:ASP:OD2	3:C:97:GLY:HA2	2.08	0.52
1:A:605:ASN:O	1:A:608:SER:OG	2.27	0.52
1:A:734:ASP:HB3	1:A:737:THR:OG1	2.10	0.51
1:A:817:LYS:O	1:A:820:VAL:N	2.40	0.51
2:B:17:ILE:HA	2:B:20:MET:CG	2.41	0.51
3:C:68:PHE:O	3:C:69:LEU:C	2.53	0.51
2:B:36:ASP:O	2:B:40:LEU:HD12	2.10	0.51
2:B:143:ARG:O	2:B:144:PHE:C	2.53	0.51
1:A:148:ILE:HG12	1:A:149:PRO:HD2	1.92	0.51
1:A:335:PHE:HB3	1:A:340:PHE:HB2	1.93	0.51
3:C:42:ILE:CD1	3:C:76:MET:HG2	2.41	0.51
1:A:567:LYS:NZ	1:A:567:LYS:HB3	2.26	0.51
1:A:568:PRO:HA	1:A:573:GLN:OE1	2.10	0.51
2:B:31:ARG:O	2:B:31:ARG:HG2	2.11	0.51
1:A:558:LYS:HE3	1:A:558:LYS:HA	1.93	0.51
1:A:667:PHE:CD1	1:A:667:PHE:N	2.78	0.51
1:A:833:VAL:O	1:A:833:VAL:HG13	2.11	0.51
1:A:36:VAL:HG11	1:A:69:VAL:HG11	1.91	0.51
2:B:30:ASN:HD21	2:B:32:ASP:HB3	1.72	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:76:GLN:HA	1:A:76:GLN:OE1	2.10	0.50
2:B:13:PRO:CB	2:B:16:GLN:HB3	2.40	0.50
2:B:15:LYS:CE	2:B:19:GLU:OE2	2.58	0.50
2:B:43:MET:O	2:B:45:SER:N	2.45	0.50
1:A:221:GLU:C	1:A:224:PRO:HD2	2.37	0.50
1:A:404:LYS:HG3	1:A:409:MET:HE3	1.93	0.50
2:B:143:ARG:O	2:B:145:VAL:N	2.45	0.50
3:C:102:SER:HA	3:C:138:ASN:HD22	1.77	0.50
1:A:792:TYR:CE1	3:C:152:PRO:HG3	2.47	0.50
1:A:399:LEU:O	1:A:414:GLN:CG	2.59	0.50
1:A:403:VAL:CG1	1:A:405:VAL:HG23	2.41	0.50
1:A:561:MET:CA	1:A:581:HIS:HD2	2.25	0.50
1:A:157:ASP:O	1:A:160:TYR:HB3	2.11	0.49
2:B:36:ASP:O	2:B:37:ILE:C	2.55	0.49
3:C:10:ASP:O	3:C:14:VAL:HG23	2.12	0.49
1:A:691:LEU:CD2	1:A:696:VAL:HG21	2.41	0.49
1:A:18:LYS:C	1:A:18:LYS:HD3	2.37	0.49
1:A:569:THR:HG22	1:A:570:ARG:HG2	1.94	0.49
1:A:591:ILE:HA	1:A:594:TRP:CE2	2.48	0.49
1:A:608:SER:O	1:A:612:VAL:HG23	2.13	0.49
1:A:159:ALA:O	1:A:170:GLN:HG3	2.11	0.49
1:A:475:LEU:HD12	1:A:594:TRP:CH2	2.47	0.49
1:A:104:ARG:HG3	1:A:682:VAL:HG11	1.94	0.49
2:B:49:ARG:HH21	2:B:52:ASP:CG	2.21	0.49
1:A:657:MET:O	1:A:661:ARG:HG2	2.13	0.49
1:A:717:LYS:HG3	1:A:718:GLN:N	2.28	0.49
2:B:35:ILE:CG2	2:B:40:LEU:HD21	2.34	0.49
1:A:287:GLN:HB3	1:A:328:PHE:CB	2.42	0.49
1:A:365:GLN:C	1:A:366:ARG:O	2.56	0.49
2:B:140:ASP:OD1	2:B:140:ASP:C	2.55	0.49
1:A:15:VAL:HG11	1:A:84:LYS:HE2	1.95	0.49
1:A:548:GLN:O	1:A:552:TYR:HD1	1.96	0.49
2:B:26:MET:SD	2:B:43:MET:HE1	2.52	0.49
1:A:229:PHE:CE2	1:A:284:ILE:CG1	2.87	0.48
1:A:291:ASN:HB2	1:A:304:PRO:CB	2.43	0.48
1:A:591:ILE:HA	1:A:594:TRP:CD1	2.48	0.48
1:A:481:ASN:HA	1:A:484:LEU:HB2	1.94	0.48
1:A:788:HIS:HE1	3:C:80:GLN:HE22	1.58	0.48
2:B:51:PRO:HB2	2:B:55:GLU:HB2	1.93	0.48
1:A:313:ASN:ND2	1:A:313:ASN:C	2.70	0.48
1:A:335:PHE:HD2	1:A:340:PHE:CG	2.32	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:691:LEU:HD23	1:A:696:VAL:HG21	1.94	0.48
1:A:707:PHE:O	1:A:710:ARG:NH1	2.46	0.48
1:A:343:GLU:HG3	1:A:344:GLU:N	2.27	0.48
1:A:486:GLN:NE2	1:A:517:GLN:HG2	2.29	0.48
1:A:62:SER:OG	1:A:63:ASP:N	2.46	0.48
1:A:126:TYR:CZ	1:A:677:LYS:HA	2.48	0.48
1:A:507:TRP:NE1	1:A:509:PHE:N	2.56	0.48
1:A:548:GLN:CG	1:A:552:TYR:HE1	2.26	0.48
2:B:30:ASN:O	2:B:31:ARG:HB3	2.11	0.48
1:A:290:SER:HB2	1:A:325:VAL:CG2	2.40	0.48
1:A:290:SER:O	1:A:291:ASN:HB3	2.13	0.48
1:A:403:VAL:HG13	1:A:404:LYS:N	2.28	0.48
1:A:34:CYS:C	1:A:77:MET:HE3	2.38	0.48
1:A:186:THR:HG23	1:A:458:VAL:CG1	2.41	0.48
1:A:517:GLN:CA	1:A:517:GLN:HE21	2.25	0.48
1:A:822:ARG:NH1	1:A:822:ARG:CB	2.74	0.48
2:B:68:ASN:HD21	2:B:71:MET:HB2	1.79	0.48
3:C:63:LEU:HD22	3:C:67:GLU:OE2	2.14	0.48
1:A:361:MET:CE	1:A:380:ALA:HA	2.43	0.48
3:C:42:ILE:HG22	3:C:43:ASN:N	2.28	0.48
1:A:437:TRP:O	1:A:440:LYS:HG2	2.13	0.48
1:A:516:LEU:O	1:A:520:ILE:HG13	2.14	0.48
1:A:712:ILE:O	1:A:713:TYR:C	2.56	0.47
1:A:29:ASP:OD2	1:A:31:LYS:HB2	2.14	0.47
2:B:38:ASN:O	2:B:41:LYS:N	2.46	0.47
2:B:147:MET:HG3	2:B:153:ASP:O	2.13	0.47
1:A:507:TRP:CD1	1:A:509:PHE:N	2.78	0.47
2:B:30:ASN:OD1	2:B:31:ARG:N	2.47	0.47
2:B:131:GLU:O	2:B:131:GLU:HG3	2.14	0.47
1:A:803:ASP:O	1:A:806:ILE:HG13	2.13	0.47
1:A:88:MET:O	1:A:94:LEU:HD13	2.14	0.47
1:A:218:GLN:NE2	1:A:337:ILE:O	2.42	0.47
1:A:400:LYS:HD3	1:A:411:THR:CG2	2.45	0.47
1:A:517:GLN:CA	1:A:517:GLN:NE2	2.77	0.47
1:A:768:GLY:O	1:A:771:GLU:HB2	2.14	0.47
1:A:9:ASP:O	1:A:13:LEU:HD12	2.15	0.47
1:A:22:LYS:NZ	1:A:24:GLN:HG3	2.29	0.47
1:A:469:PHE:C	1:A:470:ASN:ND2	2.70	0.47
1:A:505:ILE:HD12	1:A:754:ARG:HB3	1.97	0.47
1:A:612:VAL:HG12	1:A:612:VAL:O	2.13	0.47
1:A:668:VAL:O	1:A:669:ARG:NH1	2.48	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:712:ILE:HA	1:A:759:LYS:HA	1.96	0.47
3:C:126:ILE:HG23	3:C:131:LEU:HB3	1.96	0.47
1:A:361:MET:HE3	1:A:383:VAL:HG21	1.97	0.47
3:C:42:ILE:C	3:C:44:PRO:HD3	2.39	0.47
3:C:46:ASN:HA	3:C:49:VAL:HG22	1.96	0.47
1:A:15:VAL:HG21	1:A:84:LYS:CE	2.45	0.47
1:A:415:ASN:H	1:A:418:GLN:CD	2.23	0.47
1:A:818:TRP:CD2	2:B:148:ILE:HG12	2.49	0.47
3:C:129:THR:O	3:C:130:ASP:HB3	2.15	0.47
1:A:595:LEU:HD12	1:A:595:LEU:H	1.79	0.47
2:B:78:ASP:C	2:B:81:SER:HG	2.23	0.47
3:C:118:SER:HG	3:C:121:GLU:HG3	1.79	0.47
1:A:59:LYS:HA	1:A:65:SER:O	2.15	0.46
1:A:416:LEU:HB3	1:A:417:GLN:HG2	1.96	0.46
2:B:26:MET:C	2:B:43:MET:HE1	2.40	0.46
2:B:68:ASN:O	2:B:71:MET:N	2.25	0.46
3:C:61:LYS:HE3	3:C:63:LEU:HD21	1.96	0.46
1:A:489:ASN:HB3	1:A:512:PHE:HB3	1.97	0.46
2:B:15:LYS:HE2	2:B:19:GLU:CD	2.41	0.46
1:A:402:LYS:HB3	1:A:605:ASN:HD22	1.78	0.46
2:B:17:ILE:HA	2:B:20:MET:HG3	1.98	0.46
1:A:556:ILE:O	1:A:556:ILE:HG23	2.14	0.46
2:B:30:ASN:CG	2:B:32:ASP:H	2.24	0.46
2:B:49:ARG:O	2:B:49:ARG:HG3	2.15	0.46
2:B:80:LEU:O	2:B:82:GLY:N	2.48	0.46
1:A:543:ASP:OD1	1:A:544:ASP:N	2.48	0.46
2:B:49:ARG:O	2:B:50:THR:C	2.58	0.46
2:B:99:LEU:HD12	2:B:99:LEU:HA	1.64	0.46
1:A:416:LEU:O	1:A:419:VAL:HB	2.15	0.46
1:A:418:GLN:O	1:A:419:VAL:C	2.59	0.46
3:C:69:LEU:CB	3:C:70:PRO:HD3	2.45	0.46
1:A:180:ALA:HB1	1:A:670:CYS:HB3	1.97	0.46
1:A:777:ARG:O	1:A:781:ILE:HG13	2.16	0.46
3:C:152:PRO:O	3:C:154:PRO:HD3	2.16	0.46
1:A:816:ARG:O	1:A:820:VAL:HG23	2.16	0.46
2:B:13:PRO:HB2	2:B:16:GLN:HB2	1.97	0.46
2:B:68:ASN:HD22	2:B:68:ASN:N	2.14	0.46
1:A:300:MET:O	1:A:301:LEU:CB	2.64	0.45
1:A:560:ARG:HG3	1:A:561:MET:H	1.81	0.45
1:A:743:LEU:HD22	1:A:748:MET:HG3	1.97	0.45
1:A:215:LEU:O	1:A:216:GLU:C	2.59	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:608:SER:O	1:A:611:ALA:HB3	2.17	0.45
1:A:777:ARG:HD2	1:A:777:ARG:HA	1.77	0.45
2:B:48:GLY:O	2:B:49:ARG:C	2.59	0.45
3:C:69:LEU:HB2	3:C:70:PRO:HD3	1.98	0.45
1:A:149:PRO:O	1:A:150:PRO:C	2.58	0.45
1:A:225:VAL:HG12	1:A:335:PHE:CE1	2.51	0.45
3:C:27:ALA:HB1	3:C:62:SER:HB2	1.97	0.45
1:A:162:ASN:O	1:A:166:ASP:HB2	2.16	0.45
1:A:227:GLU:HA	1:A:231:ASN:OD1	2.16	0.45
1:A:369:GLU:CA	1:A:370:GLU:HG2	2.47	0.45
2:B:71:MET:HE3	2:B:71:MET:HA	1.99	0.45
1:A:541:LYS:O	1:A:541:LYS:HG2	2.17	0.45
1:A:88:MET:HE3	1:A:116:SER:HB2	1.99	0.45
1:A:276:GLN:O	1:A:279:GLU:HB2	2.17	0.45
1:A:545:LYS:O	1:A:549:ASP:CG	2.60	0.45
1:A:554:ASN:O	1:A:555:HIS:ND1	2.50	0.45
1:A:769:ASN:C	1:A:771:GLU:N	2.73	0.45
2:B:28:ASP:HA	2:B:39:ASP:HB3	1.97	0.45
1:A:22:LYS:C	1:A:24:GLN:N	2.75	0.45
1:A:107:TYR:C	1:A:109:ALA:N	2.72	0.45
1:A:127:ARG:O	1:A:127:ARG:HG3	2.17	0.45
1:A:131:ILE:O	1:A:136:VAL:HG11	2.16	0.45
1:A:561:MET:HA	1:A:581:HIS:HD2	1.76	0.45
1:A:242:ARG:HD2	1:A:271:ARG:HH11	1.82	0.45
1:A:368:ARG:HE	1:A:368:ARG:CA	2.22	0.45
1:A:512:PHE:HA	1:A:514:MET:SD	2.57	0.45
2:B:44:PHE:O	2:B:47:LEU:HB2	2.17	0.44
2:B:35:ILE:N	2:B:35:ILE:CD1	2.77	0.44
2:B:51:PRO:CG	2:B:56:LEU:HG	2.47	0.44
1:A:309:TYR:CD1	1:A:309:TYR:N	2.85	0.44
1:A:402:LYS:HE3	1:A:402:LYS:HB2	1.80	0.44
1:A:701:ARG:HH12	1:A:702:ILE:HD11	1.82	0.44
2:B:32:ASP:OD1	2:B:34:PHE:N	2.49	0.44
2:B:38:ASN:O	2:B:42:GLU:N	2.50	0.44
2:B:140:ASP:OD2	2:B:143:ARG:HG3	2.17	0.44
1:A:416:LEU:HB3	1:A:417:GLN:CG	2.47	0.44
1:A:517:GLN:NE2	1:A:517:GLN:HA	2.32	0.44
2:B:26:MET:O	2:B:43:MET:SD	2.76	0.44
3:C:96:GLU:H	3:C:96:GLU:HG2	1.27	0.44
1:A:354:SER:O	1:A:358:MET:HG3	2.18	0.44
1:A:752:GLU:HG3	1:A:766:VAL:HG22	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:20:MET:CG	2:B:73:LEU:HD21	2.48	0.44
1:A:493:PHE:CE2	1:A:510:ILE:O	2.71	0.44
1:A:702:ILE:HD13	1:A:702:ILE:HA	1.68	0.44
1:A:703:CYS:O	1:A:708:PRO:HG3	2.18	0.44
3:C:1:PRO:HG3	3:C:77:ASP:OD2	2.17	0.44
1:A:133:THR:O	1:A:137:ILE:HG13	2.18	0.44
1:A:341:THR:HG22	1:A:342:LYS:N	2.32	0.44
2:B:40:LEU:HD11	2:B:60:LEU:CD2	2.42	0.44
1:A:225:VAL:HG23	1:A:226:LEU:N	2.32	0.44
1:A:404:LYS:HA	1:A:409:MET:HE3	1.99	0.44
1:A:418:GLN:O	1:A:421:ASN:N	2.51	0.44
1:A:560:ARG:HD2	1:A:561:MET:CE	2.44	0.44
2:B:27:ILE:O	2:B:35:ILE:HG13	2.18	0.44
1:A:783:SER:HA	1:A:786:GLN:HE21	1.83	0.43
3:C:89:ALA:O	3:C:92:THR:HG23	2.18	0.43
1:A:379:GLU:O	1:A:383:VAL:HG23	2.18	0.43
1:A:536:GLU:OE2	1:A:546:SER:OG	2.25	0.43
1:A:537:CYS:HB3	1:A:599:LYS:CE	2.47	0.43
3:C:46:ASN:N	3:C:115:GLU:OE2	2.48	0.43
1:A:85:LEU:HD23	1:A:91:MET:HG2	2.00	0.43
1:A:129:LEU:HA	1:A:130:PRO:HD3	1.83	0.43
1:A:533:LEU:HG	1:A:547:PHE:CZ	2.53	0.43
1:A:818:TRP:CD1	2:B:148:ILE:HA	2.52	0.43
2:B:49:ARG:NH2	2:B:52:ASP:CG	2.75	0.43
1:A:470:ASN:N	1:A:470:ASN:ND2	2.62	0.43
1:A:578:PHE:CD1	1:A:578:PHE:C	2.96	0.43
1:A:830:TYR:C	1:A:832:LYS:H	2.26	0.43
2:B:59:MET:O	2:B:62:GLU:HB2	2.18	0.43
1:A:9:ASP:OD2	1:A:139:LYS:NZ	2.52	0.43
1:A:293:ILE:HG22	1:A:293:ILE:O	2.17	0.43
1:A:366:ARG:CG	1:A:367:PRO:HD2	2.48	0.43
1:A:826:TRP:CE3	2:B:59:MET:HE3	2.54	0.43
1:A:140:TYR:CE2	1:A:151:HIS:HB3	2.53	0.43
1:A:234:THR:HB	1:A:279:GLU:OE2	2.19	0.43
1:A:371:GLN:HE21	1:A:371:GLN:HB3	1.63	0.43
1:A:401:PRO:HG3	1:A:603:ASN:HD21	1.84	0.43
1:A:721:SER:C	1:A:723:LEU:H	2.26	0.43
2:B:37:ILE:CG2	2:B:41:LYS:NZ	2.82	0.43
1:A:132:TYR:N	1:A:132:TYR:CD1	2.87	0.43
1:A:366:ARG:HG2	1:A:367:PRO:HD2	2.00	0.43
1:A:471:SER:OG	1:A:472:PHE:N	2.50	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:713:TYR:CE2	1:A:736:LYS:HD2	2.54	0.43
2:B:54:LYS:HE3	2:B:54:LYS:CA	2.45	0.43
1:A:395:LEU:HD23	1:A:395:LEU:HA	1.92	0.43
1:A:761:PHE:CD1	1:A:761:PHE:N	2.87	0.43
1:A:792:TYR:CD1	3:C:152:PRO:HG3	2.53	0.42
1:A:829:LEU:O	1:A:832:LYS:HB2	2.18	0.42
2:B:24:PHE:O	2:B:27:ILE:HB	2.19	0.42
1:A:106:ARG:NE	1:A:114:THR:HG23	2.34	0.42
1:A:464:PHE:CD2	1:A:464:PHE:C	2.98	0.42
1:A:825:GLN:O	1:A:829:LEU:HG	2.18	0.42
2:B:20:MET:O	2:B:24:PHE:HB2	2.19	0.42
1:A:427:SER:O	1:A:428:LYS:C	2.62	0.42
1:A:526:PRO:O	1:A:531:SER:OG	2.33	0.42
1:A:548:GLN:HG2	1:A:552:TYR:CD1	2.54	0.42
1:A:35:TRP:CH2	1:A:101:ASN:ND2	2.87	0.42
1:A:217:ASP:N	1:A:217:ASP:OD2	2.51	0.42
1:A:715:GLU:O	1:A:716:PHE:C	2.62	0.42
2:B:32:ASP:OD1	2:B:32:ASP:C	2.62	0.42
2:B:80:LEU:O	2:B:81:SER:C	2.62	0.42
1:A:229:PHE:O	1:A:282:TYR:CD1	2.72	0.42
2:B:93:PHE:HB3	2:B:141:TYR:CD2	2.55	0.42
2:B:102:LYS:O	2:B:103:LYS:HG2	2.20	0.42
1:A:164:VAL:HB	1:A:165:THR:H	1.59	0.42
1:A:246:PHE:CE1	1:A:457:GLY:HA3	2.54	0.42
1:A:556:ILE:CD1	1:A:564:LYS:HE2	2.40	0.42
2:B:93:PHE:CD2	2:B:141:TYR:HB2	2.54	0.42
1:A:377:THR:CG2	1:A:381:GLU:OE2	2.68	0.42
1:A:379:GLU:N	1:A:379:GLU:CD	2.78	0.42
1:A:660:LEU:C	1:A:662:ARG:H	2.26	0.42
1:A:509:PHE:CE2	1:A:510:ILE:HD12	2.54	0.42
1:A:546:SER:O	1:A:549:ASP:HB2	2.19	0.42
1:A:552:TYR:CA	1:A:556:ILE:HG22	2.50	0.42
2:B:121:ASN:OD1	2:B:123:ASP:HB2	2.20	0.42
1:A:599:LYS:O	1:A:601:PRO:HD3	2.20	0.42
1:A:782:ILE:O	1:A:783:SER:C	2.63	0.42
3:C:49:VAL:HG23	3:C:50:PHE:CD2	2.55	0.42
1:A:174:ILE:HG22	1:A:182:LYS:HB3	2.02	0.41
1:A:291:ASN:ND2	1:A:304:PRO:HG2	2.35	0.41
1:A:481:ASN:O	1:A:485:GLN:N	2.52	0.41
1:A:510:ILE:CG2	1:A:511:ASP:H	2.29	0.41
1:A:36:VAL:O	1:A:43:PHE:HA	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:567:LYS:HA	1:A:568:PRO:HD3	1.95	0.41
1:A:644:THR:HG23	1:A:647:ALA:CB	2.48	0.41
1:A:369:GLU:HB3	1:A:370:GLU:H	1.45	0.41
1:A:538:MET:H	1:A:538:MET:HG2	1.61	0.41
1:A:806:ILE:HG13	1:A:806:ILE:H	1.59	0.41
1:A:743:LEU:HD13	1:A:753:TYR:CE2	2.55	0.41
2:B:143:ARG:C	2:B:145:VAL:N	2.78	0.41
3:C:30:ALA:O	3:C:33:ILE:HG13	2.20	0.41
1:A:514:MET:HE3	1:A:701:ARG:NH2	2.29	0.41
3:C:117:LEU:HD22	3:C:121:GLU:OE1	2.21	0.41
2:B:69:PHE:C	2:B:71:MET:N	2.77	0.41
1:A:76:GLN:HB3	1:A:93:TYR:CG	2.55	0.41
1:A:780:LYS:O	1:A:781:ILE:C	2.62	0.41
1:A:811:ILE:HD13	2:B:93:PHE:CE1	2.54	0.41
1:A:15:VAL:HG21	1:A:84:LYS:HD3	2.01	0.41
1:A:16:ASP:N	1:A:16:ASP:OD2	2.53	0.41
1:A:31:LYS:O	1:A:32:LYS:HE2	2.20	0.41
1:A:333:GLU:HA	1:A:333:GLU:OE1	2.21	0.41
1:A:410:VAL:HG12	1:A:411:THR:N	2.22	0.41
1:A:530:LEU:HD23	1:A:530:LEU:HA	1.87	0.41
1:A:578:PHE:HE1	1:A:580:LEU:HD13	1.84	0.41
1:A:644:THR:OG1	1:A:645:ILE:N	2.54	0.41
1:A:23:GLU:O	1:A:23:GLU:CG	2.67	0.41
1:A:126:TYR:CB	1:A:679:PRO:HG3	2.51	0.41
1:A:548:GLN:CG	1:A:552:TYR:CE1	3.04	0.41
3:C:105:GLU:O	3:C:106:LEU:C	2.64	0.41
1:A:126:TYR:CE2	1:A:677:LYS:HA	2.55	0.40
1:A:483:ARG:HD2	1:A:520:ILE:HD13	2.03	0.40
1:A:805:ARG:HG3	3:C:20:PHE:CZ	2.55	0.40
3:C:11:LEU:HD13	3:C:40:LEU:CD1	2.48	0.40
3:C:33:ILE:HD12	3:C:54:GLY:HA2	2.03	0.40
1:A:132:TYR:CD2	1:A:188:LYS:HG2	2.56	0.40
1:A:518:MET:HE3	1:A:560:ARG:NH1	2.35	0.40
1:A:643:GLN:HE21	1:A:643:GLN:CA	2.07	0.40
1:A:830:TYR:C	1:A:830:TYR:CD1	2.99	0.40
2:B:37:ILE:H	2:B:37:ILE:CD1	2.22	0.40
3:C:34:GLY:O	3:C:38:ARG:HG3	2.21	0.40
1:A:464:PHE:HE2	1:A:466:ILE:CG1	2.34	0.40
1:A:503:GLU:O	1:A:757:THR:HG23	2.21	0.40
1:A:698:GLU:O	1:A:702:ILE:HG12	2.21	0.40
1:A:834:LYS:C	1:A:836:LEU:H	2.29	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:28:PHE:CG	1:A:80:PRO:HD3	2.57	0.40
1:A:283:HIS:O	1:A:284:ILE:C	2.63	0.40
1:A:572:ASN:O	1:A:572:ASN:ND2	2.54	0.40
1:A:754:ARG:HG2	1:A:754:ARG:HH11	1.85	0.40
1:A:344:GLU:O	1:A:347:SER:HB2	2.22	0.40
1:A:560:ARG:HG3	1:A:561:MET:N	2.37	0.40
1:A:591:ILE:C	1:A:591:ILE:CD1	2.95	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	792/840 (94%)	667 (84%)	98 (12%)	27 (3%)	3	15
2	B	139/157 (88%)	105 (76%)	21 (15%)	13 (9%)	0	3
3	C	153/157 (98%)	136 (89%)	12 (8%)	5 (3%)	3	16
All	All	1084/1154 (94%)	908 (84%)	131 (12%)	45 (4%)	2	12

All (45) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	366	ARG
1	A	417	GLN
1	A	418	GLN
1	A	505	ILE
1	A	625	PRO
2	B	14	GLN
2	B	27	ILE
2	B	46	SER
2	B	49	ARG
2	B	51	PRO

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Mol	Chain	Res	Type
2	B	69	PHE
2	B	81	SER
3	C	116	ARG
1	A	164	VAL
1	A	304	PRO
1	A	367	PRO
1	A	449	LYS
1	A	529	ILE
1	A	645	ILE
2	B	32	ASP
2	B	44	PHE
3	C	25	ASP
3	C	54	GLY
1	A	25	THR
1	A	510	ILE
1	A	603	ASN
2	B	53	ASP
2	B	144	PHE
3	C	95	ARG
1	A	127	ARG
1	A	374	SER
1	A	399	LEU
1	A	506	GLN
3	C	130	ASP
1	A	116	SER
1	A	253	PRO
1	A	708	PRO
1	A	752	GLU
2	B	62	GLU
1	A	301	LEU
1	A	735	GLY
2	B	16	GLN
1	A	15	VAL
1	A	834	LYS
1	A	401	PRO

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	703/737 (95%)	607 (86%)	96 (14%)	3	15
2	B	123/136 (90%)	99 (80%)	24 (20%)	1	6
3	C	132/134 (98%)	116 (88%)	16 (12%)	5	19
All	All	958/1007 (95%)	822 (86%)	136 (14%)	3	14

All (136) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	7	ASP
1	A	15	VAL
1	A	17	ARG
1	A	19	LYS
1	A	22	LYS
1	A	32	LYS
1	A	36	VAL
1	A	40	LYS
1	A	47	GLU
1	A	60	ILE
1	A	72	ASP
1	A	86	GLU
1	A	114	THR
1	A	131	ILE
1	A	132	TYR
1	A	141	ARG
1	A	161	GLN
1	A	173	LEU
1	A	182	LYS
1	A	185	SER
1	A	188	LYS
1	A	191	MET
1	A	213	SER
1	A	217	ASP
1	A	218	GLN
1	A	224	PRO
1	A	234	THR
1	A	237	ASN
1	A	263	GLU
1	A	295	GLU
1	A	301	LEU
1	A	313	ASN

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Mol	Chain	Res	Type
1	A	321	ASN
1	A	322	ILE
1	A	326	GLU
1	A	343	GLU
1	A	366	ARG
1	A	370	GLU
1	A	371	GLN
1	A	381	GLU
1	A	393	ASP
1	A	403	VAL
1	A	410	VAL
1	A	411	THR
1	A	416	LEU
1	A	418	GLN
1	A	438	LEU
1	A	451	LYS
1	A	452	ARG
1	A	461	ILE
1	A	470	ASN
1	A	475	LEU
1	A	492	MET
1	A	514	MET
1	A	515	ASP
1	A	517	GLN
1	A	518	MET
1	A	522	LEU
1	A	526	PRO
1	A	533	LEU
1	A	538	MET
1	A	545	LYS
1	A	551	SER
1	A	558	LYS
1	A	560	ARG
1	A	567	LYS
1	A	598	ASN
1	A	599	LYS
1	A	600	ASP
1	A	602	ILE
1	A	603	ASN
1	A	643	GLN
1	A	653	LEU
1	A	696	VAL

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Mol	Chain	Res	Type
1	A	702	ILE
1	A	704	ARG
1	A	710	ARG
1	A	718	GLN
1	A	748	MET
1	A	751	SER
1	A	752	GLU
1	A	767	LEU
1	A	775	ASP
1	A	776	GLU
1	A	792	TYR
1	A	795	ARG
1	A	799	LYS
1	A	806	ILE
1	A	809	SER
1	A	819	LEU
1	A	821	LEU
1	A	826	TRP
1	A	827	TRP
1	A	833	VAL
1	A	834	LYS
1	A	836	LEU
2	B	14	GLN
2	B	17	ILE
2	B	20	MET
2	B	28	ASP
2	B	32	ASP
2	B	35	ILE
2	B	36	ASP
2	B	37	ILE
2	B	40	LEU
2	B	45	SER
2	B	49	ARG
2	B	54	LYS
2	B	66	PRO
2	B	67	LEU
2	B	68	ASN
2	B	71	MET
2	B	73	LEU
2	B	74	SER
2	B	75	ILE
2	B	77	SER

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Mol	Chain	Res	Type
2	B	79	LYS
2	B	98	GLU
2	B	101	THR
2	B	119	ASN
3	C	4	SER
3	C	7	GLU
3	C	8	ILE
3	C	16	GLU
3	C	66	GLU
3	C	68	PHE
3	C	77	ASP
3	C	80	GLN
3	C	92	THR
3	C	96	GLU
3	C	102	SER
3	C	120	GLU
3	C	134	ASP
3	C	136	GLU
3	C	150	THR
3	C	154	PRO

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (39) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	49	GLN
1	A	90	ASN
1	A	101	ASN
1	A	161	GLN
1	A	237	ASN
1	A	238	ASN
1	A	287	GLN
1	A	291	ASN
1	A	313	ASN
1	A	321	ASN
1	A	371	GLN
1	A	390	ASN
1	A	421	ASN
1	A	453	ASN
1	A	470	ASN
1	A	478	ASN
1	A	485	GLN
1	A	486	GLN

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Mol	Chain	Res	Type
1	A	489	ASN
1	A	517	GLN
1	A	559	ASN
1	A	572	ASN
1	A	581	HIS
1	A	586	ASN
1	A	598	ASN
1	A	603	ASN
1	A	643	GLN
1	A	694	ASN
1	A	718	GLN
1	A	769	ASN
1	A	786	GLN
1	A	788	HIS
1	A	812	GLN
2	B	14	GLN
2	B	68	ASN
2	B	91	ASN
3	C	46	ASN
3	C	98	GLN
3	C	138	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 4 ligands modelled in this entry, 3 are 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	$\# Z > 2$
5	ADP	A	999	4	28,29,29	2.69	16 (57%)	43,45,45	2.30	9 (20%)

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 Torsions and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	ADP	A	999	4	-	1/16/32/32	0/3/3/3

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	999	ADP	PB-O3B	5.29	1.74	1.54
5	A	999	ADP	O4'-C1'	4.74	1.53	1.42
5	A	999	ADP	PA-O3A	4.59	1.64	1.59
5	A	999	ADP	C5-C4	4.24	1.46	1.39
5	A	999	ADP	C2-N1	3.58	1.40	1.33
5	A	999	ADP	C2-N3	3.29	1.39	1.33
5	A	999	ADP	C3'-C4'	3.11	1.60	1.53
5	A	999	ADP	PA-O2A	2.89	1.68	1.55
5	A	999	ADP	C6-N6	2.83	1.41	1.34
5	A	999	ADP	C4-N3	2.76	1.39	1.34
5	A	999	ADP	PB-O2B	2.71	1.64	1.54
5	A	999	ADP	C1'-N9	2.54	1.53	1.46
5	A	999	ADP	O4'-C4'	2.38	1.50	1.45
5	A	999	ADP	O3'-C3'	2.29	1.48	1.43
5	A	999	ADP	PA-O5'	2.18	1.67	1.59
5	A	999	ADP	C2'-C3'	2.15	1.59	1.53

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	999	ADP	N3-C4-N9	5.65	136.78	127.17
5	A	999	ADP	O2A-PA-O3A	5.28	121.54	107.27
5	A	999	ADP	C5-C4-N3	-5.24	119.50	126.72
5	A	999	ADP	O2A-PA-O5'	-4.90	85.36	107.57

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	999	ADP	N3-C2-N1	-4.68	121.50	128.58
5	A	999	ADP	C5-N7-C8	3.45	108.87	103.45
5	A	999	ADP	C2-N3-C4	3.34	119.98	111.83
5	A	999	ADP	O5'-PA-O1A	-3.29	95.91	108.94
5	A	999	ADP	C3'-C2'-C1'	2.81	106.78	101.46

There are no chirality outliers.

All (1) torsion outliers are listed below:

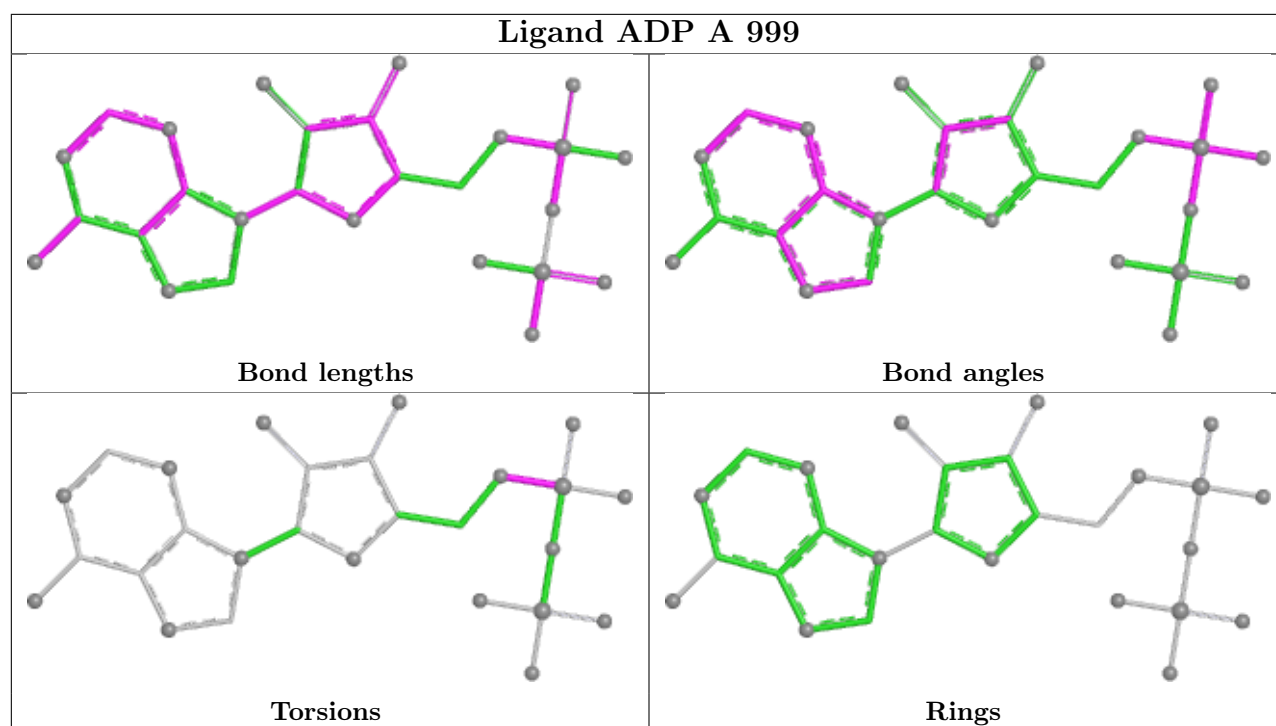
Mol	Chain	Res	Type	Atoms
5	A	999	ADP	C5'-O5'-PA-O1A

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	999	ADP	2	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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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, 95th 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 ²)	Q<0.9
1	A	800/840 (95%)	-0.11	6 (0%) 82 64	25, 81, 127, 160	0
2	B	141/157 (89%)	0.35	11 (7%) 19 10	29, 100, 178, 179	0
3	C	155/157 (98%)	-0.24	0 100 100	41, 82, 103, 116	0
All	All	1096/1154 (94%)	-0.07	17 (1%) 70 49	25, 82, 161, 179	0

All (17) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	153	ASP	6.1
1	A	626	ASP	5.8
2	B	67	LEU	3.7
2	B	40	LEU	3.3
2	B	50	THR	2.9
1	A	255	GLY	2.9
2	B	66	PRO	2.7
2	B	81	SER	2.5
2	B	29	GLN	2.5
1	A	54	GLU	2.4
1	A	398	LEU	2.2
1	A	16	ASP	2.2
2	B	76	PHE	2.2
2	B	31	ARG	2.1
1	A	829	LEU	2.1
2	B	80	LEU	2.1
2	B	27	ILE	2.1

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

6.3 Carbohydrates [i](#)

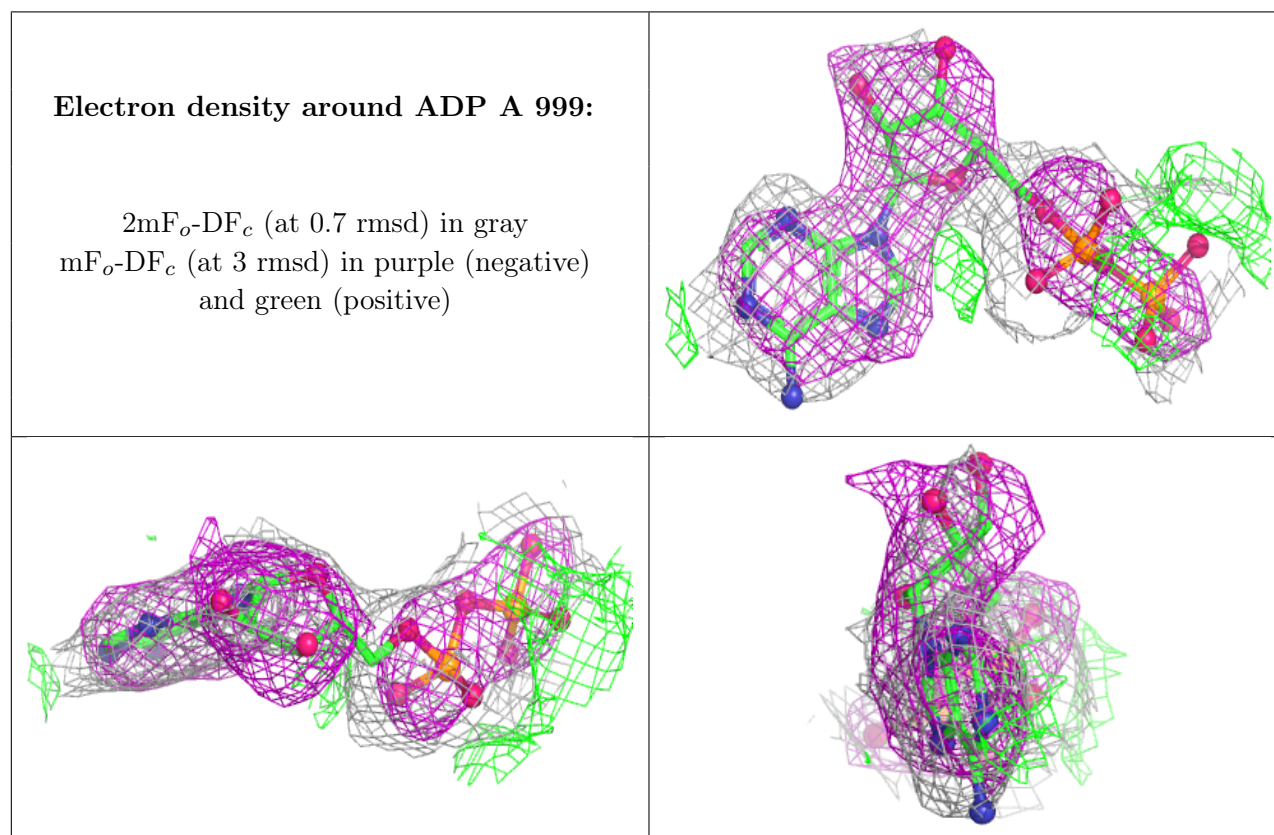
There are no oligosaccharides in this entry.

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, 95th 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(Å ²)	Q<0.9
4	MG	B	990	1/1	0.87	0.08	95,95,95,95	0
5	ADP	A	999	27/27	0.87	0.11	0,11,14,15	0
6	CA	C	991	1/1	0.94	0.07	65,65,65,65	0
4	MG	A	839	1/1	0.95	0.07	0,0,0,0	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.



6.5 Other polymers

There are no such residues in this entry.