



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 20, 2018 – 01:08 am GMT

PDB ID : 1B3R  
Title : RAT LIVER S-ADENOSYLHOMOCYSTEIN HYDROLASE  
Authors : Hu, Y.; Komoto, J.; Huang, Y.; Takusagawa, F.; Gomi, T.; Ogawa, H.; Takata, Y.; Fujioka, M.  
Deposited on : 1998-12-14  
Resolution : 2.80 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.7.3 (157068), CSD as539be (2018)  
Xtriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk30686

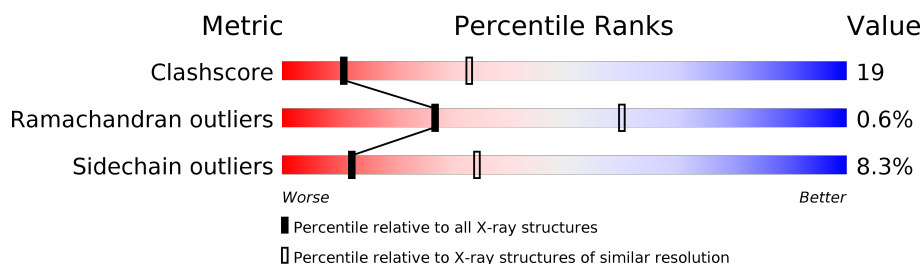
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.80 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	122078	3207 (2.80-2.80)
Ramachandran outliers	120005	3156 (2.80-2.80)
Sidechain outliers	119972	3158 (2.80-2.80)

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

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	431	 64% 31% 5% .
1	B	431	 57% 38% . .
1	C	431	 59% 36% . .
1	D	431	 63% 32% 5% .

## 2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 17535 atoms, of which 3738 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 PROTEIN (S-ADENOSYLHOMOCYSTEINE HYDROLASE).

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	428	Total	C	H	N	O	S	719	0	0
			4022	2098	720	568	611	25			
1	B	428	Total	C	H	N	O	S	720	0	0
			4022	2098	720	568	611	25			
1	C	428	Total	C	H	N	O	S	720	0	0
			4022	2098	720	568	611	25			
1	D	428	Total	C	H	N	O	S	720	0	0
			4022	2098	720	568	611	25			

- Molecule 2 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (three-letter code: NAD) (formula:  $C_{21}H_{27}N_7O_{14}P_2$ ).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total	C	H	N	O	P	8	0
			52	21	8	7	14	2		
2	B	1	Total	C	H	N	O	P	8	0
			52	21	8	7	14	2		

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Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	C	1	Total	C	H	N	O	P	8	0
			52	21	8	7	14	2		
2	D	1	Total	C	H	N	O	P	8	0
			52	21	8	7	14	2		

- Molecule 3 is water.

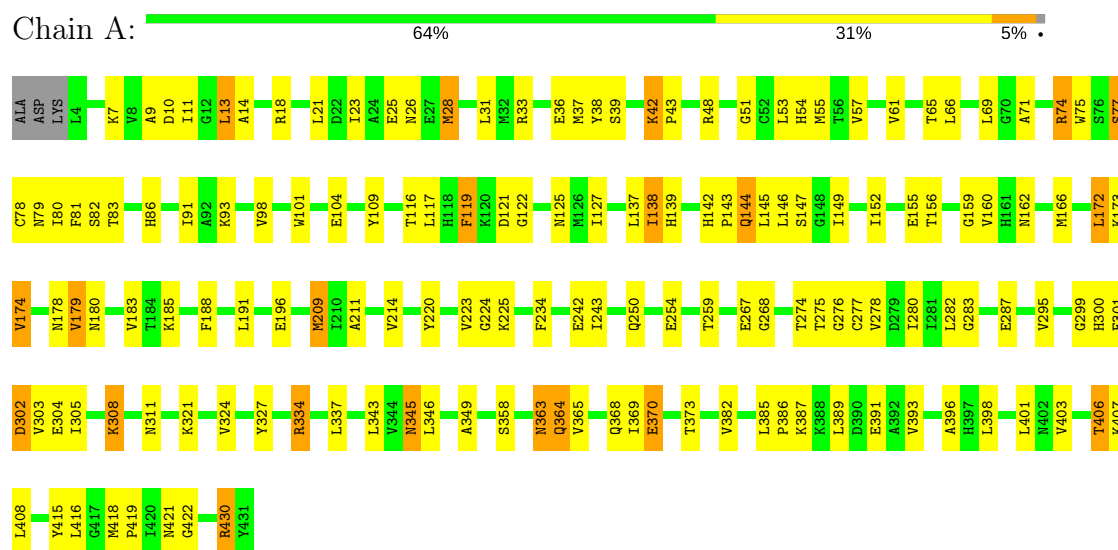
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	110	Total	H	O	220	0
			330	220	110		
3	B	109	Total	H	O	218	0
			327	218	109		
3	C	94	Total	H	O	188	0
			282	188	94		
3	D	100	Total	H	O	200	0
			300	200	100		

### 3 Residue-property plots

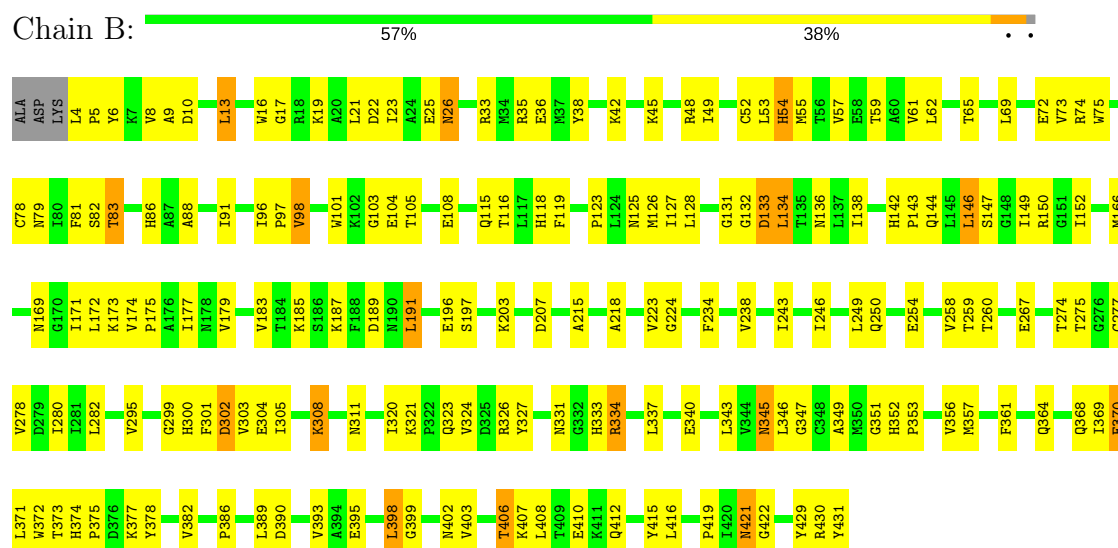
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are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

Note EDS was not executed.

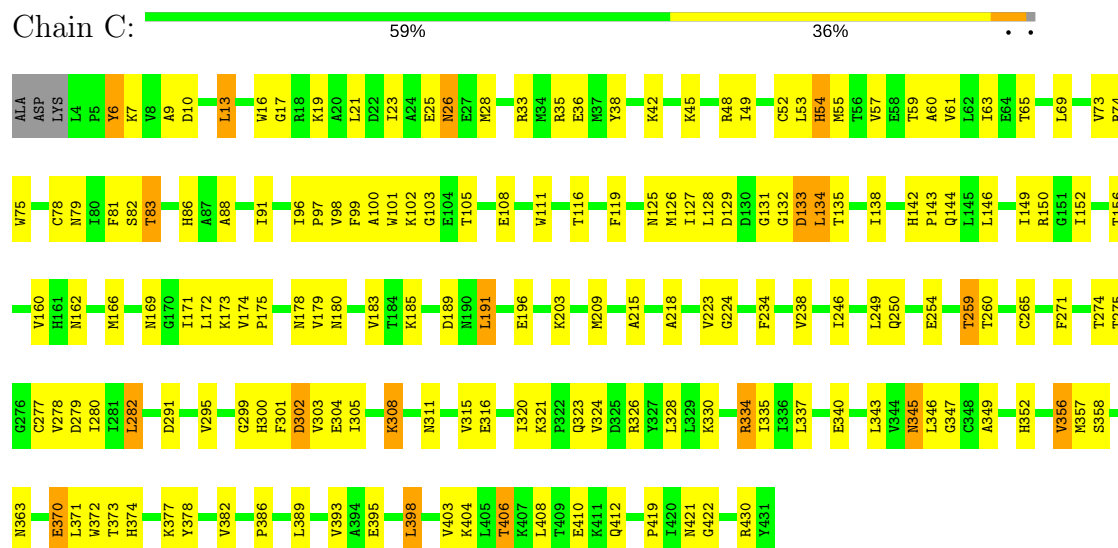
#### • Molecule 1: PROTEIN (S-ADENOSYLHOMOCYSTEINE HYDROLASE)



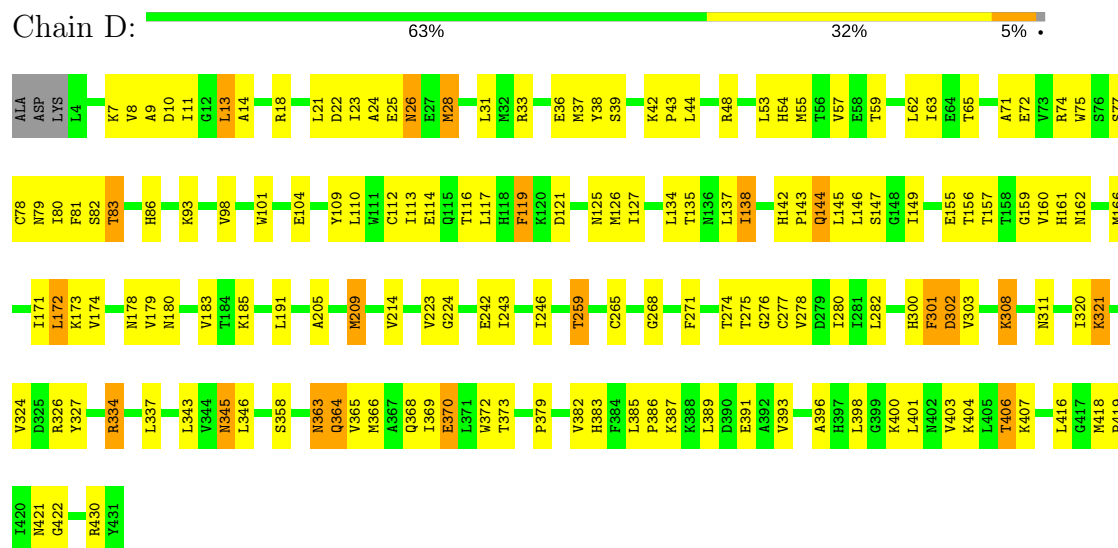
#### • Molecule 1: PROTEIN (S-ADENOSYLHOMOCYSTEINE HYDROLASE)



• Molecule 1: PROTEIN (S-ADENOSYLHOMOCYSTEINE HYDROLASE)



• Molecule 1: PROTEIN (S-ADENOSYLHOMOCYSTEINE HYDROLASE)



## 4 Data and refinement statistics

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

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	94.76Å 134.48Å 102.26Å 90.00° 114.35° 90.00°	Depositor
Resolution (Å)	8.00 – 2.80	Depositor
% Data completeness (in resolution range)	97.5 (8.00-2.80)	Depositor
$R_{merge}$	0.07	Depositor
$R_{sym}$	0.07	Depositor
Refinement program	X-PLOR 3.1	Depositor
R, $R_{free}$	0.199 , 0.269	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	17535	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	18.0	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: NAD

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z  > 5$	RMSZ	$\# Z  > 5$
1	A	0.50	0/3367	0.75	2/4557 (0.0%)
1	B	0.49	0/3367	0.76	2/4557 (0.0%)
1	C	0.48	0/3367	0.75	2/4557 (0.0%)
1	D	0.49	0/3367	0.74	1/4557 (0.0%)
All	All	0.49	0/13468	0.75	7/18228 (0.0%)

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	302	ASP	N-CA-C	6.28	127.95	111.00
1	B	302	ASP	N-CA-C	6.27	127.93	111.00
1	D	302	ASP	N-CA-C	6.17	127.65	111.00
1	C	302	ASP	N-CA-C	6.07	127.39	111.00
1	C	191	LEU	CA-CB-CG	5.32	127.54	115.30
1	B	72	GLU	N-CA-C	-5.27	96.77	111.00
1	A	430	ARG	N-CA-C	-5.14	97.11	111.00

There are no chirality outliers.

There are no planarity outliers.

### 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	3302	720	3324	129	0
1	B	3302	720	3324	151	0
1	C	3302	720	3324	140	0
1	D	3302	720	3324	136	0
2	A	44	8	26	3	0
2	B	44	8	26	4	0
2	C	44	8	26	4	0
2	D	44	8	26	2	0
3	A	110	220	0	0	0
3	B	109	218	0	0	0
3	C	94	188	0	0	0
3	D	100	200	0	0	0
All	All	13797	3738	13400	519	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 19.

All (519) 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:D:143:PRO:HA	1:D:146:LEU:HD13	1.44	0.97
1:B:370:GLU:HG3	1:B:389:LEU:HD11	1.51	0.92
1:A:143:PRO:HA	1:A:146:LEU:HD13	1.51	0.92
1:B:21:LEU:HD23	1:B:57:VAL:HG13	1.52	0.91
1:A:14:ALA:HB1	1:A:93:LYS:HD2	1.53	0.90
1:C:370:GLU:HG3	1:C:389:LEU:HD11	1.54	0.88
1:D:275:THR:CG2	1:D:277:CYS:HB3	2.04	0.88
1:D:28:MET:HE2	1:D:31:LEU:HD12	1.55	0.87
1:A:275:THR:CG2	1:A:277:CYS:HB3	2.05	0.86
1:A:343:LEU:HD12	1:A:346:LEU:HD12	1.56	0.86
1:B:275:THR:CG2	1:B:277:CYS:HB3	2.07	0.85
1:D:14:ALA:HB1	1:D:93:LYS:HD2	1.61	0.82
1:B:345:ASN:H	1:B:345:ASN:HD22	1.26	0.82
1:C:21:LEU:HD23	1:C:57:VAL:HG13	1.60	0.81
1:C:275:THR:HG22	1:C:277:CYS:HB3	1.63	0.79
1:B:54:HIS:CE1	1:B:78:CYS:SG	2.76	0.78
1:D:275:THR:HG22	1:D:277:CYS:HB3	1.65	0.78
1:A:28:MET:CE	1:A:31:LEU:HD12	2.15	0.77
1:C:54:HIS:CE1	1:C:78:CYS:SG	2.77	0.77
1:D:343:LEU:HD12	1:D:346:LEU:HD12	1.64	0.77
1:D:9:ALA:HB2	1:D:101:TRP:HB2	1.64	0.77
1:C:275:THR:CG2	1:C:277:CYS:HB3	2.14	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:224:GLY:N	1:A:274:THR:HG21	2.00	0.77
1:C:345:ASN:HD22	1:C:345:ASN:H	1.31	0.76
1:B:275:THR:HG22	1:B:277:CYS:HB3	1.68	0.75
1:B:275:THR:HG21	1:B:280:ILE:HD11	1.67	0.75
1:B:374:HIS:HB3	1:B:377:LYS:HG2	1.69	0.75
1:C:374:HIS:HB3	1:C:377:LYS:HG2	1.68	0.74
1:B:419:PRO:HB2	1:B:422:GLY:H	1.52	0.74
1:A:275:THR:HG22	1:A:277:CYS:HB3	1.70	0.74
1:A:55:MET:HE2	1:A:75:TRP:CD1	2.23	0.74
1:D:28:MET:CE	1:D:31:LEU:HD12	2.18	0.73
1:D:321:LYS:HD3	1:D:324:VAL:HG21	1.69	0.73
1:A:321:LYS:HD3	1:A:324:VAL:HG21	1.70	0.73
1:A:416:LEU:HD11	1:B:277:CYS:HB2	1.70	0.73
1:B:127:ILE:HG23	1:B:134:LEU:HD13	1.71	0.72
1:B:21:LEU:O	1:B:25:GLU:HG3	1.90	0.72
1:C:10:ASP:HB3	1:C:13:LEU:HD22	1.69	0.72
1:A:387:LYS:O	1:A:391:GLU:HG3	1.90	0.71
1:C:48:ARG:HD2	1:C:119:PHE:CG	2.24	0.71
1:B:326:ARG:NH1	1:D:23:ILE:HG12	2.06	0.71
1:C:54:HIS:ND1	1:C:78:CYS:SG	2.64	0.70
1:C:323:GLN:HG3	1:C:347:GLY:O	1.91	0.70
1:C:127:ILE:HG23	1:C:134:LEU:HD13	1.73	0.70
1:C:419:PRO:HB2	1:C:422:GLY:H	1.56	0.70
1:A:223:VAL:HB	1:A:274:THR:HG23	1.73	0.69
1:B:10:ASP:HB3	1:B:13:LEU:HD22	1.73	0.69
1:A:345:ASN:H	1:A:345:ASN:HD22	1.38	0.69
1:A:75:TRP:HB3	1:A:98:VAL:HG12	1.74	0.69
1:D:33:ARG:HD2	1:D:396:ALA:HA	1.75	0.69
1:D:370:GLU:HG3	1:D:389:LEU:HD11	1.75	0.68
1:A:406:THR:HG22	1:B:260:THR:HG22	1.76	0.68
1:A:9:ALA:HB2	1:A:101:TRP:HB2	1.74	0.68
1:C:75:TRP:HH2	1:C:128:LEU:HD13	1.59	0.68
1:C:146:LEU:HD23	1:C:173:LYS:HG3	1.74	0.68
1:A:224:GLY:CA	1:A:274:THR:HG21	2.25	0.67
1:B:54:HIS:ND1	1:B:78:CYS:SG	2.67	0.67
1:B:398:LEU:HG	1:B:403:VAL:HG11	1.77	0.67
1:A:33:ARG:HD2	1:A:396:ALA:HA	1.77	0.66
1:D:33:ARG:O	1:D:37:MET:HB2	1.95	0.66
1:C:275:THR:HG21	1:C:280:ILE:HD11	1.77	0.66
1:C:48:ARG:HD2	1:C:119:PHE:CB	2.25	0.66
1:C:21:LEU:O	1:C:25:GLU:HG3	1.95	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:75:TRP:HB3	1:D:98:VAL:HG12	1.78	0.66
1:A:275:THR:HG21	1:A:277:CYS:HB3	1.78	0.65
1:C:74:ARG:HD3	1:C:116:THR:HA	1.78	0.65
1:A:79:ASN:HB3	1:A:82:SER:OG	1.96	0.65
1:D:21:LEU:O	1:D:25:GLU:HG3	1.96	0.65
1:B:299:GLY:HA2	2:B:432:NAD:O4D	1.97	0.64
1:C:48:ARG:HD2	1:C:119:PHE:HB2	1.78	0.64
1:C:277:CYS:HB2	1:D:416:LEU:HD11	1.80	0.64
1:B:35:ARG:HG3	1:B:65:THR:HG23	1.80	0.64
1:B:146:LEU:HD23	1:B:173:LYS:HG3	1.81	0.63
1:C:345:ASN:N	1:C:345:ASN:HD22	1.97	0.63
1:B:74:ARG:HD3	1:B:116:THR:HA	1.79	0.63
1:B:126:MET:HE2	1:B:150:ARG:HB3	1.79	0.63
1:D:55:MET:HE2	1:D:75:TRP:CD1	2.33	0.63
1:D:224:GLY:N	1:D:274:THR:HG21	2.14	0.63
1:B:105:THR:OG1	1:B:108:GLU:HG3	1.99	0.63
1:C:260:THR:HG22	1:D:406:THR:HG22	1.81	0.63
1:B:55:MET:HG2	1:B:88:ALA:HB2	1.80	0.62
1:C:127:ILE:HG23	1:C:134:LEU:CD1	2.29	0.62
1:B:196:GLU:HG3	1:D:209:MET:HE3	1.80	0.62
1:A:21:LEU:O	1:A:25:GLU:HG3	1.99	0.62
1:D:78:CYS:HA	1:D:109:TYR:OH	2.00	0.62
1:B:42:LYS:HB3	1:B:45:LYS:HG2	1.82	0.62
1:C:79:ASN:HB3	1:C:82:SER:OG	2.00	0.62
1:C:55:MET:HG2	1:C:88:ALA:HB2	1.82	0.61
1:C:386:PRO:HG2	1:C:389:LEU:HD12	1.82	0.61
1:A:74:ARG:HD3	1:A:116:THR:HA	1.82	0.61
1:D:275:THR:HG21	1:D:277:CYS:HB3	1.82	0.61
1:A:407:LYS:HE3	1:A:421:ASN:OD1	2.00	0.61
1:B:81:PHE:CE1	1:B:103:GLY:HA2	2.36	0.61
1:D:308:LYS:HA	1:D:308:LYS:HE3	1.83	0.61
1:C:408:LEU:HD13	1:D:243:ILE:HG21	1.82	0.60
1:D:385:LEU:HD12	1:D:386:PRO:HD2	1.83	0.60
1:D:387:LYS:O	1:D:391:GLU:HG3	2.01	0.60
1:B:308:LYS:NZ	1:B:311:ASN:HD22	2.00	0.60
1:A:370:GLU:HG3	1:A:389:LEU:HD11	1.84	0.60
1:C:278:VAL:HG12	1:C:303:VAL:HB	1.83	0.59
1:B:48:ARG:HD2	1:B:119:PHE:CG	2.37	0.59
1:A:166:MET:CE	1:A:172:LEU:HD23	2.32	0.59
1:D:275:THR:HG21	1:D:280:ILE:HD11	1.84	0.59
1:D:398:LEU:HG	1:D:403:VAL:HG11	1.84	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:308:LYS:HA	1:C:308:LYS:HE3	1.84	0.59
1:B:345:ASN:HD22	1:B:345:ASN:N	1.99	0.59
1:C:162:ASN:ND2	1:C:166:MET:HE2	2.18	0.59
1:C:218:ALA:O	1:C:274:THR:HB	2.03	0.59
1:C:138:ILE:HG22	1:C:146:LEU:CD1	2.33	0.59
1:B:275:THR:HG21	1:B:277:CYS:HB3	1.84	0.58
1:C:169:ASN:HB2	1:C:171:ILE:HG13	1.85	0.58
1:A:78:CYS:HA	1:A:109:TYR:OH	2.03	0.58
1:D:345:ASN:H	1:D:345:ASN:HD22	1.50	0.58
1:D:419:PRO:HB2	1:D:422:GLY:H	1.69	0.58
1:A:345:ASN:HD22	1:A:345:ASN:N	2.02	0.58
1:A:275:THR:HG23	2:A:432:NAD:C8A	2.34	0.58
1:C:126:MET:HE2	1:C:372:TRP:HE3	1.69	0.58
1:C:16:TRP:CE3	1:C:86:HIS:HB3	2.37	0.58
1:C:343:LEU:HD12	1:C:346:LEU:HD12	1.86	0.58
1:A:308:LYS:NZ	1:A:311:ASN:HD22	2.02	0.57
1:C:152:ILE:HD11	1:C:174:VAL:HG13	1.85	0.57
1:A:142:HIS:HB3	1:A:145:LEU:HD12	1.85	0.57
1:D:365:VAL:O	1:D:369:ILE:HG13	2.04	0.57
1:D:407:LYS:HE3	1:D:421:ASN:OD1	2.03	0.57
1:D:138:ILE:HD13	1:D:142:HIS:HB2	1.86	0.57
1:A:242:GLU:O	1:B:406:THR:HG23	2.05	0.57
1:B:75:TRP:HB3	1:B:98:VAL:HG12	1.85	0.57
1:A:13:LEU:HB2	1:A:86:HIS:HA	1.86	0.57
1:D:308:LYS:NZ	1:D:311:ASN:HD22	2.03	0.57
1:B:33:ARG:HA	1:B:36:GLU:HG2	1.87	0.57
1:D:345:ASN:N	1:D:345:ASN:HD22	2.02	0.57
1:B:308:LYS:HA	1:B:308:LYS:HE3	1.87	0.57
1:B:278:VAL:HG12	1:B:303:VAL:HB	1.87	0.56
1:B:166:MET:HA	1:B:171:ILE:HD12	1.87	0.56
1:D:24:ALA:O	1:D:28:MET:HG3	2.06	0.56
1:B:79:ASN:HB3	1:B:82:SER:OG	2.06	0.56
1:C:81:PHE:CE1	1:C:103:GLY:HA2	2.41	0.56
1:A:278:VAL:HG12	1:A:303:VAL:HB	1.87	0.56
1:B:323:GLN:HG3	1:B:347:GLY:O	2.06	0.56
1:D:13:LEU:HB2	1:D:86:HIS:HA	1.88	0.56
1:B:81:PHE:CD1	1:B:103:GLY:HA2	2.41	0.56
1:D:80:ILE:HG22	1:D:104:GLU:HB2	1.88	0.56
1:C:308:LYS:NZ	1:C:311:ASN:HD22	2.04	0.56
1:C:370:GLU:HG3	1:C:389:LEU:CD1	2.31	0.56
1:D:224:GLY:CA	1:D:274:THR:HG21	2.36	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:275:THR:HG22	1:A:277:CYS:N	2.21	0.55
1:C:91:ILE:CG2	1:C:96:ILE:HB	2.37	0.55
1:A:419:PRO:HB2	1:A:422:GLY:HA3	1.89	0.55
1:B:48:ARG:HD2	1:B:119:PHE:CB	2.36	0.55
1:A:419:PRO:HB2	1:A:422:GLY:H	1.72	0.55
1:C:17:GLY:HA3	1:C:86:HIS:O	2.07	0.55
1:D:275:THR:HG23	2:D:432:NAD:C8A	2.37	0.55
1:B:65:THR:O	1:B:69:LEU:HD13	2.07	0.55
1:C:321:LYS:HG2	1:C:324:VAL:HB	1.89	0.55
1:C:91:ILE:HG22	1:C:96:ILE:HB	1.89	0.55
1:D:21:LEU:HD23	1:D:57:VAL:HG13	1.89	0.55
1:D:327:TYR:O	1:D:334:ARG:HA	2.07	0.55
1:D:9:ALA:HB2	1:D:101:TRP:CB	2.35	0.55
1:A:33:ARG:HA	1:A:36:GLU:HG2	1.88	0.55
1:C:275:THR:HG23	2:C:432:NAD:C5A	2.37	0.54
1:A:243:ILE:HG21	1:B:408:LEU:HD13	1.88	0.54
1:B:334:ARG:HD3	1:B:334:ARG:N	2.21	0.54
1:A:403:VAL:HG22	1:B:258:VAL:HB	1.88	0.54
1:B:69:LEU:HD23	1:B:369:ILE:HD11	1.90	0.54
1:B:275:THR:HG23	2:B:432:NAD:N7A	2.22	0.54
1:D:223:VAL:HB	1:D:274:THR:HG23	1.89	0.54
1:B:126:MET:CE	1:B:150:ARG:HB3	2.38	0.54
1:B:275:THR:HG23	2:B:432:NAD:C5A	2.37	0.54
1:C:126:MET:CE	1:C:372:TRP:HE3	2.21	0.54
1:C:343:LEU:HD12	1:C:346:LEU:CD1	2.38	0.54
1:A:155:GLU:CD	1:A:364:GLN:HE22	2.12	0.54
1:C:19:LYS:O	1:C:23:ILE:HG13	2.07	0.54
1:A:11:ILE:O	1:A:11:ILE:HG12	2.08	0.53
1:A:21:LEU:HD23	1:A:57:VAL:HG13	1.91	0.53
1:B:395:GLU:HA	1:B:398:LEU:HD22	1.89	0.53
1:B:16:TRP:CE3	1:B:86:HIS:HB3	2.42	0.53
1:B:19:LYS:O	1:B:23:ILE:HG13	2.08	0.53
1:B:419:PRO:HB2	1:B:422:GLY:N	2.23	0.53
1:B:308:LYS:HZ2	1:B:311:ASN:HD22	1.57	0.53
1:B:138:ILE:HG22	1:B:146:LEU:CD1	2.38	0.53
1:B:246:ILE:O	1:B:250:GLN:HG3	2.09	0.53
1:B:38:TYR:HB2	1:B:69:LEU:HG	1.90	0.53
1:C:17:GLY:HA2	1:C:86:HIS:CD2	2.43	0.53
1:D:162:ASN:O	1:D:166:MET:HG3	2.07	0.53
1:B:152:ILE:HD11	1:B:174:VAL:HG13	1.89	0.53
1:B:48:ARG:HD2	1:B:119:PHE:HB2	1.89	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:42:LYS:HB3	1:C:45:LYS:HG2	1.91	0.53
1:A:275:THR:HG22	1:A:277:CYS:H	1.73	0.53
1:A:209:MET:HE3	1:C:196:GLU:HG3	1.90	0.53
1:A:209:MET:CE	1:C:196:GLU:HG3	2.39	0.53
1:B:138:ILE:HG22	1:B:146:LEU:HD13	1.89	0.53
1:A:398:LEU:HG	1:A:403:VAL:HG11	1.91	0.53
1:B:275:THR:HG22	1:B:277:CYS:N	2.24	0.53
1:C:35:ARG:HG3	1:C:65:THR:HG23	1.91	0.53
1:D:276:GLY:HA2	1:D:300:HIS:HB2	1.91	0.53
1:D:138:ILE:CD1	1:D:145:LEU:HB2	2.38	0.52
1:A:295:VAL:HG12	1:A:305:ILE:HD13	1.92	0.52
1:B:275:THR:HB	1:B:304:GLU:OE1	2.09	0.52
1:C:126:MET:HE2	1:C:150:ARG:HB3	1.90	0.52
1:A:146:LEU:HD23	1:A:173:LYS:HG3	1.92	0.52
1:A:33:ARG:O	1:A:37:MET:HB2	2.10	0.52
1:A:48:ARG:HD3	1:A:121:ASP:OD2	2.09	0.52
1:B:126:MET:CE	1:B:372:TRP:HE3	2.22	0.52
1:B:386:PRO:HG2	1:B:389:LEU:HD12	1.90	0.52
1:B:398:LEU:HG	1:B:403:VAL:CG1	2.39	0.52
1:C:52:CYS:SG	1:C:78:CYS:HB3	2.49	0.52
1:D:39:SER:O	1:D:42:LYS:HD2	2.08	0.52
1:A:28:MET:HE2	1:A:31:LEU:HD12	1.89	0.52
1:A:278:VAL:HG13	1:B:415:TYR:CE2	2.45	0.52
1:D:28:MET:HA	1:D:358:SER:HB2	1.91	0.52
1:A:275:THR:HG21	1:A:280:ILE:HD11	1.91	0.52
1:D:419:PRO:HB2	1:D:422:GLY:HA3	1.92	0.52
1:A:308:LYS:HE3	1:A:308:LYS:HA	1.92	0.52
1:C:337:LEU:CD1	1:C:340:GLU:HA	2.39	0.52
1:A:119:PHE:N	1:A:119:PHE:CD1	2.78	0.52
1:A:416:LEU:HD11	1:B:277:CYS:CB	2.39	0.52
1:C:357:MET:HE3	1:C:357:MET:HA	1.92	0.52
1:C:386:PRO:HG2	1:C:389:LEU:CD1	2.40	0.52
1:D:373:THR:O	1:D:373:THR:HG22	2.10	0.52
1:C:419:PRO:HB2	1:C:422:GLY:N	2.25	0.51
1:A:101:TRP:O	1:A:104:GLU:HG3	2.10	0.51
1:B:218:ALA:O	1:B:274:THR:HB	2.10	0.51
1:C:129:ASP:OD2	1:C:135:THR:HG23	2.10	0.51
1:C:105:THR:OG1	1:C:108:GLU:HG3	2.11	0.51
1:C:38:TYR:HB2	1:C:69:LEU:HG	1.92	0.51
1:D:48:ARG:HD3	1:D:121:ASP:OD2	2.11	0.51
1:C:156:THR:O	1:C:160:VAL:HG23	2.12	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:275:THR:HG22	1:D:277:CYS:N	2.26	0.51
1:B:127:ILE:HG23	1:B:134:LEU:CD1	2.38	0.50
1:C:179:VAL:HG13	1:C:363:ASN:HB3	1.93	0.50
1:D:275:THR:HG22	1:D:277:CYS:CB	2.40	0.50
1:D:33:ARG:HA	1:D:36:GLU:HG2	1.93	0.50
1:A:117:LEU:HD11	1:A:137:LEU:HD21	1.91	0.50
1:A:277:CYS:SG	1:B:412:GLN:HG2	2.52	0.50
1:A:385:LEU:HD12	1:A:386:PRO:HD2	1.92	0.50
1:C:299:GLY:HA2	2:C:432:NAD:O4D	2.12	0.50
1:B:377:LYS:HG3	1:B:378:TYR:CD1	2.46	0.50
1:C:275:THR:HG23	2:C:432:NAD:C8A	2.42	0.50
1:C:279:ASP:HB3	1:C:282:LEU:HD11	1.92	0.50
1:D:101:TRP:O	1:D:104:GLU:HG3	2.11	0.50
1:C:295:VAL:HG12	1:C:305:ILE:HD13	1.93	0.50
1:C:60:ALA:HA	1:C:63:ILE:HD12	1.94	0.50
1:D:127:ILE:HD11	1:D:149:ILE:HD13	1.92	0.50
1:B:343:LEU:HD12	1:B:346:LEU:HD12	1.94	0.50
1:C:81:PHE:CD1	1:C:103:GLY:HA2	2.46	0.50
1:C:412:GLN:HG2	1:D:277:CYS:SG	2.52	0.50
1:D:53:LEU:HD23	1:D:54:HIS:N	2.27	0.50
1:A:39:SER:O	1:A:42:LYS:HD2	2.11	0.50
1:C:430:ARG:HA	1:D:430:ARG:HD3	1.94	0.50
1:A:250:GLN:O	1:A:254:GLU:HG2	2.11	0.50
1:D:334:ARG:HD3	1:D:334:ARG:N	2.27	0.50
1:A:408:LEU:HD13	1:B:243:ILE:HG21	1.94	0.49
1:B:55:MET:HB3	1:B:83:THR:HB	1.93	0.49
1:D:113:ILE:HG21	1:D:137:LEU:HD13	1.94	0.49
1:D:119:PHE:N	1:D:119:PHE:CD1	2.81	0.49
1:A:138:ILE:HG23	1:A:146:LEU:HD12	1.93	0.49
1:A:28:MET:HE3	1:A:31:LEU:HD12	1.91	0.49
1:C:377:LYS:HG3	1:C:378:TYR:CD1	2.47	0.49
1:A:159:GLY:O	1:A:162:ASN:HB3	2.12	0.49
1:B:215:ALA:O	1:B:238:VAL:HA	2.12	0.49
1:B:223:VAL:HB	1:B:274:THR:HG23	1.94	0.49
1:A:327:TYR:O	1:A:334:ARG:HA	2.12	0.49
1:D:127:ILE:HG23	1:D:134:LEU:HD13	1.94	0.49
1:B:169:ASN:HB2	1:B:171:ILE:HG13	1.95	0.49
1:C:126:MET:CE	1:C:150:ARG:HB3	2.42	0.49
1:C:320:ILE:HD11	1:C:326:ARG:HD3	1.94	0.49
1:B:142:HIS:N	1:B:143:PRO:CD	2.75	0.49
1:B:74:ARG:NH1	1:B:115:GLN:O	2.46	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:28:MET:HA	1:A:358:SER:HB2	1.93	0.49
1:A:80:ILE:HG13	1:A:81:PHE:CD2	2.48	0.49
1:B:337:LEU:CD1	1:B:340:GLU:HA	2.43	0.48
1:C:223:VAL:HB	1:C:274:THR:HG23	1.95	0.48
1:C:33:ARG:HA	1:C:36:GLU:HG2	1.95	0.48
1:C:395:GLU:HA	1:C:398:LEU:HD22	1.94	0.48
1:D:101:TRP:CH2	1:D:112:CYS:SG	3.06	0.48
1:D:156:THR:O	1:D:160:VAL:HG23	2.13	0.48
1:D:171:ILE:O	1:D:173:LYS:HG2	2.13	0.48
1:D:398:LEU:HG	1:D:403:VAL:CG1	2.43	0.48
1:C:142:HIS:N	1:C:143:PRO:CD	2.76	0.48
1:A:18:ARG:NH1	1:A:21:LEU:HD12	2.29	0.48
1:B:300:HIS:HD2	1:B:303:VAL:HG22	1.78	0.48
1:D:79:ASN:HB3	1:D:82:SER:OG	2.14	0.48
1:B:369:ILE:O	1:B:373:THR:HB	2.14	0.48
1:C:59:THR:O	1:C:63:ILE:HG13	2.13	0.48
1:D:142:HIS:HA	1:D:144:GLN:OE1	2.14	0.48
1:B:275:THR:HG23	2:B:432:NAD:C8A	2.44	0.48
1:D:110:LEU:O	1:D:114:GLU:HG3	2.14	0.48
1:B:185:LYS:C	1:B:185:LYS:HD3	2.33	0.48
1:C:49:ILE:HB	1:C:73:VAL:HG22	1.96	0.48
1:A:7:LYS:HG3	1:A:101:TRP:CZ3	2.48	0.48
1:D:74:ARG:HD3	1:D:116:THR:HA	1.95	0.48
1:D:11:ILE:O	1:D:11:ILE:HG12	2.14	0.48
1:B:326:ARG:HH12	1:D:23:ILE:HG12	1.79	0.47
1:C:146:LEU:HA	1:C:149:ILE:HD12	1.95	0.47
1:D:138:ILE:HG23	1:D:146:LEU:CD1	2.44	0.47
1:A:179:VAL:HG13	1:A:363:ASN:HB3	1.96	0.47
1:B:49:ILE:HB	1:B:73:VAL:HG22	1.96	0.47
1:C:152:ILE:O	1:C:371:LEU:HD11	2.14	0.47
1:D:18:ARG:NH1	1:D:21:LEU:HD12	2.30	0.47
1:B:126:MET:HE3	1:B:372:TRP:HA	1.95	0.47
1:C:74:ARG:HG2	1:C:97:PRO:HB2	1.95	0.47
1:C:55:MET:HB3	1:C:83:THR:HB	1.96	0.47
1:D:265:CYS:HA	1:D:271:PHE:CZ	2.50	0.47
1:B:320:ILE:HD11	1:B:326:ARG:HD3	1.96	0.47
1:B:17:GLY:HA2	1:B:86:HIS:CD2	2.50	0.47
1:B:337:LEU:HD12	1:B:340:GLU:HA	1.95	0.47
1:C:316:GLU:HB2	1:C:328:LEU:HB3	1.96	0.47
1:C:21:LEU:HD21	1:C:60:ALA:HB3	1.96	0.47
1:C:75:TRP:HB3	1:C:98:VAL:HG12	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:143:PRO:HA	1:D:146:LEU:CD1	2.31	0.47
1:A:415:TYR:OH	1:B:303:VAL:HG21	2.14	0.47
1:C:300:HIS:HD2	1:C:303:VAL:HG22	1.78	0.47
1:C:345:ASN:ND2	1:C:345:ASN:H	2.08	0.47
1:D:117:LEU:HD11	1:D:137:LEU:HD21	1.95	0.47
1:A:283:GLY:O	1:A:287:GLU:HG3	2.15	0.47
1:B:75:TRP:HH2	1:B:128:LEU:HD13	1.80	0.47
1:D:38:TYR:HB3	1:D:43:PRO:CD	2.45	0.47
1:B:196:GLU:HG3	1:D:209:MET:CE	2.45	0.47
1:C:215:ALA:O	1:C:238:VAL:HA	2.14	0.47
1:B:203:LYS:O	1:B:207:ASP:N	2.46	0.47
1:C:275:THR:HG23	2:C:432:NAD:N7A	2.30	0.47
1:C:189:ASP:O	1:C:352:HIS:CE1	2.68	0.47
1:D:55:MET:HE1	1:D:98:VAL:HG11	1.96	0.47
1:D:274:THR:CG2	1:D:274:THR:O	2.63	0.46
1:D:379:PRO:HD2	1:D:383:HIS:CE1	2.50	0.46
1:A:373:THR:O	1:A:373:THR:HG22	2.14	0.46
1:A:220:TYR:O	1:A:225:LYS:NZ	2.47	0.46
1:A:38:TYR:HB3	1:A:43:PRO:CD	2.45	0.46
1:C:7:LYS:HD3	1:C:111:TRP:CH2	2.50	0.46
1:C:315:VAL:CG2	1:C:330:LYS:HG2	2.46	0.46
1:D:274:THR:HG22	1:D:274:THR:O	2.15	0.46
1:D:44:LEU:HB3	1:D:71:ALA:HB2	1.96	0.46
1:B:131:GLY:O	1:B:133:ASP:N	2.49	0.46
1:C:334:ARG:CD	1:C:334:ARG:N	2.78	0.46
1:C:373:THR:HG22	1:C:373:THR:O	2.15	0.46
1:D:159:GLY:O	1:D:162:ASN:HB3	2.15	0.46
1:A:162:ASN:O	1:A:166:MET:HG3	2.15	0.46
1:A:54:HIS:CD2	1:A:78:CYS:SG	3.07	0.46
1:A:127:ILE:HD11	1:A:149:ILE:HD13	1.97	0.46
1:B:177:ILE:HG13	1:B:371:LEU:HD21	1.98	0.46
1:D:214:VAL:HB	1:D:268:GLY:HA2	1.97	0.46
1:A:274:THR:HG22	1:A:274:THR:O	2.16	0.46
1:A:275:THR:HG23	2:A:432:NAD:N7A	2.31	0.46
1:A:214:VAL:HB	1:A:268:GLY:HA2	1.97	0.46
1:B:407:LYS:NZ	1:B:421:ASN:HB3	2.31	0.46
1:C:301:PHE:CE1	1:C:343:LEU:HG	2.51	0.46
1:C:334:ARG:HD3	1:C:334:ARG:H	1.79	0.46
1:C:404:LYS:HB2	1:D:259:THR:HA	1.98	0.46
1:C:125:ASN:ND2	1:C:372:TRP:CH2	2.84	0.46
1:D:343:LEU:HD12	1:D:346:LEU:CD1	2.41	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:277:CYS:CB	1:D:416:LEU:HD11	2.45	0.46
1:D:275:THR:HG23	2:D:432:NAD:N7A	2.31	0.46
1:D:80:ILE:HG13	1:D:81:PHE:CD2	2.50	0.46
1:A:275:THR:HG22	1:A:277:CYS:CB	2.44	0.45
1:A:54:HIS:HA	1:A:77:SER:OG	2.17	0.45
1:D:166:MET:CE	1:D:172:LEU:HD23	2.46	0.45
1:C:406:THR:HG23	1:D:242:GLU:O	2.16	0.45
1:A:178:ASN:OD1	1:A:180:ASN:HB3	2.16	0.45
1:A:243:ILE:HG22	1:B:406:THR:O	2.16	0.45
1:B:8:VAL:HG12	1:B:9:ALA:N	2.31	0.45
1:B:136:ASN:ND2	1:B:166:MET:HE1	2.32	0.45
1:B:343:LEU:HD12	1:B:346:LEU:CD1	2.47	0.45
1:C:291:ASP:OD1	1:C:334:ARG:HD3	2.15	0.45
1:B:356:VAL:HG12	1:D:209:MET:SD	2.56	0.45
1:A:401:LEU:HD11	1:B:249:LEU:CD1	2.46	0.45
1:D:275:THR:HG22	1:D:277:CYS:H	1.80	0.45
1:D:419:PRO:HB2	1:D:422:GLY:N	2.31	0.45
1:A:188:PHE:HE2	1:B:249:LEU:HD21	1.82	0.45
1:B:327:TYR:O	1:B:334:ARG:HA	2.16	0.45
1:B:55:MET:CG	1:B:88:ALA:HB2	2.45	0.45
1:B:295:VAL:HG12	1:B:305:ILE:HD13	1.96	0.45
1:B:17:GLY:HA3	1:B:86:HIS:O	2.17	0.45
1:C:28:MET:HA	1:C:358:SER:HB2	1.98	0.45
1:A:276:GLY:HA2	1:A:300:HIS:HB2	1.99	0.45
1:A:277:CYS:HB2	1:B:416:LEU:HD21	1.99	0.45
1:C:57:VAL:O	1:C:61:VAL:HG23	2.17	0.45
1:B:146:LEU:HA	1:B:149:ILE:HD12	1.99	0.45
1:C:126:MET:HE3	1:C:372:TRP:HA	1.99	0.45
1:C:308:LYS:HZ1	1:C:311:ASN:HD22	1.65	0.45
1:A:142:HIS:N	1:A:143:PRO:CD	2.80	0.44
1:A:419:PRO:HB2	1:A:422:GLY:CA	2.47	0.44
1:A:54:HIS:NE2	1:A:78:CYS:SG	2.90	0.44
1:A:9:ALA:HB2	1:A:101:TRP:CB	2.46	0.44
1:D:125:ASN:HA	1:D:149:ILE:HA	1.99	0.44
1:A:138:ILE:HG23	1:A:146:LEU:CD1	2.48	0.44
1:B:197:SER:HB2	1:B:345:ASN:HB2	2.00	0.44
1:C:166:MET:HA	1:C:171:ILE:HD12	1.99	0.44
1:D:363:ASN:ND2	1:D:393:VAL:HG11	2.32	0.44
1:A:419:PRO:HB2	1:A:422:GLY:N	2.32	0.44
1:B:126:MET:HE2	1:B:372:TRP:HE3	1.81	0.44
1:C:249:LEU:CD1	1:D:401:LEU:HD11	2.48	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:138:ILE:CD1	1:A:145:LEU:HB2	2.48	0.44
1:A:139:HIS:HA	1:A:146:LEU:HD11	1.99	0.44
1:B:101:TRP:O	1:B:104:GLU:HG3	2.18	0.44
1:C:277:CYS:O	1:C:304:GLU:HG2	2.18	0.44
1:D:138:ILE:HG23	1:D:146:LEU:HD12	1.99	0.44
1:D:155:GLU:CD	1:D:364:GLN:HE22	2.21	0.44
1:A:365:VAL:O	1:A:369:ILE:HG13	2.19	0.43
1:B:125:ASN:ND2	1:B:372:TRP:CH2	2.85	0.43
1:A:343:LEU:HD12	1:A:346:LEU:CD1	2.37	0.43
1:C:65:THR:O	1:C:69:LEU:HD13	2.18	0.43
1:D:59:THR:O	1:D:63:ILE:HG13	2.19	0.43
1:B:127:ILE:HD11	1:B:149:ILE:HD13	2.00	0.43
1:D:278:VAL:HG12	1:D:303:VAL:HB	2.00	0.43
1:A:119:PHE:HB2	1:A:122:GLY:O	2.19	0.43
1:A:185:LYS:HD3	1:A:185:LYS:C	2.39	0.43
1:A:51:GLY:HA3	1:A:75:TRP:CE3	2.54	0.43
1:B:101:TRP:CE2	1:B:104:GLU:HG2	2.53	0.43
1:B:301:PHE:CE1	1:B:343:LEU:HG	2.54	0.43
1:B:59:THR:O	1:B:62:LEU:HB3	2.19	0.43
1:C:9:ALA:HB2	1:C:101:TRP:HB2	2.01	0.43
1:C:75:TRP:CH2	1:C:128:LEU:HD13	2.45	0.43
1:D:205:ALA:HB1	1:D:324:VAL:HG22	2.01	0.43
1:D:320:ILE:HD11	1:D:326:ARG:HD2	2.01	0.43
1:B:183:VAL:HG12	1:B:390:ASP:OD2	2.19	0.43
1:D:142:HIS:HB3	1:D:145:LEU:HD12	2.01	0.43
1:B:143:PRO:HA	1:B:146:LEU:HD22	2.00	0.43
1:D:74:ARG:HB3	1:D:116:THR:HA	2.00	0.43
1:A:334:ARG:N	1:A:334:ARG:HD3	2.33	0.43
1:A:430:ARG:HD3	1:B:430:ARG:HA	2.01	0.42
1:B:331:ASN:OD1	1:B:333:HIS:HB2	2.18	0.42
1:C:334:ARG:N	1:C:334:ARG:HD3	2.33	0.42
1:C:370:GLU:O	1:C:374:HIS:HB2	2.19	0.42
1:D:419:PRO:HB2	1:D:422:GLY:CA	2.49	0.42
1:A:211:ALA:HB2	1:A:234:PHE:O	2.19	0.42
1:B:91:ILE:CG2	1:B:96:ILE:HB	2.49	0.42
1:A:299:GLY:HA2	2:A:432:NAD:O4D	2.18	0.42
1:B:373:THR:O	1:B:375:PRO:HD3	2.19	0.42
1:A:401:LEU:HD11	1:B:249:LEU:HD12	2.00	0.42
1:A:51:GLY:HA3	1:A:75:TRP:CZ3	2.55	0.42
1:B:386:PRO:HG2	1:B:389:LEU:CD1	2.49	0.42
1:B:57:VAL:O	1:B:61:VAL:HG23	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:265:CYS:HA	1:C:271:PHE:CE2	2.54	0.42
1:B:334:ARG:CD	1:B:334:ARG:N	2.83	0.42
1:D:142:HIS:N	1:D:143:PRO:CD	2.82	0.42
1:D:126:MET:CE	1:D:372:TRP:HE3	2.32	0.42
1:D:93:LYS:O	1:D:93:LYS:HG2	2.19	0.42
1:B:321:LYS:HG2	1:B:324:VAL:HB	2.01	0.42
1:B:189:ASP:O	1:B:352:HIS:CE1	2.73	0.42
1:C:81:PHE:O	1:C:102:LYS:HG3	2.20	0.42
1:C:246:ILE:O	1:C:250:GLN:HG3	2.20	0.42
1:C:6:TYR:CD1	1:C:6:TYR:C	2.93	0.42
1:A:345:ASN:O	1:A:349:ALA:HB3	2.20	0.42
1:A:66:LEU:O	1:A:71:ALA:HB3	2.19	0.42
1:B:126:MET:HE3	1:B:372:TRP:CA	2.50	0.42
1:A:23:ILE:HG23	1:C:326:ARG:NH1	2.35	0.42
1:A:152:ILE:HD11	1:A:174:VAL:HG13	2.01	0.42
1:B:345:ASN:O	1:B:349:ALA:HB3	2.20	0.42
1:D:8:VAL:HG12	1:D:10:ASP:H	1.85	0.42
1:D:178:ASN:OD1	1:D:180:ASN:HB3	2.20	0.42
1:D:55:MET:O	1:D:83:THR:HA	2.20	0.42
1:A:142:HIS:HA	1:A:144:GLN:OE1	2.20	0.41
1:A:166:MET:HE3	1:A:172:LEU:HD23	2.02	0.41
1:A:53:LEU:O	1:A:54:HIS:C	2.57	0.41
1:B:224:GLY:N	1:B:274:THR:HG21	2.34	0.41
1:B:429:TYR:CE2	1:B:431:TYR:HA	2.54	0.41
1:C:185:LYS:HD3	1:C:185:LYS:C	2.40	0.41
1:C:345:ASN:O	1:C:349:ALA:HB3	2.20	0.41
1:D:321:LYS:HD3	1:D:324:VAL:CG2	2.45	0.41
1:A:224:GLY:N	1:A:274:THR:CG2	2.79	0.41
1:A:65:THR:O	1:A:69:LEU:HD13	2.21	0.41
1:C:131:GLY:O	1:C:133:ASP:N	2.54	0.41
1:D:48:ARG:HA	1:D:72:GLU:HB2	2.03	0.41
1:B:23:ILE:HD13	1:D:320:ILE:HD13	2.02	0.41
1:C:178:ASN:OD1	1:C:180:ASN:HB3	2.20	0.41
1:D:386:PRO:HB2	1:D:389:LEU:HG	2.02	0.41
1:D:386:PRO:HD2	1:D:389:LEU:HD12	2.02	0.41
1:D:7:LYS:HG3	1:D:101:TRP:CZ3	2.54	0.41
1:B:174:VAL:HA	1:B:175:PRO:HD3	1.87	0.41
1:A:91:ILE:HA	1:A:91:ILE:HD13	1.95	0.41
1:B:352:HIS:HA	1:B:353:PRO:HD3	1.86	0.41
1:C:224:GLY:N	1:C:274:THR:HG21	2.35	0.41
1:B:399:GLY:C	1:B:402:ASN:H	2.24	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:4:LEU:HD22	1:B:5:PRO:HD2	2.02	0.41
1:B:96:ILE:HA	1:B:97:PRO:HD3	1.86	0.41
1:C:7:LYS:HD3	1:C:111:TRP:CZ3	2.56	0.41
1:B:118:HIS:HA	1:B:123:PRO:HA	2.02	0.41
1:B:345:ASN:H	1:B:345:ASN:ND2	2.05	0.41
1:C:99:PHE:O	1:C:100:ALA:HB2	2.21	0.41
1:A:196:GLU:HB3	1:C:203:LYS:NZ	2.35	0.41
1:D:127:ILE:HG21	1:D:135:THR:HG23	2.02	0.41
1:A:277:CYS:O	1:A:304:GLU:HG2	2.20	0.41
1:B:26:ASN:HD22	1:B:26:ASN:HA	1.57	0.41
1:B:4:LEU:CD2	1:B:5:PRO:HD2	2.49	0.41
1:C:259:THR:HG22	1:D:404:LYS:HD2	2.02	0.41
1:D:62:LEU:O	1:D:65:THR:HB	2.20	0.41
1:C:10:ASP:O	1:C:13:LEU:HB2	2.21	0.41
1:C:183:VAL:HG11	1:D:246:ILE:HD13	2.03	0.41
1:D:301:PHE:CD1	1:D:343:LEU:HG	2.55	0.41
1:D:26:ASN:O	1:D:400:LYS:HE2	2.21	0.41
1:A:125:ASN:HA	1:A:149:ILE:HA	2.02	0.41
1:A:156:THR:O	1:A:160:VAL:HG23	2.21	0.41
1:C:275:THR:HG21	1:C:277:CYS:HB3	1.98	0.41
1:D:143:PRO:CA	1:D:146:LEU:HD13	2.32	0.41
1:D:157:THR:HG22	1:D:161:HIS:CE1	2.55	0.41
1:D:363:ASN:O	1:D:366:MET:HB2	2.20	0.41
1:A:117:LEU:HD11	1:A:137:LEU:CD2	2.52	0.41
1:A:57:VAL:O	1:A:61:VAL:HG23	2.20	0.41
1:B:361:PHE:O	1:B:364:GLN:HB2	2.21	0.41
1:C:334:ARG:O	1:C:335:ILE:HD13	2.21	0.41
1:D:185:LYS:HD3	1:D:185:LYS:C	2.41	0.41
1:D:18:ARG:HG3	1:D:22:ASP:OD2	2.21	0.41
1:D:179:VAL:HG13	1:D:363:ASN:HB3	2.02	0.41
1:B:187:LYS:O	1:B:191:LEU:HB3	2.22	0.40
1:B:334:ARG:H	1:B:334:ARG:HD3	1.84	0.40
1:B:52:CYS:SG	1:B:78:CYS:HB3	2.61	0.40
1:C:398:LEU:HG	1:C:403:VAL:HG11	2.04	0.40
1:D:54:HIS:NE2	1:D:78:CYS:SG	2.95	0.40
1:A:14:ALA:CB	1:A:93:LYS:HD2	2.37	0.40
1:B:357:MET:HE3	1:B:357:MET:HA	2.04	0.40
1:D:379:PRO:HD2	1:D:383:HIS:HE1	1.87	0.40
1:C:275:THR:HB	1:C:304:GLU:OE1	2.21	0.40
1:A:10:ASP:HB3	1:A:13:LEU:CD2	2.52	0.40
1:A:385:LEU:HG	1:A:389:LEU:HB2	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:346:LEU:HD23	1:B:351:GLY:HA3	2.04	0.40
1:B:55:MET:HG2	1:B:88:ALA:CB	2.51	0.40
1:C:174:VAL:HA	1:C:175:PRO:HD3	1.92	0.40
1:C:26:ASN:HA	1:C:26:ASN:HD22	1.54	0.40
1:C:352:HIS:HB3	1:C:356:VAL:HG21	2.04	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	426/431 (99%)	396 (93%)	29 (7%)	1 (0%)	49	81
1	B	426/431 (99%)	397 (93%)	25 (6%)	4 (1%)	19	50
1	C	426/431 (99%)	394 (92%)	28 (7%)	4 (1%)	19	50
1	D	426/431 (99%)	399 (94%)	26 (6%)	1 (0%)	49	81
All	All	1704/1724 (99%)	1586 (93%)	108 (6%)	10 (1%)	27	60

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	302	ASP
1	B	132	GLY
1	B	133	ASP
1	B	302	ASP
1	C	132	GLY
1	C	302	ASP
1	D	302	ASP
1	B	6	TYR
1	C	6	TYR
1	C	133	ASP

### 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	351/353 (99%)	318 (91%)	33 (9%)	9	28
1	B	351/353 (99%)	321 (92%)	30 (8%)	12	33
1	C	351/353 (99%)	326 (93%)	25 (7%)	16	42
1	D	351/353 (99%)	322 (92%)	29 (8%)	12	34
All	All	1404/1412 (99%)	1287 (92%)	117 (8%)	12	34

All (117) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	13	LEU
1	A	26	ASN
1	A	28	MET
1	A	42	LYS
1	A	74	ARG
1	A	77	SER
1	A	83	THR
1	A	119	PHE
1	A	138	ILE
1	A	144	GLN
1	A	147	SER
1	A	172	LEU
1	A	174	VAL
1	A	179	VAL
1	A	183	VAL
1	A	191	LEU
1	A	209	MET
1	A	259	THR
1	A	267	GLU
1	A	282	LEU
1	A	301	PHE
1	A	308	LYS
1	A	334	ARG
1	A	337	LEU

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Mol	Chain	Res	Type
1	A	345	ASN
1	A	363	ASN
1	A	364	GLN
1	A	368	GLN
1	A	370	GLU
1	A	382	VAL
1	A	393	VAL
1	A	406	THR
1	A	418	MET
1	B	13	LEU
1	B	22	ASP
1	B	26	ASN
1	B	53	LEU
1	B	54	HIS
1	B	83	THR
1	B	98	VAL
1	B	134	LEU
1	B	144	GLN
1	B	146	LEU
1	B	147	SER
1	B	172	LEU
1	B	179	VAL
1	B	191	LEU
1	B	234	PHE
1	B	254	GLU
1	B	259	THR
1	B	267	GLU
1	B	282	LEU
1	B	308	LYS
1	B	334	ARG
1	B	345	ASN
1	B	368	GLN
1	B	370	GLU
1	B	382	VAL
1	B	393	VAL
1	B	398	LEU
1	B	406	THR
1	B	410	GLU
1	B	421	ASN
1	C	13	LEU
1	C	26	ASN
1	C	53	LEU

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Mol	Chain	Res	Type
1	C	54	HIS
1	C	83	THR
1	C	134	LEU
1	C	144	GLN
1	C	172	LEU
1	C	191	LEU
1	C	209	MET
1	C	234	PHE
1	C	254	GLU
1	C	259	THR
1	C	282	LEU
1	C	308	LYS
1	C	334	ARG
1	C	345	ASN
1	C	356	VAL
1	C	370	GLU
1	C	382	VAL
1	C	393	VAL
1	C	398	LEU
1	C	406	THR
1	C	410	GLU
1	C	421	ASN
1	D	13	LEU
1	D	26	ASN
1	D	28	MET
1	D	77	SER
1	D	83	THR
1	D	119	PHE
1	D	138	ILE
1	D	144	GLN
1	D	147	SER
1	D	172	LEU
1	D	174	VAL
1	D	183	VAL
1	D	191	LEU
1	D	209	MET
1	D	259	THR
1	D	282	LEU
1	D	301	PHE
1	D	308	LYS
1	D	321	LYS
1	D	334	ARG

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Mol	Chain	Res	Type
1	D	337	LEU
1	D	345	ASN
1	D	363	ASN
1	D	364	GLN
1	D	368	GLN
1	D	370	GLU
1	D	382	VAL
1	D	406	THR
1	D	418	MET

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (37) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	54	HIS
1	A	115	GLN
1	A	161	HIS
1	A	180	ASN
1	A	288	GLN
1	A	300	HIS
1	A	311	ASN
1	A	352	HIS
1	A	359	ASN
1	A	363	ASN
1	A	364	GLN
1	B	26	ASN
1	B	136	ASN
1	B	162	ASN
1	B	169	ASN
1	B	180	ASN
1	B	288	GLN
1	B	300	HIS
1	B	311	ASN
1	B	352	HIS
1	B	368	GLN
1	C	136	ASN
1	C	162	ASN
1	C	169	ASN
1	C	180	ASN
1	C	288	GLN
1	C	300	HIS
1	C	311	ASN
1	C	352	HIS

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Mol	Chain	Res	Type
1	D	115	GLN
1	D	161	HIS
1	D	180	ASN
1	D	288	GLN
1	D	300	HIS
1	D	311	ASN
1	D	359	ASN
1	D	364	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

### 5.6 Ligand geometry [i](#)

4 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	NAD	A	432	1	40,48,48	1.13	5 (12%)	44,73,73	1.83	6 (13%)
2	NAD	B	432	1	40,48,48	1.14	3 (7%)	44,73,73	1.95	7 (15%)
2	NAD	C	432	1	40,48,48	1.00	2 (5%)	44,73,73	2.27	11 (25%)
2	NAD	D	432	1	40,48,48	1.12	4 (10%)	44,73,73	1.80	5 (11%)

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
2	NAD	A	432	1	-	0/22/62/62	0/5/5/5
2	NAD	B	432	1	-	0/22/62/62	0/5/5/5
2	NAD	C	432	1	-	0/22/62/62	0/5/5/5
2	NAD	D	432	1	-	0/22/62/62	0/5/5/5

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	432	NAD	C5A-N7A	-2.08	1.32	1.39
2	A	432	NAD	C5A-C4A	-2.04	1.35	1.40
2	D	432	NAD	C3D-C4D	-2.04	1.47	1.53
2	D	432	NAD	C6N-N1N	2.01	1.40	1.35
2	C	432	NAD	C6N-N1N	2.08	1.40	1.35
2	B	432	NAD	C6N-N1N	2.20	1.41	1.35
2	A	432	NAD	C3N-C7N	2.28	1.54	1.50
2	A	432	NAD	C6N-N1N	2.45	1.41	1.35
2	B	432	NAD	O4B-C1B	2.48	1.44	1.41
2	D	432	NAD	C3N-C7N	2.50	1.54	1.50
2	D	432	NAD	O4B-C1B	2.65	1.44	1.41
2	A	432	NAD	O4B-C1B	2.76	1.45	1.41
2	C	432	NAD	C3N-C7N	2.96	1.55	1.50
2	B	432	NAD	C3N-C7N	3.30	1.55	1.50

All (29) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	432	NAD	N3A-C2A-N1A	-8.65	121.46	128.86
2	C	432	NAD	N3A-C2A-N1A	-8.54	121.56	128.86
2	A	432	NAD	N3A-C2A-N1A	-7.92	122.08	128.86
2	B	432	NAD	N3A-C2A-N1A	-7.12	122.77	128.86
2	C	432	NAD	C4B-O4B-C1B	-5.09	104.52	109.83
2	B	432	NAD	C4B-O4B-C1B	-4.98	104.64	109.83
2	B	432	NAD	O2D-C2D-C3D	-3.56	100.44	111.83
2	C	432	NAD	O2D-C2D-C3D	-3.09	101.94	111.83
2	C	432	NAD	C1B-N9A-C4A	-2.53	122.26	126.64
2	C	432	NAD	C5B-C4B-C3B	-2.47	106.00	115.29
2	D	432	NAD	O2D-C2D-C3D	-2.27	104.57	111.83
2	B	432	NAD	C1B-N9A-C4A	-2.26	122.73	126.64

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	432	NAD	C5D-C4D-C3D	-2.14	107.22	115.29
2	C	432	NAD	O3D-C3D-C4D	-2.14	104.87	111.06
2	C	432	NAD	C5N-C6N-N1N	-2.08	117.21	120.39
2	A	432	NAD	C4D-O4D-C1D	-2.05	107.69	109.83
2	A	432	NAD	C5N-C4N-C3N	2.22	122.95	120.35
2	B	432	NAD	C3N-C2N-N1N	2.36	122.78	120.41
2	A	432	NAD	O4B-C4B-C3B	2.41	109.91	105.15
2	C	432	NAD	C2A-N1A-C6A	2.89	123.66	118.75
2	D	432	NAD	C4A-C5A-N7A	2.90	112.22	109.41
2	B	432	NAD	O4D-C4D-C5D	2.96	119.25	109.39
2	C	432	NAD	O7N-C7N-C3N	3.17	123.59	119.62
2	D	432	NAD	O7N-C7N-C3N	3.22	123.66	119.62
2	A	432	NAD	O7N-C7N-C3N	3.38	123.86	119.62
2	C	432	NAD	O4D-C4D-C5D	3.53	121.13	109.39
2	C	432	NAD	C4A-C5A-N7A	4.03	113.30	109.41
2	B	432	NAD	C4A-C5A-N7A	4.17	113.44	109.41
2	A	432	NAD	C4A-C5A-N7A	4.28	113.54	109.41

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	432	NAD	3	0
2	B	432	NAD	4	0
2	C	432	NAD	4	0
2	D	432	NAD	2	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

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.