



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 15, 2017 – 04:09 am GMT

PDB ID : 1CER
Title : DETERMINANTS OF ENZYME THERMOSTABILITY OBSERVED IN
THE MOLECULAR STRUCTURE OF THERMUS AQUATICUS D-GLYCE
RALDEHYDE-3-PHOSPHATE DEHYDROGENASE AT 2.5 ANGSTROMS
RESOLUTION
Authors : Tanner, J.J.; Hecht, R.M.; Krause, K.L.
Deposited on : 1995-11-11
Resolution : 2.50 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity	:	4.02b-467
Mogul	:	1.7.2 (RC1), CSD as538be (2017)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20161228.v01 (using entries in the PDB archive December 28th 2016)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	recalc28949

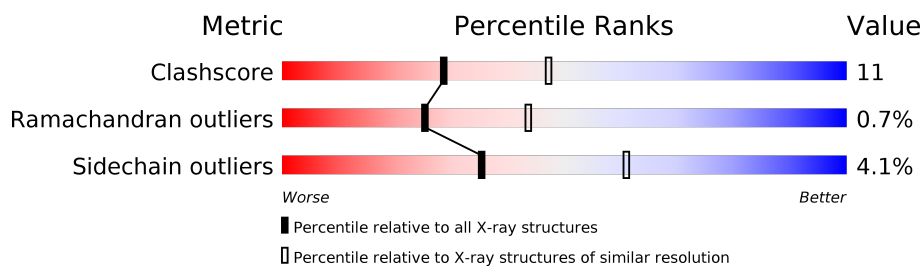
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	112137	4554 (2.50-2.50)
Ramachandran outliers	110173	4463 (2.50-2.50)
Sidechain outliers	110143	4465 (2.50-2.50)

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 ≥ 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	331	
1	B	331	
1	C	331	
1	D	331	
1	O	331	
1	P	331	
1	Q	331	

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Mol	Chain	Length	Quality of chain
1	R	331	<div><div></div><div>68%</div><div>31%</div><div></div></div>

2 Entry composition

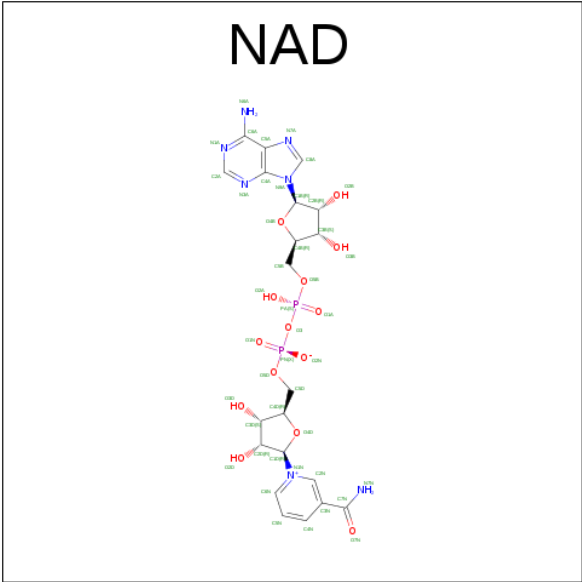
There are 2 unique types of molecules in this entry. The entry contains 20226 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 HOLO-D-GLYCERALDEHYDE-3-PHOSPHATE DEHYDROGENASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	O	331	Total	C	N	O	S	0	0	0
			2475	1572	430	466	7			
1	P	331	Total	C	N	O	S	0	0	0
			2496	1583	435	471	7			
1	Q	331	Total	C	N	O	S	0	0	0
			2487	1580	432	468	7			
1	R	331	Total	C	N	O	S	0	0	0
			2479	1575	431	466	7			
1	A	331	Total	C	N	O	S	0	0	0
			2475	1572	430	466	7			
1	B	331	Total	C	N	O	S	0	0	0
			2496	1583	435	471	7			
1	C	331	Total	C	N	O	S	0	0	0
			2487	1580	432	468	7			
1	D	331	Total	C	N	O	S	0	0	0
			2479	1575	431	466	7			

- Molecule 2 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (three-letter code: NAD) (formula: C₂₁H₂₇N₇O₁₄P₂).



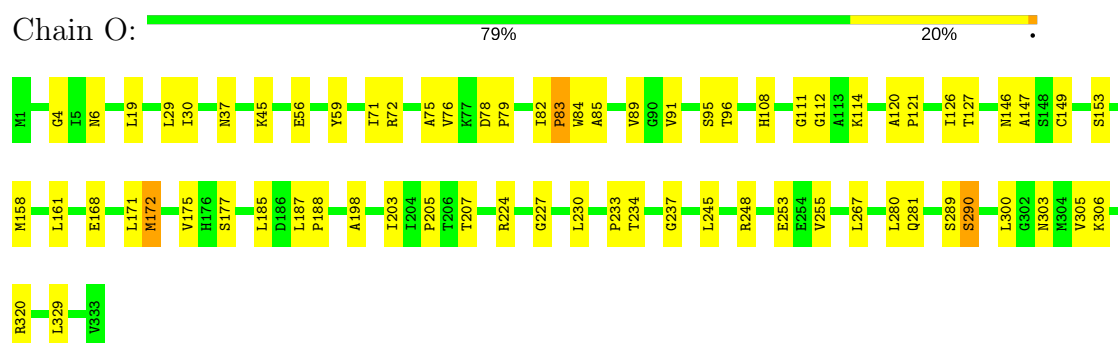
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	O	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	P	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	Q	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	R	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	A	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	B	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	C	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
2	D	1	Total	C	N	O	P	0	0
			44	21	7	14	2		

3 Residue-property plots

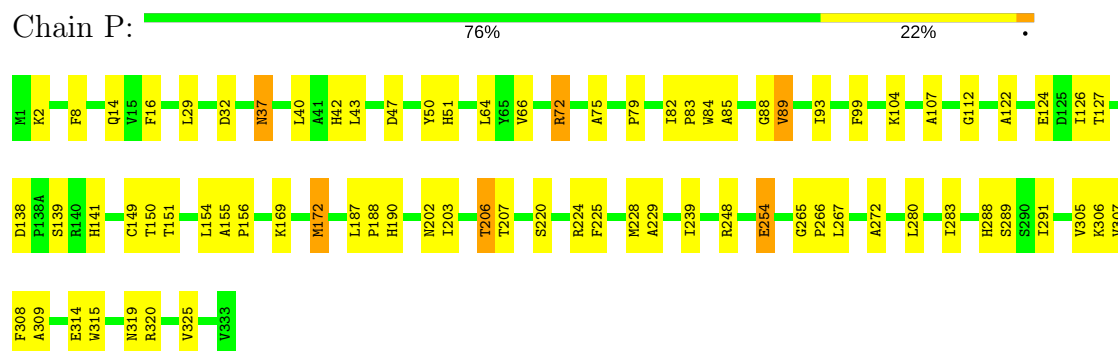
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are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

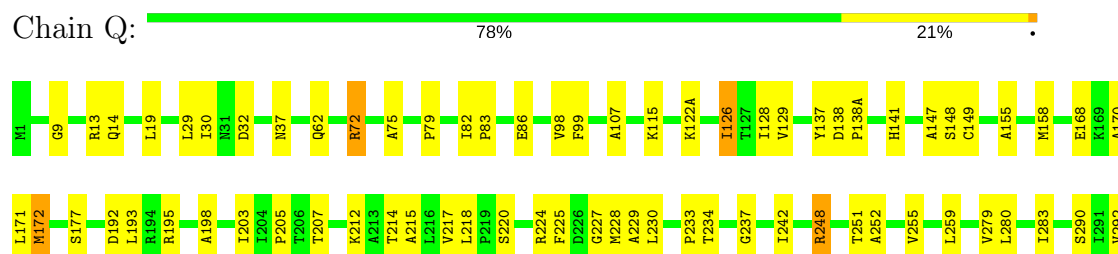
• Molecule 1: HOLO-D-GLYCERALDEHYDE-3-PHOSPHATE DEHYDROGENASE



• Molecule 1: HOLO-D-GLYCERALDEHYDE-3-PHOSPHATE DEHYDROGENASE



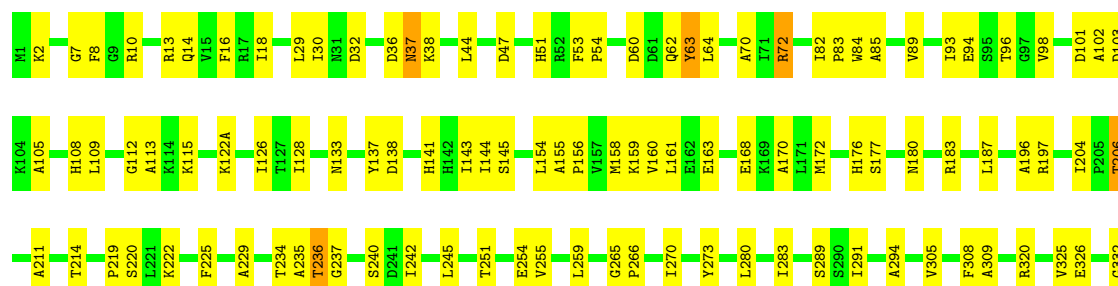
• Molecule 1: HOLO-D-GLYCERALDEHYDE-3-PHOSPHATE DEHYDROGENASE





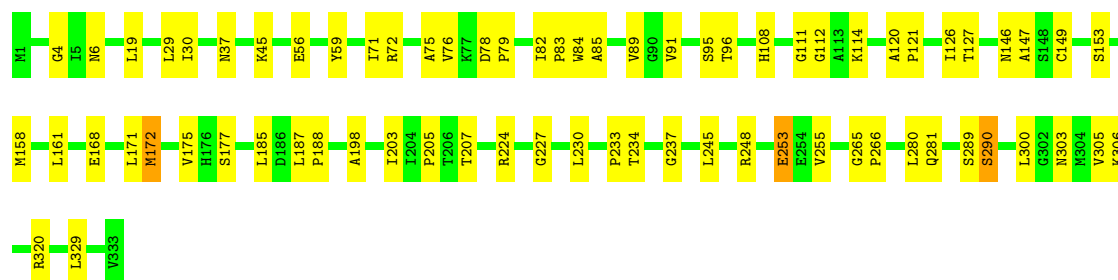
• Molecule 1: HOLO-D-GLYCERALDEHYDE-3-PHOSPHATE DEHYDROGENASE

Chain R: 68% 31%



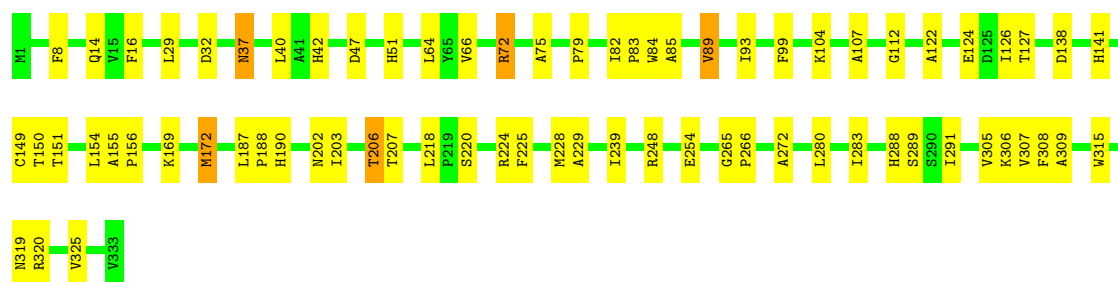
• Molecule 1: HOLO-D-GLYCERALDEHYDE-3-PHOSPHATE DEHYDROGENASE

Chain A: 79% 21%



• Molecule 1: HOLO-D-GLYCERALDEHYDE-3-PHOSPHATE DEHYDROGENASE

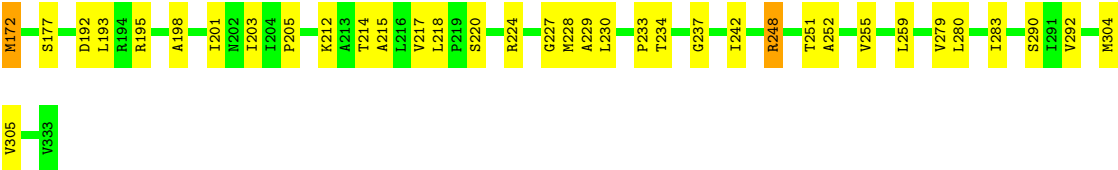
Chain B: 78% 20%



• Molecule 1: HOLO-D-GLYCERALDEHYDE-3-PHOSPHATE DEHYDROGENASE

Chain C: 79% 20%





● Molecule 1: HOLO-D-GLYCERALDEHYDE-3-PHOSPHATE DEHYDROGENASE



4 Data and refinement statistics

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

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	144.77Å 148.77Å 149.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	12.00 – 2.50	Depositor
% Data completeness (in resolution range)	72.0 (12.00-2.50)	Depositor
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR 3.1	Depositor
R, R_{free}	0.205 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	20226	wwPDB-VP
Average B, all atoms (Å ²)	28.0	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	0.91	3/2519 (0.1%)	0.99	3/3429 (0.1%)
1	B	0.91	0/2540	1.01	1/3453 (0.0%)
1	C	0.98	2/2531 (0.1%)	1.00	1/3442 (0.0%)
1	D	0.92	0/2523	1.02	3/3433 (0.1%)
1	O	0.91	3/2519 (0.1%)	0.99	3/3429 (0.1%)
1	P	0.92	0/2540	1.01	1/3453 (0.0%)
1	Q	0.98	2/2531 (0.1%)	1.00	1/3442 (0.0%)
1	R	0.92	0/2523	1.02	3/3433 (0.1%)
All	All	0.93	10/20226 (0.0%)	1.01	16/27514 (0.1%)

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	B	0	1
1	P	0	1
All	All	0	2

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	O	149	CYS	CB-SG	-6.88	1.70	1.82
1	A	149	CYS	CB-SG	-6.83	1.70	1.82
1	A	253	GLU	CG-CD	6.55	1.61	1.51
1	C	149	CYS	CB-SG	-6.53	1.71	1.82
1	O	253	GLU	CG-CD	6.52	1.61	1.51
1	Q	149	CYS	CB-SG	-6.51	1.71	1.82
1	O	56	GLU	CG-CD	5.53	1.60	1.51
1	A	56	GLU	CG-CD	5.51	1.60	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	Q	86	GLU	CG-CD	5.04	1.59	1.51
1	C	86	GLU	CG-CD	5.03	1.59	1.51

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	R	64	LEU	CA-CB-CG	8.70	135.32	115.30
1	D	64	LEU	CA-CB-CG	8.70	135.31	115.30
1	C	203	ILE	N-CA-C	-6.41	93.70	111.00
1	Q	203	ILE	N-CA-C	-6.39	93.73	111.00
1	O	203	ILE	N-CA-C	-6.08	94.58	111.00
1	A	203	ILE	N-CA-C	-6.07	94.62	111.00
1	R	176	HIS	N-CA-CB	-5.55	100.62	110.60
1	D	176	HIS	N-CA-CB	-5.54	100.62	110.60
1	D	183	ARG	NE-CZ-NH2	-5.40	117.60	120.30
1	O	111	GLY	N-CA-C	-5.34	99.76	113.10
1	A	111	GLY	N-CA-C	-5.33	99.78	113.10
1	R	183	ARG	NE-CZ-NH2	-5.31	117.64	120.30
1	O	175	VAL	N-CA-C	-5.11	97.20	111.00
1	A	175	VAL	N-CA-C	-5.11	97.20	111.00
1	B	203	ILE	N-CA-C	-5.05	97.36	111.00
1	P	203	ILE	N-CA-C	-5.05	97.37	111.00

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	190	HIS	Sidechain
1	P	190	HIS	Sidechain

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2475	0	2477	44	6
1	B	2496	0	2517	51	0
1	C	2487	0	2503	51	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	2479	0	2488	82	0
1	O	2475	0	2477	47	0
1	P	2496	0	2517	54	7
1	Q	2487	0	2503	50	1
1	R	2479	0	2488	80	0
2	A	44	0	26	1	0
2	B	44	0	26	0	0
2	C	44	0	26	0	0
2	D	44	0	26	0	0
2	O	44	0	26	1	0
2	P	44	0	26	0	0
2	Q	44	0	26	0	0
2	R	44	0	26	0	0
All	All	20226	0	20178	443	7

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 11.

All (443) 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:P:224:ARG:HH11	1:P:224:ARG:HG2	1.38	0.88
1:B:224:ARG:HG2	1:B:224:ARG:HH11	1.38	0.88
1:Q:248:ARG:HH11	1:Q:248:ARG:HB2	1.39	0.87
1:C:248:ARG:HB2	1:C:248:ARG:HH11	1.39	0.85
1:O:79:PRO:HA	1:O:82:ILE:HD12	1.64	0.80
1:P:272:ALA:HB2	1:P:288:HIS:CD2	2.17	0.80
1:B:272:ALA:HB2	1:B:288:HIS:CD2	2.17	0.79
1:A:79:PRO:HA	1:A:82:ILE:HD12	1.64	0.77
1:R:85:ALA:HB2	1:R:112:GLY:HA3	1.66	0.77
1:C:259:LEU:HD13	1:C:292:VAL:HG11	1.67	0.76
1:P:207:THR:HA	1:P:228:MET:HE3	1.67	0.76
1:D:85:ALA:HB2	1:D:112:GLY:HA3	1.66	0.76
1:R:251:THR:OG1	1:R:254:GLU:HG3	1.85	0.76
1:B:207:THR:HA	1:B:228:MET:HE3	1.67	0.75
1:B:224:ARG:HG2	1:B:224:ARG:NH1	2.01	0.75
1:O:29:LEU:HD12	1:O:30:ILE:N	2.01	0.75
1:A:29:LEU:HD12	1:A:30:ILE:N	2.01	0.75
1:D:251:THR:OG1	1:D:254:GLU:HG3	1.85	0.75
1:R:237:GLY:HA3	1:R:280:LEU:HD11	1.68	0.75
1:D:237:GLY:HA3	1:D:280:LEU:HD11	1.68	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:29:LEU:HD12	1:C:30:ILE:N	2.02	0.74
1:Q:259:LEU:HD13	1:Q:292:VAL:HG11	1.67	0.74
1:B:29:LEU:CD1	1:B:72:ARG:HB3	2.17	0.74
1:B:29:LEU:HD12	1:B:72:ARG:HB3	1.70	0.74
1:P:29:LEU:CD1	1:P:72:ARG:HB3	2.17	0.74
1:Q:29:LEU:HD12	1:Q:30:ILE:N	2.02	0.74
1:D:144:ILE:HG22	1:D:145:SER:N	2.04	0.72
1:R:144:ILE:HG22	1:R:145:SER:N	2.04	0.72
1:P:29:LEU:HD12	1:P:72:ARG:HB3	1.70	0.72
1:D:144:ILE:HG22	1:D:145:SER:H	1.54	0.71
1:C:158:MET:CE	1:C:242:ILE:HG21	2.21	0.71
1:Q:158:MET:CE	1:Q:242:ILE:HG21	2.21	0.71
1:R:144:ILE:HG22	1:R:145:SER:H	1.54	0.71
1:R:144:ILE:H	1:R:144:ILE:HD12	1.57	0.70
1:B:85:ALA:HB2	1:B:112:GLY:HA3	1.74	0.70
1:P:320:ARG:HA	1:P:320:ARG:HE	1.57	0.70
1:R:84:TRP:HE1	1:R:108:HIS:HD1	1.39	0.70
1:B:320:ARG:HE	1:B:320:ARG:HA	1.57	0.69
1:P:85:ALA:HB2	1:P:112:GLY:HA3	1.74	0.69
1:D:109:LEU:HD23	1:D:113:ALA:O	1.93	0.68
1:A:158:MET:CE	1:A:158:MET:HA	2.23	0.68
1:O:158:MET:HA	1:O:158:MET:CE	2.23	0.68
1:P:224:ARG:HG2	1:P:224:ARG:NH1	2.01	0.68
1:D:144:ILE:H	1:D:144:ILE:HD12	1.57	0.68
1:R:109:LEU:HD23	1:R:113:ALA:O	1.93	0.68
1:D:84:TRP:HE1	1:D:108:HIS:HD1	1.39	0.67
1:D:93:ILE:HD11	1:D:325:VAL:HG21	1.77	0.67
1:D:158:MET:CE	1:D:161:LEU:HD12	2.25	0.67
1:O:205:PRO:HA	1:O:230:LEU:HD23	1.77	0.67
1:Q:158:MET:HE1	1:Q:242:ILE:HG21	1.76	0.67
1:R:93:ILE:HD11	1:R:325:VAL:HG21	1.77	0.67
1:R:158:MET:CE	1:R:161:LEU:HD12	2.25	0.66
1:A:85:ALA:HB2	1:A:112:GLY:HA3	1.77	0.66
1:A:187:LEU:HG	1:A:188:PRO:HD2	1.78	0.66
1:A:205:PRO:HA	1:A:230:LEU:HD23	1.77	0.66
1:R:63:TYR:HD2	1:R:70:ALA:HB1	1.60	0.65
1:D:63:TYR:HD2	1:D:70:ALA:HB1	1.60	0.65
1:D:154:LEU:HD23	1:D:242:ILE:HD11	1.78	0.65
1:O:85:ALA:HB2	1:O:112:GLY:HA3	1.77	0.64
1:B:280:LEU:HD12	1:B:280:LEU:O	1.97	0.64
1:O:187:LEU:HG	1:O:188:PRO:HD2	1.78	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:84:TRP:CE3	1:D:89:VAL:HG11	2.33	0.64
1:R:84:TRP:CE3	1:R:89:VAL:HG11	2.33	0.64
1:R:154:LEU:HD23	1:R:242:ILE:HD11	1.78	0.64
1:R:63:TYR:CD2	1:R:70:ALA:HB1	2.33	0.64
1:P:280:LEU:O	1:P:280:LEU:HD12	1.97	0.64
1:D:63:TYR:CD2	1:D:70:ALA:HB1	2.33	0.63
1:O:158:MET:CE	1:O:161:LEU:HD12	2.28	0.63
1:Q:248:ARG:HH11	1:Q:248:ARG:CB	2.10	0.63
1:A:29:LEU:HD12	1:A:30:ILE:H	1.62	0.63
1:C:248:ARG:HH11	1:C:248:ARG:CB	2.10	0.63
1:C:304:MET:CE	1:D:245:LEU:HB2	2.29	0.63
1:Q:37:ASN:HD22	1:Q:37:ASN:N	1.96	0.63
1:O:91:VAL:HG21	1:O:329:LEU:HD21	1.81	0.63
1:A:158:MET:CE	1:A:161:LEU:HD12	2.28	0.63
1:Q:128:ILE:HD11	1:Q:137:TYR:HB2	1.80	0.63
1:A:91:VAL:HG21	1:A:329:LEU:HD21	1.81	0.62
1:B:206:THR:HG22	1:B:229:ALA:HB3	1.80	0.62
1:C:128:ILE:HD11	1:C:137:TYR:HB2	1.80	0.62
1:C:37:ASN:N	1:C:37:ASN:HD22	1.96	0.62
1:P:206:THR:HG22	1:P:229:ALA:HB3	1.80	0.62
1:Q:304:MET:CE	1:R:245:LEU:HB2	2.29	0.62
1:O:29:LEU:HD12	1:O:30:ILE:H	1.62	0.61
1:C:158:MET:HE1	1:C:242:ILE:HG21	1.82	0.61
1:O:84:TRP:CE3	1:O:89:VAL:HG11	2.36	0.60
1:P:320:ARG:NE	1:P:320:ARG:HA	2.15	0.60
1:A:84:TRP:CE3	1:A:89:VAL:HG11	2.36	0.60
1:B:320:ARG:HA	1:B:320:ARG:NE	2.15	0.60
1:D:158:MET:CE	1:D:158:MET:HA	2.32	0.59
1:R:158:MET:CE	1:R:158:MET:HA	2.32	0.59
1:O:158:MET:HA	1:O:158:MET:HE2	1.85	0.59
1:R:128:ILE:HD11	1:R:137:TYR:HB2	1.85	0.59
1:P:155:ALA:HB3	1:P:156:PRO:HD3	1.85	0.58
1:B:155:ALA:HB3	1:B:156:PRO:HD3	1.85	0.58
1:C:280:LEU:O	1:C:283:ILE:HG13	2.04	0.58
1:D:128:ILE:HD11	1:D:137:TYR:HB2	1.85	0.58
1:D:115:LYS:NZ	1:D:141:HIS:O	2.35	0.58
1:Q:280:LEU:O	1:Q:283:ILE:HG13	2.04	0.58
1:C:304:MET:HE3	1:D:245:LEU:HB2	1.86	0.58
1:D:62:GLN:HB3	1:D:63:TYR:CD1	2.39	0.58
1:R:115:LYS:NZ	1:R:141:HIS:O	2.35	0.58
1:R:325:VAL:HG12	1:R:326:GLU:N	2.19	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:144:ILE:HD12	1:D:144:ILE:N	2.19	0.57
1:D:320:ARG:HA	1:D:320:ARG:NE	2.19	0.57
1:D:325:VAL:HG12	1:D:326:GLU:N	2.19	0.57
1:R:144:ILE:N	1:R:144:ILE:HD12	2.19	0.57
1:R:62:GLN:HB3	1:R:63:TYR:CD1	2.39	0.57
1:B:29:LEU:HD23	1:B:84:TRP:CZ3	2.40	0.57
1:R:96:THR:OG1	1:R:98:VAL:HG22	2.05	0.57
1:P:8:PHE:HD2	1:P:40:LEU:HD22	1.68	0.57
1:R:320:ARG:HA	1:R:320:ARG:NE	2.19	0.57
1:P:29:LEU:HD23	1:P:84:TRP:CZ3	2.40	0.56
1:D:96:THR:OG1	1:D:98:VAL:HG22	2.05	0.56
1:R:29:LEU:HD13	1:R:72:ARG:HB3	1.87	0.56
1:B:8:PHE:HD2	1:B:40:LEU:HD22	1.68	0.56
1:B:172:MET:SD	1:B:172:MET:C	2.84	0.56
1:D:29:LEU:HD13	1:D:72:ARG:HB3	1.87	0.56
1:O:305:VAL:HG22	1:O:306:LYS:N	2.21	0.56
1:P:172:MET:C	1:P:172:MET:SD	2.84	0.56
1:A:303:ASN:OD1	1:B:169:LYS:NZ	2.40	0.55
1:D:37:ASN:HD22	1:D:37:ASN:N	2.04	0.55
1:R:37:ASN:HD22	1:R:37:ASN:N	2.04	0.55
1:Q:172:MET:HE3	1:Q:227:GLY:HA3	1.89	0.55
1:O:303:ASN:OD1	1:P:169:LYS:NZ	2.40	0.55
1:Q:172:MET:CE	1:Q:227:GLY:HA3	2.37	0.55
1:D:128:ILE:CD1	1:D:137:TYR:HB2	2.37	0.54
1:Q:304:MET:HE1	1:R:245:LEU:HB2	1.89	0.54
1:A:305:VAL:HG22	1:A:306:LYS:N	2.21	0.54
1:B:187:LEU:HD12	1:B:188:PRO:HD3	1.90	0.54
1:D:8:PHE:CD1	1:D:30:ILE:HG21	2.42	0.54
1:P:187:LEU:HD12	1:P:188:PRO:HD3	1.90	0.54
1:A:79:PRO:HB3	1:A:108:HIS:CE1	2.42	0.54
1:R:94:GLU:HG3	1:R:94:GLU:O	2.08	0.54
1:C:172:MET:CE	1:C:227:GLY:HA3	2.37	0.54
1:O:171:LEU:HD13	1:P:306:LYS:HB2	1.89	0.54
1:R:128:ILE:CD1	1:R:137:TYR:HB2	2.37	0.54
1:D:94:GLU:HG3	1:D:94:GLU:O	2.07	0.54
1:P:84:TRP:HA	1:P:84:TRP:CE3	2.43	0.53
1:R:8:PHE:CD1	1:R:30:ILE:HG21	2.42	0.53
1:O:79:PRO:HB3	1:O:108:HIS:CE1	2.42	0.53
1:B:84:TRP:HA	1:B:84:TRP:CE3	2.44	0.53
1:B:93:ILE:HD11	1:B:325:VAL:HG21	1.90	0.53
1:Q:129:VAL:HG23	1:Q:217:VAL:HG11	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:158:MET:HE1	1:D:161:LEU:HD12	1.90	0.53
1:C:129:VAL:HG23	1:C:217:VAL:HG11	1.90	0.53
1:R:8:PHE:O	1:R:13:ARG:HG3	2.09	0.53
1:A:171:LEU:HD13	1:B:306:LYS:HB2	1.89	0.53
1:D:177:SER:HB3	1:D:234:THR:O	2.09	0.53
1:A:146:ASN:O	1:A:147:ALA:HB3	2.09	0.53
1:R:177:SER:HB3	1:R:234:THR:O	2.09	0.53
1:R:158:MET:HE1	1:R:161:LEU:HD12	1.91	0.53
1:P:29:LEU:HD13	1:P:72:ARG:HB3	1.91	0.52
1:R:155:ALA:HB3	1:R:156:PRO:HD3	1.91	0.52
1:D:155:ALA:HB3	1:D:156:PRO:HD3	1.91	0.52
1:D:63:TYR:N	1:D:63:TYR:CD1	2.77	0.52
1:Q:129:VAL:CG2	1:Q:217:VAL:HG11	2.40	0.52
1:R:63:TYR:N	1:R:63:TYR:CD1	2.77	0.52
1:D:8:PHE:O	1:D:13:ARG:HG3	2.09	0.52
1:D:7:GLY:HA3	1:D:96:THR:HG22	1.92	0.52
1:O:146:ASN:O	1:O:147:ALA:HB3	2.09	0.52
1:R:7:GLY:CA	1:R:96:THR:HG22	2.40	0.52
1:D:291:ILE:O	1:D:309:ALA:HA	2.09	0.52
1:P:138:ASP:HB3	1:P:141:HIS:CE1	2.45	0.52
1:B:8:PHE:CD2	1:B:40:LEU:HD22	2.45	0.52
1:P:93:ILE:HD11	1:P:325:VAL:HG21	1.90	0.52
1:R:291:ILE:O	1:R:309:ALA:HA	2.09	0.52
1:D:7:GLY:CA	1:D:96:THR:HG22	2.40	0.51
1:D:102:ALA:HB1	1:D:143:ILE:HG21	1.92	0.51
1:R:7:GLY:HA3	1:R:96:THR:HG22	1.92	0.51
1:B:138:ASP:HB3	1:B:141:HIS:CE1	2.45	0.51
1:C:129:VAL:CG2	1:C:217:VAL:HG11	2.40	0.51
1:O:158:MET:HE1	1:O:161:LEU:HD12	1.91	0.51
1:O:79:PRO:HA	1:O:82:ILE:CD1	2.38	0.51
1:R:102:ALA:HB1	1:R:143:ILE:HG21	1.92	0.51
1:C:248:ARG:HB2	1:C:248:ARG:NH1	2.19	0.51
1:O:248:ARG:HH11	1:O:248:ARG:HG3	1.75	0.51
1:D:235:ALA:O	1:D:236:THR:HB	2.11	0.51
1:A:158:MET:HE2	1:A:158:MET:HA	1.91	0.50
1:B:126:ILE:HG12	1:B:127:THR:N	2.27	0.50
1:B:16:PHE:CZ	1:B:66:VAL:HG21	2.47	0.50
1:A:79:PRO:HA	1:A:82:ILE:CD1	2.38	0.50
1:B:283:ILE:C	1:B:283:ILE:HD12	2.32	0.50
1:C:37:ASN:N	1:C:37:ASN:ND2	2.58	0.50
1:P:8:PHE:CD2	1:P:40:LEU:HD22	2.45	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:248:ARG:HG3	1:A:248:ARG:HH11	1.75	0.50
1:D:14:GLN:O	1:D:18:ILE:HD12	2.12	0.50
1:P:126:ILE:HG12	1:P:127:THR:N	2.27	0.50
1:P:84:TRP:CE3	1:P:89:VAL:HG11	2.47	0.50
1:P:16:PHE:CZ	1:P:66:VAL:HG21	2.47	0.50
1:P:283:ILE:HD12	1:P:283:ILE:C	2.32	0.50
1:R:47:ASP:O	1:R:51:HIS:HA	2.12	0.50
1:R:235:ALA:O	1:R:236:THR:HB	2.11	0.50
1:B:307:VAL:HG12	1:B:308:PHE:N	2.27	0.50
1:D:47:ASP:O	1:D:51:HIS:HA	2.12	0.50
1:Q:128:ILE:CD1	1:Q:137:TYR:HB2	2.42	0.50
1:Q:304:MET:HE3	1:R:245:LEU:HB2	1.93	0.50
1:B:84:TRP:CE3	1:B:89:VAL:HG11	2.47	0.49
1:A:158:MET:HE1	1:A:161:LEU:HD12	1.92	0.49
1:P:291:ILE:O	1:P:309:ALA:HA	2.13	0.49
1:C:212:LYS:O	1:C:215:ALA:HB3	2.12	0.49
1:C:158:MET:HE3	1:C:242:ILE:HG21	1.93	0.49
1:A:158:MET:HE3	1:A:158:MET:HA	1.91	0.49
1:D:62:GLN:CB	1:D:63:TYR:HD1	2.26	0.49
1:Q:212:LYS:O	1:Q:215:ALA:HB3	2.12	0.49
1:A:255:VAL:HG21	1:A:305:VAL:HG21	1.95	0.49
1:R:14:GLN:O	1:R:18:ILE:HD12	2.12	0.49
1:A:224:ARG:HG2	1:A:224:ARG:NH1	2.28	0.49
1:B:29:LEU:HD13	1:B:72:ARG:HB3	1.91	0.49
1:C:128:ILE:CD1	1:C:137:TYR:HB2	2.42	0.49
1:D:63:TYR:N	1:D:63:TYR:HD1	2.10	0.49
1:P:280:LEU:HD12	1:P:280:LEU:C	2.34	0.48
1:R:62:GLN:CB	1:R:63:TYR:HD1	2.26	0.48
1:B:291:ILE:O	1:B:309:ALA:HA	2.13	0.48
1:O:255:VAL:HG21	1:O:305:VAL:HG21	1.95	0.48
1:C:177:SER:HB3	1:C:234:THR:O	2.14	0.48
1:A:300:LEU:HA	1:A:300:LEU:HD23	1.64	0.48
1:B:280:LEU:HD12	1:B:280:LEU:C	2.34	0.48
1:C:237:GLY:HA3	1:C:280:LEU:HD11	1.96	0.48
1:D:158:MET:HE2	1:D:158:MET:HA	1.95	0.48
1:P:32:ASP:O	1:P:75:ALA:HA	2.14	0.48
1:Q:237:GLY:HA3	1:Q:280:LEU:HD11	1.96	0.48
1:B:239:ILE:HD11	1:B:308:PHE:HB3	1.96	0.48
1:C:259:LEU:CD1	1:C:292:VAL:HG11	2.41	0.48
1:P:239:ILE:HD11	1:P:308:PHE:HB3	1.96	0.48
1:R:144:ILE:CG2	1:R:145:SER:N	2.76	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:Q:177:SER:HB3	1:Q:234:THR:O	2.14	0.48
1:B:32:ASP:O	1:B:75:ALA:HA	2.14	0.48
1:R:63:TYR:N	1:R:63:TYR:HD1	2.11	0.47
1:D:133:ASN:CG	1:D:133:ASN:O	2.52	0.47
1:O:224:ARG:NH1	1:O:224:ARG:HG2	2.28	0.47
1:P:307:VAL:HG12	1:P:308:PHE:N	2.27	0.47
1:P:289:SER:OG	1:P:320:ARG:HD2	2.14	0.47
1:B:42:HIS:CG	1:C:193:LEU:HD13	2.49	0.47
1:O:114:LYS:HE2	1:O:114:LYS:HB3	1.64	0.47
1:Q:259:LEU:CD1	1:Q:292:VAL:HG11	2.41	0.47
1:Q:29:LEU:HA	1:Q:72:ARG:O	2.15	0.47
1:Q:248:ARG:NH1	1:Q:248:ARG:HB2	2.19	0.47
1:R:36:ASP:OD1	1:R:38:LYS:HB3	2.15	0.47
1:R:62:GLN:HB3	1:R:63:TYR:HD1	1.80	0.47
1:C:304:MET:HE1	1:D:245:LEU:HB2	1.96	0.47
1:D:36:ASP:OD1	1:D:38:LYS:HB3	2.15	0.47
1:P:37:ASN:N	1:P:37:ASN:HD22	2.12	0.47
1:Q:255:VAL:HG21	1:Q:305:VAL:HG21	1.97	0.47
1:A:281:GLN:HG2	1:B:202:ASN:OD1	2.15	0.46
1:C:172:MET:HE2	1:C:227:GLY:HA3	1.97	0.46
1:C:255:VAL:HG21	1:C:305:VAL:HG21	1.97	0.46
1:P:42:HIS:CG	1:Q:193:LEU:HD13	2.50	0.46
1:R:240:SER:O	1:R:308:PHE:HA	2.15	0.46
1:D:320:ARG:HE	1:D:320:ARG:HA	1.80	0.46
1:O:37:ASN:N	1:O:37:ASN:HD22	2.13	0.46
1:B:187:LEU:HA	1:B:187:LEU:HD12	1.81	0.46
1:C:29:LEU:HA	1:C:72:ARG:O	2.15	0.46
1:B:289:SER:OG	1:B:320:ARG:HD2	2.15	0.46
1:B:37:ASN:HD22	1:B:37:ASN:N	2.12	0.46
1:O:245:LEU:HD12	1:O:245:LEU:HA	1.58	0.46
1:Q:9:GLY:O	1:Q:13:ARG:HG3	2.16	0.46
1:C:172:MET:HE3	1:C:227:GLY:HA3	1.97	0.46
1:Q:192:ASP:HB3	1:Q:195:ARG:HB2	1.98	0.46
1:B:14:GLN:HG3	1:B:315:TRP:CE3	2.50	0.46
1:C:192:ASP:HB3	1:C:195:ARG:HB2	1.98	0.46
1:D:170:ALA:O	1:D:225:PHE:HD1	1.99	0.46
1:O:281:GLN:HG2	1:P:202:ASN:OD1	2.15	0.46
1:P:14:GLN:HG3	1:P:315:TRP:CE3	2.50	0.46
1:R:273:TYR:CE1	1:R:294:ALA:HB2	2.50	0.46
1:A:245:LEU:HA	1:A:245:LEU:HD12	1.58	0.46
1:A:265:GLY:HA3	1:A:266:PRO:HD3	1.81	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:240:SER:O	1:D:308:PHE:HA	2.16	0.46
1:R:144:ILE:CG2	1:R:145:SER:H	2.27	0.46
1:D:10:ARG:O	1:D:14:GLN:HG2	2.16	0.46
1:D:108:HIS:O	1:D:113:ALA:HB3	2.16	0.46
1:R:170:ALA:O	1:R:225:PHE:HD1	1.99	0.46
1:A:289:SER:OG	1:A:320:ARG:HD2	2.16	0.45
1:C:9:GLY:O	1:C:13:ARG:HG3	2.16	0.45
1:R:10:ARG:O	1:R:14:GLN:HG2	2.16	0.45
1:C:19:LEU:HA	1:C:19:LEU:HD23	1.62	0.45
1:D:44:LEU:HD11	1:D:53:PHE:CD2	2.51	0.45
1:Q:155:ALA:HB2	1:Q:214:THR:HG23	1.98	0.45
1:D:273:TYR:CE1	1:D:294:ALA:HB2	2.50	0.45
1:O:289:SER:OG	1:O:320:ARG:HD2	2.16	0.45
1:P:320:ARG:NE	1:P:320:ARG:CA	2.80	0.45
1:C:122(A):LYS:HB3	1:C:122(A):LYS:HE2	1.74	0.45
1:O:177:SER:HB3	1:O:234:THR:O	2.17	0.45
1:O:19:LEU:HA	1:O:19:LEU:HD23	1.86	0.45
1:Q:37:ASN:N	1:Q:37:ASN:ND2	2.58	0.45
1:R:44:LEU:HD11	1:R:53:PHE:CD2	2.51	0.45
1:A:19:LEU:HA	1:A:19:LEU:HD23	1.86	0.45
1:O:158:MET:HA	1:O:158:MET:HE3	1.98	0.45
1:O:153:SER:O	1:O:290:SER:OG	2.34	0.44
1:R:270:ILE:HG23	1:R:289:SER:HB2	1.99	0.44
1:A:37:ASN:N	1:A:37:ASN:HD22	2.14	0.44
1:D:102:ALA:HA	1:D:105:ALA:HB3	2.00	0.44
1:R:320:ARG:HE	1:R:320:ARG:HA	1.80	0.44
1:D:270:ILE:HG23	1:D:289:SER:HB2	1.99	0.44
1:Q:228:MET:HG3	1:Q:229:ALA:H	1.82	0.44
1:R:108:HIS:O	1:R:113:ALA:HB3	2.16	0.44
1:B:320:ARG:CA	1:B:320:ARG:NE	2.80	0.44
1:P:187:LEU:HA	1:P:187:LEU:HD12	1.81	0.44
1:Q:29:LEU:HD12	1:Q:30:ILE:H	1.81	0.44
1:R:160:VAL:HG11	1:R:259:LEU:HD23	2.00	0.44
1:A:177:SER:HB3	1:A:234:THR:O	2.17	0.44
1:C:155:ALA:HB2	1:C:214:THR:HG23	1.99	0.44
1:O:84:TRP:HA	1:O:84:TRP:CE3	2.52	0.44
1:C:9:GLY:HA2	1:C:13:ARG:NH1	2.33	0.44
1:D:8:PHE:N	1:D:32:ASP:OD2	2.47	0.44
1:R:158:MET:HA	1:R:158:MET:HE2	1.98	0.44
1:B:82:ILE:HA	1:B:83:PRO:HD3	1.76	0.44
1:P:267:LEU:HD23	1:P:267:LEU:HA	1.75	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:O:187:LEU:HD12	1:O:187:LEU:HA	1.74	0.44
1:O:82:ILE:HA	1:O:83:PRO:HD3	1.72	0.44
1:P:224:ARG:HH11	1:P:224:ARG:CG	2.16	0.44
1:P:82:ILE:HA	1:P:83:PRO:HD3	1.76	0.44
1:R:16:PHE:CD1	1:R:16:PHE:C	2.91	0.43
1:A:114:LYS:HB3	1:A:114:LYS:HE2	1.64	0.43
1:D:187:LEU:O	1:D:196:ALA:HB1	2.18	0.43
1:Q:82:ILE:HA	1:Q:83:PRO:HD3	1.67	0.43
1:A:153:SER:O	1:A:290:SER:OG	2.34	0.43
1:D:16:PHE:CD1	1:D:16:PHE:C	2.91	0.43
1:D:160:VAL:HG11	1:D:259:LEU:HD23	2.00	0.43
1:R:133:ASN:O	1:R:133:ASN:CG	2.52	0.43
1:R:187:LEU:O	1:R:196:ALA:HB1	2.18	0.43
1:A:84:TRP:CE3	1:A:84:TRP:HA	2.52	0.43
1:D:101:ASP:HA	1:D:122(A):LYS:HB3	2.00	0.43
1:Q:9:GLY:HA2	1:Q:13:ARG:NH1	2.33	0.43
1:A:6:ASN:ND2	1:A:96:THR:CG2	2.82	0.43
1:C:228:MET:HG3	1:C:229:ALA:H	1.82	0.43
1:O:6:ASN:ND2	1:O:96:THR:CG2	2.82	0.43
1:Q:115:LYS:NZ	1:Q:141:HIS:O	2.42	0.43
1:R:255:VAL:HG21	1:R:305:VAL:HG21	2.01	0.43
1:D:255:VAL:HG21	1:D:305:VAL:HG21	2.01	0.43
1:R:101:ASP:HA	1:R:122(A):LYS:HB3	2.00	0.43
1:R:8:PHE:CE1	1:R:30:ILE:HD13	2.53	0.43
1:R:8:PHE:N	1:R:32:ASP:OD2	2.47	0.43
1:D:8:PHE:CE1	1:D:30:ILE:HD13	2.53	0.43
1:Q:214:THR:HG22	1:Q:218:LEU:HD12	2.01	0.43
1:A:78:ASP:HA	1:A:79:PRO:HD3	1.93	0.43
1:O:267:LEU:HA	1:O:267:LEU:HD23	1.79	0.43
1:C:279:VAL:HG11	1:D:204:ILE:HG12	2.01	0.43
1:O:171:LEU:HA	1:O:171:LEU:HD23	1.75	0.43
1:C:32:ASP:O	1:C:75:ALA:HA	2.19	0.42
1:D:144:ILE:CG2	1:D:145:SER:N	2.76	0.42
1:O:30:ILE:HG13	1:O:71:ILE:HG21	2.01	0.42
1:Q:138:ASP:HA	1:Q:138(A):PRO:HD2	1.78	0.42
1:A:30:ILE:HG13	1:A:71:ILE:HG21	2.01	0.42
1:A:4:GLY:HA3	1:A:84:TRP:CZ3	2.54	0.42
1:C:29:LEU:HD12	1:C:30:ILE:H	1.81	0.42
1:Q:279:VAL:HG11	1:R:204:ILE:HG12	2.01	0.42
1:R:102:ALA:HA	1:R:105:ALA:HB3	2.00	0.42
1:R:138:ASP:N	1:R:141:HIS:ND1	2.59	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:R:82:ILE:HA	1:R:83:PRO:HD3	1.74	0.42
1:D:11:ILE:HA	1:D:11:ILE:HD13	1.87	0.42
1:D:144:ILE:CG2	1:D:145:SER:H	2.27	0.42
1:R:159:LYS:O	1:R:163:GLU:HG3	2.20	0.42
1:C:214:THR:HG22	1:C:218:LEU:HD12	2.01	0.42
1:C:98:VAL:HG23	1:C:99:PHE:CE1	2.54	0.42
1:O:4:GLY:HA3	1:O:84:TRP:CZ3	2.54	0.42
1:P:122:ALA:HB3	1:P:124:GLU:HB3	2.02	0.42
1:A:120:ALA:HB1	1:A:121:PRO:CD	2.49	0.42
1:B:47:ASP:O	1:B:51:HIS:HA	2.20	0.42
1:D:159:LYS:O	1:D:163:GLU:HG3	2.20	0.42
2:A:336:NAD:H2D	2:A:336:NAD:H2N	1.90	0.42
1:D:280:LEU:O	1:D:283:ILE:HG13	2.19	0.42
1:O:120:ALA:HB1	1:O:121:PRO:CD	2.49	0.42
1:O:91:VAL:HG21	1:O:329:LEU:CD2	2.48	0.42
1:P:43:LEU:HA	1:P:43:LEU:HD23	1.68	0.42
1:R:53:PHE:HA	1:R:54:PRO:HD3	1.76	0.42
1:B:265:GLY:HA3	1:B:266:PRO:HD2	1.83	0.42
1:B:79:PRO:HG3	1:B:99:PHE:CE2	2.54	0.42
1:C:82:ILE:HA	1:C:83:PRO:HD3	1.67	0.42
1:D:53:PHE:HA	1:D:54:PRO:HD3	1.76	0.42
1:P:150:THR:HG22	1:P:154:LEU:HD11	2.02	0.42
1:Q:32:ASP:O	1:Q:75:ALA:HA	2.19	0.42
1:R:197:ARG:HA	1:R:197:ARG:HD2	1.95	0.42
1:C:79:PRO:HB2	1:C:107:ALA:HB3	2.02	0.42
1:C:201:ILE:HG21	1:C:201:ILE:HD13	1.83	0.42
1:D:60:ASP:C	1:D:62:GLN:H	2.23	0.42
1:P:8:PHE:N	1:P:32:ASP:OD2	2.51	0.42
1:Q:126:ILE:HD13	1:Q:128:ILE:CG1	2.50	0.42
1:R:280:LEU:O	1:R:283:ILE:HG13	2.19	0.42
1:B:122:ALA:HB3	1:B:124:GLU:HB3	2.02	0.42
1:C:126:ILE:HD13	1:C:128:ILE:CG1	2.50	0.42
1:D:138:ASP:N	1:D:141:HIS:ND1	2.59	0.42
1:O:126:ILE:HG12	1:O:127:THR:N	2.34	0.42
1:Q:168:GLU:O	1:Q:224:ARG:HD3	2.20	0.42
1:D:62:GLN:HB3	1:D:63:TYR:CE1	2.55	0.42
1:A:237:GLY:HA3	1:A:280:LEU:HD11	2.02	0.41
1:C:168:GLU:O	1:C:224:ARG:HD3	2.20	0.41
1:C:205:PRO:HA	1:C:230:LEU:HD23	2.01	0.41
1:C:251:THR:O	1:C:252:ALA:C	2.58	0.41
1:O:172:MET:CE	1:O:227:GLY:HA3	2.50	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:P:79:PRO:HB2	1:P:107:ALA:HB3	2.02	0.41
1:P:79:PRO:HG3	1:P:99:PHE:CE2	2.54	0.41
1:Q:19:LEU:HA	1:Q:19:LEU:HD23	1.62	0.41
1:R:219:PRO:O	1:R:222:LYS:HB2	2.20	0.41
1:R:62:GLN:HB3	1:R:63:TYR:CE1	2.55	0.41
1:A:126:ILE:HG12	1:A:127:THR:N	2.34	0.41
1:B:150:THR:HG22	1:B:154:LEU:HD11	2.02	0.41
1:C:115:LYS:NZ	1:C:141:HIS:O	2.42	0.41
1:Q:251:THR:O	1:Q:252:ALA:C	2.58	0.41
1:A:76:VAL:HG12	1:A:78:ASP:H	1.85	0.41
1:D:206:THR:HG22	1:D:229:ALA:HB3	2.01	0.41
1:D:59:TYR:CG	1:D:59:TYR:O	2.73	0.41
1:P:47:ASP:O	1:P:51:HIS:HA	2.20	0.41
1:Q:205:PRO:HA	1:Q:230:LEU:HD23	2.01	0.41
1:Q:98:VAL:HG23	1:Q:99:PHE:CE1	2.54	0.41
1:R:211:ALA:O	1:R:214:THR:HB	2.20	0.41
1:B:187:LEU:HD12	1:B:188:PRO:CD	2.51	0.41
1:B:42:HIS:CD2	1:C:193:LEU:HD13	2.56	0.41
2:O:336:NAD:H2D	2:O:336:NAD:H2N	1.90	0.41
1:O:76:VAL:HG12	1:O:78:ASP:H	1.85	0.41
1:R:206:THR:HG22	1:R:229:ALA:HB3	2.01	0.41
1:R:265:GLY:HA3	1:R:266:PRO:HD2	1.80	0.41
1:Q:79:PRO:HB2	1:Q:107:ALA:HB3	2.02	0.41
1:R:60:ASP:C	1:R:62:GLN:H	2.23	0.41
1:D:19:LEU:HD23	1:D:19:LEU:HA	1.88	0.41
1:O:59:TYR:N	1:O:59:TYR:CD1	2.89	0.41
1:P:42:HIS:CD2	1:Q:193:LEU:HD13	2.56	0.41
1:A:171:LEU:HA	1:A:171:LEU:HD23	1.75	0.41
1:D:126:ILE:HG23	1:D:128:ILE:HG13	2.02	0.41
1:P:265:GLY:HA3	1:P:266:PRO:HD2	1.83	0.41
1:P:319:ASN:HB3	1:P:320:ARG:NH2	2.36	0.41
1:R:126:ILE:HG23	1:R:128:ILE:HG13	2.02	0.41
1:D:211:ALA:O	1:D:214:THR:HB	2.20	0.41
1:D:219:PRO:O	1:D:222:LYS:HB2	2.20	0.41
1:Q:170:ALA:O	1:Q:171:LEU:HD23	2.21	0.41
1:B:79:PRO:HB2	1:B:107:ALA:HB3	2.02	0.41
1:B:319:ASN:HB3	1:B:320:ARG:NH2	2.36	0.41
1:D:251:THR:HG1	1:D:254:GLU:HG3	1.85	0.41
1:A:59:TYR:N	1:A:59:TYR:CD1	2.89	0.40
1:B:8:PHE:N	1:B:32:ASP:OD2	2.51	0.40
1:C:78:ASP:HA	1:C:79:PRO:HD3	1.84	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:82:ILE:HA	1:D:83:PRO:HD3	1.74	0.40
1:O:237:GLY:HA3	1:O:280:LEU:HD11	2.02	0.40
1:B:218:LEU:HA	1:B:218:LEU:HD23	1.82	0.40
1:O:78:ASP:HA	1:O:79:PRO:HD3	1.93	0.40
1:Q:207:THR:HA	1:Q:228:MET:HE3	2.03	0.40
1:A:172:MET:CE	1:A:227:GLY:HA3	2.50	0.40
1:C:170:ALA:O	1:C:171:LEU:HD23	2.21	0.40
1:D:146:ASN:HD21	1:D:320:ARG:HB3	1.87	0.40
1:O:300:LEU:HD23	1:O:300:LEU:HA	1.64	0.40
1:P:2:LYS:HB2	1:P:88:GLY:O	2.21	0.40
1:P:50:TYR:OH	1:P:314:GLU:HB2	2.22	0.40
1:Q:170:ALA:HB3	1:Q:225:PHE:CD1	2.56	0.40
1:Q:228:MET:HG3	1:Q:229:ALA:N	2.37	0.40

All (7) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:P:138:ASP:CG	1:A:253:GLU:OE1[1_545]	1.58	0.62
1:P:138:ASP:OD1	1:A:253:GLU:OE2[1_545]	1.60	0.60
1:P:139:SER:OG	1:A:253:GLU:OE2[1_545]	1.64	0.56
1:P:254:GLU:OE2	1:Q:224:ARG:NH2[2_555]	1.65	0.55
1:P:138:ASP:OD1	1:A:253:GLU:CD[1_545]	1.76	0.44
1:P:138:ASP:OD2	1:A:253:GLU:OE1[1_545]	1.83	0.37
1:P:138:ASP:OD1	1:A:253:GLU:OE1[1_545]	1.83	0.37

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	329/331 (99%)	300 (91%)	25 (8%)	4 (1%)	15 27

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	329/331 (99%)	305 (93%)	24 (7%)	0	100	100
1	C	329/331 (99%)	303 (92%)	23 (7%)	3 (1%)	20	36
1	D	329/331 (99%)	291 (88%)	36 (11%)	2 (1%)	28	48
1	O	329/331 (99%)	300 (91%)	25 (8%)	4 (1%)	15	27
1	P	329/331 (99%)	305 (93%)	24 (7%)	0	100	100
1	Q	329/331 (99%)	303 (92%)	23 (7%)	3 (1%)	20	36
1	R	329/331 (99%)	291 (88%)	36 (11%)	2 (1%)	28	48
All	All	2632/2648 (99%)	2398 (91%)	216 (8%)	18 (1%)	25	43

All (18) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	O	198	ALA
1	A	198	ALA
1	R	332	GLY
1	D	332	GLY
1	Q	147	ALA
1	Q	198	ALA
1	R	180	ASN
1	C	147	ALA
1	C	198	ALA
1	D	180	ASN
1	O	83	PRO
1	A	83	PRO
1	O	75	ALA
1	O	233	PRO
1	A	75	ALA
1	A	233	PRO
1	Q	233	PRO
1	C	233	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	251/265 (95%)	243 (97%)	8 (3%)	44	71
1	B	257/265 (97%)	243 (95%)	14 (5%)	26	47
1	C	254/265 (96%)	244 (96%)	10 (4%)	37	63
1	D	252/265 (95%)	242 (96%)	10 (4%)	36	62
1	O	251/265 (95%)	243 (97%)	8 (3%)	44	71
1	P	257/265 (97%)	243 (95%)	14 (5%)	26	47
1	Q	254/265 (96%)	244 (96%)	10 (4%)	37	63
1	R	252/265 (95%)	242 (96%)	10 (4%)	36	62
All	All	2028/2120 (96%)	1944 (96%)	84 (4%)	35	61

All (84) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	O	45	LYS
1	O	72	ARG
1	O	95	SER
1	O	168	GLU
1	O	172	MET
1	O	185	LEU
1	O	207	THR
1	O	290	SER
1	P	37	ASN
1	P	64	LEU
1	P	72	ARG
1	P	89	VAL
1	P	104	LYS
1	P	149	CYS
1	P	151	THR
1	P	172	MET
1	P	206	THR
1	P	220	SER
1	P	225	PHE
1	P	248	ARG
1	P	254	GLU
1	P	305	VAL
1	Q	14	GLN
1	Q	62	GLN
1	Q	72	ARG
1	Q	122(A)	LYS
1	Q	126	ILE

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Mol	Chain	Res	Type
1	Q	148	SER
1	Q	172	MET
1	Q	220	SER
1	Q	248	ARG
1	Q	290	SER
1	R	2	LYS
1	R	37	ASN
1	R	63	TYR
1	R	72	ARG
1	R	103	ASP
1	R	168	GLU
1	R	172	MET
1	R	206	THR
1	R	220	SER
1	R	236	THR
1	A	45	LYS
1	A	72	ARG
1	A	95	SER
1	A	168	GLU
1	A	172	MET
1	A	185	LEU
1	A	207	THR
1	A	290	SER
1	B	37	ASN
1	B	64	LEU
1	B	72	ARG
1	B	89	VAL
1	B	104	LYS
1	B	149	CYS
1	B	151	THR
1	B	172	MET
1	B	206	THR
1	B	220	SER
1	B	225	PHE
1	B	248	ARG
1	B	254	GLU
1	B	305	VAL
1	C	14	GLN
1	C	62	GLN
1	C	72	ARG
1	C	122(A)	LYS
1	C	126	ILE

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Mol	Chain	Res	Type
1	C	148	SER
1	C	172	MET
1	C	220	SER
1	C	248	ARG
1	C	290	SER
1	D	2	LYS
1	D	37	ASN
1	D	63	TYR
1	D	72	ARG
1	D	103	ASP
1	D	168	GLU
1	D	172	MET
1	D	206	THR
1	D	220	SER
1	D	236	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (25) such sidechains are listed below:

Mol	Chain	Res	Type
1	O	42	HIS
1	O	256	ASN
1	P	37	ASN
1	P	42	HIS
1	P	256	ASN
1	Q	37	ASN
1	Q	42	HIS
1	Q	256	ASN
1	R	37	ASN
1	R	42	HIS
1	R	146	ASN
1	R	256	ASN
1	A	37	ASN
1	A	42	HIS
1	A	256	ASN
1	B	37	ASN
1	B	42	HIS
1	B	256	ASN
1	C	37	ASN
1	C	42	HIS
1	C	256	ASN
1	D	37	ASN
1	D	42	HIS

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Mol	Chain	Res	Type
1	D	146	ASN
1	D	256	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

5.6 Ligand geometry ⓘ

8 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	336	-	41,48,48	1.16	3 (7%)	43,73,73	2.50	10 (23%)
2	NAD	B	336	-	41,48,48	1.22	3 (7%)	43,73,73	2.48	17 (39%)
2	NAD	C	336	-	41,48,48	1.27	5 (12%)	43,73,73	1.82	8 (18%)
2	NAD	D	336	-	41,48,48	1.04	2 (4%)	43,73,73	2.21	16 (37%)
2	NAD	O	336	-	41,48,48	1.17	3 (7%)	43,73,73	2.50	10 (23%)
2	NAD	P	336	-	41,48,48	1.22	3 (7%)	43,73,73	2.48	17 (39%)
2	NAD	Q	336	-	41,48,48	1.27	5 (12%)	43,73,73	1.82	8 (18%)
2	NAD	R	336	-	41,48,48	1.04	2 (4%)	43,73,73	2.21	16 (37%)

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	336	-	-	0/22/62/62	0/5/5/5
2	NAD	B	336	-	-	0/22/62/62	0/5/5/5
2	NAD	C	336	-	-	0/22/62/62	0/5/5/5
2	NAD	D	336	-	-	0/22/62/62	0/5/5/5
2	NAD	O	336	-	-	0/22/62/62	0/5/5/5
2	NAD	P	336	-	-	0/22/62/62	0/5/5/5
2	NAD	Q	336	-	-	0/22/62/62	0/5/5/5
2	NAD	R	336	-	-	0/22/62/62	0/5/5/5

All (26) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	P	336	NAD	C2D-C1D	-3.52	1.48	1.53
2	B	336	NAD	C2D-C1D	-3.50	1.48	1.53
2	B	336	NAD	C2B-C1B	-3.15	1.48	1.53
2	P	336	NAD	C2B-C1B	-3.14	1.48	1.53
2	C	336	NAD	C2B-C1B	-3.05	1.48	1.53
2	Q	336	NAD	C2B-C1B	-3.03	1.48	1.53
2	R	336	NAD	C2D-C1D	-2.85	1.49	1.53
2	D	336	NAD	C2D-C1D	-2.85	1.49	1.53
2	A	336	NAD	C2B-C1B	-2.75	1.49	1.53
2	O	336	NAD	C2B-C1B	-2.74	1.49	1.53
2	Q	336	NAD	PA-O2A	-2.10	1.44	1.55
2	C	336	NAD	PA-O2A	-2.09	1.44	1.55
2	Q	336	NAD	C2D-C1D	-2.01	1.50	1.53
2	C	336	NAD	C2D-C1D	-2.00	1.50	1.53
2	D	336	NAD	C2A-N3A	2.28	1.36	1.32
2	Q	336	NAD	O4D-C1D	2.31	1.44	1.41
2	C	336	NAD	O4D-C1D	2.32	1.44	1.41
2	R	336	NAD	C2A-N3A	2.32	1.36	1.32
2	O	336	NAD	C6N-N1N	2.38	1.41	1.35
2	A	336	NAD	C6N-N1N	2.38	1.41	1.35
2	C	336	NAD	C6N-N1N	2.41	1.41	1.35
2	Q	336	NAD	C6N-N1N	2.43	1.41	1.35
2	B	336	NAD	O3D-C3D	2.54	1.48	1.43
2	P	336	NAD	O3D-C3D	2.55	1.48	1.43
2	A	336	NAD	O4D-C1D	3.32	1.45	1.41
2	O	336	NAD	O4D-C1D	3.36	1.45	1.41

All (102) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	O	336	NAD	N3A-C2A-N1A	-10.98	119.30	128.86
2	A	336	NAD	N3A-C2A-N1A	-10.97	119.30	128.86
2	B	336	NAD	N3A-C2A-N1A	-8.18	121.74	128.86
2	P	336	NAD	N3A-C2A-N1A	-8.15	121.76	128.86
2	B	336	NAD	C4B-O4B-C1B	-5.99	103.39	109.77
2	P	336	NAD	C4B-O4B-C1B	-5.98	103.41	109.77
2	A	336	NAD	C1B-N9A-C4A	-5.31	117.47	126.64
2	O	336	NAD	C1B-N9A-C4A	-5.27	117.52	126.64
2	Q	336	NAD	O7N-C7N-C3N	-5.24	113.50	119.62
2	C	336	NAD	O7N-C7N-C3N	-5.23	113.50	119.62
2	C	336	NAD	N3A-C2A-N1A	-3.86	125.50	128.86
2	Q	336	NAD	N3A-C2A-N1A	-3.85	125.50	128.86
2	R	336	NAD	C5A-C6A-N6A	-3.81	112.71	120.47
2	D	336	NAD	C5A-C6A-N6A	-3.81	112.71	120.47
2	P	336	NAD	C2D-C3D-C4D	-3.42	95.95	102.62
2	B	336	NAD	C2D-C3D-C4D	-3.41	95.97	102.62
2	B	336	NAD	O5D-PN-O1N	-3.28	96.04	109.25
2	P	336	NAD	O5D-PN-O1N	-3.27	96.06	109.25
2	P	336	NAD	C3N-C7N-N7N	-3.09	114.24	117.77
2	B	336	NAD	C3N-C7N-N7N	-3.08	114.26	117.77
2	D	336	NAD	C2N-C3N-C4N	-3.00	114.83	118.26
2	R	336	NAD	C2N-C3N-C4N	-3.00	114.83	118.26
2	O	336	NAD	O7N-C7N-N7N	-2.96	118.36	122.58
2	A	336	NAD	O7N-C7N-N7N	-2.96	118.37	122.58
2	B	336	NAD	O4B-C4B-C5B	-2.95	99.43	109.40
2	P	336	NAD	O4B-C4B-C5B	-2.95	99.43	109.40
2	R	336	NAD	N3A-C2A-N1A	-2.94	126.29	128.86
2	R	336	NAD	C5N-C6N-N1N	-2.91	115.93	120.40
2	D	336	NAD	N3A-C2A-N1A	-2.90	126.34	128.86
2	D	336	NAD	C5N-C6N-N1N	-2.88	115.98	120.40
2	A	336	NAD	O2B-C2B-C1B	-2.86	102.68	111.61
2	O	336	NAD	O2B-C2B-C1B	-2.85	102.71	111.61
2	R	336	NAD	C1B-N9A-C4A	-2.74	121.90	126.64
2	D	336	NAD	C1B-N9A-C4A	-2.73	121.91	126.64
2	O	336	NAD	C5A-C6A-N6A	-2.48	115.41	120.47
2	A	336	NAD	C5A-C6A-N6A	-2.48	115.42	120.47
2	P	336	NAD	C5B-C4B-C3B	-2.39	106.19	115.29
2	B	336	NAD	C5B-C4B-C3B	-2.38	106.22	115.29
2	B	336	NAD	C3N-C2N-N1N	-2.29	118.12	120.43
2	P	336	NAD	C3N-C2N-N1N	-2.28	118.13	120.43
2	B	336	NAD	O3B-C3B-C2B	-2.28	104.53	111.83
2	P	336	NAD	O3B-C3B-C2B	-2.27	104.54	111.83
2	D	336	NAD	O3B-C3B-C4B	-2.27	104.46	111.09

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	R	336	NAD	O3B-C3B-C4B	-2.26	104.48	111.09
2	P	336	NAD	C6N-C5N-C4N	-2.24	116.06	119.44
2	B	336	NAD	C6N-C5N-C4N	-2.24	116.07	119.44
2	Q	336	NAD	O4D-C4D-C3D	-2.22	100.75	105.17
2	C	336	NAD	O4D-C4D-C3D	-2.22	100.76	105.17
2	R	336	NAD	O4D-C4D-C3D	-2.16	100.88	105.17
2	P	336	NAD	O2A-PA-O5B	-2.15	98.01	108.14
2	B	336	NAD	O2A-PA-O5B	-2.15	98.01	108.14
2	D	336	NAD	O4D-C4D-C3D	-2.14	100.91	105.17
2	B	336	NAD	O7N-C7N-N7N	-2.12	119.57	122.58
2	P	336	NAD	O7N-C7N-N7N	-2.09	119.60	122.58
2	R	336	NAD	O4D-C4D-C5D	2.08	116.43	109.40
2	D	336	NAD	O4D-C4D-C5D	2.09	116.45	109.40
2	R	336	NAD	O5B-PA-O1A	2.23	118.23	109.25
2	D	336	NAD	O5B-PA-O1A	2.23	118.26	109.25
2	O	336	NAD	O2A-PA-O1A	2.27	124.03	112.28
2	A	336	NAD	O2A-PA-O1A	2.27	124.04	112.28
2	D	336	NAD	O2D-C2D-C1D	2.30	118.80	111.61
2	R	336	NAD	O2D-C2D-C1D	2.30	118.81	111.61
2	A	336	NAD	O2N-PN-O1N	2.38	124.58	112.28
2	O	336	NAD	O2N-PN-O1N	2.38	124.59	112.28
2	D	336	NAD	C6N-C5N-C4N	2.41	123.08	119.44
2	R	336	NAD	C6N-C5N-C4N	2.44	123.11	119.44
2	P	336	NAD	C4D-O4D-C1D	2.53	112.46	109.77
2	D	336	NAD	C4D-O4D-C1D	2.54	112.47	109.77
2	B	336	NAD	C4D-O4D-C1D	2.55	112.48	109.77
2	R	336	NAD	C4D-O4D-C1D	2.55	112.48	109.77
2	O	336	NAD	O7N-C7N-C3N	2.62	122.68	119.62
2	A	336	NAD	O7N-C7N-C3N	2.65	122.72	119.62
2	C	336	NAD	O2N-PN-O1N	2.68	126.17	112.28
2	Q	336	NAD	O2N-PN-O1N	2.68	126.18	112.28
2	P	336	NAD	C5N-C4N-C3N	2.74	123.57	120.35
2	B	336	NAD	C5N-C4N-C3N	2.75	123.59	120.35
2	O	336	NAD	N6A-C6A-N1A	2.97	124.66	118.77
2	A	336	NAD	N6A-C6A-N1A	2.98	124.68	118.77
2	C	336	NAD	O4D-C4D-C5D	3.09	119.83	109.40
2	Q	336	NAD	O4D-C4D-C5D	3.09	119.84	109.40
2	R	336	NAD	C3N-C2N-N1N	3.11	123.56	120.43
2	D	336	NAD	C3N-C2N-N1N	3.15	123.60	120.43
2	D	336	NAD	O2N-PN-O1N	3.50	130.41	112.28
2	R	336	NAD	O2N-PN-O1N	3.51	130.43	112.28
2	C	336	NAD	C3N-C7N-N7N	3.53	121.81	117.77

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	Q	336	NAD	C3N-C7N-N7N	3.57	121.86	117.77
2	B	336	NAD	O7N-C7N-C3N	3.88	124.16	119.62
2	P	336	NAD	O7N-C7N-C3N	3.88	124.17	119.62
2	P	336	NAD	C4A-C5A-N7A	3.92	113.20	109.41
2	B	336	NAD	C4A-C5A-N7A	3.92	113.20	109.41
2	Q	336	NAD	C4A-C5A-N7A	3.95	113.22	109.41
2	C	336	NAD	C4A-C5A-N7A	3.97	113.25	109.41
2	P	336	NAD	O2N-PN-O1N	4.12	133.62	112.28
2	B	336	NAD	O2N-PN-O1N	4.13	133.66	112.28
2	D	336	NAD	N6A-C6A-N1A	4.23	127.16	118.77
2	R	336	NAD	N6A-C6A-N1A	4.24	127.16	118.77
2	C	336	NAD	C4D-O4D-C1D	4.50	114.56	109.77
2	Q	336	NAD	C4D-O4D-C1D	4.51	114.57	109.77
2	A	336	NAD	C4A-C5A-N7A	6.50	115.69	109.41
2	O	336	NAD	C4A-C5A-N7A	6.55	115.74	109.41
2	R	336	NAD	C4A-C5A-N7A	6.86	116.03	109.41
2	D	336	NAD	C4A-C5A-N7A	6.86	116.04	109.41

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	336	NAD	1	0
2	O	336	NAD	1	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.