Full wwPDB X-ray Structure Validation Report (i)

Aug 2, 2023 – 02:44 AM EDT

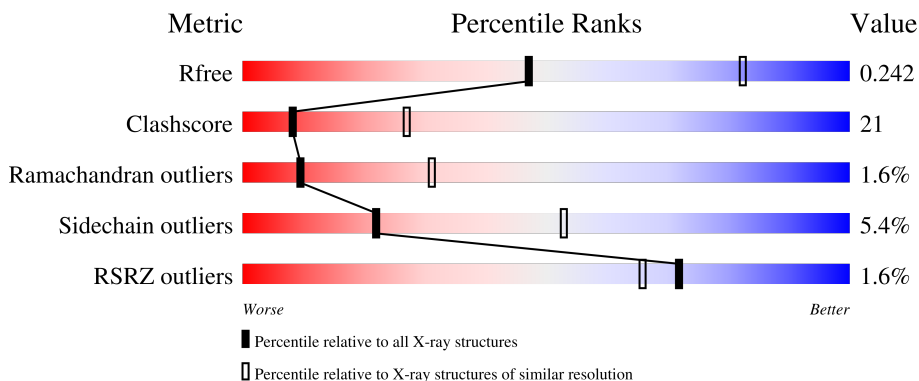|		
PDB ID	:	1BPW
Title	:	BETAINE ALDEHYDE DEHYDROGENASE FROM COD LIVER
Authors	:	Johansson, K.; El Ahmad, M.; Ramaswamy, S.; Hjelmqvist, L.; Jornvall, H.; Eklund, H.
Deposited on	:	1998-08-12
Resolution	:	2.80 Å(reported)

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
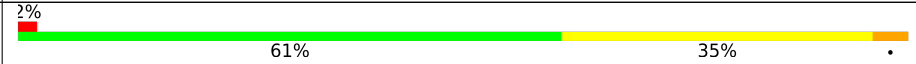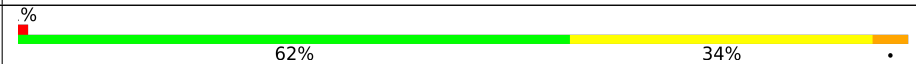*X-RAY DIFFRACTION*

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	Percentile Ranks	Value
Rfree		0.242
Clashscore		21
Ramachandran outliers		1.6%
Sidechain outliers		5.4%
RSRZ outliers		1.6%

Worse *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (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 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 <=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	503	2% / 61% 35% •
1	B	503	2% / 61% 35% •
1	C	503	% / 62% 34% •
1	D	503	2% / 62% 34% •

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 15824 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 PROTEIN (ALDEHYDE DEHYDROGENASE).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	503	Total	C	N	O	S	0	0	0
			3806	2408	651	717	30			
1	B	503	Total	C	N	O	S	0	0	0
			3806	2408	651	717	30			
1	C	503	Total	C	N	O	S	0	0	0
			3806	2408	651	717	30			
1	D	503	Total	C	N	O	S	0	0	0
			3806	2408	651	717	30			

- 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	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		

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

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	105	Total 105	O 105	0	0
3	B	105	Total 105	O 105	0	0
3	C	108	Total 108	O 108	0	0
3	D	106	Total 106	O 106	0	0

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: PROTEIN (ALDEHYDE DEHYDROGENASE)
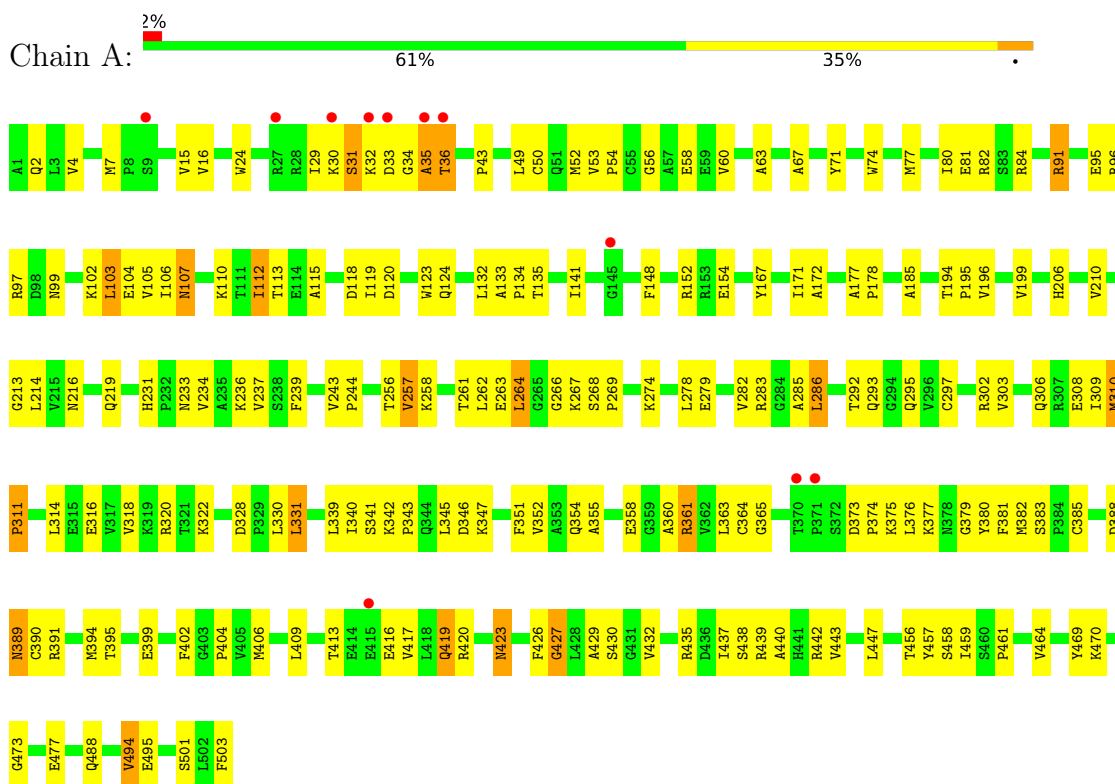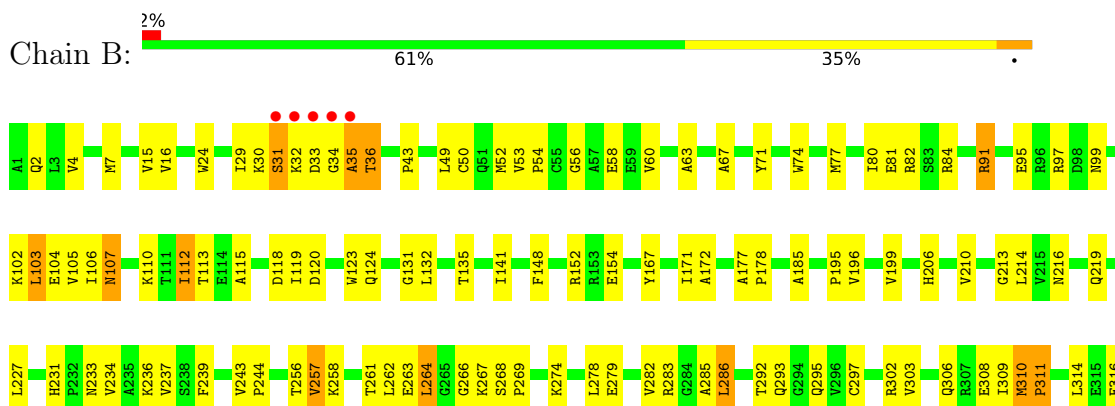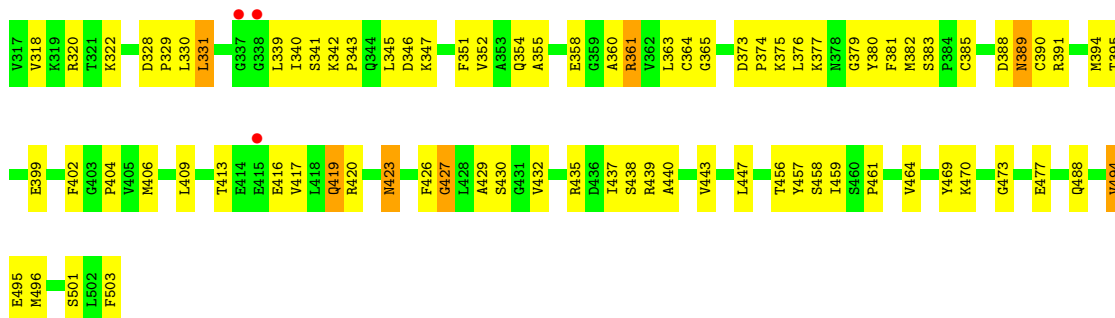
• Molecule 1: PROTEIN (ALDEHYDE DEHYDROGENASE)

• Molecule 1: PROTEIN (ALDEHYDE DEHYDROGENASE)

Chain C:

%

62%   34%   •

• Molecule 1: PROTEIN (ALDEHYDE DEHYDROGENASE)

Chain D:

2%

62%   34%   •

V405 M406 L409 T413 E414 E415 E416 V417 L418 Q419 R420 N423 F426 G427 L428 A429 S430 G431 V432 R435 D436 I437 S438 R439 A440 H441 R442 V443 L447 T456 Y457 S458 I459 S460 P461 V464 Y469 K470 G473 E477 Q488 V494 S501 L502 F503
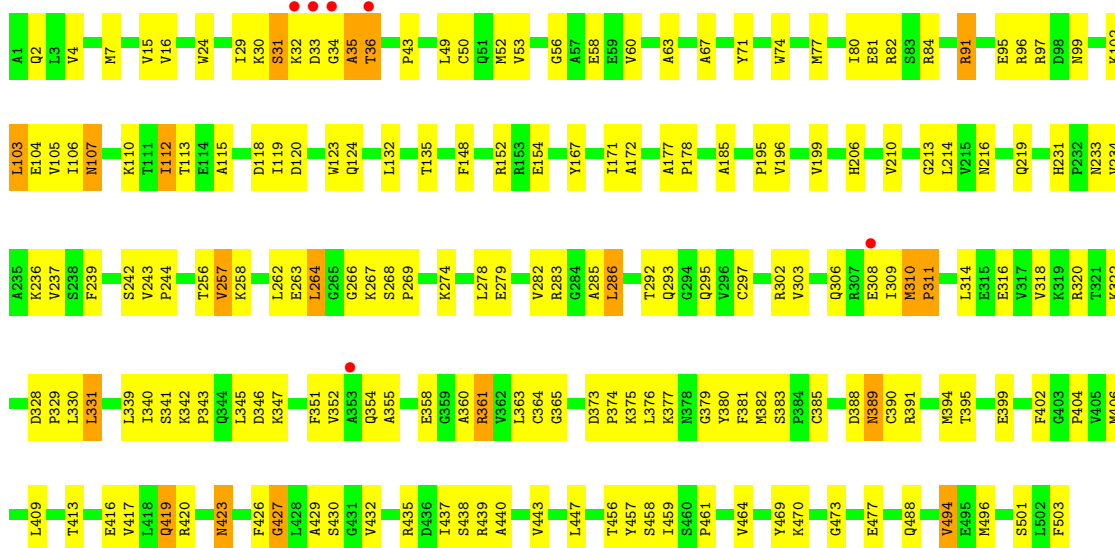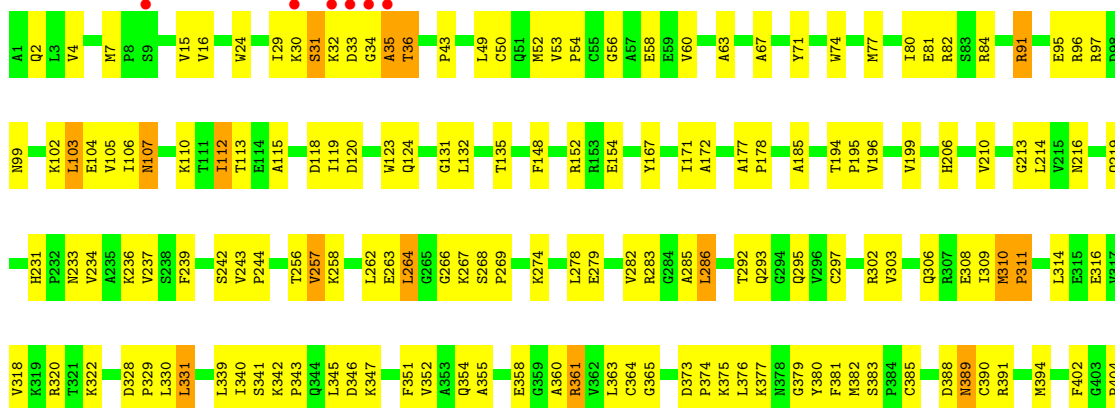
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	85.40Å 86.57Å 89.81Å 105.32° 113.29° 98.16°	Depositor
Resolution (Å)	80.00 – 2.80 19.85 – 2.80	Depositor EDS
% Data completeness (in resolution range)	92.6 (80.00-2.80) 92.7 (19.85-2.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	12.00	Depositor
$< I/\sigma(I) >$ [1]	1.63 (at 2.79Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.239 , 0.257 0.225 , 0.242	Depositor DCC
R_{free} test set	2508 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å^2)	34.8	Xtriage
Anisotropy	0.670	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 45.9	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	15824	wwPDB-VP
Average B, all atoms (Å^2)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.08% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: 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	0.57	0/3880	0.76	0/5264
1	B	0.57	0/3880	0.76	0/5264
1	C	0.57	0/3880	0.76	0/5264
1	D	0.57	0/3880	0.76	0/5264
All	All	0.57	0/15520	0.76	0/21056

There are no bond length outliers.

There are no bond angle outliers.

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	3806	0	3826	167	0
1	B	3806	0	3826	169	1
1	C	3806	0	3826	163	0
1	D	3806	0	3826	162	1
2	A	44	0	26	4	0
2	B	44	0	26	4	0
2	C	44	0	26	4	0
2	D	44	0	26	4	0
3	A	105	0	0	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	105	0	0	5	0
3	C	108	0	0	5	0
3	D	106	0	0	4	0
All	All	15824	0	15408	649	1

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 21.

All (649) 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:C:52:MET:HE1	1:C:219:GLN:HB3	1.46	0.97
1:D:52:MET:HE1	1:D:219:GLN:HB3	1.46	0.97
1:A:52:MET:HE1	1:A:219:GLN:HB3	1.47	0.94
1:A:231:HIS:HD2	1:A:233:ASN:H	1.09	0.94
1:B:231:HIS:HD2	1:B:233:ASN:H	1.09	0.94
1:D:231:HIS:HD2	1:D:233:ASN:H	1.09	0.93
1:B:52:MET:HE1	1:B:219:GLN:HB3	1.48	0.93
1:C:231:HIS:HD2	1:C:233:ASN:H	1.09	0.92
1:D:231:HIS:CD2	1:D:233:ASN:H	1.99	0.80
1:B:459:ILE:HG22	1:B:461:PRO:HD3	1.63	0.80
1:A:459:ILE:HG22	1:A:461:PRO:HD3	1.63	0.80
1:D:459:ILE:HG22	1:D:461:PRO:HD3	1.63	0.80
1:C:459:ILE:HG22	1:C:461:PRO:HD3	1.63	0.79
1:D:105:VAL:HG21	1:D:112:ILE:HG23	1.64	0.79
1:D:318:VAL:O	1:D:322:LYS:HG3	1.83	0.79
1:C:318:VAL:O	1:C:322:LYS:HG3	1.83	0.79
1:C:105:VAL:HG21	1:C:112:ILE:HG23	1.64	0.79
1:B:318:VAL:O	1:B:322:LYS:HG3	1.83	0.78
1:A:105:VAL:HG21	1:A:112:ILE:HG23	1.64	0.78
1:B:105:VAL:HG21	1:B:112:ILE:HG23	1.64	0.78
1:A:318:VAL:O	1:A:322:LYS:HG3	1.83	0.78
1:B:374:PRO:HA	1:B:377:LYS:HD3	1.68	0.76
1:C:374:PRO:HA	1:C:377:LYS:HD3	1.68	0.76
1:D:74:TRP:HA	1:D:77:MET:CE	2.16	0.76
1:A:74:TRP:HA	1:A:77:MET:CE	2.16	0.76
1:D:206:HIS:HE1	1:D:213:GLY:H	1.32	0.76
1:B:74:TRP:HA	1:B:77:MET:CE	2.16	0.75
1:C:74:TRP:HA	1:C:77:MET:CE	2.16	0.75
1:A:206:HIS:HE1	1:A:213:GLY:H	1.32	0.75
1:B:206:HIS:HE1	1:B:213:GLY:H	1.32	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:374:PRO:HA	1:D:377:LYS:HD3	1.67	0.75
1:A:231:HIS:CD2	1:A:233:ASN:H	1.99	0.75
1:C:231:HIS:CD2	1:C:233:ASN:H	1.99	0.74
1:B:231:HIS:CD2	1:B:233:ASN:H	1.99	0.74
1:A:374:PRO:HA	1:A:377:LYS:HD3	1.68	0.74
1:C:206:HIS:HE1	1:C:213:GLY:H	1.32	0.73
1:C:310:MET:HE3	1:C:310:MET:HA	1.70	0.73
1:D:342:LYS:HB3	1:D:343:PRO:HD3	1.72	0.72
1:D:293:GLN:HB2	1:D:295:GLN:HE21	1.55	0.72
1:B:293:GLN:HB2	1:B:295:GLN:HE21	1.55	0.71
1:C:293:GLN:HB2	1:C:295:GLN:HE21	1.55	0.71
1:A:293:GLN:HB2	1:A:295:GLN:HE21	1.55	0.71
1:C:342:LYS:HB3	1:C:343:PRO:HD3	1.72	0.71
1:A:310:MET:HE3	1:A:310:MET:HA	1.72	0.71
1:B:342:LYS:HB3	1:B:343:PRO:HD3	1.72	0.70
1:A:342:LYS:HB3	1:A:343:PRO:HD3	1.72	0.70
1:B:310:MET:HE3	1:B:310:MET:HA	1.74	0.70
1:D:310:MET:HE3	1:D:310:MET:HA	1.72	0.70
1:A:461:PRO:HG2	1:A:464:VAL:HG22	1.73	0.70
1:B:461:PRO:HG2	1:B:464:VAL:HG22	1.73	0.70
1:C:461:PRO:HG2	1:C:464:VAL:HG22	1.73	0.70
1:B:52:MET:CE	1:B:219:GLN:HB3	2.23	0.69
1:D:52:MET:CE	1:D:219:GLN:HB3	2.23	0.69
1:D:263:GLU:HB3	2:D:504:NAD:C7N	2.23	0.69
1:D:461:PRO:HG2	1:D:464:VAL:HG22	1.73	0.69
1:A:52:MET:CE	1:A:219:GLN:HB3	2.23	0.69
1:C:52:MET:CE	1:C:219:GLN:HB3	2.23	0.69
1:B:263:GLU:HB3	2:B:504:NAD:C7N	2.23	0.68
1:C:263:GLU:HB3	2:C:504:NAD:C7N	2.23	0.68
1:A:263:GLU:HB3	2:A:504:NAD:C7N	2.23	0.68
1:B:391:ARG:NH1	1:B:394:MET:HE2	2.10	0.67
1:B:15:VAL:HG12	1:B:16:VAL:N	2.10	0.67
1:D:375:LYS:HG3	1:D:376:LEU:CD1	2.25	0.67
1:C:375:LYS:HG3	1:C:376:LEU:CD1	2.25	0.67
1:D:15:VAL:HG12	1:D:16:VAL:N	2.10	0.67
1:A:354:GLN:O	1:A:358:GLU:HG3	1.95	0.67
1:B:354:GLN:O	1:B:358:GLU:HG3	1.95	0.67
1:C:15:VAL:HG12	1:C:16:VAL:N	2.10	0.67
1:A:375:LYS:HG3	1:A:376:LEU:CD1	2.25	0.66
1:A:379:GLY:HA3	1:A:381:PHE:CE1	2.31	0.66
1:B:375:LYS:HG3	1:B:376:LEU:CD1	2.25	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:379:GLY:HA3	1:C:381:PHE:CE1	2.31	0.66
1:B:373:ASP:OD1	1:B:375:LYS:HG2	1.96	0.66
1:C:354:GLN:O	1:C:358:GLU:HG3	1.95	0.66
1:B:379:GLY:HA3	1:B:381:PHE:CE1	2.31	0.66
1:C:2:GLN:CD	1:C:2:GLN:H	1.99	0.66
1:C:373:ASP:OD1	1:C:375:LYS:HG2	1.96	0.66
1:D:120:ASP:O	1:D:124:GLN:HG3	1.96	0.66
1:A:120:ASP:O	1:A:124:GLN:HG3	1.96	0.65
1:D:2:GLN:CD	1:D:2:GLN:H	2.00	0.65
1:C:391:ARG:NH1	1:C:394:MET:HE2	2.11	0.65
1:D:379:GLY:HA3	1:D:381:PHE:CE1	2.31	0.65
1:D:391:ARG:NH1	1:D:394:MET:HE2	2.11	0.65
1:A:2:GLN:H	1:A:2:GLN:CD	1.99	0.65
1:D:354:GLN:O	1:D:358:GLU:HG3	1.95	0.65
1:D:373:ASP:OD1	1:D:375:LYS:HG2	1.96	0.65
1:A:15:VAL:HG12	1:A:16:VAL:N	2.10	0.65
1:A:266:GLY:HA2	1:A:426:PHE:CD1	2.32	0.65
1:B:2:GLN:CD	1:B:2:GLN:H	2.00	0.65
1:B:120:ASP:O	1:B:124:GLN:HG3	1.96	0.65
1:B:262:LEU:HB3	1:B:264:LEU:HD13	1.78	0.65
1:A:373:ASP:OD1	1:A:375:LYS:HG2	1.96	0.65
1:B:266:GLY:HA2	1:B:426:PHE:CD1	2.32	0.65
1:A:262:LEU:HB3	1:A:264:LEU:HD13	1.78	0.65
1:C:58:GLU:HB3	3:C:596:HOH:O	1.97	0.65
1:C:120:ASP:O	1:C:124:GLN:HG3	1.96	0.64
1:D:262:LEU:HB3	1:D:264:LEU:HD13	1.78	0.64
1:C:262:LEU:HB3	1:C:264:LEU:HD13	1.78	0.64
1:D:443:VAL:O	1:D:447:LEU:HD13	1.98	0.64
1:B:58:GLU:HB3	3:B:590:HOH:O	1.97	0.64
1:C:443:VAL:O	1:C:447:LEU:HD13	1.98	0.64
1:D:266:GLY:HA2	1:D:426:PHE:CD1	2.32	0.64
1:D:58:GLU:HB3	3:D:598:HOH:O	1.97	0.64
1:A:74:TRP:HA	1:A:77:MET:HE3	1.79	0.64
1:A:391:ARG:NH1	1:A:394:MET:HE2	2.12	0.64
1:B:443:VAL:O	1:B:447:LEU:HD13	1.98	0.64
1:B:74:TRP:HA	1:B:77:MET:HE3	1.79	0.64
1:C:266:GLY:HA2	1:C:426:PHE:CD1	2.32	0.64
1:A:443:VAL:O	1:A:447:LEU:HD13	1.98	0.64
1:D:379:GLY:HA3	1:D:381:PHE:HE1	1.63	0.64
1:A:58:GLU:HB3	3:A:588:HOH:O	1.97	0.64
1:D:7:MET:HE2	1:D:7:MET:HA	1.80	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:58:GLU:CD	1:D:58:GLU:H	2.02	0.63
1:C:112:ILE:HD12	1:C:113:THR:H	1.63	0.63
1:A:379:GLY:HA3	1:A:381:PHE:HE1	1.63	0.63
1:C:379:GLY:HA3	1:C:381:PHE:HE1	1.63	0.63
1:C:58:GLU:H	1:C:58:GLU:CD	2.02	0.63
1:B:112:ILE:HD12	1:B:113:THR:H	1.63	0.62
1:D:112:ILE:HD12	1:D:113:THR:H	1.63	0.62
1:A:112:ILE:HD12	1:A:113:THR:H	1.63	0.62
1:D:74:TRP:HA	1:D:77:MET:HE3	1.81	0.62
1:A:7:MET:HE2	1:A:7:MET:HA	1.83	0.61
1:B:58:GLU:CD	1:B:58:GLU:H	2.02	0.61
1:A:110:LYS:HA	1:A:293:GLN:HE22	1.66	0.61
1:D:239:PHE:HB3	1:D:262:LEU:HD23	1.83	0.61
1:A:58:GLU:CD	1:A:58:GLU:H	2.02	0.61
1:B:379:GLY:HA3	1:B:381:PHE:HE1	1.63	0.61
1:C:97:ARG:HD2	1:C:97:ARG:C	2.21	0.61
1:C:239:PHE:HB3	1:C:262:LEU:HD23	1.83	0.61
1:D:97:ARG:C	1:D:97:ARG:HD2	2.21	0.61
1:B:97:ARG:HD2	1:B:97:ARG:C	2.21	0.61
1:A:310:MET:HB3	1:A:311:PRO:HD3	1.83	0.61
1:B:110:LYS:HA	1:B:293:GLN:HE22	1.66	0.61
1:C:110:LYS:HA	1:C:293:GLN:HE22	1.66	0.61
1:C:310:MET:HB3	1:C:311:PRO:HD3	1.83	0.61
1:A:283:ARG:HB3	1:B:501:SER:HB2	1.83	0.60
1:A:97:ARG:C	1:A:97:ARG:HD2	2.21	0.60
1:B:310:MET:HB3	1:B:311:PRO:HD3	1.83	0.60
1:A:91:ARG:O	1:A:95:GLU:HG3	2.01	0.60
1:B:488:GLN:NE2	3:B:557:HOH:O	2.31	0.60
1:B:239:PHE:HB3	1:B:262:LEU:HD23	1.83	0.60
1:A:234:VAL:O	1:A:258:LYS:HE3	2.02	0.60
1:B:91:ARG:O	1:B:95:GLU:HG3	2.01	0.60
1:C:91:ARG:O	1:C:95:GLU:HG3	2.01	0.60
1:A:112:ILE:HD12	1:A:113:THR:N	2.17	0.60
1:A:239:PHE:HB3	1:A:262:LEU:HD23	1.83	0.60
1:A:488:GLN:NE2	3:A:555:HOH:O	2.31	0.60
1:B:7:MET:HA	1:B:7:MET:HE2	1.84	0.60
1:D:310:MET:HB3	1:D:311:PRO:HD3	1.83	0.60
1:B:234:VAL:O	1:B:258:LYS:HE3	2.02	0.60
1:C:7:MET:HE2	1:C:7:MET:HA	1.83	0.59
1:D:91:ARG:O	1:D:95:GLU:HG3	2.01	0.59
1:B:112:ILE:HD12	1:B:113:THR:N	2.17	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:234:VAL:O	1:D:258:LYS:HE3	2.02	0.59
1:C:74:TRP:HA	1:C:77:MET:HE3	1.84	0.59
1:D:263:GLU:HB3	2:D:504:NAD:N7N	2.18	0.59
1:B:231:HIS:HD2	1:B:233:ASN:N	1.91	0.59
1:C:234:VAL:O	1:C:258:LYS:HE3	2.02	0.59
1:C:263:GLU:HB3	2:C:504:NAD:N7N	2.18	0.59
1:D:112:ILE:HD12	1:D:113:THR:N	2.17	0.59
1:D:374:PRO:HA	1:D:377:LYS:CD	2.33	0.59
1:A:263:GLU:HB3	2:A:504:NAD:N7N	2.18	0.59
1:C:112:ILE:HD12	1:C:113:THR:N	2.17	0.58
1:D:231:HIS:HD2	1:D:233:ASN:N	1.91	0.58
1:D:110:LYS:HA	1:D:293:GLN:HE22	1.66	0.58
1:A:231:HIS:HD2	1:A:233:ASN:N	1.91	0.58
1:C:374:PRO:HA	1:C:377:LYS:CD	2.33	0.58
1:B:263:GLU:HB3	2:B:504:NAD:N7N	2.18	0.57
1:B:374:PRO:HA	1:B:377:LYS:CD	2.33	0.57
1:B:131:GLY:HA3	1:D:131:GLY:HA3	1.87	0.57
1:C:120:ASP:HA	1:C:123:TRP:CD1	2.40	0.57
1:B:120:ASP:HA	1:B:123:TRP:CD1	2.40	0.57
1:D:120:ASP:HA	1:D:123:TRP:CD1	2.40	0.57
1:A:262:LEU:HB3	1:A:264:LEU:CD1	2.35	0.57
1:C:374:PRO:HA	1:C:377:LYS:CE	2.35	0.57
1:D:262:LEU:HB3	1:D:264:LEU:CD1	2.35	0.57
1:A:120:ASP:HA	1:A:123:TRP:CD1	2.40	0.56
1:D:374:PRO:HA	1:D:377:LYS:CE	2.35	0.56
1:A:243:VAL:HB	1:A:244:PRO:HD3	1.86	0.56
1:A:374:PRO:HA	1:A:377:LYS:CE	2.35	0.56
1:C:243:VAL:HA	1:C:264:LEU:HG	1.87	0.56
1:C:262:LEU:HB3	1:C:264:LEU:CD1	2.35	0.56
1:A:243:VAL:HA	1:A:264:LEU:HG	1.87	0.56
1:B:243:VAL:HB	1:B:244:PRO:HD3	1.86	0.56
1:C:243:VAL:HB	1:C:244:PRO:HD3	1.86	0.56
1:C:488:GLN:NE2	3:C:561:HOH:O	2.31	0.56
1:A:423:ASN:C	1:A:423:ASN:HD22	2.09	0.56
1:D:243:VAL:HB	1:D:244:PRO:HD3	1.86	0.56
1:A:374:PRO:HA	1:A:377:LYS:CD	2.33	0.56
1:B:262:LEU:HB3	1:B:264:LEU:CD1	2.35	0.56
1:C:231:HIS:HD2	1:C:233:ASN:N	1.91	0.56
1:D:488:GLN:NE2	3:D:563:HOH:O	2.31	0.56
1:B:374:PRO:HA	1:B:377:LYS:CE	2.35	0.56
1:B:423:ASN:C	1:B:423:ASN:HD22	2.09	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:167:TYR:O	1:B:171:ILE:HG22	2.07	0.55
1:C:74:TRP:HA	1:C:77:MET:HE2	1.88	0.55
1:A:297:CYS:SG	2:A:504:NAD:C4N	2.95	0.55
1:C:423:ASN:C	1:C:423:ASN:HD22	2.09	0.55
1:A:457:TYR:CD1	1:A:458:SER:N	2.75	0.55
1:B:243:VAL:HA	1:B:264:LEU:HG	1.87	0.55
1:C:71:TYR:HB2	1:C:185:ALA:HB2	1.89	0.55
1:D:423:ASN:HD22	1:D:423:ASN:C	2.09	0.55
1:A:167:TYR:O	1:A:171:ILE:HG22	2.07	0.55
1:B:71:TYR:HB2	1:B:185:ALA:HB2	1.89	0.55
1:D:297:CYS:SG	2:D:504:NAD:C4N	2.95	0.55
1:B:297:CYS:SG	2:B:504:NAD:C4N	2.95	0.55
1:D:457:TYR:CD1	1:D:458:SER:N	2.75	0.55
1:B:457:TYR:CD1	1:B:458:SER:N	2.75	0.55
1:D:71:TYR:HB2	1:D:185:ALA:HB2	1.89	0.55
1:D:243:VAL:HA	1:D:264:LEU:HG	1.87	0.55
1:C:167:TYR:O	1:C:171:ILE:HG22	2.07	0.54
1:C:297:CYS:SG	2:C:504:NAD:C4N	2.95	0.54
1:C:457:TYR:CD1	1:C:458:SER:N	2.75	0.54
1:D:167:TYR:O	1:D:171:ILE:HG22	2.07	0.54
1:A:71:TYR:HB2	1:A:185:ALA:HB2	1.89	0.54
1:A:285:ALA:HB1	1:A:406:MET:HE3	1.89	0.54
1:D:285:ALA:HB1	1:D:406:MET:HE3	1.88	0.54
1:A:56:GLY:O	1:A:60:VAL:HG23	2.08	0.54
1:B:15:VAL:CG1	1:B:16:VAL:N	2.71	0.54
1:C:56:GLY:O	1:C:60:VAL:HG23	2.08	0.54
1:B:316:GLU:O	1:B:320:ARG:HG2	2.08	0.54
1:C:316:GLU:O	1:C:320:ARG:HG2	2.08	0.54
1:D:262:LEU:O	1:D:473:GLY:HA3	2.08	0.54
1:A:15:VAL:CG1	1:A:16:VAL:N	2.71	0.54
1:C:15:VAL:CG1	1:C:16:VAL:N	2.71	0.54
1:C:262:LEU:O	1:C:473:GLY:HA3	2.08	0.53
1:B:56:GLY:O	1:B:60:VAL:HG23	2.08	0.53
1:C:285:ALA:HB1	1:C:406:MET:HE3	1.91	0.53
1:D:15:VAL:CG1	1:D:16:VAL:N	2.71	0.53
1:A:316:GLU:O	1:A:320:ARG:HG2	2.08	0.53
1:D:56:GLY:O	1:D:60:VAL:HG23	2.08	0.53
1:B:285:ALA:HB1	1:B:406:MET:HE3	1.90	0.53
1:A:120:ASP:HA	1:A:123:TRP:NE1	2.24	0.53
1:B:262:LEU:O	1:B:473:GLY:HA3	2.08	0.52
1:C:120:ASP:HA	1:C:123:TRP:NE1	2.24	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:262:LEU:O	1:A:473:GLY:HA3	2.08	0.52
1:D:316:GLU:O	1:D:320:ARG:HG2	2.08	0.52
1:A:314:LEU:O	1:A:318:VAL:HG23	2.10	0.52
1:C:501:SER:HB2	1:D:283:ARG:HB3	1.91	0.52
1:A:430:SER:HB2	1:A:447:LEU:HD23	1.92	0.52
1:B:120:ASP:HA	1:B:123:TRP:NE1	2.24	0.52
1:C:430:SER:HB2	1:C:447:LEU:HD23	1.92	0.52
1:B:314:LEU:O	1:B:318:VAL:HG23	2.10	0.52
1:C:314:LEU:O	1:C:318:VAL:HG23	2.10	0.52
1:B:177:ALA:HB3	1:B:178:PRO:CD	2.40	0.51
1:D:74:TRP:HA	1:D:77:MET:HE2	1.92	0.51
1:D:314:LEU:O	1:D:318:VAL:HG23	2.10	0.51
1:D:274:LYS:HG2	1:D:306:GLN:OE1	2.11	0.51
1:B:430:SER:HB2	1:B:447:LEU:HD23	1.92	0.51
1:D:120:ASP:HA	1:D:123:TRP:NE1	2.24	0.51
1:B:257:VAL:O	1:B:257:VAL:HG12	2.11	0.51
1:C:257:VAL:HG12	1:C:257:VAL:O	2.11	0.51
1:A:60:VAL:O	1:A:63:ALA:HB3	2.11	0.51
1:C:177:ALA:HB3	1:C:178:PRO:CD	2.40	0.51
1:C:210:VAL:CG1	1:C:214:LEU:HB3	2.41	0.51
1:C:345:LEU:HD11	1:C:382:MET:HB3	1.93	0.51
1:D:177:ALA:HB3	1:D:178:PRO:CD	2.40	0.51
1:A:501:SER:HB2	1:B:283:ARG:HB3	1.93	0.51
1:B:210:VAL:CG1	1:B:214:LEU:HB3	2.41	0.51
1:D:342:LYS:HE3	1:D:346:ASP:OD2	2.11	0.51
1:C:60:VAL:O	1:C:63:ALA:HB3	2.11	0.51
1:D:60:VAL:O	1:D:63:ALA:HB3	2.11	0.51
1:A:257:VAL:HG12	1:A:257:VAL:O	2.11	0.51
1:A:342:LYS:HE3	1:A:346:ASP:OD2	2.11	0.51
1:A:345:LEU:HD11	1:A:382:MET:HB3	1.93	0.51
1:B:60:VAL:O	1:B:63:ALA:HB3	2.11	0.51
1:C:274:LYS:HG2	1:C:306:GLN:OE1	2.11	0.51
1:C:342:LYS:HE3	1:C:346:ASP:OD2	2.11	0.51
1:D:257:VAL:HG12	1:D:257:VAL:O	2.11	0.51
1:A:210:VAL:CG1	1:A:214:LEU:HB3	2.41	0.51
1:B:274:LYS:HG2	1:B:306:GLN:OE1	2.11	0.51
1:A:274:LYS:HG2	1:A:306:GLN:OE1	2.10	0.50
1:A:177:ALA:HB3	1:A:178:PRO:CD	2.40	0.50
1:D:345:LEU:HD11	1:D:382:MET:HB3	1.93	0.50
1:A:456:THR:O	1:A:457:TYR:HB2	2.11	0.50
1:B:342:LYS:HE3	1:B:346:ASP:OD2	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:345:LEU:HD11	1:B:382:MET:HB3	1.93	0.50
1:B:274:LYS:HA	1:B:309:ILE:HD13	1.94	0.50
1:C:292:THR:HG22	1:C:292:THR:O	2.12	0.50
1:D:210:VAL:CG1	1:D:214:LEU:HB3	2.41	0.50
1:D:456:THR:O	1:D:457:TYR:HB2	2.11	0.50
1:B:456:THR:O	1:B:457:TYR:HB2	2.11	0.50
1:D:430:SER:HB2	1:D:447:LEU:HD23	1.92	0.50
1:A:274:LYS:HA	1:A:309:ILE:HD13	1.94	0.50
1:B:206:HIS:CE1	1:B:213:GLY:H	2.22	0.50
1:D:43:PRO:HB3	1:D:339:LEU:O	2.12	0.50
1:C:456:THR:O	1:C:457:TYR:HB2	2.11	0.49
1:C:43:PRO:HB3	1:C:339:LEU:O	2.12	0.49
1:B:292:THR:HG22	1:B:292:THR:O	2.12	0.49
1:C:4:VAL:O	1:C:99:ASN:HB3	2.12	0.49
1:A:43:PRO:HB3	1:A:339:LEU:O	2.12	0.49
1:A:495:GLU:HB2	1:B:456:THR:HB	1.94	0.49
1:B:4:VAL:O	1:B:99:ASN:HB3	2.12	0.49
1:D:292:THR:O	1:D:292:THR:HG22	2.12	0.49
1:A:278:LEU:O	1:A:282:VAL:HG23	2.13	0.49
1:A:361:ARG:NH1	1:A:388:ASP:OD2	2.46	0.49
1:B:437:ILE:HG23	1:B:438:SER:N	2.27	0.49
1:C:206:HIS:CE1	1:C:213:GLY:H	2.22	0.49
1:C:279:GLU:O	1:C:283:ARG:HG3	2.13	0.49
1:C:361:ARG:NH1	1:C:388:ASP:OD2	2.46	0.49
1:D:278:LEU:O	1:D:282:VAL:HG23	2.13	0.49
1:D:274:LYS:HA	1:D:309:ILE:HD13	1.94	0.49
1:A:7:MET:HE2	1:A:7:MET:CA	2.43	0.49
1:A:292:THR:O	1:A:292:THR:HG22	2.12	0.49
1:A:437:ILE:HG23	1:A:438:SER:N	2.27	0.49
1:D:279:GLU:O	1:D:283:ARG:HG3	2.13	0.49
1:B:278:LEU:O	1:B:282:VAL:HG23	2.13	0.49
1:C:7:MET:HE2	1:C:7:MET:CA	2.43	0.49
1:D:437:ILE:HG23	1:D:438:SER:N	2.27	0.49
1:A:4:VAL:O	1:A:99:ASN:HB3	2.12	0.48
1:B:279:GLU:O	1:B:283:ARG:HG3	2.13	0.48
1:D:4:VAL:O	1:D:99:ASN:HB3	2.12	0.48
1:C:278:LEU:O	1:C:282:VAL:HG23	2.13	0.48
1:A:374:PRO:O	1:A:377:LYS:HD3	2.14	0.48
1:C:274:LYS:HA	1:C:309:ILE:HD13	1.94	0.48
1:D:361:ARG:NH1	1:D:388:ASP:OD2	2.46	0.48
1:B:43:PRO:HB3	1:B:339:LEU:O	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:361:ARG:NH1	1:B:388:ASP:OD2	2.46	0.48
1:D:256:THR:O	1:D:257:VAL:HB	2.14	0.48
1:A:432:VAL:O	1:A:432:VAL:HG13	2.14	0.48
1:B:256:THR:O	1:B:257:VAL:HB	2.14	0.48
1:B:374:PRO:O	1:B:377:LYS:HD3	2.14	0.48
1:C:256:THR:O	1:C:257:VAL:HB	2.14	0.48
1:D:374:PRO:O	1:D:377:LYS:HD3	2.14	0.47
1:D:7:MET:HE2	1:D:7:MET:CA	2.43	0.47
1:B:74:TRP:HA	1:B:77:MET:HE2	1.94	0.47
1:C:437:ILE:HG23	1:C:438:SER:N	2.28	0.47
1:A:107:ASN:OD1	1:A:196:VAL:HG12	2.15	0.47
1:A:279:GLU:O	1:A:283:ARG:HG3	2.13	0.47
1:B:24:TRP:CE2	1:B:29:ILE:HG13	2.50	0.47
1:B:107:ASN:OD1	1:B:196:VAL:HG12	2.15	0.47
1:B:110:LYS:NZ	1:B:118:ASP:OD2	2.39	0.47
1:D:374:PRO:CA	1:D:377:LYS:HD3	2.42	0.47
1:A:30:LYS:O	1:A:31:SER:C	2.53	0.47
1:B:35:ALA:O	1:B:36:THR:C	2.53	0.47
1:C:364:CYS:O	1:C:385:CYS:HA	2.15	0.47
1:D:432:VAL:HG13	1:D:432:VAL:O	2.14	0.47
1:A:256:THR:O	1:A:257:VAL:HB	2.14	0.47
1:B:30:LYS:O	1:B:31:SER:C	2.53	0.47
1:C:24:TRP:CE2	1:C:29:ILE:HG13	2.50	0.47
1:C:286:LEU:HD21	1:C:320:ARG:HB3	1.97	0.47
1:C:374:PRO:O	1:C:377:LYS:HD3	2.14	0.47
1:C:374:PRO:CA	1:C:377:LYS:HD3	2.42	0.47
1:C:390:CYS:HB2	1:C:409:LEU:HG	1.97	0.47
1:C:432:VAL:HG13	1:C:432:VAL:O	2.14	0.47
1:D:96:ARG:NH1	3:D:594:HOH:O	2.43	0.47
1:A:286:LEU:HD21	1:A:320:ARG:HB3	1.97	0.47
1:A:388:ASP:O	1:A:389:ASN:HB2	2.15	0.47
1:B:286:LEU:HD21	1:B:320:ARG:HB3	1.97	0.47
1:B:374:PRO:CA	1:B:377:LYS:HD3	2.42	0.47
1:D:364:CYS:O	1:D:385:CYS:HA	2.15	0.47
1:D:388:ASP:O	1:D:389:ASN:HB2	2.15	0.47
1:A:364:CYS:O	1:A:385:CYS:HA	2.15	0.47
1:B:364:CYS:O	1:B:385:CYS:HA	2.15	0.47
1:C:388:ASP:O	1:C:389:ASN:HB2	2.15	0.47
1:D:35:ALA:O	1:D:36:THR:C	2.53	0.47
1:C:107:ASN:OD1	1:C:196:VAL:HG12	2.15	0.47
1:B:432:VAL:HG13	1:B:432:VAL:O	2.14	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:430:SER:CB	1:C:447:LEU:HD23	2.46	0.46
1:A:24:TRP:CE2	1:A:29:ILE:HG13	2.50	0.46
1:A:390:CYS:HB2	1:A:409:LEU:HG	1.97	0.46
1:B:239:PHE:HB3	1:B:262:LEU:CD2	2.46	0.46
1:B:375:LYS:HG3	1:B:376:LEU:HD12	1.97	0.46
1:D:107:ASN:OD1	1:D:196:VAL:HG12	2.15	0.46
1:D:390:CYS:HB2	1:D:409:LEU:HG	1.97	0.46
1:A:35:ALA:O	1:A:36:THR:C	2.53	0.46
1:A:293:GLN:O	1:A:404:PRO:HD3	2.16	0.46
1:B:7:MET:HE2	1:B:7:MET:CA	2.43	0.46
1:B:388:ASP:O	1:B:389:ASN:HB2	2.15	0.46
1:D:53:VAL:HA	1:D:54:PRO:HD2	1.78	0.46
1:D:115:ALA:O	1:D:118:ASP:HB2	2.16	0.46
1:D:286:LEU:HD21	1:D:320:ARG:HB3	1.97	0.46
1:A:374:PRO:CA	1:A:377:LYS:HD3	2.42	0.46
1:A:375:LYS:HG3	1:A:376:LEU:HD12	1.97	0.46
1:A:430:SER:CB	1:A:447:LEU:HD23	2.46	0.46
1:A:74:TRP:HA	1:A:77:MET:HE2	1.94	0.46
1:C:293:GLN:O	1:C:404:PRO:HD3	2.16	0.46
1:A:115:ALA:O	1:A:118:ASP:HB2	2.16	0.46
1:D:32:LYS:HG3	1:D:33:ASP:H	1.81	0.46
1:D:430:SER:CB	1:D:447:LEU:HD23	2.46	0.46
1:A:256:THR:O	1:A:256:THR:HG22	2.16	0.46
1:B:49:LEU:HD11	1:B:106:ILE:HG22	1.98	0.46
1:C:35:ALA:O	1:C:36:THR:C	2.53	0.46
1:C:115:ALA:O	1:C:118:ASP:HB2	2.16	0.46
1:D:24:TRP:CE2	1:D:29:ILE:HG13	2.50	0.46
1:D:30:LYS:O	1:D:31:SER:C	2.53	0.46
1:D:293:GLN:O	1:D:404:PRO:HD3	2.15	0.46
1:D:339:LEU:HD12	1:D:345:LEU:HA	1.98	0.46
1:B:293:GLN:O	1:B:404:PRO:HD3	2.16	0.45
1:B:339:LEU:HD12	1:B:345:LEU:HA	1.98	0.45
1:B:390:CYS:HB2	1:B:409:LEU:HG	1.97	0.45
1:B:430:SER:CB	1:B:447:LEU:HD23	2.46	0.45
1:C:375:LYS:HG3	1:C:376:LEU:HD12	1.97	0.45
1:A:49:LEU:HD11	1:A:106:ILE:HG22	1.98	0.45
1:A:52:MET:HE1	1:A:219:GLN:CB	2.34	0.45
1:A:103:LEU:HD23	1:A:103:LEU:O	2.16	0.45
1:A:347:LYS:O	1:A:351:PHE:HD1	2.00	0.45
1:C:49:LEU:HD11	1:C:106:ILE:HG22	1.98	0.45
1:C:256:THR:O	1:C:256:THR:CG2	2.64	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:256:THR:O	1:D:256:THR:CG2	2.64	0.45
1:C:103:LEU:HD23	1:C:103:LEU:O	2.16	0.45
1:B:32:LYS:HG3	1:B:33:ASP:H	1.81	0.45
1:C:16:VAL:O	1:C:16:VAL:HG13	2.16	0.45
1:B:16:VAL:O	1:B:16:VAL:HG13	2.16	0.45
1:C:236:LYS:HG2	1:C:237:VAL:N	2.31	0.45
1:C:256:THR:O	1:C:256:THR:HG22	2.16	0.45
1:C:375:LYS:HG3	1:C:376:LEU:HD13	1.99	0.45
1:A:141:ILE:HD12	1:B:464:VAL:HG12	1.98	0.45
1:B:103:LEU:O	1:B:103:LEU:HD23	2.16	0.45
1:C:239:PHE:HB3	1:C:262:LEU:CD2	2.46	0.45
1:D:49:LEU:HD11	1:D:106:ILE:HG22	1.98	0.45
1:A:32:LYS:HG3	1:A:33:ASP:H	1.81	0.45
1:A:110:LYS:NZ	1:A:118:ASP:OD2	2.39	0.45
1:A:236:LYS:HG2	1:A:237:VAL:N	2.31	0.45
1:B:52:MET:HE1	1:B:219:GLN:CB	2.34	0.45
1:D:103:LEU:O	1:D:103:LEU:HD23	2.16	0.45
1:D:132:LEU:O	1:D:135:THR:HB	2.17	0.45
1:D:375:LYS:HG3	1:D:376:LEU:HD12	1.97	0.45
1:B:115:ALA:O	1:B:118:ASP:HB2	2.16	0.45
1:C:112:ILE:HA	1:C:115:ALA:HB3	1.99	0.45
1:B:112:ILE:HA	1:B:115:ALA:HB3	1.99	0.45
1:B:132:LEU:O	1:B:135:THR:HB	2.17	0.45
1:C:439:ARG:O	1:C:443:VAL:HG23	2.17	0.45
1:B:236:LYS:HG2	1:B:237:VAL:N	2.31	0.45
1:B:256:THR:O	1:B:256:THR:CG2	2.64	0.45
1:B:256:THR:O	1:B:256:THR:HG22	2.16	0.45
1:C:339:LEU:HD12	1:C:345:LEU:HA	1.98	0.45
1:C:347:LYS:O	1:C:351:PHE:HD1	2.00	0.45
1:C:423:ASN:C	1:C:423:ASN:ND2	2.71	0.45
1:D:16:VAL:HG13	1:D:16:VAL:O	2.16	0.45
1:D:256:THR:O	1:D:256:THR:HG22	2.16	0.45
1:D:263:GLU:HB3	2:D:504:NAD:O7N	2.17	0.45
1:D:347:LYS:O	1:D:351:PHE:HD1	2.00	0.45
1:D:423:ASN:C	1:D:423:ASN:ND2	2.71	0.45
1:A:16:VAL:HG13	1:A:16:VAL:O	2.16	0.44
1:A:171:ILE:HG23	1:A:172:ALA:N	2.32	0.44
1:B:263:GLU:HB3	2:B:504:NAD:O7N	2.17	0.44
1:C:30:LYS:O	1:C:31:SER:C	2.53	0.44
1:D:102:LYS:HG3	1:D:330:LEU:HD11	1.99	0.44
1:A:15:VAL:CG1	1:A:16:VAL:H	2.30	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:439:ARG:O	1:A:443:VAL:HG23	2.17	0.44
1:B:171:ILE:HG23	1:B:172:ALA:N	2.32	0.44
1:B:303:VAL:HG21	1:B:406:MET:HE3	1.99	0.44
1:B:347:LYS:O	1:B:351:PHE:HD1	2.00	0.44
1:B:439:ARG:O	1:B:443:VAL:HG23	2.17	0.44
1:C:132:LEU:O	1:C:135:THR:HB	2.17	0.44
1:C:365:GLY:HA2	1:C:383:SER:OG	2.17	0.44
1:A:132:LEU:O	1:A:135:THR:HB	2.17	0.44
1:B:365:GLY:HA2	1:B:383:SER:OG	2.17	0.44
1:C:32:LYS:HG3	1:C:33:ASP:H	1.81	0.44
1:D:15:VAL:CG1	1:D:16:VAL:H	2.30	0.44
1:D:236:LYS:HG2	1:D:237:VAL:N	2.31	0.44
1:D:239:PHE:HB3	1:D:262:LEU:CD2	2.46	0.44
1:D:439:ARG:O	1:D:443:VAL:HG23	2.17	0.44
1:A:256:THR:O	1:A:256:THR:CG2	2.64	0.44
1:C:283:ARG:HB3	1:D:501:SER:HB2	2.00	0.44
1:A:339:LEU:HD12	1:A:345:LEU:HA	1.98	0.44
1:D:171:ILE:HG23	1:D:172:ALA:N	2.32	0.44
1:D:365:GLY:HA2	1:D:383:SER:OG	2.17	0.44
1:A:112:ILE:HA	1:A:115:ALA:HB3	1.99	0.44
1:A:243:VAL:N	1:A:244:PRO:CD	2.81	0.44
1:A:363:LEU:O	1:A:364:CYS:HB3	2.18	0.44
1:B:102:LYS:HG3	1:B:330:LEU:HD11	1.99	0.44
1:B:375:LYS:HG3	1:B:376:LEU:HD13	1.99	0.44
1:B:423:ASN:C	1:B:423:ASN:ND2	2.70	0.44
1:C:303:VAL:HG21	1:C:406:MET:HE3	1.99	0.44
1:D:152:ARG:NH1	1:D:154:GLU:OE2	2.51	0.44
1:A:234:VAL:HB	1:A:258:LYS:HE3	2.00	0.44
1:B:152:ARG:NH1	1:B:154:GLU:OE2	2.51	0.44
1:D:53:VAL:O	1:D:53:VAL:HG13	2.18	0.44
1:D:243:VAL:N	1:D:244:PRO:CD	2.81	0.44
1:D:328:ASP:HA	1:D:329:PRO:HD2	1.85	0.44
1:A:456:THR:HB	1:B:495:GLU:HB2	2.00	0.44
1:C:171:ILE:HG23	1:C:172:ALA:N	2.32	0.44
1:D:52:MET:HE1	1:D:219:GLN:CB	2.34	0.44
1:C:363:LEU:O	1:C:364:CYS:HB3	2.18	0.44
1:A:15:VAL:HG12	1:A:16:VAL:H	1.83	0.43
1:A:263:GLU:HB3	2:A:504:NAD:O7N	2.17	0.43
1:A:365:GLY:HA2	1:A:383:SER:OG	2.17	0.43
1:C:102:LYS:HG3	1:C:330:LEU:HD11	1.99	0.43
1:C:243:VAL:N	1:C:244:PRO:CD	2.81	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:112:ILE:HA	1:D:115:ALA:HB3	1.99	0.43
1:A:53:VAL:HA	1:A:54:PRO:HD2	1.78	0.43
1:A:239:PHE:HB3	1:A:262:LEU:CD2	2.46	0.43
1:A:96:ARG:NH1	3:A:584:HOH:O	2.43	0.43
1:A:341:SER:HA	1:A:380:TYR:CE2	2.53	0.43
1:C:52:MET:HE1	1:C:219:GLN:CB	2.34	0.43
1:C:234:VAL:HB	1:C:258:LYS:HE3	2.00	0.43
1:D:234:VAL:HB	1:D:258:LYS:HE3	2.00	0.43
1:A:53:VAL:HG13	1:A:53:VAL:O	2.18	0.43
1:A:152:ARG:NH1	1:A:154:GLU:OE2	2.51	0.43
1:B:234:VAL:HB	1:B:258:LYS:HE3	2.00	0.43
1:B:243:VAL:N	1:B:244:PRO:CD	2.81	0.43
1:C:152:ARG:NH1	1:C:154:GLU:OE2	2.51	0.43
1:D:375:LYS:HG3	1:D:376:LEU:HD13	1.99	0.43
1:A:303:VAL:HG21	1:A:406:MET:HE3	2.01	0.43
1:A:375:LYS:HG3	1:A:376:LEU:HD13	1.99	0.43
1:A:423:ASN:C	1:A:423:ASN:ND2	2.71	0.43
1:B:67:ALA:HB2	1:B:216:ASN:ND2	2.34	0.43
1:C:210:VAL:HG11	1:C:214:LEU:HB3	2.01	0.43
1:C:341:SER:HA	1:C:380:TYR:CE2	2.53	0.43
1:C:413:THR:O	1:C:416:GLU:HB3	2.19	0.43
1:D:426:PHE:O	1:D:470:LYS:HD2	2.19	0.43
1:A:102:LYS:HG3	1:A:330:LEU:HD11	1.99	0.43
1:A:413:THR:O	1:A:416:GLU:HB3	2.19	0.43
1:B:53:VAL:O	1:B:53:VAL:HG13	2.18	0.43
1:C:15:VAL:CG1	1:C:16:VAL:H	2.30	0.43
1:D:341:SER:HA	1:D:380:TYR:CE2	2.53	0.43
1:A:67:ALA:HB2	1:A:216:ASN:ND2	2.34	0.43
1:B:91:ARG:NH2	1:D:91:ARG:NH2	2.67	0.43
1:D:105:VAL:HG21	1:D:112:ILE:CG2	2.43	0.43
1:A:210:VAL:HG11	1:A:214:LEU:HB3	2.01	0.43
1:B:413:THR:O	1:B:416:GLU:HB3	2.19	0.43
1:C:457:TYR:HD1	1:C:458:SER:N	2.17	0.43
1:D:457:TYR:HD1	1:D:458:SER:N	2.17	0.43
1:A:355:ALA:C	1:A:360:ALA:HB3	2.39	0.43
1:B:15:VAL:HG12	1:B:16:VAL:H	1.83	0.43
1:B:15:VAL:CG1	1:B:16:VAL:H	2.30	0.43
1:C:263:GLU:HB3	2:C:504:NAD:O7N	2.17	0.43
1:D:74:TRP:CZ2	1:D:82:ARG:HB3	2.54	0.43
1:B:341:SER:HA	1:B:380:TYR:CE2	2.53	0.43
1:B:363:LEU:O	1:B:364:CYS:HB3	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:457:TYR:HD1	1:B:458:SER:N	2.17	0.43
1:C:53:VAL:O	1:C:53:VAL:HG13	2.18	0.43
1:C:328:ASP:O	1:C:331:LEU:HB2	2.19	0.43
1:D:210:VAL:HG11	1:D:214:LEU:HB3	2.01	0.43
1:A:49:LEU:O	1:A:50:CYS:HB3	2.19	0.42
1:A:328:ASP:O	1:A:331:LEU:HB2	2.19	0.42
1:C:426:PHE:O	1:C:470:LYS:HD2	2.19	0.42
1:A:74:TRP:CZ2	1:A:82:ARG:HB3	2.54	0.42
1:D:328:ASP:O	1:D:331:LEU:HB2	2.19	0.42
1:A:416:GLU:O	1:A:419:GLN:HG3	2.20	0.42
1:C:74:TRP:CZ2	1:C:82:ARG:HB3	2.54	0.42
1:C:308:GLU:OE1	1:C:308:GLU:N	2.45	0.42
1:C:328:ASP:HA	1:C:329:PRO:HD2	1.85	0.42
1:D:67:ALA:HB2	1:D:216:ASN:ND2	2.34	0.42
1:D:104:GLU:HA	1:D:104:GLU:OE1	2.20	0.42
1:A:206:HIS:CE1	1:A:213:GLY:H	2.22	0.42
1:B:210:VAL:HG11	1:B:214:LEU:HB3	2.01	0.42
1:B:328:ASP:O	1:B:331:LEU:HB2	2.19	0.42
1:B:426:PHE:O	1:B:470:LYS:HD2	2.19	0.42
1:C:352:VAL:O	1:C:355:ALA:HB3	2.20	0.42
1:C:355:ALA:C	1:C:360:ALA:HB3	2.39	0.42
1:D:413:THR:O	1:D:416:GLU:HB3	2.19	0.42
1:A:104:GLU:OE1	1:A:104:GLU:HA	2.20	0.42
1:B:308:GLU:OE1	1:B:308:GLU:N	2.45	0.42
1:B:416:GLU:O	1:B:419:GLN:HG3	2.20	0.42
1:C:104:GLU:OE1	1:C:104:GLU:HA	2.20	0.42
1:D:363:LEU:O	1:D:364:CYS:HB3	2.18	0.42
1:D:416:GLU:O	1:D:419:GLN:HG3	2.20	0.42
1:B:328:ASP:HA	1:B:329:PRO:HD2	1.85	0.42
1:B:352:VAL:O	1:B:355:ALA:HB3	2.20	0.42
1:B:355:ALA:C	1:B:360:ALA:HB3	2.39	0.42
1:C:49:LEU:O	1:C:50:CYS:HB3	2.19	0.42
1:D:49:LEU:O	1:D:50:CYS:HB3	2.19	0.42
1:D:330:LEU:HD12	1:D:330:LEU:HA	1.93	0.42
1:A:7:MET:HE2	1:A:7:MET:N	2.35	0.42
1:A:119:ILE:O	1:A:120:ASP:C	2.58	0.42
1:A:352:VAL:O	1:A:355:ALA:HB3	2.20	0.42
1:A:426:PHE:O	1:A:470:LYS:HD2	2.19	0.42
1:C:416:GLU:O	1:C:419:GLN:HG3	2.20	0.42
1:B:7:MET:HE2	1:B:7:MET:N	2.34	0.42
1:B:49:LEU:O	1:B:50:CYS:HB3	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:96:ARG:NH1	3:C:592:HOH:O	2.43	0.42
1:C:427:GLY:O	1:C:469:TYR:HB2	2.20	0.42
1:D:119:ILE:O	1:D:120:ASP:C	2.58	0.42
1:D:355:ALA:C	1:D:360:ALA:HB3	2.39	0.42
1:B:74:TRP:CZ2	1:B:82:ARG:HB3	2.54	0.42
1:B:91:ARG:NH2	3:B:609:HOH:O	2.42	0.42
1:B:104:GLU:HA	1:B:104:GLU:OE1	2.20	0.42
1:C:459:ILE:HD11	3:D:604:HOH:O	2.20	0.42
1:D:206:HIS:CE1	1:D:213:GLY:H	2.22	0.42
1:A:419:GLN:O	1:A:423:ASN:HB2	2.20	0.41
1:B:390:CYS:HA	1:B:394:MET:HE3	2.02	0.41
1:C:268:SER:HB3	1:C:429:ALA:O	2.20	0.41
1:D:427:GLY:O	1:D:469:TYR:HB2	2.20	0.41
1:A:32:LYS:O	1:A:33:ASP:HB3	2.20	0.41
1:A:196:VAL:O	1:A:199:VAL:HG12	2.20	0.41
1:B:267:LYS:HD2	1:B:302:ARG:HD3	2.02	0.41
1:C:7:MET:HE2	1:C:7:MET:N	2.35	0.41
1:C:32:LYS:O	1:C:33:ASP:HB3	2.20	0.41
1:C:67:ALA:HB2	1:C:216:ASN:ND2	2.34	0.41
1:C:196:VAL:O	1:C:199:VAL:HG12	2.20	0.41
1:D:293:GLN:HB2	1:D:295:GLN:NE2	2.30	0.41
1:D:419:GLN:O	1:D:423:ASN:HB2	2.20	0.41
1:A:395:THR:HG23	1:A:399:GLU:HG3	2.03	0.41
1:B:32:LYS:O	1:B:33:ASP:HB3	2.20	0.41
1:B:7:MET:HA	1:B:7:MET:CE	2.50	0.41
1:B:105:VAL:HG21	1:B:112:ILE:CG2	2.43	0.41
1:D:32:LYS:O	1:D:33:ASP:HB3	2.20	0.41
1:D:196:VAL:O	1:D:199:VAL:HG12	2.20	0.41
1:D:308:GLU:OE1	1:D:308:GLU:N	2.45	0.41
1:D:419:GLN:HG3	1:D:420:ARG:N	2.35	0.41
1:A:80:ILE:HG23	1:A:81:GLU:N	2.36	0.41
1:A:464:VAL:HG12	1:B:141:ILE:HD12	2.02	0.41
1:B:196:VAL:HG13	3:B:526:HOH:O	2.21	0.41
1:B:427:GLY:O	1:B:469:TYR:HB2	2.20	0.41
1:C:267:LYS:HD2	1:C:302:ARG:HD3	2.02	0.41
1:C:330:LEU:HD12	1:C:330:LEU:HA	1.93	0.41
1:D:352:VAL:O	1:D:355:ALA:HB3	2.20	0.41
1:B:80:ILE:HG23	1:B:81:GLU:N	2.36	0.41
1:C:119:ILE:O	1:C:120:ASP:C	2.58	0.41
1:C:286:LEU:HD12	1:C:286:LEU:HA	1.94	0.41
1:C:395:THR:HG23	1:C:399:GLU:HG3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:461:PRO:HG2	1:C:464:VAL:CG2	2.47	0.41
1:D:267:LYS:HD2	1:D:302:ARG:HD3	2.02	0.41
1:A:293:GLN:HB2	1:A:295:GLN:NE2	2.30	0.41
1:A:308:GLU:OE1	1:A:308:GLU:N	2.45	0.41
1:B:196:VAL:O	1:B:199:VAL:HG12	2.20	0.41
1:C:242:SER:HB2	1:C:244:PRO:HD2	2.03	0.41
1:C:293:GLN:HB2	1:C:295:GLN:NE2	2.30	0.41
1:D:268:SER:HB3	1:D:429:ALA:O	2.20	0.41
1:A:261:THR:HG22	3:A:566:HOH:O	2.21	0.41
1:A:267:LYS:HD2	1:A:302:ARG:HD3	2.02	0.41
1:A:268:SER:HB3	1:A:429:ALA:O	2.20	0.41
1:A:427:GLY:O	1:A:469:TYR:HB2	2.20	0.41
1:A:442:ARG:HB2	1:C:496:MET:HE3	2.03	0.41
1:B:119:ILE:O	1:B:120:ASP:C	2.58	0.41
1:B:374:PRO:C	1:B:377:LYS:HD3	2.41	0.41
1:B:395:THR:HG23	1:B:399:GLU:HG3	2.03	0.41
1:B:419:GLN:O	1:B:423:ASN:HB2	2.20	0.41
1:B:496:MET:HE3	1:D:442:ARG:HB2	2.02	0.41
1:C:374:PRO:C	1:C:377:LYS:HD3	2.41	0.41
1:D:242:SER:HB2	1:D:244:PRO:HD2	2.03	0.41
1:D:303:VAL:HG21	1:D:406:MET:HE3	2.02	0.41
1:B:53:VAL:HA	1:B:54:PRO:HD2	1.78	0.41
1:B:261:THR:HG22	3:B:568:HOH:O	2.21	0.41
1:B:268:SER:HB3	1:B:429:ALA:O	2.20	0.41
1:C:80:ILE:HG23	1:C:81:GLU:N	2.36	0.41
1:D:80:ILE:HG23	1:D:81:GLU:N	2.36	0.41
1:D:148:PHE:CZ	1:D:494:VAL:HG11	2.56	0.41
1:A:133:ALA:N	1:A:134:PRO:CD	2.84	0.40
1:A:286:LEU:HD12	1:A:286:LEU:HA	1.94	0.40
1:A:419:GLN:HG3	1:A:420:ARG:N	2.36	0.40
1:B:419:GLN:HG3	1:B:420:ARG:N	2.36	0.40
1:C:148:PHE:CZ	1:C:494:VAL:HG11	2.56	0.40
3:C:602:HOH:O	1:D:459:ILE:HD11	2.20	0.40
1:A:196:VAL:HG13	3:A:523:HOH:O	2.21	0.40
1:C:419:GLN:HG3	1:C:420:ARG:N	2.36	0.40
1:D:374:PRO:C	1:D:377:LYS:HD3	2.41	0.40
1:A:374:PRO:C	1:A:377:LYS:HD3	2.41	0.40
1:C:15:VAL:HG12	1:C:16:VAL:H	1.83	0.40
1:A:7:MET:HA	1:A:7:MET:CE	2.50	0.40
1:A:107:ASN:OD1	1:A:194:THR:HA	2.21	0.40
1:A:148:PHE:CZ	1:A:494:VAL:HG11	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:148:PHE:CZ	1:B:494:VAL:HG11	2.56	0.40
1:C:196:VAL:HG13	3:C:528:HOH:O	2.21	0.40
1:C:419:GLN:O	1:C:423:ASN:HB2	2.20	0.40
1:D:107:ASN:OD1	1:D:194:THR:HA	2.21	0.40

All (1) 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:B:227:LEU:CD2	1:D:33:ASP:OD2[1_455]	1.93	0.27

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	501/503 (100%)	452 (90%)	41 (8%)	8 (2%)	9	31
1	B	501/503 (100%)	451 (90%)	42 (8%)	8 (2%)	9	31
1	C	501/503 (100%)	452 (90%)	41 (8%)	8 (2%)	9	31
1	D	501/503 (100%)	451 (90%)	42 (8%)	8 (2%)	9	31
All	All	2004/2012 (100%)	1806 (90%)	166 (8%)	32 (2%)	9	31

All (32) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	35	ALA
1	B	35	ALA
1	C	35	ALA
1	D	35	ALA
1	A	36	THR
1	B	36	THR

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Mol	Chain	Res	Type
1	C	36	THR
1	D	36	THR
1	A	31	SER
1	B	31	SER
1	C	31	SER
1	D	31	SER
1	A	311	PRO
1	B	311	PRO
1	C	311	PRO
1	D	311	PRO
1	A	440	ALA
1	B	440	ALA
1	C	440	ALA
1	D	440	ALA
1	A	257	VAL
1	B	257	VAL
1	C	257	VAL
1	D	257	VAL
1	A	427	GLY
1	B	427	GLY
1	C	427	GLY
1	D	34	GLY
1	D	427	GLY
1	A	34	GLY
1	B	34	GLY
1	C	34	GLY

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	410/410 (100%)	388 (95%)	22 (5%)	22	53
1	B	410/410 (100%)	388 (95%)	22 (5%)	22	53
1	C	410/410 (100%)	388 (95%)	22 (5%)	22	53
1	D	410/410 (100%)	388 (95%)	22 (5%)	22	53

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1640/1640 (100%)	1552 (95%)	88 (5%)	22 53

All (88) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	84	ARG
1	A	91	ARG
1	A	103	LEU
1	A	107	ASN
1	A	112	ILE
1	A	195	PRO
1	A	264	LEU
1	A	269	PRO
1	A	286	LEU
1	A	310	MET
1	A	331	LEU
1	A	340	ILE
1	A	361	ARG
1	A	389	ASN
1	A	402	PHE
1	A	417	VAL
1	A	419	GLN
1	A	423	ASN
1	A	435	ARG
1	A	477	GLU
1	A	494	VAL
1	A	503	PHE
1	B	84	ARG
1	B	91	ARG
1	B	103	LEU
1	B	107	ASN
1	B	112	ILE
1	B	195	PRO
1	B	264	LEU
1	B	269	PRO
1	B	286	LEU
1	B	310	MET
1	B	331	LEU
1	B	340	ILE
1	B	361	ARG
1	B	389	ASN
1	B	402	PHE

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Mol	Chain	Res	Type
1	B	417	VAL
1	B	419	GLN
1	B	423	ASN
1	B	435	ARG
1	B	477	GLU
1	B	494	VAL
1	B	503	PHE
1	C	84	ARG
1	C	91	ARG
1	C	103	LEU
1	C	107	ASN
1	C	112	ILE
1	C	195	PRO
1	C	264	LEU
1	C	269	PRO
1	C	286	LEU
1	C	310	MET
1	C	331	LEU
1	C	340	ILE
1	C	361	ARG
1	C	389	ASN
1	C	402	PHE
1	C	417	VAL
1	C	419	GLN
1	C	423	ASN
1	C	435	ARG
1	C	477	GLU
1	C	494	VAL
1	C	503	PHE
1	D	84	ARG
1	D	91	ARG
1	D	103	LEU
1	D	107	ASN
1	D	112	ILE
1	D	195	PRO
1	D	264	LEU
1	D	269	PRO
1	D	286	LEU
1	D	310	MET
1	D	331	LEU
1	D	340	ILE
1	D	361	ARG

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Mol	Chain	Res	Type
1	D	389	ASN
1	D	402	PHE
1	D	417	VAL
1	D	419	GLN
1	D	423	ASN
1	D	435	ARG
1	D	477	GLU
1	D	494	VAL
1	D	503	PHE

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	2	GLN
1	A	206	HIS
1	A	231	HIS
1	A	233	ASN
1	A	295	GLN
1	A	299	ASN
1	A	354	GLN
1	A	378	ASN
1	A	423	ASN
1	A	480	GLN
1	B	2	GLN
1	B	206	HIS
1	B	231	HIS
1	B	233	ASN
1	B	295	GLN
1	B	299	ASN
1	B	354	GLN
1	B	378	ASN
1	B	423	ASN
1	B	480	GLN
1	C	2	GLN
1	C	206	HIS
1	C	231	HIS
1	C	233	ASN
1	C	295	GLN
1	C	299	ASN
1	C	354	GLN
1	C	378	ASN
1	C	423	ASN

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Mol	Chain	Res	Type
1	D	2	GLN
1	D	206	HIS
1	D	231	HIS
1	D	233	ASN
1	D	295	GLN
1	D	299	ASN
1	D	354	GLN
1	D	378	ASN
1	D	423	ASN
1	D	480	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

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	C	504	-	42,48,48	3.99	24 (57%)	50,73,73	1.34	4 (8%)
2	NAD	B	504	-	42,48,48	3.99	24 (57%)	50,73,73	1.34	4 (8%)
2	NAD	D	504	-	42,48,48	4.00	25 (59%)	50,73,73	1.34	4 (8%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
2	NAD	A	504	-	42,48,48	3.99	25 (59%)	50,73,73	1.34	4 (8%)

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	C	504	-	-	8/26/62/62	0/5/5/5
2	NAD	B	504	-	-	8/26/62/62	0/5/5/5
2	NAD	D	504	-	-	8/26/62/62	0/5/5/5
2	NAD	A	504	-	-	8/26/62/62	0/5/5/5

All (98) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	504	NAD	C2N-N1N	12.78	1.50	1.35
2	C	504	NAD	C2N-N1N	12.78	1.50	1.35
2	A	504	NAD	C2N-N1N	12.75	1.50	1.35
2	B	504	NAD	C2N-N1N	12.74	1.50	1.35
2	B	504	NAD	O4D-C1D	9.25	1.54	1.41
2	C	504	NAD	O4D-C1D	9.22	1.54	1.41
2	A	504	NAD	O4D-C1D	9.21	1.53	1.41
2	D	504	NAD	O4D-C1D	9.21	1.53	1.41
2	A	504	NAD	C3N-C7N	7.81	1.62	1.50
2	D	504	NAD	C3N-C7N	7.81	1.62	1.50
2	B	504	NAD	C3N-C7N	7.81	1.62	1.50
2	C	504	NAD	C3N-C7N	7.79	1.62	1.50
2	D	504	NAD	C2B-C1B	-5.94	1.44	1.53
2	A	504	NAD	C2B-C1B	-5.90	1.44	1.53
2	B	504	NAD	C2B-C1B	-5.89	1.44	1.53
2	C	504	NAD	C2B-C1B	-5.88	1.44	1.53
2	C	504	NAD	O4B-C1B	5.64	1.48	1.41
2	D	504	NAD	O4B-C1B	5.63	1.48	1.41
2	A	504	NAD	O4B-C1B	5.61	1.48	1.41
2	B	504	NAD	O4B-C1B	5.55	1.48	1.41
2	A	504	NAD	C2A-N3A	5.12	1.40	1.32
2	C	504	NAD	C2A-N3A	5.12	1.40	1.32
2	D	504	NAD	C2A-N3A	5.11	1.40	1.32
2	B	504	NAD	C2A-N3A	5.10	1.40	1.32
2	B	504	NAD	PN-O5D	4.93	1.79	1.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	504	NAD	PN-O5D	4.92	1.79	1.59
2	D	504	NAD	PN-O5D	4.91	1.79	1.59
2	A	504	NAD	PN-O5D	4.90	1.79	1.59
2	A	504	NAD	C5N-C4N	4.65	1.48	1.38
2	D	504	NAD	O4D-C4D	4.64	1.55	1.45
2	B	504	NAD	C5N-C4N	4.63	1.48	1.38
2	A	504	NAD	O4D-C4D	4.62	1.55	1.45
2	B	504	NAD	C6N-N1N	4.62	1.46	1.35
2	C	504	NAD	C5N-C4N	4.62	1.48	1.38
2	B	504	NAD	O4D-C4D	4.62	1.55	1.45
2	D	504	NAD	C6N-N1N	4.62	1.46	1.35
2	D	504	NAD	C5N-C4N	4.61	1.48	1.38
2	C	504	NAD	C6N-N1N	4.60	1.46	1.35
2	C	504	NAD	O4D-C4D	4.59	1.55	1.45
2	A	504	NAD	C6N-N1N	4.59	1.46	1.35
2	C	504	NAD	C2N-C3N	4.51	1.46	1.39
2	B	504	NAD	C2N-C3N	4.51	1.46	1.39
2	A	504	NAD	C2N-C3N	4.50	1.46	1.39
2	D	504	NAD	C2N-C3N	4.49	1.46	1.39
2	D	504	NAD	C4N-C3N	4.41	1.46	1.39
2	B	504	NAD	C4N-C3N	4.40	1.46	1.39
2	A	504	NAD	C4N-C3N	4.39	1.46	1.39
2	C	504	NAD	C4N-C3N	4.37	1.46	1.39
2	C	504	NAD	C7N-N7N	4.04	1.40	1.33
2	D	504	NAD	C7N-N7N	4.03	1.40	1.33
2	A	504	NAD	C7N-N7N	4.02	1.40	1.33
2	B	504	NAD	C7N-N7N	4.02	1.40	1.33
2	D	504	NAD	C2A-N1A	3.90	1.41	1.33
2	B	504	NAD	C2A-N1A	3.90	1.41	1.33
2	C	504	NAD	C2A-N1A	3.89	1.41	1.33
2	A	504	NAD	C2A-N1A	3.88	1.41	1.33
2	B	504	NAD	O3D-C3D	3.54	1.51	1.43
2	D	504	NAD	O3D-C3D	3.53	1.51	1.43
2	A	504	NAD	O3D-C3D	3.52	1.51	1.43
2	C	504	NAD	O3D-C3D	3.49	1.51	1.43
2	D	504	NAD	C8A-N7A	3.22	1.40	1.34
2	A	504	NAD	C8A-N7A	3.22	1.40	1.34
2	B	504	NAD	C8A-N7A	3.21	1.40	1.34
2	C	504	NAD	C8A-N7A	3.21	1.40	1.34
2	D	504	NAD	C3B-C4B	-3.11	1.45	1.53
2	C	504	NAD	C3B-C4B	-3.10	1.45	1.53
2	A	504	NAD	C3B-C4B	-3.07	1.45	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	504	NAD	C3B-C4B	-3.07	1.45	1.53
2	B	504	NAD	C6N-C5N	3.05	1.45	1.38
2	D	504	NAD	C6N-C5N	3.03	1.45	1.38
2	C	504	NAD	C6N-C5N	3.02	1.45	1.38
2	A	504	NAD	C6N-C5N	3.02	1.45	1.38
2	B	504	NAD	PA-O5B	2.91	1.71	1.59
2	A	504	NAD	PA-O5B	2.89	1.71	1.59
2	C	504	NAD	PA-O5B	2.88	1.71	1.59
2	D	504	NAD	C2D-C3D	2.88	1.61	1.53
2	C	504	NAD	C2D-C3D	2.88	1.61	1.53
2	A	504	NAD	C2D-C3D	2.87	1.61	1.53
2	B	504	NAD	C2D-C3D	2.87	1.61	1.53
2	D	504	NAD	PA-O5B	2.87	1.70	1.59
2	A	504	NAD	O2D-C2D	2.86	1.49	1.43
2	C	504	NAD	O2D-C2D	2.86	1.49	1.43
2	B	504	NAD	O2D-C2D	2.84	1.49	1.43
2	D	504	NAD	O2D-C2D	2.84	1.49	1.43
2	B	504	NAD	O4B-C4B	2.63	1.50	1.45
2	D	504	NAD	O4B-C4B	2.60	1.50	1.45
2	A	504	NAD	O4B-C4B	2.60	1.50	1.45
2	C	504	NAD	O4B-C4B	2.58	1.50	1.45
2	C	504	NAD	C5A-C4A	-2.42	1.34	1.40
2	A	504	NAD	C5A-C4A	-2.40	1.34	1.40
2	D	504	NAD	C5A-C4A	-2.38	1.34	1.40
2	B	504	NAD	C5A-C4A	-2.37	1.34	1.40
2	A	504	NAD	O5D-C5D	2.09	1.52	1.44
2	D	504	NAD	O5D-C5D	2.08	1.52	1.44
2	C	504	NAD	O5D-C5D	2.08	1.52	1.44
2	B	504	NAD	O5D-C5D	2.08	1.52	1.44
2	D	504	NAD	C2D-C1D	-2.02	1.50	1.53
2	A	504	NAD	C2D-C1D	-2.01	1.50	1.53

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	504	NAD	N3A-C2A-N1A	-5.17	120.59	128.68
2	A	504	NAD	N3A-C2A-N1A	-5.15	120.63	128.68
2	B	504	NAD	N3A-C2A-N1A	-5.15	120.63	128.68
2	D	504	NAD	N3A-C2A-N1A	-5.14	120.65	128.68
2	C	504	NAD	C4A-C5A-N7A	4.56	114.15	109.40
2	A	504	NAD	C4A-C5A-N7A	4.55	114.14	109.40
2	D	504	NAD	C4A-C5A-N7A	4.52	114.11	109.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	504	NAD	C4A-C5A-N7A	4.50	114.09	109.40
2	B	504	NAD	O4D-C1D-C2D	-2.35	103.50	106.93
2	C	504	NAD	O4D-C1D-C2D	-2.35	103.50	106.93
2	A	504	NAD	O4D-C1D-C2D	-2.34	103.50	106.93
2	D	504	NAD	O4D-C1D-C2D	-2.34	103.50	106.93
2	B	504	NAD	C6N-N1N-C2N	-2.27	119.90	121.97
2	D	504	NAD	C6N-N1N-C2N	-2.26	119.91	121.97
2	C	504	NAD	C6N-N1N-C2N	-2.26	119.91	121.97
2	A	504	NAD	C6N-N1N-C2N	-2.24	119.94	121.97

There are no chirality outliers.

All (32) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	504	NAD	O4B-C4B-C5B-O5B
2	A	504	NAD	C3B-C4B-C5B-O5B
2	A	504	NAD	C5D-O5D-PN-O2N
2	A	504	NAD	C3D-C4D-C5D-O5D
2	B	504	NAD	O4B-C4B-C5B-O5B
2	B	504	NAD	C3B-C4B-C5B-O5B
2	B	504	NAD	C5D-O5D-PN-O2N
2	B	504	NAD	C3D-C4D-C5D-O5D
2	C	504	NAD	O4B-C4B-C5B-O5B
2	C	504	NAD	C3B-C4B-C5B-O5B
2	C	504	NAD	C5D-O5D-PN-O2N
2	C	504	NAD	C3D-C4D-C5D-O5D
2	D	504	NAD	O4B-C4B-C5B-O5B
2	D	504	NAD	C3B-C4B-C5B-O5B
2	D	504	NAD	C5D-O5D-PN-O2N
2	D	504	NAD	C3D-C4D-C5D-O5D
2	A	504	NAD	O4D-C4D-C5D-O5D
2	B	504	NAD	O4D-C4D-C5D-O5D
2	C	504	NAD	O4D-C4D-C5D-O5D
2	D	504	NAD	O4D-C4D-C5D-O5D
2	A	504	NAD	C5D-O5D-PN-O3
2	B	504	NAD	C5D-O5D-PN-O3
2	C	504	NAD	C5D-O5D-PN-O3
2	D	504	NAD	C5D-O5D-PN-O3
2	A	504	NAD	C4D-C5D-O5D-PN
2	B	504	NAD	C4D-C5D-O5D-PN
2	C	504	NAD	C4D-C5D-O5D-PN
2	D	504	NAD	C4D-C5D-O5D-PN

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Mol	Chain	Res	Type	Atoms
2	A	504	NAD	C5D-O5D-PN-O1N
2	B	504	NAD	C5D-O5D-PN-O1N
2	C	504	NAD	C5D-O5D-PN-O1N
2	D	504	NAD	C5D-O5D-PN-O1N

There are no ring outliers.

4 monomers are involved in 16 short contacts:

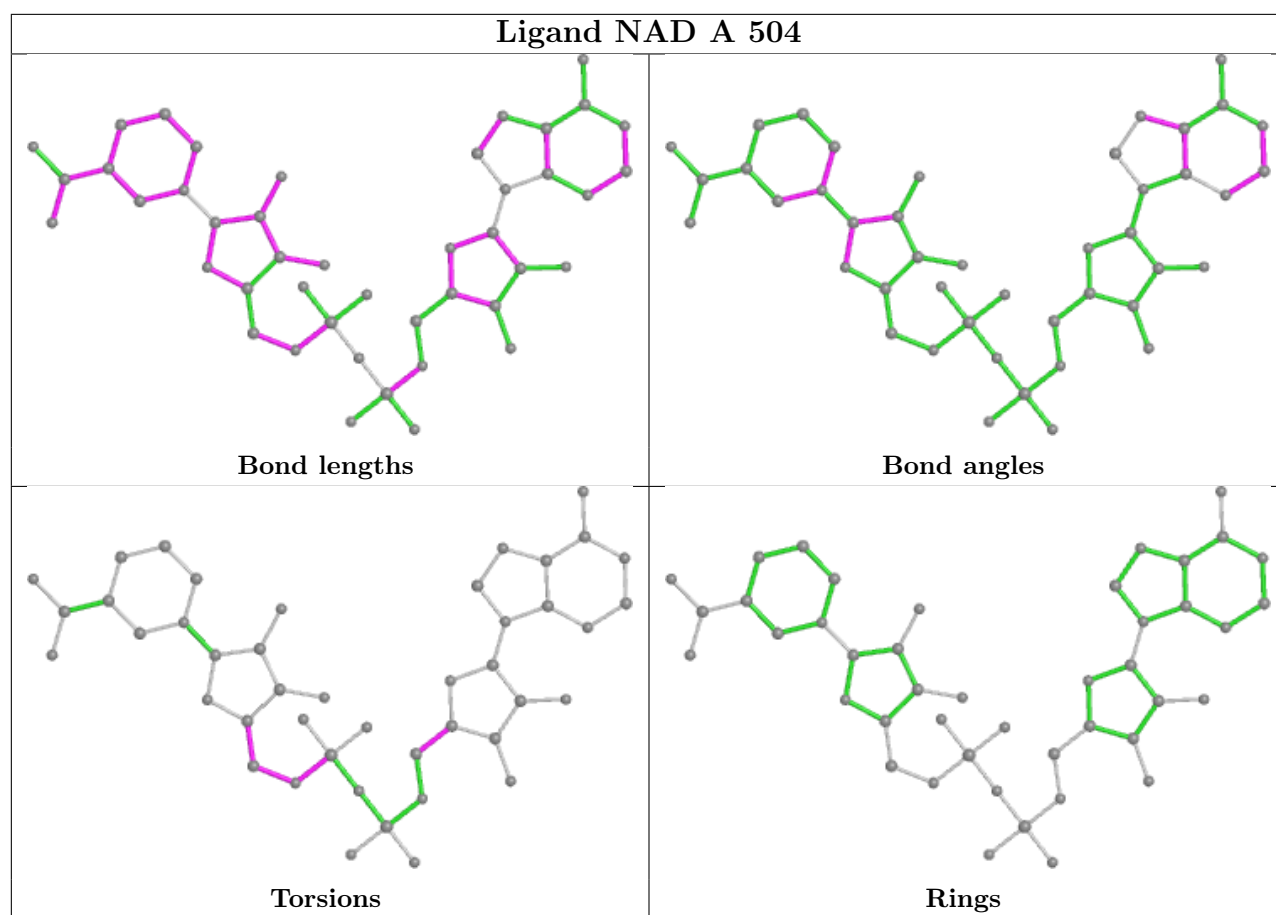| Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	504	NAD	4	0
2	B	504	NAD	4	0
2	D	504	NAD	4	0
2	A	504	NAD	4	0

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 then 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.

Ligand NAD C 504

Bond lengths

Bond angles

Torsions

Rings

Ligand NAD B 504

Bond lengths

Bond angles

Torsions

Rings

Ligand NAD D 504

Bond lengths

Bond angles

Torsions

Rings

Ligand NAD A 504

Bond lengths

Bond angles

Torsions

Rings
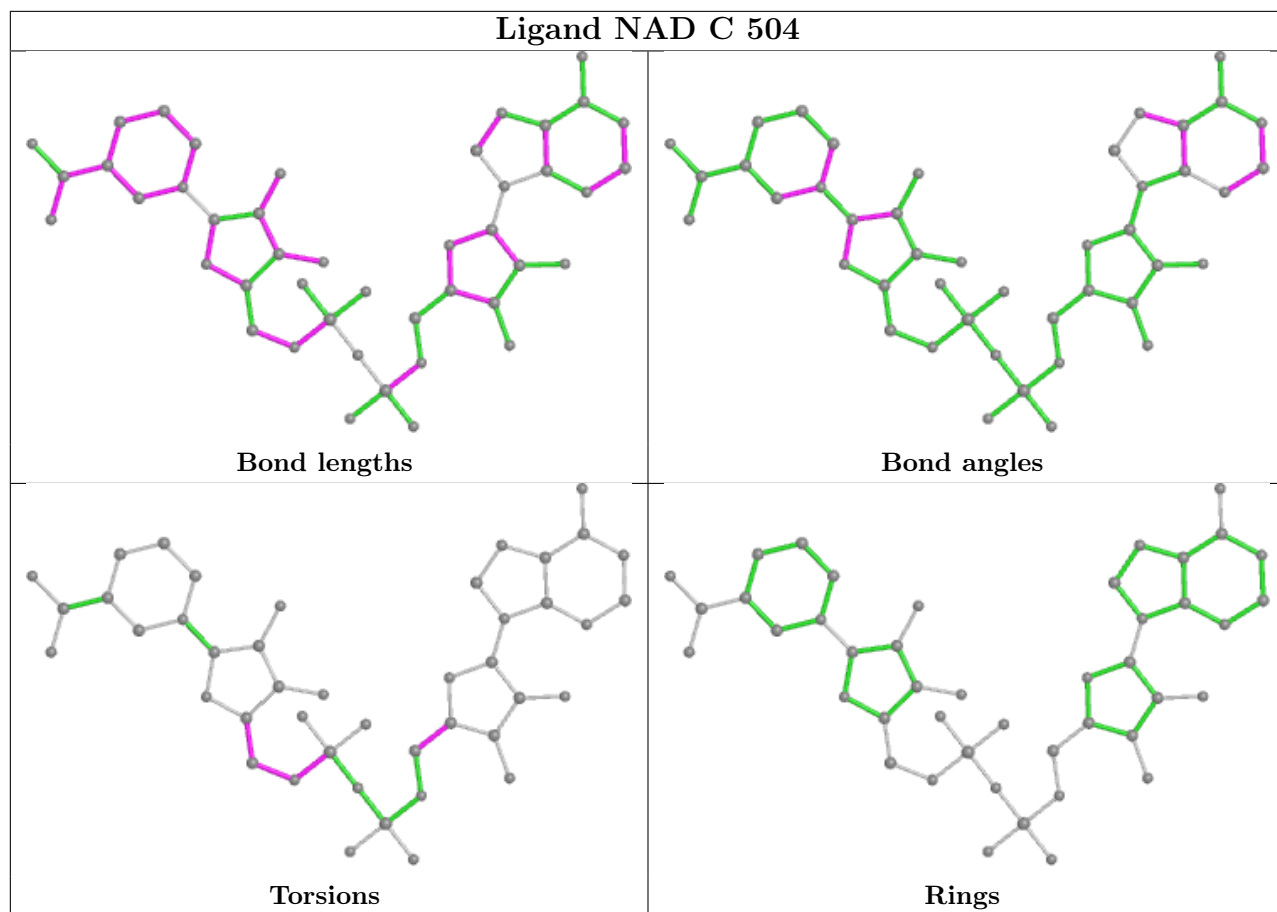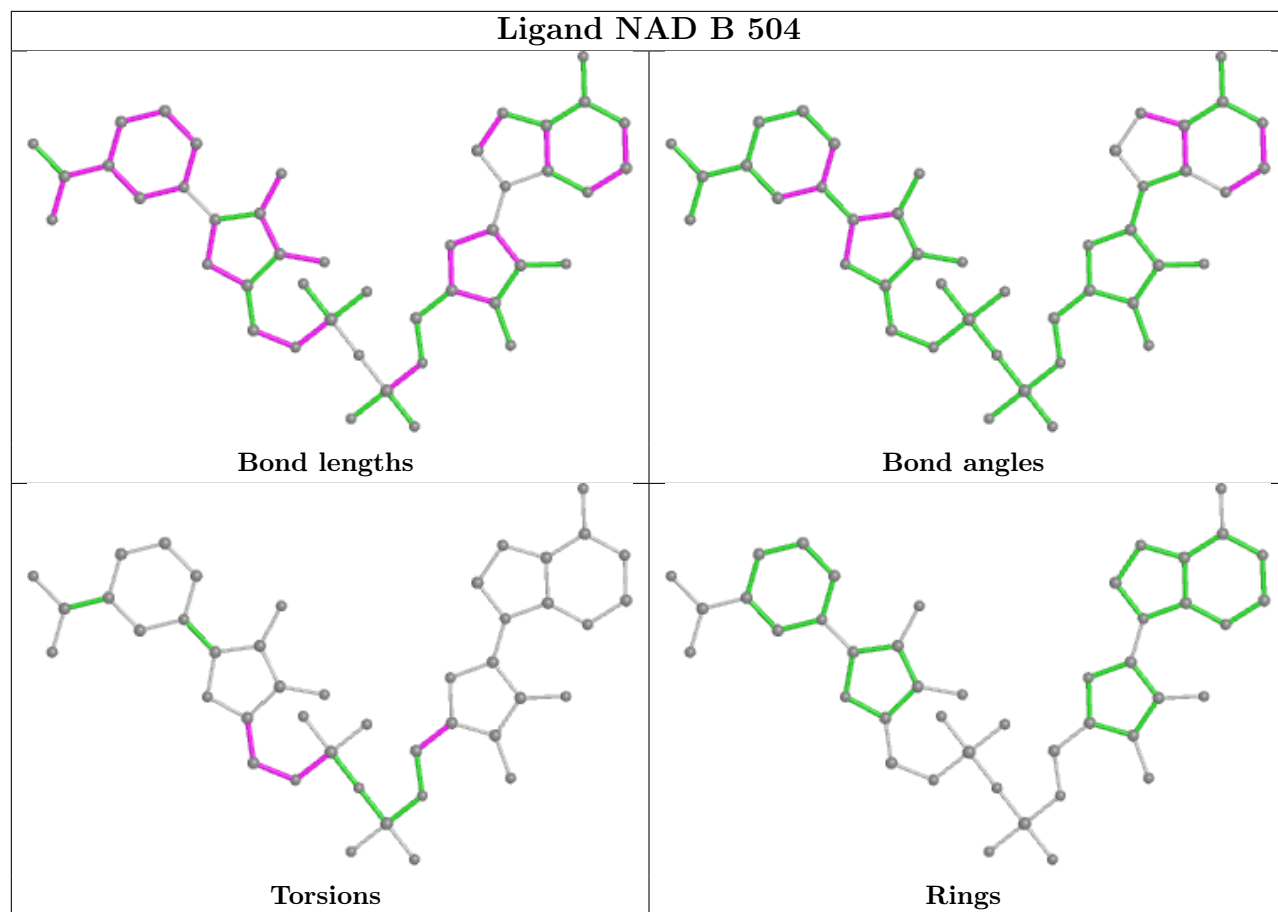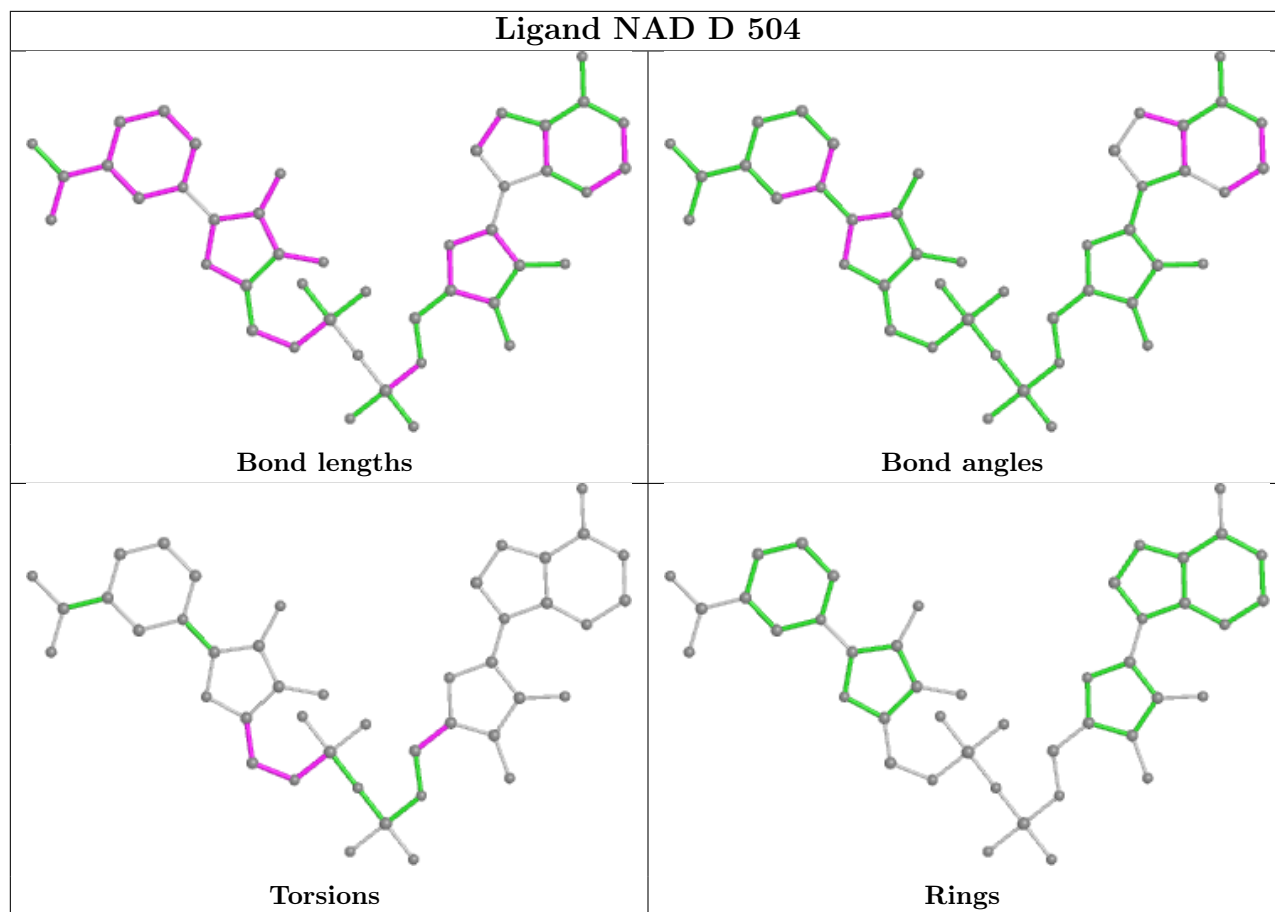
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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(Å²)	Q<0.9
1	A	503/503 (100%)	-0.24	11 (2%)	62	52	24, 36, 53, 73	0
1	B	503/503 (100%)	-0.30	8 (1%)	72	66	24, 36, 53, 73	0
1	C	503/503 (100%)	-0.29	6 (1%)	79	73	24, 36, 53, 73	0
1	D	503/503 (100%)	-0.28	8 (1%)	72	66	24, 36, 53, 73	0
All	All	2012/2012 (100%)	-0.27	33 (1%)	72	66	24, 36, 53, 73	0

All (33) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	32	LYS	4.9
1	B	33	ASP	4.5
1	A	33	ASP	4.4
1	C	33	ASP	3.9
1	A	32	LYS	3.7
1	D	35	ALA	3.3
1	C	34	GLY	3.2
1	D	33	ASP	3.2
1	C	32	LYS	3.1
1	A	415	GLU	3.0
1	D	9	SER	2.9
1	D	419	GLN	2.9
1	B	34	GLY	2.8
1	A	371	PRO	2.7
1	B	32	LYS	2.6
1	A	36	THR	2.6
1	C	308	GLU	2.6
1	B	415	GLU	2.4
1	B	337	GLY	2.4
1	D	34	GLY	2.3
1	D	30	LYS	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	35	ALA	2.2
1	A	27	ARG	2.2
1	A	9	SER	2.2
1	A	30	LYS	2.1
1	C	353	ALA	2.1
1	A	35	ALA	2.1
1	B	338	GLY	2.1
1	A	370	THR	2.1
1	B	31	SER	2.1
1	C	36	THR	2.0
1	D	415	GLU	2.0
1	A	145	GLY	2.0

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

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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
2	NAD	C	504	44/44	0.86	0.24	61,61,61,61	0
2	NAD	B	504	44/44	0.87	0.22	61,61,61,61	0
2	NAD	A	504	44/44	0.88	0.23	61,61,61,61	0
2	NAD	D	504	44/44	0.88	0.21	61,61,61,61	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around NAD C 504:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
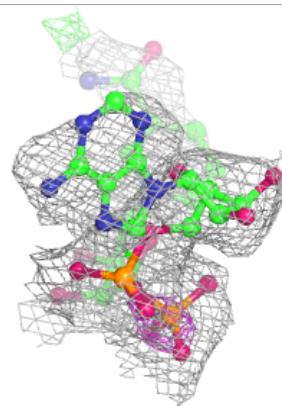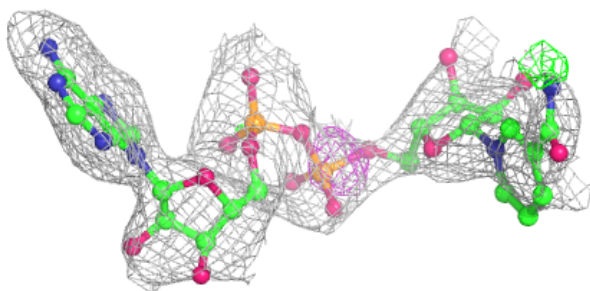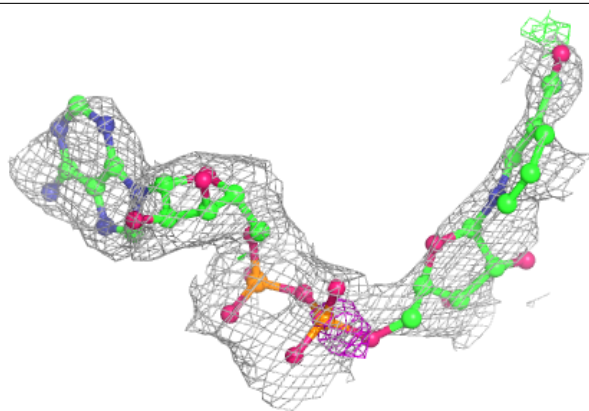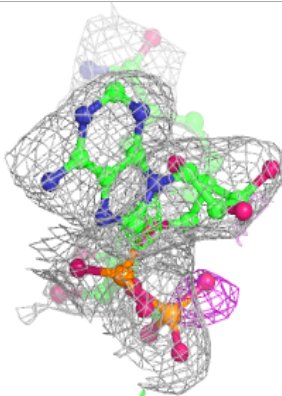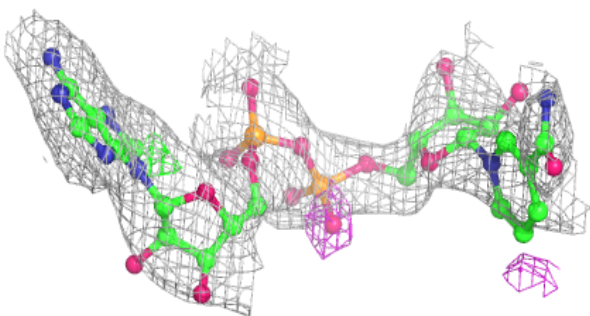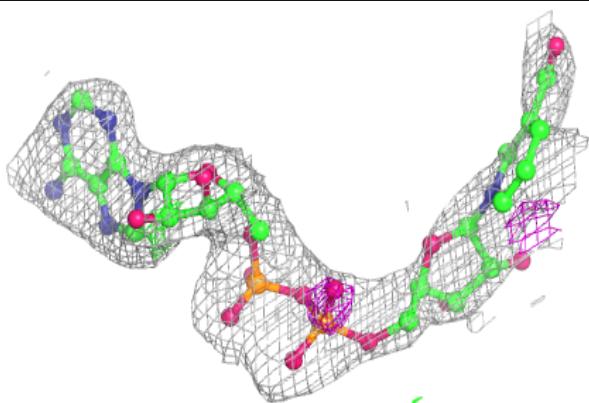and green (positive)
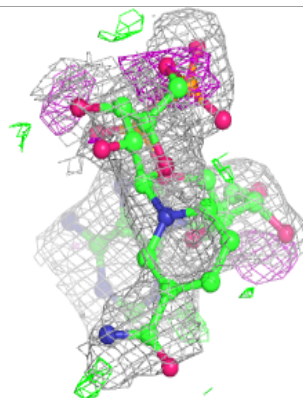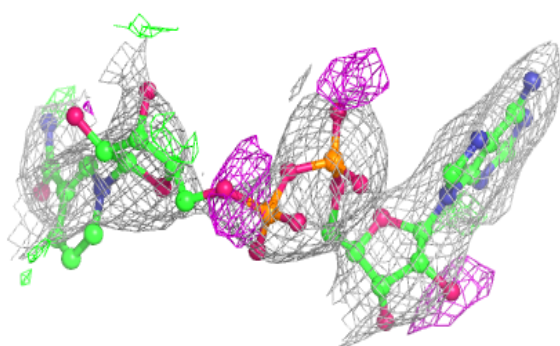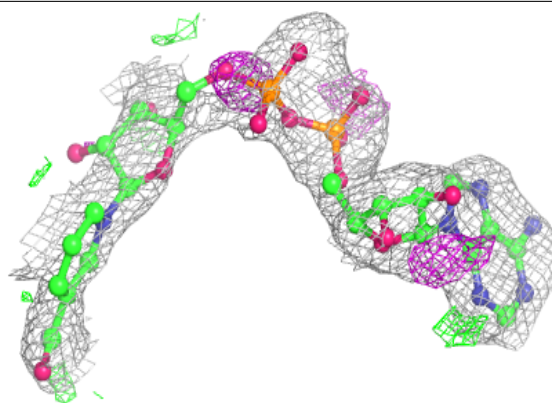
Electron density around NAD B 504:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
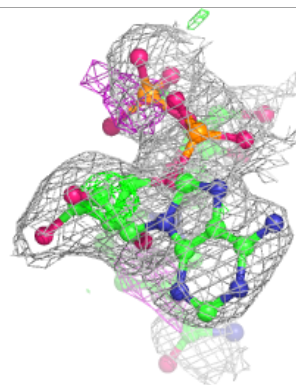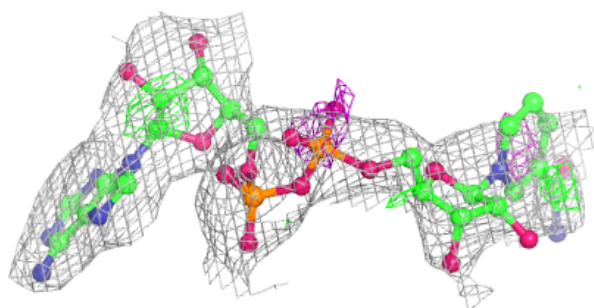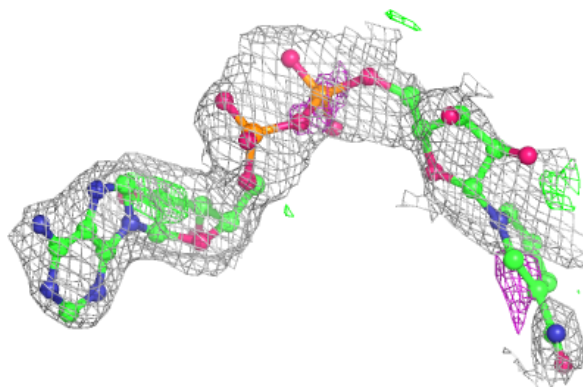
Electron density around NAD A 504:

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

Electron density around NAD D 504:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.