Full wwPDB X-ray Structure Validation Report (i)

Oct 18, 2023 – 11:57 PM EDT

PDB ID	:	2QFV
Title	:	Crystal structure of Saccharomyces cerevesiae mitochondrial NADP(+)-dependent isocitrate dehydrogenase in complex with NADP(+)
Authors	:	Peng, Y.J.; Ding, J.P.
Deposited on	:	2007-06-28
Resolution	:	2.30 Å(reported)

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

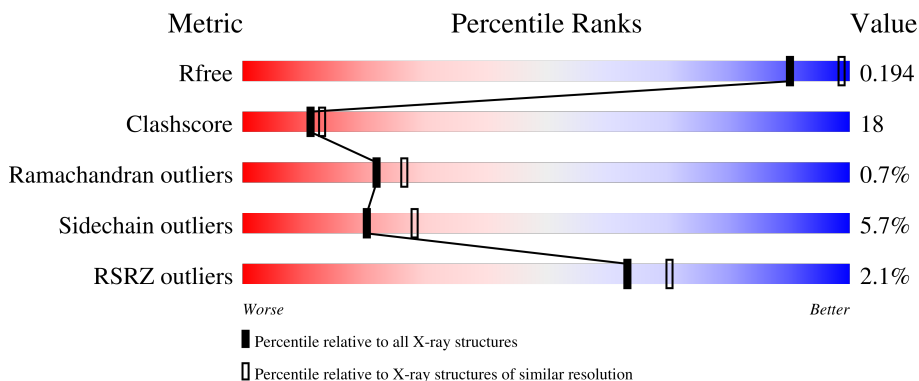|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 2.30 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		0.194
Clashscore		18
Ramachandran outliers		0.7%
Sidechain outliers		5.7%
RSRZ outliers		2.1%

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	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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	427	3% 68% 24% 5% ·
1	B	427	% 66% 25% · ·
1	C	427	% 65% 27% · ·
1	D	427	3% 64% 28% · ·

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 14100 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 Isocitrate dehydrogenase [NADP].

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	410	Total	C	N	O	S	0	0	0
			3248	2070	550	616	12			
1	B	408	Total	C	N	O	S	0	0	0
			3231	2058	548	613	12			
1	C	408	Total	C	N	O	S	0	0	0
			3231	2058	548	613	12			
1	D	410	Total	C	N	O	S	0	0	0
			3248	2070	550	616	12			

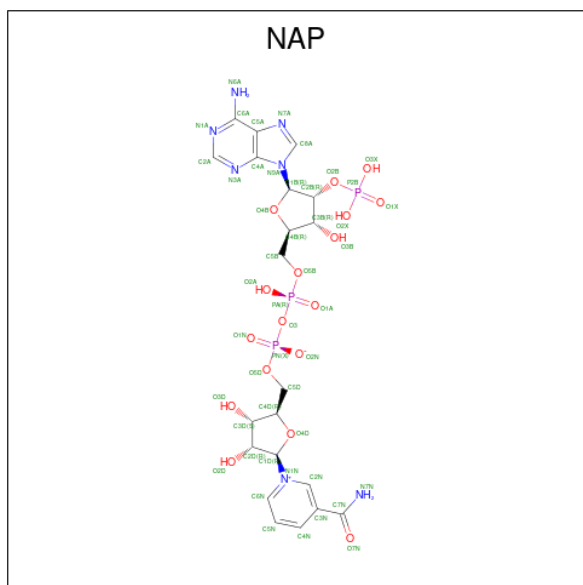There are 56 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-13	MET	-	expression tag	UNP P21954
A	-12	HIS	-	expression tag	UNP P21954
A	-11	HIS	-	expression tag	UNP P21954
A	-10	HIS	-	expression tag	UNP P21954
A	-9	HIS	-	expression tag	UNP P21954
A	-8	HIS	-	expression tag	UNP P21954
A	-7	HIS	-	expression tag	UNP P21954
A	-6	ALA	-	expression tag	UNP P21954
A	-5	MET	-	expression tag	UNP P21954
A	-4	GLY	-	expression tag	UNP P21954
A	-3	ILE	-	expression tag	UNP P21954
A	-2	PRO	-	expression tag	UNP P21954
A	-1	GLY	-	expression tag	UNP P21954
A	0	HIS	-	expression tag	UNP P21954
B	-13	MET	-	expression tag	UNP P21954
B	-12	HIS	-	expression tag	UNP P21954
B	-11	HIS	-	expression tag	UNP P21954
B	-10	HIS	-	expression tag	UNP P21954
B	-9	HIS	-	expression tag	UNP P21954
B	-8	HIS	-	expression tag	UNP P21954
B	-7	HIS	-	expression tag	UNP P21954

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-6	ALA	-	expression tag	UNP P21954
B	-5	MET	-	expression tag	UNP P21954
B	-4	GLY	-	expression tag	UNP P21954
B	-3	ILE	-	expression tag	UNP P21954
B	-2	PRO	-	expression tag	UNP P21954
B	-1	GLY	-	expression tag	UNP P21954
B	0	HIS	-	expression tag	UNP P21954
C	-13	MET	-	expression tag	UNP P21954
C	-12	HIS	-	expression tag	UNP P21954
C	-11	HIS	-	expression tag	UNP P21954
C	-10	HIS	-	expression tag	UNP P21954
C	-9	HIS	-	expression tag	UNP P21954
C	-8	HIS	-	expression tag	UNP P21954
C	-7	HIS	-	expression tag	UNP P21954
C	-6	ALA	-	expression tag	UNP P21954
C	-5	MET	-	expression tag	UNP P21954
C	-4	GLY	-	expression tag	UNP P21954
C	-3	ILE	-	expression tag	UNP P21954
C	-2	PRO	-	expression tag	UNP P21954
C	-1	GLY	-	expression tag	UNP P21954
C	0	HIS	-	expression tag	UNP P21954
D	-13	MET	-	expression tag	UNP P21954
D	-12	HIS	-	expression tag	UNP P21954
D	-11	HIS	-	expression tag	UNP P21954
D	-10	HIS	-	expression tag	UNP P21954
D	-9	HIS	-	expression tag	UNP P21954
D	-8	HIS	-	expression tag	UNP P21954
D	-7	HIS	-	expression tag	UNP P21954
D	-6	ALA	-	expression tag	UNP P21954
D	-5	MET	-	expression tag	UNP P21954
D	-4	GLY	-	expression tag	UNP P21954
D	-3	ILE	-	expression tag	UNP P21954
D	-2	PRO	-	expression tag	UNP P21954
D	-1	GLY	-	expression tag	UNP P21954
D	0	HIS	-	expression tag	UNP P21954

- Molecule 2 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NAP) (formula: $C_{21}H_{28}N_7O_{17}P_3$).
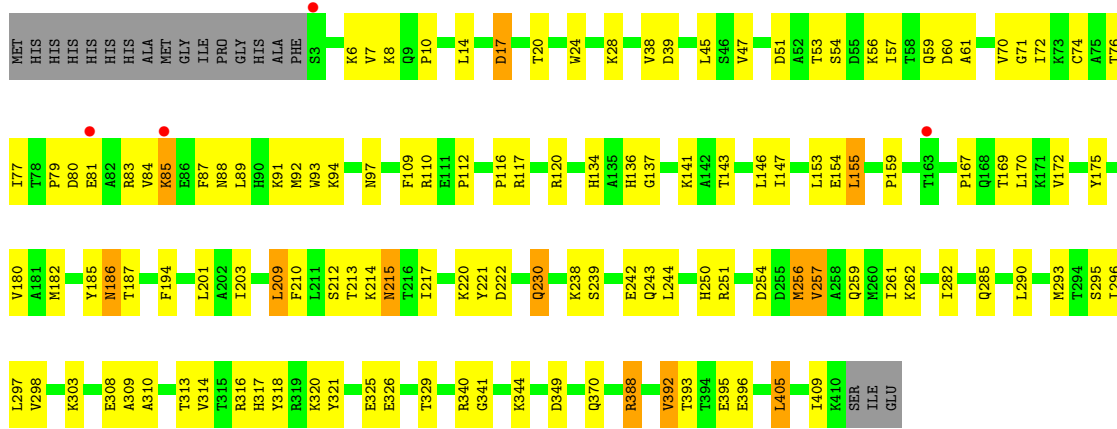
NAP

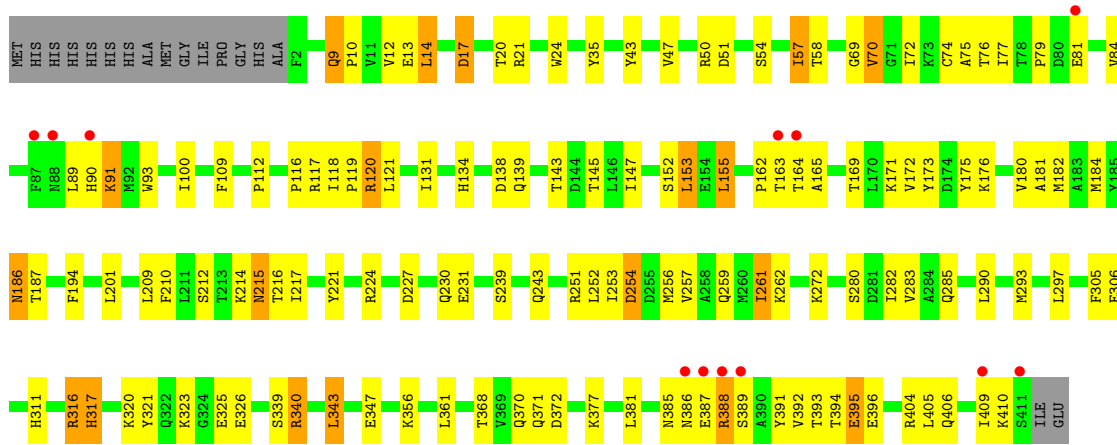| Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
2	B	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
2	C	1	Total	C	N	O	P	0	0
			48	21	7	17	3		
2	D	1	Total	C	N	O	P	0	0
			48	21	7	17	3		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	244	Total	O	0	0
			244	244		
3	B	253	Total	O	0	0
			253	253		
3	C	249	Total	O	0	0
			249	249		
3	D	204	Total	O	0	0
			204	204		

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: Isocitrate dehydrogenase [NADP]

Chain A:

- Molecule 1: Isocitrate dehydrogenase [NADP]

Chain B:

- Molecule 1: Isocitrate dehydrogenase [NADP]

Chain C:

• Molecule 1: Isocitrate dehydrogenase [NADP]

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	58.18Å 71.44Å 101.63Å 87.80° 88.00° 90.10°	Depositor
Resolution (Å)	45.15 – 2.30 45.15 – 2.20	Depositor EDS
% Data completeness (in resolution range)	95.5 (45.15-2.30) 94.9 (45.15-2.20)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	0.08	Depositor
$< I/\sigma(I) >$ [1]	3.11 (at 2.20Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.198 , 0.258 0.201 , 0.194	Depositor DCC
R_{free} test set	3952 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	26.7	Xtriage
Anisotropy	0.042	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 46.2	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.024 for h,-k,-l 0.077 for -h,k,-l 0.017 for -h,-k,l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	14100	wwPDB-VP
Average B, all atoms (Å^2)	32.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.13% 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 (i)

5.1 Standard geometry (i)

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

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	0.35	0/3311	0.62	0/4466
1	B	0.35	0/3293	0.63	2/4442 (0.0%)
1	C	0.35	0/3293	0.62	0/4442
1	D	0.35	0/3311	0.62	0/4466
All	All	0.35	0/13208	0.62	2/17816 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	70	VAL	N-CA-CB	-11.25	86.74	111.50
1	B	122	VAL	N-CA-C	-5.07	97.31	111.00

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3248	0	3291	125	0
1	B	3231	0	3277	128	0
1	C	3231	0	3277	138	0
1	D	3248	0	3291	136	0
2	A	48	0	25	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	48	0	25	4	0
2	C	48	0	25	5	0
2	D	48	0	25	3	0
3	A	244	0	0	16	0
3	B	253	0	0	15	0
3	C	249	0	0	14	0
3	D	204	0	0	10	0
All	All	14100	0	13236	471	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 18.

All (471) 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:261:ILE:HD11	1:D:285:GLN:HB2	1.34	1.04
1:C:180:VAL:HG21	1:D:221:TYR:HA	1.39	1.03
1:A:285:GLN:HB3	1:B:261:ILE:HD11	1.45	0.99
1:A:221:TYR:HA	1:B:180:VAL:HG21	1.42	0.98
1:B:50:ARG:HA	1:B:57:ILE:HD11	1.43	0.98
1:D:316:ARG:HH11	1:D:316:ARG:HG3	1.32	0.95
1:A:405:LEU:HD22	1:A:409:ILE:HD11	1.50	0.93
1:C:117:ARG:H	1:C:370:GLN:HE22	1.17	0.92
1:C:221:TYR:HA	1:D:180:VAL:HG21	1.51	0.92
1:B:117:ARG:H	1:B:370:GLN:HE22	1.14	0.92
1:C:392:VAL:HG13	1:C:396:GLU:HB2	1.50	0.92
1:A:348:LEU:HB2	3:A:1050:HOH:O	1.70	0.90
1:C:261:ILE:HD11	1:D:285:GLN:CB	2.01	0.90
1:A:180:VAL:HG21	1:B:221:TYR:HA	1.52	0.90
1:C:143:THR:HG21	1:D:172:VAL:HG22	1.51	0.89
1:D:50:ARG:HA	1:D:57:ILE:HD11	1.53	0.89
1:B:261:ILE:HD12	1:B:262:LYS:N	1.90	0.87
1:D:117:ARG:H	1:D:370:GLN:HE22	1.24	0.84
1:C:388:ARG:O	1:C:388:ARG:HD3	1.78	0.84
1:C:212:SER:OG	1:C:256:MET:HG3	1.79	0.82
1:C:214:LYS:HE3	1:C:217:ILE:HD13	1.62	0.82
1:B:209:LEU:HD12	1:B:248:TYR:HD2	1.45	0.81
1:D:251:ARG:NH1	1:D:259:GLN:HE22	1.79	0.81
1:A:285:GLN:HB3	1:B:261:ILE:CD1	2.11	0.80
1:A:143:THR:HG23	3:A:1096:HOH:O	1.81	0.79
1:B:212:SER:OG	1:B:256:MET:HG3	1.82	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:176:LYS:HA	1:D:176:LYS:HE2	1.62	0.79
1:A:214:LYS:HE3	1:A:217:ILE:HD13	1.62	0.79
1:B:101:ARG:HD2	3:B:1053:HOH:O	1.83	0.78
1:C:257:VAL:HG22	1:D:282:ILE:HD11	1.65	0.78
1:B:209:LEU:HD12	1:B:248:TYR:CD2	2.19	0.77
1:C:141:LYS:HG2	1:C:185:TYR:OH	1.84	0.76
1:A:117:ARG:H	1:A:370:GLN:HE22	1.34	0.76
1:B:392:VAL:HG22	1:B:396:GLU:OE1	1.86	0.75
1:C:91:LYS:HD3	1:C:92:MET:H	1.51	0.75
1:A:139:GLN:HG3	1:A:184:MET:CE	2.18	0.73
1:A:405:LEU:HD22	1:A:409:ILE:CD1	2.19	0.73
1:B:120:ARG:HD2	1:B:125:TRP:O	1.89	0.73
1:D:152:SER:HB2	1:D:171:LYS:HE2	1.69	0.73
1:C:303:LYS:HE2	3:C:1194:HOH:O	1.90	0.71
1:C:17:ASP:OD1	1:C:77:ILE:HG13	1.91	0.70
1:A:76:THR:O	2:A:1001:NAP:H2N	1.91	0.70
1:A:153:LEU:HD21	1:B:155:LEU:HD22	1.73	0.70
1:D:230:GLN:HG3	3:D:1077:HOH:O	1.91	0.70
1:A:345:ARG:HA	3:A:1050:HOH:O	1.93	0.69
1:D:76:THR:O	2:D:1004:NAP:H2N	1.91	0.69
1:C:296:ILE:HD12	3:C:1122:HOH:O	1.93	0.69
1:C:251:ARG:HG3	1:C:256:MET:HE3	1.75	0.68
1:A:282:ILE:HD11	1:B:279:GLN:HE22	1.56	0.68
1:B:47:VAL:HG21	1:B:77:ILE:HD12	1.75	0.68
1:C:76:THR:O	2:C:1003:NAP:H2N	1.92	0.68
1:B:209:LEU:HD13	1:B:210:PHE:N	2.09	0.68
1:C:53:THR:HG21	1:C:57:ILE:HD11	1.76	0.67
1:C:79:PRO:HG3	1:C:93:TRP:HB2	1.76	0.67
1:A:171:LYS:HE3	1:A:174:ASP:OD2	1.95	0.66
1:C:72:ILE:HD11	1:C:341:GLY:HA3	1.76	0.66
1:A:53:THR:OG1	1:A:57:ILE:HG13	1.95	0.66
1:B:239:SER:O	1:B:243:GLN:HG3	1.96	0.66
1:C:186:ASN:HD22	1:C:187:THR:H	1.43	0.66
1:A:139:GLN:HG3	1:A:184:MET:HE2	1.77	0.66
1:C:213:THR:OG1	1:C:250:HIS:HE1	1.79	0.66
1:D:81:GLU:O	1:D:84:VAL:HG22	1.95	0.66
1:D:316:ARG:HG3	3:D:1030:HOH:O	1.97	0.65
1:C:392:VAL:HG13	1:C:396:GLU:CB	2.25	0.65
1:A:47:VAL:HG21	1:A:77:ILE:HD12	1.78	0.65
1:A:145:THR:HG21	1:B:170:LEU:HD11	1.79	0.65
1:D:17:ASP:OD1	1:D:77:ILE:HG13	1.97	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:409:ILE:C	1:A:411:SER:H	2.01	0.64
1:C:296:ILE:HD13	3:C:1131:HOH:O	1.98	0.64
1:C:153:LEU:HD11	1:D:155:LEU:HD21	1.80	0.64
1:D:316:ARG:HH11	1:D:316:ARG:CG	2.06	0.64
1:C:285:GLN:OE1	1:D:262:LYS:HE2	1.98	0.63
1:C:285:GLN:HB2	1:D:261:ILE:CD1	2.29	0.63
1:B:209:LEU:HD13	1:B:209:LEU:C	2.19	0.63
1:C:72:ILE:CD1	1:C:341:GLY:HA3	2.28	0.62
1:A:17:ASP:OD1	1:A:77:ILE:HG13	1.99	0.62
1:A:395:GLU:CD	1:A:395:GLU:H	2.02	0.62
1:D:169:THR:HG23	1:D:169:THR:O	1.99	0.62
1:A:282:ILE:CD1	1:B:279:GLN:HE22	2.12	0.62
1:A:410:LYS:O	1:A:411:SER:HB3	1.99	0.62
1:B:131:ILE:HD11	1:B:283:VAL:HG21	1.82	0.62
1:D:152:SER:HB2	1:D:171:LYS:CE	2.28	0.62
1:C:309:ALA:HB3	3:C:1027:HOH:O	1.99	0.62
1:B:112:PRO:HD3	1:B:293:MET:HE1	1.82	0.62
1:D:35:TYR:CD2	1:D:409:ILE:HD13	2.34	0.62
1:A:169:THR:HG23	1:A:169:THR:O	1.99	0.61
1:A:238:LYS:O	1:A:242:GLU:HG3	1.99	0.61
1:B:45:LEU:HD11	1:B:58:THR:HA	1.81	0.61
1:B:261:ILE:HD12	1:B:261:ILE:C	2.20	0.61
1:C:326:GLU:CD	1:C:388:ARG:HH21	2.04	0.61
1:A:47:VAL:CG2	1:A:77:ILE:HD12	2.30	0.61
1:C:251:ARG:HH12	1:C:259:GLN:NE2	1.99	0.61
1:D:163:THR:HB	3:D:1134:HOH:O	1.99	0.61
1:A:91:LYS:HB3	1:D:386:ASN:HB2	1.81	0.61
1:D:131:ILE:HD11	1:D:283:VAL:HG21	1.83	0.61
1:C:76:THR:H	2:C:1003:NAP:H71N	1.49	0.60
1:A:385:ASN:OD1	1:A:390:ALA:HB2	2.00	0.60
1:B:215:ASN:H	1:B:215:ASN:HD22	1.49	0.60
1:C:47:VAL:CG1	1:C:77:ILE:HB	2.32	0.60
1:C:221:TYR:HA	1:D:180:VAL:CG2	2.28	0.60
1:C:53:THR:OG1	1:C:57:ILE:HG13	2.01	0.60
1:A:285:GLN:CB	1:B:261:ILE:HD11	2.27	0.60
1:C:109:PHE:HD2	3:C:1054:HOH:O	1.84	0.60
1:A:50:ARG:HA	1:A:57:ILE:HD11	1.84	0.60
1:A:410:LYS:O	1:A:411:SER:CB	2.50	0.59
1:A:171:LYS:HG3	3:A:1200:HOH:O	2.01	0.59
1:C:388:ARG:HD3	1:C:388:ARG:C	2.21	0.59
1:C:170:LEU:HD11	1:D:145:THR:HG21	1.85	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:94:LYS:HE3	3:C:1113:HOH:O	2.02	0.59
1:C:239:SER:O	1:C:243:GLN:HG3	2.02	0.59
1:A:139:GLN:HG3	1:A:184:MET:HE1	1.83	0.59
1:A:106:GLY:HA2	3:A:1024:HOH:O	2.03	0.59
1:A:57:ILE:HD12	1:A:58:THR:H	1.67	0.58
1:C:251:ARG:HH12	1:C:259:GLN:HE22	1.50	0.58
1:D:116:PRO:HD2	1:D:370:GLN:NE2	2.17	0.58
1:A:23:ILE:O	1:A:27:ILE:HG13	2.03	0.58
1:B:47:VAL:HG22	1:B:77:ILE:HB	1.84	0.58
1:C:251:ARG:HB2	1:C:256:MET:HG2	1.85	0.58
1:D:371:GLN:NE2	1:D:404:ARG:HH22	2.01	0.58
1:A:282:ILE:HD11	1:B:257:VAL:HG21	1.85	0.58
1:C:109:PHE:CG	1:C:201:LEU:HD22	2.39	0.58
1:B:336:PHE:HA	1:B:339:SER:OG	2.04	0.58
1:A:405:LEU:O	1:A:409:ILE:HG13	2.04	0.57
1:B:214:LYS:HD2	1:B:217:ILE:HD13	1.86	0.57
1:C:116:PRO:HG2	1:C:370:GLN:NE2	2.18	0.57
1:D:186:ASN:HD22	1:D:187:THR:H	1.50	0.57
1:A:214:LYS:HE3	1:A:217:ILE:CD1	2.33	0.57
1:D:297:LEU:HB3	1:D:306:GLU:HB3	1.85	0.57
1:D:343:LEU:HD12	1:D:347:GLU:OE2	2.04	0.57
1:B:104:LEU:HD22	1:B:304:THR:HG21	1.85	0.57
1:C:212:SER:HA	1:C:251:ARG:O	2.04	0.57
1:C:261:ILE:CD1	1:D:285:GLN:HB2	2.23	0.57
1:A:131:ILE:HD11	1:A:283:VAL:HG21	1.87	0.57
1:D:81:GLU:HB3	3:D:1035:HOH:O	2.04	0.57
1:B:251:ARG:HH11	1:B:256:MET:HE3	1.69	0.57
1:C:298:VAL:HG23	3:C:1054:HOH:O	2.05	0.57
1:C:137:GLY:O	1:C:185:TYR:O	2.22	0.57
1:B:109:PHE:CG	1:B:201:LEU:HD22	2.40	0.56
1:A:57:ILE:HD12	1:A:58:THR:N	2.21	0.56
1:B:298:VAL:HG13	3:B:1095:HOH:O	2.04	0.56
1:D:259:GLN:HG2	3:D:1141:HOH:O	2.04	0.56
1:C:56:LYS:HE2	1:C:60:ASP:OD2	2.06	0.56
1:C:28:LYS:HB2	1:C:28:LYS:NZ	2.20	0.56
1:C:153:LEU:HD12	1:C:172:VAL:HB	1.86	0.56
1:A:109:PHE:CG	1:A:201:LEU:HD22	2.41	0.55
1:A:221:TYR:CD1	1:B:180:VAL:HG22	2.41	0.55
1:C:134:HIS:HB2	1:C:194:PHE:CE1	2.42	0.55
1:A:80:ASP:O	1:A:84:VAL:HG23	2.06	0.55
1:C:7:VAL:HG21	1:C:38:VAL:HB	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:215:ASN:N	1:D:215:ASN:HD22	2.04	0.55
1:A:215:ASN:N	1:A:215:ASN:HD22	2.03	0.55
1:C:317:HIS:HE1	2:C:1003:NAP:O2X	1.89	0.55
1:D:79:PRO:HG2	1:D:93:TRP:O	2.07	0.55
1:B:182:MET:HG2	1:B:183:ALA:N	2.22	0.55
1:B:387:GLU:HB2	3:B:1094:HOH:O	2.07	0.55
1:A:214:LYS:NZ	1:A:254:ASP:OD1	2.40	0.54
1:C:51:ASP:OD1	1:C:89:LEU:HA	2.07	0.54
1:D:9:GLN:HG3	1:D:10:PRO:HD2	1.88	0.54
1:C:262:LYS:HG2	1:D:121:LEU:HD11	1.90	0.54
1:D:316:ARG:HG3	1:D:316:ARG:NH1	2.13	0.54
1:D:139:GLN:HG3	1:D:184:MET:HE1	1.90	0.54
1:B:134:HIS:HD2	3:B:1016:HOH:O	1.91	0.54
1:A:123:PRO:HG2	3:B:1100:HOH:O	2.07	0.54
1:A:91:LYS:HB2	1:D:386:ASN:ND2	2.23	0.54
1:C:262:LYS:HE3	1:D:285:GLN:OE1	2.07	0.54
1:A:387:GLU:C	1:A:389:SER:H	2.11	0.54
1:B:47:VAL:CG2	1:B:77:ILE:HD12	2.38	0.54
1:A:69:GLY:O	1:A:345:ARG:NH1	2.41	0.54
1:A:80:ASP:H	1:A:83:ARG:HB2	1.71	0.53
1:B:299:THR:HG21	3:B:1057:HOH:O	2.07	0.53
1:C:214:LYS:HE3	1:C:217:ILE:CD1	2.37	0.53
1:B:76:THR:O	2:B:1002:NAP:H2N	2.08	0.53
1:C:80:ASP:O	1:C:84:VAL:HG23	2.08	0.53
1:D:320:LYS:HB3	1:D:325:GLU:HB3	1.89	0.53
1:C:79:PRO:HG2	1:C:93:TRP:O	2.08	0.53
1:B:113:ILE:HD11	1:B:294:THR:HG21	1.91	0.53
1:C:262:LYS:HB2	1:C:262:LYS:NZ	2.23	0.53
1:C:316:ARG:HD2	3:C:1193:HOH:O	2.08	0.53
1:D:153:LEU:HD11	1:D:181:ALA:HB1	1.91	0.53
1:A:257:VAL:CG1	1:B:282:ILE:HG13	2.39	0.53
1:A:323:LYS:HD2	3:A:1043:HOH:O	2.09	0.53
1:B:161:ASP:C	1:B:163:THR:H	2.13	0.53
1:C:213:THR:HB	1:C:222:ASP:HB3	1.91	0.53
1:C:395:GLU:CD	1:C:395:GLU:H	2.11	0.52
1:D:251:ARG:HG3	1:D:256:MET:CE	2.40	0.52
1:A:124:ARG:NH2	1:B:121:LEU:HD22	2.23	0.52
1:B:109:PHE:CD1	1:B:201:LEU:HD22	2.44	0.52
1:C:182:MET:HB2	1:D:221:TYR:CD1	2.44	0.52
1:C:215:ASN:HD22	1:C:215:ASN:H	1.58	0.52
1:C:393:THR:OG1	1:C:396:GLU:HG3	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:71:GLY:O	1:C:72:ILE:HD13	2.09	0.52
1:D:139:GLN:HG3	1:D:184:MET:CE	2.40	0.52
1:D:70:VAL:HA	1:D:305:PHE:O	2.10	0.52
1:D:131:ILE:HD12	1:D:280:SER:HA	1.90	0.52
1:B:340:ARG:HG2	3:B:1009:HOH:O	2.09	0.52
1:C:85:LYS:HD2	1:C:85:LYS:N	2.25	0.52
1:A:90:HIS:O	1:A:91:LYS:HB2	2.10	0.52
1:A:343:LEU:O	1:A:347:GLU:HG3	2.10	0.52
1:B:54:SER:HA	1:B:93:TRP:CH2	2.45	0.51
1:A:154:GLU:HG3	3:A:1178:HOH:O	2.10	0.51
1:B:113:ILE:HG12	1:B:292:LEU:O	2.11	0.51
1:B:251:ARG:HB2	1:B:256:MET:HG2	1.93	0.51
1:D:17:ASP:HA	1:D:21:ARG:HB2	1.92	0.51
1:D:116:PRO:HD2	1:D:370:GLN:HE21	1.75	0.51
1:D:251:ARG:HG3	1:D:251:ARG:HH11	1.75	0.51
1:A:79:PRO:HG2	1:A:93:TRP:O	2.11	0.51
1:A:377:LYS:O	1:A:381:LEU:HG	2.11	0.51
1:C:209:LEU:HD23	1:C:210:PHE:N	2.25	0.51
1:D:84:VAL:HA	1:D:89:LEU:HD12	1.93	0.51
1:B:136:HIS:HD2	1:B:186:ASN:ND2	2.09	0.51
1:C:146:LEU:HD22	1:D:224:ARG:HD3	1.93	0.51
1:C:318:TYR:O	1:C:321:TYR:HB3	2.10	0.51
1:D:120:ARG:HD3	1:D:120:ARG:N	2.26	0.51
1:B:217:ILE:N	1:B:217:ILE:HD12	2.26	0.51
1:B:176:LYS:HE3	1:D:321:TYR:CE1	2.46	0.51
1:B:395:GLU:H	1:B:395:GLU:CD	2.14	0.51
1:A:392:VAL:HG22	1:A:396:GLU:OE2	2.10	0.51
1:A:7:VAL:HG21	1:A:38:VAL:HB	1.93	0.50
1:B:170:LEU:HD21	3:B:1191:HOH:O	2.09	0.50
1:D:24:TRP:HH2	1:D:72:ILE:HG22	1.74	0.50
1:A:257:VAL:HG13	1:B:282:ILE:CG1	2.40	0.50
1:D:134:HIS:HB2	1:D:194:PHE:CE1	2.47	0.50
1:A:91:LYS:HE3	1:D:387:GLU:HG2	1.93	0.50
1:A:134:HIS:HB2	1:A:194:PHE:CE1	2.46	0.50
1:B:405:LEU:O	1:B:409:ILE:HG12	2.11	0.50
1:C:203:ILE:HG23	1:C:244:LEU:HD11	1.94	0.50
1:A:70:VAL:HA	1:A:305:PHE:O	2.12	0.50
1:C:180:VAL:HG22	1:D:221:TYR:CD1	2.47	0.50
1:B:59:GLN:O	1:B:63:GLU:HG2	2.11	0.50
1:C:24:TRP:HH2	1:C:72:ILE:HG22	1.76	0.50
1:D:227:ASP:O	1:D:231:GLU:HG3	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:317:HIS:HE1	2:B:1002:NAP:O2X	1.94	0.50
1:C:14:LEU:CD2	1:C:61:ALA:HB1	2.41	0.50
1:A:153:LEU:CD2	1:B:155:LEU:HD22	2.42	0.49
1:D:153:LEU:HD11	1:D:181:ALA:CB	2.42	0.49
1:C:293:MET:HG3	1:C:310:ALA:CB	2.42	0.49
1:D:210:PHE:HB3	1:D:256:MET:HE3	1.93	0.49
1:A:9:GLN:NE2	1:A:10:PRO:HD2	2.27	0.49
1:A:251:ARG:HG3	1:A:256:MET:CE	2.42	0.49
1:B:350:ASN:OD1	1:B:350:ASN:O	2.30	0.49
1:D:239:SER:O	1:D:243:GLN:HG3	2.12	0.49
1:A:112:PRO:HB3	1:A:293:MET:CE	2.42	0.49
1:A:405:LEU:HD22	1:A:409:ILE:CG1	2.42	0.49
1:B:261:ILE:CD1	1:B:262:LYS:HG3	2.43	0.49
1:C:136:HIS:HD2	1:C:186:ASN:ND2	2.10	0.49
1:C:217:ILE:N	1:C:217:ILE:HD12	2.28	0.49
1:D:254:ASP:N	1:D:254:ASP:OD2	2.44	0.49
1:A:17:ASP:HA	1:A:21:ARG:HB2	1.95	0.49
1:A:257:VAL:HG13	1:B:282:ILE:HG13	1.95	0.49
1:B:109:PHE:O	1:B:295:SER:HA	2.13	0.48
1:C:215:ASN:HD22	1:C:215:ASN:N	2.10	0.48
1:A:217:ILE:HD12	1:A:217:ILE:N	2.28	0.48
1:A:63:GLU:HA	1:A:63:GLU:OE1	2.13	0.48
1:D:406:GLN:O	1:D:410:LYS:HG3	2.12	0.48
1:C:282:ILE:HG12	1:D:257:VAL:HG13	1.96	0.48
1:D:297:LEU:O	1:D:305:PHE:HA	2.13	0.48
1:A:153:LEU:HD11	1:A:181:ALA:HB1	1.95	0.48
1:A:387:GLU:HA	3:A:1241:HOH:O	2.13	0.48
1:B:250:HIS:HD2	3:B:1212:HOH:O	1.96	0.48
1:B:388:ARG:HD2	1:B:388:ARG:O	2.13	0.48
1:A:261:ILE:HD11	1:B:285:GLN:HB3	1.94	0.48
1:D:175:TYR:OH	1:D:181:ALA:HB2	2.14	0.48
1:A:282:ILE:HD11	1:B:257:VAL:CG2	2.43	0.48
1:D:13:GLU:C	1:D:14:LEU:HD23	2.34	0.48
1:D:214:LYS:NZ	1:D:254:ASP:OD1	2.47	0.48
1:B:50:ARG:HA	1:B:57:ILE:CD1	2.31	0.48
1:D:134:HIS:HD2	3:D:1015:HOH:O	1.96	0.48
1:A:136:HIS:HD2	1:A:186:ASN:ND2	2.11	0.48
1:A:285:GLN:CB	1:B:261:ILE:CD1	2.89	0.48
1:B:79:PRO:HG2	1:B:93:TRP:HB2	1.96	0.48
1:C:230:GLN:HG2	3:C:1070:HOH:O	2.14	0.48
1:D:147:ILE:HD11	1:D:181:ALA:HB3	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:377:LYS:O	1:D:381:LEU:HG	2.13	0.48
1:A:409:ILE:C	1:A:411:SER:N	2.68	0.47
1:B:70:VAL:HA	1:B:305:PHE:O	2.14	0.47
1:A:140:TYR:O	1:A:141:LYS:HD2	2.15	0.47
1:A:127:LYS:HD2	3:A:1191:HOH:O	2.14	0.47
1:B:213:THR:OG1	1:B:250:HIS:HE1	1.97	0.47
1:B:305:PHE:CE1	1:B:344:LYS:HD2	2.50	0.47
1:A:155:LEU:HD22	1:B:153:LEU:HD11	1.96	0.47
1:A:340:ARG:HH11	1:A:340:ARG:HG2	1.79	0.47
1:B:176:LYS:NZ	3:B:1137:HOH:O	2.47	0.47
1:C:117:ARG:HG2	1:C:117:ARG:HH11	1.80	0.47
1:D:371:GLN:HE22	1:D:404:ARG:HH22	1.61	0.47
1:A:253:ILE:O	1:A:257:VAL:HB	2.15	0.47
1:C:238:LYS:O	1:C:242:GLU:HG3	2.13	0.47
1:C:392:VAL:CG1	1:C:396:GLU:HB2	2.34	0.47
1:D:212:SER:OG	1:D:256:MET:HG2	2.15	0.47
1:D:253:ILE:O	1:D:257:VAL:HB	2.15	0.47
1:B:72:ILE:CD1	1:B:341:GLY:HA3	2.44	0.47
1:A:297:LEU:HD23	1:A:297:LEU:C	2.35	0.47
1:B:406:GLN:O	1:B:410:LYS:HG3	2.15	0.47
1:C:28:LYS:HD3	3:C:1126:HOH:O	2.13	0.47
1:D:24:TRP:CH2	1:D:72:ILE:HG22	2.49	0.47
1:D:212:SER:HA	1:D:251:ARG:O	2.15	0.47
1:A:84:VAL:HA	1:A:89:LEU:HD12	1.97	0.47
1:C:155:LEU:HD22	1:D:153:LEU:HD22	1.97	0.47
1:C:298:VAL:N	3:C:1054:HOH:O	2.48	0.46
1:B:251:ARG:HH11	1:B:251:ARG:HG3	1.79	0.46
1:B:77:ILE:HA	2:B:1002:NAP:O3D	2.16	0.46
1:C:185:TYR:CD1	1:C:185:TYR:C	2.88	0.46
1:C:147:ILE:HG13	1:C:175:TYR:CZ	2.51	0.46
1:A:379:LEU:HD22	3:A:1019:HOH:O	2.16	0.46
1:B:297:LEU:HB3	1:B:306:GLU:HB3	1.97	0.46
1:C:91:LYS:HD3	1:C:92:MET:N	2.27	0.46
1:A:219:LYS:N	3:A:1235:HOH:O	2.44	0.46
1:C:54:SER:HA	1:C:93:TRP:CH2	2.50	0.46
1:C:314:VAL:HG12	1:C:317:HIS:HB2	1.97	0.46
1:B:296:ILE:HD13	3:B:1126:HOH:O	2.16	0.46
1:C:59:GLN:NE2	3:C:1228:HOH:O	2.49	0.46
1:D:340:ARG:HG2	1:D:340:ARG:HH11	1.80	0.46
1:A:2:PHE:N	1:A:2:PHE:CD1	2.82	0.46
1:B:222:ASP:OD1	1:B:272:LYS:HE2	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:14:LEU:HD23	1:D:14:LEU:N	2.31	0.46
1:D:147:ILE:N	1:D:147:ILE:HD12	2.31	0.46
1:B:18:GLU:HB2	1:B:313:THR:HB	1.97	0.46
1:C:221:TYR:CE1	1:D:180:VAL:HG13	2.51	0.46
1:C:285:GLN:HB2	1:D:261:ILE:HD11	1.98	0.46
1:D:176:LYS:HE2	1:D:176:LYS:CA	2.40	0.46
1:A:91:LYS:HG2	1:D:386:ASN:H	1.81	0.46
1:A:145:THR:HG21	3:B:1191:HOH:O	2.16	0.46
1:C:185:TYR:CD2	1:D:173:TYR:HB2	2.51	0.46
1:C:297:LEU:C	1:C:297:LEU:HD23	2.36	0.46
1:C:308:GLU:HG3	1:C:309:ALA:O	2.16	0.46
1:B:117:ARG:N	1:B:370:GLN:HE22	1.97	0.45
1:C:155:LEU:HD22	1:D:153:LEU:CD2	2.46	0.45
1:A:167:PRO:HG2	3:A:1054:HOH:O	2.15	0.45
1:B:113:ILE:HD11	1:B:294:THR:CG2	2.46	0.45
1:C:10:PRO:HB3	1:C:39:ASP:HB3	1.98	0.45
1:D:100:ILE:HG21	1:D:306:GLU:OE1	2.16	0.45
1:A:117:ARG:HG2	3:A:1131:HOH:O	2.16	0.45
1:B:251:ARG:HH11	1:B:256:MET:CE	2.29	0.45
1:C:110:ARG:HG3	1:C:110:ARG:HH11	1.82	0.45
1:D:112:PRO:HB3	1:D:293:MET:CE	2.46	0.45
1:D:388:ARG:HD2	1:D:391:TYR:CZ	2.51	0.45
1:B:215:ASN:HD22	1:B:215:ASN:N	2.14	0.45
1:A:345:ARG:CZ	3:A:1050:HOH:O	2.64	0.45
1:B:187:THR:O	1:B:191:ILE:HG13	2.16	0.45
1:D:393:THR:HG23	1:D:396:GLU:OE1	2.16	0.45
1:C:28:LYS:HB2	1:C:28:LYS:HZ3	1.80	0.45
1:C:110:ARG:HG3	1:C:110:ARG:NH1	2.32	0.45
1:D:117:ARG:H	1:D:370:GLN:NE2	2.04	0.45
1:D:251:ARG:HH12	1:D:259:GLN:HE22	1.60	0.45
1:B:131:ILE:N	1:B:131:ILE:HD12	2.32	0.45
1:C:110:ARG:HD3	1:C:295:SER:OG	2.16	0.45
1:B:47:VAL:HG12	1:B:89:LEU:HD21	1.98	0.45
1:B:240:LYS:NZ	3:B:1025:HOH:O	2.43	0.45
1:C:262:LYS:NZ	1:C:262:LYS:CB	2.80	0.44
1:A:134:HIS:HE1	1:A:190:SER:OG	2.00	0.44
1:B:368:THR:HG22	1:B:374:ILE:HB	2.00	0.44
1:C:116:PRO:HG2	1:C:370:GLN:CD	2.38	0.44
1:D:90:HIS:O	1:D:91:LYS:HD2	2.17	0.44
1:D:131:ILE:HD11	1:D:283:VAL:CG2	2.45	0.44
1:B:117:ARG:HB3	1:B:370:GLN:NE2	2.32	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:12:VAL:HG12	1:D:14:LEU:CD2	2.47	0.44
1:A:35:TYR:CE2	1:A:409:ILE:CD1	3.00	0.44
1:C:392:VAL:CG1	1:C:393:THR:N	2.80	0.44
1:A:106:GLY:CA	1:A:299:THR:HA	2.48	0.44
1:B:405:LEU:HD22	1:B:409:ILE:HG12	2.00	0.44
1:C:24:TRP:CH2	1:C:72:ILE:HG22	2.52	0.44
1:A:261:ILE:HD11	1:B:285:GLN:C	2.37	0.44
1:C:20:THR:HB	1:C:74:CYS:SG	2.58	0.44
1:D:216:THR:HG23	1:D:252:LEU:HD13	1.99	0.44
1:C:405:LEU:O	1:C:409:ILE:HG12	2.18	0.44
1:D:143:THR:O	1:D:182:MET:HA	2.18	0.44
1:A:283:VAL:O	1:A:287:PHE:HD1	2.01	0.44
1:B:17:ASP:OD1	1:B:76:THR:HA	2.18	0.44
1:D:169:THR:O	1:D:169:THR:CG2	2.65	0.44
1:A:282:ILE:HD11	1:B:279:GLN:NE2	2.28	0.43
1:A:297:LEU:HD23	1:A:298:VAL:N	2.33	0.43
1:B:33:LEU:HB2	1:B:34:PRO:HD3	1.99	0.43
1:C:47:VAL:HG13	1:C:77:ILE:HB	2.00	0.43
1:C:53:THR:HG21	1:C:57:ILE:CD1	2.47	0.43
1:D:138:ASP:OD2	1:D:272:LYS:HE2	2.18	0.43
1:D:394:THR:HB	1:D:395:GLU:OE1	2.18	0.43
1:D:47:VAL:CG1	1:D:77:ILE:HB	2.48	0.43
1:D:54:SER:HA	1:D:93:TRP:CH2	2.53	0.43
1:A:18:GLU:HB2	1:A:313:THR:HB	2.00	0.43
1:C:313:THR:OG1	2:C:1003:NAP:H4D	2.18	0.43
1:D:57:ILE:HD12	1:D:58:THR:H	1.83	0.43
1:D:251:ARG:HG3	1:D:256:MET:HE2	2.00	0.43
1:B:130:ILE:C	1:B:131:ILE:HD12	2.39	0.43
1:B:241:PHE:CD2	1:B:246:ILE:HG13	2.54	0.43
1:C:251:ARG:HG3	1:C:251:ARG:HH11	1.83	0.43
1:D:317:HIS:HE1	2:D:1004:NAP:O2X	2.01	0.43
1:B:56:LYS:HE3	3:B:1113:HOH:O	2.19	0.43
1:D:24:TRP:CD2	1:D:74:CYS:HB2	2.52	0.43
1:B:388:ARG:HD2	1:B:388:ARG:C	2.39	0.43
1:C:6:LYS:NZ	3:C:1089:HOH:O	2.51	0.43
1:D:387:GLU:C	1:D:389:SER:H	2.21	0.43
1:C:20:THR:O	1:C:24:TRP:HB2	2.18	0.43
1:C:153:LEU:HB2	1:C:175:TYR:HE1	1.83	0.43
3:A:1009:HOH:O	1:B:146:LEU:HD21	2.17	0.43
1:B:58:THR:O	1:B:61:ALA:HB3	2.19	0.43
1:B:216:THR:OG1	1:B:217:ILE:HD12	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:323:LYS:HG3	3:D:1059:HOH:O	2.18	0.43
1:A:387:GLU:O	1:A:389:SER:N	2.52	0.42
1:B:76:THR:H	2:B:1002:NAP:H71N	1.66	0.42
1:C:14:LEU:HD21	1:C:61:ALA:HB1	2.01	0.42
1:B:209:LEU:C	1:B:209:LEU:CD1	2.88	0.42
1:C:282:ILE:HA	1:D:261:ILE:CD1	2.49	0.42
1:B:388:ARG:HD3	1:B:391:TYR:CZ	2.54	0.42
1:A:137:GLY:N	3:A:1002:HOH:O	2.22	0.42
1:B:35:TYR:OH	1:B:406:GLN:HG2	2.19	0.42
1:D:109:PHE:CD1	1:D:201:LEU:HD22	2.54	0.42
1:C:320:LYS:O	1:C:325:GLU:HB3	2.20	0.42
1:B:275:ASP:O	1:B:279:GLN:HB2	2.20	0.42
1:C:8:LYS:HB3	1:C:349:ASP:OD1	2.19	0.42
1:C:143:THR:HG22	1:D:172:VAL:HG13	2.02	0.42
1:D:14:LEU:HA	1:D:43:TYR:O	2.20	0.42
1:A:336:PHE:O	1:A:340:ARG:HB2	2.20	0.42
1:C:112:PRO:HB3	1:C:293:MET:CE	2.50	0.42
1:D:164:THR:HG23	3:D:1134:HOH:O	2.19	0.42
1:D:214:LYS:HE3	1:D:217:ILE:HD13	2.01	0.42
1:D:251:ARG:NH1	1:D:251:ARG:HG3	2.34	0.42
1:D:368:THR:O	1:D:372:ASP:HB2	2.20	0.42
1:A:76:THR:H	2:A:1001:NAP:H71N	1.66	0.42
1:D:339:SER:OG	1:D:361:LEU:HD23	2.20	0.42
1:B:84:VAL:HA	1:B:89:LEU:HD12	2.01	0.42
1:C:214:LYS:HZ3	1:C:254:ASP:CG	2.23	0.42
1:D:9:GLN:HA	1:D:10:PRO:HD3	1.92	0.42
1:A:81:GLU:OE1	1:A:81:GLU:HA	2.21	0.41
1:A:107:THR:HG22	1:A:108:VAL:N	2.35	0.41
1:C:87:PHE:O	1:C:88:ASN:HB2	2.20	0.41
1:C:109:PHE:CD1	1:C:201:LEU:HD22	2.54	0.41
1:C:159:PRO:HD3	1:C:167:PRO:HA	2.02	0.41
1:B:137:GLY:O	1:B:185:TYR:O	2.38	0.41
1:B:251:ARG:NH1	1:B:256:MET:CE	2.83	0.41
1:A:215:ASN:HD22	1:A:216:THR:N	2.18	0.41
1:B:261:ILE:CD1	1:B:261:ILE:C	2.87	0.41
1:D:109:PHE:CG	1:D:201:LEU:HD22	2.56	0.41
1:A:215:ASN:N	1:A:215:ASN:ND2	2.68	0.41
1:C:80:ASP:H	1:C:83:ARG:HB2	1.85	0.41
1:C:290:LEU:HD23	1:C:290:LEU:HA	1.90	0.41
1:B:141:LYS:HG2	1:B:185:TYR:OH	2.20	0.41
1:B:176:LYS:HE3	1:D:321:TYR:CZ	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:147:ILE:HG13	1:A:175:TYR:CZ	2.55	0.41
1:A:212:SER:OG	1:A:256:MET:HG2	2.20	0.41
1:C:81:GLU:OE2	1:C:85:LYS:HE3	2.21	0.41
1:C:94:LYS:HD3	3:C:1044:HOH:O	2.21	0.41
1:D:51:ASP:OD2	1:D:89:LEU:HA	2.20	0.41
1:D:76:THR:H	2:D:1004:NAP:H71N	1.67	0.41
1:A:120:ARG:HD3	1:A:120:ARG:N	2.36	0.41
1:A:180:VAL:CG2	1:B:221:TYR:HA	2.37	0.41
1:C:201:LEU:O	1:C:201:LEU:HG	2.21	0.41
1:C:282:ILE:CG1	1:D:257:VAL:HG13	2.50	0.41
1:A:251:ARG:HH12	1:A:259:GLN:NE2	2.19	0.41
1:B:16:GLY:N	1:B:74:CYS:HB3	2.35	0.41
1:A:213:THR:OG1	1:A:250:HIS:HE1	2.04	0.41
1:C:344:LYS:HA	1:C:344:LYS:HD3	1.89	0.41
1:B:368:THR:CG2	1:B:374:ILE:HB	2.51	0.41
1:D:316:ARG:CG	1:D:316:ARG:NH1	2.72	0.41
1:B:258:ALA:O	1:B:261:ILE:HG13	2.21	0.40
1:C:317:HIS:HD2	1:C:329:THR:OG1	2.04	0.40
1:D:290:LEU:HB3	1:D:311:HIS:HB3	2.03	0.40
1:A:47:VAL:HG22	1:A:77:ILE:HB	2.03	0.40
1:B:131:ILE:CD1	1:B:283:VAL:HG21	2.49	0.40
1:B:251:ARG:HG3	1:B:256:MET:HE3	2.04	0.40
1:D:69:GLY:O	1:D:70:VAL:HB	2.20	0.40
1:D:165:ALA:HA	3:D:1155:HOH:O	2.21	0.40
1:A:392:VAL:HG13	1:A:396:GLU:HB2	2.02	0.40
1:C:97:ASN:HD21	2:C:1003:NAP:C7N	2.34	0.40
1:A:45:LEU:HD22	1:A:57:ILE:HD13	2.02	0.40
1:A:386:ASN:O	1:A:386:ASN:ND2	2.54	0.40
1:B:18:GLU:HG2	1:B:318:TYR:CD2	2.56	0.40
1:B:296:ILE:HG12	3:B:1009:HOH:O	2.21	0.40
1:D:326:GLU:HG3	3:D:1125:HOH:O	2.19	0.40
1:A:221:TYR:CD1	1:B:180:VAL:CG2	3.04	0.40
1:B:251:ARG:HG3	1:B:251:ARG:NH1	2.35	0.40
1:D:20:THR:OG1	1:D:75:ALA:HB3	2.21	0.40
1:D:118:ILE:HA	1:D:119:PRO:HD3	1.86	0.40

There are no symmetry-related clashes.

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	408/427 (96%)	383 (94%)	18 (4%)	7 (2%)	9	8
1	B	406/427 (95%)	387 (95%)	18 (4%)	1 (0%)	47	58
1	C	406/427 (95%)	382 (94%)	23 (6%)	1 (0%)	47	58
1	D	408/427 (96%)	388 (95%)	18 (4%)	2 (0%)	29	35
All	All	1628/1708 (95%)	1540 (95%)	77 (5%)	11 (1%)	22	26

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	92	MET
1	A	388	ARG
1	A	70	VAL
1	A	138	ASP
1	D	70	VAL
1	A	91	LYS
1	A	410	LYS
1	C	70	VAL
1	A	106	GLY
1	B	162	PRO
1	D	162	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	354/367 (96%)	337 (95%)	17 (5%)	25	36
1	B	352/367 (96%)	330 (94%)	22 (6%)	18	24
1	C	352/367 (96%)	334 (95%)	18 (5%)	24	33
1	D	354/367 (96%)	331 (94%)	23 (6%)	17	23
All	All	1412/1468 (96%)	1332 (94%)	80 (6%)	20	28

All (80) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	PHE
1	A	17	ASP
1	A	47	VAL
1	A	63	GLU
1	A	153	LEU
1	A	155	LEU
1	A	186	ASN
1	A	209	LEU
1	A	215	ASN
1	A	261	ILE
1	A	340	ARG
1	A	379	LEU
1	A	386	ASN
1	A	388	ARG
1	A	392	VAL
1	A	395	GLU
1	A	405	LEU
1	B	17	ASP
1	B	57	ILE
1	B	110	ARG
1	B	120	ARG
1	B	155	LEU
1	B	169	THR
1	B	186	ASN
1	B	215	ASN
1	B	220	LYS
1	B	249	GLU
1	B	256	MET
1	B	257	VAL
1	B	296	ILE
1	B	316	ARG
1	B	317	HIS
1	B	340	ARG

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Mol	Chain	Res	Type
1	B	379	LEU
1	B	387	GLU
1	B	388	ARG
1	B	392	VAL
1	B	395	GLU
1	B	405	LEU
1	C	17	ASP
1	C	45	LEU
1	C	85	LYS
1	C	120	ARG
1	C	154	GLU
1	C	155	LEU
1	C	169	THR
1	C	186	ASN
1	C	209	LEU
1	C	215	ASN
1	C	220	LYS
1	C	230	GLN
1	C	256	MET
1	C	257	VAL
1	C	340	ARG
1	C	388	ARG
1	C	392	VAL
1	C	405	LEU
1	D	9	GLN
1	D	14	LEU
1	D	17	ASP
1	D	57	ILE
1	D	91	LYS
1	D	120	ARG
1	D	153	LEU
1	D	155	LEU
1	D	186	ASN
1	D	209	LEU
1	D	215	ASN
1	D	254	ASP
1	D	261	ILE
1	D	316	ARG
1	D	317	HIS
1	D	340	ARG
1	D	343	LEU
1	D	356	LYS

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Mol	Chain	Res	Type
1	D	385	ASN
1	D	388	ARG
1	D	392	VAL
1	D	395	GLU
1	D	405	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (48) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	9	GLN
1	A	102	ASN
1	A	134	HIS
1	A	136	HIS
1	A	186	ASN
1	A	215	ASN
1	A	230	GLN
1	A	250	HIS
1	A	370	GLN
1	A	386	ASN
1	B	9	GLN
1	B	102	ASN
1	B	134	HIS
1	B	136	HIS
1	B	186	ASN
1	B	215	ASN
1	B	230	GLN
1	B	243	GLN
1	B	250	HIS
1	B	279	GLN
1	B	317	HIS
1	B	370	GLN
1	C	97	ASN
1	C	102	ASN
1	C	134	HIS
1	C	136	HIS
1	C	186	ASN
1	C	215	ASN
1	C	230	GLN
1	C	250	HIS
1	C	259	GLN
1	C	317	HIS
1	C	370	GLN

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Mol	Chain	Res	Type
1	C	371	GLN
1	D	97	ASN
1	D	102	ASN
1	D	134	HIS
1	D	136	HIS
1	D	186	ASN
1	D	215	ASN
1	D	230	GLN
1	D	250	HIS
1	D	259	GLN
1	D	317	HIS
1	D	370	GLN
1	D	371	GLN
1	D	385	ASN
1	D	406	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	NAP	A	1001	-	45,52,52	1.17	4 (8%)	56,80,80	1.15	4 (7%)
2	NAP	C	1003	-	45,52,52	1.19	5 (11%)	56,80,80	1.19	5 (8%)
2	NAP	D	1004	-	45,52,52	1.17	5 (11%)	56,80,80	1.16	3 (5%)
2	NAP	B	1002	-	45,52,52	1.20	5 (11%)	56,80,80	1.20	2 (3%)

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	NAP	A	1001	-	-	5/31/67/67	0/5/5/5
2	NAP	C	1003	-	-	6/31/67/67	0/5/5/5
2	NAP	D	1004	-	-	6/31/67/67	0/5/5/5
2	NAP	B	1002	-	-	7/31/67/67	0/5/5/5

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1002	NAP	C2N-N1N	4.73	1.40	1.35
2	C	1003	NAP	C2N-N1N	4.71	1.40	1.35
2	D	1004	NAP	C2N-N1N	4.59	1.40	1.35
2	A	1001	NAP	C2N-N1N	4.51	1.40	1.35
2	A	1001	NAP	O4B-C1B	2.43	1.44	1.41
2	B	1002	NAP	O4B-C1B	2.42	1.44	1.41
2	B	1002	NAP	O4D-C1D	2.40	1.44	1.41
2	C	1003	NAP	O4B-C1B	2.39	1.44	1.41
2	D	1004	NAP	O4B-C1B	2.34	1.44	1.41
2	A	1001	NAP	O4D-C1D	2.26	1.44	1.41
2	C	1003	NAP	O4D-C1D	2.23	1.44	1.41
2	A	1001	NAP	C6N-N1N	2.22	1.40	1.35
2	D	1004	NAP	O4D-C1D	2.19	1.44	1.41
2	D	1004	NAP	C6N-N1N	2.15	1.40	1.35
2	B	1002	NAP	C3N-C7N	2.14	1.53	1.50
2	B	1002	NAP	C6N-N1N	2.13	1.40	1.35
2	C	1003	NAP	C6N-N1N	2.09	1.40	1.35
2	C	1003	NAP	C3N-C7N	2.03	1.53	1.50
2	D	1004	NAP	C3N-C7N	2.01	1.53	1.50

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	1003	NAP	N3A-C2A-N1A	-4.90	121.01	128.68
2	A	1001	NAP	N3A-C2A-N1A	-4.89	121.04	128.68
2	D	1004	NAP	N3A-C2A-N1A	-4.86	121.08	128.68
2	B	1002	NAP	N3A-C2A-N1A	-4.86	121.09	128.68
2	B	1002	NAP	PN-O3-PA	-3.50	120.81	132.83
2	C	1003	NAP	PN-O3-PA	-3.23	121.76	132.83
2	A	1001	NAP	PN-O3-PA	-3.19	121.88	132.83
2	D	1004	NAP	PN-O3-PA	-3.11	122.16	132.83
2	C	1003	NAP	C3B-C2B-C1B	-2.26	98.64	102.89
2	C	1003	NAP	O4D-C1D-C2D	-2.23	103.67	106.93
2	D	1004	NAP	O4D-C1D-C2D	-2.12	103.83	106.93
2	A	1001	NAP	O4D-C1D-C2D	-2.10	103.86	106.93
2	C	1003	NAP	C6N-N1N-C2N	-2.06	120.09	121.97
2	A	1001	NAP	C6N-N1N-C2N	-2.04	120.12	121.97

There are no chirality outliers.

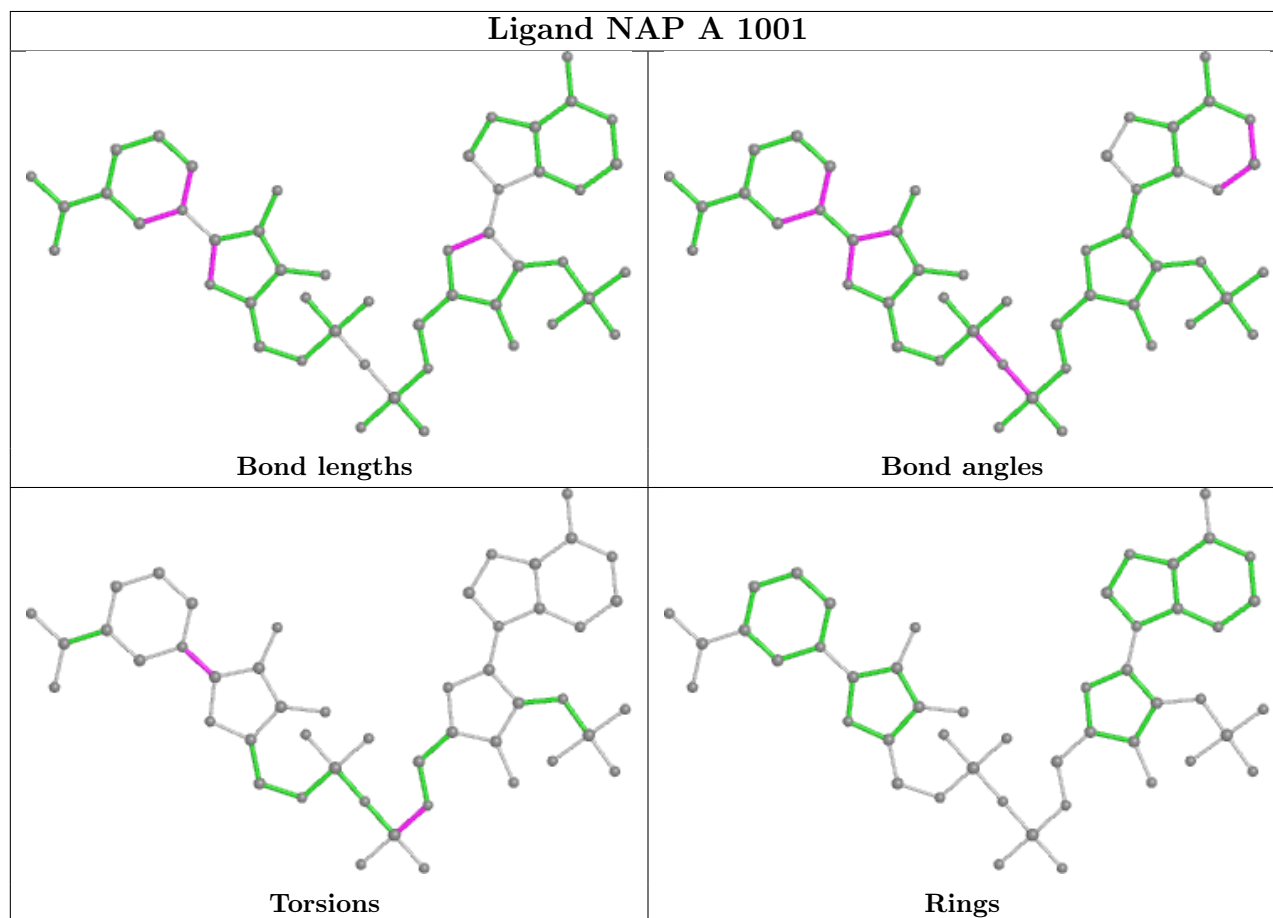All (24) torsion outliers are listed below:

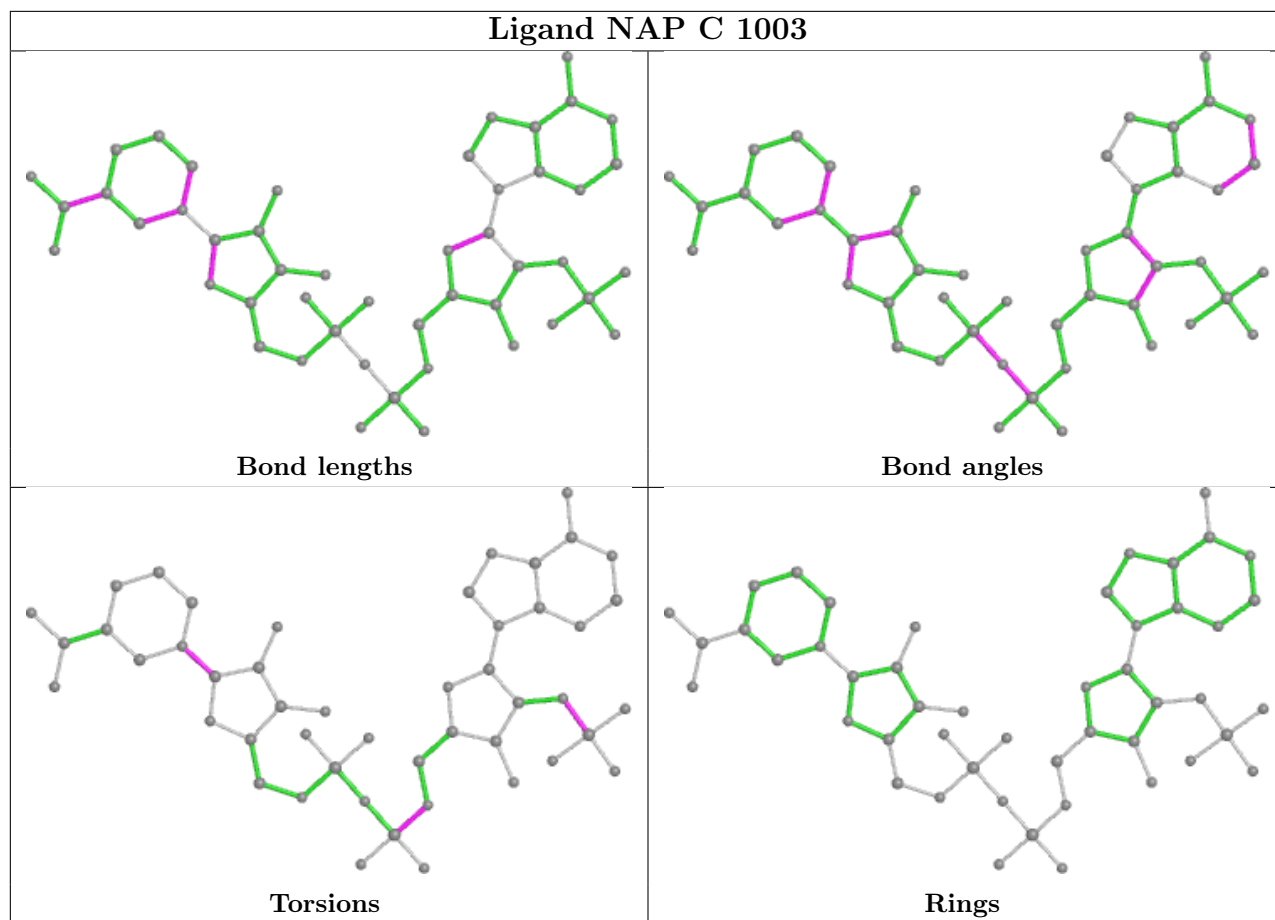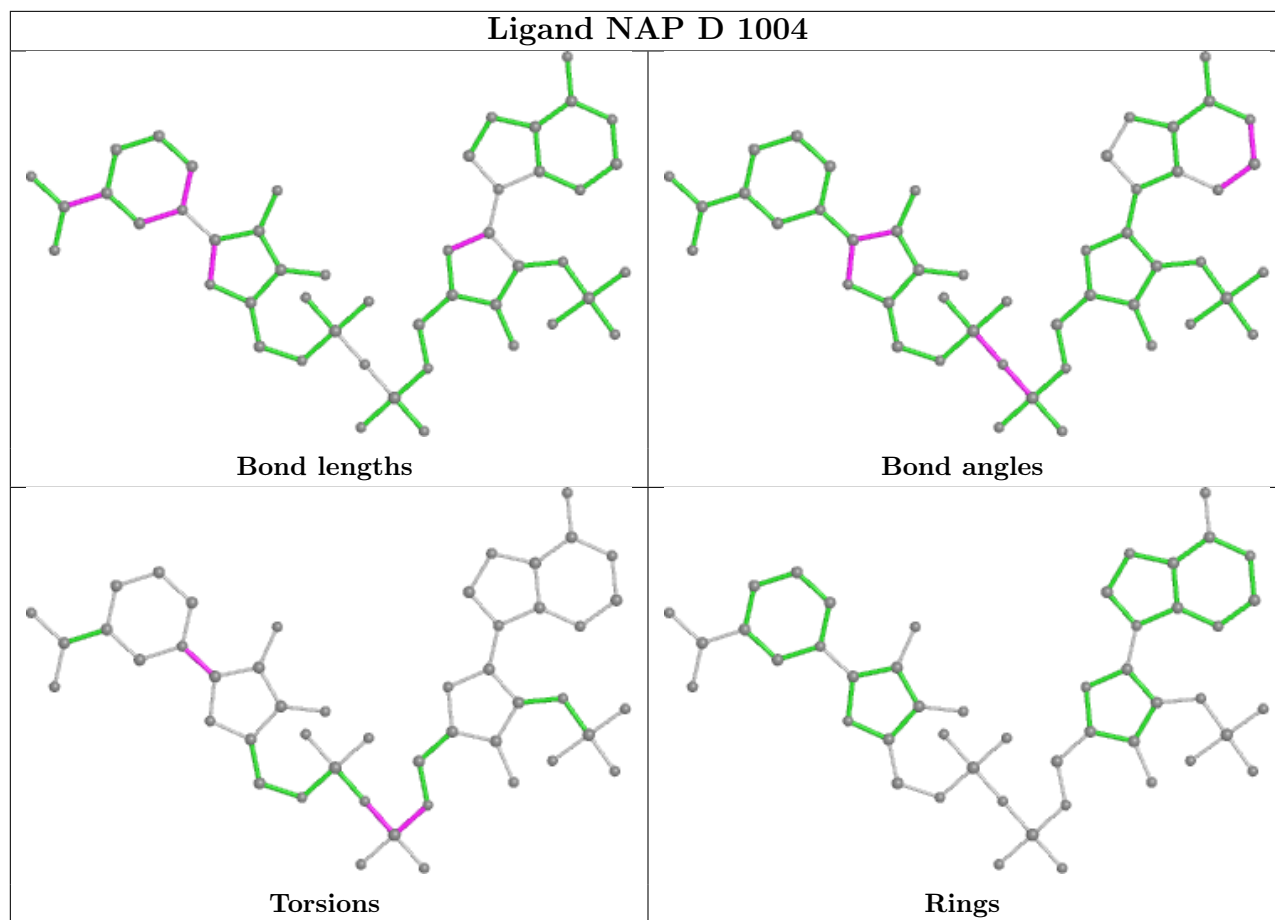| Mol	Chain	Res	Type	Atoms
2	A	1001	NAP	O4D-C1D-N1N-C2N
2	A	1001	NAP	O4D-C1D-N1N-C6N
2	A	1001	NAP	C2D-C1D-N1N-C2N
2	A	1001	NAP	C2D-C1D-N1N-C6N
2	B	1002	NAP	C5B-O5B-PA-O1A
2	B	1002	NAP	C5B-O5B-PA-O3
2	B	1002	NAP	C2B-O2B-P2B-O1X
2	B	1002	NAP	O4D-C1D-N1N-C6N
2	C	1003	NAP	C2B-O2B-P2B-O1X
2	C	1003	NAP	O4D-C1D-N1N-C2N
2	C	1003	NAP	O4D-C1D-N1N-C6N
2	C	1003	NAP	C2D-C1D-N1N-C2N
2	C	1003	NAP	C2D-C1D-N1N-C6N
2	D	1004	NAP	O4D-C1D-N1N-C2N
2	D	1004	NAP	O4D-C1D-N1N-C6N
2	D	1004	NAP	C2D-C1D-N1N-C2N
2	D	1004	NAP	C2D-C1D-N1N-C6N
2	B	1002	NAP	C2B-O2B-P2B-O3X
2	D	1004	NAP	PN-O3-PA-O1A
2	A	1001	NAP	C5B-O5B-PA-O1A
2	B	1002	NAP	C5B-O5B-PA-O2A
2	B	1002	NAP	C5D-O5D-PN-O1N
2	C	1003	NAP	C5B-O5B-PA-O1A
2	D	1004	NAP	C5B-O5B-PA-O1A

There are no ring outliers.
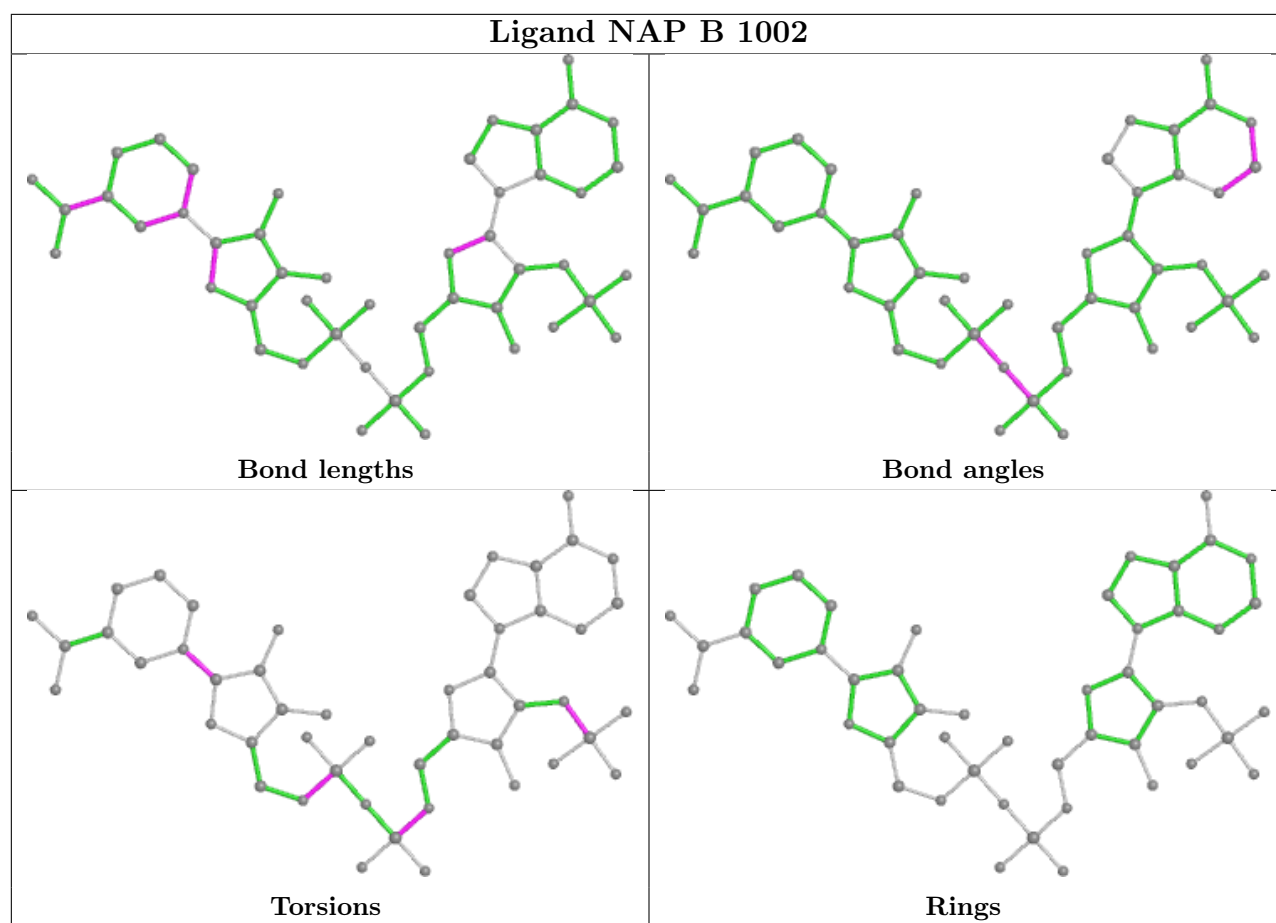
4 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1001	NAP	2	0
2	C	1003	NAP	5	0
2	D	1004	NAP	3	0
2	B	1002	NAP	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 NAP A 1001

Bond lengths   Bond angles

Torsions   Rings

Ligand NAP C 1003

Bond lengths

Bond angles

Torsions

Rings

Ligand NAP D 1004

Bond lengths

Bond angles

Torsions

Rings

Ligand NAP B 1002

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 ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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	410/427 (96%)	-0.06	14 (3%) 45	52	14, 27, 64, 111	0
1	B	408/427 (95%)	-0.07	4 (0%) 82	86	14, 30, 53, 105	0
1	C	408/427 (95%)	-0.10	4 (0%) 82	86	15, 29, 55, 74	0
1	D	410/427 (96%)	-0.06	12 (2%) 51	58	13, 27, 64, 102	0
All	All	1636/1708 (95%)	-0.07	34 (2%) 63	70	13, 28, 59, 111	0

All (34) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	410	LYS	5.1
1	D	388	ARG	4.8
1	D	389	SER	4.5
1	A	164	THR	4.4
1	D	88	ASN	4.4
1	A	387	GLU	4.2
1	A	91	LYS	4.1
1	A	386	ASN	3.7
1	A	411	SER	3.7
1	A	389	SER	3.6
1	A	385	ASN	3.6
1	D	409	ILE	3.2
1	B	410	LYS	3.2
1	D	386	ASN	3.1
1	C	3	SER	3.0
1	D	164	THR	3.0
1	A	88	ASN	2.9
1	D	387	GLU	2.8
1	B	411	SER	2.6
1	D	163	THR	2.6
1	A	2	PHE	2.6

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Mol	Chain	Res	Type	RSRZ
1	D	411	SER	2.5
1	A	69	GLY	2.5
1	D	90	HIS	2.4
1	B	316	ARG	2.3
1	C	85	LYS	2.3
1	A	90	HIS	2.2
1	B	69	GLY	2.2
1	D	81	GLU	2.1
1	C	163	THR	2.1
1	A	87	PHE	2.0
1	D	87	PHE	2.0
1	C	81	GLU	2.0
1	A	388	ARG	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	NAP	B	1002	48/48	0.93	0.14	21,40,47,49	0
2	NAP	A	1001	48/48	0.94	0.13	19,36,42,44	0
2	NAP	C	1003	48/48	0.94	0.13	26,39,43,44	0
2	NAP	D	1004	48/48	0.94	0.14	17,33,40,42	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 NAP B 1002:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
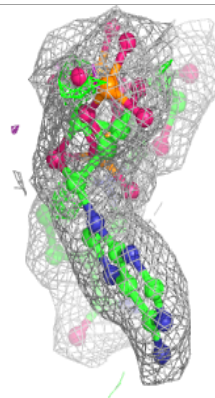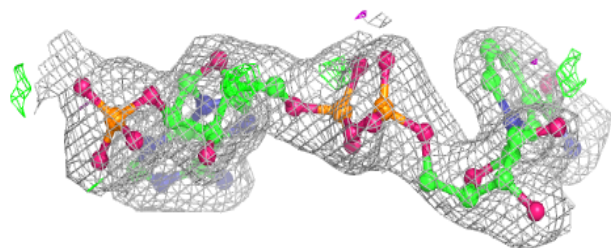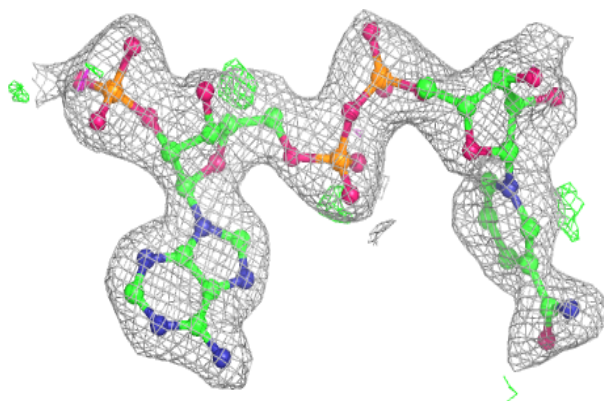and green (positive)
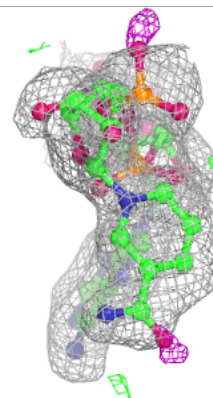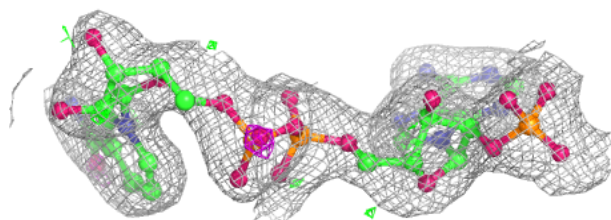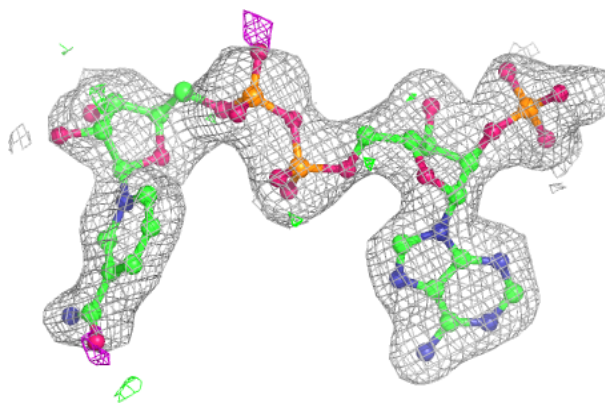
Electron density around NAP A 1001:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
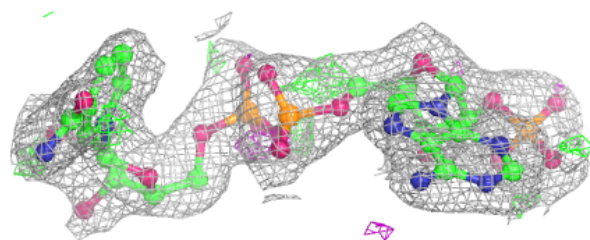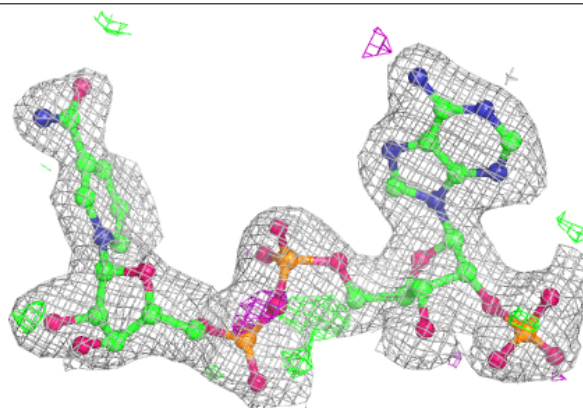and green (positive)
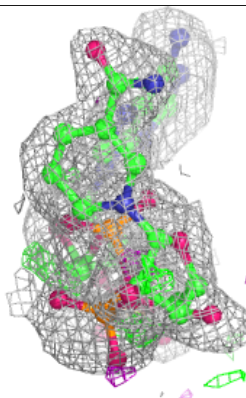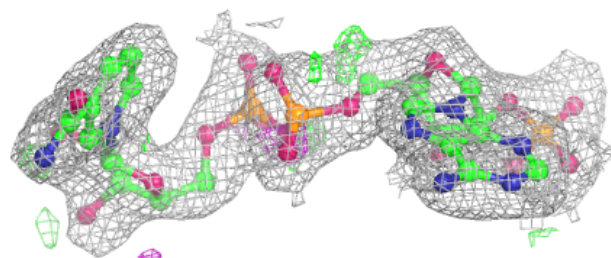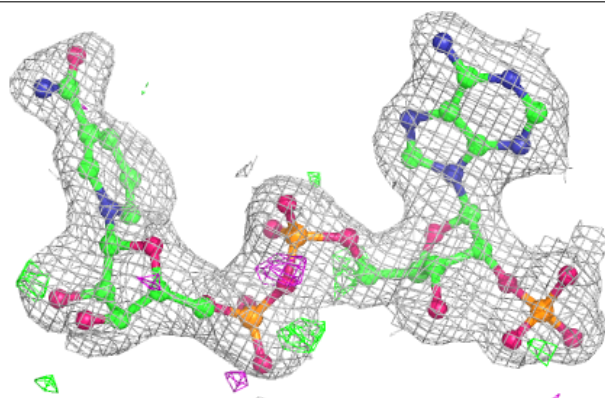
Electron density around NAP C 1003:

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

Electron density around NAP D 1004:

$2mF_o$-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 (i)

There are no such residues in this entry.