Full wwPDB X-ray Structure Validation Report (i)

Nov 5, 2023 – 01:53 AM EST

PDB ID	:	1PJ2
Title	:	Crystal structure of human mitochondrial NAD(P)+-dependent malic enzyme in a pentary complex with natural substrate malate, cofactor NADH, Mn++, and allosteric activator fumarate
Authors	:	Tao, X.; Yang, Z.; Tong, L.
Deposited on	:	2003-05-30
Resolution	:	2.30 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

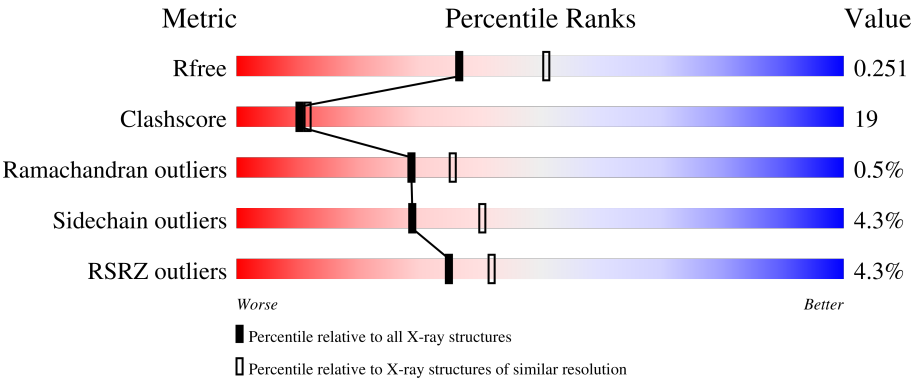
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber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

1 Overall quality at a glance (i)

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	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	564	4% 66% 30%
1	B	564	4% 58% 38%
1	C	564	2% 70% 26%
1	D	564	7% 62% 32%

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 18640 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 NAD-dependent malic enzyme, mitochondrial.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	553	Total	C	N	O	S	Se	0	0	0
			4367	2796	744	804	9	14			
1	B	553	Total	C	N	O	S	Se	0	0	0
			4367	2796	744	804	9	14			
1	C	553	Total	C	N	O	S	Se	0	0	0
			4367	2796	744	804	9	14			
1	D	553	Total	C	N	O	S	Se	0	0	0
			4367	2796	744	804	9	14			

There are 56 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	29	MSE	MET	modified residue	UNP P23368
A	38	MSE	MET	modified residue	UNP P23368
A	47	MSE	MET	modified residue	UNP P23368
A	75	MSE	MET	modified residue	UNP P23368
A	86	MSE	MET	modified residue	UNP P23368
A	108	MSE	MET	modified residue	UNP P23368
A	177	MSE	MET	modified residue	UNP P23368
A	219	MSE	MET	modified residue	UNP P23368
A	239	MSE	MET	modified residue	UNP P23368
A	325	MSE	MET	modified residue	UNP P23368
A	327	MSE	MET	modified residue	UNP P23368
A	343	MSE	MET	modified residue	UNP P23368
A	407	MSE	MET	modified residue	UNP P23368
A	539	MSE	MET	modified residue	UNP P23368
B	1029	MSE	MET	modified residue	UNP P23368
B	1038	MSE	MET	modified residue	UNP P23368
B	1047	MSE	MET	modified residue	UNP P23368
B	1075	MSE	MET	modified residue	UNP P23368
B	1086	MSE	MET	modified residue	UNP P23368
B	1108	MSE	MET	modified residue	UNP P23368
B	1177	MSE	MET	modified residue	UNP P23368

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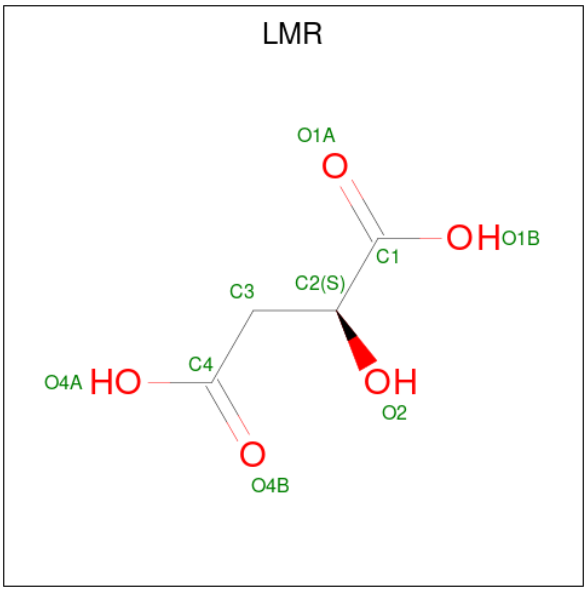
Chain	Residue	Modelled	Actual	Comment	Reference
B	1219	MSE	MET	modified residue	UNP P23368
B	1239	MSE	MET	modified residue	UNP P23368
B	1325	MSE	MET	modified residue	UNP P23368
B	1327	MSE	MET	modified residue	UNP P23368
B	1343	MSE	MET	modified residue	UNP P23368
B	1407	MSE	MET	modified residue	UNP P23368
B	1539	MSE	MET	modified residue	UNP P23368
C	2029	MSE	MET	modified residue	UNP P23368
C	2038	MSE	MET	modified residue	UNP P23368
C	2047	MSE	MET	modified residue	UNP P23368
C	2075	MSE	MET	modified residue	UNP P23368
C	2086	MSE	MET	modified residue	UNP P23368
C	2108	MSE	MET	modified residue	UNP P23368
C	2177	MSE	MET	modified residue	UNP P23368
C	2219	MSE	MET	modified residue	UNP P23368
C	2239	MSE	MET	modified residue	UNP P23368
C	2325	MSE	MET	modified residue	UNP P23368
C	2327	MSE	MET	modified residue	UNP P23368
C	2343	MSE	MET	modified residue	UNP P23368
C	2407	MSE	MET	modified residue	UNP P23368
C	2539	MSE	MET	modified residue	UNP P23368
D	3029	MSE	MET	modified residue	UNP P23368
D	3038	MSE	MET	modified residue	UNP P23368
D	3047	MSE	MET	modified residue	UNP P23368
D	3075	MSE	MET	modified residue	UNP P23368
D	3086	MSE	MET	modified residue	UNP P23368
D	3108	MSE	MET	modified residue	UNP P23368
D	3177	MSE	MET	modified residue	UNP P23368
D	3219	MSE	MET	modified residue	UNP P23368
D	3239	MSE	MET	modified residue	UNP P23368
D	3325	MSE	MET	modified residue	UNP P23368
D	3327	MSE	MET	modified residue	UNP P23368
D	3343	MSE	MET	modified residue	UNP P23368
D	3407	MSE	MET	modified residue	UNP P23368
D	3539	MSE	MET	modified residue	UNP P23368

- Molecule 2 is (2S)-2-hydroxybutanedioic acid (three-letter code: LMR) (formula: $C_4H_6O_5$).

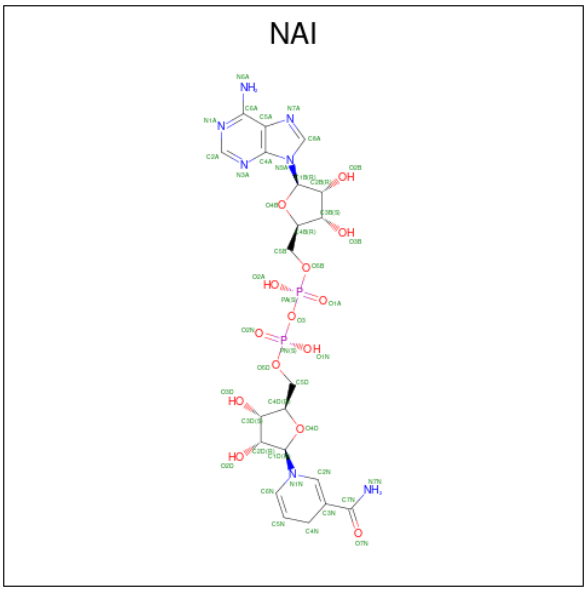


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C O 9 4 5	0	0
2	B	1	Total C O 9 4 5	0	0
2	C	1	Total C O 9 4 5	0	0
2	D	1	Total C O 9 4 5	0	0

- Molecule 3 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn).

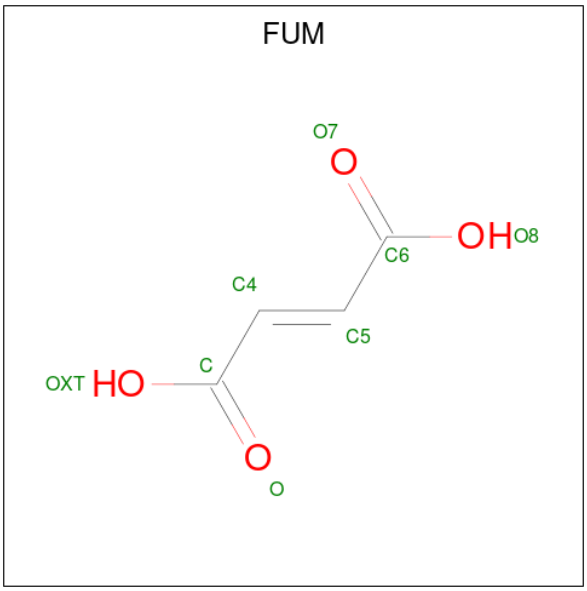
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Mn 1 1	0	0
3	B	1	Total Mn 1 1	0	0
3	C	1	Total Mn 1 1	0	0
3	D	1	Total Mn 1 1	0	0

- Molecule 4 is 1,4-DIHYDRONICOTINAMIDE ADENINE DINUCLEOTIDE (three-letter code: NAI) (formula: $C_{21}H_{29}N_7O_{14}P_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
4	A	1	Total	C	N	O	P	9	0
			44	21	7	14	2		
4	B	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
4	B	1	Total	C	N	O	P	9	0
			44	21	7	14	2		
4	C	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
4	C	1	Total	C	N	O	P	9	0
			44	21	7	14	2		
4	D	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
4	D	1	Total	C	N	O	P	9	0
			44	21	7	14	2		

- Molecule 5 is FUMARIC ACID (three-letter code: FUM) (formula: $C_4H_4O_4$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 8 4 4	0	0
5	B	1	Total C O 8 4 4	0	0
5	C	1	Total C O 8 4 4	0	0
5	D	1	Total C O 8 4 4	0	0

- Molecule 6 is water.

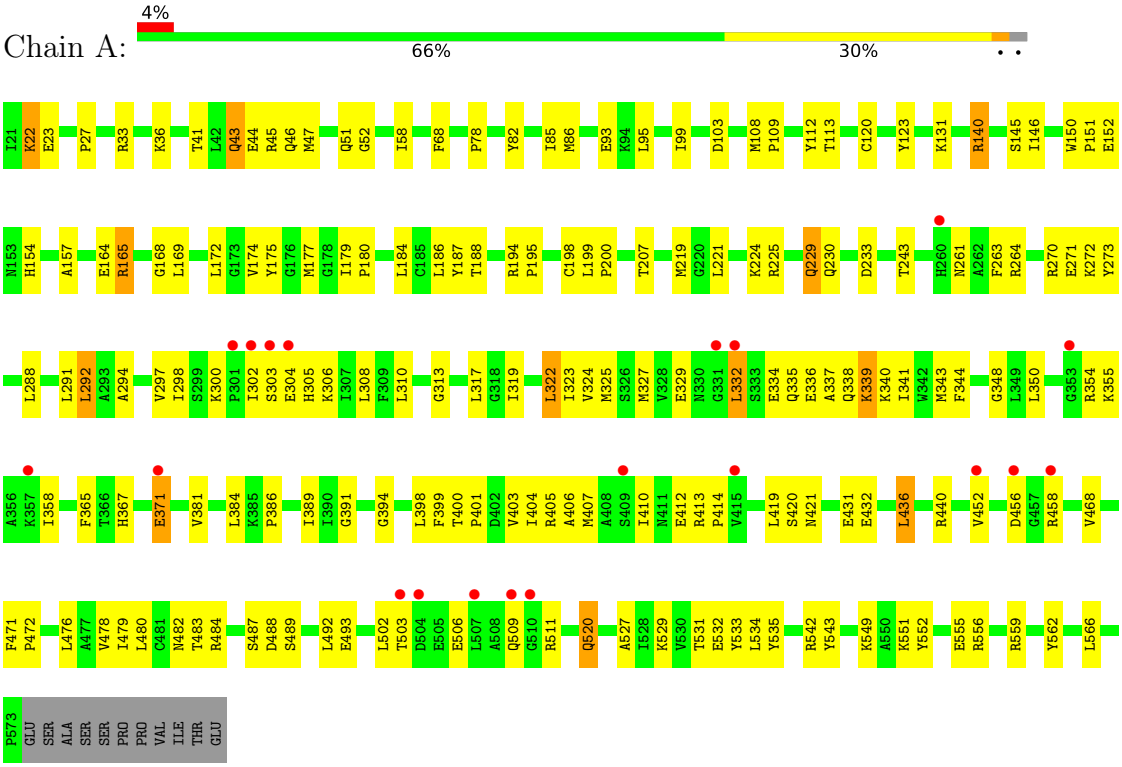
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	193	Total O 193 193	0	0
6	B	164	Total O 164 164	0	0
6	C	212	Total O 212 212	0	0
6	D	179	Total O 179 179	0	0

3 Residue-property plots (i)

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.

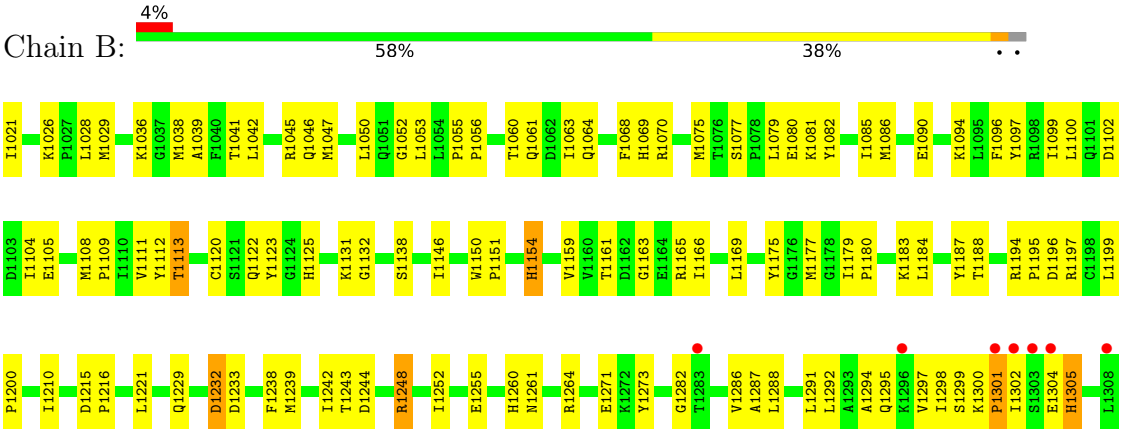
• Molecule 1: NAD-dependent malic enzyme, mitochondrial

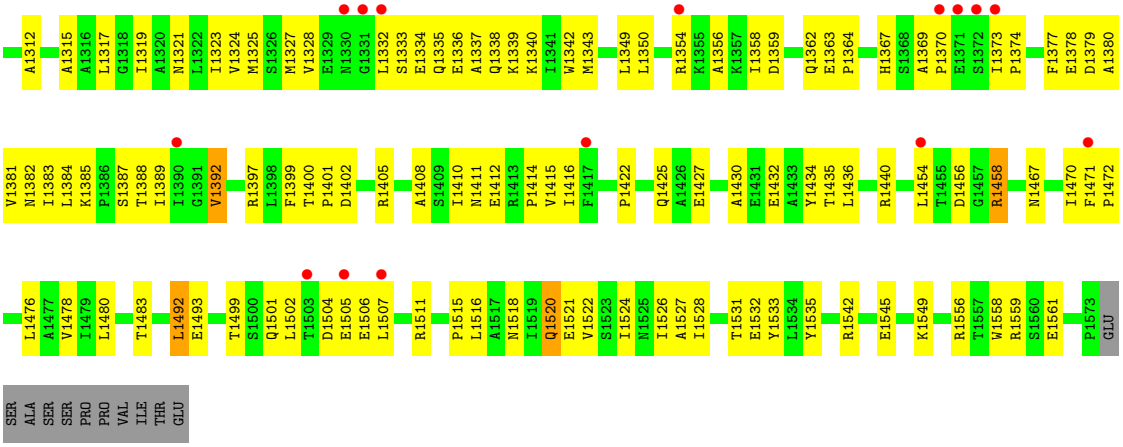
Chain A:



• Molecule 1: NAD-dependent malic enzyme, mitochondrial

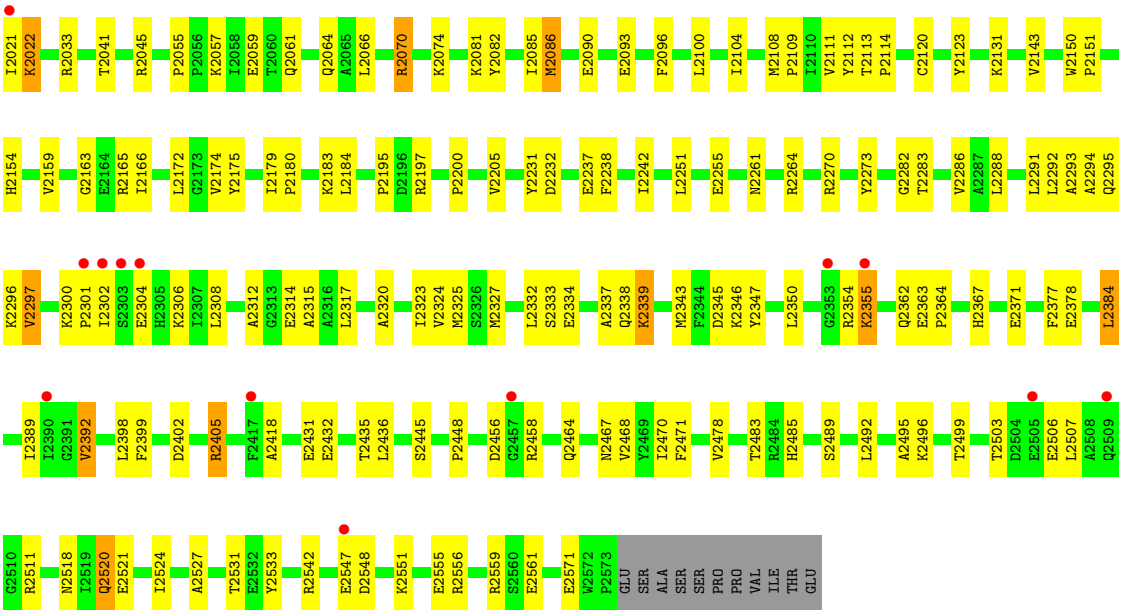
Chain B:





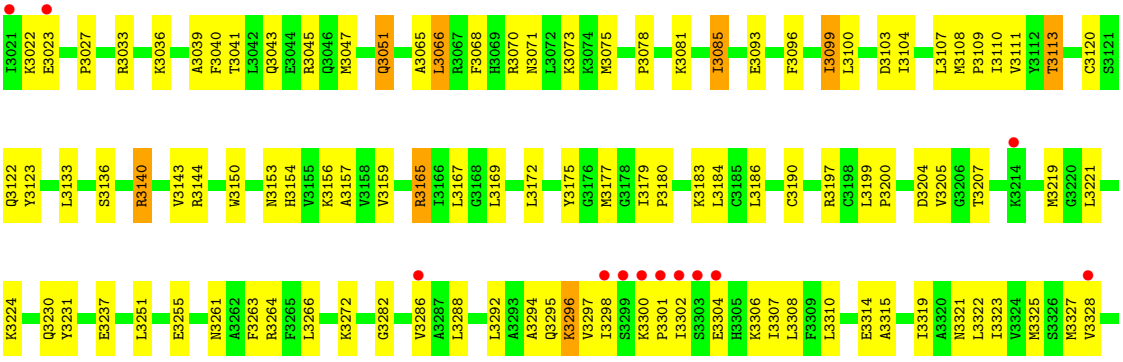
• Molecule 1: NAD-dependent malic enzyme, mitochondrial

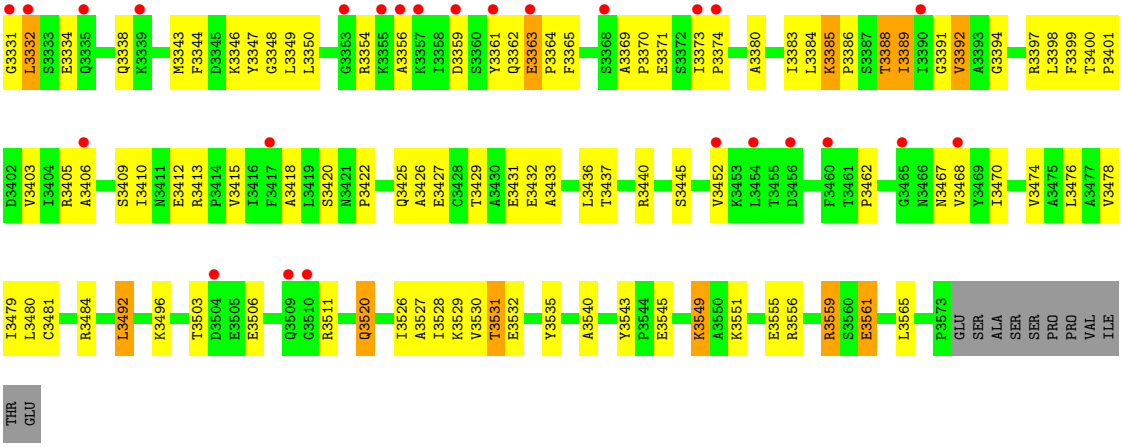
Chain C:



• Molecule 1: NAD-dependent malic enzyme, mitochondrial

Chain D:




G3331 L3332 S3333 E3334 Q3335 Q3338 K3339 M3343 F3344 D3345 K3346 Y3347 G3348 L3349 L3350 G3353 R3354 K3355 A3356 K3357 I3358 D3359 S3360 Y3361 Q3362 E3363 P3364 F3365 S3368 A3369 P3370 E3371 S3372 I3373 P3374 A3380 I3383 L3384 K3385 P3386 S3387 T3388 I3389 I3390 G3391 V3392 A3393 G3394 R3397 L3398 F3399 T3400 P3401 D3402 V3403 I3404 R3405 A3406 S3409 I3410 N3411 E3412 R3413 P3414 V3415 I3416 F3417 A3418 L3419 S3420 N3421 P3422 Q3425 A3426 E3427 C3428 T3429 A3430 E3431 E3432 A3433 L3436 T3437 R3440 S3445 V3452 K3453 L3454 T3455 D3456 F3460 T3461 P3462 G3465 N3466 N3467 V3468 Y3469 I3470 V3474 A3475 L3476 A3477 V3478 I3479 L3480 C3481 R3484 L3492 K3496 T3503 D3504 E3505 E3506 Q3509 G3510 R3511 Q3520 I3526 A3527 I3528 K3529 V3530 T3531 E3532 Y3535 A3540 Y3543 P3544 E3545 K3549 A3550 K3551 E3555 R3556 R3559 S3560 E3561 L3565 P3573 GLU SER ALA SER SER PRO PRO VAL ILE THR GLU

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	227.28Å 117.34Å 113.02Å 90.00° 109.79° 90.00°	Depositor
Resolution (Å)	20.00 – 2.30 29.62 – 2.30	Depositor EDS
% Data completeness (in resolution range)	93.9 (20.00-2.30) 94.7 (29.62-2.30)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	0.08	Depositor
$< I/\sigma(I) >$ [1]	3.27 (at 2.29Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.205 , 0.256 0.201 , 0.251	Depositor DCC
R_{free} test set	8855 reflections (7.52%)	wwPDB-VP
Wilson B-factor (Å^2)	32.1	Xtriage
Anisotropy	0.451	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 48.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.44$, $< L^2 > = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	18640	wwPDB-VP
Average B, all atoms (Å^2)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.30% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: FUM, LMR, NAI, MN

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	0/4447	0.60	0/5998
1	B	0.34	0/4447	0.60	0/5998
1	C	0.36	0/4447	0.61	0/5998
1	D	0.34	0/4447	0.59	0/5998
All	All	0.35	0/17788	0.60	0/23992

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	4367	0	4407	154	0
1	B	4367	0	4407	211	0
1	C	4367	0	4407	128	0
1	D	4367	0	4407	177	0
2	A	9	0	3	1	0
2	B	9	0	3	2	0
2	C	9	0	3	2	0
2	D	9	0	3	1	0
3	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
4	A	88	0	54	4	0
4	B	88	0	54	1	0
4	C	88	0	54	7	0
4	D	88	0	54	4	0
5	A	8	0	1	0	0
5	B	8	0	1	0	0
5	C	8	0	1	0	0
5	D	8	0	1	0	0
6	A	193	0	0	12	0
6	B	164	0	0	3	0
6	C	212	0	0	5	0
6	D	179	0	0	6	0
All	All	18640	0	17860	667	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 19.

All (667) 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:B:1029:MSE:HE2	1:B:1050:LEU:HD22	1.23	1.13
1:A:381:VAL:HG13	1:A:407:MSE:HE3	1.42	1.01
1:D:3315:ALA:HB3	1:D:3392:VAL:HG21	1.43	0.99
1:B:1210:ILE:HD12	1:B:1210:ILE:H	1.26	0.99
1:D:3343:MSE:HE2	1:D:3365:PHE:HB2	1.46	0.97
1:A:532:GLU:HG2	1:A:549:LYS:HG3	1.44	0.97
1:C:2286:VAL:HG21	1:C:2467:ASN:HA	1.45	0.95
1:A:323:ILE:HG22	1:A:327:MSE:HE2	1.47	0.94
1:C:2323:ILE:HG22	1:C:2327:MSE:HE2	1.46	0.93
1:B:1315:ALA:HB3	1:B:1392:VAL:HG21	1.52	0.91
1:D:3286:VAL:HG21	1:D:3467:ASN:HA	1.52	0.90
1:B:1026:LYS:HA	1:B:1029:MSE:HE3	1.54	0.89
1:A:108:MSE:HE1	1:A:186:LEU:HD21	1.53	0.88
1:D:3113:THR:HB	6:D:4542:HOH:O	1.76	0.86
1:D:3334:GLU:O	1:D:3338:GLN:HG3	1.76	0.85
1:A:407:MSE:HA	1:A:407:MSE:HE2	1.58	0.84
1:D:3520:GLN:H	1:D:3520:GLN:HE21	1.25	0.83
1:C:2184:LEU:HD12	1:C:2200:PRO:HG3	1.60	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1286:VAL:HG21	1:B:1467:ASN:HA	1.61	0.82
1:B:1323:ILE:HG22	1:B:1327:MSE:HE2	1.60	0.82
1:C:2355:LYS:HE3	1:C:2355:LYS:HA	1.61	0.80
1:B:1085:ILE:HD11	1:B:1111:VAL:HG12	1.64	0.80
1:B:1504:ASP:HA	1:B:1507:LEU:HD12	1.64	0.80
1:B:1301:PRO:HD2	1:B:1304:GLU:HG3	1.62	0.79
1:B:1339:LYS:HA	1:B:1367:HIS:CE1	2.18	0.79
1:B:1377:PHE:CZ	1:B:1389:ILE:HD11	2.18	0.79
1:D:3332:LEU:HD12	1:D:3332:LEU:H	1.48	0.79
1:B:1239:MSE:O	1:B:1243:THR:HG22	1.83	0.78
1:C:2520:GLN:H	1:C:2520:GLN:HE21	1.29	0.78
1:B:1300:LYS:HE2	1:B:1304:GLU:HB3	1.66	0.77
1:C:2086:MSE:HE1	1:C:2111:VAL:HG23	1.66	0.76
1:D:3140:ARG:HH21	1:D:3230:GLN:HG2	1.50	0.75
1:A:108:MSE:HB3	1:A:109:PRO:HD3	1.67	0.75
1:B:1047:MSE:HE2	1:D:3047:MSE:SE	2.37	0.75
1:C:2332:LEU:HD12	1:C:2332:LEU:H	1.52	0.75
1:D:3068:PHE:CD2	1:D:3099:ILE:HG13	2.22	0.75
1:A:493:GLU:HG3	1:A:533:TYR:CD1	2.22	0.75
1:B:1377:PHE:O	1:B:1381:VAL:HG23	1.86	0.75
1:A:381:VAL:CG1	1:A:407:MSE:HE3	2.17	0.75
1:A:261:ASN:HD22	1:A:264:ARG:HE	1.33	0.75
1:A:43:GLN:HG2	1:A:47:MSE:HE3	1.68	0.74
1:B:1515:PRO:HG2	1:B:1518:ASN:HD22	1.52	0.74
1:C:2527:ALA:O	1:C:2531:THR:HG23	1.86	0.74
1:D:3315:ALA:HB3	1:D:3392:VAL:CG2	2.15	0.73
2:A:701:LMR:H2	4:A:601:NAI:H42N	1.70	0.73
1:D:3022:LYS:O	1:D:3022:LYS:HD3	1.88	0.73
1:D:3302:ILE:HG23	1:D:3327:MSE:HE2	1.70	0.72
1:B:1515:PRO:HG2	1:B:1518:ASN:ND2	2.04	0.71
1:C:2325:MSE:HE2	1:C:2492:LEU:HD12	1.72	0.71
1:A:261:ASN:ND2	1:A:264:ARG:HE	1.87	0.71
1:D:3371:GLU:CD	1:D:3371:GLU:H	1.93	0.71
1:C:2033:ARG:HD3	1:C:2093:GLU:OE2	1.89	0.71
1:D:3527:ALA:O	1:D:3531:THR:HG22	1.90	0.71
1:B:1456:ASP:OD2	1:B:1458:ARG:HB2	1.90	0.70
1:D:3184:LEU:HD12	1:D:3200:PRO:HG3	1.73	0.70
1:C:2315:ALA:HB3	1:C:2392:VAL:HG21	1.74	0.70
1:C:2154:HIS:O	1:C:2197:ARG:HD2	1.91	0.70
1:C:2506:GLU:O	1:C:2511:ARG:HB2	1.91	0.70
1:D:3374:PRO:HG3	1:D:3383:ILE:HD12	1.74	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:3476:LEU:O	1:D:3480:LEU:HG	1.91	0.69
1:D:3179:ILE:HB	1:D:3180:PRO:HD3	1.74	0.69
1:D:3520:GLN:H	1:D:3520:GLN:NE2	1.90	0.69
1:A:272:LYS:HB2	1:A:272:LYS:NZ	2.08	0.69
1:D:3294:ALA:O	1:D:3297:VAL:HG22	1.93	0.68
2:B:1701:LMR:H2	4:B:1601:NAI:H42N	1.76	0.68
1:A:302:ILE:HD12	1:A:305:HIS:ND1	2.09	0.68
1:C:2478:VAL:HG13	1:C:2483:THR:HB	1.75	0.68
1:A:334:GLU:O	1:A:338:GLN:HG3	1.94	0.67
1:B:1324:VAL:HA	1:B:1327:MSE:HE3	1.76	0.67
1:D:3400:THR:OG1	1:D:3403:VAL:HG23	1.95	0.67
1:A:108:MSE:HE1	1:A:186:LEU:CD2	2.22	0.67
1:B:1179:ILE:HB	1:B:1180:PRO:HD3	1.76	0.67
1:B:1377:PHE:HZ	1:B:1389:ILE:HD11	1.56	0.67
1:B:1520:GLN:H	1:B:1520:GLN:HE21	1.42	0.67
1:C:2327:MSE:HE3	1:C:2337:ALA:HB1	1.75	0.67
1:D:3108:MSE:HB3	1:D:3109:PRO:HD3	1.77	0.67
1:A:288:LEU:HD22	1:A:322:LEU:HD12	1.76	0.67
1:D:3288:LEU:HD22	1:D:3322:LEU:HG	1.75	0.67
1:B:1177:MSE:O	1:B:1180:PRO:HD2	1.95	0.67
1:D:3503:THR:OG1	1:D:3506:GLU:HG3	1.95	0.67
1:B:1132:GLY:HA3	1:B:1200:PRO:HG2	1.75	0.67
1:A:413:ARG:HA	1:A:440:ARG:O	1.95	0.66
1:B:1154:HIS:O	1:B:1197:ARG:HD3	1.95	0.66
1:B:1260:HIS:O	1:B:1264:ARG:HG2	1.96	0.66
1:B:1527:ALA:O	1:B:1531:THR:HG23	1.96	0.66
1:C:2286:VAL:CG2	1:C:2467:ASN:HA	2.25	0.66
1:B:1315:ALA:O	1:B:1319:ILE:HG13	1.96	0.66
1:C:2061:GLN:HA	1:C:2064:GLN:HE21	1.61	0.65
2:D:3701:LMR:H2	4:D:3601:NAI:H42N	1.77	0.65
1:A:343:MSE:HE3	1:A:350:LEU:HD12	1.77	0.65
1:B:1210:ILE:H	1:B:1210:ILE:CD1	2.03	0.65
1:D:3298:ILE:HD12	1:D:3300:LYS:HE3	1.78	0.65
1:D:3385:LYS:HZ3	1:D:3385:LYS:HB3	1.61	0.65
1:B:1384:LEU:N	1:B:1384:LEU:HD12	2.12	0.65
1:B:1090:GLU:OE1	1:B:1131:LYS:HE2	1.97	0.65
1:D:3308:LEU:HD23	1:D:3389:ILE:HD11	1.79	0.64
1:B:1354:ARG:CZ	1:B:1356:ALA:HB3	2.28	0.64
1:A:343:MSE:HE2	1:A:365:PHE:HB2	1.80	0.64
1:C:2492:LEU:CD2	1:C:2496:LYS:HE3	2.26	0.64
1:D:3308:LEU:HB3	1:D:3389:ILE:CD1	2.27	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:319:ILE:O	1:A:323:ILE:HG13	1.97	0.64
1:B:1029:MSE:HE1	1:B:1053:LEU:CD1	2.29	0.63
1:D:3492:LEU:HD22	1:D:3496:LYS:HE2	1.80	0.63
1:B:1108:MSE:HB3	1:B:1109:PRO:HD3	1.81	0.63
1:D:3085:ILE:HD11	1:D:3111:VAL:HG12	1.80	0.63
1:C:2108:MSE:HB3	1:C:2109:PRO:HD3	1.80	0.63
1:B:1108:MSE:HE3	1:B:1516:LEU:HD11	1.81	0.63
1:B:1300:LYS:HG2	1:B:1304:GLU:CB	2.29	0.63
1:D:3301:PRO:HB2	1:D:3304:GLU:HG2	1.79	0.63
1:A:108:MSE:HE2	1:A:112:TYR:HB2	1.79	0.62
1:B:1305:HIS:HA	1:B:1387:SER:OG	1.99	0.62
1:A:298:ILE:HG22	1:A:300:LYS:HB2	1.80	0.62
1:A:36:LYS:HE2	1:A:562:TYR:HB3	1.81	0.62
1:B:1238:PHE:O	1:B:1242:ILE:HD13	1.99	0.62
1:B:1286:VAL:CG2	1:B:1467:ASN:HA	2.30	0.62
1:D:3391:GLY:HA3	1:D:3427:GLU:HG2	1.80	0.62
1:A:179:ILE:HB	1:A:180:PRO:HD3	1.81	0.62
1:A:184:LEU:HD12	1:A:200:PRO:HG3	1.82	0.62
1:C:2282:GLY:O	1:C:2286:VAL:HG23	1.99	0.62
1:D:3143:VAL:HB	1:D:3237:GLU:HG2	1.82	0.62
1:D:3363:GLU:HB3	1:D:3364:PRO:HD3	1.81	0.62
1:A:41:THR:OG1	1:A:44:GLU:HG3	2.00	0.61
1:B:1334:GLU:O	1:B:1338:GLN:HG3	2.00	0.61
1:D:3308:LEU:HB3	1:D:3389:ILE:HD12	1.82	0.61
1:D:3394:GLY:HA2	1:D:3420:SER:HB3	1.81	0.61
1:B:1085:ILE:C	1:B:1085:ILE:HD12	2.21	0.61
1:C:2402:ASP:HA	1:C:2405:ARG:NH1	2.15	0.61
1:C:2492:LEU:HD22	1:C:2496:LYS:HE3	1.82	0.61
1:A:288:LEU:CD2	1:A:322:LEU:HD12	2.30	0.61
1:B:1379:ASP:O	1:B:1383:ILE:HD13	1.99	0.61
1:C:2306:LYS:HE3	1:C:2384:LEU:O	2.01	0.61
1:D:3051:GLN:HE21	1:D:3051:GLN:HA	1.66	0.61
1:D:3183:LYS:HE3	1:D:3255:GLU:OE2	2.00	0.61
1:A:108:MSE:HE2	1:A:112:TYR:CB	2.31	0.61
1:B:1085:ILE:CD1	1:B:1111:VAL:HG12	2.30	0.61
1:B:1298:ILE:HD12	1:B:1300:LYS:HB3	1.82	0.61
1:B:1524:ILE:O	1:B:1528:ILE:HG13	2.00	0.61
1:A:288:LEU:HG	1:A:292:LEU:CD2	2.31	0.61
1:D:3319:ILE:O	1:D:3323:ILE:HG13	1.99	0.61
1:C:2183:LYS:HE3	1:C:2255:GLU:CD	2.20	0.60
1:B:1369:ALA:HB1	1:B:1373:ILE:HD11	1.83	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1518:ASN:HB3	1:B:1521:GLU:OE2	2.01	0.60
1:B:1350:LEU:HD23	1:B:1354:ARG:CZ	2.31	0.60
1:B:1085:ILE:HD12	1:B:1086:MSE:N	2.17	0.60
1:A:207:THR:O	1:A:224:LYS:HA	2.02	0.60
1:B:1068:PHE:CD2	1:B:1099:ILE:HG13	2.37	0.60
1:C:2286:VAL:HG22	1:C:2470:ILE:HG12	1.82	0.60
1:A:294:ALA:O	1:A:297:VAL:HG22	2.02	0.59
1:C:2179:ILE:HB	1:C:2180:PRO:HD3	1.84	0.59
1:D:3385:LYS:HA	1:D:3410:ILE:HD13	1.84	0.59
1:C:2195:PRO:HG2	6:C:4349:HOH:O	2.03	0.59
1:C:2346:LYS:HE2	1:C:2347:TYR:CE1	2.36	0.59
1:D:3392:VAL:HG22	1:D:3392:VAL:O	2.02	0.59
1:B:1342:TRP:HE3	1:B:1349:LEU:HD11	1.68	0.59
1:C:2431:GLU:O	1:C:2435:THR:HG23	2.01	0.59
1:B:1343:MSE:HE3	1:B:1350:LEU:HD13	1.83	0.59
1:D:3140:ARG:NH2	1:D:3230:GLN:HG2	2.17	0.59
1:D:3401:PRO:HA	1:D:3436:LEU:HD13	1.83	0.59
1:C:2448:PRO:HD3	1:C:2464:GLN:HE22	1.68	0.59
1:D:3120:CYS:O	1:D:3175:TYR:HB3	2.02	0.59
1:B:1389:ILE:HG22	1:B:1416:ILE:HA	1.83	0.59
1:B:1506:GLU:O	1:B:1511:ARG:HB2	2.02	0.59
1:D:3354:ARG:NE	1:D:3356:ALA:HB3	2.18	0.59
1:D:3085:ILE:HD12	1:D:3096:PHE:HE1	1.68	0.58
1:A:140:ARG:NH2	1:A:230:GLN:HA	2.18	0.58
1:B:1382:ASN:O	1:B:1385:LYS:HG3	2.03	0.58
1:D:3261:ASN:HD22	1:D:3264:ARG:HE	1.49	0.58
1:B:1075:MSE:HG2	1:B:1080:GLU:CD	2.23	0.58
1:C:2363:GLU:HG2	6:C:4628:HOH:O	2.02	0.58
1:B:1325:MSE:HE2	1:B:1492:LEU:HD12	1.85	0.58
1:B:1335:GLN:O	1:B:1339:LYS:HG3	2.03	0.58
1:D:3314:GLU:HB2	4:D:3601:NAI:O1N	2.03	0.58
1:B:1505:GLU:CD	1:B:1505:GLU:H	2.06	0.58
1:C:2021:ILE:HG13	1:C:2022:LYS:N	2.18	0.58
1:B:1029:MSE:HE1	1:B:1053:LEU:HD13	1.86	0.58
1:C:2301:PRO:HD2	1:C:2304:GLU:OE2	2.03	0.58
1:D:3041:THR:O	1:D:3045:ARG:HG3	2.03	0.58
1:A:272:LYS:HB2	1:A:272:LYS:HZ3	1.68	0.58
1:B:1506:GLU:OE1	1:B:1515:PRO:HD3	2.04	0.58
1:A:332:LEU:HG	1:A:336:GLU:OE2	2.04	0.58
1:B:1319:ILE:O	1:B:1323:ILE:HG13	2.03	0.58
1:D:3323:ILE:O	1:D:3327:MSE:HG3	2.03	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:3388:THR:OG1	1:D:3415:VAL:HB	2.04	0.58
1:C:2503:THR:OG1	1:C:2506:GLU:HG3	2.04	0.57
1:D:3266:LEU:HD13	1:D:3266:LEU:C	2.25	0.57
1:A:325:MSE:HE1	1:A:488:ASP:HB3	1.87	0.57
1:D:3066:LEU:O	1:D:3070:ARG:HG2	2.04	0.57
2:C:2701:LMR:H2	4:C:2601:NAI:H42N	1.87	0.57
1:B:1339:LYS:HA	1:B:1367:HIS:NE2	2.20	0.57
1:B:1476:LEU:O	1:B:1480:LEU:HG	2.03	0.57
1:C:2061:GLN:HA	1:C:2064:GLN:NE2	2.19	0.57
1:A:556:ARG:HG3	1:A:556:ARG:HH11	1.69	0.57
1:D:3207:THR:O	1:D:3224:LYS:HA	2.05	0.56
1:A:140:ARG:NH2	1:A:233:ASP:HB2	2.20	0.56
1:A:288:LEU:HG	1:A:292:LEU:HD22	1.88	0.56
1:B:1036:LYS:HB3	1:B:1039:ALA:HB3	1.88	0.56
1:B:1401:PRO:O	1:B:1405:ARG:HG3	2.05	0.56
1:C:2402:ASP:HA	1:C:2405:ARG:HH12	1.69	0.56
1:A:484:ARG:NH1	1:D:3543:TYR:HB3	2.20	0.56
1:B:1298:ILE:C	1:B:1300:LYS:H	2.08	0.56
1:B:1042:LEU:O	1:B:1046:GLN:HG3	2.05	0.56
1:A:400:THR:OG1	1:A:403:VAL:HG23	2.05	0.56
1:A:506:GLU:HB3	1:A:511:ARG:HD2	1.87	0.56
1:A:371:GLU:H	1:A:371:GLU:CD	2.07	0.56
1:B:1261:ASN:HA	1:B:1264:ARG:HD3	1.87	0.56
1:B:1402:ASP:HA	1:B:1405:ARG:NH1	2.21	0.56
1:C:2041:THR:O	1:C:2045:ARG:HG3	2.05	0.56
1:B:1401:PRO:HA	1:B:1436:LEU:HD23	1.87	0.56
1:B:1113:THR:HG21	2:B:1701:LMR:O4A	2.05	0.55
1:C:2324:VAL:HA	1:C:2327:MSE:HE3	1.87	0.55
1:D:3043:GLN:HG2	1:D:3047:MSE:HE3	1.87	0.55
1:B:1021:ILE:HG12	1:B:1028:LEU:HD21	1.87	0.55
1:B:1343:MSE:HB2	1:B:1350:LEU:CD1	2.36	0.55
1:D:3023:GLU:CG	1:D:3027:PRO:HB2	2.36	0.55
1:D:3023:GLU:HG3	1:D:3027:PRO:HB2	1.87	0.55
1:A:140:ARG:HH22	1:A:233:ASP:HB2	1.71	0.55
1:A:432:GLU:O	1:A:436:LEU:HB2	2.07	0.55
1:B:1363:GLU:HB3	1:B:1364:PRO:HD3	1.87	0.55
1:B:1456:ASP:OD2	1:B:1458:ARG:NH1	2.35	0.55
1:D:3099:ILE:HG22	1:D:3100:LEU:HD12	1.89	0.55
1:A:113:THR:HB	6:A:4543:HOH:O	2.07	0.55
1:D:3043:GLN:HG2	1:D:3047:MSE:CE	2.37	0.55
1:D:3073:LYS:HE3	6:D:4513:HOH:O	2.07	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:41:THR:O	1:A:45:ARG:HG3	2.06	0.55
1:D:3343:MSE:HE2	1:D:3365:PHE:CB	2.30	0.55
1:C:2520:GLN:H	1:C:2520:GLN:NE2	2.03	0.55
1:D:3169:LEU:HD21	1:D:3422:PRO:HD3	1.89	0.54
1:D:3380:ALA:O	1:D:3384:LEU:HB2	2.06	0.54
1:A:46:GLN:HG2	1:A:51:GLN:HG3	1.89	0.54
1:B:1081:LYS:O	1:B:1085:ILE:HG23	2.08	0.54
1:D:3078:PRO:HD2	6:D:4257:HOH:O	2.07	0.54
1:C:2495:ALA:O	1:C:2499:THR:HG22	2.07	0.54
1:D:3397:ARG:HA	1:D:3427:GLU:O	2.08	0.54
1:D:3040:PHE:HE2	1:D:3565:LEU:HD12	1.71	0.54
1:A:288:LEU:HD22	1:A:322:LEU:CD1	2.37	0.54
1:B:1132:GLY:CA	1:B:1200:PRO:HG2	2.37	0.54
1:C:2273:TYR:HB3	6:C:4008:HOH:O	2.08	0.54
1:D:3177:MSE:O	1:D:3180:PRO:HD2	2.08	0.54
1:D:3315:ALA:O	1:D:3319:ILE:HG13	2.07	0.54
1:D:3506:GLU:O	1:D:3511:ARG:HB2	2.08	0.54
1:D:3397:ARG:HD3	1:D:3426:ALA:O	2.08	0.54
1:D:3385:LYS:HB3	1:D:3385:LYS:NZ	2.23	0.54
1:C:2559:ARG:HH11	1:C:2559:ARG:HG2	1.72	0.54
1:C:2022:LYS:NZ	1:C:2022:LYS:HB3	2.23	0.54
1:D:3420:SER:HA	4:D:3601:NAI:H1D	1.90	0.54
1:C:2520:GLN:HG2	6:C:4597:HOH:O	2.08	0.53
1:A:529:LYS:HE2	1:A:529:LYS:HA	1.89	0.53
1:C:2302:ILE:HG21	1:C:2332:LEU:HD11	1.90	0.53
1:A:389:ILE:HG23	1:A:399:PHE:CE1	2.44	0.53
1:B:1343:MSE:HE1	1:B:1362:GLN:HG2	1.90	0.53
1:B:1383:ILE:HG22	1:B:1384:LEU:HD12	1.91	0.53
1:C:2456:ASP:OD2	1:C:2458:ARG:HD3	2.07	0.53
1:B:1504:ASP:HA	1:B:1507:LEU:CD1	2.36	0.53
1:A:483:THR:OG1	1:A:534:LEU:HD13	2.08	0.53
1:C:2082:TYR:O	1:C:2086:MSE:HB2	2.09	0.53
1:B:1248:ARG:HG2	1:B:1248:ARG:HH11	1.73	0.53
1:B:1261:ASN:HD22	1:B:1264:ARG:HD3	1.74	0.53
1:B:1324:VAL:O	1:B:1328:VAL:HG23	2.09	0.53
1:C:2021:ILE:HG13	1:C:2022:LYS:H	1.74	0.53
1:D:3315:ALA:CB	1:D:3392:VAL:HG21	2.27	0.53
1:A:108:MSE:HE3	1:A:108:MSE:HA	1.90	0.53
1:B:1559:ARG:HB3	1:B:1561:GLU:OE1	2.09	0.53
1:D:3065:ALA:HA	1:D:3099:ILE:HD11	1.89	0.53
1:B:1432:GLU:O	1:B:1436:LEU:HB2	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:2286:VAL:HG22	1:C:2470:ILE:CG1	2.39	0.52
1:B:1493:GLU:HG3	1:B:1533:TYR:CD1	2.44	0.52
1:D:3068:PHE:HE1	1:D:3085:ILE:HG22	1.74	0.52
1:A:68:PHE:CD2	1:A:99:ILE:HG13	2.44	0.52
1:A:341:ILE:O	1:A:367:HIS:HE1	1.92	0.52
1:B:1401:PRO:HA	1:B:1436:LEU:CD2	2.39	0.52
1:C:2312:ALA:HB1	1:C:2362:GLN:HE21	1.73	0.52
1:C:2432:GLU:O	1:C:2436:LEU:HD23	2.09	0.52
1:B:1343:MSE:HB2	1:B:1350:LEU:HD12	1.91	0.52
1:D:3559:ARG:HG3	1:D:3561:GLU:OE1	2.09	0.52
1:A:184:LEU:HD22	1:A:198:CYS:HB3	1.92	0.52
1:A:407:MSE:HA	1:A:407:MSE:CE	2.35	0.52
1:B:1099:ILE:HG22	1:B:1100:LEU:HD12	1.90	0.52
1:B:1282:GLY:O	1:B:1286:VAL:HG23	2.09	0.52
1:A:22:LYS:HD2	1:A:23:GLU:N	2.25	0.52
1:C:2327:MSE:CE	1:C:2337:ALA:HB1	2.40	0.52
1:A:551:LYS:O	1:A:555:GLU:HG3	2.09	0.52
1:D:3344:PHE:CZ	1:D:3348:GLY:HA2	2.45	0.52
1:A:165:ARG:O	1:A:165:ARG:NE	2.42	0.51
1:B:1542:ARG:HD3	1:B:1542:ARG:C	2.31	0.51
1:C:2165:ARG:NH2	2:C:2701:LMR:O1B	2.43	0.51
1:A:543:TYR:HB3	1:D:3484:ARG:NH1	2.25	0.51
1:C:2551:LYS:O	1:C:2555:GLU:HB2	2.09	0.51
1:D:3286:VAL:HG22	1:D:3470:ILE:CG1	2.41	0.51
1:D:3033:ARG:NH1	1:D:3093:GLU:OE2	2.43	0.51
1:B:1335:GLN:HE21	1:B:1339:LYS:HE2	1.75	0.51
1:C:2205:VAL:HG11	1:C:2231:TYR:HD1	1.74	0.51
1:D:3096:PHE:O	1:D:3100:LEU:HD13	2.10	0.51
1:B:1295:GLN:OE1	1:B:1302:ILE:HD11	2.10	0.51
1:B:1298:ILE:HG13	1:B:1300:LYS:H	1.74	0.51
1:D:3343:MSE:O	1:D:3349:LEU:HD12	2.11	0.51
1:A:354:ARG:HD2	6:A:4396:HOH:O	2.11	0.51
1:B:1298:ILE:CD1	1:B:1305:HIS:HE2	2.24	0.51
1:A:503:THR:OG1	1:A:506:GLU:HG3	2.10	0.51
1:D:3085:ILE:HD12	1:D:3085:ILE:C	2.31	0.51
1:D:3418:ALA:O	1:D:3445:SER:HA	2.10	0.51
1:A:78:PRO:HD2	6:A:4088:HOH:O	2.10	0.51
1:A:298:ILE:CG2	1:A:300:LYS:HB2	2.41	0.51
1:A:468:VAL:HA	1:A:471:PHE:CE2	2.46	0.50
1:B:1380:ALA:O	1:B:1384:LEU:HD13	2.11	0.50
1:C:2333:SER:HB2	6:C:4596:HOH:O	2.10	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1385:LYS:HG2	1:B:1410:ILE:HD13	1.93	0.50
1:C:2085:ILE:HD12	1:C:2096:PHE:HE1	1.76	0.50
1:B:1302:ILE:HA	6:B:4055:HOH:O	2.11	0.50
1:B:1515:PRO:CG	1:B:1518:ASN:ND2	2.74	0.50
1:C:2261:ASN:ND2	1:C:2264:ARG:HH21	2.09	0.50
1:B:1312:ALA:HB1	1:B:1343:MSE:CE	2.41	0.50
1:B:1384:LEU:N	1:B:1384:LEU:CD1	2.74	0.50
1:B:1478:VAL:HG13	1:B:1483:THR:HB	1.92	0.50
1:C:2378:GLU:OE1	1:C:2402:ASP:HB3	2.12	0.50
1:A:120:CYS:O	1:A:175:TYR:HB3	2.12	0.50
1:B:1120:CYS:O	1:B:1175:TYR:HB3	2.11	0.50
1:B:1315:ALA:CB	1:B:1392:VAL:HG21	2.32	0.50
1:C:2300:LYS:HG3	1:C:2301:PRO:HD2	1.93	0.50
1:C:2363:GLU:HB3	1:C:2364:PRO:HD3	1.92	0.50
1:A:68:PHE:CE1	1:A:85:ILE:HG22	2.47	0.50
1:A:308:LEU:HB3	1:A:389:ILE:HD12	1.94	0.50
1:A:394:GLY:HA2	1:A:420:SER:HB3	1.93	0.50
1:C:2317:LEU:HD23	1:C:2343:MSE:HE1	1.94	0.50
1:D:3282:GLY:O	1:D:3286:VAL:HG23	2.12	0.50
1:D:3346:LYS:HG2	4:D:3601:NAI:O2B	2.12	0.50
1:D:3431:GLU:OE1	1:D:3452:VAL:HG13	2.10	0.50
1:D:3535:TYR:CD2	1:D:3545:GLU:HG3	2.47	0.50
1:A:489:SER:HB3	1:A:533:TYR:OH	2.12	0.50
1:B:1096:PHE:O	1:B:1100:LEU:HD13	2.12	0.50
1:D:3051:GLN:HA	1:D:3051:GLN:NE2	2.27	0.50
1:A:157:ALA:HB2	1:A:479:ILE:HD11	1.93	0.49
1:A:43:GLN:HG2	1:A:47:MSE:CE	2.41	0.49
1:A:95:LEU:O	1:A:99:ILE:HD13	2.12	0.49
1:A:324:VAL:HA	1:A:327:MSE:HE3	1.95	0.49
1:B:1556:ARG:HH11	1:B:1556:ARG:HG3	1.76	0.49
1:C:2104:ILE:HG13	1:C:2108:MSE:HE2	1.94	0.49
1:D:3150:TRP:CE2	1:D:3199:LEU:HD13	2.47	0.49
1:D:3302:ILE:HD12	1:D:3327:MSE:HE2	1.94	0.49
1:A:535:TYR:OH	1:A:542:ARG:HB3	2.11	0.49
1:C:2389:ILE:HG23	1:C:2399:PHE:CE1	2.46	0.49
1:D:3081:LYS:O	1:D:3085:ILE:HG23	2.11	0.49
1:D:3167:LEU:HB2	1:D:3169:LEU:CD2	2.43	0.49
1:D:3286:VAL:HG22	1:D:3470:ILE:HG12	1.93	0.49
1:B:1041:THR:O	1:B:1045:ARG:HG3	2.12	0.49
1:C:2081:LYS:O	1:C:2085:ILE:HG23	2.13	0.49
1:C:2154:HIS:O	1:C:2197:ARG:CD	2.60	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:3429:THR:OG1	1:D:3432:GLU:HG3	2.12	0.49
1:D:3528:ILE:O	1:D:3531:THR:HG23	2.12	0.49
1:A:532:GLU:HG2	1:A:549:LYS:CG	2.31	0.49
1:B:1312:ALA:HB1	1:B:1343:MSE:HE3	1.95	0.49
1:B:1196:ASP:OD1	1:B:1197:ARG:HG2	2.12	0.49
1:C:2163:GLY:HA2	1:C:2166:ILE:HD11	1.94	0.49
1:C:2300:LYS:HG3	1:C:2304:GLU:OE2	2.13	0.49
1:C:2392:VAL:O	1:C:2392:VAL:HG13	2.13	0.49
1:D:3302:ILE:HG23	1:D:3327:MSE:CE	2.42	0.49
1:D:3371:GLU:CD	1:D:3371:GLU:N	2.65	0.49
1:D:3389:ILE:HG23	1:D:3399:PHE:CZ	2.47	0.49
1:C:2315:ALA:CB	1:C:2392:VAL:HG21	2.42	0.49
1:D:3385:LYS:HZ3	1:D:3410:ILE:HG23	1.78	0.49
1:B:1359:ASP:OD2	1:B:1362:GLN:HG3	2.13	0.49
1:B:1422:PRO:HD2	1:B:1425:GLN:NE2	2.28	0.49
1:D:3169:LEU:CD2	1:D:3422:PRO:HD3	2.43	0.49
1:A:302:ILE:HD12	1:A:305:HIS:HD1	1.75	0.48
1:A:420:SER:HA	4:A:601:NAI:H1D	1.95	0.48
1:D:3308:LEU:HB3	1:D:3389:ILE:HD11	1.95	0.48
1:A:310:LEU:HD21	1:A:398:LEU:HB2	1.95	0.48
1:B:1183:LYS:HE3	1:B:1255:GLU:CD	2.33	0.48
1:B:1515:PRO:CG	1:B:1518:ASN:HD22	2.23	0.48
1:D:3292:LEU:O	1:D:3296:LYS:HE2	2.13	0.48
1:B:1163:GLY:HA2	1:B:1166:ILE:HD11	1.95	0.48
1:B:1343:MSE:O	1:B:1350:LEU:HD12	2.13	0.48
1:B:1532:GLU:HG2	1:B:1549:LYS:HG2	1.95	0.48
1:D:3401:PRO:O	1:D:3405:ARG:HG3	2.13	0.48
1:D:3535:TYR:CE2	1:D:3545:GLU:HG3	2.49	0.48
1:A:177:MSE:O	1:A:180:PRO:HD2	2.13	0.48
1:A:243:THR:HG21	1:A:273:TYR:CD2	2.49	0.48
1:A:520:GLN:HE21	1:A:520:GLN:H	1.61	0.48
1:B:1333:SER:OG	1:B:1336:GLU:HG2	2.12	0.48
1:A:339:LYS:HB2	1:A:339:LYS:NZ	2.28	0.48
1:A:412:GLU:O	1:A:440:ARG:NH1	2.46	0.48
1:B:1248:ARG:CZ	4:C:2602:NAI:O2N	2.61	0.48
1:D:3359:ASP:OD2	1:D:3362:GLN:HG3	2.12	0.48
1:A:168:GLY:N	1:A:421:ASN:O	2.47	0.48
1:B:1029:MSE:HE1	1:B:1053:LEU:HD12	1.96	0.48
1:D:3307:ILE:HD13	1:D:3323:ILE:HD13	1.95	0.48
1:B:1210:ILE:HD12	1:B:1210:ILE:N	2.10	0.48
1:B:1400:THR:HB	1:B:1401:PRO:HD2	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:151:PRO:HG2	1:A:152:GLU:OE1	2.13	0.48
1:B:1273:TYR:HB3	6:B:4691:HOH:O	2.12	0.48
1:C:2090:GLU:OE1	1:C:2131:LYS:HE2	2.14	0.48
1:D:3172:LEU:O	1:D:3175:TYR:HB2	2.13	0.48
1:A:332:LEU:HD12	1:A:332:LEU:H	1.79	0.47
1:B:1287:ALA:O	1:B:1291:LEU:HD23	2.14	0.47
1:B:1383:ILE:HD12	1:B:1383:ILE:N	2.29	0.47
1:D:3369:ALA:HB1	1:D:3373:ILE:CD1	2.44	0.47
1:D:3036:LYS:HB3	1:D:3039:ALA:HB3	1.96	0.47
1:A:329:GLU:HA	6:A:4296:HOH:O	2.13	0.47
1:A:476:LEU:O	1:A:480:LEU:HG	2.15	0.47
1:D:3556:ARG:HH11	1:D:3556:ARG:HG3	1.79	0.47
1:B:1343:MSE:C	1:B:1350:LEU:HD12	2.35	0.47
1:B:1499:THR:C	1:B:1501:GLN:H	2.18	0.47
1:C:2288:LEU:O	1:C:2292:LEU:HD13	2.14	0.47
1:A:51:GLN:NE2	6:A:4239:HOH:O	2.48	0.47
1:C:2312:ALA:CB	1:C:2362:GLN:HE21	2.28	0.47
1:D:3022:LYS:HD3	1:D:3022:LYS:C	2.34	0.47
1:D:3154:HIS:HD2	1:D:3197:ARG:CZ	2.27	0.47
1:A:68:PHE:HE1	1:A:85:ILE:HG22	1.80	0.47
1:A:471:PHE:CG	1:A:472:PRO:HD3	2.50	0.47
1:A:527:ALA:O	1:A:531:THR:HG23	2.15	0.47
1:B:1060:THR:OG1	1:B:1063:ILE:HG13	2.15	0.47
1:B:1286:VAL:HG22	1:B:1470:ILE:HG12	1.96	0.47
1:B:1556:ARG:HG3	1:B:1556:ARG:NH1	2.30	0.47
1:C:2339:LYS:HA	1:C:2367:HIS:CE1	2.50	0.47
1:D:3186:LEU:HD13	1:D:3468:VAL:HG23	1.96	0.47
1:B:1188:THR:HG21	1:B:1195:PRO:HG3	1.97	0.47
1:C:2143:VAL:HB	1:C:2237:GLU:HG2	1.96	0.47
1:A:45:ARG:NH2	1:A:58:ILE:HD13	2.30	0.47
1:A:371:GLU:CD	1:A:371:GLU:N	2.68	0.46
1:B:1161:THR:HG22	1:B:1180:PRO:HG2	1.97	0.46
1:D:3165:ARG:O	1:D:3165:ARG:NE	2.47	0.46
1:D:3331:GLY:O	1:D:3332:LEU:O	2.33	0.46
1:D:3526:ILE:O	1:D:3530:VAL:HG23	2.14	0.46
1:A:401:PRO:O	1:A:405:ARG:HG3	2.14	0.46
1:D:3328:VAL:HA	1:D:3332:LEU:O	2.14	0.46
1:C:2293:ALA:O	1:C:2296:LYS:HB2	2.15	0.46
1:B:1232:ASP:OD1	1:B:1264:ARG:NH2	2.49	0.46
1:C:2197:ARG:HG3	1:C:2197:ARG:HH11	1.79	0.46
1:D:3532:GLU:HG2	1:D:3549:LYS:HG2	1.96	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:145:SER:HB2	6:A:4288:HOH:O	2.15	0.46
1:A:229:GLN:O	1:A:229:GLN:HG2	2.15	0.46
1:B:1302:ILE:C	1:B:1304:GLU:H	2.15	0.46
1:C:2489:SER:HB3	1:C:2533:TYR:OH	2.16	0.46
1:D:3261:ASN:ND2	1:D:3264:ARG:HE	2.13	0.46
1:D:3350:LEU:HD13	1:D:3354:ARG:CZ	2.45	0.46
1:A:406:ALA:O	1:A:410:ILE:HG13	2.15	0.46
1:B:1150:TRP:CE2	1:B:1199:LEU:HD13	2.50	0.46
1:B:1328:VAL:HA	1:B:1332:LEU:O	2.15	0.46
1:C:2086:MSE:CE	1:C:2111:VAL:HG23	2.41	0.46
1:D:3346:LYS:HG3	1:D:3347:TYR:CD1	2.51	0.46
1:C:2295:GLN:NE2	1:C:2300:LYS:O	2.47	0.46
1:D:3321:ASN:O	1:D:3325:MSE:HG3	2.16	0.46
1:A:354:ARG:NE	1:A:358:ILE:HD11	2.31	0.46
1:B:1294:ALA:O	1:B:1297:VAL:HB	2.16	0.45
1:C:2120:CYS:O	1:C:2175:TYR:HB3	2.15	0.45
1:D:3136:SER:HA	1:D:3204:ASP:O	2.16	0.45
1:A:401:PRO:HA	1:A:436:LEU:HD23	1.98	0.45
1:B:1288:LEU:HG	1:B:1292:LEU:HD13	1.99	0.45
1:C:2302:ILE:CG2	1:C:2332:LEU:HD11	2.46	0.45
1:C:2315:ALA:HB3	1:C:2392:VAL:CG2	2.45	0.45
1:D:3263:PHE:CZ	1:D:3314:GLU:HA	2.52	0.45
1:A:327:MSE:HE3	1:A:337:ALA:HB1	1.99	0.45
1:C:2270:ARG:O	1:C:2485:HIS:HD2	1.99	0.45
1:A:219:MSE:HG2	1:B:1038:MSE:HE1	1.99	0.45
1:A:306:LYS:HB3	1:A:386:PRO:HA	1.98	0.45
1:C:2057:LYS:HE2	1:C:2059:GLU:HG2	1.97	0.45
1:C:2468:VAL:HA	1:C:2471:PHE:CE2	2.51	0.45
1:D:3051:GLN:HE21	1:D:3051:GLN:CA	2.27	0.45
1:A:52:GLY:HA3	1:B:1146:ILE:HG23	1.98	0.45
1:B:1079:LEU:O	1:B:1082:TYR:HB3	2.17	0.45
1:B:1392:VAL:O	1:B:1392:VAL:HG13	2.16	0.45
1:A:43:GLN:NE2	1:A:566:LEU:HD11	2.32	0.45
1:A:271:GLU:HB2	6:A:4614:HOH:O	2.16	0.45
1:A:520:GLN:H	1:A:520:GLN:NE2	2.15	0.45
1:C:2085:ILE:HD11	1:C:2086:MSE:SE	2.66	0.45
1:D:3068:PHE:CE1	1:D:3085:ILE:HG22	2.50	0.45
1:A:343:MSE:HE3	1:A:350:LEU:CD1	2.45	0.45
1:D:3297:VAL:HG23	1:D:3298:ILE:HG23	1.99	0.45
1:D:3306:LYS:HE3	1:D:3384:LEU:O	2.16	0.45
1:A:172:LEU:O	1:A:175:TYR:HB2	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1154:HIS:O	1:B:1197:ARG:CD	2.63	0.45
1:B:1229:GLN:HG3	1:B:1233:ASP:OD2	2.16	0.45
1:B:1422:PRO:HD2	1:B:1425:GLN:HE21	1.82	0.45
1:A:146:ILE:HG23	1:B:1052:GLY:HA3	1.99	0.45
1:A:194:ARG:HA	1:A:195:PRO:HD3	1.87	0.45
1:D:3412:GLU:HG3	1:D:3413:ARG:HG2	1.99	0.45
1:A:33:ARG:HD2	1:A:93:GLU:OE2	2.17	0.45
1:A:509:GLN:NE2	1:A:511:ARG:HE	2.15	0.45
1:B:1300:LYS:HG2	1:B:1304:GLU:HB3	1.97	0.45
1:B:1321:ASN:O	1:B:1325:MSE:HG3	2.17	0.45
1:C:2205:VAL:HG11	1:C:2231:TYR:CD1	2.52	0.44
1:A:86:MSE:HE3	1:A:131:LYS:NZ	2.31	0.44
1:B:1392:VAL:O	1:B:1392:VAL:HG22	2.16	0.44
1:C:2070:ARG:O	1:C:2074:LYS:HD3	2.17	0.44
1:B:1518:ASN:O	1:B:1521:GLU:HG2	2.18	0.44
1:B:1520:GLN:O	1:B:1524:ILE:HG12	2.18	0.44
1:C:2172:LEU:O	1:C:2175:TYR:HB2	2.17	0.44
1:D:3369:ALA:HA	1:D:3370:PRO:HD3	1.80	0.44
1:D:3474:VAL:O	1:D:3478:VAL:HG23	2.17	0.44
1:D:3528:ILE:O	1:D:3531:THR:CG2	2.65	0.44
1:A:154:HIS:CD2	6:A:4548:HOH:O	2.70	0.44
1:B:1069:HIS:HE1	1:B:1102:ASP:OD2	2.00	0.44
1:B:1342:TRP:CZ3	1:B:1349:LEU:HD21	2.53	0.44
1:C:2150:TRP:HA	1:C:2151:PRO:HD3	1.80	0.44
1:B:1458:ARG:HB2	1:B:1458:ARG:HH11	1.82	0.44
1:D:3036:LYS:HE3	1:D:3565:LEU:HG	2.00	0.44
1:D:3186:LEU:HD13	1:D:3468:VAL:CG2	2.47	0.44
1:B:1122:GLN:HG2	1:B:1125:HIS:HB2	1.99	0.44
1:C:2308:LEU:HD23	1:C:2389:ILE:HD11	1.99	0.44
1:C:2518:ASN:O	1:C:2521:GLU:HG2	2.17	0.44
1:C:2520:GLN:O	1:C:2524:ILE:HG12	2.18	0.44
1:A:263:PHE:HZ	1:A:317:LEU:HB2	1.81	0.44
1:A:350:LEU:HD22	1:A:354:ARG:CZ	2.48	0.44
1:C:2350:LEU:HD13	1:C:2354:ARG:CZ	2.48	0.44
1:D:3159:VAL:HG23	1:D:3184:LEU:HD21	1.99	0.44
1:D:3385:LYS:N	1:D:3386:PRO:CD	2.80	0.44
1:A:306:LYS:CG	1:A:386:PRO:HA	2.48	0.44
1:B:1471:PHE:CG	1:B:1472:PRO:HD3	2.53	0.44
1:D:3413:ARG:HA	1:D:3440:ARG:O	2.18	0.44
1:A:552:TYR:O	1:A:556:ARG:HG3	2.17	0.43
1:D:3199:LEU:HA	1:D:3200:PRO:HD3	1.89	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:3406:ALA:O	1:D:3409:SER:HB3	2.17	0.43
1:B:1239:MSE:SE	1:B:1252:ILE:HD13	2.69	0.43
1:D:3272:LYS:HE3	1:D:3272:LYS:HB3	1.92	0.43
1:A:478:VAL:HG13	1:A:483:THR:HB	1.99	0.43
1:A:482:ASN:HD21	4:A:602:NAI:H4B	1.84	0.43
1:B:1184:LEU:O	1:B:1187:TYR:HB2	2.18	0.43
1:B:1302:ILE:C	1:B:1304:GLU:N	2.69	0.43
1:B:1378:GLU:OE1	1:B:1402:ASP:HB3	2.18	0.43
1:B:1399:PHE:CG	1:B:1427:GLU:HB3	2.53	0.43
1:B:1522:VAL:O	1:B:1526:ILE:HG13	2.18	0.43
1:C:2334:GLU:O	1:C:2338:GLN:HG3	2.17	0.43
1:D:3071:ASN:O	1:D:3075:MSE:HG3	2.18	0.43
1:A:23:GLU:CG	1:A:27:PRO:HB2	2.48	0.43
1:A:188:THR:HG21	1:A:195:PRO:HG3	1.99	0.43
1:A:306:LYS:HE3	6:A:4713:HOH:O	2.18	0.43
1:B:1298:ILE:O	1:B:1299:SER:HB2	2.18	0.43
1:C:2066:LEU:O	1:C:2070:ARG:HB2	2.18	0.43
1:D:3157:ALA:HB2	1:D:3479:ILE:HD11	2.00	0.43
1:A:332:LEU:H	1:A:332:LEU:CD1	2.32	0.43
1:A:344:PHE:CZ	1:A:348:GLY:HA2	2.53	0.43
1:C:2556:ARG:HH11	1:C:2556:ARG:HG3	1.84	0.43
1:D:3156:LYS:HA	1:D:3156:LYS:HE2	2.00	0.43
1:A:184:LEU:O	1:A:187:TYR:HB2	2.19	0.43
1:A:506:GLU:O	1:A:511:ARG:HB2	2.19	0.43
1:B:1327:MSE:HE3	1:B:1337:ALA:HB1	2.01	0.43
1:B:1068:PHE:CE1	1:B:1085:ILE:HG22	2.53	0.43
1:B:1094:LYS:HD2	1:B:1558:TRP:CZ2	2.53	0.43
1:B:1300:LYS:HA	1:B:1301:PRO:HD3	1.91	0.43
1:A:288:LEU:CD2	1:A:322:LEU:CD1	2.95	0.43
1:B:1184:LEU:HD12	1:B:1200:PRO:HB3	2.01	0.43
1:C:2448:PRO:HD3	1:C:2464:GLN:NE2	2.33	0.43
1:D:3140:ARG:O	1:D:3140:ARG:HG3	2.18	0.43
1:B:1261:ASN:HA	1:B:1264:ARG:CG	2.48	0.43
1:B:1298:ILE:C	1:B:1300:LYS:N	2.71	0.43
1:B:1411:ASN:HB2	1:B:1414:PRO:HB3	2.00	0.43
1:C:2082:TYR:CE1	1:C:2086:MSE:HE2	2.54	0.43
1:D:3300:LYS:HZ2	1:D:3300:LYS:HB2	1.84	0.43
1:D:3310:LEU:HB3	1:D:3391:GLY:HA2	2.00	0.43
1:A:414:PRO:HD2	1:A:440:ARG:O	2.19	0.42
1:B:1405:ARG:O	1:B:1408:ALA:HB3	2.18	0.42
1:D:3310:LEU:HD21	1:D:3398:LEU:HB2	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:3481:CYS:HB3	1:D:3540:ALA:CB	2.49	0.42
1:B:1229:GLN:HE21	1:B:1229:GLN:HA	1.84	0.42
1:D:3104:ILE:O	1:D:3108:MSE:HB2	2.19	0.42
1:D:3143:VAL:CB	1:D:3237:GLU:HG2	2.49	0.42
1:D:3295:GLN:O	1:D:3295:GLN:HG3	2.19	0.42
1:B:1260:HIS:NE2	1:B:1264:ARG:HD2	2.34	0.42
1:D:3085:ILE:HD11	1:D:3111:VAL:CG1	2.48	0.42
1:D:3144:ARG:HA	1:D:3144:ARG:HD2	1.86	0.42
1:D:3186:LEU:O	1:D:3190:CYS:HB2	2.19	0.42
1:B:1138:SER:OG	1:B:1221:LEU:HD21	2.20	0.42
1:C:2418:ALA:O	1:C:2445:SER:HA	2.20	0.42
1:D:3462:PRO:HB2	6:D:4170:HOH:O	2.20	0.42
1:B:1097:TYR:CE2	1:B:1188:THR:HB	2.55	0.42
1:D:3085:ILE:CD1	1:D:3096:PHE:HE1	2.29	0.42
1:D:3107:LEU:HA	1:D:3110:ILE:HD12	2.01	0.42
1:A:174:VAL:O	1:A:174:VAL:HG12	2.19	0.42
1:A:302:ILE:HG13	1:A:340:LYS:HE2	2.02	0.42
1:B:1085:ILE:HD11	1:B:1086:MSE:SE	2.69	0.42
1:C:2165:ARG:NH1	4:C:2601:NAI:O1N	2.49	0.42
1:A:108:MSE:N	1:A:109:PRO:CD	2.83	0.42
1:A:313:GLY:HA2	6:A:4407:HOH:O	2.19	0.42
1:A:407:MSE:CE	1:A:410:ILE:HD12	2.50	0.42
1:B:1243:THR:OG1	1:B:1248:ARG:HA	2.19	0.42
1:B:1298:ILE:HG13	1:B:1299:SER:N	2.35	0.42
1:B:1412:GLU:O	1:B:1440:ARG:HB3	2.20	0.42
1:B:1535:TYR:CE2	1:B:1545:GLU:HG3	2.55	0.42
1:C:2085:ILE:HD12	1:C:2085:ILE:C	2.39	0.42
1:C:2542:ARG:HD3	1:C:2542:ARG:C	2.40	0.42
1:D:3551:LYS:O	1:D:3555:GLU:HG3	2.19	0.42
1:C:2184:LEU:HD12	1:C:2200:PRO:CG	2.40	0.42
1:C:2238:PHE:CE1	1:C:2242:ILE:HG13	2.54	0.42
1:A:270:ARG:HH21	1:A:487:SER:HA	1.85	0.42
1:B:1243:THR:HG23	1:B:1244:ASP:N	2.34	0.42
1:C:2096:PHE:O	1:C:2100:LEU:HD13	2.20	0.42
1:D:3307:ILE:HG23	1:D:3388:THR:HG22	2.01	0.42
1:B:1094:LYS:HD2	1:B:1558:TRP:HZ2	1.85	0.41
1:B:1104:ILE:HG23	1:B:1105:GLU:N	2.35	0.41
1:B:1194:ARG:HA	1:B:1195:PRO:HD3	1.85	0.41
1:B:1229:GLN:HA	1:B:1229:GLN:NE2	2.34	0.41
1:B:1232:ASP:CG	1:B:1264:ARG:HH22	2.21	0.41
1:A:556:ARG:HH11	1:A:556:ARG:CG	2.31	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1150:TRP:HA	1:B:1151:PRO:HD3	1.91	0.41
1:B:1400:THR:HB	1:B:1401:PRO:CD	2.51	0.41
1:C:2086:MSE:HE1	1:C:2111:VAL:CG2	2.44	0.41
1:C:2288:LEU:HG	1:C:2292:LEU:HD13	2.02	0.41
1:C:2112:TYR:CG	1:C:2113:THR:N	2.89	0.41
1:C:2314:GLU:HB2	4:C:2601:NAI:O1N	2.20	0.41
1:D:3556:ARG:HG3	1:D:3556:ARG:NH1	2.35	0.41
1:A:154:HIS:HD2	6:A:4548:HOH:O	2.02	0.41
1:B:1159:VAL:HG23	1:B:1184:LEU:HD21	2.01	0.41
1:B:1215:ASP:HA	1:B:1216:PRO:HD3	1.86	0.41
1:B:1349:LEU:HD22	1:B:1374:PRO:HG2	2.02	0.41
1:D:3167:LEU:HB2	1:D:3169:LEU:HD23	2.01	0.41
1:B:1286:VAL:HG21	1:B:1467:ASN:CA	2.39	0.41
1:D:3122:GLN:HE21	1:D:3122:GLN:HB3	1.64	0.41
1:A:556:ARG:CG	1:A:556:ARG:NH1	2.84	0.41
1:B:1077:SER:HB2	6:B:4206:HOH:O	2.21	0.41
1:C:2283:THR:CG2	4:C:2601:NAI:H4N	2.51	0.41
1:D:3361:TYR:H	1:D:3361:TYR:HD1	1.67	0.41
1:B:1354:ARG:NE	1:B:1358:ILE:HD11	2.35	0.41
1:B:1388:THR:HG23	1:B:1415:VAL:CG1	2.50	0.41
1:C:2294:ALA:O	1:C:2297:VAL:HG13	2.20	0.41
1:D:3549:LYS:HB2	6:D:4386:HOH:O	2.20	0.41
1:A:431:GLU:OE2	1:A:452:VAL:HG13	2.21	0.41
1:B:1383:ILE:CG2	1:B:1384:LEU:HD12	2.51	0.41
1:B:1430:ALA:O	1:B:1434:TYR:HD1	2.03	0.41
1:C:2055:PRO:HG2	1:D:3219:MSE:HE3	2.02	0.41
1:C:2295:GLN:OE1	1:C:2295:GLN:HA	2.21	0.41
1:A:164:GLU:HB2	1:A:225:ARG:CZ	2.51	0.41
1:A:302:ILE:HD11	1:A:327:MSE:SE	2.70	0.41
1:A:310:LEU:HB3	1:A:391:GLY:HA2	2.03	0.41
1:B:1061:GLN:HA	1:B:1064:GLN:HE21	1.85	0.41
1:B:1298:ILE:HD11	1:B:1305:HIS:HE2	1.84	0.41
1:B:1304:GLU:O	1:B:1305:HIS:HB2	2.20	0.41
1:B:1381:VAL:O	1:B:1385:LYS:HA	2.20	0.41
1:C:2108:MSE:N	1:C:2109:PRO:CD	2.84	0.41
1:C:2197:ARG:HG3	1:C:2197:ARG:NH1	2.36	0.41
1:C:2332:LEU:H	1:C:2332:LEU:CD1	2.26	0.41
1:C:2355:LYS:HA	1:C:2355:LYS:CE	2.40	0.41
1:D:3068:PHE:CD2	1:D:3099:ILE:CG1	3.00	0.41
1:D:3093:GLU:O	1:D:3096:PHE:HB3	2.21	0.41
1:D:3350:LEU:HD13	1:D:3354:ARG:NH1	2.36	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:3433:ALA:O	1:D:3437:THR:HG23	2.21	0.41
1:A:82:TYR:CZ	1:A:86:MSE:HG3	2.55	0.41
1:A:419:LEU:O	4:A:601:NAI:H2N	2.21	0.41
1:B:1298:ILE:HD12	1:B:1300:LYS:CB	2.50	0.41
1:B:1312:ALA:CB	1:B:1343:MSE:HE3	2.51	0.41
1:B:1435:THR:HG22	1:B:1454:LEU:CD2	2.50	0.41
1:C:2345:ASP:HB2	4:C:2601:NAI:O2B	2.21	0.41
1:C:2548:ASP:OD2	1:C:2551:LYS:HB2	2.21	0.41
1:A:302:ILE:HG23	1:A:303:SER:N	2.36	0.40
1:A:456:ASP:OD1	1:A:458:ARG:HD3	2.21	0.40
1:B:1286:VAL:HG22	1:B:1470:ILE:CG1	2.52	0.40
1:B:1430:ALA:O	1:B:1434:TYR:CD1	2.74	0.40
1:C:2159:VAL:HG23	1:C:2184:LEU:HD21	2.03	0.40
1:C:2346:LYS:HG2	4:C:2601:NAI:O2B	2.21	0.40
1:D:3205:VAL:HG11	1:D:3231:TYR:HD1	1.86	0.40
1:A:150:TRP:CE2	1:A:199:LEU:HD13	2.56	0.40
1:A:308:LEU:HB3	1:A:389:ILE:CD1	2.51	0.40
1:B:1317:LEU:HD21	1:B:1362:GLN:HG2	2.02	0.40
1:D:3099:ILE:HD12	1:D:3099:ILE:HA	1.82	0.40
1:A:233:ASP:HB3	6:A:4438:HOH:O	2.22	0.40
1:B:1055:PRO:HA	1:B:1056:PRO:HD3	1.99	0.40
1:B:1108:MSE:O	1:B:1112:TYR:HB3	2.21	0.40
1:B:1342:TRP:CH2	1:B:1370:PRO:HG3	2.56	0.40
1:C:2377:PHE:CZ	1:C:2389:ILE:HD11	2.56	0.40
1:D:3113:THR:CB	6:D:4542:HOH:O	2.48	0.40
1:A:68:PHE:CE2	1:A:99:ILE:HG23	2.56	0.40
1:A:412:GLU:O	1:A:440:ARG:HB3	2.22	0.40
1:C:2174:VAL:O	1:C:2174:VAL:HG12	2.21	0.40
1:C:2183:LYS:HE3	1:C:2255:GLU:OE1	2.21	0.40
1:C:2294:ALA:O	1:C:2297:VAL:CG1	2.69	0.40
1:D:3023:GLU:HA	1:D:3023:GLU:OE1	2.22	0.40
1:D:3108:MSE:N	1:D:3109:PRO:CD	2.85	0.40
1:A:400:THR:O	1:A:404:ILE:HG13	2.21	0.40
1:C:2320:ALA:O	1:C:2324:VAL:HG23	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	551/564 (98%)	522 (95%)	27 (5%)	2 (0%)	34	42
1	B	551/564 (98%)	518 (94%)	29 (5%)	4 (1%)	22	26
1	C	551/564 (98%)	530 (96%)	19 (3%)	2 (0%)	34	42
1	D	551/564 (98%)	518 (94%)	30 (5%)	3 (0%)	29	35
All	All	2204/2256 (98%)	2088 (95%)	105 (5%)	11 (0%)	29	35

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	3332	LEU
1	B	1392	VAL
1	B	1301	PRO
1	C	2392	VAL
1	B	1305	HIS
1	B	1397	ARG
1	C	2371	GLU
1	D	3103	ASP
1	D	3392	VAL
1	A	103	ASP
1	A	332	LEU

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	469/465 (101%)	447 (95%)	22 (5%)	26 37
1	B	469/465 (101%)	455 (97%)	14 (3%)	41 57
1	C	469/465 (101%)	450 (96%)	19 (4%)	30 43
1	D	469/465 (101%)	444 (95%)	25 (5%)	22 31
All	All	1876/1860 (101%)	1796 (96%)	80 (4%)	29 40

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

Mol	Chain	Res	Type
1	A	22	LYS
1	A	43	GLN
1	A	123	TYR
1	A	140	ARG
1	A	165	ARG
1	A	169	LEU
1	A	221	LEU
1	A	229	GLN
1	A	291	LEU
1	A	292	LEU
1	A	304	GLU
1	A	322	LEU
1	A	335	GLN
1	A	339	LYS
1	A	355	LYS
1	A	371	GLU
1	A	384	LEU
1	A	436	LEU
1	A	492	LEU
1	A	502	LEU
1	A	520	GLN
1	A	559	ARG
1	B	1070	ARG
1	B	1113	THR
1	B	1123	TYR
1	B	1154	HIS
1	B	1165	ARG
1	B	1169	LEU
1	B	1232	ASP
1	B	1248	ARG
1	B	1271	GLU
1	B	1340	LYS
1	B	1458	ARG

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Mol	Chain	Res	Type
1	B	1492	LEU
1	B	1502	LEU
1	B	1520	GLN
1	C	2022	LYS
1	C	2070	ARG
1	C	2086	MSE
1	C	2114	PRO
1	C	2123	TYR
1	C	2232	ASP
1	C	2251	LEU
1	C	2291	LEU
1	C	2297	VAL
1	C	2339	LYS
1	C	2355	LYS
1	C	2384	LEU
1	C	2398	LEU
1	C	2405	ARG
1	C	2507	LEU
1	C	2520	GLN
1	C	2547	GLU
1	C	2561	GLU
1	C	2571	GLU
1	D	3051	GLN
1	D	3066	LEU
1	D	3085	ILE
1	D	3099	ILE
1	D	3113	THR
1	D	3123	TYR
1	D	3133	LEU
1	D	3140	ARG
1	D	3153	ASN
1	D	3165	ARG
1	D	3221	LEU
1	D	3251	LEU
1	D	3296	LYS
1	D	3363	GLU
1	D	3385	LYS
1	D	3388	THR
1	D	3389	ILE
1	D	3425	GLN
1	D	3492	LEU
1	D	3520	GLN

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Mol	Chain	Res	Type
1	D	3529	LYS
1	D	3531	THR
1	D	3549	LYS
1	D	3559	ARG
1	D	3561	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (47) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	43	GLN
1	A	51	GLN
1	A	64	GLN
1	A	125	HIS
1	A	230	GLN
1	A	261	ASN
1	A	330	ASN
1	A	335	GLN
1	A	367	HIS
1	A	482	ASN
1	A	509	GLN
1	A	518	ASN
1	A	520	GLN
1	B	1043	GLN
1	B	1064	GLN
1	B	1069	HIS
1	B	1229	GLN
1	B	1249	ASN
1	B	1261	ASN
1	B	1335	GLN
1	B	1338	GLN
1	B	1425	GLN
1	B	1482	ASN
1	B	1509	GLN
1	B	1518	ASN
1	B	1520	GLN
1	C	2064	GLN
1	C	2229	GLN
1	C	2230	GLN
1	C	2261	ASN
1	C	2362	GLN
1	C	2425	GLN
1	C	2482	ASN

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Mol	Chain	Res	Type
1	C	2518	ASN
1	C	2520	GLN
1	D	3043	GLN
1	D	3051	GLN
1	D	3064	GLN
1	D	3122	GLN
1	D	3153	ASN
1	D	3230	GLN
1	D	3261	ASN
1	D	3305	HIS
1	D	3330	ASN
1	D	3425	GLN
1	D	3509	GLN
1	D	3520	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 20 ligands modelled in this entry, 4 are monoatomic - leaving 16 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
4	NAI	A	601	-	42,48,48	1.69	10 (23%)	47,73,73	1.35	3 (6%)
5	FUM	A	700	-	7,7,7	1.92	3 (42%)	8,8,8	0.82	0
4	NAI	B	1602	-	42,48,48	1.79	10 (23%)	47,73,73	1.38	5 (10%)
4	NAI	C	2601	-	42,48,48	1.79	13 (30%)	47,73,73	1.33	3 (6%)
2	LMR	A	701	3	8,8,8	1.35	1 (12%)	10,10,10	1.52	2 (20%)
5	FUM	B	1700	-	7,7,7	1.92	3 (42%)	8,8,8	0.85	0
5	FUM	C	2700	-	7,7,7	1.96	3 (42%)	8,8,8	1.00	0
2	LMR	C	2701	3	8,8,8	1.17	1 (12%)	10,10,10	1.66	2 (20%)
4	NAI	D	3601	-	42,48,48	1.79	12 (28%)	47,73,73	1.36	4 (8%)
2	LMR	B	1701	3	8,8,8	1.30	2 (25%)	10,10,10	1.55	2 (20%)
4	NAI	D	3602	-	42,48,48	1.78	11 (26%)	47,73,73	1.41	6 (12%)
5	FUM	D	3700	-	7,7,7	1.75	2 (28%)	8,8,8	0.99	0
4	NAI	A	602	-	42,48,48	1.80	12 (28%)	47,73,73	1.44	7 (14%)
4	NAI	C	2602	-	42,48,48	1.75	11 (26%)	47,73,73	1.42	6 (12%)
2	LMR	D	3701	3	8,8,8	1.19	1 (12%)	10,10,10	1.70	2 (20%)
4	NAI	B	1601	-	42,48,48	1.80	12 (28%)	47,73,73	1.36	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
4	NAI	A	601	-	-	4/25/72/72	0/5/5/5
5	FUM	A	700	-	-	0/5/5/5	-
4	NAI	B	1602	-	-	6/25/72/72	0/5/5/5
4	NAI	C	2601	-	-	3/25/72/72	0/5/5/5
2	LMR	A	701	3	-	1/8/8/8	-
5	FUM	B	1700	-	-	0/5/5/5	-
5	FUM	C	2700	-	-	2/5/5/5	-
2	LMR	C	2701	3	-	3/8/8/8	-
4	NAI	D	3601	-	-	4/25/72/72	0/5/5/5
2	LMR	B	1701	3	-	1/8/8/8	-
4	NAI	D	3602	-	-	3/25/72/72	0/5/5/5
5	FUM	D	3700	-	-	2/5/5/5	-
4	NAI	A	602	-	-	9/25/72/72	0/5/5/5
4	NAI	C	2602	-	-	7/25/72/72	0/5/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	LMR	D	3701	3	-	3/8/8/8	-
4	NAI	B	1601	-	-	5/25/72/72	0/5/5/5

All (107) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	3602	NAI	C6N-C5N	4.42	1.41	1.33
4	A	602	NAI	C6N-C5N	4.41	1.41	1.33
4	C	2602	NAI	C6N-C5N	4.30	1.41	1.33
4	B	1602	NAI	O4B-C1B	4.27	1.47	1.41
4	C	2601	NAI	C4N-C3N	-4.27	1.41	1.49
4	D	3601	NAI	O4B-C1B	4.26	1.47	1.41
4	B	1602	NAI	C6N-C5N	4.25	1.40	1.33
4	A	601	NAI	C6N-C5N	4.12	1.40	1.33
4	B	1601	NAI	C4N-C3N	-4.06	1.42	1.49
4	C	2602	NAI	O4B-C1B	4.03	1.46	1.41
4	D	3601	NAI	C4N-C3N	-3.97	1.42	1.49
4	D	3601	NAI	C6N-C5N	3.95	1.40	1.33
4	B	1601	NAI	C6N-C5N	3.86	1.40	1.33
4	B	1601	NAI	C2A-N3A	3.74	1.38	1.32
4	C	2601	NAI	C6N-C5N	3.72	1.40	1.33
4	A	601	NAI	C4N-C3N	-3.72	1.42	1.49
4	D	3601	NAI	C2A-N3A	3.71	1.38	1.32
4	D	3602	NAI	O4B-C1B	3.67	1.46	1.41
4	C	2602	NAI	C4N-C3N	-3.65	1.42	1.49
4	B	1602	NAI	C4N-C3N	-3.64	1.42	1.49
4	D	3602	NAI	C4N-C3N	-3.62	1.42	1.49
4	A	602	NAI	O4B-C1B	3.60	1.46	1.41
4	C	2601	NAI	O4B-C1B	3.58	1.46	1.41
4	A	602	NAI	C4N-C3N	-3.55	1.43	1.49
4	A	602	NAI	C2A-N3A	3.52	1.37	1.32
4	A	601	NAI	C2A-N3A	3.32	1.37	1.32
4	A	601	NAI	C6N-N1N	3.31	1.45	1.37
4	B	1601	NAI	O4B-C1B	3.29	1.45	1.41
4	C	2601	NAI	C7N-C3N	3.24	1.55	1.48
4	B	1602	NAI	C2A-N3A	3.22	1.37	1.32
4	C	2602	NAI	C7N-C3N	3.16	1.55	1.48
4	A	602	NAI	C7N-C3N	3.16	1.55	1.48
4	D	3602	NAI	C7N-C3N	3.14	1.55	1.48
4	D	3602	NAI	C2A-N3A	3.11	1.37	1.32
4	C	2602	NAI	C2A-N3A	3.08	1.37	1.32
4	D	3601	NAI	C6N-N1N	3.06	1.44	1.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	2601	NAI	C2A-N3A	3.05	1.37	1.32
4	A	601	NAI	C7N-C3N	3.05	1.55	1.48
4	D	3601	NAI	C7N-C3N	3.02	1.55	1.48
5	C	2700	FUM	C5-C6	3.01	1.55	1.48
4	B	1602	NAI	C4N-C5N	-2.97	1.41	1.48
4	A	601	NAI	C5A-C4A	-2.95	1.33	1.40
4	C	2601	NAI	C5A-C4A	-2.94	1.33	1.40
4	A	602	NAI	C6N-N1N	2.90	1.44	1.37
4	B	1601	NAI	C6N-N1N	2.89	1.44	1.37
4	B	1601	NAI	C7N-C3N	2.89	1.54	1.48
4	D	3602	NAI	C6N-N1N	2.88	1.44	1.37
5	B	1700	FUM	OXT-C	-2.86	1.22	1.30
5	D	3700	FUM	C5-C6	2.83	1.54	1.48
4	B	1602	NAI	C7N-C3N	2.79	1.54	1.48
4	C	2602	NAI	C5A-C4A	-2.76	1.33	1.40
4	D	3602	NAI	C5A-C4A	-2.74	1.33	1.40
4	D	3601	NAI	C5A-C4A	-2.74	1.33	1.40
4	C	2601	NAI	C6N-N1N	2.67	1.44	1.37
4	B	1602	NAI	C5A-C4A	-2.67	1.33	1.40
5	A	700	FUM	OXT-C	-2.62	1.23	1.30
4	A	601	NAI	O4B-C1B	2.60	1.44	1.41
4	B	1602	NAI	C2N-C3N	2.60	1.42	1.34
4	B	1601	NAI	C4N-C5N	-2.59	1.42	1.48
4	C	2601	NAI	C2B-C1B	-2.58	1.49	1.53
4	D	3601	NAI	C4N-C5N	-2.57	1.42	1.48
4	B	1601	NAI	C5A-C4A	-2.54	1.34	1.40
4	A	602	NAI	C5A-C4A	-2.53	1.34	1.40
4	D	3602	NAI	C4N-C5N	-2.52	1.42	1.48
4	A	602	NAI	C4N-C5N	-2.51	1.42	1.48
4	D	3602	NAI	C2N-C3N	2.51	1.41	1.34
5	C	2700	FUM	C5-C4	2.47	1.40	1.33
4	D	3601	NAI	C5A-N7A	-2.47	1.30	1.39
5	A	700	FUM	C5-C6	2.46	1.54	1.48
4	A	602	NAI	C2N-C3N	2.44	1.41	1.34
4	C	2601	NAI	C4N-C5N	-2.40	1.42	1.48
4	C	2602	NAI	C2N-C3N	2.38	1.41	1.34
5	B	1700	FUM	C5-C6	2.38	1.53	1.48
4	A	602	NAI	O4D-C1D	2.38	1.47	1.42
4	B	1602	NAI	C6N-N1N	2.37	1.43	1.37
4	B	1601	NAI	C5A-N7A	-2.37	1.31	1.39
5	A	700	FUM	C5-C4	2.36	1.40	1.33
4	D	3602	NAI	O4D-C1D	2.35	1.47	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	2601	NAI	C5A-N7A	-2.35	1.31	1.39
2	B	1701	LMR	O1B-C1	-2.34	1.22	1.30
4	A	602	NAI	C5A-N7A	-2.30	1.31	1.39
5	B	1700	FUM	C5-C4	2.28	1.40	1.33
4	C	2601	NAI	O4B-C4B	2.27	1.50	1.45
4	B	1601	NAI	C2A-N1A	2.27	1.38	1.33
4	B	1601	NAI	O4D-C1D	2.26	1.47	1.42
4	B	1602	NAI	C5A-N7A	-2.26	1.31	1.39
4	A	601	NAI	C5A-N7A	-2.23	1.31	1.39
4	C	2602	NAI	C5A-N7A	-2.23	1.31	1.39
4	D	3601	NAI	O4D-C1D	2.22	1.47	1.42
2	B	1701	LMR	O4A-C4	-2.20	1.23	1.30
2	D	3701	LMR	O1B-C1	-2.20	1.23	1.30
4	D	3602	NAI	C5A-N7A	-2.18	1.31	1.39
4	C	2601	NAI	C2N-C3N	2.16	1.41	1.34
4	D	3601	NAI	C2A-N1A	2.13	1.37	1.33
5	D	3700	FUM	C5-C4	2.13	1.39	1.33
4	D	3601	NAI	C2N-C3N	2.12	1.40	1.34
4	A	601	NAI	C4N-C5N	-2.12	1.43	1.48
4	C	2602	NAI	C4N-C5N	-2.10	1.43	1.48
4	A	602	NAI	C2A-N1A	2.10	1.37	1.33
4	C	2602	NAI	C6N-N1N	2.09	1.42	1.37
2	C	2701	LMR	O1B-C1	-2.09	1.23	1.30
2	A	701	LMR	O1B-C1	-2.08	1.23	1.30
4	C	2602	NAI	C2B-C1B	-2.08	1.50	1.53
4	A	601	NAI	C2A-N1A	2.07	1.37	1.33
4	C	2601	NAI	C2A-N1A	2.03	1.37	1.33
5	C	2700	FUM	O8-C6	-2.01	1.25	1.30
4	B	1601	NAI	C2N-C3N	2.00	1.40	1.34

All (46) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	601	NAI	N3A-C2A-N1A	-5.26	120.46	128.68
4	C	2601	NAI	N3A-C2A-N1A	-5.20	120.55	128.68
4	A	602	NAI	N3A-C2A-N1A	-5.14	120.64	128.68
4	D	3602	NAI	N3A-C2A-N1A	-5.13	120.66	128.68
4	B	1601	NAI	N3A-C2A-N1A	-5.11	120.69	128.68
4	B	1602	NAI	N3A-C2A-N1A	-5.10	120.70	128.68
4	C	2602	NAI	N3A-C2A-N1A	-5.10	120.71	128.68
4	D	3601	NAI	N3A-C2A-N1A	-5.01	120.86	128.68
4	D	3602	NAI	C4A-C5A-N7A	4.18	113.76	109.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	2601	NAI	C4A-C5A-N7A	4.18	113.76	109.40
4	B	1602	NAI	C4A-C5A-N7A	4.18	113.75	109.40
4	D	3601	NAI	C4A-C5A-N7A	4.18	113.75	109.40
4	B	1601	NAI	C4A-C5A-N7A	4.16	113.74	109.40
4	C	2602	NAI	C4A-C5A-N7A	4.15	113.72	109.40
4	A	601	NAI	C4A-C5A-N7A	4.14	113.71	109.40
4	A	602	NAI	C4A-C5A-N7A	4.11	113.68	109.40
2	D	3701	LMR	O1B-C1-C2	3.73	120.91	112.72
2	C	2701	LMR	O1B-C1-C2	3.69	120.82	112.72
2	B	1701	LMR	O1B-C1-C2	3.32	120.01	112.72
2	A	701	LMR	O1B-C1-C2	3.27	119.90	112.72
4	C	2602	NAI	C3B-C2B-C1B	3.13	105.70	100.98
4	A	602	NAI	C3B-C2B-C1B	3.07	105.60	100.98
4	D	3602	NAI	C3B-C2B-C1B	2.73	105.08	100.98
4	C	2602	NAI	C3D-C2D-C1D	2.63	106.42	101.43
4	B	1602	NAI	C3B-C2B-C1B	2.58	104.86	100.98
4	D	3601	NAI	C3B-C2B-C1B	2.48	104.72	100.98
4	B	1602	NAI	C3D-C2D-C1D	2.45	106.07	101.43
4	D	3602	NAI	C3D-C2D-C1D	2.44	106.06	101.43
4	B	1602	NAI	C3N-C2N-N1N	-2.44	119.62	123.10
4	B	1601	NAI	C3B-C2B-C1B	2.41	104.60	100.98
4	A	602	NAI	C3D-C2D-C1D	2.37	105.93	101.43
2	B	1701	LMR	O1B-C1-O1A	-2.28	118.90	124.09
2	D	3701	LMR	O1B-C1-O1A	-2.23	119.02	124.09
4	D	3601	NAI	C3N-C2N-N1N	-2.19	119.97	123.10
4	D	3602	NAI	C3N-C2N-N1N	-2.15	120.02	123.10
4	A	602	NAI	O4D-C1D-N1N	2.15	112.26	108.06
2	C	2701	LMR	O1B-C1-O1A	-2.14	119.23	124.09
4	C	2601	NAI	C3N-C2N-N1N	-2.14	120.04	123.10
2	A	701	LMR	O1B-C1-O1A	-2.13	119.25	124.09
4	D	3602	NAI	O4D-C1D-N1N	2.11	112.19	108.06
4	A	601	NAI	C1D-N1N-C2N	-2.11	117.60	121.11
4	C	2602	NAI	C3N-C2N-N1N	-2.08	120.13	123.10
4	A	602	NAI	C2D-C3D-C4D	2.07	106.67	102.64
4	A	602	NAI	C3N-C2N-N1N	-2.06	120.16	123.10
4	C	2602	NAI	O4D-C1D-N1N	2.05	112.06	108.06
4	B	1601	NAI	C3N-C2N-N1N	-2.01	120.22	123.10

There are no chirality outliers.

All (53) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	D	3701	LMR	O1A-C1-C2-C3
4	A	602	NAI	C5B-O5B-PA-O1A
4	A	602	NAI	C5B-O5B-PA-O2A
4	A	602	NAI	C5D-O5D-PN-O2N
4	A	602	NAI	O4D-C1D-N1N-C2N
4	C	2602	NAI	C5D-O5D-PN-O3
4	C	2602	NAI	C5D-O5D-PN-O1N
4	A	602	NAI	C3D-C4D-C5D-O5D
4	D	3602	NAI	O4D-C1D-N1N-C2N
4	B	1601	NAI	O4B-C4B-C5B-O5B
5	C	2700	FUM	O-C-C4-C5
5	C	2700	FUM	OXT-C-C4-C5
4	A	602	NAI	O4D-C4D-C5D-O5D
2	C	2701	LMR	O1B-C1-C2-C3
2	D	3701	LMR	O1B-C1-C2-C3
4	A	602	NAI	C4D-C5D-O5D-PN
4	A	602	NAI	PA-O3-PN-O5D
4	B	1602	NAI	C4D-C5D-O5D-PN
4	A	602	NAI	C5B-O5B-PA-O3
4	C	2602	NAI	C5B-O5B-PA-O3
5	D	3700	FUM	O-C-C4-C5
4	C	2602	NAI	C5D-O5D-PN-O2N
5	D	3700	FUM	OXT-C-C4-C5
4	C	2602	NAI	O4D-C1D-N1N-C6N
4	D	3601	NAI	O4D-C1D-N1N-C2N
4	B	1602	NAI	O4D-C1D-N1N-C6N
4	B	1602	NAI	C2D-C1D-N1N-C6N
4	A	601	NAI	O4D-C1D-N1N-C2N
4	B	1601	NAI	O4D-C1D-N1N-C2N
4	C	2601	NAI	O4D-C1D-N1N-C2N
4	C	2602	NAI	PA-O3-PN-O1N
4	B	1601	NAI	C3B-C4B-C5B-O5B
4	C	2601	NAI	O4B-C4B-C5B-O5B
4	D	3601	NAI	O4B-C4B-C5B-O5B
2	C	2701	LMR	O1A-C1-C2-C3
4	B	1602	NAI	O4D-C1D-N1N-C2N
2	C	2701	LMR	O1B-C1-C2-O2
2	D	3701	LMR	O1B-C1-C2-O2
4	D	3602	NAI	O4B-C4B-C5B-O5B
4	A	601	NAI	C5D-O5D-PN-O2N
4	A	601	NAI	C2N-C3N-C7N-N7N
4	B	1601	NAI	C5D-O5D-PN-O2N
4	B	1601	NAI	C2N-C3N-C7N-N7N

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Mol	Chain	Res	Type	Atoms
4	B	1602	NAI	C5B-O5B-PA-O1A
4	C	2601	NAI	C2N-C3N-C7N-N7N
4	C	2602	NAI	C5B-O5B-PA-O1A
4	D	3601	NAI	C5D-O5D-PN-O2N
4	D	3601	NAI	C2N-C3N-C7N-N7N
4	D	3602	NAI	C2N-C3N-C7N-N7N
4	A	601	NAI	O4B-C4B-C5B-O5B
4	B	1602	NAI	C2D-C1D-N1N-C2N
2	A	701	LMR	O1B-C1-C2-C3
2	B	1701	LMR	O1B-C1-C2-C3

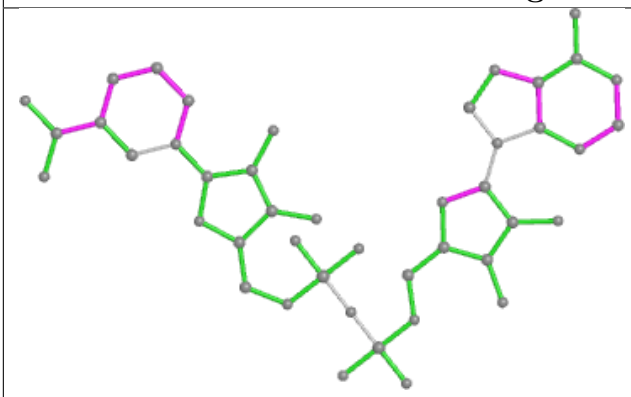
There are no ring outliers.

10 monomers are involved in 18 short contacts:

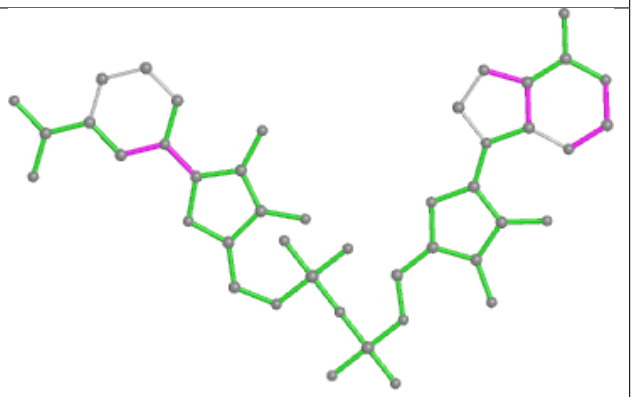
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	601	NAI	3	0
4	C	2601	NAI	6	0
2	A	701	LMR	1	0
2	C	2701	LMR	2	0
4	D	3601	NAI	4	0
2	B	1701	LMR	2	0
4	A	602	NAI	1	0
4	C	2602	NAI	1	0
2	D	3701	LMR	1	0
4	B	1601	NAI	1	0

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.

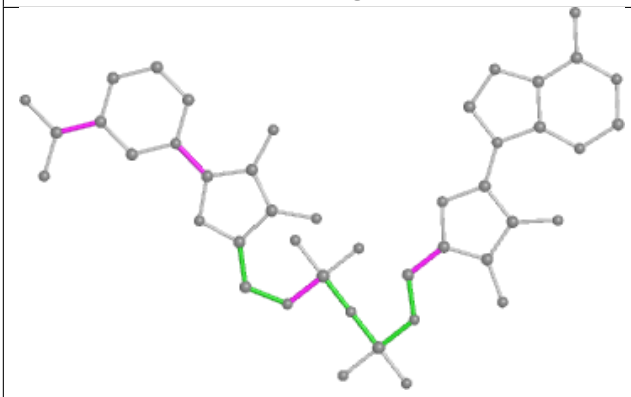
Ligand NAI A 601



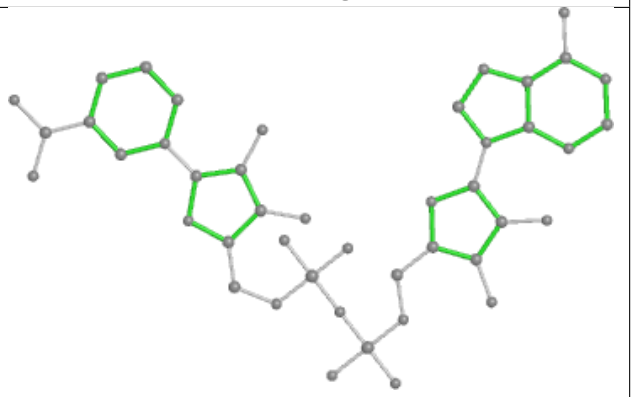
Bond lengths



Bond angles

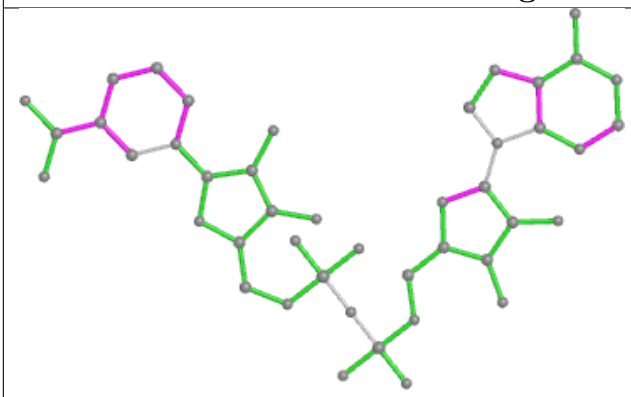


Torsions

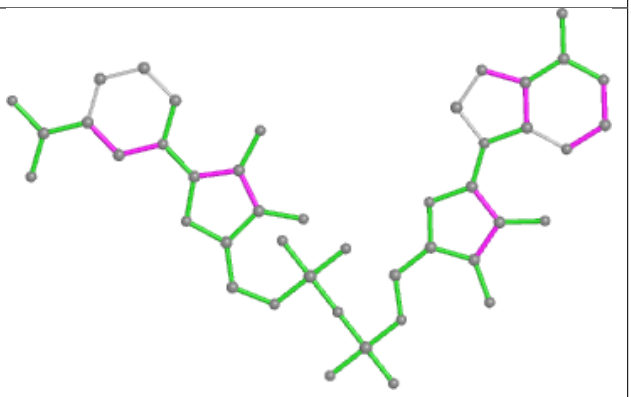


Rings

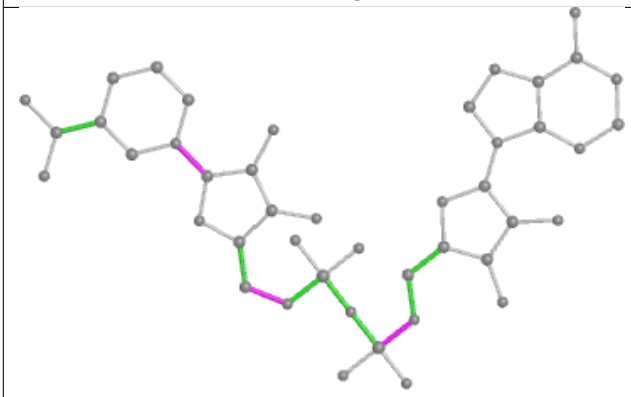
Ligand NAI B 1602



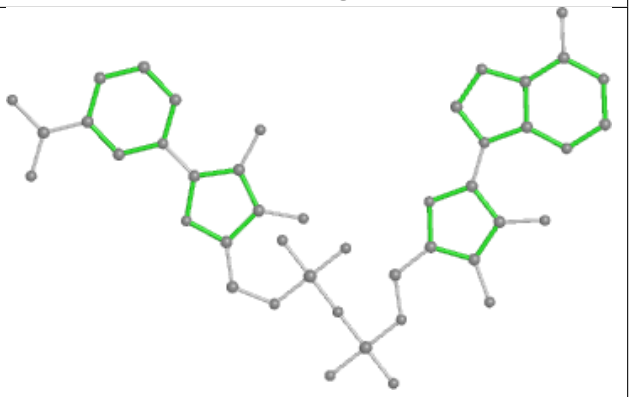
Bond lengths



Bond angles

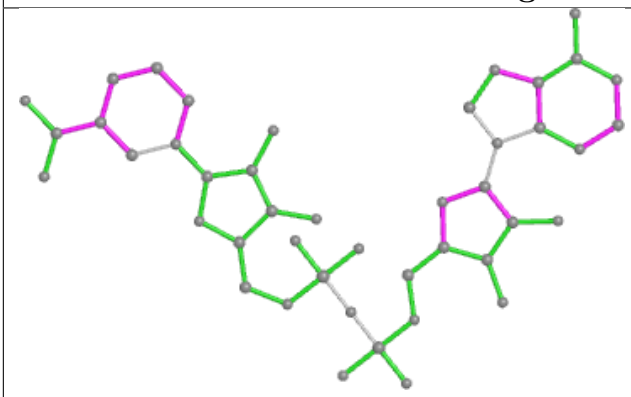


Torsions

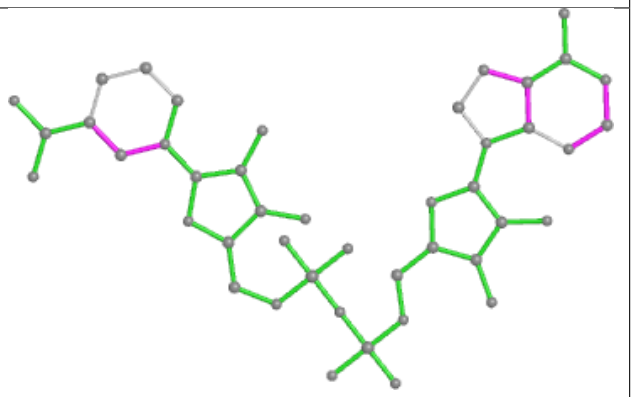


Rings

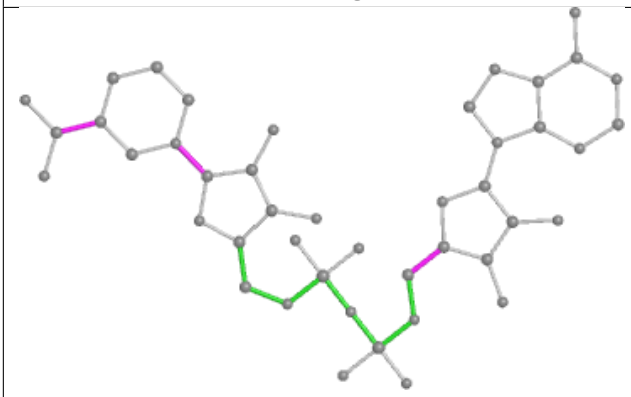
Ligand NAI C 2601



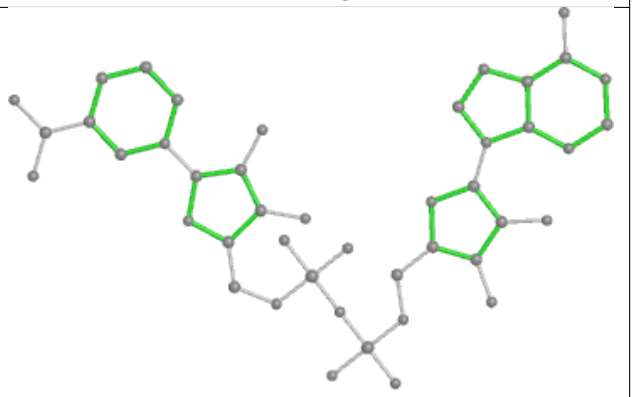
Bond lengths



Bond angles

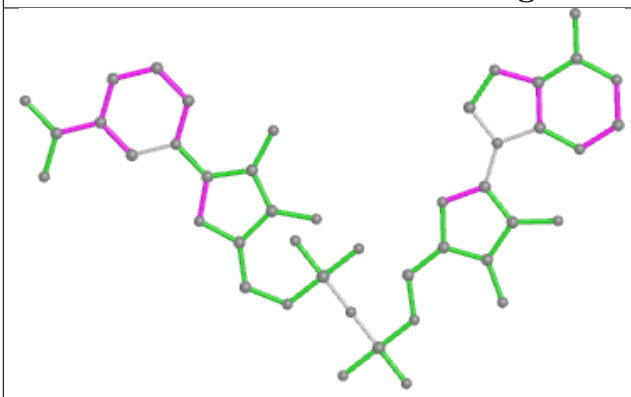


Torsions

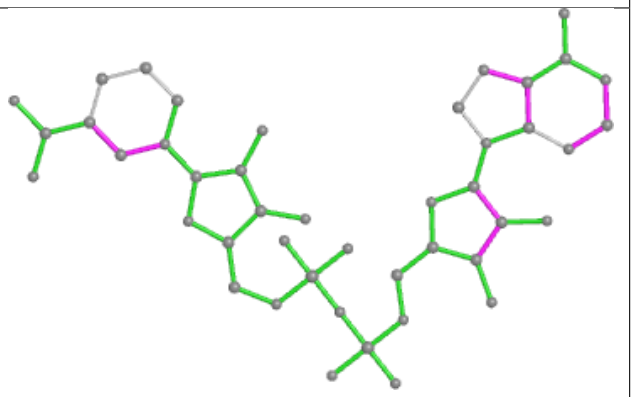


Rings

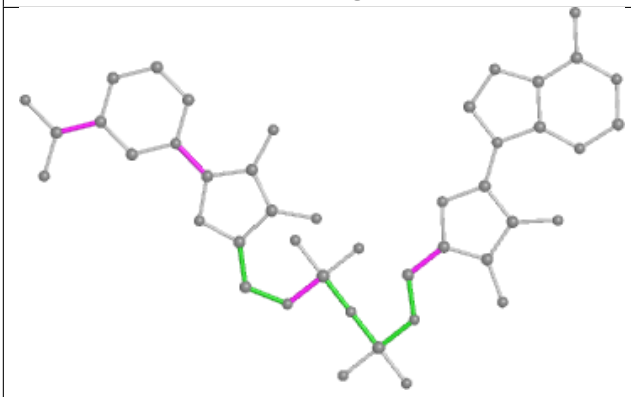
Ligand NAI D 3601



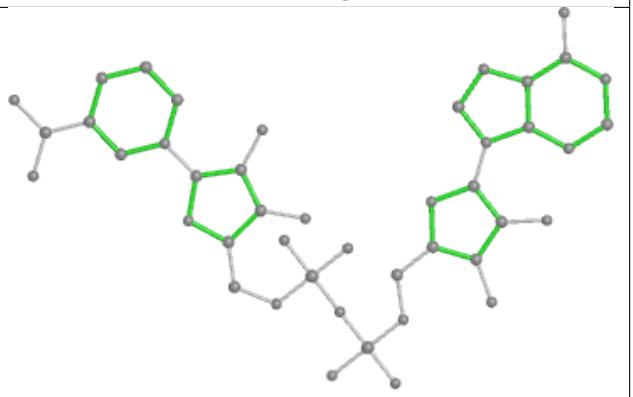
Bond lengths



Bond angles

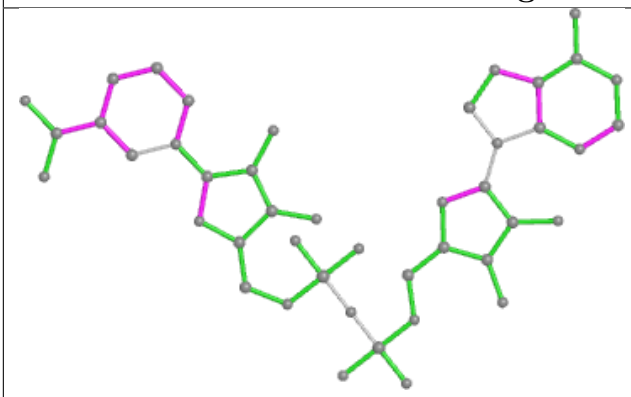


Torsions

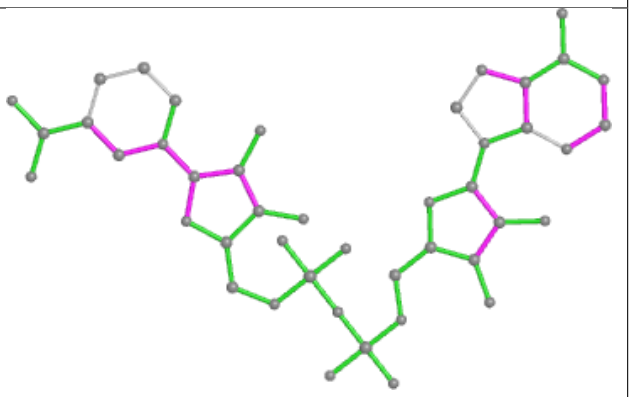


Rings

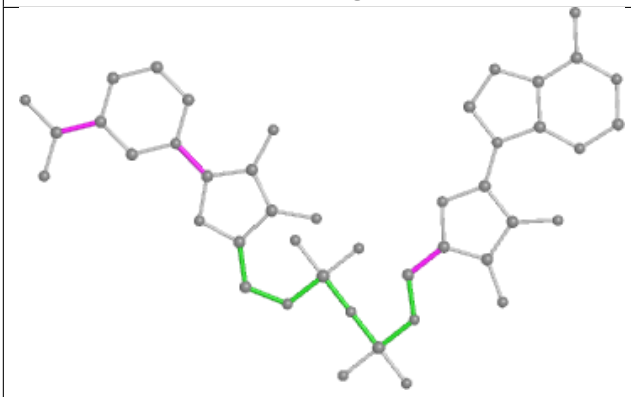
Ligand NAI D 3602



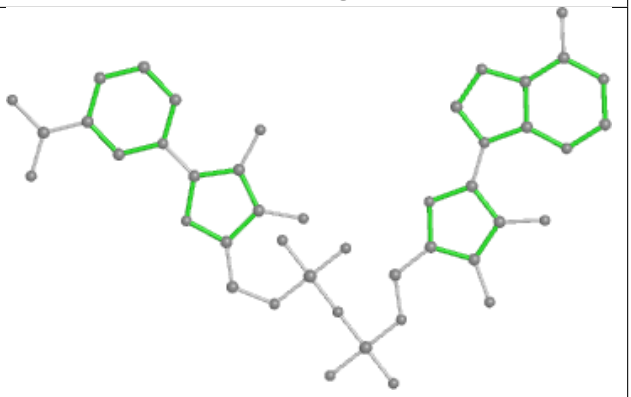
Bond lengths



Bond angles

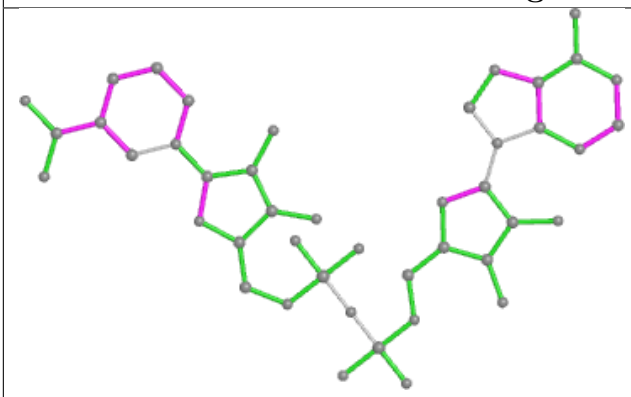


Torsions

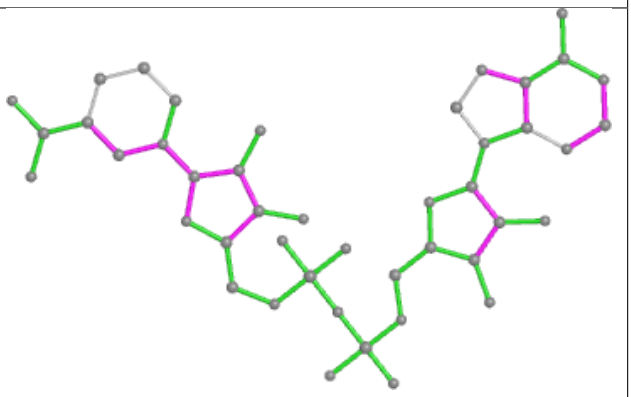


Rings

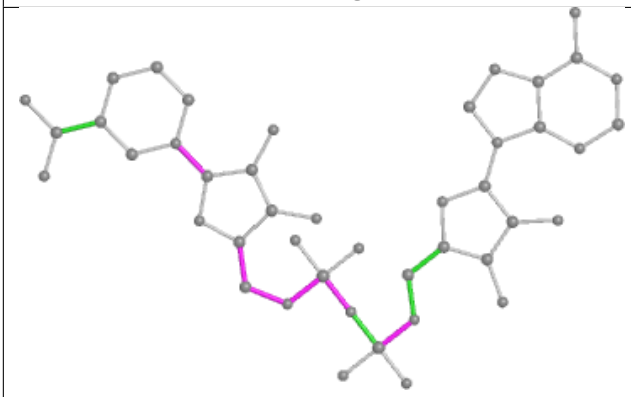
Ligand NAI A 602



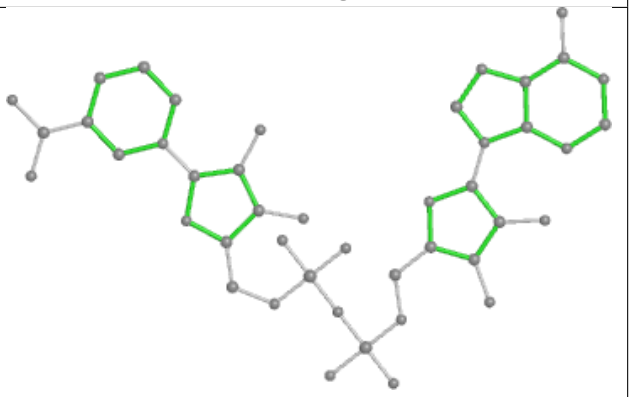
Bond lengths



Bond angles

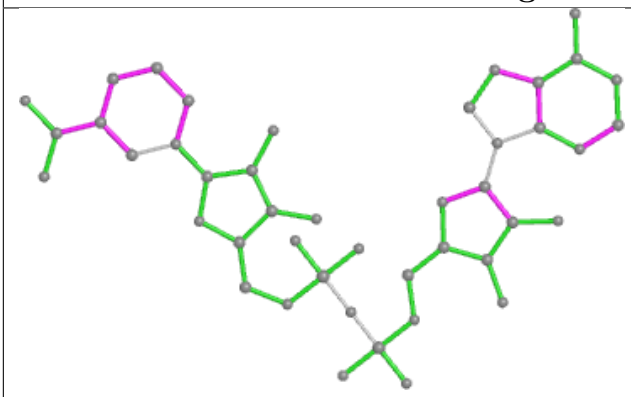


Torsions

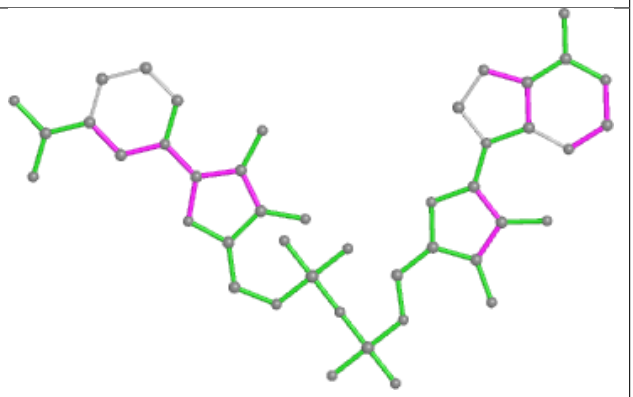


Rings

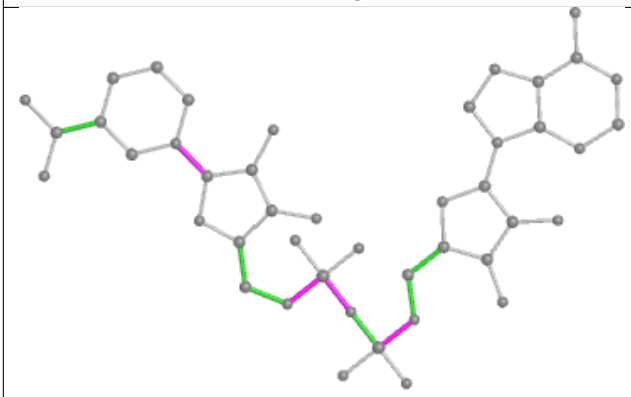
Ligand NAI C 2602



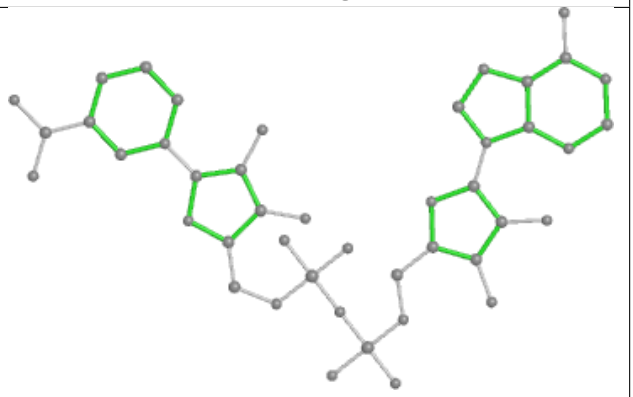
Bond lengths



Bond angles

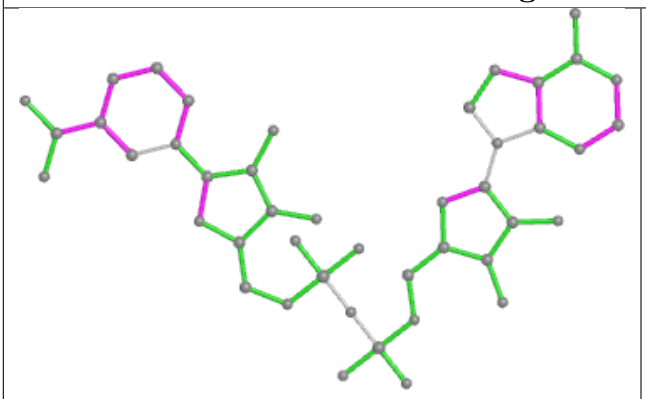


Torsions

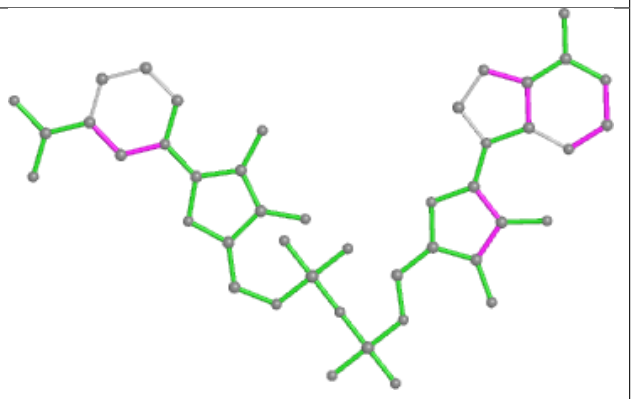


Rings

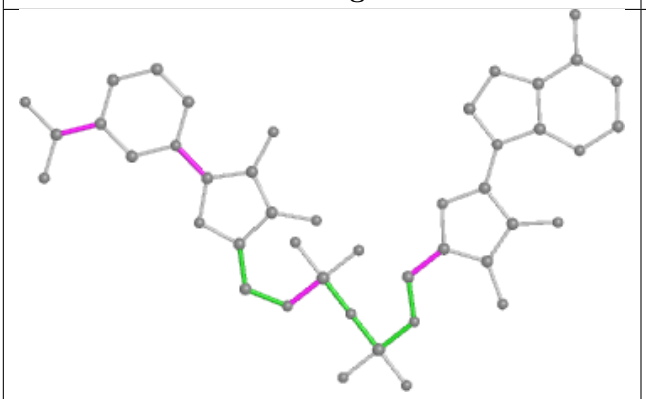
Ligand NAI B 1601



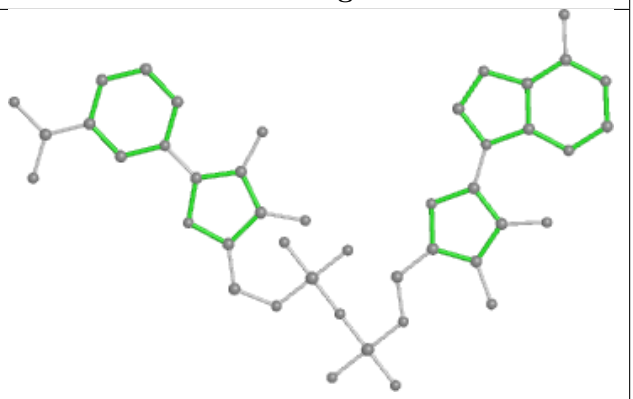
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	539/564 (95%)	0.10	20 (3%)	41	48	16, 33, 61, 79	0
1	B	539/564 (95%)	0.25	22 (4%)	37	44	18, 36, 67, 97	0
1	C	539/564 (95%)	-0.01	13 (2%)	59	66	16, 31, 54, 68	0
1	D	539/564 (95%)	0.30	38 (7%)	16	21	20, 37, 69, 93	0
All	All	2156/2256 (95%)	0.16	93 (4%)	35	42	16, 34, 64, 97	0

All (93) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	1301	PRO	7.3
1	B	1303	SER	7.2
1	D	3302	ILE	5.7
1	A	301	PRO	4.8
1	A	304	GLU	4.7
1	A	510	GLY	4.7
1	D	3301	PRO	4.4
1	B	1331	GLY	4.3
1	A	303	SER	4.3
1	B	1302	ILE	4.2
1	C	2303	SER	4.1
1	D	3021	ILE	4.0
1	A	302	ILE	3.9
1	D	3303	SER	3.9
1	D	3304	GLU	3.6
1	A	507	LEU	3.6
1	D	3374	PRO	3.5
1	B	1390	ILE	3.5
1	C	2304	GLU	3.3
1	B	1372	SER	3.3
1	D	3504	ASP	3.2

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Mol	Chain	Res	Type	RSRZ
1	A	509	GLN	3.2
1	D	3300	LYS	3.2
1	B	1332	LEU	3.1
1	B	1373	ILE	3.1
1	A	452	VAL	3.1
1	D	3509	GLN	3.0
1	C	2301	PRO	3.0
1	C	2021	ILE	2.9
1	C	2390	ILE	2.9
1	D	3359	ASP	2.7
1	B	1505	GLU	2.7
1	D	3373	ILE	2.7
1	A	504	ASP	2.7
1	C	2547	GLU	2.7
1	B	1330	ASN	2.7
1	C	2509	GLN	2.7
1	D	3361	TYR	2.7
1	B	1417	PHE	2.7
1	D	3460	PHE	2.7
1	D	3452	VAL	2.7
1	B	1283	THR	2.6
1	B	1503	THR	2.6
1	C	2457	GLY	2.6
1	B	1370	PRO	2.6
1	A	371	GLU	2.5
1	D	3353	GLY	2.5
1	A	331	GLY	2.5
1	D	3355	LYS	2.5
1	B	1304	GLU	2.4
1	D	3368	SER	2.4
1	B	1296	LYS	2.4
1	A	357	LYS	2.4
1	B	1454	LEU	2.4
1	D	3357	LYS	2.4
1	B	1354	ARG	2.3
1	D	3356	ALA	2.3
1	D	3328	VAL	2.3
1	D	3298	ILE	2.3
1	D	3023	GLU	2.3
1	D	3339	LYS	2.3
1	D	3286	VAL	2.3
1	D	3454	LEU	2.3

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Mol	Chain	Res	Type	RSRZ
1	D	3417	PHE	2.3
1	D	3468	VAL	2.3
1	D	3390	ILE	2.2
1	A	458	ARG	2.2
1	C	2302	ILE	2.2
1	B	1507	LEU	2.2
1	A	409	SER	2.2
1	D	3456	ASP	2.2
1	D	3465	GLY	2.2
1	D	3335	GLN	2.2
1	A	260	HIS	2.2
1	D	3299	SER	2.2
1	D	3214	LYS	2.1
1	D	3332	LEU	2.1
1	A	415	VAL	2.1
1	C	2417	PHE	2.1
1	A	332	LEU	2.1
1	A	503	THR	2.1
1	B	1371	GLU	2.1
1	D	3331	GLY	2.1
1	D	3363	GLU	2.1
1	D	3510	GLY	2.1
1	A	456	ASP	2.0
1	B	1308	LEU	2.0
1	D	3406	ALA	2.0
1	B	1471	PHE	2.0
1	C	2505	GLU	2.0
1	A	353	GLY	2.0
1	C	2353	GLY	2.0
1	C	2355	LYS	2.0

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

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

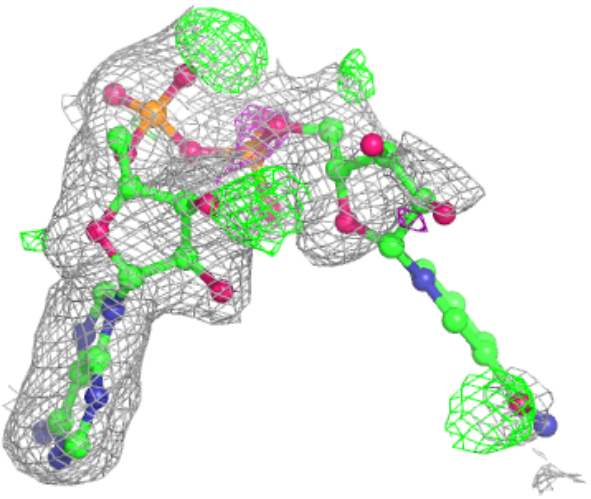
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

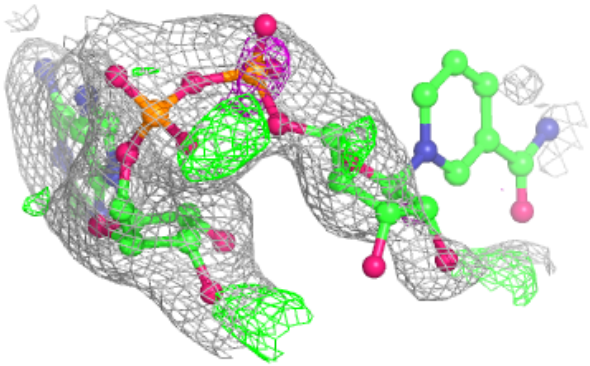
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	NAI	A	602	44/44	0.87	0.17	37,54,82,82	9
4	NAI	C	2602	44/44	0.88	0.17	36,58,91,92	9
4	NAI	B	1602	44/44	0.90	0.14	30,55,79,79	9
4	NAI	D	3602	44/44	0.90	0.15	30,51,79,79	9
5	FUM	A	700	8/8	0.91	0.19	32,35,37,39	0
4	NAI	B	1601	44/44	0.92	0.15	28,35,41,42	0
5	FUM	B	1700	8/8	0.92	0.20	42,44,46,46	0
4	NAI	D	3601	44/44	0.95	0.12	22,39,45,47	0
4	NAI	C	2601	44/44	0.95	0.13	22,30,36,37	0
4	NAI	A	601	44/44	0.96	0.11	24,30,32,36	0
2	LMR	D	3701	9/9	0.96	0.15	24,30,32,35	0
5	FUM	C	2700	8/8	0.96	0.15	34,38,41,42	0
2	LMR	B	1701	9/9	0.97	0.13	25,28,32,33	0
2	LMR	C	2701	9/9	0.97	0.13	18,20,24,25	0
5	FUM	D	3700	8/8	0.97	0.24	35,37,38,38	0
2	LMR	A	701	9/9	0.98	0.11	15,20,21,22	0
3	MN	B	1604	1/1	0.99	0.14	31,31,31,31	0
3	MN	C	2604	1/1	0.99	0.14	27,27,27,27	0
3	MN	D	3604	1/1	0.99	0.12	30,30,30,30	0
3	MN	A	604	1/1	1.00	0.10	25,25,25,25	0

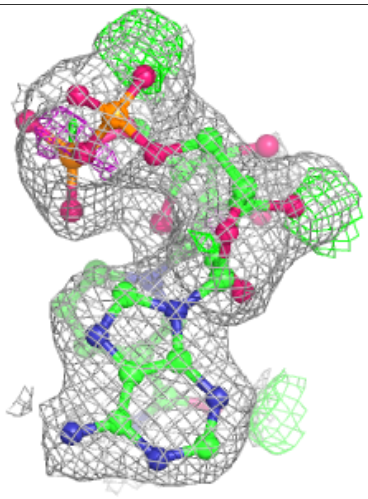
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around NAI A 602:

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

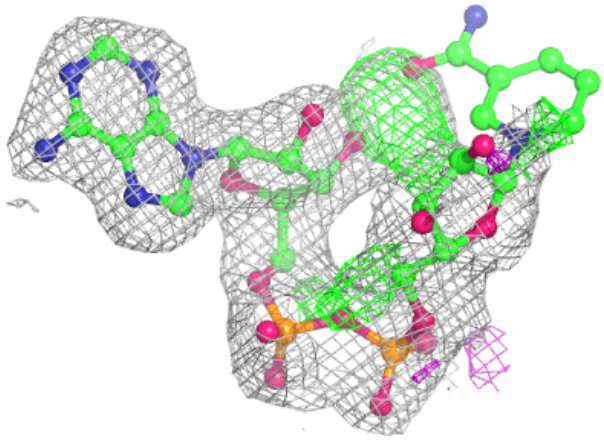


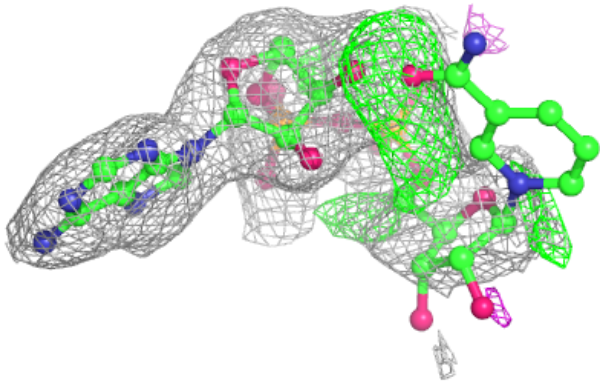


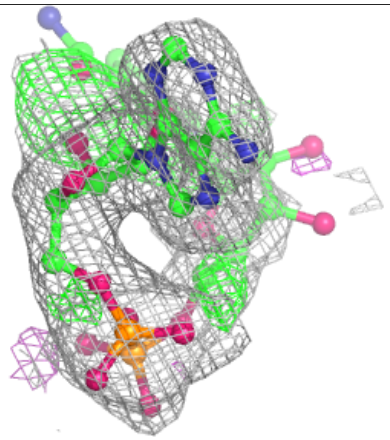


Electron density around NAI C 2602:

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

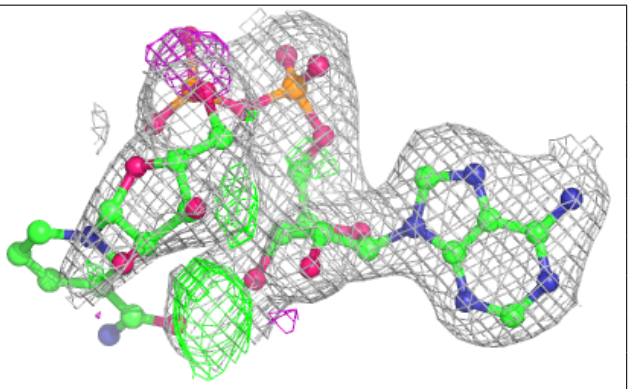


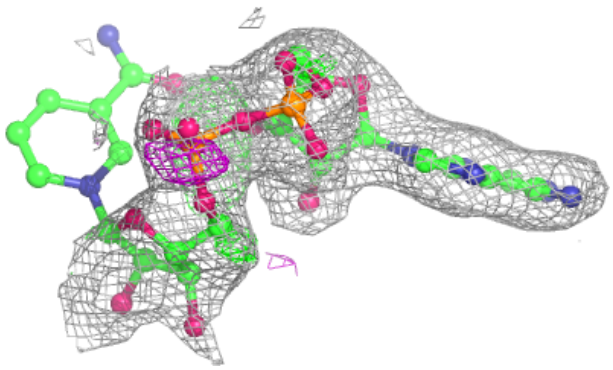


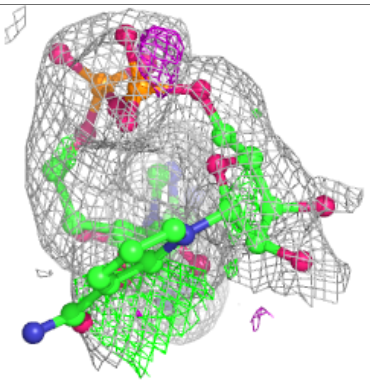


Electron density around NAI B 1602:

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

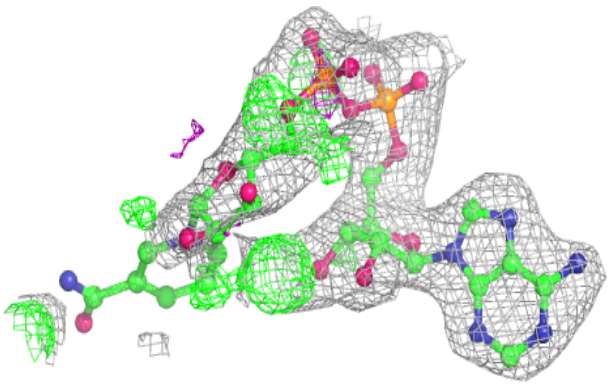


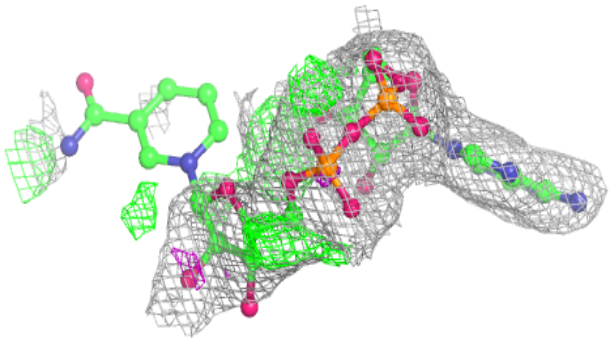


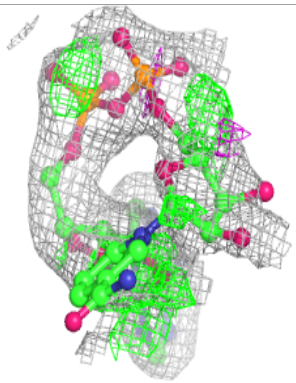


Electron density around NAI D 3602:

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

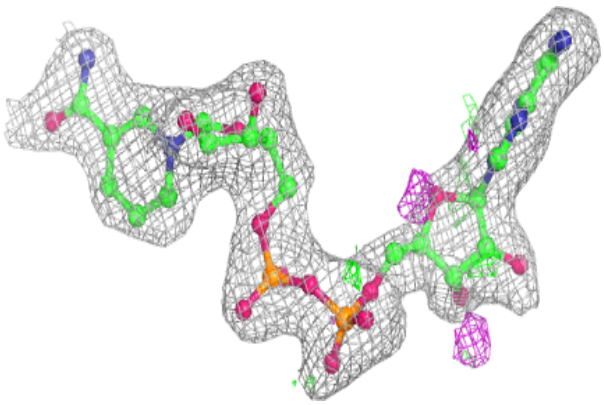


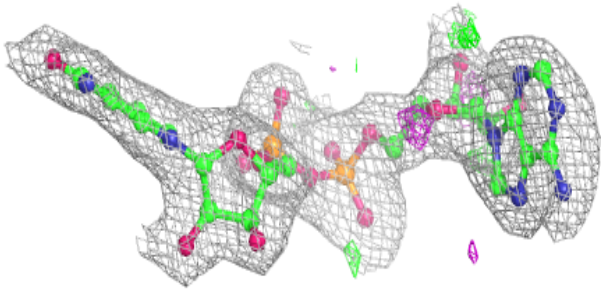


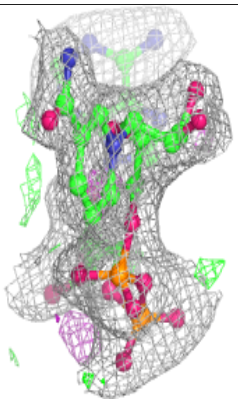


Electron density around NAI B 1601:

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

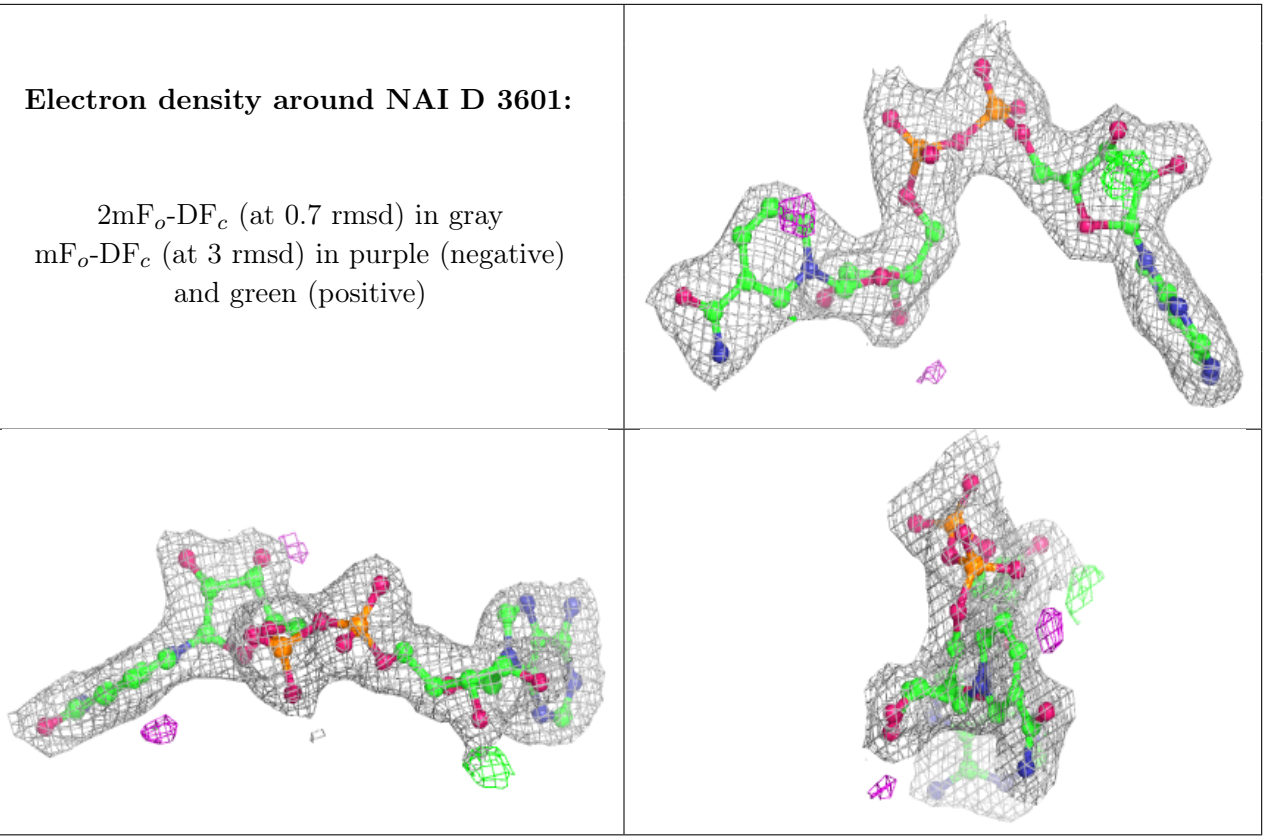






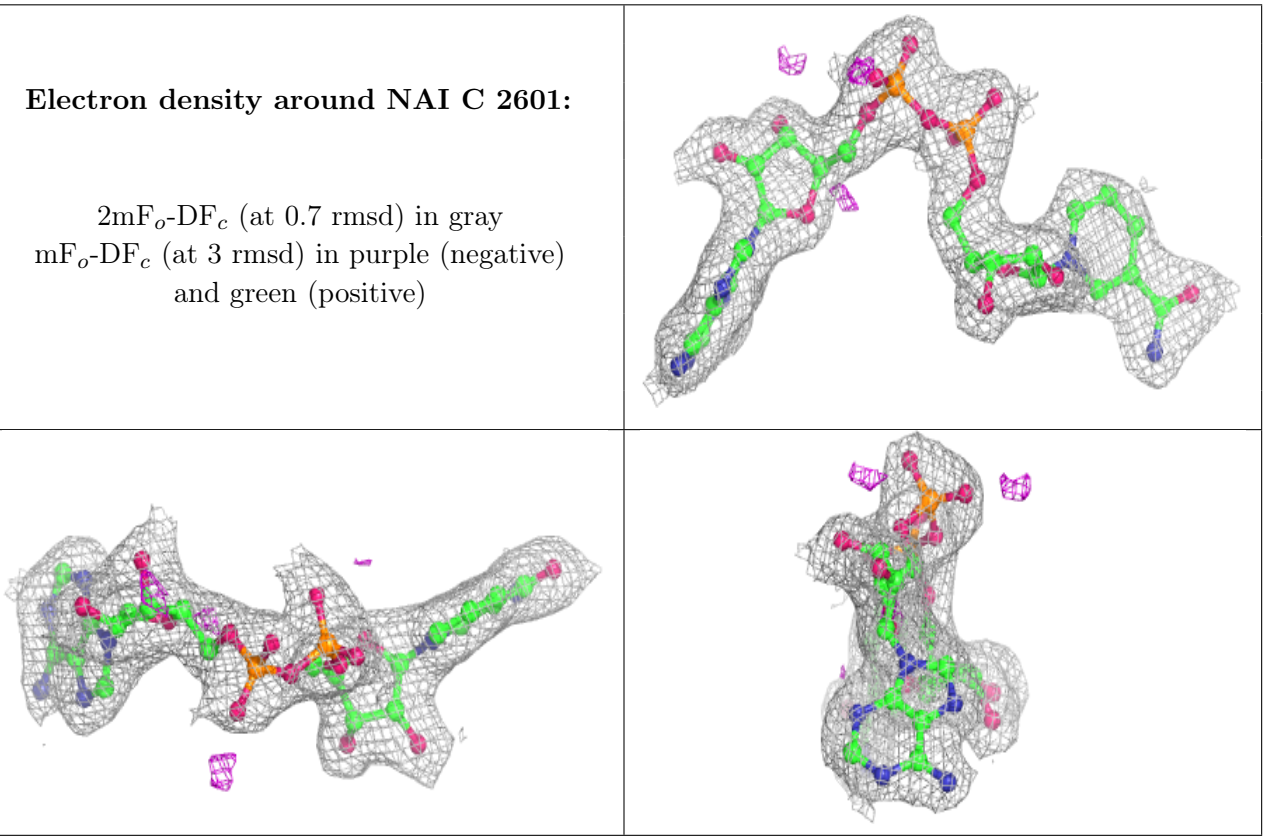
Electron density around NAI D 3601:

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



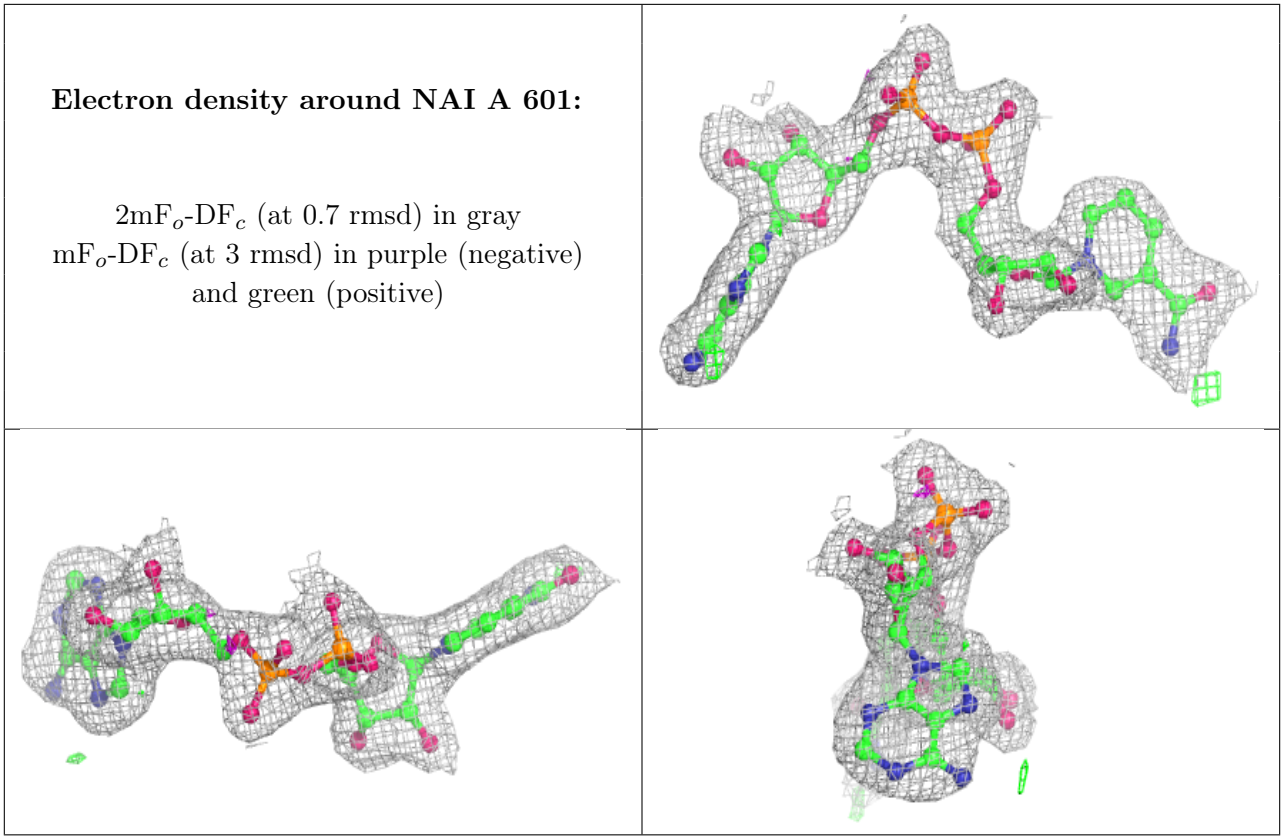
Electron density around NAI C 2601:

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



Electron density around NAI A 601:

$2mF_o$-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.