



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 23, 2025 – 09:46 pm BST

PDB ID : 2J3I / pdb_00002j3i
Title : Crystal structure of Arabidopsis thaliana Double Bond Reductase (AT5G16970)-Binary Complex
Authors : Youn, B.; Kim, S.J.; Moinuddin, S.G.; Lee, C.; Bedgar, D.L.; Harper, A.R.; Davin, L.B.; Lewis, N.G.; Kang, C.
Deposited on : 2006-08-21
Resolution : 2.80 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ 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 ⓘ](#)) were used in the production of this report:

MolProbity : 4-5-2 with Phenix2.0
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.46

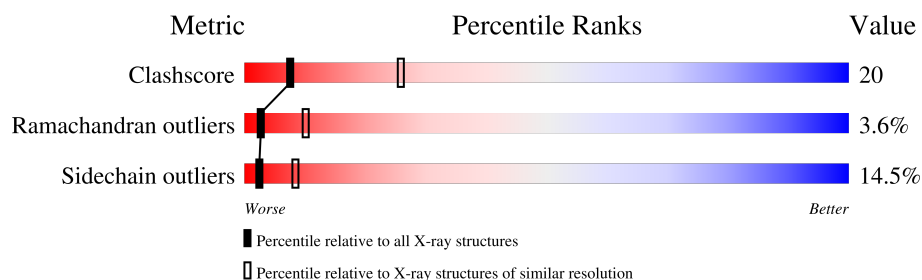
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	180529	4123 (2.80-2.80)
Ramachandran outliers	177936	4071 (2.80-2.80)
Sidechain outliers	177891	4073 (2.80-2.80)

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

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	345	
1	B	345	

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.

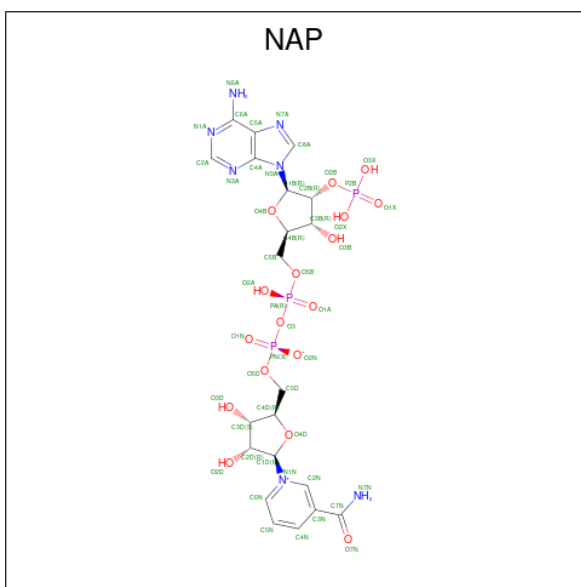
- Molecule 1 is a protein called NADP-DEPENDENT OXIDOREDUCTASE P1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	336	Total 2623	C 1681	N 432	O 493	S 17	0	0	0
1	B	345	Total 2680	C 1717	N 440	O 506	S 17	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	279	ASN	ILE	conflict	UNP Q39172
B	1279	ASN	ILE	conflict	UNP Q39172

- Molecule 2 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NAP) (formula: $\text{C}_{21}\text{H}_{28}\text{N}_7\text{O}_{17}\text{P}_3$).



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

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

- Molecule 3 is water.

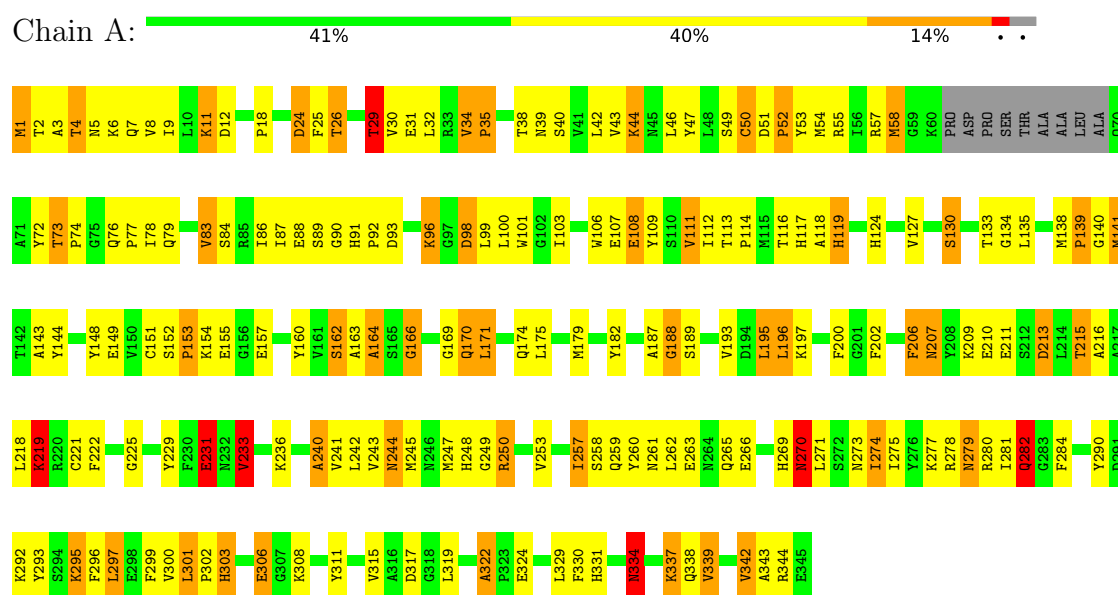
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	50	Total	O	0	0
			50	50		
3	B	42	Total	O	0	0
			42	42		

3 Residue-property plots

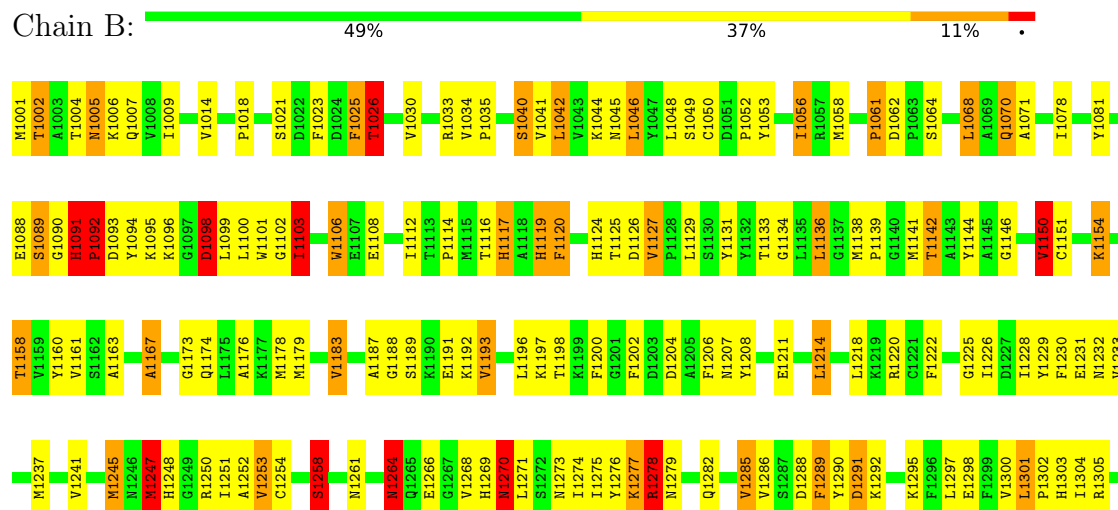
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

Note EDS was not executed.

• Molecule 1: NADP-DEPENDENT OXIDOREDUCTASE P1



• Molecule 1: NADP-DEPENDENT OXIDOREDUCTASE P1



T1310	Y1311	D1317	E1320	K1321	A1322	P1323	L1326	V1327	G1328	L1329	F1330	H1331	N1334	K1337	Q1338	V1339	V1340	V1341	V1342	E1345
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4 Data and refinement statistics

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

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	49.15Å 122.66Å 147.94Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	15.00 – 2.80	Depositor
% Data completeness (in resolution range)	98.9 (15.00-2.80)	Depositor
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR	Depositor
R, R_{free}	0.189 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	5491	wwPDB-VP
Average B, all atoms (Å ²)	25.0	wwPDB-VP

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	1.05	14/2681 (0.5%)	2.03	104/3625 (2.9%)
1	B	1.05	13/2740 (0.5%)	1.92	75/3708 (2.0%)
All	All	1.05	27/5421 (0.5%)	1.97	179/7333 (2.4%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1

All (27) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	1119	HIS	CD2-NE2	-7.44	1.29	1.37
1	B	1091	HIS	CD2-NE2	-7.33	1.29	1.37
1	A	303	HIS	CD2-NE2	-7.32	1.29	1.37
1	A	91	HIS	CD2-NE2	-7.02	1.30	1.37
1	B	1117	HIS	CD2-NE2	-6.96	1.30	1.37
1	B	1056	ILE	CA-CB	6.86	1.63	1.54
1	A	119	HIS	CD2-NE2	-6.82	1.30	1.37
1	A	331	HIS	CD2-NE2	-6.78	1.30	1.37
1	A	117	HIS	CD2-NE2	-6.62	1.30	1.37
1	B	1124	HIS	CD2-NE2	-6.41	1.30	1.37
1	B	1248	HIS	CD2-NE2	-6.33	1.30	1.37
1	B	1303	HIS	CD2-NE2	-6.31	1.30	1.37
1	A	124	HIS	CD2-NE2	-6.22	1.31	1.37
1	B	1331	HIS	CD2-NE2	-6.15	1.31	1.37
1	A	269	HIS	CD2-NE2	-6.08	1.31	1.37
1	A	119	HIS	CG-ND1	-6.07	1.31	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	248	HIS	CD2-NE2	-6.07	1.31	1.37
1	B	1183	VAL	CA-CB	-5.96	1.47	1.54
1	A	29	THR	CA-CB	5.80	1.64	1.53
1	B	1269	HIS	CD2-NE2	-5.80	1.31	1.37
1	A	331	HIS	CG-ND1	-5.65	1.32	1.38
1	A	303	HIS	CG-ND1	-5.47	1.32	1.38
1	B	1004	THR	CA-CB	5.38	1.59	1.52
1	B	1091	HIS	CG-ND1	-5.32	1.32	1.38
1	A	139	PRO	CA-CB	-5.22	1.46	1.53
1	A	124	HIS	CG-ND1	-5.19	1.32	1.38
1	B	1117	HIS	CG-ND1	-5.14	1.32	1.38

All (179) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	51	ASP	CA-CB-CG	12.48	125.08	112.60
1	A	3	ALA	N-CA-C	8.89	123.20	109.60
1	A	279	ASN	CA-CB-CG	8.82	121.42	112.60
1	A	34	VAL	N-CA-C	8.21	126.60	108.88
1	A	31	GLU	CA-C-O	-8.17	111.37	120.60
1	A	98	ASP	CA-CB-CG	8.15	120.75	112.60
1	B	1291	ASP	N-CA-C	-8.05	101.26	112.45
1	B	1183	VAL	CB-CA-C	-8.04	99.35	111.33
1	A	50	CYS	O-C-N	7.74	132.39	122.87
1	B	1291	ASP	CA-CB-CG	7.72	120.32	112.60
1	B	1103	ILE	CA-C-O	7.70	129.66	120.66
1	A	244	ASN	N-CA-C	7.67	122.46	113.18
1	A	219	LYS	CB-CG-CD	7.64	128.88	111.30
1	A	141	MET	N-CA-C	-7.59	102.69	110.97
1	B	1233	VAL	N-CA-C	7.50	124.95	109.34
1	A	331	HIS	N-CA-C	-7.50	102.95	112.93
1	B	1053	TYR	CA-C-O	7.39	128.47	119.97
1	A	119	HIS	N-CA-C	7.34	120.75	108.20
1	A	162	SER	N-CA-C	7.34	126.43	110.80
1	B	1150	VAL	CA-C-O	-7.26	111.71	120.78
1	B	1091	HIS	CB-CG-CD2	-7.23	121.80	131.20
1	A	111	VAL	CA-C-O	7.21	127.89	120.39
1	B	1289	PHE	CA-CB-CG	7.21	121.01	113.80
1	A	282	GLN	CG-CD-NE2	-7.20	105.60	116.40
1	A	31	GLU	CA-C-N	-7.14	111.24	122.23
1	A	31	GLU	C-N-CA	-7.14	111.24	122.23
1	B	1341	VAL	CB-CA-C	-7.14	102.19	111.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	342	VAL	N-CA-CB	-7.12	104.38	112.21
1	A	101	TRP	CA-CB-CG	7.12	127.12	113.60
1	B	1253	VAL	CA-C-O	7.12	130.32	120.86
1	A	50	CYS	CA-C-O	7.10	128.51	120.84
1	A	240	ALA	CA-C-O	7.10	127.91	119.60
1	A	270	ASN	N-CA-C	7.08	125.87	110.80
1	A	93	ASP	CA-CB-CG	7.03	119.63	112.60
1	A	222	PHE	CA-C-N	7.03	126.56	119.24
1	A	222	PHE	C-N-CA	7.03	126.56	119.24
1	A	331	HIS	CA-CB-CG	-7.02	106.78	113.80
1	A	116	THR	N-CA-C	6.97	121.40	112.34
1	A	219	LYS	CG-CD-CE	6.94	127.26	111.30
1	A	163	ALA	N-CA-C	-6.93	93.18	107.67
1	B	1061	PRO	N-CA-C	6.88	126.64	112.47
1	A	157	GLU	N-CA-C	6.86	120.11	109.07
1	B	1025	PHE	N-CA-C	6.82	121.38	111.02
1	A	101	TRP	CG-CD2-CE3	6.81	140.71	133.90
1	A	344	ARG	N-CA-C	6.73	119.63	111.82
1	B	1278	ARG	N-CA-C	6.72	125.12	110.80
1	A	170	GLN	N-CA-C	6.68	121.17	112.89
1	A	130	SER	N-CA-C	-6.65	105.70	113.88
1	A	281	ILE	N-CA-C	-6.63	97.96	107.77
1	A	315	VAL	N-CA-C	6.62	116.95	106.88
1	B	1098	ASP	N-CA-C	6.61	124.87	110.80
1	A	166	GLY	O-C-N	6.60	129.39	122.59
1	A	34	VAL	N-CA-CB	-6.59	101.98	111.21
1	A	164	ALA	N-CA-C	6.58	121.05	112.89
1	A	99	LEU	N-CA-C	6.57	119.95	109.24
1	A	265	GLN	N-CA-C	6.55	119.22	109.59
1	B	1026	THR	CA-CB-OG1	-6.53	99.80	109.60
1	B	1091	HIS	CA-C-N	6.51	127.98	119.84
1	B	1091	HIS	C-N-CA	6.51	127.98	119.84
1	A	44	LYS	CA-CB-CG	6.50	127.11	114.10
1	A	76	GLN	CA-C-N	6.46	126.49	119.90
1	A	76	GLN	C-N-CA	6.46	126.49	119.90
1	B	1277	LYS	N-CA-CB	-6.43	102.96	110.35
1	A	84	SER	N-CA-C	6.42	118.71	109.14
1	A	339	VAL	N-CA-CB	-6.40	105.05	112.34
1	B	1142	THR	CA-CB-OG1	-6.39	100.01	109.60
1	B	1002	THR	N-CA-C	6.34	119.42	110.23
1	A	118	ALA	N-CA-C	-6.32	103.09	111.24
1	A	215	THR	N-CA-C	-6.31	104.33	111.14

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	101	TRP	CB-CG-CD1	-6.28	117.48	126.90
1	B	1270	ASN	N-CA-C	6.28	124.18	110.80
1	A	52	PRO	N-CA-C	6.28	121.75	114.03
1	A	24	ASP	CA-CB-CG	6.24	118.84	112.60
1	A	213	ASP	CA-CB-CG	6.22	118.82	112.60
1	B	1183	VAL	N-CA-CB	6.22	117.96	110.31
1	A	303	HIS	CB-CG-CD2	-6.21	123.13	131.20
1	A	231	GLU	N-CA-C	6.20	118.90	108.23
1	A	182	TYR	N-CA-C	-6.14	97.27	108.02
1	A	188	GLY	N-CA-C	6.14	123.36	115.32
1	B	1179	MET	CA-C-O	6.13	126.53	121.02
1	A	206	PHE	CA-CB-CG	6.12	119.92	113.80
1	B	1062	ASP	CA-CB-CG	6.09	118.69	112.60
1	B	1108	GLU	N-CA-C	6.07	117.90	111.28
1	B	1277	LYS	N-CA-C	6.04	118.25	110.65
1	A	243	VAL	CB-CA-C	-5.99	104.19	112.04
1	A	175	LEU	N-CA-C	-5.99	104.39	111.03
1	A	127	VAL	N-CA-CB	-5.98	102.84	111.21
1	B	1303	HIS	CB-CG-CD2	-5.93	123.49	131.20
1	B	1200	PHE	CA-CB-CG	-5.89	107.91	113.80
1	B	1116	THR	N-CA-C	5.88	118.45	111.33
1	B	1248	HIS	CB-CG-CD2	-5.84	123.61	131.20
1	A	12	ASP	CA-CB-CG	-5.83	106.77	112.60
1	A	93	ASP	N-CA-C	5.82	119.64	112.54
1	B	1247	MET	CG-SD-CE	-5.80	88.14	100.90
1	A	91	HIS	CB-CG-CD2	-5.79	123.68	131.20
1	A	277	LYS	CA-CB-CG	-5.79	102.53	114.10
1	B	1252	ALA	CA-C-O	5.76	126.66	120.32
1	A	171	LEU	N-CA-C	-5.75	104.99	112.23
1	B	1264	ASN	CA-CB-CG	5.74	118.34	112.60
1	B	1303	HIS	N-CA-C	5.74	118.31	111.71
1	A	280	ARG	N-CA-C	-5.72	101.16	110.20
1	A	1	MET	CA-C-O	5.72	130.52	120.80
1	A	101	TRP	CE2-CD2-CG	-5.69	100.37	107.20
1	B	1198	THR	CA-C-N	5.67	128.20	120.54
1	B	1198	THR	C-N-CA	5.67	128.20	120.54
1	A	152	SER	CA-CB-OG	5.65	122.40	111.10
1	B	1056	ILE	N-CA-C	-5.63	105.67	113.00
1	A	98	ASP	N-CA-C	5.63	122.78	110.80
1	A	263	GLU	CA-C-N	5.61	129.18	121.33
1	A	263	GLU	C-N-CA	5.61	129.18	121.33
1	B	1088	GLU	N-CA-C	5.60	117.79	108.99

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	1092	PRO	N-CA-C	5.59	123.98	112.47
1	A	284	PHE	N-CA-C	5.58	118.49	109.79
1	A	245	MET	CG-SD-CE	-5.58	88.64	100.90
1	B	1269	HIS	CB-CG-CD2	-5.54	124.00	131.20
1	A	330	PHE	CA-CB-CG	-5.53	108.27	113.80
1	B	1183	VAL	O-C-N	5.52	128.68	122.67
1	A	153	PRO	O-C-N	5.49	129.68	123.10
1	A	219	LYS	CA-CB-CG	5.49	125.07	114.10
1	B	1342	VAL	O-C-N	5.46	127.45	121.83
1	B	1206	PHE	CA-CB-CG	5.46	119.26	113.80
1	B	1288	ASP	CA-CB-CG	5.45	118.05	112.60
1	A	108	GLU	N-CA-C	-5.44	106.78	113.41
1	A	257	ILE	N-CA-CB	5.44	117.94	110.54
1	A	269	HIS	CB-CG-CD2	-5.44	124.13	131.20
1	B	1269	HIS	CA-C-N	5.43	131.92	121.54
1	B	1269	HIS	C-N-CA	5.43	131.92	121.54
1	A	30	VAL	N-CA-C	5.42	115.76	108.17
1	A	306	GLU	O-C-N	5.42	129.80	122.59
1	A	124	HIS	CB-CG-CD2	-5.42	124.15	131.20
1	B	1285	VAL	N-CA-CB	-5.41	105.30	112.34
1	A	236	LYS	CA-CB-CG	5.41	124.92	114.10
1	B	1119	HIS	CA-CB-CG	-5.40	108.40	113.80
1	B	1088	GLU	CB-CG-CD	5.39	121.77	112.60
1	A	117	HIS	CA-CB-CG	-5.39	108.41	113.80
1	A	233	VAL	N-CA-C	5.38	120.52	109.34
1	B	1127	VAL	CA-C-N	5.36	125.67	119.93
1	B	1127	VAL	C-N-CA	5.36	125.67	119.93
1	A	257	ILE	CB-CA-C	-5.35	104.92	112.14
1	B	1334	ASN	N-CA-C	-5.34	99.42	110.80
1	A	282	GLN	OE1-CD-NE2	5.33	127.93	122.60
1	A	148	TYR	N-CA-C	5.32	118.23	111.69
1	B	1124	HIS	N-CA-C	5.32	117.41	108.96
1	B	1341	VAL	CA-CB-CG1	-5.31	101.38	110.40
1	A	261	ASN	N-CA-C	5.28	119.88	113.38
1	A	322	ALA	CA-C-N	5.28	124.60	118.85
1	A	322	ALA	C-N-CA	5.28	124.60	118.85
1	A	278	ARG	N-CA-C	5.25	117.06	110.91
1	B	1331	HIS	CB-CG-CD2	-5.24	124.38	131.20
1	A	334	ASN	CA-CB-CG	5.22	117.82	112.60
1	A	300	VAL	CB-CA-C	-5.21	105.26	112.24
1	A	108	GLU	CA-CB-CG	5.20	124.50	114.10
1	A	269	HIS	CA-CB-CG	-5.20	108.61	113.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	1258	SER	N-CA-C	-5.19	99.74	110.80
1	B	1026	THR	N-CA-C	5.19	121.85	110.80
1	B	1266	GLU	N-CA-C	5.18	117.39	110.35
1	A	40	SER	N-CA-C	5.15	118.10	110.48
1	B	1021	SER	N-CA-C	5.14	116.89	111.28
1	B	1231	GLU	N-CA-C	5.14	116.77	108.34
1	A	11	LYS	O-C-N	5.13	127.37	122.03
1	B	1264	ASN	OD1-CG-ND2	-5.13	117.47	122.60
1	B	1120	PHE	N-CA-C	5.12	116.76	108.41
1	B	1289	PHE	N-CA-C	5.11	118.65	112.93
1	B	1103	ILE	N-CA-CB	-5.10	105.24	111.67
1	B	1334	ASN	CA-CB-CG	5.10	117.70	112.60
1	A	73	THR	CA-C-N	5.10	125.10	119.90
1	A	73	THR	C-N-CA	5.10	125.10	119.90
1	B	1117	HIS	CB-CG-CD2	-5.09	124.59	131.20
1	B	1317	ASP	CA-CB-CG	5.08	117.68	112.60
1	A	225	GLY	O-C-N	5.07	128.07	122.70
1	B	1206	PHE	O-C-N	5.05	129.00	123.25
1	B	1211	GLU	N-CA-C	5.05	116.99	108.96
1	B	1204	ASP	CA-CB-CG	5.04	117.64	112.60
1	A	2	THR	CA-C-N	5.03	129.69	121.74
1	A	2	THR	C-N-CA	5.03	129.69	121.74
1	B	1021	SER	CA-C-O	-5.03	115.21	120.55
1	B	1106	TRP	CE2-CD2-CG	-5.02	101.18	107.20
1	B	1125	THR	CA-C-O	5.02	125.75	120.33
1	B	1091	HIS	N-CA-C	5.01	118.25	109.48

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	1322	ALA	Peptide

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	2623	0	2594	102	0
1	B	2680	0	2643	115	0
2	A	48	0	25	5	0
2	B	48	0	25	12	0
3	A	50	0	0	2	0
3	B	42	0	0	1	0
All	All	5491	0	5287	213	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 20.

All (213) 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:1188:GLY:H	2:B:351:NAP:P2B	1.81	1.02
1:B:1208:TYR:HE1	2:B:351:NAP:O3X	1.47	0.95
1:B:1188:GLY:N	2:B:351:NAP:O2X	2.02	0.93
1:B:1189:SER:HB3	1:B:1192:LYS:HB2	1.59	0.84
1:A:207:ASN:HD22	1:A:209:LYS:H	1.28	0.81
1:B:1014:VAL:HG21	1:B:1058:MET:HE2	1.64	0.79
1:A:52:PRO:HB2	2:A:350:NAP:H3D	1.63	0.78
1:A:50:CYS:HB2	1:A:338:GLN:HB3	1.63	0.78
1:B:1208:TYR:CE1	2:B:351:NAP:O3X	2.37	0.77
1:A:229:TYR:CE2	1:A:231:GLU:HG2	2.21	0.76
1:B:1114:PRO:HA	1:B:1119:HIS:HD2	1.50	0.74
1:B:1158:THR:HG21	1:B:1225:GLY:O	1.88	0.74
1:B:1099:LEU:HD21	1:B:1129:LEU:HD21	1.70	0.74
1:A:229:TYR:CD2	1:A:241:VAL:HG11	2.25	0.72
1:B:1285:VAL:HA	2:B:351:NAP:H72N	1.56	0.71
1:A:213:ASP:HB2	1:A:216:ALA:HB3	1.71	0.71
1:B:1188:GLY:N	2:B:351:NAP:P2B	2.63	0.71
1:A:34:VAL:HA	1:A:88:GLU:HB3	1.72	0.70
1:B:1218:LEU:HD23	1:B:1226:ILE:HD11	1.74	0.70
1:B:1264:ASN:H	1:B:1264:ASN:HD22	1.40	0.67
1:A:282:GLN:HE22	1:B:1278:ARG:NH2	1.93	0.66
1:B:1056:ILE:HD11	1:B:1068:LEU:HG	1.78	0.66
1:A:329:LEU:HA	1:A:334:ASN:OD1	1.96	0.66
1:B:1187:ALA:O	1:B:1207:ASN:HA	1.96	0.66
1:A:207:ASN:ND2	1:A:209:LYS:H	1.96	0.64
1:B:1114:PRO:HA	1:B:1119:HIS:CD2	2.31	0.63
1:B:1134:GLY:HA3	1:B:1311:TYR:OH	1.99	0.63
1:A:188:GLY:N	2:A:350:NAP:O1X	2.31	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:160:TYR:HD2	1:A:229:TYR:CD1	2.17	0.62
1:A:49:SER:HB2	1:A:133:THR:HB	1.79	0.62
1:A:219:LYS:HD2	1:A:244:ASN:ND2	2.13	0.62
1:B:1117:HIS:HD2	1:B:1290:TYR:HB2	1.65	0.62
1:A:53:TYR:HD1	1:A:57:ARG:HG3	1.66	0.61
1:B:1144:TYR:OH	1:B:1295:LYS:HE3	2.01	0.60
1:A:44:LYS:HB2	1:A:87:ILE:HD11	1.84	0.59
1:A:138:MET:SD	1:A:138:MET:C	2.86	0.59
1:B:1187:ALA:HB1	2:B:351:NAP:O2X	2.02	0.59
1:B:1006:LYS:HG2	1:B:1007:GLN:N	2.16	0.59
1:B:1167:ALA:HB2	1:B:1337:LYS:HD2	1.85	0.59
1:A:9:ILE:HA	1:A:77:PRO:HA	1.86	0.58
1:A:46:LEU:HB2	1:A:47:TYR:HD2	1.69	0.57
1:A:7:GLN:HB3	1:A:107:GLU:HG2	1.86	0.57
1:A:270:ASN:HD22	1:A:270:ASN:H	1.52	0.57
1:B:1158:THR:HG23	1:B:1222:PHE:CD2	2.39	0.57
1:B:1329:LEU:HA	1:B:1334:ASN:HD22	1.70	0.57
1:B:1006:LYS:HG2	1:B:1007:GLN:H	1.69	0.57
1:B:1270:ASN:ND2	1:B:1270:ASN:H	2.02	0.57
1:B:1277:LYS:HE3	1:B:1279:ASN:HD21	1.69	0.57
1:A:153:PRO:HB2	1:A:179:MET:SD	2.44	0.57
1:B:1106:TRP:CH2	1:B:1326:LEU:HD23	2.40	0.57
1:A:170:GLN:O	1:A:174:GLN:HG3	2.04	0.56
1:A:249:GLY:HA2	1:A:250:ARG:HH21	1.69	0.56
1:A:250:ARG:HE	1:A:250:ARG:N	2.03	0.56
1:A:5:ASN:HD21	1:A:108:GLU:H	1.52	0.56
1:B:1329:LEU:HA	1:B:1334:ASN:ND2	2.20	0.56
1:A:103:ILE:O	1:A:119:HIS:HE1	1.89	0.56
1:B:1049:SER:HB2	1:B:1133:THR:HB	1.87	0.56
1:A:250:ARG:HE	1:A:250:ARG:H	1.55	0.55
1:B:1052:PRO:HB2	2:B:351:NAP:H3D	1.89	0.55
1:A:47:TYR:HB2	1:A:83:VAL:HG13	1.87	0.55
1:B:1146:GLY:O	1:B:1150:VAL:HB	2.06	0.55
1:A:337:LYS:HA	1:A:337:LYS:HZ3	1.72	0.55
1:B:1160:TYR:HB2	1:B:1222:PHE:CZ	2.42	0.54
1:A:52:PRO:CB	2:A:350:NAP:H3D	2.37	0.54
1:B:1040:SER:O	1:B:1090:GLY:HA3	2.07	0.54
1:B:1052:PRO:HB2	2:B:351:NAP:C3D	2.38	0.54
1:B:1273:ASN:HA	1:B:1276:TYR:CD1	2.43	0.54
1:A:200:PHE:HB2	1:A:202:PHE:CE2	2.42	0.54
1:B:1161:VAL:HG23	1:B:1230:PHE:HB3	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:86:ILE:HG12	1:A:98:ASP:O	2.08	0.53
1:A:52:PRO:HB2	2:A:350:NAP:C3D	2.38	0.53
1:B:1050:CYS:HB3	1:B:1329:LEU:HD11	1.91	0.53
1:B:1174:GLN:HE22	1:B:1310:THR:H	1.56	0.53
1:B:1214:LEU:HD11	1:B:1237:MET:SD	2.48	0.53
1:A:273:ASN:HD21	1:B:1064:SER:HB3	1.74	0.53
1:B:1273:ASN:HA	1:B:1276:TYR:HD1	1.73	0.53
1:B:1095:LYS:O	1:B:1098:ASP:HB2	2.09	0.53
1:B:1133:THR:O	1:B:1337:LYS:HD3	2.10	0.52
1:A:187:ALA:HB3	1:A:193:VAL:HG22	1.90	0.52
1:A:297:LEU:O	1:A:301:LEU:HB2	2.10	0.52
1:B:1151:CYS:HB3	1:B:1228:ILE:HG23	1.91	0.52
1:B:1270:ASN:H	1:B:1270:ASN:HD22	1.56	0.52
1:B:1247:MET:HG2	1:B:1277:LYS:HB2	1.91	0.52
1:A:18:PRO:HB3	1:A:58:MET:HE2	1.92	0.51
1:A:53:TYR:CD1	1:A:57:ARG:HG3	2.45	0.51
1:A:135:LEU:O	1:A:140:GLY:HA3	2.10	0.51
1:A:231:GLU:HG3	1:A:253:VAL:HG22	1.92	0.51
1:B:1033:ARG:HD3	1:B:1034:VAL:H	1.75	0.51
1:B:1100:LEU:HD21	1:B:1112:ILE:HD11	1.93	0.51
1:A:38:THR:HG23	1:A:39:ASN:H	1.75	0.50
1:A:219:LYS:HD2	1:A:244:ASN:CG	2.37	0.50
1:B:1101:TRP:NE1	1:B:1120:PHE:HB2	2.26	0.50
1:B:1117:HIS:CD2	1:B:1290:TYR:HB2	2.44	0.50
1:A:219:LYS:HA	1:A:244:ASN:HD21	1.76	0.50
1:A:4:THR:HA	1:A:29:THR:HA	1.93	0.50
1:B:1174:GLN:HE22	1:B:1310:THR:N	2.09	0.50
1:B:1264:ASN:H	1:B:1264:ASN:ND2	2.08	0.50
1:A:83:VAL:HG12	1:A:133:THR:HG23	1.94	0.50
1:B:1091:HIS:CE1	1:B:1093:ASP:H	2.29	0.50
1:A:5:ASN:ND2	1:A:109:TYR:H	2.08	0.49
1:A:164:ALA:HA	1:A:169:GLY:HA3	1.95	0.49
1:B:1138:MET:HG2	1:B:1290:TYR:OH	2.13	0.49
1:A:114:PRO:HA	1:A:119:HIS:CD2	2.48	0.49
1:B:1264:ASN:ND2	1:B:1264:ASN:N	2.61	0.49
1:B:1023:PHE:HD2	1:B:1078:ILE:HD11	1.78	0.48
1:A:6:LYS:NZ	1:A:25:PHE:HB3	2.28	0.48
1:B:1264:ASN:HD22	1:B:1264:ASN:N	2.10	0.48
1:B:1329:LEU:HD23	1:B:1334:ASN:ND2	2.28	0.48
1:A:215:THR:HA	1:A:240:ALA:HB1	1.96	0.48
1:B:1158:THR:CG2	1:B:1226:ILE:HA	2.42	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1163:ALA:HB3	1:B:1232:ASN:HB2	1.94	0.48
1:B:1131:TYR:HB3	1:B:1136:LEU:HD22	1.95	0.48
1:B:1103:ILE:H	1:B:1119:HIS:CE1	2.32	0.48
1:B:1154:LYS:NZ	1:B:1154:LYS:HA	2.29	0.48
1:B:1091:HIS:CD2	1:B:1094:TYR:HD1	2.32	0.47
1:A:89:SER:H	1:A:96:LYS:HG2	1.78	0.47
1:A:162:SER:HB3	1:A:229:TYR:HE1	1.79	0.47
1:A:270:ASN:HD22	1:A:270:ASN:N	2.11	0.47
1:A:42:LEU:HG	1:A:111:VAL:HG22	1.95	0.47
1:A:275:ILE:CG1	1:B:1253:VAL:HG12	2.45	0.47
1:A:200:PHE:HB2	1:A:202:PHE:HE2	1.78	0.47
1:A:233:VAL:HG23	1:A:258:SER:HB3	1.96	0.47
1:A:43:VAL:HG12	1:A:86:ILE:HA	1.96	0.47
1:A:206:PHE:CD2	1:A:221:CYS:SG	3.02	0.47
1:B:1095:LYS:HA	3:B:2015:HOH:O	2.14	0.47
1:A:141:MET:SD	1:A:293:TYR:HA	2.55	0.47
1:A:187:ALA:O	1:A:207:ASN:HA	2.14	0.47
1:A:6:LYS:CE	1:A:25:PHE:HB3	2.45	0.46
1:B:1048:LEU:HD22	1:B:1342:VAL:HG21	1.97	0.46
2:B:351:NAP:H6N	2:B:351:NAP:H51N	1.97	0.46
1:A:295:LYS:HE3	3:A:2045:HOH:O	2.15	0.46
1:B:1045:ASN:O	1:B:1342:VAL:HB	2.15	0.46
1:A:273:ASN:HD21	1:B:1064:SER:CB	2.28	0.46
1:B:1189:SER:OG	1:B:1191:GLU:HG3	2.16	0.46
1:B:1094:TYR:CE2	1:B:1100:LEU:HD23	2.50	0.46
1:B:1158:THR:HG21	1:B:1226:ILE:HA	1.98	0.46
1:A:144:TYR:HE1	1:A:299:PHE:CD2	2.33	0.45
1:A:189:SER:O	1:A:193:VAL:HG23	2.16	0.45
1:A:5:ASN:HD21	1:A:109:TYR:H	1.63	0.45
1:B:1300:VAL:HG22	1:B:1304:ILE:HD11	1.97	0.45
1:A:302:PRO:O	1:A:306:GLU:HB2	2.16	0.45
1:B:1160:TYR:CE2	1:B:1218:LEU:HD21	2.52	0.45
1:A:47:TYR:HB2	1:A:83:VAL:CG1	2.46	0.45
1:A:44:LYS:HD3	1:A:109:TYR:HE2	1.82	0.45
1:A:270:ASN:H	1:A:270:ASN:ND2	2.14	0.45
1:B:1251:ILE:HG22	1:B:1253:VAL:HG23	1.98	0.45
1:A:259:GLN:HE22	1:A:266:GLU:HB2	1.82	0.45
1:A:260:TYR:HE1	2:A:350:NAP:HO2N	1.63	0.45
1:B:1117:HIS:HB3	1:B:1290:TYR:HD1	1.81	0.45
1:B:1229:TYR:CG	1:B:1241:VAL:HG11	2.51	0.45
1:A:32:LEU:HD13	1:A:87:ILE:HG21	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:207:ASN:HD22	1:A:207:ASN:C	2.25	0.44
1:A:44:LYS:NZ	1:A:343:ALA:HB1	2.32	0.44
1:B:1322:ALA:HB2	1:B:1340:VAL:HG11	1.98	0.44
1:A:271:LEU:HD12	1:B:1268:VAL:HG21	2.00	0.44
1:A:143:ALA:HB3	1:A:171:LEU:HD23	1.99	0.44
1:A:154:LYS:HE2	1:A:155:GLU:N	2.33	0.44
1:A:8:VAL:CG2	1:A:319:LEU:HB3	2.48	0.44
1:A:151:CYS:O	1:A:250:ARG:HD2	2.17	0.44
1:B:1023:PHE:CD2	1:B:1078:ILE:HD11	2.53	0.44
1:B:1035:PRO:HG2	1:B:1042:LEU:N	2.32	0.44
1:A:292:LYS:HE3	3:A:2043:HOH:O	2.18	0.44
1:B:1081:TYR:HA	1:B:1102:GLY:O	2.17	0.44
1:B:1292:LYS:HB3	1:B:1295:LYS:HE2	2.00	0.44
1:A:52:PRO:HG3	1:A:329:LEU:HD13	1.99	0.44
1:A:274:ILE:HG22	1:A:279:ASN:OD1	2.18	0.43
1:B:1273:ASN:HB3	1:B:1277:LYS:HE2	2.00	0.43
1:B:1005:ASN:HB3	1:B:1030:VAL:HG23	2.00	0.43
1:B:1034:VAL:HA	1:B:1035:PRO:HD3	1.75	0.43
1:B:1041:VAL:HG12	1:B:1089:SER:O	2.18	0.43
1:B:1142:THR:CG2	1:B:1254:CYS:SG	3.06	0.43
1:B:1161:VAL:HG11	1:B:1202:PHE:HE1	1.84	0.43
1:A:253:VAL:HG12	1:B:1275:ILE:HG22	2.01	0.43
1:B:1189:SER:O	1:B:1193:VAL:HG12	2.18	0.43
1:A:11:LYS:HD3	1:A:24:ASP:HB2	2.00	0.43
1:B:1009:ILE:O	1:B:1023:PHE:HA	2.19	0.43
1:B:1187:ALA:HA	2:B:351:NAP:O3X	2.19	0.43
1:A:334:ASN:O	1:A:334:ASN:ND2	2.52	0.43
1:A:54:MET:HE2	1:A:78:ILE:HD12	2.01	0.42
1:A:42:LEU:HD23	1:A:43:VAL:N	2.34	0.42
1:B:1018:PRO:HB2	1:B:1327:VAL:HG22	2.00	0.42
1:A:44:LYS:HZ2	1:A:343:ALA:HB1	1.85	0.42
1:B:1139:PRO:HB2	1:B:1167:ALA:HB1	2.01	0.42
2:B:351:NAP:O1A	2:B:351:NAP:H4B	2.18	0.42
1:B:1226:ILE:HG22	1:B:1228:ILE:O	2.20	0.42
1:B:1044:LYS:O	1:B:1046:LEU:HD13	2.20	0.42
1:B:1275:ILE:HG13	1:B:1276:TYR:N	2.34	0.41
1:A:18:PRO:HD3	1:A:55:ARG:HD3	2.01	0.41
1:A:112:ILE:O	1:A:112:ILE:HG13	2.20	0.41
1:A:197:LYS:HB3	1:A:197:LYS:HE3	1.73	0.41
1:B:1048:LEU:HD22	1:B:1342:VAL:CG2	2.50	0.41
1:B:1096:LYS:H	1:B:1096:LYS:HD3	1.84	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1245:MET:HE1	1:B:1250:ARG:O	2.19	0.41
1:B:1173:GLY:HA3	1:B:1202:PHE:CZ	2.55	0.41
1:B:1237:MET:HE2	1:B:1237:MET:HB2	1.96	0.41
1:A:303:HIS:HB3	1:A:308:LYS:HB3	2.02	0.41
1:B:1339:VAL:HG12	1:B:1340:VAL:N	2.36	0.41
1:B:1056:ILE:HD11	1:B:1068:LEU:CG	2.49	0.41
1:B:1297:LEU:O	1:B:1301:LEU:HB2	2.20	0.41
1:B:1245:MET:SD	1:B:1279:ASN:OD1	2.79	0.41
1:A:293:TYR:O	1:A:296:PHE:HB3	2.21	0.41
1:B:1025:PHE:CZ	1:B:1320:GLU:HA	2.56	0.41
1:A:141:MET:HG2	1:A:290:TYR:CD1	2.56	0.41
1:B:1295:LYS:O	1:B:1298:GLU:HB3	2.21	0.41
1:A:166:GLY:O	1:A:170:GLN:HG2	2.20	0.40
1:A:195:LEU:HD23	1:A:195:LEU:HA	1.93	0.40
1:B:1049:SER:HB3	1:B:1081:TYR:O	2.21	0.40
1:A:1:MET:HB3	1:A:32:LEU:CD1	2.51	0.40
1:A:8:VAL:HB	1:A:106:TRP:HE3	1.86	0.40
1:B:1014:VAL:HG21	1:B:1058:MET:CE	2.42	0.40
1:B:1274:ILE:HD13	1:B:1274:ILE:HG21	1.86	0.40
1:B:1297:LEU:HA	1:B:1297:LEU:HD23	1.83	0.40
1:A:7:GLN:HG2	1:A:26:THR:O	2.22	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	332/345 (96%)	274 (82%)	51 (15%)	7 (2%)	5	20
1	B	341/345 (99%)	282 (83%)	42 (12%)	17 (5%)	1	5
All	All	673/690 (98%)	556 (83%)	93 (14%)	24 (4%)	3	10

All (24) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	35	PRO
1	A	96	LYS
1	A	270	ASN
1	B	1089	SER
1	B	1270	ASN
1	B	1278	ARG
1	A	134	GLY
1	B	1026	THR
1	B	1071	ALA
1	B	1126	ASP
1	B	1167	ALA
1	B	1258	SER
1	B	1305	ARG
1	B	1098	ASP
1	A	196	LEU
1	A	322	ALA
1	B	1176	ALA
1	B	1323	PRO
1	A	90	GLY
1	B	1070	GLN
1	B	1092	PRO
1	B	1061	PRO
1	B	1286	VAL
1	B	1150	VAL

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	283/289 (98%)	240 (85%)	43 (15%)	2	7
1	B	289/289 (100%)	249 (86%)	40 (14%)	3	10
All	All	572/578 (99%)	489 (86%)	83 (14%)	2	8

All (83) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	THR
1	A	26	THR
1	A	29	THR
1	A	35	PRO
1	A	58	MET
1	A	72	TYR
1	A	73	THR
1	A	74	PRO
1	A	79	GLN
1	A	83	VAL
1	A	92	PRO
1	A	100	LEU
1	A	113	THR
1	A	130	SER
1	A	139	PRO
1	A	149	GLU
1	A	195	LEU
1	A	196	LEU
1	A	207	ASN
1	A	210	GLU
1	A	211	GLU
1	A	218	LEU
1	A	219	LYS
1	A	231	GLU
1	A	233	VAL
1	A	242	LEU
1	A	247	MET
1	A	250	ARG
1	A	257	ILE
1	A	262	LEU
1	A	270	ASN
1	A	274	ILE
1	A	282	GLN
1	A	295	LYS
1	A	297	LEU
1	A	301	LEU
1	A	311	TYR
1	A	317	ASP
1	A	324	GLU
1	A	334	ASN
1	A	337	LYS
1	A	339	VAL
1	A	342	VAL

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Mol	Chain	Res	Type
1	B	1001	MET
1	B	1002	THR
1	B	1005	ASN
1	B	1026	THR
1	B	1040	SER
1	B	1042	LEU
1	B	1046	LEU
1	B	1068	LEU
1	B	1070	GLN
1	B	1091	HIS
1	B	1092	PRO
1	B	1103	ILE
1	B	1127	VAL
1	B	1136	LEU
1	B	1141	MET
1	B	1154	LYS
1	B	1158	THR
1	B	1178	MET
1	B	1183	VAL
1	B	1193	VAL
1	B	1196	LEU
1	B	1197	LYS
1	B	1214	LEU
1	B	1220	ARG
1	B	1245	MET
1	B	1247	MET
1	B	1258	SER
1	B	1261	ASN
1	B	1264	ASN
1	B	1271	LEU
1	B	1282	GLN
1	B	1289	PHE
1	B	1291	ASP
1	B	1301	LEU
1	B	1302	PRO
1	B	1323	PRO
1	B	1326	LEU
1	B	1337	LYS
1	B	1339	VAL
1	B	1341	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	5	ASN
1	A	7	GLN
1	A	39	ASN
1	A	70	GLN
1	A	119	HIS
1	A	207	ASN
1	A	232	ASN
1	A	244	ASN
1	A	261	ASN
1	A	264	ASN
1	A	270	ASN
1	A	273	ASN
1	A	282	GLN
1	B	1117	HIS
1	B	1119	HIS
1	B	1124	HIS
1	B	1170	GLN
1	B	1174	GLN
1	B	1232	ASN
1	B	1264	ASN
1	B	1270	ASN
1	B	1273	ASN
1	B	1279	ASN
1	B	1334	ASN

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

2 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	350	-	45,52,52	1.52	8 (17%)	56,80,80	1.75	9 (16%)
2	NAP	B	351	-	45,52,52	1.34	5 (11%)	56,80,80	1.49	7 (12%)

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	350	-	-	21/31/67/67	0/5/5/5
2	NAP	B	351	-	-	19/31/67/67	0/5/5/5

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	350	NAP	C2N-N1N	4.85	1.40	1.35
2	B	351	NAP	C2N-N1N	4.45	1.40	1.35
2	B	351	NAP	O4D-C1D	4.03	1.46	1.41
2	A	350	NAP	O4D-C1D	3.36	1.45	1.41
2	A	350	NAP	PN-O5D	3.29	1.72	1.59
2	A	350	NAP	C3N-C7N	2.72	1.54	1.50
2	A	350	NAP	O4B-C1B	2.70	1.44	1.41
2	A	350	NAP	C6N-N1N	2.60	1.41	1.35
2	B	351	NAP	C3N-C7N	2.36	1.54	1.50
2	A	350	NAP	C5D-C4D	2.27	1.58	1.51
2	B	351	NAP	C6N-N1N	2.24	1.40	1.35
2	A	350	NAP	PA-O5B	2.05	1.67	1.59
2	B	351	NAP	PA-O5B	2.04	1.67	1.59

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	350	NAP	O5D-C5D-C4D	6.66	131.93	108.99

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	350	NAP	O4D-C4D-C3D	-4.72	95.77	105.11
2	B	351	NAP	N3A-C2A-N1A	-4.31	121.94	128.68
2	A	350	NAP	N3A-C2A-N1A	-4.14	122.21	128.68
2	B	351	NAP	O5D-C5D-C4D	4.07	123.00	108.99
2	A	350	NAP	O4D-C4D-C5D	4.01	122.58	109.37
2	B	351	NAP	O4D-C4D-C3D	-3.70	97.79	105.11
2	B	351	NAP	C4A-C5A-N7A	3.22	112.76	109.40
2	A	350	NAP	C4A-C5A-N7A	3.22	112.75	109.40
2	A	350	NAP	C6N-N1N-C2N	-3.09	119.16	121.97
2	B	351	NAP	PN-O3-PA	2.30	140.72	132.83
2	A	350	NAP	O5B-C5B-C4B	2.18	116.51	108.99
2	B	351	NAP	O3X-P2B-O2B	2.14	115.60	105.99
2	B	351	NAP	C5A-C6A-N1A	-2.10	115.60	120.35
2	A	350	NAP	C5A-C6A-N1A	-2.08	115.63	120.35
2	A	350	NAP	O2X-P2B-O2B	2.06	115.20	105.99

There are no chirality outliers.

All (40) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	350	NAP	C5B-O5B-PA-O1A
2	A	350	NAP	C4B-C5B-O5B-PA
2	A	350	NAP	C3B-C4B-C5B-O5B
2	A	350	NAP	C4D-C5D-O5D-PN
2	A	350	NAP	O4D-C1D-N1N-C2N
2	A	350	NAP	O4D-C1D-N1N-C6N
2	A	350	NAP	C2D-C1D-N1N-C2N
2	A	350	NAP	C2D-C1D-N1N-C6N
2	B	351	NAP	C5B-O5B-PA-O1A
2	B	351	NAP	C5B-O5B-PA-O2A
2	B	351	NAP	C4B-C5B-O5B-PA
2	B	351	NAP	C1B-C2B-O2B-P2B
2	B	351	NAP	C2B-O2B-P2B-O3X
2	B	351	NAP	PA-O3-PN-O5D
2	B	351	NAP	O4D-C4D-C5D-O5D
2	B	351	NAP	O4D-C1D-N1N-C2N
2	B	351	NAP	O4D-C1D-N1N-C6N
2	B	351	NAP	C2D-C1D-N1N-C2N
2	B	351	NAP	C2D-C1D-N1N-C6N
2	A	350	NAP	O4B-C4B-C5B-O5B
2	B	351	NAP	C3B-C2B-O2B-P2B
2	A	350	NAP	C2N-C3N-C7N-O7N

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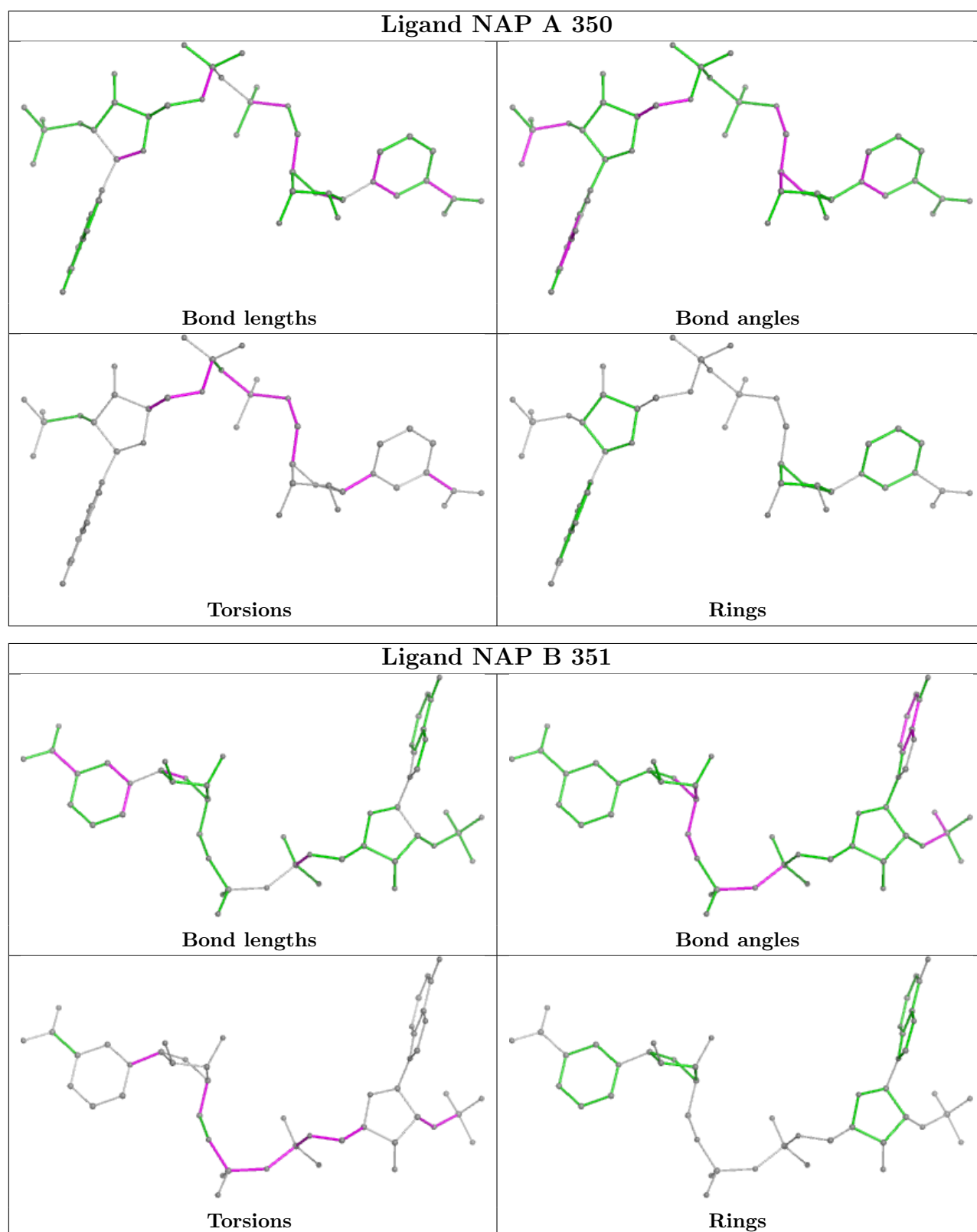
Mol	Chain	Res	Type	Atoms
2	A	350	NAP	C3D-C4D-C5D-O5D
2	B	351	NAP	C3B-C4B-C5B-O5B
2	A	350	NAP	PA-O3-PN-O5D
2	A	350	NAP	O4D-C4D-C5D-O5D
2	A	350	NAP	C5B-O5B-PA-O3
2	A	350	NAP	C5D-O5D-PN-O3
2	B	351	NAP	C5D-O5D-PN-O3
2	B	351	NAP	PN-O3-PA-O2A
2	A	350	NAP	C5B-O5B-PA-O2A
2	A	350	NAP	C5D-O5D-PN-O1N
2	A	350	NAP	C5D-O5D-PN-O2N
2	A	350	NAP	C2N-C3N-C7N-N7N
2	A	350	NAP	C4N-C3N-C7N-O7N
2	A	350	NAP	PA-O3-PN-O1N
2	B	351	NAP	C5B-O5B-PA-O3
2	B	351	NAP	C2B-O2B-P2B-O2X
2	B	351	NAP	PN-O3-PA-O1A
2	B	351	NAP	C5D-O5D-PN-O2N

There are no ring outliers.

2 monomers are involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	350	NAP	5	0
2	B	351	NAP	12	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 than 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.



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

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.