



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 07:28 AM UTC

PDB ID : 1TYT / pdb_00001tyt
Title : CRYSTAL AND MOLECULAR STRUCTURE OF CRITHIDIA FASCICULATA TRYPANOTHIONE REDUCTASE AT 2.6 ANGSTROMS RESOLUTION
Authors : Bailey, S.; Hunter, W.N.
Deposited on : 1993-06-10
Resolution : 2.60 Å(reported)

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

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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	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

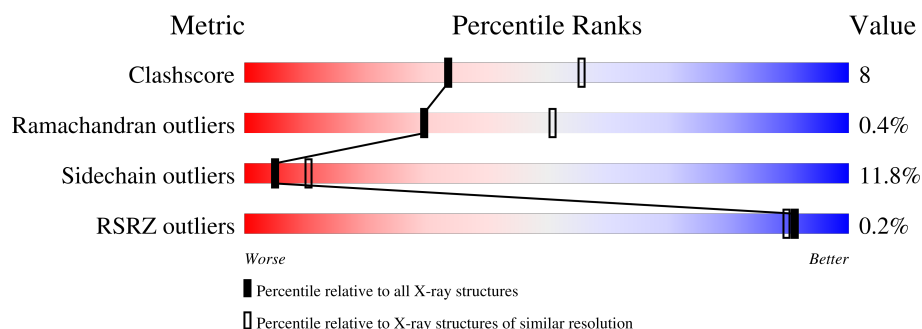
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.60 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	190562	4347 (2.60-2.60)
Ramachandran outliers	187476	4277 (2.60-2.60)
Sidechain outliers	187428	4277 (2.60-2.60)
RSRZ outliers	180081	4008 (2.60-2.60)

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 $\leq 5\%$. 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	487	
1	B	487	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	FAD	A	493	X	-	-	-
2	FAD	B	493	X	-	-	-

2 Entry composition [i](#)

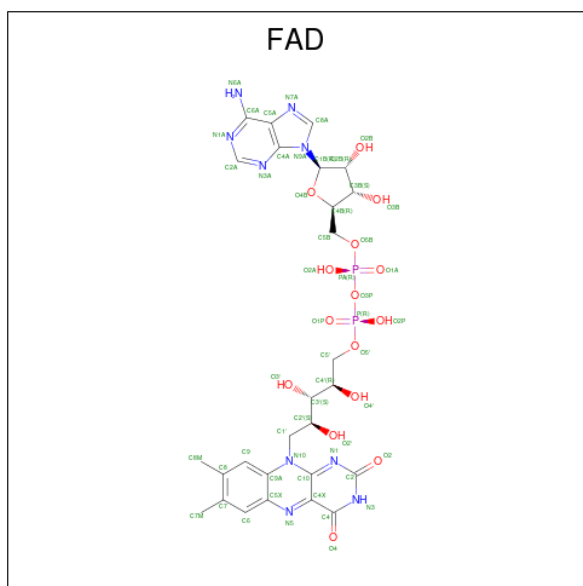
There are 3 unique types of molecules in this entry. The entry contains 7908 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 TRYPANOTHIONE REDUCTASE, OXIDIZED FORM.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	487	Total	C	N	O	S	0	0	0
			3710	2334	644	711	21			
1	B	486	Total	C	N	O	S	0	0	0
			3702	2329	643	710	20			

- Molecule 2 is FLAVIN-ADENINE DINUCLEOTIDE (CCD ID: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	B	1	Total	C	N	O	P	0	0
			53	27	9	15	2		

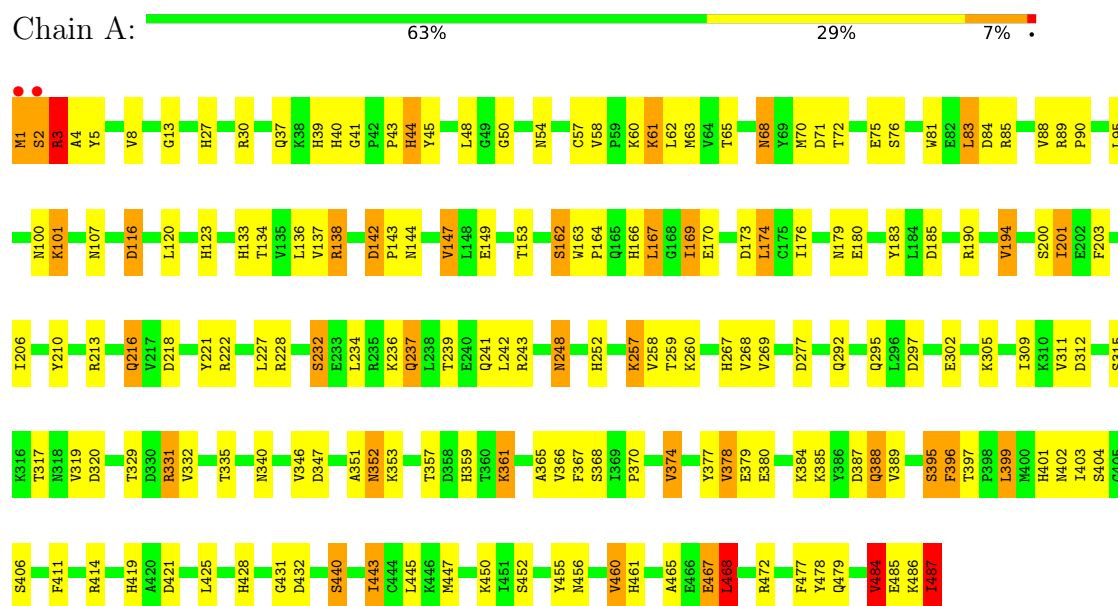
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	213	Total 213	O 213	0	0
3	B	177	Total 177	O 177	0	0

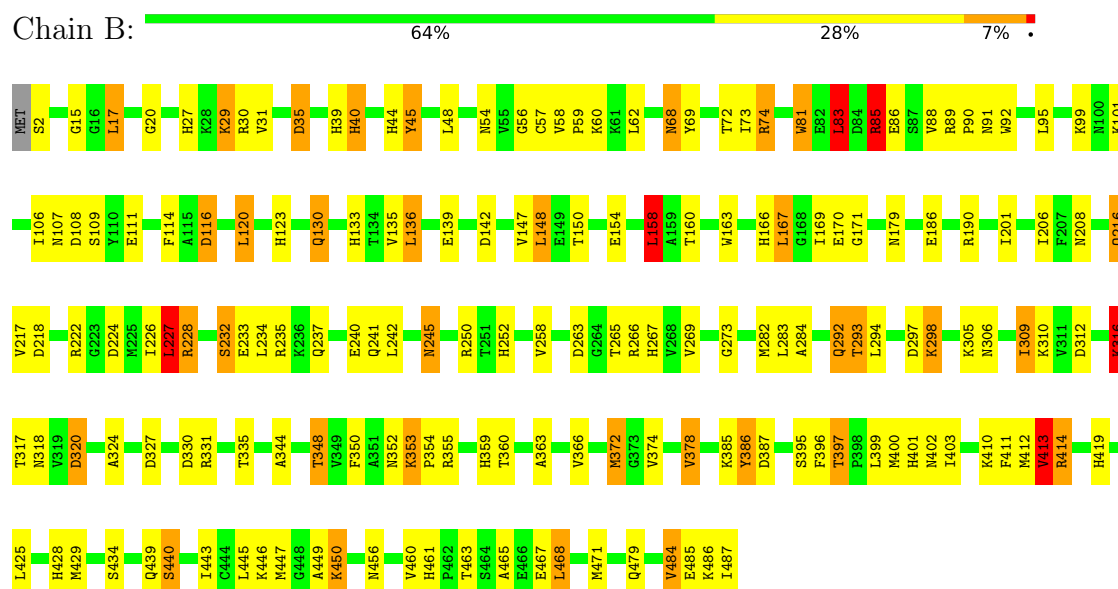
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: TRYPANOTHIONE REDUCTASE, OXIDIZED FORM



• Molecule 1: TRYPANOTHIONE REDUCTASE, OXIDIZED FORM



4 Data and refinement statistics

Property	Value	Source
Space group	P 41	Depositor
Cell constants a, b, c, α , β , γ	128.80Å 128.80Å 92.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	8.00 – 2.60 8.00 – 2.60	Depositor EDS
% Data completeness (in resolution range)	(Not available) (8.00-2.60) 55.2 (8.00-2.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.80 (at 2.61Å)	Xtriage
Refinement program	X-PLOR	Depositor
R, R_{free}	0.161 , (Not available) 0.164 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	22.4	Xtriage
Anisotropy	0.093	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 60.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.044 for h,-k,-l	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	7908	wwPDB-VP
Average B, all atoms (Å ²)	14.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.71% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	1.23	27/3783 (0.7%)	1.94	94/5124 (1.8%)
1	B	1.20	24/3775 (0.6%)	2.01	111/5114 (2.2%)
All	All	1.22	51/7558 (0.7%)	1.98	205/10238 (2.0%)

All (51) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	395	SER	CA-CB	-12.05	1.33	1.53
1	A	468	LEU	CB-CG	-8.85	1.35	1.53
1	A	194	VAL	CA-CB	8.77	1.65	1.54
1	A	138	ARG	CZ-NH1	8.45	1.44	1.32
1	B	83	LEU	CB-CG	-8.37	1.36	1.53
1	B	148	LEU	CB-CG	-8.00	1.37	1.53
1	B	218	ASP	CA-CB	-7.39	1.42	1.53
1	B	27	HIS	CD2-NE2	-7.23	1.29	1.37
1	B	252	HIS	CD2-NE2	-7.19	1.29	1.37
1	B	206	ILE	CA-CB	7.13	1.62	1.54
1	A	166	HIS	CD2-NE2	-7.03	1.30	1.37
1	B	428	HIS	CD2-NE2	-6.98	1.30	1.37
1	A	419	HIS	CD2-NE2	-6.95	1.30	1.37
1	A	39	HIS	CD2-NE2	-6.89	1.30	1.37
1	B	147	VAL	C-N	-6.87	1.24	1.34
1	A	123	HIS	CD2-NE2	-6.76	1.30	1.37
1	B	40	HIS	CD2-NE2	-6.67	1.30	1.37
1	B	461	HIS	CD2-NE2	-6.59	1.30	1.37
1	B	133	HIS	CD2-NE2	-6.57	1.30	1.37
1	A	162	SER	CA-CB	-6.47	1.43	1.53
1	A	359	HIS	CD2-NE2	-6.32	1.30	1.37
1	B	39	HIS	CD2-NE2	-6.32	1.30	1.37
1	B	425	LEU	CB-CG	-6.23	1.41	1.53
1	B	419	HIS	CD2-NE2	-6.23	1.30	1.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	133	HIS	CD2-NE2	-6.17	1.31	1.37
1	B	359	HIS	CD2-NE2	-6.16	1.31	1.37
1	A	428	HIS	CD2-NE2	-6.15	1.31	1.37
1	B	44	HIS	CD2-NE2	-6.08	1.31	1.37
1	A	147	VAL	CA-CB	6.06	1.61	1.54
1	A	317	THR	CA-CB	5.94	1.62	1.53
1	B	158	LEU	CB-CG	-5.90	1.41	1.53
1	A	365	ALA	CA-CB	-5.88	1.43	1.53
1	A	123	HIS	CG-ND1	-5.81	1.31	1.38
1	A	461	HIS	CD2-NE2	-5.79	1.31	1.37
1	B	123	HIS	CD2-NE2	-5.78	1.31	1.37
1	A	27	HIS	CD2-NE2	-5.74	1.31	1.37
1	A	401	HIS	CD2-NE2	-5.73	1.31	1.37
1	B	90	PRO	CA-CB	-5.70	1.46	1.53
1	A	44	HIS	CD2-NE2	-5.69	1.31	1.37
1	A	90	PRO	CA-CB	-5.57	1.47	1.53
1	B	401	HIS	CD2-NE2	-5.57	1.31	1.37
1	B	166	HIS	CD2-NE2	-5.55	1.31	1.37
1	A	252	HIS	CD2-NE2	-5.53	1.31	1.37
1	A	206	ILE	CA-CB	5.48	1.60	1.54
1	A	461	HIS	CG-ND1	-5.36	1.32	1.38
1	B	267	HIS	CD2-NE2	-5.29	1.32	1.37
1	A	267	HIS	CG-ND1	-5.28	1.32	1.38
1	A	166	HIS	CG-ND1	-5.21	1.32	1.38
1	B	413	VAL	CA-CB	5.15	1.62	1.54
1	B	317	THR	CA-CB	5.09	1.60	1.53
1	A	267	HIS	CD2-NE2	-5.06	1.32	1.37

All (205) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	402	ASN	CA-CB-CG	22.15	134.75	112.60
1	B	387	ASP	CA-CB-CG	13.39	125.99	112.60
1	B	402	ASN	CB-CA-C	-12.84	90.62	110.90
1	A	237	GLN	OE1-CD-NE2	-12.51	110.09	122.60
1	A	402	ASN	CA-CB-CG	11.68	124.28	112.60
1	B	402	ASN	N-CA-CB	11.03	126.06	110.07
1	B	402	ASN	CB-CG-ND2	10.80	132.60	116.40
1	B	116	ASP	CA-CB-CG	10.33	122.93	112.60
1	A	484	VAL	N-CA-CB	-10.03	100.91	112.34
1	A	320	ASP	N-CA-C	9.86	124.37	111.75
1	B	27	HIS	CA-CB-CG	-9.86	103.94	113.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	402	ASN	N-CA-C	-8.81	101.62	111.14
1	B	114	PHE	N-CA-C	-8.64	101.06	111.69
1	B	402	ASN	OD1-CG-ND2	-8.63	113.97	122.60
1	B	136	LEU	N-CA-CB	-8.45	96.13	110.83
1	B	378	VAL	N-CA-CB	-8.23	98.98	110.26
1	B	401	HIS	CA-CB-CG	-8.23	105.57	113.80
1	A	116	ASP	CA-CB-CG	8.16	120.76	112.60
1	B	312	ASP	CA-CB-CG	8.08	120.68	112.60
1	A	61	LYS	CA-CB-CG	-7.90	98.29	114.10
1	A	142	ASP	CA-CB-CG	7.83	120.43	112.60
1	A	84	ASP	CA-CB-CG	7.63	120.23	112.60
1	B	245	ASN	OD1-CG-ND2	-7.56	115.04	122.60
1	A	1	MET	CA-CB-CG	7.55	129.19	114.10
1	A	332	VAL	O-C-N	-7.53	114.94	122.99
1	A	54	ASN	OD1-CG-ND2	-7.49	115.11	122.60
1	B	232	SER	N-CA-C	7.47	119.42	111.28
1	A	39	HIS	CB-CG-CD2	-7.42	121.55	131.20
1	B	461	HIS	CB-CG-CD2	-7.37	121.62	131.20
1	A	170	GLU	N-CA-C	-7.36	99.00	109.96
1	B	348	THR	CA-CB-OG1	-7.28	98.68	109.60
1	B	163	TRP	O-C-N	-7.26	116.77	121.85
1	A	352	ASN	CA-CB-CG	-7.24	105.36	112.60
1	A	460	VAL	N-CA-C	-7.23	98.02	108.36
1	B	265	THR	N-CA-C	-7.21	99.85	110.52
1	A	374	VAL	N-CA-CB	-7.20	98.46	111.92
1	A	312	ASP	CA-CB-CG	7.18	119.78	112.60
1	B	136	LEU	CA-CB-CG	7.16	141.37	116.30
1	B	106	ILE	N-CA-C	-7.16	103.80	110.53
1	A	401	HIS	CA-CB-CG	-7.15	106.65	113.80
1	B	428	HIS	CB-CG-CD2	-7.11	121.95	131.20
1	B	39	HIS	CB-CG-CD2	-7.10	121.97	131.20
1	B	91	ASN	OD1-CG-ND2	-7.10	115.50	122.60
1	A	241	GLN	CA-CB-CG	-7.08	99.93	114.10
1	B	456	ASN	OD1-CG-ND2	-7.06	115.54	122.60
1	B	292	GLN	N-CA-C	7.04	121.12	112.54
1	B	133	HIS	CB-CG-CD2	-6.85	122.30	131.20
1	A	319	VAL	N-CA-C	-6.80	97.82	107.75
1	A	179	ASN	OD1-CG-ND2	-6.77	115.83	122.60
1	B	109	SER	CA-CB-OG	-6.73	97.63	111.10
1	B	74	ARG	CG-CD-NE	6.70	126.75	112.00
1	A	163	TRP	CG-CD2-CE3	6.69	140.59	133.90
1	A	222	ARG	N-CA-C	6.69	119.14	111.11

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	378	VAL	CB-CA-C	6.68	120.82	111.34
1	A	456	ASN	OD1-CG-ND2	-6.67	115.93	122.60
1	B	374	VAL	O-C-N	-6.66	115.41	123.00
1	A	357	THR	CA-CB-OG1	-6.59	99.72	109.60
1	B	179	ASN	OD1-CG-ND2	-6.54	116.06	122.60
1	A	54	ASN	N-CA-C	6.50	121.49	112.45
1	B	250	ARG	CB-CG-CD	-6.49	96.38	111.30
1	B	439	GLN	CG-CD-NE2	6.47	126.11	116.40
1	B	208	ASN	OD1-CG-ND2	-6.47	116.13	122.60
1	A	486	LYS	N-CA-C	6.46	124.57	110.80
1	A	107	ASN	OD1-CG-ND2	-6.44	116.16	122.60
1	B	273	GLY	N-CA-C	-6.44	106.79	115.36
1	A	395	SER	N-CA-CB	-6.44	99.99	110.81
1	A	68	ASN	OD1-CG-ND2	-6.44	116.16	122.60
1	A	396	PHE	CA-CB-CG	6.40	120.20	113.80
1	A	213	ARG	O-C-N	-6.40	114.08	122.59
1	B	27	HIS	CB-CG-CD2	-6.37	122.92	131.20
1	A	100	ASN	OD1-CG-ND2	-6.36	116.24	122.60
1	B	154	GLU	CA-C-O	-6.35	114.36	120.90
1	A	44	HIS	CA-CB-CG	-6.34	107.45	113.80
1	A	164	PRO	O-C-N	-6.27	115.44	123.03
1	A	396	PHE	O-C-N	-6.26	116.72	123.42
1	A	71	ASP	CA-CB-CG	6.25	118.85	112.60
1	B	186	GLU	CA-CB-CG	6.24	126.57	114.10
1	B	414	ARG	NE-CZ-NH2	-6.19	113.63	119.20
1	A	388	GLN	CA-CB-CG	6.17	126.43	114.10
1	A	174	LEU	N-CA-CB	-6.14	101.40	110.49
1	B	150	THR	O-C-N	-6.13	115.79	123.27
1	B	190	ARG	CG-CD-NE	-6.12	98.53	112.00
1	B	318	ASN	CA-CB-CG	6.12	118.72	112.60
1	A	173	ASP	CA-CB-CG	6.11	118.71	112.60
1	A	456	ASN	CA-CB-CG	-6.11	106.50	112.60
1	B	378	VAL	N-CA-C	-6.11	100.91	109.21
1	A	248	ASN	OD1-CG-ND2	-6.10	116.50	122.60
1	B	267	HIS	CB-CG-CD2	-6.08	123.29	131.20
1	B	120	LEU	O-C-N	-6.06	116.17	123.13
1	B	446	LYS	N-CA-C	-6.05	104.59	111.07
1	A	361	LYS	CA-CB-CG	-6.04	102.01	114.10
1	A	486	LYS	CA-CB-CG	-6.00	102.11	114.10
1	B	352	ASN	CA-CB-CG	-5.99	106.61	112.60
1	A	378	VAL	N-CA-CB	-5.99	99.81	110.95
1	A	487	ILE	N-CA-CB	-5.99	101.32	111.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	397	THR	N-CA-C	-5.98	97.68	109.10
1	A	63	MET	CA-C-O	-5.93	114.26	120.55
1	A	2	SER	N-CA-C	-5.92	105.92	113.02
1	A	210	TYR	N-CA-C	5.89	120.47	113.28
1	B	89	ARG	CA-C-N	5.88	126.08	119.90
1	B	89	ARG	C-N-CA	5.88	126.08	119.90
1	B	167	LEU	N-CA-CB	-5.82	100.80	110.23
1	B	318	ASN	OD1-CG-ND2	-5.82	116.78	122.60
1	A	169	ILE	CA-C-O	5.81	128.04	120.78
1	B	136	LEU	CB-CA-C	5.80	120.44	109.37
1	A	138	ARG	CB-CG-CD	-5.79	97.98	111.30
1	B	366	VAL	N-CA-C	-5.78	100.02	108.11
1	B	68	ASN	OD1-CG-ND2	-5.77	116.83	122.60
1	A	3	ARG	CA-CB-CG	-5.76	102.58	114.10
1	B	142	ASP	CA-C-N	5.75	126.14	119.47
1	B	142	ASP	C-N-CA	5.75	126.14	119.47
1	A	144	ASN	OD1-CG-ND2	-5.74	116.86	122.60
1	B	429	MET	CG-SD-CE	-5.74	88.26	100.90
1	B	15	GLY	CA-C-N	5.73	127.30	120.14
1	B	15	GLY	C-N-CA	5.73	127.30	120.14
1	A	467	GLU	CA-C-N	5.73	128.23	120.38
1	A	467	GLU	C-N-CA	5.73	128.23	120.38
1	A	366	VAL	N-CA-C	-5.73	100.09	108.11
1	A	70	MET	N-CA-C	-5.72	105.12	111.36
1	B	73	ILE	N-CA-C	-5.72	104.94	110.72
1	A	332	VAL	CA-C-O	5.72	126.77	120.48
1	B	45	TYR	CA-CB-CG	-5.72	103.61	113.90
1	A	401	HIS	ND1-CE1-NE2	-5.71	102.69	108.40
1	B	35	ASP	CA-C-N	5.70	128.39	120.29
1	B	35	ASP	C-N-CA	5.70	128.39	120.29
1	B	263	ASP	CA-CB-CG	5.70	118.30	112.60
1	B	306	ASN	CA-CB-CG	5.69	118.29	112.60
1	A	40	HIS	N-CA-C	5.69	117.67	110.33
1	B	316	LYS	CG-CD-CE	-5.68	98.24	111.30
1	B	107	ASN	OD1-CG-ND2	-5.66	116.94	122.60
1	A	213	ARG	N-CA-C	5.65	122.83	110.80
1	B	107	ASN	CB-CG-ND2	5.64	124.86	116.40
1	A	174	LEU	N-CA-C	-5.64	106.06	113.17
1	B	374	VAL	N-CA-CB	-5.61	101.44	111.92
1	A	460	VAL	O-C-N	-5.60	116.81	123.03
1	B	241	GLN	OE1-CD-NE2	-5.59	117.00	122.60
1	B	133	HIS	CB-CG-ND1	5.58	131.07	122.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	222	ARG	CB-CA-C	-5.56	101.40	110.85
1	A	163	TRP	O-C-N	-5.56	117.94	121.88
1	A	487	ILE	N-CA-C	5.55	126.55	111.00
1	B	130	GLN	OE1-CD-NE2	-5.55	117.05	122.60
1	B	327	ASP	N-CA-C	5.54	118.84	111.75
1	B	484	VAL	N-CA-C	5.52	120.82	109.34
1	B	348	THR	CA-CB-CG2	5.51	119.86	110.50
1	B	461	HIS	CB-CG-ND1	5.50	130.94	122.70
1	A	378	VAL	CB-CA-C	5.50	119.87	111.68
1	B	460	VAL	N-CA-C	-5.49	99.33	107.51
1	B	120	LEU	CA-C-O	-5.45	114.32	120.43
1	A	297	ASP	CA-CB-CG	5.43	118.03	112.60
1	A	346	VAL	N-CA-CB	-5.43	102.44	110.58
1	B	136	LEU	N-CA-C	-5.41	100.59	109.40
1	A	397	THR	CA-C-N	5.40	126.59	119.84
1	A	397	THR	C-N-CA	5.40	126.59	119.84
1	B	463	THR	O-C-N	-5.39	117.10	123.25
1	A	443	ILE	N-CA-C	-5.39	105.28	110.72
1	B	92	TRP	CE2-CD2-CG	-5.38	100.74	107.20
1	A	309	ILE	N-CA-C	-5.36	101.82	108.89
1	B	397	THR	N-CA-C	-5.36	100.90	109.04
1	B	29	LYS	O-C-N	-5.35	116.42	122.68
1	A	340	ASN	OD1-CG-ND2	-5.32	117.28	122.60
1	A	401	HIS	CE1-NE2-CD2	5.31	114.31	109.00
1	A	352	ASN	CA-C-O	5.29	128.08	120.51
1	B	330	ASP	CA-CB-CG	5.28	117.88	112.60
1	B	484	VAL	N-CA-CB	-5.28	102.52	111.23
1	B	360	THR	CA-CB-OG1	-5.27	101.70	109.60
1	B	386	TYR	CA-C-N	-5.25	114.25	122.65
1	B	386	TYR	C-N-CA	-5.25	114.25	122.65
1	A	461	HIS	CB-CG-CD2	-5.24	124.39	131.20
1	A	89	ARG	CA-CB-CG	5.22	124.55	114.10
1	A	401	HIS	CA-C-N	-5.22	112.00	121.14
1	A	401	HIS	C-N-CA	-5.22	112.00	121.14
1	B	252	HIS	CB-CG-CD2	-5.20	124.44	131.20
1	A	402	ASN	N-CA-C	-5.20	106.45	112.89
1	B	81	TRP	CE2-CD2-CG	-5.19	100.97	107.20
1	B	85	ARG	CA-CB-CG	-5.19	103.72	114.10
1	A	419	HIS	CB-CG-CD2	-5.18	124.47	131.20
1	B	123	HIS	CB-CG-CD2	-5.18	124.47	131.20
1	B	320	ASP	N-CA-C	5.18	118.38	111.75
1	B	428	HIS	CB-CG-ND1	5.17	130.46	122.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	439	GLN	OE1-CD-NE2	-5.17	117.43	122.60
1	A	461	HIS	CA-C-O	-5.17	113.98	120.23
1	B	309	ILE	N-CA-CB	-5.17	104.90	110.53
1	A	421	ASP	CA-CB-CG	5.17	117.77	112.60
1	A	4	ALA	N-CA-C	5.15	117.57	111.33
1	A	203	PHE	CA-CB-CG	-5.15	108.65	113.80
1	B	135	VAL	O-C-N	-5.14	117.89	123.14
1	A	269	VAL	N-CA-C	-5.13	100.92	108.11
1	A	388	GLN	OE1-CD-NE2	-5.12	117.48	122.60
1	B	293	THR	CA-C-O	5.11	125.33	119.35
1	B	461	HIS	CA-CB-CG	5.11	118.91	113.80
1	A	257	LYS	CA-CB-CG	5.11	124.31	114.10
1	A	384	LYS	O-C-N	-5.11	116.01	122.19
1	B	450	LYS	CA-CB-CG	5.09	124.28	114.10
1	B	58	VAL	CA-C-N	5.09	124.26	118.97
1	B	58	VAL	C-N-CA	5.09	124.26	118.97
1	B	92	TRP	CG-CD2-CE3	5.08	138.98	133.90
1	A	432	ASP	O-C-N	5.07	129.05	122.81
1	B	269	VAL	N-CA-C	-5.07	99.87	107.37
1	A	138	ARG	NE-CZ-NH1	5.06	126.56	121.50
1	A	361	LYS	N-CA-C	5.05	118.41	111.54
1	A	58	VAL	N-CA-CB	-5.04	104.15	111.21
1	B	86	GLU	N-CA-C	-5.03	106.92	113.16
1	B	227	LEU	N-CA-C	5.03	118.56	111.52
1	B	434	SER	CA-C-N	5.01	125.03	119.32
1	B	434	SER	C-N-CA	5.01	125.03	119.32

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	3710	0	3657	63	0
1	B	3702	0	3645	61	0
2	A	53	0	31	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	53	0	31	2	0
3	A	213	0	0	6	0
3	B	177	0	0	4	0
All	All	7908	0	7364	114	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 8.

All (114) 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:A:396:PHE:CE1	1:A:467:GLU:HG3	2.18	0.79
1:B:237:GLN:HG2	3:B:643:HOH:O	1.89	0.71
1:B:228:ARG:HB2	1:B:228:ARG:HH11	1.59	0.67
1:A:479:GLN:HB2	1:A:484:VAL:HG21	1.77	0.66
1:B:353:LYS:NZ	1:B:355:ARG:HD3	2.11	0.66
1:A:101:LYS:NZ	1:B:403:ILE:HG12	2.11	0.65
1:A:101:LYS:HZ3	1:B:403:ILE:HG12	1.61	0.65
1:B:344:ALA:HA	1:B:355:ARG:HE	1.62	0.65
1:A:347:ASP:HA	1:A:351:ALA:HB3	1.78	0.64
1:A:388:GLN:HA	1:A:487:ILE:HD11	1.80	0.64
1:B:282:MET:HE3	1:B:284:ALA:HB2	1.80	0.63
1:B:201:ILE:HD12	1:B:227:LEU:HD13	1.80	0.63
1:B:316:LYS:HE3	1:B:320:ASP:HA	1.82	0.62
1:B:130:GLN:HB2	1:B:136:LEU:HD22	1.82	0.62
1:B:413:VAL:HG13	1:B:471:MET:HE1	1.82	0.62
1:B:412:MET:HE2	1:B:414:ARG:HD3	1.83	0.59
1:B:108:ASP:HA	1:B:111:GLU:HG2	1.86	0.58
1:A:62:LEU:HD22	1:B:403:ILE:HD12	1.86	0.57
1:A:65:THR:HG21	1:B:400:MET:HG3	1.86	0.57
1:B:158:LEU:HD13	1:B:309:ILE:HD13	1.85	0.57
1:A:138:ARG:NH2	1:A:295:GLN:HE22	2.04	0.56
1:A:361:LYS:HD2	1:A:445:LEU:HB3	1.87	0.56
1:B:467:GLU:O	1:B:471:MET:HE3	2.06	0.55
1:A:477:PHE:CD2	1:A:487:ILE:HG21	2.42	0.55
1:A:75:GLU:HG2	1:A:404:SER:HB2	1.89	0.55
1:A:138:ARG:HD2	3:A:658:HOH:O	2.05	0.55
1:A:228:ARG:HG2	3:A:666:HOH:O	2.06	0.55
1:B:397:THR:OG1	1:B:410:LYS:HD2	2.06	0.55
1:A:1:MET:HE3	1:A:3:ARG:O	2.06	0.54
1:B:353:LYS:HZ2	1:B:355:ARG:HD3	1.72	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:158:LEU:HD12	1:B:324:ALA:HB2	1.90	0.54
1:A:477:PHE:HB3	1:A:487:ILE:HD13	1.90	0.53
1:B:240:GLU:HG2	3:B:607:HOH:O	2.08	0.53
1:B:167:LEU:HD23	1:B:283:LEU:HD22	1.91	0.53
1:B:465:ALA:O	1:B:468:LEU:HB2	2.09	0.53
1:A:72:THR:HG21	3:A:549:HOH:O	2.09	0.52
1:A:138:ARG:HH22	1:A:295:GLN:HE22	1.56	0.52
1:A:76:SER:HB2	1:A:81:TRP:HB2	1.91	0.52
1:B:293:THR:HG21	3:B:525:HOH:O	2.10	0.51
1:A:5:TYR:CD1	1:A:30:ARG:HG2	2.45	0.51
1:B:81:TRP:O	1:B:85:ARG:NH2	2.43	0.51
1:A:403:ILE:HD12	1:B:62:LEU:HD22	1.91	0.51
1:B:413:VAL:CG1	1:B:471:MET:HE1	2.41	0.51
1:B:160:THR:HG21	1:B:294:LEU:HD21	1.93	0.51
1:A:329:THR:HB	1:A:331:ARG:HD2	1.94	0.50
1:B:228:ARG:HD2	3:B:657:HOH:O	2.12	0.50
1:A:8:VAL:HG23	1:A:153:THR:HB	1.93	0.50
1:B:40:HIS:HB3	1:B:54:ASN:OD1	2.11	0.50
1:A:1:MET:HB2	1:A:3:ARG:O	2.11	0.50
1:A:399:LEU:HD13	1:B:62:LEU:HD11	1.94	0.49
1:A:440:SER:HB2	1:B:440:SER:HB2	1.93	0.49
1:B:385:LYS:HB2	1:B:386:TYR:CD1	2.47	0.49
1:B:353:LYS:HZ3	1:B:355:ARG:HD3	1.78	0.49
1:A:137:VAL:HB	1:A:149:GLU:HB2	1.94	0.49
1:A:88:VAL:HG22	1:B:83:LEU:CD1	2.43	0.48
1:B:29:LYS:HE2	1:B:350:PHE:CD1	2.47	0.48
1:B:234:LEU:HD23	1:B:372:MET:HE3	1.94	0.48
1:B:35:ASP:OD2	2:B:493:FAD:H3B	2.14	0.47
1:A:379:GLU:OE2	1:A:414:ARG:NH2	2.48	0.47
1:A:83:LEU:HB3	1:B:88:VAL:HG22	1.97	0.46
1:B:59:PRO:HB3	1:B:99:LYS:HD2	1.97	0.46
1:A:347:ASP:HB3	1:A:353:LYS:O	2.14	0.46
1:A:377:TYR:HA	3:A:628:HOH:O	2.16	0.46
1:A:1:MET:HB3	1:A:2:SER:H	1.49	0.46
1:A:239:THR:O	1:A:243:ARG:HG3	2.15	0.46
1:B:20:GLY:HA2	1:B:31:VAL:HG11	1.98	0.45
1:A:138:ARG:HH22	1:A:295:GLN:NE2	2.13	0.45
1:A:258:VAL:HG22	1:A:268:VAL:HG22	1.99	0.45
1:A:37:GLN:OE1	1:A:44:HIS:HB2	2.17	0.45
1:A:232:SER:O	1:A:236:LYS:HG3	2.16	0.45
1:B:233:GLU:HG3	1:B:412:MET:HE1	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:396:PHE:CE1	1:B:467:GLU:HG3	2.52	0.45
1:B:17:LEU:HD12	1:B:17:LEU:HA	1.84	0.44
1:B:298:LYS:HZ2	1:B:298:LYS:HB3	1.82	0.44
1:A:167:LEU:HB3	1:A:169:ILE:HG12	2.00	0.44
1:B:29:LYS:HE2	1:B:350:PHE:HD1	1.82	0.44
1:B:395:SER:HA	1:B:411:PHE:O	2.18	0.44
1:A:142:ASP:HA	1:A:143:PRO:HD2	1.73	0.43
1:A:81:TRP:O	1:A:85:ARG:NH2	2.52	0.43
1:A:460:VAL:HG22	1:B:363:ALA:HB3	2.00	0.43
1:B:69:TYR:HA	1:B:72:THR:OG1	2.18	0.43
1:B:232:SER:HA	1:B:235:ARG:HD3	2.00	0.43
1:A:201:ILE:HG22	1:A:368:SER:HB3	1.99	0.43
1:B:385:LYS:HB2	1:B:386:TYR:CE1	2.54	0.43
1:B:216:GLN:HG3	1:B:217:VAL:N	2.34	0.43
1:B:74:ARG:NH2	1:B:245:ASN:OD1	2.51	0.43
1:B:348:THR:OG1	1:B:354:PRO:HA	2.19	0.43
1:A:190:ARG:HA	1:A:216:GLN:O	2.19	0.42
1:A:13:GLY:HA2	1:A:50:GLY:HA3	2.01	0.42
1:A:176:ILE:HB	1:A:180:GLU:HB2	2.01	0.42
1:A:443:ILE:HG22	1:A:447:MET:HE2	2.01	0.42
1:B:171:GLY:HA3	1:B:258:VAL:O	2.19	0.42
1:A:295:GLN:HA	3:A:674:HOH:O	2.18	0.42
1:B:56:GLY:O	1:B:59:PRO:HD2	2.20	0.42
1:A:311:VAL:HB	1:A:315:SER:HA	2.01	0.42
1:A:411:PHE:CD1	1:A:431:GLY:HA3	2.55	0.42
1:A:465:ALA:O	1:A:468:LEU:HB2	2.20	0.42
1:B:139:GLU:N	1:B:148:LEU:HD13	2.35	0.42
1:A:43:PRO:HG2	1:A:44:HIS:CD2	2.55	0.42
1:A:447:MET:HE1	1:B:449:ALA:HB2	2.01	0.42
2:B:493:FAD:H9	2:B:493:FAD:H1'1	1.88	0.42
1:A:138:ARG:NH1	1:A:143:PRO:HA	2.35	0.41
1:A:44:HIS:O	1:A:45:TYR:HB2	2.20	0.41
1:A:218:ASP:OD1	1:A:248:ASN:HB3	2.20	0.41
1:A:41:GLY:HA2	1:A:183:TYR:CZ	2.56	0.41
1:A:389:VAL:HB	1:A:478:TYR:HB2	2.03	0.41
1:B:479:GLN:HB2	1:B:484:VAL:HG11	2.02	0.41
1:A:295:GLN:NE2	3:A:653:HOH:O	2.55	0.40
1:A:292:GLN:CD	1:A:292:GLN:H	2.29	0.40
1:A:455:TYR:HB2	1:A:472:ARG:NH1	2.36	0.40
1:B:447:MET:HB2	1:B:447:MET:HE3	1.82	0.40
1:B:443:ILE:HG21	1:B:443:ILE:HD13	1.85	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:61:LYS:HE3	1:A:367:PHE:CE1	2.56	0.40
1:A:221:TYR:OH	1:A:228:ARG:HD2	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	485/487 (100%)	456 (94%)	28 (6%)	1 (0%)	43	66
1	B	484/487 (99%)	465 (96%)	16 (3%)	3 (1%)	21	42
All	All	969/974 (100%)	921 (95%)	44 (4%)	4 (0%)	30	51

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	485	GLU
1	A	352	ASN
1	B	45	TYR
1	B	169	ILE

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.

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	390/390 (100%)	339 (87%)	51 (13%)	4 8
1	B	389/390 (100%)	348 (90%)	41 (10%)	6 14
All	All	779/780 (100%)	687 (88%)	92 (12%)	5 10

All (92) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	ARG
1	A	48	LEU
1	A	57	CYS
1	A	60	LYS
1	A	68	ASN
1	A	83	LEU
1	A	95	LEU
1	A	101	LYS
1	A	116	ASP
1	A	120	LEU
1	A	134	THR
1	A	136	LEU
1	A	147	VAL
1	A	162	SER
1	A	167	LEU
1	A	174	LEU
1	A	185	ASP
1	A	194	VAL
1	A	200	SER
1	A	201	ILE
1	A	216	GLN
1	A	227	LEU
1	A	232	SER
1	A	234	LEU
1	A	237	GLN
1	A	242	LEU
1	A	257	LYS
1	A	259	THR
1	A	260	LYS
1	A	277	ASP
1	A	302	GLU
1	A	305	LYS

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Mol	Chain	Res	Type
1	A	331	ARG
1	A	335	THR
1	A	370	PRO
1	A	374	VAL
1	A	378	VAL
1	A	380	GLU
1	A	385	LYS
1	A	387	ASP
1	A	395	SER
1	A	399	LEU
1	A	406	SER
1	A	425	LEU
1	A	440	SER
1	A	450	LYS
1	A	452	SER
1	A	468	LEU
1	A	484	VAL
1	A	485	GLU
1	A	487	ILE
1	B	2	SER
1	B	17	LEU
1	B	30	ARG
1	B	48	LEU
1	B	57	CYS
1	B	60	LYS
1	B	68	ASN
1	B	83	LEU
1	B	85	ARG
1	B	95	LEU
1	B	101	LYS
1	B	116	ASP
1	B	120	LEU
1	B	158	LEU
1	B	170	GLU
1	B	216	GLN
1	B	224	ASP
1	B	226	ILE
1	B	227	LEU
1	B	228	ARG
1	B	242	LEU
1	B	266	ARG
1	B	292	GLN

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Mol	Chain	Res	Type
1	B	297	ASP
1	B	298	LYS
1	B	305	LYS
1	B	310	LYS
1	B	316	LYS
1	B	331	ARG
1	B	335	THR
1	B	353	LYS
1	B	372	MET
1	B	378	VAL
1	B	399	LEU
1	B	413	VAL
1	B	440	SER
1	B	445	LEU
1	B	450	LYS
1	B	468	LEU
1	B	486	LYS
1	B	487	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	44	HIS
1	A	179	ASN
1	A	388	GLN
1	B	68	ASN
1	B	179	ASN
1	B	292	GLN
1	B	388	GLN
1	B	479	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

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	FAD	A	493	-	58,58,58	1.37	8 (13%)	85,89,89	1.93	19 (22%)
2	FAD	B	493	-	58,58,58	1.38	7 (12%)	85,89,89	1.81	14 (16%)

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	FAD	A	493	-	1/1/9/9	7/34/50/50	0/6/6/6
2	FAD	B	493	-	1/1/9/9	5/34/50/50	0/6/6/6

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	493	FAD	C9-C8	-4.08	1.34	1.39
2	A	493	FAD	C5X-N5	-3.83	1.32	1.39
2	A	493	FAD	C1'-C2'	-3.70	1.47	1.52
2	B	493	FAD	C6-C7	-3.55	1.34	1.39
2	A	493	FAD	C6-C7	-3.49	1.34	1.39
2	B	493	FAD	C1'-C2'	-3.48	1.47	1.52
2	B	493	FAD	C2'-C3'	-3.15	1.47	1.53
2	B	493	FAD	C5X-N5	-3.01	1.33	1.39
2	A	493	FAD	C9-C8	-2.55	1.36	1.39
2	A	493	FAD	C9-C9A	2.55	1.43	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	493	FAD	C9A-N10	-2.30	1.37	1.41
2	A	493	FAD	C5'-C4'	-2.27	1.48	1.51
2	B	493	FAD	PA-O3P	-2.18	1.57	1.59
2	A	493	FAD	C4X-C4	2.15	1.52	1.44
2	B	493	FAD	C9A-N10	-2.10	1.37	1.41

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	493	FAD	C3B-C2B-C1B	-9.77	82.98	101.46
2	A	493	FAD	O2A-PA-O3P	8.39	129.94	107.27
2	A	493	FAD	C3B-C2B-C1B	-7.59	87.11	101.46
2	B	493	FAD	O4B-C4B-C3B	-5.14	94.95	105.15
2	A	493	FAD	O3P-PA-O1A	-4.10	98.38	110.70
2	A	493	FAD	O3B-C3B-C4B	3.71	121.74	111.08
2	A	493	FAD	C4'-C3'-C2'	3.55	119.47	113.57
2	B	493	FAD	C2B-C1B-N9A	3.46	121.89	113.30
2	B	493	FAD	O4'-C4'-C3'	3.29	116.94	109.25
2	A	493	FAD	C2B-C1B-N9A	3.28	121.46	113.30
2	B	493	FAD	C10-N1-C2	3.18	123.73	116.85
2	B	493	FAD	O3B-C3B-C2B	3.13	121.85	111.82
2	A	493	FAD	C10-C4X-N5	-3.00	118.68	124.81
2	B	493	FAD	O4B-C1B-C2B	-3.00	100.21	106.62
2	A	493	FAD	C5X-N5-C4X	2.93	122.83	118.09
2	A	493	FAD	O4B-C4B-C3B	-2.89	99.43	105.15
2	B	493	FAD	C2B-C3B-C4B	2.85	108.11	102.61
2	A	493	FAD	C10-N1-C2	2.82	122.95	116.85
2	B	493	FAD	O2A-PA-O3P	2.81	114.86	107.27
2	A	493	FAD	C4-C4X-N5	2.67	121.89	118.21
2	B	493	FAD	O4'-C4'-C5'	-2.53	104.40	109.99
2	A	493	FAD	O2'-C2'-C1'	-2.52	99.84	110.20
2	A	493	FAD	O3'-C3'-C4'	-2.41	103.46	108.93
2	A	493	FAD	C4X-C10-N10	2.30	119.78	116.48
2	A	493	FAD	C9-C9A-N10	2.28	124.92	121.85
2	A	493	FAD	C4X-C10-N1	-2.26	119.05	124.59
2	B	493	FAD	C4-C4X-N5	2.24	121.30	118.21
2	B	493	FAD	O3B-C3B-C4B	2.21	117.42	111.08
2	B	493	FAD	C10-C4X-N5	-2.14	120.43	124.81
2	A	493	FAD	O2-C2-N1	-2.10	118.31	121.80
2	B	493	FAD	C4X-C10-N10	2.09	119.48	116.48
2	A	493	FAD	O2-C2-N3	2.04	122.50	118.58
2	A	493	FAD	O4'-C4'-C5'	-2.00	105.57	109.99

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	A	493	FAD	C3B
2	B	493	FAD	C3B

All (12) torsion outliers are listed below:

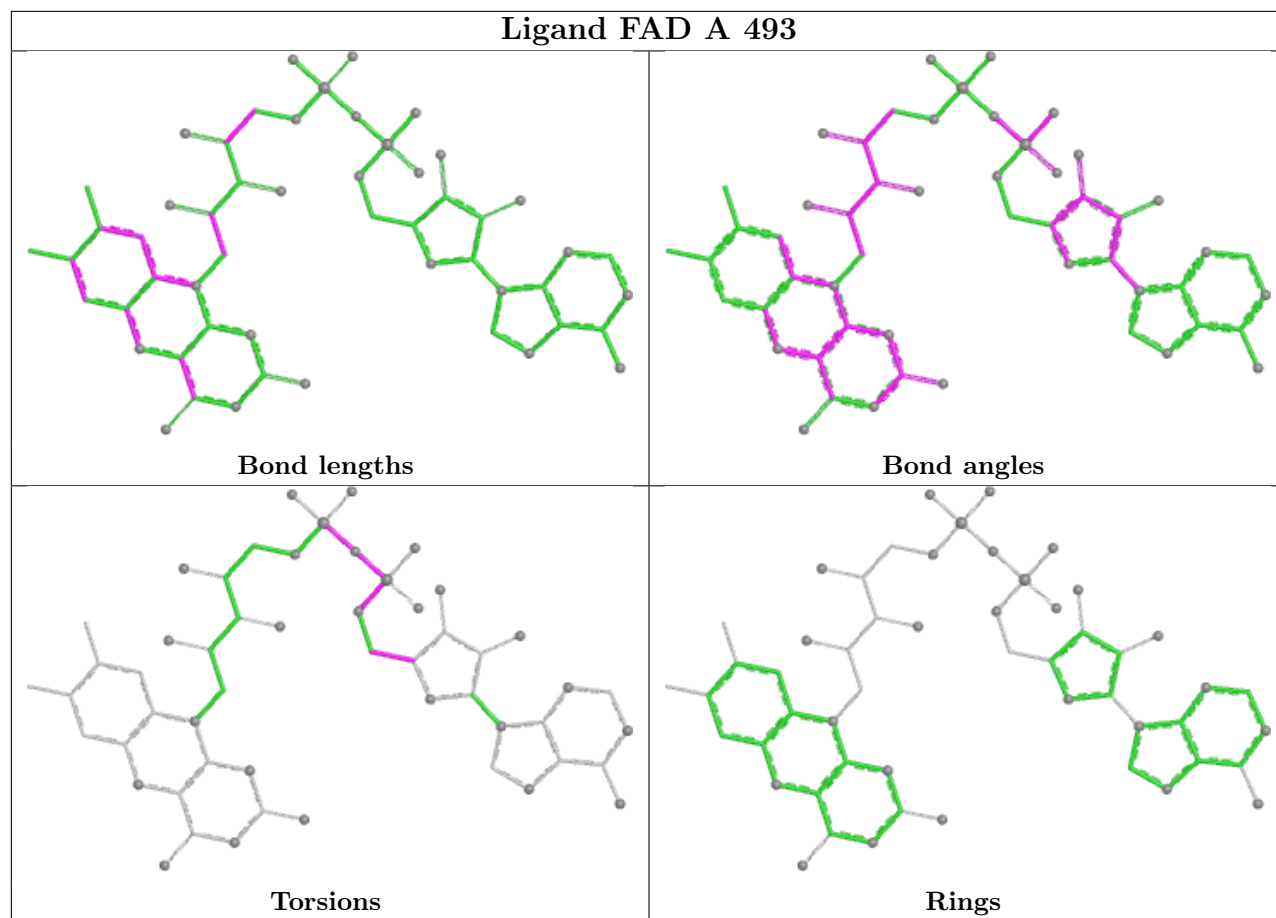
Mol	Chain	Res	Type	Atoms
2	A	493	FAD	C5B-O5B-PA-O1A
2	A	493	FAD	C5B-O5B-PA-O2A
2	A	493	FAD	C5B-O5B-PA-O3P
2	A	493	FAD	O4B-C4B-C5B-O5B
2	A	493	FAD	C3B-C4B-C5B-O5B
2	B	493	FAD	C3B-C4B-C5B-O5B
2	B	493	FAD	O4B-C4B-C5B-O5B
2	B	493	FAD	PA-O3P-P-O5'
2	B	493	FAD	P-O3P-PA-O2A
2	A	493	FAD	PA-O3P-P-O5'
2	A	493	FAD	P-O3P-PA-O2A
2	B	493	FAD	P-O3P-PA-O1A

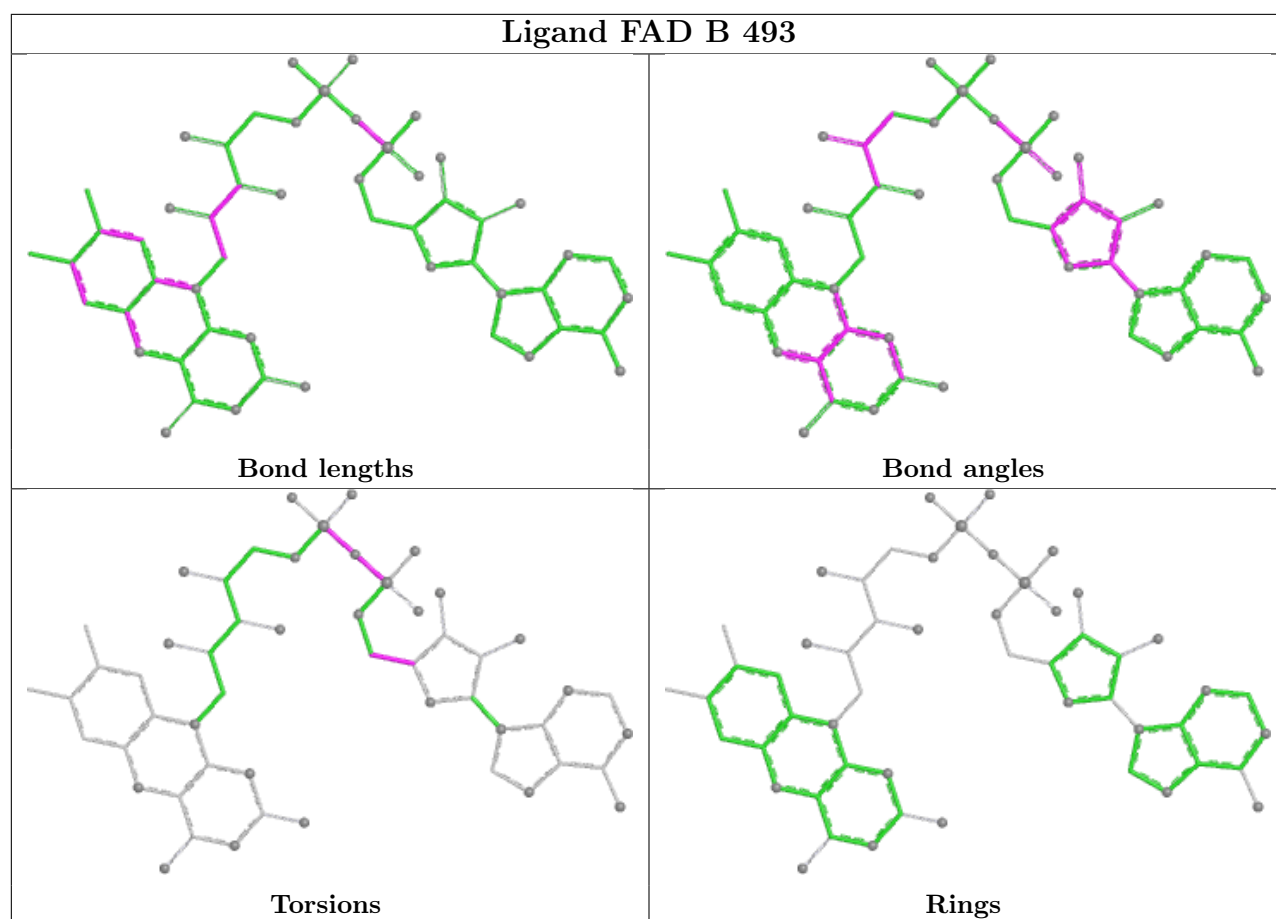
There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	493	FAD	2	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 [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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	487/487 (100%)	-0.71	2 (0%) 88 86	3, 11, 33, 57	0
1	B	486/487 (99%)	-0.78	0 100 100	3, 9, 34, 59	0
All	All	973/974 (99%)	-0.74	2 (0%) 91 90	3, 10, 34, 59	0

All (2) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	1	MET	3.3
1	A	2	SER	2.2

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](#)

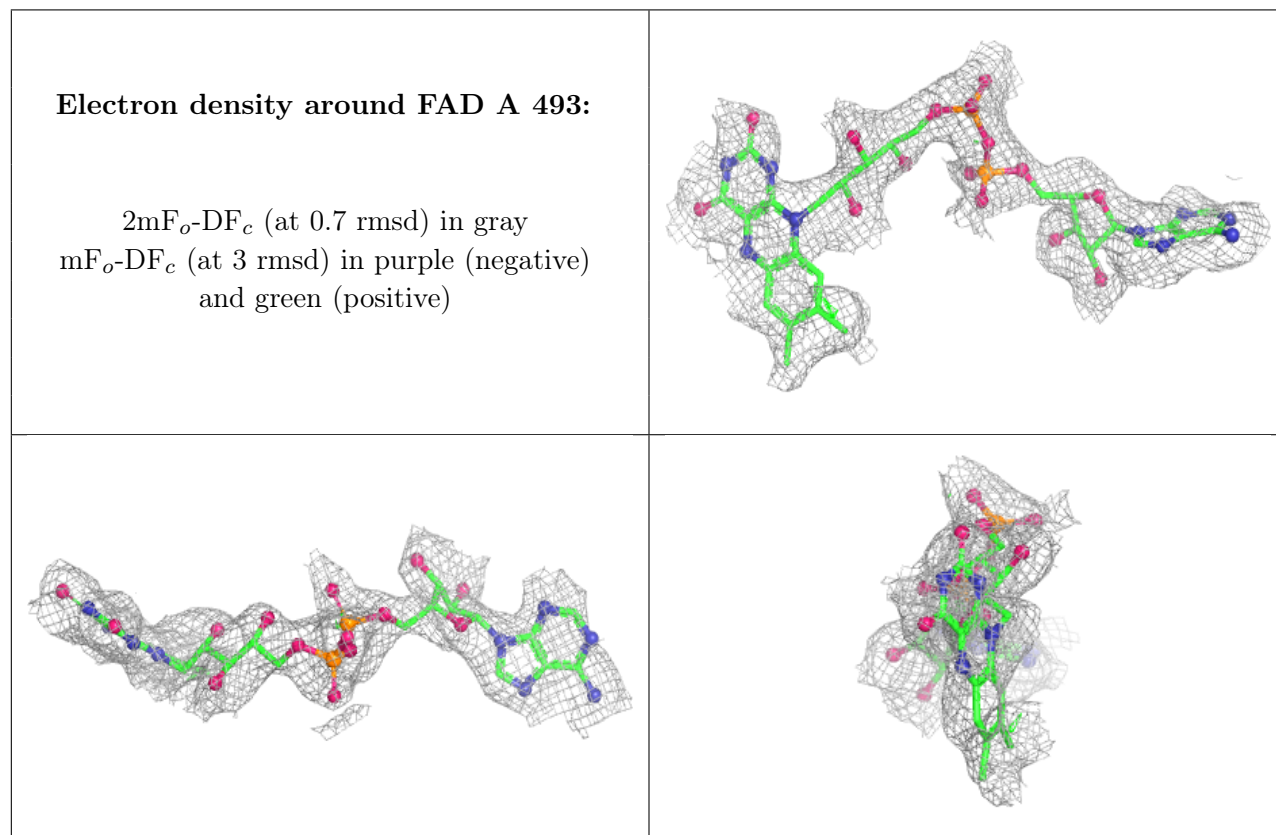
There are no oligosaccharides in this entry.

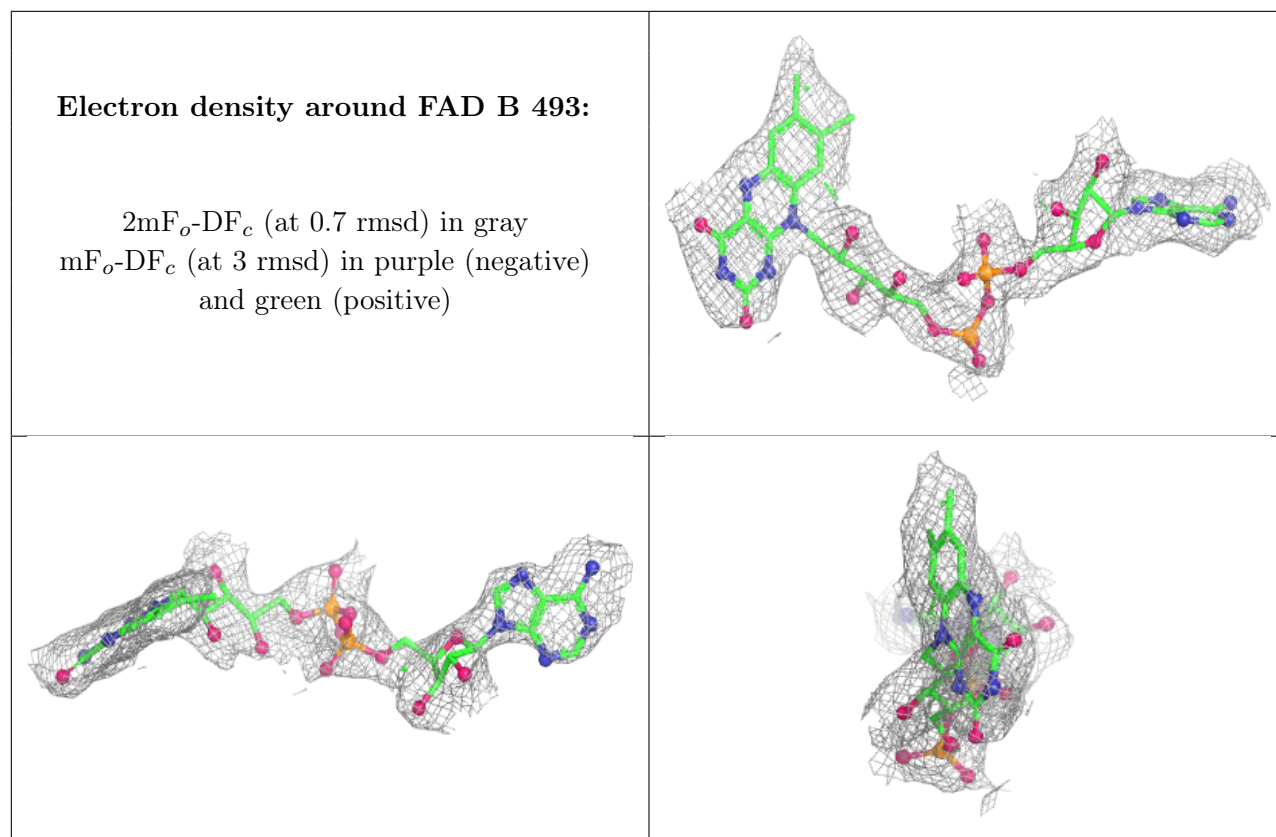
6.4 Ligands [i](#)

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, 95th percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 0.9’ lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	FAD	A	493	53/53	0.98	0.05	3,4,9,12	0
2	FAD	B	493	53/53	0.99	0.05	3,4,10,12	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.





6.5 Other polymers [i](#)

There are no such residues in this entry.