Full wwPDB X-ray Structure Validation Report ⓘ

Dec 17, 2023 – 10:27 am GMT

PDB ID	:	4A6N
Title	:	STRUCTURE OF THE TETRACYCLINE DEGRADING MONOOXYGE-NASE TETX IN COMPLEX WITH TIGECYCLINE
Authors	:	Volkers, G.; Palm, G.J.; Weiss, M.S.; Hinrichs, W.
Deposited on	:	2011-11-07
Resolution	:	2.30 Å(reported)

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

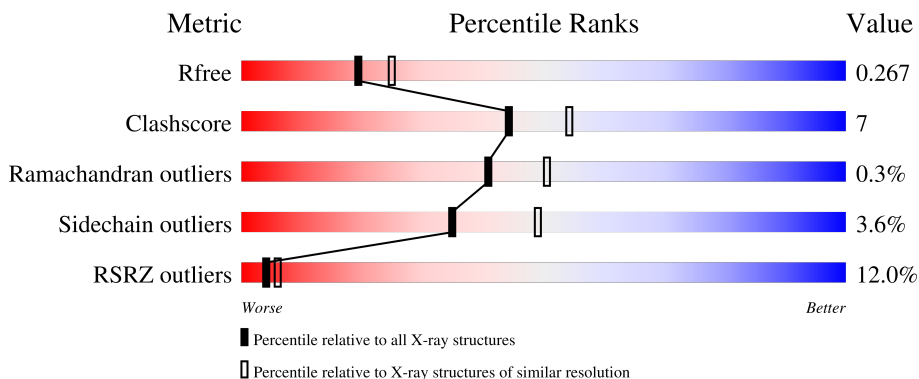|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance ⓘ

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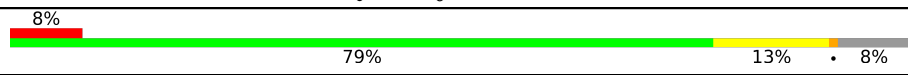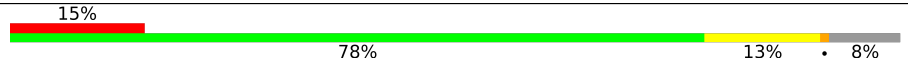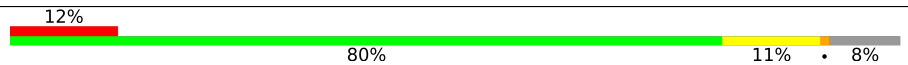*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.30 Å.

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

Metric	Percentile Ranks	Value
Rfree		0.267
Clashscore		7
Ramachandran outliers		0.3%
Sidechain outliers		3.6%
RSRZ outliers		12.0%

Worse *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	398	8% / 79% 13% · 8%
2	B	398	10% / 78% 13% · 8%
2	C	398	15% / 78% 13% · 8%
2	D	398	12% / 80% 11% · 8%

2   Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 12141 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 TETX2 PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	368	2886	1827	490	557	12	0	0	0

There are 21 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-9	MET	-	expression tag	UNP Q93L51
A	-8	GLY	-	expression tag	UNP Q93L51
A	-7	SER	-	expression tag	UNP Q93L51
A	-6	SER	-	expression tag	UNP Q93L51
A	-5	HIS	-	expression tag	UNP Q93L51
A	-4	HIS	-	expression tag	UNP Q93L51
A	-3	HIS	-	expression tag	UNP Q93L51
A	-2	HIS	-	expression tag	UNP Q93L51
A	-1	HIS	-	expression tag	UNP Q93L51
A	0	HIS	-	expression tag	UNP Q93L51
A	1	SER	-	expression tag	UNP Q93L51
A	2	SER	-	expression tag	UNP Q93L51
A	3	GLY	-	expression tag	UNP Q93L51
A	4	LEU	-	expression tag	UNP Q93L51
A	5	VAL	-	expression tag	UNP Q93L51
A	6	PRO	-	expression tag	UNP Q93L51
A	7	ARG	-	expression tag	UNP Q93L51
A	8	GLY	-	expression tag	UNP Q93L51
A	9	SER	-	expression tag	UNP Q93L51
A	10	HIS	-	expression tag	UNP Q93L51
A	272	LYS	GLU	conflict	UNP Q93L51

- Molecule 2 is a protein called TETX2 PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	368	Total 2883	C 1826	N 489	O 556	S 12	0	0	0
2	C	367	Total 2868	C 1817	N 485	O 554	S 12	0	0	0
2	D	367	Total 2859	C 1812	N 485	O 550	S 12	0	0	0

There are 60 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-9	MET	-	expression tag	UNP Q93L51
B	-8	GLY	-	expression tag	UNP Q93L51
B	-7	SER	-	expression tag	UNP Q93L51
B	-6	SER	-	expression tag	UNP Q93L51
B	-5	HIS	-	expression tag	UNP Q93L51
B	-4	HIS	-	expression tag	UNP Q93L51
B	-3	HIS	-	expression tag	UNP Q93L51
B	-2	HIS	-	expression tag	UNP Q93L51
B	-1	HIS	-	expression tag	UNP Q93L51
B	0	HIS	-	expression tag	UNP Q93L51
B	1	SER	-	expression tag	UNP Q93L51
B	2	SER	-	expression tag	UNP Q93L51
B	3	GLY	-	expression tag	UNP Q93L51
B	4	LEU	-	expression tag	UNP Q93L51
B	5	VAL	-	expression tag	UNP Q93L51
B	6	PRO	-	expression tag	UNP Q93L51
B	7	ARG	-	expression tag	UNP Q93L51
B	8	GLY	-	expression tag	UNP Q93L51
B	9	SER	-	expression tag	UNP Q93L51
B	10	HIS	-	expression tag	UNP Q93L51
C	-9	MET	-	expression tag	UNP Q93L51
C	-8	GLY	-	expression tag	UNP Q93L51
C	-7	SER	-	expression tag	UNP Q93L51
C	-6	SER	-	expression tag	UNP Q93L51
C	-5	HIS	-	expression tag	UNP Q93L51
C	-4	HIS	-	expression tag	UNP Q93L51
C	-3	HIS	-	expression tag	UNP Q93L51
C	-2	HIS	-	expression tag	UNP Q93L51
C	-1	HIS	-	expression tag	UNP Q93L51
C	0	HIS	-	expression tag	UNP Q93L51
C	1	SER	-	expression tag	UNP Q93L51
C	2	SER	-	expression tag	UNP Q93L51
C	3	GLY	-	expression tag	UNP Q93L51

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Chain	Residue	Modelled	Actual	Comment	Reference
C	4	LEU	-	expression tag	UNP Q93L51
C	5	VAL	-	expression tag	UNP Q93L51
C	6	PRO	-	expression tag	UNP Q93L51
C	7	ARG	-	expression tag	UNP Q93L51
C	8	GLY	-	expression tag	UNP Q93L51
C	9	SER	-	expression tag	UNP Q93L51
C	10	HIS	-	expression tag	UNP Q93L51
D	-9	MET	-	expression tag	UNP Q93L51
D	-8	GLY	-	expression tag	UNP Q93L51
D	-7	SER	-	expression tag	UNP Q93L51
D	-6	SER	-	expression tag	UNP Q93L51
D	-5	HIS	-	expression tag	UNP Q93L51
D	-4	HIS	-	expression tag	UNP Q93L51
D	-3	HIS	-	expression tag	UNP Q93L51
D	-2	HIS	-	expression tag	UNP Q93L51
D	-1	HIS	-	expression tag	UNP Q93L51
D	0	HIS	-	expression tag	UNP Q93L51
D	1	SER	-	expression tag	UNP Q93L51
D	2	SER	-	expression tag	UNP Q93L51
D	3	GLY	-	expression tag	UNP Q93L51
D	4	LEU	-	expression tag	UNP Q93L51
D	5	VAL	-	expression tag	UNP Q93L51
D	6	PRO	-	expression tag	UNP Q93L51
D	7	ARG	-	expression tag	UNP Q93L51
D	8	GLY	-	expression tag	UNP Q93L51
D	9	SER	-	expression tag	UNP Q93L51
D	10	HIS	-	expression tag	UNP Q93L51

- Molecule 3 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$).
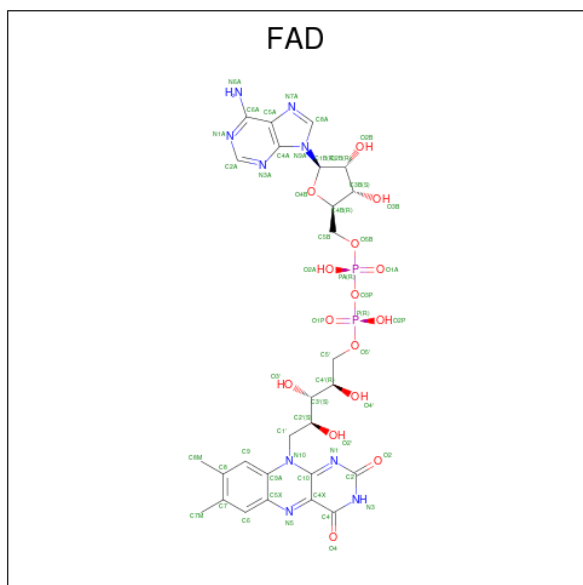
FAD

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

- Molecule 4 is TIGECYCLINE (three-letter code: T1C) (formula: $C_{29}H_{41}N_5O_8$).

T1C
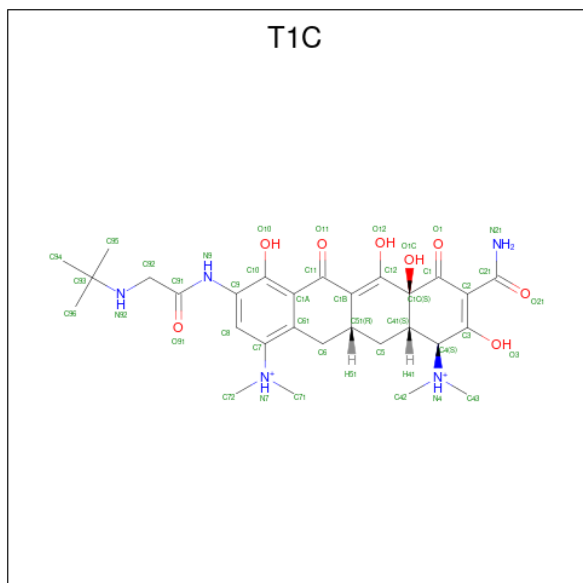
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total 42	C 29	N 5	O 8	0	0
4	B	1	Total 42	C 29	N 5	O 8	0	0
4	C	1	Total 42	C 29	N 5	O 8	0	0
4	D	1	Total 42	C 29	N 5	O 8	0	0

- Molecule 5 is SULFATE ION (three-letter code: SO4) (formula: O_4S).
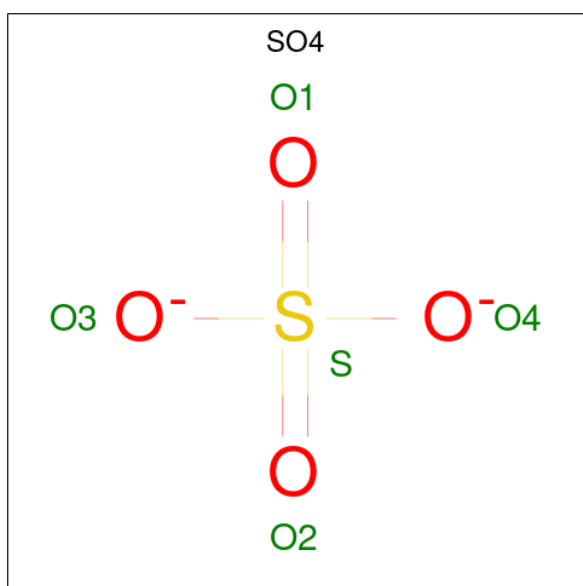
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total 5	O 4	S 1	0	0
5	A	1	Total 5	O 4	S 1	0	0
5	B	1	Total 5	O 4	S 1	0	0
5	B	1	Total 5	O 4	S 1	0	0
5	B	1	Total 5	O 4	S 1	0	0
5	B	1	Total 5	O 4	S 1	0	0
5	C	1	Total 5	O 4	S 1	0	0
5	C	1	Total 5	O 4	S 1	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	D	1	Total 5	O 4	S 1	0	0
5	D	1	Total 5	O 4	S 1	0	0
5	D	1	Total 5	O 4	S 1	0	0

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	61	Total 61	O 61	0	0
6	B	68	Total 68	O 68	0	0
6	C	35	Total 35	O 35	0	0
6	D	46	Total 46	O 46	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 geom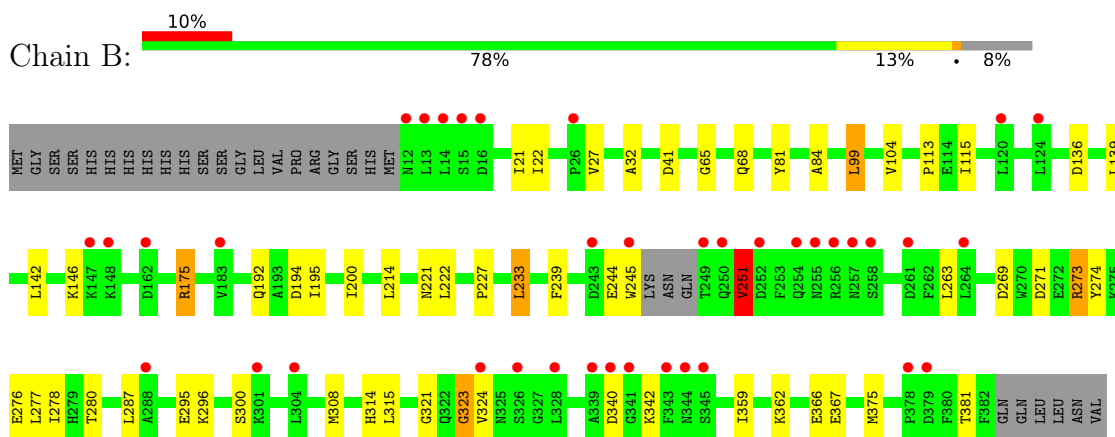etry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 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.
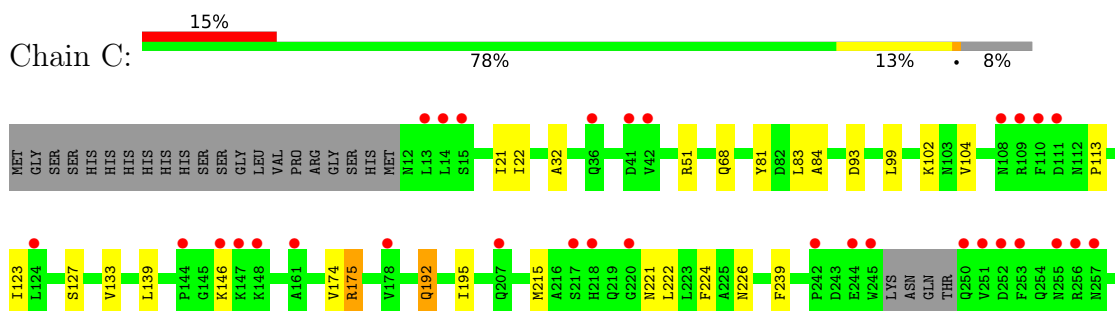
- Molecule 1: TETX2 PROTEIN

Chain A:

- Molecule 2: TETX2 PROTEIN

Chain B:

- Molecule 2: TETX2 PROTEIN

Chain C:

D261 F262 L263 L264 S268 D269 W270 D271 E272 R273 Y274 K275 E276 L277 I278 H279 T280 G286 L287 I291 L294 E295 K296 P297 W298 K299 S300 L304 M308 H314 F319 Q322 G323 L328 V329 D330 A331 A339 D340 G341 K342 F343 N344 S345 E348 A349 N352

Q355 F358 I359 K362 E366 Q370 M375 F376 F380 T381 F382 GLN GLN LEU LEU ASN VAL

• Molecule 2: TETX2 PROTEIN

Chain D:

12%

80%   11%   •   8%

MET GLY SER SER HIS HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET N12 L13 L14 S15 D16 I21 I22 A32 R54 Q68 Y81 A84 V104 R109 F110 D111 N112 P113 S127 L139 L142 K146 K147 K148 D162

V174 R175 V178 Q192 I195 H196 H218 N221 L222 L223 F224 A225 N226 F239 P242 D243 E244 W245 LYS ASN GLN THR Q250 V251 D252 F253 Q254 N255 R256 N257 L263 S268 D269 R273 Y274 K275 E276 L277 I278 H279 T280 L287 L294 E295 K296 S300 K301

R302 P303 M308 P318 F319 A320 G321 Q322 G323 D336 A339 D340 G341 K342 F343 N344 S345 I346 A349 N352 Y353 F358 I359 Y360 G361 K362 E363 A364 Q365 E366 M375 F376 K377 P378 D379 F380 T381 F382 GLN GLN LEU LEU ASN VAL

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	68.88Å 80.79Å 87.65Å 110.84° 89.84° 93.63°	Depositor
Resolution (Å)	81.90 – 2.30 40.95 – 2.30	Depositor EDS
% Data completeness (in resolution range)	96.0 (81.90-2.30) 96.1 (40.95-2.30)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.08 (at 2.29Å)	Xtriage
Refinement program	REFMAC 5.6.0116	Depositor
R, R_{free}	0.218 , 0.260 0.227 , 0.267	Depositor DCC
R_{free} test set	3769 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	43.0	Xtriage
Anisotropy	0.334	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 59.0	EDS
L-test for twinning[2]	$< \lvert L \rvert > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	12141	wwPDB-VP
Average B, all atoms (Å^2)	72.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.33% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< \lvert L \rvert >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: T1C, FAD, SO4

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	0.85	0/2944	0.89	5/3987 (0.1%)
2	B	0.84	0/2941	0.90	7/3983 (0.2%)
2	C	0.70	1/2926 (0.0%)	0.80	3/3965 (0.1%)
2	D	0.70	0/2917	0.80	4/3954 (0.1%)
All	All	0.78	1/11728 (0.0%)	0.85	19/15889 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	298	TRP	CD2-CE2	5.54	1.48	1.41

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	175	ARG	NE-CZ-NH1	8.96	124.78	120.30
2	B	251	VAL	CG1-CB-CG2	8.76	124.92	110.90
2	B	175	ARG	NE-CZ-NH1	8.12	124.36	120.30
2	C	175	ARG	NE-CZ-NH1	7.27	123.94	120.30
2	D	175	ARG	NE-CZ-NH1	7.17	123.88	120.30
2	B	175	ARG	NE-CZ-NH2	-6.92	116.84	120.30
2	D	175	ARG	NE-CZ-NH2	-6.27	117.16	120.30
2	D	287	LEU	CB-CG-CD2	6.08	121.33	111.00
1	A	175	ARG	NE-CZ-NH2	-6.07	117.26	120.30
1	A	50	ASP	CB-CG-OD1	5.90	123.61	118.30
2	B	99	LEU	CB-CG-CD2	5.79	120.85	111.00
1	A	311	ASP	CB-CG-OD2	-5.74	113.14	118.30
2	C	175	ARG	NE-CZ-NH2	-5.45	117.58	120.30
2	B	41	ASP	CB-CG-OD1	5.43	123.19	118.30
2	D	54	ARG	NE-CZ-NH1	5.24	122.92	120.30
1	A	311	ASP	CB-CG-OD1	5.23	123.01	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	93	ASP	CB-CG-OD1	5.11	122.90	118.30
2	B	194	ASP	CB-CG-OD1	5.04	122.83	118.30
2	B	136	ASP	CB-CG-OD1	5.03	122.82	118.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2886	0	2807	32	0
2	B	2883	0	2797	36	0
2	C	2868	0	2771	31	0
2	D	2859	0	2761	33	0
3	A	53	0	31	4	0
3	B	53	0	31	8	0
3	C	53	0	31	1	0
3	D	53	0	31	2	0
4	A	42	0	39	10	0
4	B	42	0	39	7	0
4	C	42	0	40	5	0
4	D	42	0	38	15	0
5	A	10	0	0	0	0
5	B	20	0	0	0	0
5	C	10	0	0	0	0
5	D	15	0	0	0	0
6	A	61	0	0	0	0
6	B	68	0	0	2	0
6	C	35	0	0	4	0
6	D	46	0	0	5	0
All	All	12141	0	11416	154	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 7.

All (154) 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)
3:A:389:FAD:HM73	4:A:392:T1C:H421	1.35	1.06
2:C:269:ASP:HB2	6:C:2030:HOH:O	1.59	1.02
2:D:279:HIS:CE1	6:D:2037:HOH:O	2.13	0.98
4:D:392:T1C:C72	4:D:392:T1C:H62C	2.03	0.87
4:D:392:T1C:H422	4:D:392:T1C:O3	1.81	0.81
4:D:392:T1C:H62C	4:D:392:T1C:H722	1.62	0.80
3:A:389:FAD:C7M	4:A:392:T1C:H421	2.19	0.72
3:B:389:FAD:H6	4:B:392:T1C:H433	1.71	0.72
2:D:146:LYS:HG3	6:D:2021:HOH:O	1.90	0.71
4:D:392:T1C:C72	4:D:392:T1C:C6	2.69	0.70
2:B:263:LEU:HB3	2:B:278:ILE:HD13	1.75	0.69
4:A:392:T1C:C6	4:A:392:T1C:H712	2.25	0.66
3:B:389:FAD:HM73	4:B:392:T1C:H431	1.77	0.65
2:C:133:VAL:O	6:C:2016:HOH:O	2.14	0.65
2:D:263:LEU:HB3	2:D:278:ILE:HD13	1.77	0.64
4:D:392:T1C:H62C	4:D:392:T1C:H723	1.79	0.64
4:D:392:T1C:C6	4:D:392:T1C:H723	2.28	0.64
2:C:263:LEU:HB3	2:C:278:ILE:HD13	1.81	0.61
2:B:323:GLY:HA3	3:B:389:FAD:H1'2	1.82	0.60
4:B:392:T1C:O11	4:B:392:T1C:O12	2.12	0.60
2:D:21:ILE:HD12	2:D:32:ALA:HB2	1.82	0.60
3:B:389:FAD:H6	4:B:392:T1C:C43	2.32	0.60
2:D:146:LYS:CG	6:D:2021:HOH:O	2.48	0.60
2:D:318:PRO:HG2	4:D:392:T1C:H431	1.84	0.59
1:A:263:LEU:HB3	1:A:278:ILE:HD13	1.85	0.59
4:C:392:T1C:H432	4:C:392:T1C:O3	2.01	0.59
2:B:324:VAL:HG12	3:B:389:FAD:O2	2.06	0.56
2:D:375:MET:SD	4:D:392:T1C:H721	2.46	0.56
3:B:389:FAD:C6	4:B:392:T1C:C43	2.84	0.56
4:A:392:T1C:O3	4:A:392:T1C:C42	2.54	0.56
2:D:84:ALA:HB1	2:D:113:PRO:HB2	1.86	0.55
2:C:362:LYS:O	2:C:366:GLU:HG2	2.06	0.55
1:A:95:LYS:NZ	2:B:367:GLU:HA	2.22	0.54
2:C:68:GLN:NE2	2:C:81:TYR:OH	2.39	0.54
2:D:68:GLN:NE2	2:D:81:TYR:OH	2.41	0.53
2:D:22:ILE:HD13	2:D:22:ILE:N	2.24	0.53
2:C:84:ALA:HB1	2:C:113:PRO:HB2	1.90	0.53
2:D:362:LYS:O	2:D:366:GLU:HG2	2.09	0.52
1:A:362:LYS:O	1:A:366:GLU:HG2	2.10	0.52
2:B:323:GLY:N	6:B:2061:HOH:O	2.18	0.52
2:B:68:GLN:NE2	2:B:81:TYR:OH	2.42	0.52
2:D:222:LEU:CD2	2:D:375:MET:HE3	2.40	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:107:GLU:HG2	2:C:359:ILE:HD13	1.92	0.51
2:C:221:ASN:HD22	2:C:239:PHE:HB3	1.76	0.51
2:D:279:HIS:HE1	6:D:2037:HOH:O	1.71	0.51
2:B:362:LYS:O	2:B:366:GLU:HG2	2.11	0.50
1:A:379:ASP:HB3	2:B:65:GLY:HA3	1.94	0.50
2:C:382:PHE:C	6:C:2035:HOH:O	2.49	0.50
2:B:221:ASN:HD22	2:B:239:PHE:HB3	1.77	0.50
2:D:22:ILE:HG13	2:D:139:LEU:HD22	1.94	0.49
1:A:318:PRO:HG2	4:A:392:T1C:H431	1.93	0.49
2:D:318:PRO:HG2	4:D:392:T1C:C43	2.42	0.49
1:A:100:SER:HB2	2:B:359:ILE:HG12	1.95	0.49
1:A:84:ALA:HB1	1:A:113:PRO:HB2	1.94	0.49
2:C:224:PHE:HB2	4:C:392:T1C:O3	2.12	0.48
2:B:245:TRP:CZ2	2:B:251:VAL:HG13	2.49	0.48
2:C:21:ILE:HD12	2:C:32:ALA:HB2	1.95	0.48
2:C:195:ILE:HD12	2:C:277:LEU:HD12	1.96	0.48
1:A:22:ILE:HD13	1:A:22:ILE:N	2.29	0.47
1:A:68:GLN:NE2	1:A:81:TYR:OH	2.47	0.47
2:B:139:LEU:HD21	2:B:142:LEU:HD13	1.94	0.47
2:C:222:LEU:CD2	2:C:375:MET:HE3	2.43	0.47
1:A:274:TYR:O	1:A:277:LEU:HB3	2.14	0.47
1:A:21:ILE:HD12	1:A:32:ALA:HB2	1.96	0.47
2:B:295:GLU:HG3	2:B:296:LYS:HG2	1.97	0.47
2:C:295:GLU:HG3	2:C:296:LYS:HG2	1.97	0.47
2:D:295:GLU:HG3	2:D:296:LYS:HG2	1.97	0.47
1:A:95:LYS:NZ	2:B:367:GLU:HG3	2.29	0.47
1:A:372:GLU:O	1:A:376:PHE:HD2	1.97	0.47
2:B:84:ALA:HB1	2:B:113:PRO:HB2	1.97	0.46
2:C:328:LEU:O	2:C:331:ALA:HB3	2.15	0.46
3:B:389:FAD:HM73	4:B:392:T1C:C43	2.44	0.46
4:C:392:T1C:H41	4:C:392:T1C:H423	1.73	0.46
2:B:27:VAL:HG23	3:B:389:FAD:P	2.55	0.46
2:B:274:TYR:O	2:B:277:LEU:HB3	2.16	0.46
4:D:392:T1C:O3	4:D:392:T1C:C42	2.56	0.46
2:B:21:ILE:HD12	2:B:32:ALA:HB2	1.98	0.46
2:D:195:ILE:HD13	2:D:280:THR:CG2	2.46	0.46
1:A:221:ASN:HD22	1:A:239:PHE:HB3	1.81	0.46
1:A:22:ILE:HG13	1:A:139:LEU:HD22	1.99	0.46
2:D:196:HIS:CE1	6:D:2034:HOH:O	2.68	0.46
1:A:314:HIS:O	1:A:315:LEU:C	2.55	0.45
2:D:358:PHE:O	2:D:362:LYS:HB2	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:375:MET:SD	4:A:392:T1C:H721	2.56	0.45
2:C:226:ASN:OD1	2:C:226:ASN:C	2.55	0.45
2:B:340:ASP:HB2	2:B:342:LYS:HB2	1.97	0.45
2:D:221:ASN:HD22	2:D:239:PHE:HB3	1.82	0.45
2:D:139:LEU:HD23	2:D:174:VAL:HG11	1.99	0.45
4:D:392:T1C:H951	4:D:392:T1C:H922	1.80	0.45
1:A:295:GLU:HG3	1:A:296:LYS:HG2	1.99	0.45
2:B:321:GLY:HA2	6:B:2060:HOH:O	2.16	0.45
1:A:379:ASP:CB	2:B:65:GLY:HA3	2.47	0.45
2:C:195:ILE:HD13	2:C:280:THR:CG2	2.47	0.45
2:C:274:TYR:O	2:C:277:LEU:HB3	2.17	0.44
2:B:227:PRO:HA	2:B:233:LEU:HD12	2.00	0.44
2:D:340:ASP:HB2	2:D:342:LYS:HB2	1.99	0.44
4:D:392:T1C:O10	4:D:392:T1C:O11	2.31	0.44
2:B:22:ILE:HG13	2:B:139:LEU:HD22	1.99	0.44
1:A:222:LEU:CD2	1:A:375:MET:HE2	2.47	0.44
2:C:358:PHE:O	2:C:362:LYS:HB2	2.18	0.44
3:D:389:FAD:N1	3:D:389:FAD:H2'	2.32	0.44
4:D:392:T1C:O11	4:D:392:T1C:O12	2.32	0.44
4:A:392:T1C:H712	4:A:392:T1C:H62C	1.99	0.44
2:C:139:LEU:HD23	2:C:174:VAL:HG11	1.99	0.44
2:D:139:LEU:HD21	2:D:142:LEU:HD13	1.99	0.44
1:A:142:LEU:HD12	1:A:142:LEU:HA	1.87	0.43
2:D:226:ASN:OD1	2:D:226:ASN:C	2.56	0.43
1:A:340:ASP:HB2	1:A:342:LYS:HB2	1.99	0.43
2:D:274:TYR:O	2:D:277:LEU:HB3	2.17	0.43
2:D:375:MET:SD	4:D:392:T1C:C72	3.07	0.43
2:B:222:LEU:CD2	2:B:375:MET:HE3	2.47	0.43
1:A:192:GLN:NE2	3:A:389:FAD:HM72	2.34	0.43
2:B:214:LEU:C	2:B:214:LEU:HD23	2.39	0.43
2:B:175:ARG:HG2	2:B:308:MET:SD	2.59	0.42
4:B:392:T1C:H41	4:B:392:T1C:H423	1.74	0.42
2:C:340:ASP:HB2	2:C:342:LYS:HB2	2.00	0.42
2:C:314:HIS:NE2	2:C:330:ASP:OD2	2.44	0.42
1:A:226:ASN:C	1:A:226:ASN:OD1	2.58	0.42
3:A:389:FAD:H9	3:A:389:FAD:H1'1	1.76	0.42
2:B:340:ASP:CB	2:B:342:LYS:HB2	2.49	0.42
2:D:175:ARG:HG2	2:D:308:MET:SD	2.60	0.42
1:A:139:LEU:HD21	1:A:142:LEU:HD13	2.01	0.42
1:A:340:ASP:CB	1:A:342:LYS:HB2	2.49	0.42
2:C:382:PHE:CE1	4:C:392:T1C:H711	2.55	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:83:LEU:HD22	2:C:123:ILE:HD11	2.02	0.41
4:A:392:T1C:O11	4:A:392:T1C:O12	2.37	0.41
2:B:195:ILE:HD13	2:B:280:THR:CG2	2.51	0.41
2:C:51:ARG:HG2	6:C:2005:HOH:O	2.20	0.41
2:C:215:MET:SD	4:C:392:T1C:H712	2.60	0.41
4:A:392:T1C:C6	4:A:392:T1C:C71	2.95	0.41
2:B:221:ASN:ND2	2:B:239:PHE:HB3	2.36	0.41
2:D:192:GLN:NE2	3:D:389:FAD:HM72	2.35	0.41
2:D:195:ILE:HD12	2:D:277:LEU:HD12	2.03	0.41
2:C:22:ILE:HG13	2:C:139:LEU:HD22	2.03	0.41
2:C:192:GLN:NE2	3:C:389:FAD:HM72	2.36	0.41
1:A:54:ARG:CZ	2:D:54:ARG:CZ	2.98	0.41
4:A:392:T1C:O3	4:A:392:T1C:H423	2.20	0.41
2:D:340:ASP:CB	2:D:342:LYS:HB2	2.50	0.41
2:B:115:ILE:O	2:B:115:ILE:HG23	2.20	0.41
2:B:142:LEU:HD12	2:B:142:LEU:HA	1.89	0.41
2:C:195:ILE:CD1	2:C:277:LEU:HD12	2.50	0.41
2:B:200:ILE:HD13	2:B:200:ILE:HA	1.82	0.41
2:D:224:PHE:CD2	4:D:392:T1C:H51C	2.55	0.41
2:C:22:ILE:N	2:C:22:ILE:HD13	2.36	0.40
1:A:259:VAL:HG11	1:A:284:PHE:CG	2.57	0.40
2:B:271:ASP:OD2	2:B:273:ARG:HD3	2.21	0.40
1:A:175:ARG:HG2	1:A:308:MET:SD	2.62	0.40
1:A:271:ASP:OD2	1:A:273:ARG:HD3	2.22	0.40
1:A:358:PHE:O	1:A:362:LYS:HB2	2.20	0.40
2:B:22:ILE:N	2:B:22:ILE:HD13	2.35	0.40
2:D:302:ARG:HA	2:D:303:PRO:HD3	1.99	0.40
2:B:244:GLU:H	2:B:244:GLU:CD	2.24	0.40
2:C:175:ARG:HG2	2:C:308:MET:SD	2.61	0.40
2:B:314:HIS:O	2:B:315:LEU:C	2.60	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	364/398 (92%)	351 (96%)	12 (3%)	1 (0%)	41	50
2	B	364/398 (92%)	350 (96%)	13 (4%)	1 (0%)	41	50
2	C	363/398 (91%)	348 (96%)	14 (4%)	1 (0%)	41	50
2	D	363/398 (91%)	348 (96%)	14 (4%)	1 (0%)	41	50
All	All	1454/1592 (91%)	1397 (96%)	53 (4%)	4 (0%)	41	50

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	323	GLY
1	A	323	GLY
2	D	323	GLY
2	C	323	GLY

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	312/345 (90%)	302 (97%)	10 (3%)	39	54
2	B	310/345 (90%)	298 (96%)	12 (4%)	32	46
2	C	307/345 (89%)	295 (96%)	12 (4%)	32	46
2	D	305/345 (88%)	295 (97%)	10 (3%)	38	53
All	All	1234/1380 (89%)	1190 (96%)	44 (4%)	35	49

All (44) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	104	VAL
1	A	146	LYS
1	A	192	GLN
1	A	269	ASP

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Mol	Chain	Res	Type
1	A	272	LYS
1	A	273	ARG
1	A	276	GLU
1	A	287	LEU
1	A	300	SER
1	A	381	THR
2	B	99	LEU
2	B	104	VAL
2	B	146	LYS
2	B	192	GLN
2	B	233	LEU
2	B	251	VAL
2	B	269	ASP
2	B	273	ARG
2	B	276	GLU
2	B	287	LEU
2	B	300	SER
2	B	381	THR
2	C	99	LEU
2	C	102	LYS
2	C	104	VAL
2	C	127	SER
2	C	146	LYS
2	C	192	GLN
2	C	269	ASP
2	C	273	ARG
2	C	276	GLU
2	C	287	LEU
2	C	300	SER
2	C	381	THR
2	D	104	VAL
2	D	127	SER
2	D	146	LYS
2	D	192	GLN
2	D	269	ASP
2	D	273	ARG
2	D	276	GLU
2	D	287	LEU
2	D	300	SER
2	D	381	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (28) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	38	ASN
1	A	68	GLN
1	A	130	ASN
1	A	190	ASN
1	A	221	ASN
1	A	371	ASN
2	B	38	ASN
2	B	68	GLN
2	B	130	ASN
2	B	190	ASN
2	B	192	GLN
2	B	221	ASN
2	B	250	GLN
2	B	371	ASN
2	C	38	ASN
2	C	68	GLN
2	C	130	ASN
2	C	190	ASN
2	C	221	ASN
2	C	371	ASN
2	D	38	ASN
2	D	68	GLN
2	D	130	ASN
2	D	190	ASN
2	D	192	GLN
2	D	207	GLN
2	D	221	ASN
2	D	371	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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

19 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	#$|Z| > 2$
5	SO4	D	1384	-	4,4,4	0.38	0	6,6,6	0.30	0
4	T1C	B	392	-	44,45,45	2.03	10 (22%)	53,72,72	2.26	15 (28%)
5	SO4	A	1384	-	4,4,4	0.48	0	6,6,6	0.46	0
5	SO4	A	1383	-	4,4,4	0.32	0	6,6,6	0.34	0
5	SO4	D	1383	-	4,4,4	0.35	0	6,6,6	0.18	0
5	SO4	D	1385	-	4,4,4	0.41	0	6,6,6	0.43	0
4	T1C	A	392	-	44,45,45	2.02	11 (25%)	53,72,72	1.82	12 (22%)
5	SO4	C	1384	-	4,4,4	0.44	0	6,6,6	0.32	0
5	SO4	B	1384	-	4,4,4	0.39	0	6,6,6	0.35	0
3	FAD	B	389	-	53,58,58	1.60	10 (18%)	68,89,89	1.52	12 (17%)
5	SO4	C	1383	-	4,4,4	0.55	0	6,6,6	0.34	0
5	SO4	B	1383	-	4,4,4	0.33	0	6,6,6	0.35	0
3	FAD	A	389	-	53,58,58	1.57	10 (18%)	68,89,89	1.58	13 (19%)
4	T1C	D	392	-	44,45,45	1.80	9 (20%)	53,72,72	1.98	14 (26%)
3	FAD	D	389	-	53,58,58	1.62	11 (20%)	68,89,89	1.89	20 (29%)
5	SO4	B	1385	-	4,4,4	0.36	0	6,6,6	0.26	0
3	FAD	C	389	-	53,58,58	1.44	7 (13%)	68,89,89	1.75	14 (20%)
4	T1C	C	392	-	44,45,45	1.79	10 (22%)	53,72,72	1.82	10 (18%)
5	SO4	B	1386	-	4,4,4	0.43	0	6,6,6	0.30	0

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
3	FAD	C	389	-	-	3/30/50/50	0/6/6/6
4	T1C	C	392	-	-	5/22/80/80	0/4/4/4
4	T1C	B	392	-	-	0/22/80/80	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	FAD	A	389	-	-	1/30/50/50	0/6/6/6
4	T1C	D	392	-	-	7/22/80/80	0/4/4/4
3	FAD	D	389	-	-	4/30/50/50	0/6/6/6
3	FAD	B	389	-	-	1/30/50/50	0/6/6/6
4	T1C	A	392	-	-	3/22/80/80	0/4/4/4

All (78) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	392	T1C	C2-C21	6.89	1.61	1.47
4	B	392	T1C	C1C-C12	6.47	1.57	1.52
4	C	392	T1C	C2-C21	5.91	1.59	1.47
3	A	389	FAD	C9A-C5X	5.77	1.50	1.41
4	B	392	T1C	C2-C21	5.73	1.59	1.47
4	D	392	T1C	C2-C21	5.68	1.59	1.47
3	C	389	FAD	C9A-C5X	5.60	1.50	1.41
3	D	389	FAD	C9A-C5X	5.35	1.50	1.41
4	A	392	T1C	C1C-C41	-5.16	1.48	1.53
3	B	389	FAD	C9A-C5X	5.00	1.49	1.41
4	D	392	T1C	C1C-C12	4.71	1.56	1.52
4	C	392	T1C	C1C-C12	4.35	1.55	1.52
3	C	389	FAD	C8-C7	4.24	1.51	1.40
3	D	389	FAD	O4B-C1B	4.10	1.46	1.41
4	B	392	T1C	C6-C61	3.97	1.57	1.51
4	D	392	T1C	C6-C61	3.97	1.57	1.51
4	A	392	T1C	C1C-C12	3.87	1.55	1.52
4	A	392	T1C	C6-C61	3.85	1.57	1.51
3	D	389	FAD	C8-C7	3.57	1.49	1.40
4	B	392	T1C	C1C-C41	-3.57	1.50	1.53
3	A	389	FAD	C4X-N5	3.56	1.37	1.30
3	D	389	FAD	C2B-C1B	-3.46	1.48	1.53
3	A	389	FAD	C8-C7	3.46	1.49	1.40
3	B	389	FAD	C2-N3	-3.33	1.31	1.39
3	B	389	FAD	C8A-N7A	3.21	1.40	1.34
4	C	392	T1C	C6-C61	3.19	1.56	1.51
4	C	392	T1C	C7-N7	-3.17	1.34	1.42
3	A	389	FAD	C4-N3	-3.17	1.33	1.38
4	B	392	T1C	C51-C1B	3.11	1.54	1.51
3	A	389	FAD	O4'-C4'	3.11	1.49	1.43
4	C	392	T1C	C9-N9	-3.06	1.35	1.41
3	C	389	FAD	C8A-N7A	2.93	1.39	1.34
4	B	392	T1C	C1B-C11	-2.90	1.40	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	392	T1C	C9-N9	-2.89	1.36	1.41
3	B	389	FAD	C4-N3	-2.88	1.33	1.38
3	B	389	FAD	C4X-N5	2.88	1.36	1.30
3	D	389	FAD	C5A-C4A	2.84	1.48	1.40
4	A	392	T1C	C9-N9	-2.78	1.36	1.41
3	B	389	FAD	PA-O1A	-2.77	1.41	1.50
4	B	392	T1C	C9-N9	-2.73	1.36	1.41
4	C	392	T1C	C1B-C11	-2.72	1.40	1.47
4	C	392	T1C	C1B-C12	2.70	1.39	1.36
4	D	392	T1C	C7-N7	-2.70	1.35	1.42
4	A	392	T1C	C7-N7	-2.63	1.35	1.42
4	C	392	T1C	C1A-C11	-2.62	1.39	1.46
4	B	392	T1C	O1C-C1C	2.62	1.46	1.42
3	A	389	FAD	C6-C5X	-2.59	1.35	1.40
4	A	392	T1C	C1C-C1	2.57	1.58	1.55
4	A	392	T1C	C1B-C12	2.55	1.39	1.36
3	D	389	FAD	C4X-N5	2.54	1.35	1.30
4	B	392	T1C	C7-N7	-2.52	1.35	1.42
3	D	389	FAD	C8A-N7A	2.51	1.39	1.34
3	B	389	FAD	C5X-N5	-2.50	1.34	1.39
4	D	392	T1C	C1B-C11	-2.49	1.41	1.47
4	B	392	T1C	C4-C3	2.49	1.56	1.51
4	D	392	T1C	C1B-C12	2.46	1.39	1.36
4	D	392	T1C	C7-C61	2.41	1.43	1.40
3	A	389	FAD	C4'-C3'	-2.38	1.49	1.53
4	D	392	T1C	C1A-C11	-2.34	1.40	1.46
3	B	389	FAD	O4B-C4B	-2.31	1.39	1.45
3	C	389	FAD	C4'-C3'	-2.31	1.49	1.53
3	D	389	FAD	C4'-C3'	-2.28	1.49	1.53
3	A	389	FAD	O4-C4	2.28	1.27	1.23
3	C	389	FAD	C2A-N3A	2.27	1.35	1.32
3	D	389	FAD	C2A-N3A	2.26	1.35	1.32
4	A	392	T1C	C1B-C11	-2.25	1.41	1.47
4	A	392	T1C	C2-C1	-2.20	1.40	1.45
3	A	389	FAD	C2A-N3A	2.16	1.35	1.32
4	C	392	T1C	C1C-C1	2.13	1.58	1.55
3	C	389	FAD	C4X-N5	2.12	1.34	1.30
3	D	389	FAD	O4-C4	2.10	1.27	1.23
3	D	389	FAD	C4X-C10	2.08	1.50	1.44
3	B	389	FAD	C1'-C2'	2.05	1.55	1.52
3	B	389	FAD	O3B-C3B	2.03	1.47	1.43
4	C	392	T1C	C92-C91	2.01	1.58	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	389	FAD	C8M-C8	2.01	1.55	1.51
4	A	392	T1C	C4-C3	2.01	1.55	1.51
3	A	389	FAD	C5'-C4'	2.00	1.54	1.51

All (110) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	392	T1C	O12-C12-C1C	7.03	123.55	113.37
3	D	389	FAD	C5'-C4'-C3'	-6.85	98.97	112.20
4	C	392	T1C	C1C-C1-C2	6.35	125.83	115.75
3	A	389	FAD	C5'-C4'-C3'	-5.59	101.40	112.20
4	D	392	T1C	C1C-C1-C2	5.44	124.40	115.75
4	B	392	T1C	O12-C12-C1B	-5.27	116.68	123.90
4	C	392	T1C	O12-C12-C1B	-5.21	116.77	123.90
3	C	389	FAD	O2-C2-N1	-5.21	113.19	121.83
4	D	392	T1C	C8-C7-N7	-5.19	113.95	120.91
4	D	392	T1C	C61-C7-N7	5.17	125.23	118.91
4	D	392	T1C	O12-C12-C1B	-5.04	117.00	123.90
4	B	392	T1C	C42-N4-C4	-4.99	102.37	114.09
4	A	392	T1C	C43-N4-C4	-4.73	102.98	114.09
4	A	392	T1C	C1C-C1-C2	4.65	123.13	115.75
4	B	392	T1C	O1C-C1C-C41	-4.65	104.38	110.09
4	B	392	T1C	C41-C1C-C1	4.53	116.24	111.05
3	C	389	FAD	C1B-N9A-C4A	-4.31	119.08	126.64
4	A	392	T1C	O1C-C1C-C12	-4.30	103.27	110.14
3	C	389	FAD	N3A-C2A-N1A	-4.27	122.01	128.68
4	C	392	T1C	O12-C12-C1C	4.22	119.48	113.37
3	D	389	FAD	N3A-C2A-N1A	-4.16	122.17	128.68
3	C	389	FAD	O3'-C3'-C4'	-4.09	98.93	108.81
4	B	392	T1C	C1C-C1-C2	3.98	122.08	115.75
3	D	389	FAD	C1B-N9A-C4A	-3.89	119.81	126.64
4	A	392	T1C	C1-C1C-C12	3.81	114.34	109.88
4	B	392	T1C	C21-C2-C1	-3.68	116.61	120.97
4	A	392	T1C	O1-C1-C2	-3.65	115.89	123.55
4	D	392	T1C	O12-C12-C1C	3.64	118.64	113.37
3	B	389	FAD	C5X-C9A-N10	3.61	121.68	117.95
4	C	392	T1C	C42-N4-C4	-3.59	105.67	114.09
3	B	389	FAD	O4-C4-C4X	-3.56	117.15	126.60
3	D	389	FAD	O3'-C3'-C4'	-3.47	100.42	108.81
3	D	389	FAD	O2-C2-N1	-3.43	116.14	121.83
3	C	389	FAD	C4-C4X-N5	3.33	122.97	118.23
3	A	389	FAD	O4-C4-C4X	-3.32	117.80	126.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	392	T1C	O1-C1-C2	-3.29	116.64	123.55
4	B	392	T1C	O1C-C1C-C12	-3.27	104.91	110.14
4	A	392	T1C	C21-C2-C1	-3.24	117.13	120.97
4	B	392	T1C	C1C-C12-C1B	-3.24	119.77	123.06
4	D	392	T1C	C8-C9-C10	-3.24	117.27	120.49
3	A	389	FAD	O2-C2-N1	-3.18	116.56	121.83
4	B	392	T1C	O11-C11-C1B	-3.17	115.92	120.78
3	A	389	FAD	O3B-C3B-C2B	-3.16	101.61	111.82
4	A	392	T1C	O12-C12-C1C	3.11	117.88	113.37
3	B	389	FAD	O5B-C5B-C4B	-3.11	98.27	108.99
3	D	389	FAD	C5A-C6A-N6A	3.10	125.06	120.35
3	B	389	FAD	N3A-C2A-N1A	-3.08	123.86	128.68
4	D	392	T1C	O1-C1-C2	-3.08	117.09	123.55
4	D	392	T1C	O1C-C1C-C12	-3.02	105.31	110.14
3	C	389	FAD	O5'-P-O1P	3.01	120.85	109.07
3	B	389	FAD	O4B-C1B-C2B	-3.00	102.54	106.93
3	D	389	FAD	C4-C4X-N5	2.98	122.47	118.23
3	A	389	FAD	N3A-C2A-N1A	-2.97	124.04	128.68
3	A	389	FAD	O4-C4-N3	2.90	125.67	120.12
4	A	392	T1C	O12-C12-C1B	-2.87	119.96	123.90
3	C	389	FAD	O4-C4-C4X	-2.87	118.98	126.60
4	C	392	T1C	O1C-C1C-C12	-2.83	105.62	110.14
4	B	392	T1C	C1-C1C-C12	2.79	113.15	109.88
4	C	392	T1C	C8-C9-C10	-2.79	117.72	120.49
3	D	389	FAD	C2A-N1A-C6A	2.78	123.51	118.75
3	D	389	FAD	O4'-C4'-C5'	2.78	116.16	109.92
3	C	389	FAD	O2-C2-N3	2.76	124.01	118.65
4	B	392	T1C	C11-C1B-C12	-2.73	116.64	118.80
4	C	392	T1C	C1-C1C-C12	-2.71	106.70	109.88
3	C	389	FAD	C5'-C4'-C3'	-2.71	106.96	112.20
3	D	389	FAD	C4A-C5A-N7A	-2.66	106.62	109.40
4	D	392	T1C	C1A-C11-C1B	2.65	123.04	118.53
4	A	392	T1C	O11-C11-C1B	-2.64	116.73	120.78
4	A	392	T1C	C1A-C11-C1B	2.58	122.92	118.53
3	B	389	FAD	C4X-C4-N3	2.57	119.71	113.19
3	A	389	FAD	C1B-N9A-C4A	-2.56	122.15	126.64
3	D	389	FAD	O3B-C3B-C2B	-2.54	103.60	111.82
3	D	389	FAD	O4-C4-C4X	-2.53	119.90	126.60
4	D	392	T1C	O1C-C1C-C41	-2.50	107.02	110.09
3	C	389	FAD	C4A-C5A-N7A	-2.49	106.81	109.40
3	A	389	FAD	O4B-C1B-C2B	-2.46	103.33	106.93
3	B	389	FAD	C4-C4X-C10	-2.45	112.67	116.79

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	392	T1C	C8-C9-C10	-2.44	118.06	120.49
3	B	389	FAD	O2P-P-O1P	2.42	124.22	112.24
3	D	389	FAD	O4-C4-N3	2.37	124.66	120.12
3	B	389	FAD	C9A-N10-C10	-2.31	117.16	120.77
4	C	392	T1C	C1A-C11-C1B	2.30	122.45	118.53
3	D	389	FAD	C2B-C3B-C4B	2.26	107.03	102.64
4	D	392	T1C	C43-N4-C4	-2.25	108.81	114.09
3	C	389	FAD	O4-C4-N3	2.23	124.39	120.12
3	C	389	FAD	C9A-C5X-N5	-2.22	120.01	122.43
4	B	392	T1C	C8-C9-C10	-2.21	118.30	120.49
4	D	392	T1C	C42-N4-C4	-2.21	108.91	114.09
4	D	392	T1C	O11-C11-C1A	-2.21	117.82	121.99
3	B	389	FAD	C5X-N5-C4X	-2.17	114.47	118.07
4	B	392	T1C	O1C-C1C-C1	-2.16	100.09	106.40
3	D	389	FAD	N3-C2-N1	2.13	123.57	119.38
3	C	389	FAD	C5A-C6A-N6A	2.12	123.57	120.35
4	B	392	T1C	C72-N7-C71	-2.11	109.31	116.12
3	A	389	FAD	C8M-C8-C7	2.10	125.03	120.74
4	D	392	T1C	C72-N7-C71	-2.09	109.39	116.12
3	A	389	FAD	O3'-C3'-C4'	-2.08	103.78	108.81
3	B	389	FAD	O3'-C3'-C2'	-2.08	103.78	108.81
3	C	389	FAD	O2'-C2'-C1'	2.08	114.83	109.80
3	D	389	FAD	P-O3P-PA	-2.07	125.73	132.83
3	D	389	FAD	C1'-N10-C9A	2.06	123.95	120.51
3	A	389	FAD	C6-C5X-N5	2.06	122.11	118.51
3	D	389	FAD	O2P-P-O1P	-2.05	102.09	112.24
3	D	389	FAD	O2A-PA-O1A	2.05	122.38	112.24
3	B	389	FAD	C5B-C4B-C3B	-2.04	107.52	115.18
3	D	389	FAD	C7M-C7-C6	-2.04	115.71	119.49
4	C	392	T1C	O11-C11-C1A	-2.03	118.15	121.99
4	A	392	T1C	O1C-C1C-C41	-2.02	107.61	110.09
3	A	389	FAD	P-O3P-PA	-2.02	125.91	132.83
3	A	389	FAD	O4'-C4'-C3'	2.02	114.00	109.10

There are no chirality outliers.

All (24) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	C	392	T1C	C41-C4-N4-C42
4	D	392	T1C	C94-C93-N92-C92
4	D	392	T1C	C95-C93-N92-C92
4	D	392	T1C	C41-C4-N4-C43

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Mol	Chain	Res	Type	Atoms
4	D	392	T1C	C96-C93-N92-C92
4	D	392	T1C	C61-C7-N7-C72
4	D	392	T1C	C8-C7-N7-C72
4	C	392	T1C	C96-C93-N92-C92
3	C	389	FAD	PA-O3P-P-O5'
3	D	389	FAD	PA-O3P-P-O5'
4	A	392	T1C	C91-C92-N92-C93
4	A	392	T1C	C3-C4-N4-C43
4	A	392	T1C	C3-C4-N4-C42
4	C	392	T1C	C95-C93-N92-C92
3	D	389	FAD	P-O3P-PA-O2A
4	C	392	T1C	C94-C93-N92-C92
3	D	389	FAD	O4B-C4B-C5B-O5B
3	D	389	FAD	P-O3P-PA-O1A
4	D	392	T1C	C91-C92-N92-C93
3	A	389	FAD	O4B-C4B-C5B-O5B
3	B	389	FAD	O4B-C4B-C5B-O5B
3	C	389	FAD	O4B-C4B-C5B-O5B
3	C	389	FAD	O4'-C4'-C5'-O5'
4	C	392	T1C	C61-C7-N7-C71

There are no ring outliers.

8 monomers are involved in 45 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	392	T1C	7	0
4	A	392	T1C	10	0
3	B	389	FAD	8	0
3	A	389	FAD	4	0
4	D	392	T1C	15	0
3	D	389	FAD	2	0
3	C	389	FAD	1	0
4	C	392	T1C	5	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 T1C B 392	
Bond lengths	Bond angles
Torsions	Rings

Ligand T1C A 392	
Bond lengths	Bond angles
Torsions	Rings

Ligand FAD B 389

Bond lengths

Bond angles

Torsions

Rings

Ligand FAD A 389

Bond lengths

Bond angles

Torsions

Rings

Ligand T1C D 392

Bond lengths

Bond angles

Torsions

Rings

Ligand FAD D 389

Bond lengths

Bond angles

Torsions

Rings

Ligand FAD C 389

Bond lengths

Bond angles

Torsions

Rings

Ligand T1C C 392

Bond lengths

Bond angles

Torsions

Rings

5.7　Other polymers ⓘ

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, 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	368/398 (92%)	0.68	32 (8%)	10	14	43, 62, 96, 142	0
2	B	368/398 (92%)	0.79	38 (10%)	6	9	45, 63, 95, 130	0
2	C	367/398 (92%)	0.95	60 (16%)	1	2	53, 75, 111, 156	0
2	D	367/398 (92%)	0.89	46 (12%)	3	5	50, 75, 115, 144	0
All	All	1470/1592 (92%)	0.83	176 (11%)	4	6	43, 69, 108, 156	0

All (176) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	C	340	ASP	8.7
2	B	249	THR	7.3
1	A	249	THR	6.9
1	A	343	PHE	6.5
2	C	380	PHE	6.4
2	B	343	PHE	6.0
2	D	245	TRP	5.7
2	B	12	ASN	5.4
2	C	343	PHE	5.4
2	B	341	GLY	5.3
1	A	378	PRO	5.1
2	D	378	PRO	5.0
2	D	380	PHE	5.0
2	D	110	PHE	4.9
1	A	145	GLY	4.8
2	C	252	ASP	4.7
2	C	341	GLY	4.7
2	B	250	GLN	4.7
1	A	147	LYS	4.7
2	D	339	ALA	4.7
2	D	340	ASP	4.6

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Mol	Chain	Res	Type	RSRZ
2	D	343	PHE	4.5
2	D	147	LYS	4.5
1	A	250	GLN	4.4
2	B	344	ASN	4.4
2	D	252	ASP	4.3
2	B	258	SER	4.3
2	C	148	LYS	4.3
2	B	13	LEU	4.2
2	C	268	SER	4.1
2	C	220	GLY	4.1
2	D	322	GLN	4.1
2	B	252	ASP	4.1
2	C	245	TRP	4.1
2	C	110	PHE	4.1
2	D	14	LEU	4.0
2	C	253	PHE	4.0
1	A	12	ASN	4.0
2	C	376	PHE	3.9
2	C	261	ASP	3.9
2	B	243	ASP	3.8
2	C	344	ASN	3.8
2	D	341	GLY	3.6
1	A	254	GLN	3.6
1	A	243	ASP	3.5
2	D	320	ALA	3.5
2	D	251	VAL	3.5
2	D	109	ARG	3.5
2	B	245	TRP	3.4
2	C	345	SER	3.4
2	C	15	SER	3.3
2	B	147	LYS	3.3
2	D	254	GLN	3.3
2	C	370	GLN	3.2
2	C	147	LYS	3.2
2	B	339	ALA	3.2
2	B	264	LEU	3.2
2	D	255	ASN	3.2
2	C	348	GLU	3.2
2	B	345	SER	3.2
2	D	15	SER	3.2
1	A	245	TRP	3.2
2	C	217	SER	3.1

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Mol	Chain	Res	Type	RSRZ
2	C	256	ARG	3.1
2	D	300	SER	3.1
2	C	161	ALA	3.1
2	D	218	HIS	3.1
2	D	16	ASP	3.0
2	C	257	ASN	3.0
1	A	301	LYS	3.0
2	C	264	LEU	3.0
1	A	344	ASN	3.0
2	D	269	ASP	3.0
2	C	279	HIS	3.0
2	C	375	MET	3.0
2	C	342	LYS	2.9
2	D	345	SER	2.9
2	C	381	THR	2.9
1	A	341	GLY	2.9
2	D	243	ASP	2.9
2	B	304	LEU	2.9
2	D	242	PRO	2.9
2	D	12	ASN	2.8
2	B	14	LEU	2.8
2	B	15	SER	2.8
2	C	14	LEU	2.8
2	C	144	PRO	2.8
1	A	146	LYS	2.8
2	B	255	ASN	2.8
2	B	340	ASP	2.8
2	D	336	ASP	2.8
2	D	349	ALA	2.8
1	A	13	LEU	2.7
2	D	360	TYR	2.7
1	A	251	VAL	2.7
2	C	36	GLN	2.7
2	D	364	ALA	2.7
2	D	352	ASN	2.7
1	A	355	GLN	2.7
2	C	250	GLN	2.7
2	D	344	ASN	2.7
1	A	124	LEU	2.7
2	D	268	SER	2.6
2	C	251	VAL	2.6
2	B	254	GLN	2.6

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Mol	Chain	Res	Type	RSRZ
2	D	346	ILE	2.6
1	A	376	PHE	2.6
1	A	252	ASP	2.6
2	B	261	ASP	2.6
2	D	376	PHE	2.6
2	C	319	PHE	2.6
2	C	339	ALA	2.6
1	A	148	LYS	2.5
2	B	257	ASN	2.5
2	C	294	LEU	2.5
1	A	14	LEU	2.5
2	C	13	LEU	2.5
2	C	382	PHE	2.5
1	A	268	SER	2.5
2	D	353	TYR	2.5
2	D	146	LYS	2.4
2	C	244	GLU	2.4
2	C	349	ALA	2.4
1	A	253	PHE	2.4
2	C	178	VAL	2.4
2	C	352	ASN	2.4
2	B	378	PRO	2.3
2	B	148	LYS	2.3
2	C	269	ASP	2.3
2	C	242	PRO	2.3
2	C	111	ASP	2.3
2	B	124	LEU	2.3
2	D	253	PHE	2.3
2	C	291	ILE	2.3
2	D	381	THR	2.3
2	B	301	LYS	2.3
2	D	148	LYS	2.3
2	B	183	VAL	2.3
2	B	324	VAL	2.3
2	D	257	ASN	2.3
2	B	326	SER	2.3
2	C	42	VAL	2.2
2	C	124	LEU	2.2
2	D	104	VAL	2.2
2	B	16	ASP	2.2
2	B	379	ASP	2.2
2	C	207	GLN	2.2

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Mol	Chain	Res	Type	RSRZ
2	B	120	LEU	2.2
2	C	255	ASN	2.2
1	A	322	GLN	2.2
2	C	322	GLN	2.2
2	B	256	ARG	2.2
1	A	375	MET	2.2
2	D	178	VAL	2.2
2	B	288	ALA	2.2
2	C	355	GLN	2.2
2	B	328	LEU	2.1
2	C	108	ASN	2.1
2	B	162	ASP	2.1
2	C	41	ASP	2.1
2	D	111	ASP	2.1
1	A	382	PHE	2.1
2	C	218	HIS	2.1
1	A	381	THR	2.1
2	C	109	ARG	2.1
2	C	146	LYS	2.1
1	A	328	LEU	2.1
2	C	304	LEU	2.1
2	C	271	ASP	2.0
2	C	286	GLY	2.0
1	A	26	PRO	2.0
2	B	26	PRO	2.0
2	D	162	ASP	2.0
1	A	342	LYS	2.0
2	D	294	LEU	2.0
1	A	255	ASN	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, 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
5	SO4	A	1384	5/5	0.37	0.25	109,115,142,145	0
4	T1C	C	392	42/42	0.66	0.35	77,120,163,175	0
5	SO4	C	1383	5/5	0.74	0.16	99,100,115,129	0
4	T1C	D	392	42/42	0.77	0.31	91,115,142,151	0
4	T1C	B	392	42/42	0.78	0.24	61,90,115,117	0
4	T1C	A	392	42/42	0.83	0.22	61,85,102,117	0
5	SO4	B	1385	5/5	0.88	0.12	105,109,124,129	0
5	SO4	D	1383	5/5	0.89	0.20	117,119,129,130	0
5	SO4	C	1384	5/5	0.91	0.21	90,97,107,118	0
3	FAD	B	389	53/53	0.92	0.19	33,45,58,72	0
5	SO4	B	1383	5/5	0.94	0.15	98,100,106,119	0
3	FAD	C	389	53/53	0.94	0.14	36,50,62,73	0
5	SO4	B	1386	5/5	0.94	0.24	80,96,107,108	0
5	SO4	D	1385	5/5	0.94	0.24	90,93,100,108	0
5	SO4	B	1384	5/5	0.95	0.11	89,95,103,109	0
3	FAD	A	389	53/53	0.96	0.14	30,43,53,65	0
3	FAD	D	389	53/53	0.96	0.14	39,50,61,69	0
5	SO4	A	1383	5/5	0.96	0.11	94,96,104,108	0
5	SO4	D	1384	5/5	0.98	0.08	88,88,92,98	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.
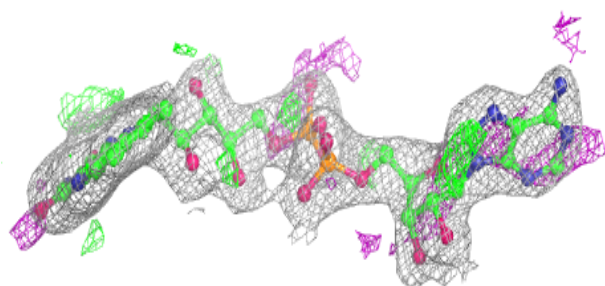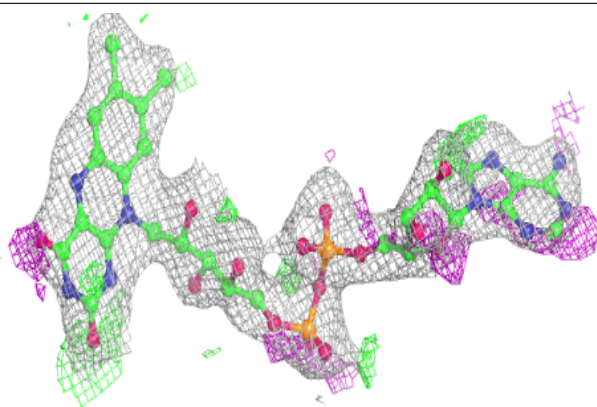
Electron density around T1C C 392:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
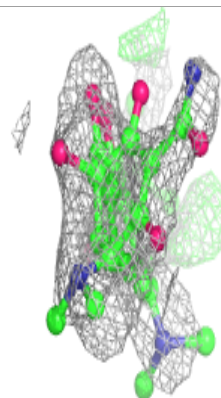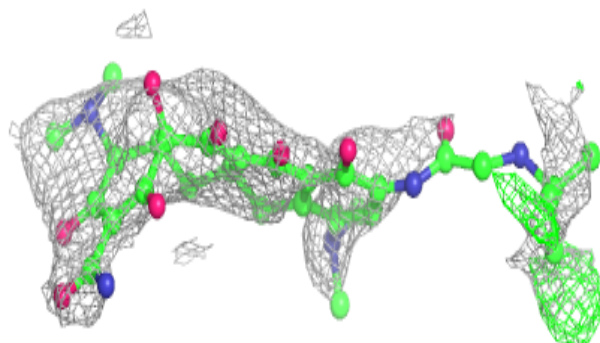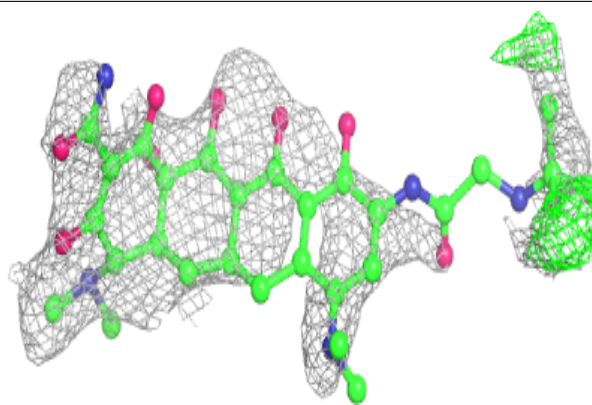
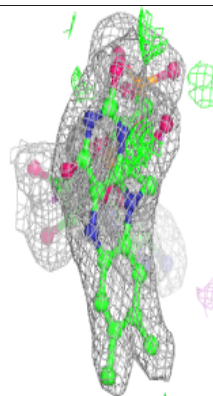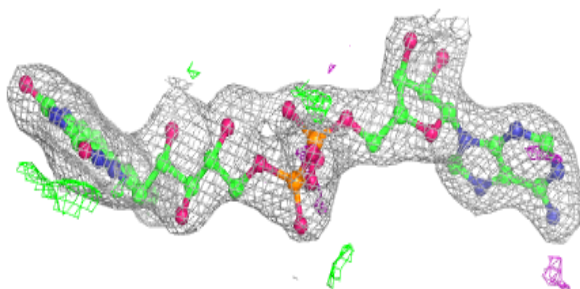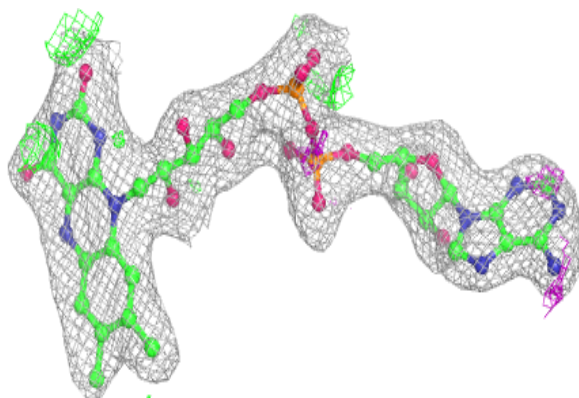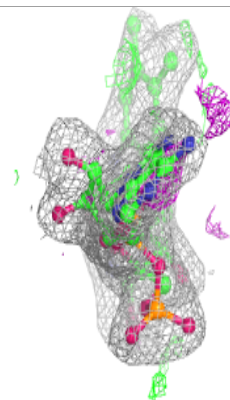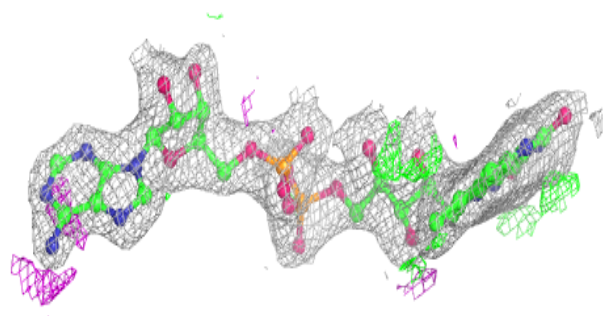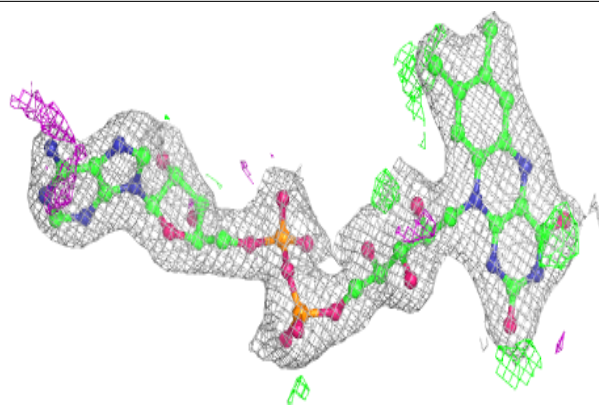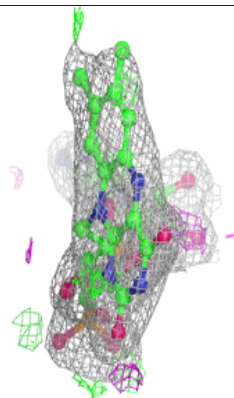**Electron density around T1C D 392:**

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
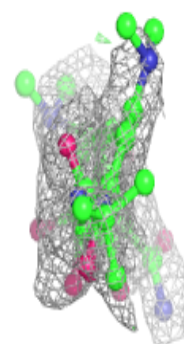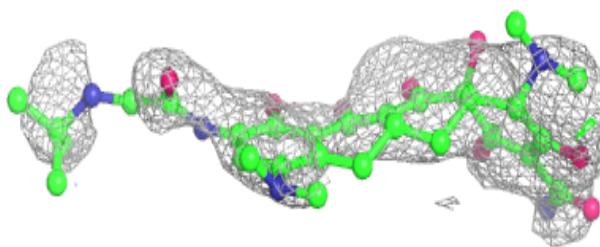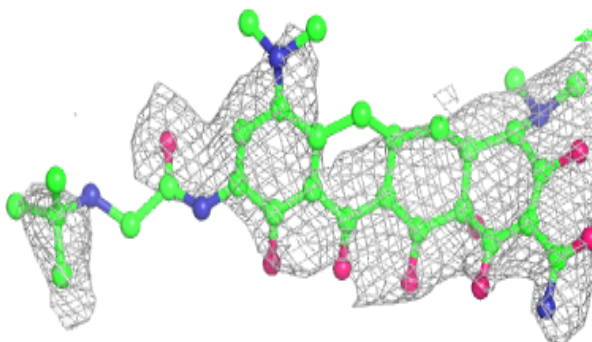
Electron density around T1C B 392:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
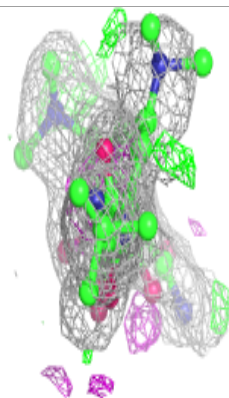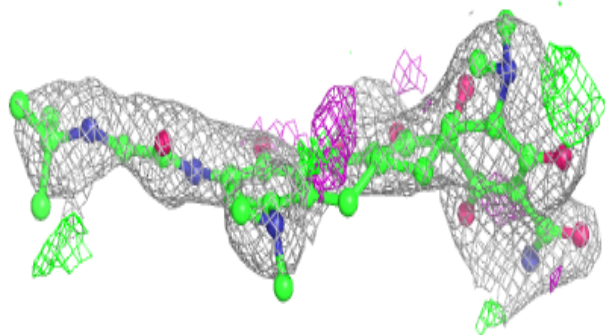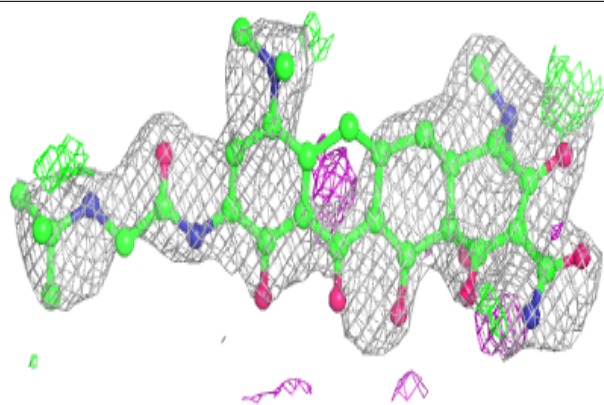
Electron density around T1C A 392:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
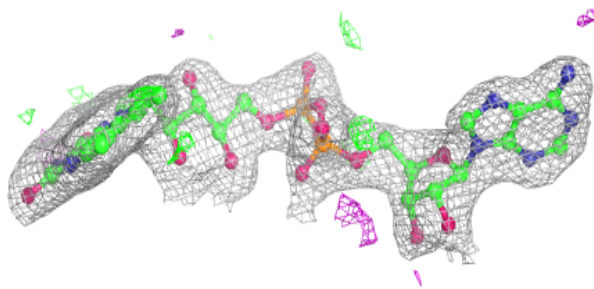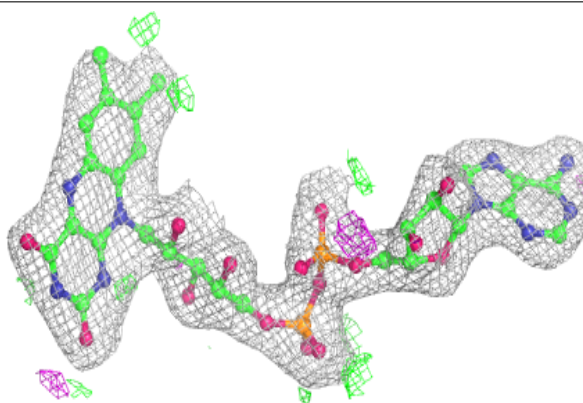and green (positive)
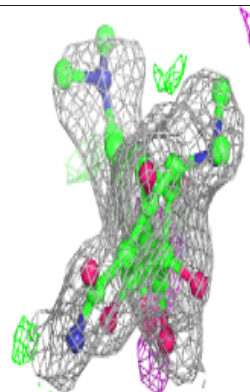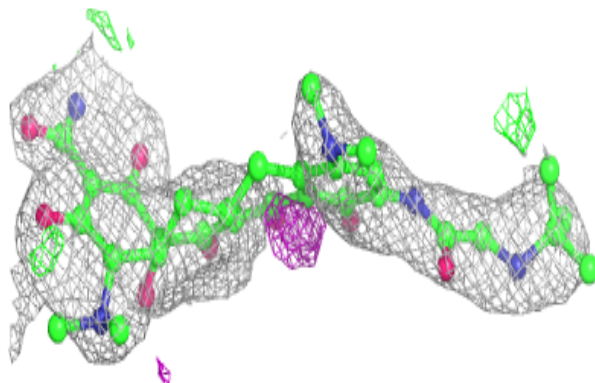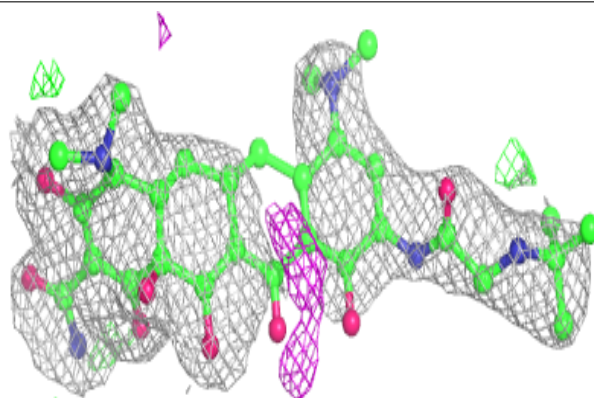
Electron density around FAD B 389:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
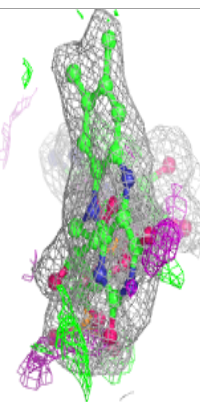
Electron density around FAD C 389:

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

Electron density around FAD A 389:

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

Electron density around FAD D 389:

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

6.5 Other polymers (i)

There are no such residues in this entry.