WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Feb 26, 2024 – 02:30 PM JST

PDB ID	:	8IL4
Title	:	Crystal structure of alcohol oxidase ParAOX(M59V/Q60P/R61N/F101S/N6 02H)(Polyporus arcularius)
Authors	:	Wu, B.; Wang, Y.
Deposited on	:	2023-03-01
Resolution	:	3.36 Å(reported)

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

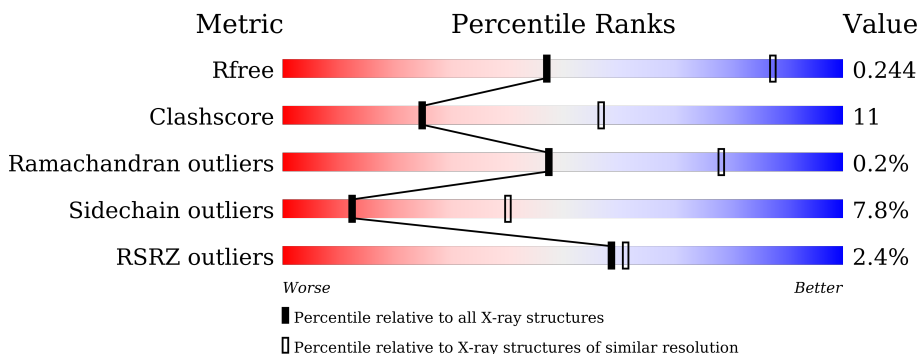|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh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

1   Overall quality at a glance ⓘ

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

The reported resolution of this entry is 3.36 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		0.244
Clashscore		11
Ramachandran outliers		0.2%
Sidechain outliers		7.8%
RSRZ outliers		2.4%

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	1558 (3.42-3.30)
Clashscore	141614	1627 (3.42-3.30)
Ramachandran outliers	138981	1599 (3.42-3.30)
Sidechain outliers	138945	1598 (3.42-3.30)
RSRZ outliers	127900	1507 (3.42-3.30)

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	649	.% / 71% / 22% / • 5%
1	B	649	2% / 71% / 20% / • 6%
1	C	649	3% / 68% / 25% / • 5%
1	D	649	3% / 61% / 29% / • 6%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 19024 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 GMC oxidoreductase.

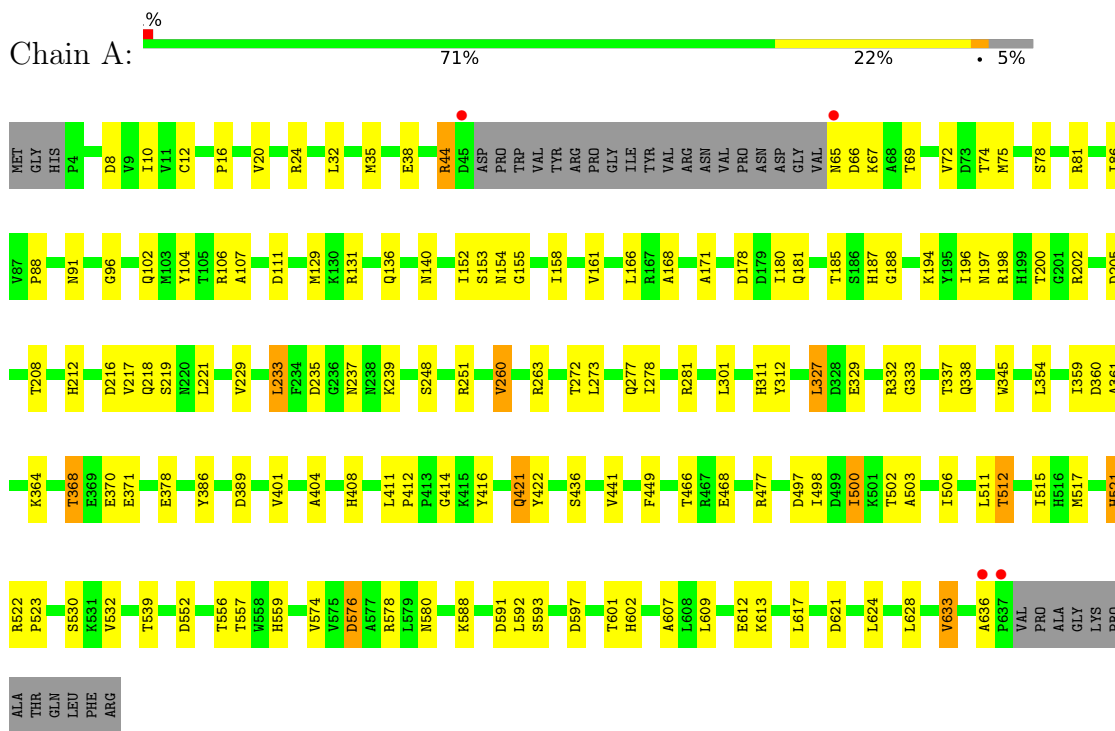| Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	615	Total	C	N	O	S	0	0	0
			4765	2994	842	909	20			
1	B	607	Total	C	N	O	S	0	0	0
			4648	2916	817	896	19			
1	C	619	Total	C	N	O	S	0	0	0
			4736	2976	830	910	20			
1	D	609	Total	C	N	O	S	0	0	0
			4663	2937	811	895	20			

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	59	VAL	MET	engineered mutation	UNP A0A5C3NW19
A	60	PRO	GLN	engineered mutation	UNP A0A5C3NW19
A	61	ASN	ARG	engineered mutation	UNP A0A5C3NW19
A	101	SER	PHE	engineered mutation	UNP A0A5C3NW19
A	602	HIS	ASN	engineered mutation	UNP A0A5C3NW19
B	59	VAL	MET	engineered mutation	UNP A0A5C3NW19
B	60	PRO	GLN	engineered mutation	UNP A0A5C3NW19
B	61	ASN	ARG	engineered mutation	UNP A0A5C3NW19
B	101	SER	PHE	engineered mutation	UNP A0A5C3NW19
B	602	HIS	ASN	engineered mutation	UNP A0A5C3NW19
C	59	VAL	MET	engineered mutation	UNP A0A5C3NW19
C	60	PRO	GLN	engineered mutation	UNP A0A5C3NW19
C	61	ASN	ARG	engineered mutation	UNP A0A5C3NW19
C	101	SER	PHE	engineered mutation	UNP A0A5C3NW19
C	602	HIS	ASN	engineered mutation	UNP A0A5C3NW19
D	59	VAL	MET	engineered mutation	UNP A0A5C3NW19
D	60	PRO	GLN	engineered mutation	UNP A0A5C3NW19
D	61	ASN	ARG	engineered mutation	UNP A0A5C3NW19
D	101	SER	PHE	engineered mutation	UNP A0A5C3NW19
D	602	HIS	ASN	engineered mutation	UNP A0A5C3NW19

- Molecule 2 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$) (labeled as "Ligand of Interest" by depositor).

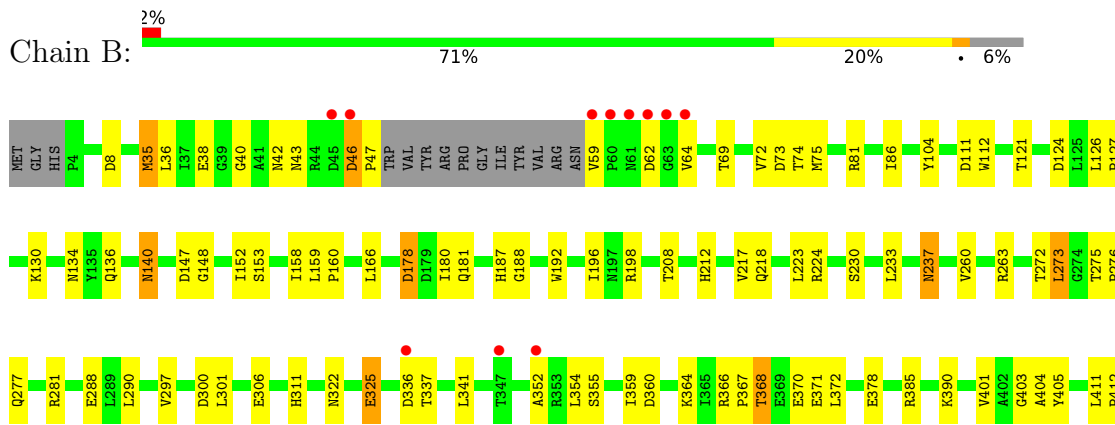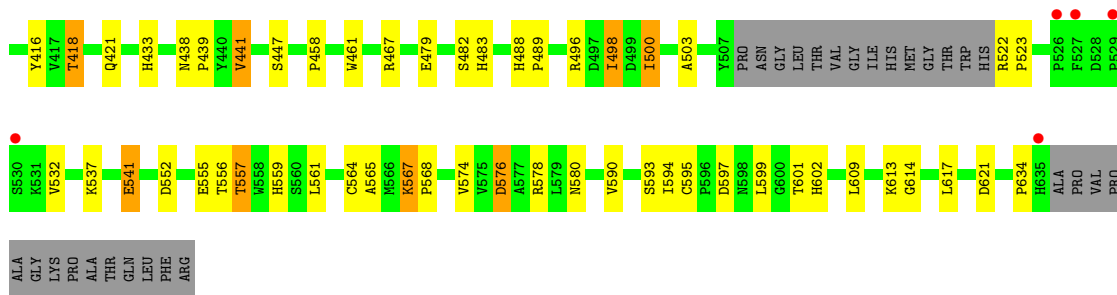| Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	B	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	C	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	D	1	Total	C	N	O	P	0	0
			53	27	9	15	2		

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.
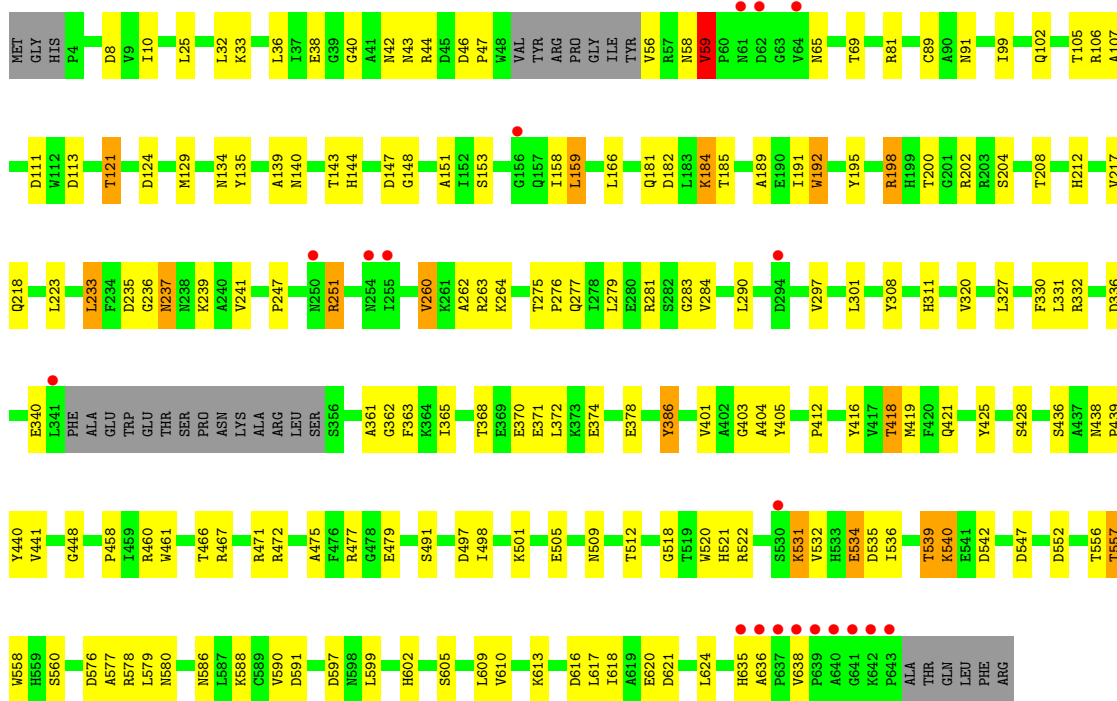
• Molecule 1: GMC oxidoreductase
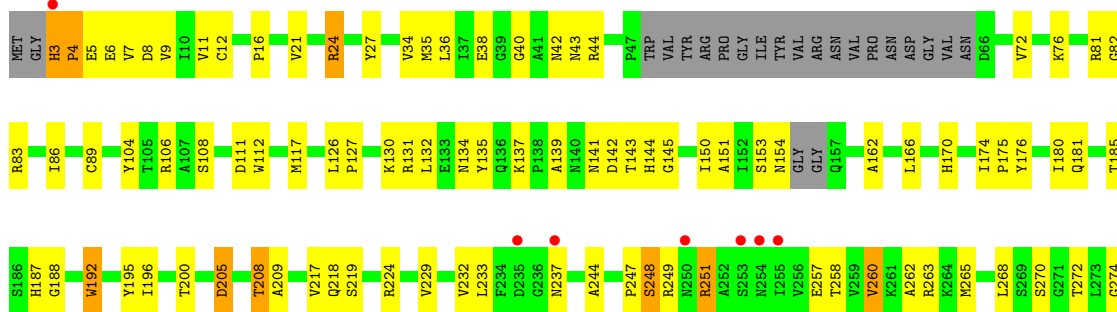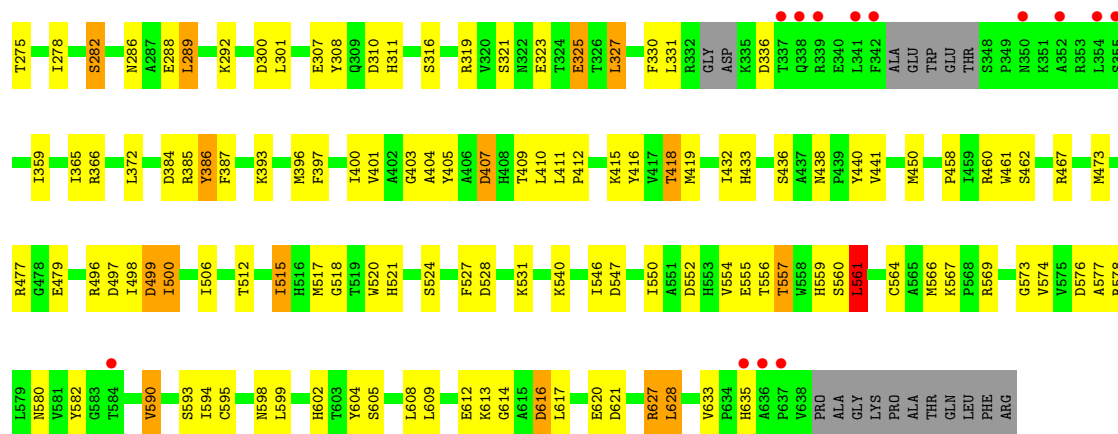
Chain A:

• Molecule 1: GMC oxidoreductase

Chain B:

Y416 V417 T418 Q421 H433 N438 P439 Y440 V441 S447 P458 W461 R467 E479 S482 H483 H488 P489 R496 D497 I498 D499 I500 A503 Y507 PRO ASN GLY LEU THR VAL GLY ILE HIS MET GLY THR TRP HIS R522 P523 P526 F527 D528 P529

S530 K531 V532 K537 E541 D552 E555 T556 T557 W558 H559 S560 L561 C564 A565 M566 K567 P568 V574 V575 D576 A577 R578 L579 N580 V590 S593 I594 C595 P596 D597 N598 G600 T601 H602 L609 K613 G614 L617 D621 P634 H635 ALA PRO VAL PRO

ALA GLY LYS PRO ALA THR GLN LEU PHE ARG

• **Molecule 1: GMC oxidoreductase**

Chain C:

MET GLY HIS P4 D8 V9 I10 L25 L32 K33 L36 I37 E38 G39 G40 A41 N42 N43 R44 D45 D46 P47 W48 VAL TYR ARG PRO GLY ILE TYR V56 R57 N58 V59 P60 N61 D62 G63 V64 N65 T69 R81 C89 A90 N91 I99 Q102 T105 R106 A107

D111 W112 D113 T121 D124 M129 N134 Y135 A139 N140 T143 H144 D147 G148 A151 I152 S153 G156 Q157 I158 L159 L166 Q181 D182 L183 K184 T185 A189 E190 I191 W192 Y195 R198 H199 G201 R202 R203 S204 T208 H212 V217

Q218 L223 L233 F234 D235 G236 N237 N238 K239 A240 V241 P247 N250 R251 N254 I255 V260 K261 A262 R263 K264 T275 P276 Q277 I278 L279 E280 R281 S282 G283 V284 L290 D294 V297 L301 Y308 H311 V320 L327 F330 L331 R332 D336

E340 L341 PHE ALA GLU TRP GLU THR SER PRO ASN LYS ALA ARG LEU SER S356 A361 G362 F363 K364 I365 T368 E369 E370 E371 L372 K373 E374 E378 Y386 V401 A402 G403 A404 Y405 P412 Y416 V417 T418 M419 F420 Q421 Y425 S428 S436 A437 N438 P439

Y440 V441 G448 P458 I459 R460 W461 T466 R467 R471 R472 A475 F476 R477 G478 E479 S491 D497 I498 K501 E505 N509 T512 G518 T519 W520 H521 R522 S530 K531 V532 H533 E534 D535 I536 T539 K540 E541 D542 D547 D552 T556 T557

W558 H559 S560 D576 A577 R578 L579 N580 N586 L587 K588 C589 V590 D591 D597 N598 L599 H602 S605 L609 V610 K613 D616 L617 I618 A619 E620 D621 L624 H635 A636 P637 V638 P639 A640 G641 K642 P643 ALA THR GLN LEU PHE ARG

• **Molecule 1: GMC oxidoreductase**

Chain D:

MET GLY H3 P4 E5 E6 V7 D8 V9 I10 V11 C12 P16 V21 R24 Y27 V34 M35 L36 I37 E38 G39 G40 A41 N42 N43 R44 P47 TRP VAL TYR ARG PRO GLY ILE TYR VAL ARG ASN VAL PRO ASN ASP GLY VAL ASN D66 V72 K76 R81 G82

R83 I86 C89 Y104 T105 R106 A107 S108 D111 W112 M117 L126 P127 K130 R131 L132 E133 N134 Y135 Q136 K137 P138 A139 N140 N141 D142 T143 H144 G145 I150 A151 I152 S153 N154 GLY GLY Q157 A162 L166 H170 I174 P175 Y176 I180 Q181 T185

S186 H187 G188 W192 Y195 I196 T200 D205 T208 A209 V217 Q218 S219 R224 V229 V232 L233 F234 D235 G236 N237 A244 P247 S248 R249 N250 R251 A252 S253 N254 I255 V256 E257 T258 V259 V260 K261 A262 R263 K264 M265 L268 S269 S270 G271 T272 L273 G274

T275 I278 S282 N286 A287 E288 L289 K292 D300 L301 E307 Y308 Q309 D310 H311 S316 R319 V320 S321 N322 E323 T324 E325 T326 L327 F330 L331 R332 GLY ASP K335 D336 T337 Q338 R339 E340 L341 F342 ALA GLU TRP GLU THR S348 P349 N350 K351 A352 R353 L354 S355

I359 I365 R366 L372 D384 R385 Y386 F387 K393 M396 F397 I400 V401 A402 G403 A404 Y405 A406 D407 H408 T409 L410 L411 P412 K415 Y416 V417 T418 M419 I432 H433 S436 A437 N438 P439 Y440 V441 M450 P458 I459 R460 W461 S462 R467 M473

R477 G478 E479 R496 D497 I498 D499 I500 I506 T512 I515 H516 M517 G518 T519 W520 H521 S524 F527 D528 K531 K540 I546 D547 I550 A551 D552 H553 V554 E555 T556 T557 W558 H559 S560 L561 C564 A565 M566 K567 P568 R569 G573 V574 V575 D576 A577 R578

L579 N580 V581 Y582 G583 T584 V590 S593 I594 C595 N598 L599 H602 T603 Y604 S605 L608 L609 E612 K613 G614 A615 D616 L617 E620 D621 R627 L628 V633 P634 H635 A636 P637 V638 PRO ALA GLY LYS PRO ALA THR GLN LEU PHE ARG

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	71.71Å 187.43Å 118.53Å 90.00° 90.29° 90.00°	Depositor
Resolution (Å)	45.57 – 3.36 45.57 – 3.36	Depositor EDS
% Data completeness (in resolution range)	94.1 (45.57-3.36) 94.1 (45.57-3.36)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	2.29 (at 3.32Å)	Xtriage
Refinement program	PHENIX 1.9_1692+SVN	Depositor
R, R_{free}	0.194 , 0.243 0.197 , 0.244	Depositor DCC
R_{free} test set	1996 reflections (4.74%)	wwPDB-VP
Wilson B-factor (Å^2)	53.5	Xtriage
Anisotropy	0.430	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 17.7	EDS
L-test for twinning[2]	$<\lvert L \rvert> = 0.49, <L^2> = 0.32$	Xtriage
Estimated twinning fraction	0.115 for h,-k,-l	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	19024	wwPDB-VP
Average B, all atoms (Å^2)	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.61% 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: 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	0.74	0/4880	0.67	0/6630
1	B	0.71	0/4754	0.65	0/6464
1	C	0.66	0/4849	0.66	1/6596 (0.0%)
1	D	0.54	0/4775	0.61	1/6499 (0.0%)
All	All	0.67	0/19258	0.65	2/26189 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	561	LEU	CA-CB-CG	6.37	129.94	115.30
1	C	59	VAL	C-N-CD	5.61	140.18	128.40

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	4765	0	4608	87	0
1	B	4648	0	4454	84	0
1	C	4736	0	4540	103	0
1	D	4663	0	4436	128	0
2	A	53	0	30	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	53	0	30	2	0
2	C	53	0	30	2	0
2	D	53	0	30	4	0
All	All	19024	0	18158	402	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 11.

All (402) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:184:LYS:HZ3	1:C:185:THR:HG23	1.28	0.95
1:D:137:LYS:HE3	1:D:154:ASN:HB3	1.55	0.86
1:D:72:VAL:HG12	1:D:86:ILE:HG12	1.58	0.86
1:B:136:GLN:O	1:B:198:ARG:NH1	2.08	0.86
1:D:528:ASP:HB3	1:D:531:LYS:HG3	1.56	0.85
1:D:217:VAL:HG23	1:D:218:GLN:HG3	1.60	0.83
1:A:436:SER:HB3	1:A:441:VAL:HG21	1.60	0.82
1:C:460:ARG:NH1	1:C:547:ASP:OD1	2.14	0.79
1:D:83:ARG:NH2	1:D:554:VAL:O	2.18	0.77
1:A:35:MET:HE1	1:A:260:VAL:HG21	1.68	0.75
1:C:81:ARG:NH1	1:C:552:ASP:OD2	2.20	0.74
1:A:576:ASP:HB3	1:A:578:ARG:H	1.53	0.74
1:C:412:PRO:O	1:C:416:TYR:OH	2.05	0.73
1:D:141:ASN:OD1	1:D:142:ASP:N	2.21	0.73
1:C:580:ASN:OD1	1:C:588:LYS:NZ	2.20	0.73
1:C:69:THR:HG23	1:C:91:ASN:HB2	1.71	0.73
1:D:278:ILE:O	1:D:282:SER:OG	2.07	0.73
1:D:401:VAL:HB	1:D:418:THR:HG23	1.69	0.72
1:B:576:ASP:HB3	1:B:578:ARG:H	1.54	0.72
1:D:24:ARG:NH1	1:D:612:GLU:OE2	2.22	0.72
1:D:613:LYS:HE3	1:D:617:LEU:HD21	1.71	0.72
1:C:251:ARG:HB2	1:C:251:ARG:HH21	1.55	0.72
1:C:158:ILE:HG12	1:C:191:ILE:HD12	1.72	0.71
1:D:407:ASP:OD1	1:D:407:ASP:N	2.17	0.69
1:C:578:ARG:NH1	1:C:621:ASP:OD1	2.25	0.69
1:B:404:ALA:HB2	1:B:416:TYR:HB2	1.72	0.69
1:C:471:ARG:NH1	1:C:479:GLU:OE2	2.26	0.69
1:D:205:ASP:OD2	1:D:208:THR:OG1	2.10	0.68
1:C:184:LYS:NZ	1:C:185:THR:HG23	2.07	0.68
1:D:436:SER:HB3	1:D:441:VAL:HG21	1.74	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:311:HIS:O	1:A:557:THR:OG1	2.10	0.68
1:A:153:SER:OG	1:A:196:ILE:O	2.10	0.68
1:A:412:PRO:O	1:A:416:TYR:OH	2.11	0.67
1:B:482:SER:HG	1:B:483:HIS:HD1	1.42	0.67
1:D:308:TYR:OH	1:D:310:ASP:OD2	2.09	0.67
1:B:217:VAL:HG23	1:B:218:GLN:HG3	1.75	0.67
1:C:217:VAL:HG13	1:C:218:GLN:HG3	1.75	0.66
1:D:321:SER:OG	1:D:323:GLU:OE2	2.14	0.66
1:B:412:PRO:O	1:B:416:TYR:OH	2.11	0.65
1:D:35:MET:HE1	1:D:260:VAL:HG21	1.78	0.65
1:C:401:VAL:HB	1:C:418:THR:HG23	1.78	0.65
1:D:117:MET:HG3	1:D:566:MET:HG2	1.78	0.65
1:D:576:ASP:OD1	1:D:577:ALA:N	2.30	0.64
1:B:341:LEU:HD12	1:B:354:LEU:HG	1.79	0.64
1:D:403:GLY:O	1:D:418:THR:HG22	1.98	0.64
1:A:217:VAL:HG23	1:A:218:GLN:HG3	1.80	0.63
1:D:407:ASP:HB2	1:D:409:THR:HG22	1.81	0.63
1:A:219:SER:OG	1:C:124:ASP:OD2	2.16	0.63
1:A:301:LEU:HD13	1:A:574:VAL:HG13	1.81	0.62
1:B:496:ARG:HD2	1:B:522:ARG:HH21	1.63	0.62
1:C:235:ASP:OD1	1:C:237:ASN:N	2.30	0.62
2:D:1000:FAD:O1A	2:D:1000:FAD:O4'	2.15	0.62
1:C:311:HIS:O	1:C:557:THR:OG1	2.17	0.61
1:C:38:GLU:HG3	1:C:40:GLY:H	1.66	0.61
1:B:237:ASN:OD1	1:B:237:ASN:N	2.33	0.61
1:B:311:HIS:O	1:B:557:THR:OG1	2.12	0.61
1:B:488:HIS:ND1	1:B:489:PRO:HD2	2.15	0.61
1:D:289:LEU:HD11	1:D:433:HIS:HB3	1.83	0.61
1:B:81:ARG:NH1	1:B:552:ASP:OD2	2.34	0.61
1:D:153:SER:OG	1:D:196:ILE:O	2.18	0.60
1:D:412:PRO:O	1:D:416:TYR:OH	2.13	0.60
1:C:371:GLU:O	1:C:374:GLU:HG2	2.02	0.60
1:C:613:LYS:HE3	1:C:617:LEU:HD21	1.83	0.60
1:D:602:HIS:HB3	2:D:1000:FAD:C2	2.32	0.60
1:A:180:ILE:HD11	1:A:188:GLY:HA3	1.83	0.60
1:C:531:LYS:HD3	1:C:532:VAL:N	2.17	0.60
1:D:135:TYR:HE2	1:D:139:ALA:HB2	1.67	0.59
1:D:192:TRP:CZ2	1:D:397:PHE:HE2	2.19	0.59
1:D:405:TYR:H	1:D:418:THR:HG21	1.67	0.59
1:D:497:ASP:OD1	1:D:498:ILE:N	2.35	0.59
1:B:72:VAL:HG22	1:B:86:ILE:HG12	1.85	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:69:THR:HG23	1:A:91:ASN:HB2	1.85	0.58
1:B:401:VAL:HB	1:B:418:THR:HG23	1.85	0.58
1:C:200:THR:OG1	1:C:202:ARG:HG2	2.04	0.58
1:C:290:LEU:HD12	1:C:297:VAL:HG22	1.85	0.58
1:C:386:TYR:HH	1:C:425:TYR:HD2	1.51	0.58
1:B:613:LYS:HE3	1:B:617:LEU:HD21	1.85	0.58
1:D:112:TRP:CZ2	1:D:609:LEU:HD23	2.40	0.57
1:C:404:ALA:HB2	1:C:416:TYR:HB2	1.85	0.57
1:B:366:ARG:NH2	1:B:390:LYS:O	2.38	0.57
1:D:232:VAL:H	1:D:282:SER:HB3	1.70	0.57
1:D:311:HIS:O	1:D:557:THR:OG1	2.20	0.57
1:B:158:ILE:HD12	1:B:360:ASP:HB3	1.86	0.57
1:B:482:SER:OG	1:B:483:HIS:ND1	2.38	0.56
1:C:99:ILE:HD11	2:C:1000:FAD:HM82	1.87	0.56
1:D:247:PRO:O	1:D:440:TYR:OH	2.11	0.56
1:D:12:CYS:HB3	1:D:229:VAL:HG21	1.87	0.56
1:D:438:ASN:HB3	1:D:441:VAL:HG13	1.87	0.56
1:C:405:TYR:H	1:C:418:THR:HG21	1.70	0.56
1:C:531:LYS:HD3	1:C:532:VAL:H	1.71	0.56
1:A:408:HIS:HA	1:A:411:LEU:HB2	1.87	0.56
1:A:65:ASN:HD21	1:A:67:LYS:HE2	1.71	0.55
1:A:131:ARG:NH2	1:A:612:GLU:OE1	2.31	0.55
1:B:467:ARG:NH2	1:B:479:GLU:OE1	2.36	0.55
1:D:170:HIS:CE1	1:D:176:TYR:HB2	2.41	0.55
1:C:534:GLU:N	1:C:534:GLU:OE1	2.40	0.55
1:D:162:ALA:O	1:D:166:LEU:HD22	2.07	0.55
1:C:471:ARG:HD2	1:C:536:ILE:HD11	1.88	0.55
1:C:602:HIS:HB3	2:C:1000:FAD:C2	2.37	0.54
1:A:556:THR:OG1	1:A:557:THR:N	2.39	0.54
1:B:38:GLU:HG3	1:B:40:GLY:H	1.72	0.54
1:C:111:ASP:HB3	1:C:599:LEU:HD23	1.90	0.54
1:D:150:ILE:HG13	1:D:608:LEU:HD13	1.89	0.54
1:A:601:THR:OG1	1:A:602:HIS:O	2.23	0.54
1:A:613:LYS:HE3	1:A:617:LEU:HD21	1.89	0.54
1:C:403:GLY:O	1:C:418:THR:HG22	2.07	0.54
1:D:8:ASP:OD1	1:D:263:ARG:NE	2.40	0.54
1:D:602:HIS:HB3	2:D:1000:FAD:O2	2.06	0.54
1:C:239:LYS:HD2	1:C:586:ASN:ND2	2.23	0.54
1:B:180:ILE:HD11	1:B:188:GLY:HA3	1.89	0.53
1:A:65:ASN:ND2	1:A:67:LYS:HE2	2.22	0.53
1:C:134:ASN:HB3	1:C:151:ALA:HA	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:284:VAL:HG13	1:C:301:LEU:HD12	1.89	0.53
1:A:332:ARG:NH2	1:A:414:GLY:O	2.41	0.53
1:B:62:ASP:HB3	1:B:64:VAL:HG12	1.89	0.53
1:A:602:HIS:HB3	2:A:1000:FAD:C2	2.38	0.53
1:C:113:ASP:OD1	1:C:121:THR:HG22	2.09	0.53
1:D:244:ALA:HB1	1:D:257:GLU:HG2	1.90	0.53
1:D:311:HIS:HE1	1:D:598:ASN:OD1	1.92	0.53
1:D:321:SER:HB2	1:D:527:PHE:CE2	2.43	0.53
1:D:576:ASP:HB3	1:D:580:ASN:H	1.74	0.53
1:B:8:ASP:OD1	1:B:263:ARG:NH1	2.42	0.53
1:C:308:TYR:HE1	1:C:560:SER:HB3	1.73	0.53
1:D:21:VAL:HG21	1:D:590:VAL:HG21	1.90	0.53
1:A:272:THR:HA	1:A:593:SER:HB3	1.91	0.53
1:B:403:GLY:O	1:B:418:THR:HG22	2.08	0.53
1:D:400:ILE:HD12	1:D:473:MET:HE1	1.89	0.53
1:B:153:SER:OG	1:B:196:ILE:O	2.17	0.52
1:D:27:TYR:CE2	1:D:627:ARG:HG2	2.44	0.52
1:D:76:LYS:HD3	1:D:82:GLY:O	2.09	0.52
1:D:131:ARG:NH2	1:D:612:GLU:OE1	2.39	0.52
1:D:106:ARG:HH21	1:D:144:HIS:CE1	2.28	0.52
1:A:512:THR:O	1:A:515:ILE:HG23	2.09	0.52
1:A:251:ARG:NH2	1:B:300:ASP:OD2	2.43	0.52
1:B:359:ILE:HG12	1:B:401:VAL:HG22	1.91	0.52
1:A:404:ALA:HB2	1:A:416:TYR:HB2	1.91	0.52
1:C:135:TYR:CE2	1:C:139:ALA:HB2	2.45	0.52
1:D:366:ARG:NH2	1:D:387:PHE:O	2.41	0.52
1:D:126:LEU:HG	1:D:130:LYS:HE3	1.92	0.52
1:B:576:ASP:HB2	1:B:580:ASN:H	1.75	0.51
1:D:132:LEU:HD23	1:D:612:GLU:HG3	1.92	0.51
1:C:105:THR:O	1:C:605:SER:OG	2.19	0.51
1:C:202:ARG:HH22	1:C:636:ALA:HB2	1.75	0.51
1:D:578:ARG:NH1	1:D:621:ASP:OD1	2.42	0.51
1:A:208:THR:HG22	1:A:212:HIS:HD2	1.74	0.51
1:C:121:THR:OG1	1:C:124:ASP:OD2	2.28	0.51
1:C:198:ARG:HH11	1:C:198:ARG:HB2	1.75	0.51
1:C:436:SER:HB3	1:C:441:VAL:HG21	1.92	0.51
1:C:134:ASN:HB2	1:C:148:GLY:O	2.11	0.51
1:B:230:SER:O	1:B:281:ARG:HD2	2.11	0.50
1:D:499:ASP:OD1	1:D:500:ILE:N	2.44	0.50
1:C:277:GLN:O	1:C:281:ARG:HG3	2.11	0.50
1:C:327:LEU:O	1:C:330:PHE:HB3	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:559:HIS:CE1	1:D:602:HIS:HA	2.46	0.50
1:D:450:MET:HE2	1:D:554:VAL:HG11	1.92	0.50
1:B:36:LEU:HD23	1:B:223:LEU:HD13	1.94	0.50
1:C:59:VAL:HG21	1:C:558:TRP:CZ2	2.46	0.50
1:D:170:HIS:NE2	1:D:176:TYR:HB2	2.27	0.50
1:A:498:ILE:HD13	1:A:503:ALA:HB2	1.94	0.50
1:D:518:GLY:HA3	1:D:520:TRP:NE1	2.27	0.50
1:A:578:ARG:HB2	1:A:580:ASN:ND2	2.26	0.50
1:D:288:GLU:O	1:D:292:LYS:HG3	2.10	0.50
1:B:272:THR:HA	1:B:593:SER:HB3	1.94	0.50
1:A:187:HIS:HA	1:A:364:LYS:O	2.11	0.49
1:C:419:MET:HG3	1:C:466:THR:HB	1.94	0.49
1:A:10:ILE:HD11	1:A:260:VAL:HG22	1.94	0.49
1:C:235:ASP:OD2	1:C:239:LYS:HB3	2.12	0.49
1:C:105:THR:HG23	1:C:181:GLN:NE2	2.28	0.49
1:B:565:ALA:HB1	1:B:567:LYS:HE3	1.94	0.49
1:A:44:ARG:NH2	1:A:216:ASP:OD2	2.42	0.49
1:D:556:THR:OG1	1:D:557:THR:N	2.46	0.49
1:C:576:ASP:OD1	1:C:577:ALA:N	2.46	0.49
1:B:111:ASP:HB3	1:B:599:LEU:HD23	1.95	0.49
1:C:363:PHE:CD1	1:C:365:ILE:HG23	2.48	0.49
1:C:518:GLY:HA3	1:C:520:TRP:CZ3	2.48	0.49
1:B:73:ASP:OD1	1:B:447:SER:HB2	2.14	0.48
1:C:198:ARG:HB2	1:C:198:ARG:NH1	2.27	0.48
1:C:467:ARG:NH2	1:C:479:GLU:OE1	2.44	0.48
1:D:567:LYS:O	1:D:573:GLY:HA3	2.12	0.48
1:A:155:GLY:O	1:A:198:ARG:NH1	2.47	0.48
1:B:482:SER:HG	1:B:483:HIS:CE1	2.31	0.48
1:D:321:SER:HB2	1:D:527:PHE:CZ	2.49	0.48
1:C:102:GLN:HB2	1:C:195:TYR:HB2	1.96	0.48
1:C:8:ASP:O	1:C:264:LYS:HB2	2.13	0.48
1:A:333:GLY:HA2	1:A:338:GLN:NE2	2.28	0.48
1:A:166:LEU:HD21	1:A:361:ALA:HB1	1.95	0.48
1:D:270:SER:O	1:D:274:GLY:HA3	2.14	0.48
1:A:106:ARG:H	1:A:181:GLN:HG3	1.78	0.48
1:C:539:THR:HG22	1:C:540:LYS:H	1.79	0.48
1:D:200:THR:HG21	1:D:635:HIS:O	2.13	0.48
1:D:404:ALA:HB2	1:D:416:TYR:HB2	1.96	0.48
1:A:277:GLN:O	1:A:281:ARG:HG2	2.14	0.47
1:A:578:ARG:NH1	1:A:621:ASP:OD1	2.47	0.47
1:B:578:ARG:NH1	1:B:621:ASP:OD1	2.47	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:131:ARG:NH2	1:D:616:ASP:OD1	2.46	0.47
1:B:368:THR:OG1	1:B:371:GLU:OE1	2.31	0.47
1:C:540:LYS:HD2	1:C:540:LYS:N	2.27	0.47
1:C:534:GLU:CD	1:C:534:GLU:H	2.18	0.47
1:D:268:LEU:HB3	1:D:275:THR:HG23	1.96	0.47
1:A:359:ILE:HG12	1:A:401:VAL:HG22	1.97	0.47
1:A:421:GLN:HG2	1:A:466:THR:HG21	1.95	0.47
1:D:16:PRO:HB3	1:D:604:TYR:HE1	1.80	0.47
1:D:308:TYR:HE1	1:D:560:SER:HB3	1.78	0.47
1:D:327:LEU:O	1:D:330:PHE:HB3	2.15	0.47
1:D:4:PRO:O	1:D:6:GLU:N	2.48	0.47
1:D:248:SER:HA	1:D:249:ARG:HA	1.71	0.47
1:B:578:ARG:HA	1:B:617:LEU:HD13	1.96	0.47
1:D:564:CYS:HA	1:D:574:VAL:HG21	1.97	0.47
1:D:316:SER:HB2	1:D:419:MET:HB2	1.96	0.46
1:B:112:TRP:CZ2	1:B:609:LEU:HD23	2.49	0.46
1:C:166:LEU:HD21	1:C:361:ALA:HB1	1.97	0.46
1:D:35:MET:HE3	1:D:260:VAL:HG11	1.96	0.46
1:D:42:ASN:OD1	1:D:43:ASN:N	2.49	0.46
1:D:564:CYS:O	1:D:594:ILE:HA	2.15	0.46
1:A:65:ASN:OD1	1:A:66:ASP:N	2.34	0.46
1:A:81:ARG:NH1	1:A:552:ASP:OD2	2.48	0.46
1:C:308:TYR:CE1	1:C:560:SER:HB3	2.50	0.46
1:D:104:TYR:OH	1:D:106:ARG:NE	2.49	0.46
1:D:458:PRO:O	1:D:461:TRP:HB3	2.15	0.46
1:B:496:ARG:HD2	1:B:522:ARG:NH2	2.31	0.46
1:D:9:VAL:HG22	1:D:265:MET:HB3	1.97	0.46
1:D:477:ARG:HA	1:D:527:PHE:HE1	1.80	0.46
1:A:38:GLU:OE2	2:A:1000:FAD:O3B	2.33	0.46
1:C:106:ARG:HH21	1:C:144:HIS:CE1	2.33	0.46
1:C:202:ARG:NH2	1:C:635:HIS:O	2.43	0.46
1:D:518:GLY:HA3	1:D:520:TRP:CD1	2.50	0.46
1:A:129:MET:HG2	1:A:609:LEU:HD22	1.97	0.46
1:D:108:SER:N	1:D:111:ASP:OD2	2.48	0.46
1:D:272:THR:HA	1:D:593:SER:HB3	1.97	0.46
1:D:249:ARG:O	1:D:251:ARG:HG3	2.15	0.46
1:D:546:ILE:O	1:D:550:ILE:HG12	2.15	0.46
1:A:559:HIS:CE1	1:A:602:HIS:HA	2.50	0.46
1:C:105:THR:HG23	1:C:181:GLN:HE22	1.80	0.46
1:C:235:ASP:OD1	1:C:236:GLY:N	2.49	0.46
1:C:241:VAL:O	1:C:262:ALA:N	2.38	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:500:ILE:H	1:A:500:ILE:HG13	1.46	0.46
1:C:106:ARG:NH2	1:C:144:HIS:CE1	2.84	0.46
1:D:27:TYR:HE2	1:D:627:ARG:HG2	1.80	0.46
1:D:195:TYR:CE2	1:D:604:TYR:HD2	2.34	0.46
1:D:590:VAL:HG11	1:D:614:GLY:HA3	1.98	0.46
1:A:592:LEU:HD23	1:A:592:LEU:HA	1.78	0.45
1:B:160:PRO:HG2	1:B:325:GLU:OE2	2.17	0.45
1:C:556:THR:OG1	1:C:557:THR:N	2.49	0.45
1:D:301:LEU:HD21	1:D:582:TYR:HB2	1.98	0.45
1:D:598:ASN:OD1	1:D:599:LEU:N	2.47	0.45
1:A:576:ASP:HB2	1:A:580:ASN:H	1.82	0.45
1:A:591:ASP:OD1	1:A:593:SER:OG	2.23	0.45
1:B:306:GLU:OE2	1:B:433:HIS:NE2	2.37	0.45
1:C:472:ARG:NH2	1:C:535:ASP:OD1	2.50	0.45
1:D:3:HIS:NE2	1:D:224:ARG:HD3	2.31	0.45
1:D:38:GLU:HG3	1:D:40:GLY:H	1.80	0.45
1:D:300:ASP:O	1:D:569:ARG:NH2	2.45	0.45
1:A:107:ALA:HB1	1:A:111:ASP:OD2	2.17	0.45
1:D:540:LYS:HB3	1:D:540:LYS:HE2	1.75	0.45
1:D:561:LEU:HD23	1:D:595:CYS:HB2	1.99	0.45
1:C:192:TRP:HZ3	1:C:362:GLY:C	2.19	0.45
1:A:327:LEU:HD22	1:A:327:LEU:HA	1.71	0.45
1:A:16:PRO:O	1:A:20:VAL:HG23	2.18	0.44
1:B:601:THR:OG1	1:B:602:HIS:O	2.35	0.44
1:D:286:ASN:HB3	1:D:289:LEU:HB2	1.99	0.44
1:B:556:THR:OG1	1:B:557:THR:N	2.50	0.44
1:B:38:GLU:OE1	1:B:40:GLY:N	2.50	0.44
1:A:368:THR:O	1:A:371:GLU:N	2.50	0.44
1:B:46:ASP:HA	1:B:47:PRO:HD3	1.80	0.44
1:C:182:ASP:OD2	1:C:184:LYS:NZ	2.49	0.44
1:C:368:THR:OG1	1:C:370:GLU:HG2	2.17	0.44
1:A:24:ARG:NH2	1:A:612:GLU:OE2	2.33	0.44
1:C:33:LYS:HD3	1:C:263:ARG:HH12	1.81	0.44
1:A:477:ARG:HA	1:A:477:ARG:HD3	1.73	0.44
1:C:10:ILE:HD11	1:C:260:VAL:HG22	1.99	0.44
1:A:168:ALA:O	1:A:171:ALA:HB3	2.18	0.44
1:B:590:VAL:HG21	1:B:614:GLY:HA3	2.00	0.44
1:B:561:LEU:HD13	1:B:595:CYS:HB2	1.99	0.44
1:C:438:ASN:HA	1:C:439:PRO:HD3	1.89	0.44
1:C:106:ARG:NH2	1:C:143:THR:O	2.51	0.43
1:A:354:LEU:HD23	1:A:354:LEU:HA	1.84	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:624:LEU:HD12	1:A:624:LEU:HA	1.82	0.43
1:B:438:ASN:HB3	1:B:441:VAL:HG13	1.98	0.43
1:A:233:LEU:HA	1:A:233:LEU:HD12	1.68	0.43
1:C:107:ALA:HB1	1:C:111:ASP:OD2	2.18	0.43
1:B:541:GLU:H	1:B:541:GLU:HG2	1.41	0.43
1:A:44:ARG:HG3	1:A:44:ARG:HH11	1.84	0.43
1:C:428:SER:HB3	1:C:448:GLY:O	2.19	0.43
1:B:522:ARG:HA	1:B:523:PRO:HD3	1.84	0.43
1:C:458:PRO:O	1:C:461:TRP:HB3	2.19	0.43
1:A:154:ASN:O	1:A:194:LYS:NZ	2.52	0.43
1:C:56:VAL:C	1:C:58:ASN:H	2.22	0.43
1:C:159:LEU:HD12	1:C:159:LEU:HA	1.83	0.43
1:C:208:THR:HG22	1:C:212:HIS:HD2	1.84	0.43
1:C:279:LEU:HD23	1:C:279:LEU:HA	1.84	0.43
1:D:180:ILE:HD11	1:D:188:GLY:HA3	2.01	0.43
1:D:359:ILE:HG12	1:D:401:VAL:HG22	2.01	0.43
1:B:438:ASN:HA	1:B:439:PRO:HD3	1.92	0.43
1:B:458:PRO:O	1:B:461:TRP:HB3	2.19	0.43
1:D:174:ILE:HA	1:D:175:PRO:HD2	1.87	0.43
1:A:32:LEU:HD22	1:A:624:LEU:HD21	2.01	0.42
1:A:158:ILE:HD12	1:A:360:ASP:HB3	2.01	0.42
1:A:235:ASP:HB3	1:A:239:LYS:H	1.84	0.42
1:D:11:VAL:O	1:D:36:LEU:HD12	2.19	0.42
1:D:460:ARG:HD3	1:D:547:ASP:OD1	2.19	0.42
1:A:35:MET:HE1	1:A:260:VAL:HG11	2.01	0.42
1:A:633:VAL:O	1:A:636:ALA:HB3	2.19	0.42
1:B:275:THR:N	1:B:276:PRO:HD2	2.35	0.42
1:A:8:ASP:OD1	1:A:263:ARG:NH1	2.44	0.42
1:A:411:LEU:HD23	1:A:411:LEU:HA	1.74	0.42
1:A:521:HIS:O	1:A:522:ARG:HD3	2.19	0.42
1:C:129:MET:HG2	1:C:609:LEU:HD22	2.01	0.42
1:D:131:ARG:HG3	1:D:628:LEU:HD21	2.01	0.42
1:A:88:PRO:HD2	1:A:556:THR:HG21	2.01	0.42
1:A:200:THR:OG1	1:A:202:ARG:HG2	2.20	0.42
1:A:251:ARG:NH1	1:B:288:GLU:HG2	2.34	0.42
1:B:498:ILE:CG2	1:B:503:ALA:HB2	2.50	0.42
1:C:233:LEU:O	1:C:241:VAL:HG22	2.19	0.42
1:C:591:ASP:O	1:C:610:VAL:HG11	2.18	0.42
1:D:209:ALA:HA	1:D:633:VAL:HG22	2.01	0.42
1:B:140:ASN:ND2	1:B:178:ASP:HB2	2.34	0.42
1:B:187:HIS:HA	1:B:364:LYS:O	2.18	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:301:LEU:HD13	1:B:574:VAL:HG13	2.02	0.42
1:D:130:LYS:O	1:D:145:GLY:HA3	2.18	0.42
1:A:12:CYS:HB3	1:A:229:VAL:HG21	2.01	0.42
1:D:3:HIS:NE2	1:D:224:ARG:HB2	2.34	0.42
1:D:386:TYR:HE1	1:D:393:LYS:HZ2	1.66	0.42
1:B:104:TYR:CE1	1:B:152:ILE:HD13	2.55	0.42
1:B:126:LEU:HG	1:B:130:LYS:HE3	2.01	0.42
1:C:25:LEU:HD11	1:C:618:ILE:HG21	2.02	0.42
1:C:283:GLY:HA2	1:C:290:LEU:HD13	2.02	0.42
1:D:576:ASP:CB	1:D:580:ASN:H	2.32	0.42
1:B:42:ASN:OD1	1:B:43:ASN:N	2.53	0.42
1:B:121:THR:O	1:B:124:ASP:HB2	2.20	0.42
1:B:500:ILE:H	1:B:500:ILE:HG13	1.56	0.42
1:B:180:ILE:HG22	1:B:181:GLN:NE2	2.34	0.42
1:B:277:GLN:O	1:B:281:ARG:HG2	2.20	0.42
1:D:141:ASN:OD1	1:D:143:THR:N	2.53	0.42
1:D:175:PRO:HD2	1:D:187:HIS:CD2	2.55	0.42
1:D:325:GLU:H	1:D:325:GLU:HG2	1.57	0.42
1:A:511:LEU:O	1:A:512:THR:HB	2.20	0.42
1:B:277:GLN:HB3	1:B:281:ARG:NH2	2.35	0.42
1:B:354:LEU:HD23	1:B:354:LEU:HA	1.92	0.42
2:B:1000:FAD:H8A	2:B:1000:FAD:H2B	1.83	0.42
1:C:208:THR:HA	1:C:212:HIS:CD2	2.55	0.42
1:D:3:HIS:HD1	1:D:3:HIS:HA	1.80	0.42
1:A:96:GLY:O	1:A:102:GLN:NE2	2.53	0.41
1:A:312:TYR:O	1:A:422:TYR:HA	2.20	0.41
1:B:290:LEU:HD12	1:B:297:VAL:HG22	2.02	0.41
1:B:325:GLU:CD	1:B:325:GLU:H	2.23	0.41
1:C:275:THR:N	1:C:276:PRO:HD2	2.35	0.41
1:D:251:ARG:HG3	1:D:251:ARG:H	1.35	0.41
1:A:578:ARG:O	1:A:588:LYS:NZ	2.47	0.41
1:C:579:LEU:HD13	1:C:590:VAL:HG22	2.02	0.41
1:D:372:LEU:HA	1:D:372:LEU:HD13	1.82	0.41
1:A:74:THR:HG22	1:A:75:MET:HG2	2.01	0.41
1:B:352:ALA:O	1:B:355:SER:HB2	2.21	0.41
1:D:81:ARG:HD3	1:D:552:ASP:OD1	2.21	0.41
1:D:467:ARG:NH2	1:D:479:GLU:OE1	2.54	0.41
1:D:616:ASP:O	1:D:620:GLU:HG3	2.20	0.41
1:A:312:TYR:CE1	1:A:449:PHE:CD1	3.08	0.41
1:A:502:THR:O	1:A:506:ILE:HG13	2.20	0.41
1:A:522:ARG:HA	1:A:523:PRO:HD3	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:159:LEU:HA	1:B:160:PRO:HD3	1.91	0.41
1:B:273:LEU:HD12	1:B:273:LEU:HA	1.93	0.41
1:C:189:ALA:HB2	1:C:363:PHE:HB3	2.02	0.41
1:C:491:SER:OG	1:C:542:ASP:OD2	2.35	0.41
1:D:131:ARG:HD2	1:D:628:LEU:HD11	2.02	0.41
1:D:319:ARG:NH2	1:D:412:PRO:HB2	2.36	0.41
1:D:396:MET:HE2	1:D:462:SER:CB	2.51	0.41
1:D:432:ILE:O	1:D:433:HIS:ND1	2.51	0.41
1:A:607:ALA:HB2	2:A:1000:FAD:H5'2	2.03	0.41
1:B:35:MET:CE	1:B:260:VAL:HG21	2.51	0.41
1:D:134:ASN:HB3	1:D:151:ALA:HA	2.01	0.41
1:B:74:THR:HG22	1:B:75:MET:HG3	2.02	0.41
1:B:367:PRO:HB2	1:B:372:LEU:HD22	2.02	0.41
1:A:104:TYR:CE1	1:A:152:ILE:HD13	2.56	0.41
1:C:284:VAL:CG1	1:C:301:LEU:HD12	2.51	0.41
1:C:320:VAL:HG13	1:C:475:ALA:HB1	2.03	0.41
1:D:7:VAL:O	1:D:262:ALA:HA	2.21	0.41
1:D:365:ILE:HG13	1:D:396:MET:HB2	2.03	0.41
1:D:512:THR:O	1:D:515:ILE:HB	2.20	0.41
2:D:1000:FAD:H9	2:D:1000:FAD:H1'1	1.85	0.41
1:A:72:VAL:HG22	1:A:86:ILE:HG12	2.02	0.41
1:A:329:GLU:N	1:A:329:GLU:OE1	2.53	0.41
1:B:557:THR:O	1:B:559:HIS:CD2	2.74	0.41
1:C:32:LEU:HD22	1:C:624:LEU:HD21	2.02	0.41
1:D:506:ILE:HG21	1:D:506:ILE:HD13	1.83	0.41
1:A:136:GLN:NE2	1:A:197:ASN:OD1	2.38	0.40
1:A:205:ASP:OD1	1:A:208:THR:HG23	2.21	0.40
1:A:278:ILE:HD13	1:A:278:ILE:HG21	1.88	0.40
1:C:42:ASN:OD1	1:C:43:ASN:N	2.54	0.40
1:C:247:PRO:O	1:C:440:TYR:OH	2.25	0.40
1:B:208:THR:HA	1:B:212:HIS:HB2	2.03	0.40
1:B:564:CYS:O	1:B:594:ILE:HA	2.21	0.40
1:C:336:ASP:O	1:C:340:GLU:HG3	2.21	0.40
1:C:497:ASP:OD1	1:C:498:ILE:N	2.53	0.40
1:A:81:ARG:HD3	1:A:552:ASP:OD1	2.22	0.40
1:B:153:SER:CB	1:B:198:ARG:HB3	2.51	0.40
1:B:567:LYS:HB2	1:B:568:PRO:HD2	2.02	0.40
1:B:126:LEU:N	1:B:127:PRO:HD2	2.36	0.40
1:C:36:LEU:HD23	1:C:223:LEU:HD13	2.03	0.40
1:C:135:TYR:HE2	1:C:139:ALA:HB2	1.85	0.40
1:D:409:THR:HG23	1:D:410:LEU:HG	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:134:ASN:HB2	1:B:148:GLY:O	2.21	0.40
1:B:602:HIS:HB3	2:B:1000:FAD:C2	2.52	0.40
1:D:126:LEU:N	1:D:127:PRO:HD2	2.36	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	611/649 (94%)	591 (97%)	20 (3%)	0	100	100
1	B	601/649 (93%)	573 (95%)	27 (4%)	1 (0%)	47	78
1	C	613/649 (94%)	584 (95%)	26 (4%)	3 (0%)	29	63
1	D	599/649 (92%)	570 (95%)	27 (4%)	2 (0%)	41	73
All	All	2424/2596 (93%)	2318 (96%)	100 (4%)	6 (0%)	47	78

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	5	GLU
1	C	47	PRO
1	D	4	PRO
1	C	46	ASP
1	C	59	VAL
1	B	634	PRO

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	506/544 (93%)	472 (93%)	34 (7%)	16	47
1	B	489/544 (90%)	453 (93%)	36 (7%)	13	42
1	C	498/544 (92%)	459 (92%)	39 (8%)	12	40
1	D	488/544 (90%)	442 (91%)	46 (9%)	8	31
All	All	1981/2176 (91%)	1826 (92%)	155 (8%)	12	40

All (155) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	44	ARG
1	A	78	SER
1	A	140	ASN
1	A	161	VAL
1	A	178	ASP
1	A	185	THR
1	A	221	LEU
1	A	233	LEU
1	A	237	ASN
1	A	248	SER
1	A	260	VAL
1	A	273	LEU
1	A	327	LEU
1	A	337	THR
1	A	345	TRP
1	A	368	THR
1	A	370	GLU
1	A	378	GLU
1	A	386	TYR
1	A	389	ASP
1	A	421	GLN
1	A	468	GLU
1	A	497	ASP
1	A	500	ILE
1	A	512	THR
1	A	517	MET
1	A	521	HIS
1	A	530	SER
1	A	532	VAL
1	A	539	THR

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Mol	Chain	Res	Type
1	A	576	ASP
1	A	597	ASP
1	A	628	LEU
1	A	633	VAL
1	B	35	MET
1	B	46	ASP
1	B	59	VAL
1	B	69	THR
1	B	140	ASN
1	B	147	ASP
1	B	166	LEU
1	B	178	ASP
1	B	192	TRP
1	B	224	ARG
1	B	233	LEU
1	B	237	ASN
1	B	273	LEU
1	B	322	ASN
1	B	325	GLU
1	B	336	ASP
1	B	337	THR
1	B	368	THR
1	B	370	GLU
1	B	378	GLU
1	B	385	ARG
1	B	405	TYR
1	B	411	LEU
1	B	418	THR
1	B	421	GLN
1	B	441	VAL
1	B	498	ILE
1	B	500	ILE
1	B	532	VAL
1	B	537	LYS
1	B	541	GLU
1	B	555	GLU
1	B	557	THR
1	B	567	LYS
1	B	576	ASP
1	B	597	ASP
1	C	44	ARG
1	C	65	ASN

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Mol	Chain	Res	Type
1	C	89	CYS
1	C	121	THR
1	C	140	ASN
1	C	147	ASP
1	C	153	SER
1	C	159	LEU
1	C	184	LYS
1	C	192	TRP
1	C	198	ARG
1	C	204	SER
1	C	233	LEU
1	C	237	ASN
1	C	251	ARG
1	C	260	VAL
1	C	331	LEU
1	C	332	ARG
1	C	372	LEU
1	C	378	GLU
1	C	386	TYR
1	C	418	THR
1	C	421	GLN
1	C	477	ARG
1	C	501	LYS
1	C	505	GLU
1	C	509	ASN
1	C	512	THR
1	C	521	HIS
1	C	522	ARG
1	C	531	LYS
1	C	534	GLU
1	C	539	THR
1	C	540	LYS
1	C	557	THR
1	C	597	ASP
1	C	616	ASP
1	C	620	GLU
1	C	638	VAL
1	D	3	HIS
1	D	24	ARG
1	D	34	VAL
1	D	44	ARG
1	D	89	CYS

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Mol	Chain	Res	Type
1	D	181	GLN
1	D	185	THR
1	D	192	TRP
1	D	205	ASP
1	D	208	THR
1	D	219	SER
1	D	233	LEU
1	D	237	ASN
1	D	248	SER
1	D	251	ARG
1	D	258	THR
1	D	260	VAL
1	D	282	SER
1	D	289	LEU
1	D	307	GLU
1	D	325	GLU
1	D	327	LEU
1	D	331	LEU
1	D	336	ASP
1	D	384	ASP
1	D	385	ARG
1	D	386	TYR
1	D	407	ASP
1	D	411	LEU
1	D	415	LYS
1	D	418	THR
1	D	496	ARG
1	D	499	ASP
1	D	500	ILE
1	D	515	ILE
1	D	517	MET
1	D	521	HIS
1	D	524	SER
1	D	555	GLU
1	D	557	THR
1	D	561	LEU
1	D	590	VAL
1	D	605	SER
1	D	616	ASP
1	D	627	ARG
1	D	628	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such

sidechains are listed below:

Mol	Chain	Res	Type
1	C	65	ASN
1	C	212	HIS
1	C	421	GLN
1	D	311	HIS

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5   Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6   Ligand geometry ⓘ

4 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
2	FAD	C	1000	-	53,58,58	3.74	16 (30%)	68,89,89	2.19	13 (19%)
2	FAD	D	1000	-	53,58,58	3.78	17 (32%)	68,89,89	2.27	18 (26%)
2	FAD	B	1000	-	53,58,58	3.84	17 (32%)	68,89,89	2.42	16 (23%)
2	FAD	A	1000	-	53,58,58	3.92	16 (30%)	68,89,89	2.39	18 (26%)

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	C	1000	-	-	12/30/50/50	0/6/6/6
2	FAD	D	1000	-	-	10/30/50/50	0/6/6/6
2	FAD	B	1000	-	-	7/30/50/50	0/6/6/6
2	FAD	A	1000	-	-	8/30/50/50	0/6/6/6

All (66) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1000	FAD	C2B-C1B	-17.54	1.27	1.53
2	B	1000	FAD	C2B-C1B	-17.38	1.27	1.53
2	D	1000	FAD	C2B-C1B	-16.75	1.28	1.53
2	C	1000	FAD	C2B-C1B	-16.52	1.28	1.53
2	A	1000	FAD	O4B-C1B	14.61	1.61	1.41
2	B	1000	FAD	O4B-C1B	14.50	1.61	1.41
2	D	1000	FAD	O4B-C1B	14.22	1.60	1.41
2	C	1000	FAD	O4B-C1B	13.95	1.60	1.41
2	D	1000	FAD	O4B-C4B	-7.14	1.29	1.45
2	B	1000	FAD	O4B-C4B	-6.86	1.29	1.45
2	A	1000	FAD	O4B-C4B	-6.76	1.29	1.45
2	C	1000	FAD	O4B-C4B	-6.53	1.30	1.45
2	D	1000	FAD	C4X-N5	6.36	1.43	1.30
2	C	1000	FAD	C4X-N5	6.30	1.43	1.30
2	A	1000	FAD	C4X-N5	6.12	1.42	1.30
2	B	1000	FAD	C4X-N5	5.99	1.42	1.30
2	C	1000	FAD	C10-N1	5.52	1.44	1.33
2	A	1000	FAD	C10-N1	5.52	1.44	1.33
2	B	1000	FAD	C10-N1	5.20	1.43	1.33
2	A	1000	FAD	O3B-C3B	-5.09	1.31	1.43
2	D	1000	FAD	C10-N1	5.02	1.43	1.33
2	B	1000	FAD	O3B-C3B	-5.02	1.31	1.43
2	A	1000	FAD	C9A-N10	4.80	1.49	1.41
2	D	1000	FAD	O3B-C3B	-4.75	1.31	1.43
2	A	1000	FAD	C2-N1	4.68	1.47	1.36
2	C	1000	FAD	O3B-C3B	-4.46	1.32	1.43
2	C	1000	FAD	C2-N1	4.19	1.46	1.36
2	D	1000	FAD	C9A-N10	4.10	1.48	1.41
2	C	1000	FAD	C9A-N10	4.10	1.48	1.41
2	B	1000	FAD	C9A-N10	4.02	1.48	1.41
2	B	1000	FAD	C2-N1	3.99	1.46	1.36
2	D	1000	FAD	C2-N1	3.93	1.46	1.36
2	C	1000	FAD	C2-N3	3.86	1.48	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1000	FAD	C2-N3	3.78	1.47	1.39
2	D	1000	FAD	C2-N3	3.70	1.47	1.39
2	A	1000	FAD	C2-N3	3.59	1.47	1.39
2	D	1000	FAD	C5X-N5	3.46	1.46	1.39
2	B	1000	FAD	C5X-N5	3.32	1.45	1.39
2	C	1000	FAD	O2B-C2B	3.16	1.50	1.43
2	C	1000	FAD	C5X-N5	3.12	1.45	1.39
2	A	1000	FAD	O2B-C2B	3.08	1.50	1.43
2	A	1000	FAD	O2'-C2'	-3.05	1.36	1.43
2	C	1000	FAD	O2'-C2'	-3.03	1.36	1.43
2	A	1000	FAD	C5X-N5	2.96	1.45	1.39
2	A	1000	FAD	C5A-C4A	-2.93	1.33	1.40
2	B	1000	FAD	C5A-C4A	-2.91	1.33	1.40
2	D	1000	FAD	O2B-C2B	2.91	1.49	1.43
2	A	1000	FAD	C4'-C3'	-2.88	1.48	1.53
2	D	1000	FAD	C6A-N6A	2.77	1.44	1.34
2	B	1000	FAD	O2'-C2'	-2.75	1.37	1.43
2	C	1000	FAD	C6A-N6A	2.73	1.44	1.34
2	B	1000	FAD	C6A-N6A	2.71	1.43	1.34
2	C	1000	FAD	C4-N3	2.70	1.43	1.38
2	D	1000	FAD	O2'-C2'	-2.67	1.37	1.43
2	D	1000	FAD	C2A-N3A	2.65	1.36	1.32
2	C	1000	FAD	C5A-C4A	-2.54	1.34	1.40
2	C	1000	FAD	C2A-N3A	2.51	1.36	1.32
2	B	1000	FAD	O2B-C2B	2.49	1.48	1.43
2	D	1000	FAD	C5A-C4A	-2.49	1.34	1.40
2	D	1000	FAD	C4-N3	2.41	1.43	1.38
2	A	1000	FAD	C6A-N6A	2.41	1.42	1.34
2	A	1000	FAD	C2A-N3A	2.35	1.35	1.32
2	B	1000	FAD	C2A-N3A	2.28	1.35	1.32
2	D	1000	FAD	C2A-N1A	2.11	1.37	1.33
2	B	1000	FAD	C4'-C3'	-2.10	1.49	1.53
2	B	1000	FAD	C4-N3	2.07	1.42	1.38

All (65) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	1000	FAD	C5A-C6A-N6A	10.38	136.13	120.35
2	C	1000	FAD	C5A-C6A-N6A	10.28	135.98	120.35
2	B	1000	FAD	C5A-C6A-N6A	10.12	135.74	120.35
2	A	1000	FAD	C5A-C6A-N6A	9.71	135.10	120.35
2	C	1000	FAD	N6A-C6A-N1A	-7.03	103.98	118.57

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	1000	FAD	N6A-C6A-N1A	-6.74	104.59	118.57
2	B	1000	FAD	N6A-C6A-N1A	-6.68	104.70	118.57
2	D	1000	FAD	N6A-C6A-N1A	-6.68	104.71	118.57
2	B	1000	FAD	C7M-C7-C6	-6.66	107.18	119.49
2	B	1000	FAD	C7M-C7-C8	5.89	132.81	120.74
2	B	1000	FAD	N3A-C2A-N1A	-5.72	119.73	128.68
2	A	1000	FAD	C7M-C7-C6	-5.71	108.94	119.49
2	A	1000	FAD	N3A-C2A-N1A	-5.70	119.77	128.68
2	D	1000	FAD	C7M-C7-C6	-5.52	109.29	119.49
2	D	1000	FAD	N3A-C2A-N1A	-5.51	120.07	128.68
2	C	1000	FAD	N3A-C2A-N1A	-5.24	120.48	128.68
2	A	1000	FAD	O4B-C1B-C2B	-5.09	99.48	106.93
2	C	1000	FAD	C7M-C7-C6	-4.99	110.25	119.49
2	A	1000	FAD	C7M-C7-C8	4.85	130.68	120.74
2	D	1000	FAD	C7M-C7-C8	4.56	130.08	120.74
2	C	1000	FAD	C7M-C7-C8	4.13	129.21	120.74
2	B	1000	FAD	O4B-C1B-C2B	-4.02	101.05	106.93
2	B	1000	FAD	P-O3P-PA	-3.72	120.05	132.83
2	A	1000	FAD	C4'-C3'-C2'	-3.72	105.63	113.36
2	A	1000	FAD	C4-N3-C2	-3.69	118.83	125.64
2	D	1000	FAD	C4-N3-C2	-3.48	119.21	125.64
2	B	1000	FAD	C4-N3-C2	-3.41	119.34	125.64
2	A	1000	FAD	C4X-C4-N3	3.17	121.25	113.19
2	B	1000	FAD	O4-C4-C4X	-3.12	118.33	126.60
2	C	1000	FAD	C4-N3-C2	-3.03	120.05	125.64
2	A	1000	FAD	O4-C4-C4X	-3.00	118.63	126.60
2	C	1000	FAD	P-O3P-PA	-2.98	122.61	132.83
2	B	1000	FAD	C4'-C3'-C2'	-2.91	107.30	113.36
2	A	1000	FAD	C5'-C4'-C3'	-2.91	106.59	112.20
2	C	1000	FAD	C3B-C2B-C1B	2.83	105.24	100.98
2	A	1000	FAD	P-O3P-PA	-2.81	123.17	132.83
2	D	1000	FAD	P-O3P-PA	-2.75	123.39	132.83
2	D	1000	FAD	C4X-C4-N3	2.71	120.06	113.19
2	A	1000	FAD	C9A-C5X-N5	-2.68	119.52	122.43
2	D	1000	FAD	C1'-C2'-C3'	-2.64	102.39	109.79
2	B	1000	FAD	C1'-C2'-C3'	-2.63	102.44	109.79
2	D	1000	FAD	C10-C4X-N5	-2.62	119.30	124.86
2	B	1000	FAD	C4X-C4-N3	2.60	119.80	113.19
2	D	1000	FAD	C4X-C10-N10	2.58	120.25	116.48
2	C	1000	FAD	C4X-C4-N3	2.58	119.74	113.19
2	B	1000	FAD	C4-C4X-C10	2.57	121.10	116.79
2	C	1000	FAD	O4-C4-C4X	-2.48	120.02	126.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	1000	FAD	C4X-C10-N1	-2.44	119.06	124.73
2	D	1000	FAD	O4'-C4'-C5'	-2.37	104.59	109.92
2	A	1000	FAD	C5X-C9A-N10	2.31	120.34	117.95
2	B	1000	FAD	C9A-C5X-N5	-2.30	119.93	122.43
2	B	1000	FAD	C5X-C9A-N10	2.29	120.32	117.95
2	D	1000	FAD	O4-C4-C4X	-2.27	120.57	126.60
2	D	1000	FAD	C5B-C4B-C3B	-2.26	106.72	115.18
2	A	1000	FAD	C4-C4X-C10	2.24	120.55	116.79
2	B	1000	FAD	C4X-C10-N1	-2.21	119.61	124.73
2	D	1000	FAD	C9A-C5X-N5	-2.20	120.04	122.43
2	C	1000	FAD	C9A-C5X-N5	-2.12	120.12	122.43
2	A	1000	FAD	O3B-C3B-C4B	-2.12	104.93	111.05
2	D	1000	FAD	C4X-C10-N1	-2.10	119.85	124.73
2	C	1000	FAD	C10-C4X-N5	-2.08	120.44	124.86
2	D	1000	FAD	O5'-C5'-C4'	-2.07	103.83	109.36
2	C	1000	FAD	C5X-C9A-N10	2.06	120.08	117.95
2	A	1000	FAD	C5B-C4B-C3B	-2.02	107.62	115.18
2	D	1000	FAD	C10-N1-C2	2.01	120.92	116.90

There are no chirality outliers.

All (37) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1000	FAD	C5B-O5B-PA-O1A
2	A	1000	FAD	C5B-O5B-PA-O2A
2	A	1000	FAD	C3B-C4B-C5B-O5B
2	A	1000	FAD	O4'-C4'-C5'-O5'
2	B	1000	FAD	C5B-O5B-PA-O1A
2	B	1000	FAD	O4'-C4'-C5'-O5'
2	C	1000	FAD	C5B-O5B-PA-O1A
2	C	1000	FAD	C5B-O5B-PA-O2A
2	C	1000	FAD	C5B-O5B-PA-O3P
2	C	1000	FAD	O4'-C4'-C5'-O5'
2	C	1000	FAD	C5'-O5'-P-O1P
2	C	1000	FAD	C5'-O5'-P-O2P
2	D	1000	FAD	N10-C1'-C2'-O2'
2	D	1000	FAD	C2'-C3'-C4'-O4'
2	D	1000	FAD	O3'-C3'-C4'-O4'
2	D	1000	FAD	O3'-C3'-C4'-C5'
2	D	1000	FAD	C5'-O5'-P-O2P
2	B	1000	FAD	O4B-C4B-C5B-O5B
2	B	1000	FAD	C3B-C4B-C5B-O5B

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Mol	Chain	Res	Type	Atoms
2	C	1000	FAD	O4B-C4B-C5B-O5B
2	D	1000	FAD	C2'-C3'-C4'-C5'
2	A	1000	FAD	O4B-C4B-C5B-O5B
2	C	1000	FAD	C3B-C4B-C5B-O5B
2	A	1000	FAD	C3'-C4'-C5'-O5'
2	B	1000	FAD	C3'-C4'-C5'-O5'
2	C	1000	FAD	C3'-C4'-C5'-O5'
2	B	1000	FAD	C5B-O5B-PA-O3P
2	C	1000	FAD	C5'-O5'-P-O3P
2	D	1000	FAD	C5'-O5'-P-O3P
2	B	1000	FAD	C5B-O5B-PA-O2A
2	D	1000	FAD	C5'-O5'-P-O1P
2	D	1000	FAD	N10-C1'-C2'-C3'
2	C	1000	FAD	O2'-C2'-C3'-O3'
2	A	1000	FAD	C5B-O5B-PA-O3P
2	D	1000	FAD	O4B-C4B-C5B-O5B
2	C	1000	FAD	O2'-C2'-C3'-C4'
2	A	1000	FAD	C2'-C1'-N10-C10

There are no ring outliers.

4 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	1000	FAD	2	0
2	D	1000	FAD	4	0
2	B	1000	FAD	2	0
2	A	1000	FAD	3	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 FAD C 1000

Bond lengths

Bond angles

Torsions

Rings

Ligand FAD D 1000

Bond lengths

Bond angles

Torsions

Rings

Ligand FAD B 1000

Bond lengths

Bond angles

Torsions

Rings

Ligand FAD A 1000

Bond lengths

Bond angles

Torsions

Rings
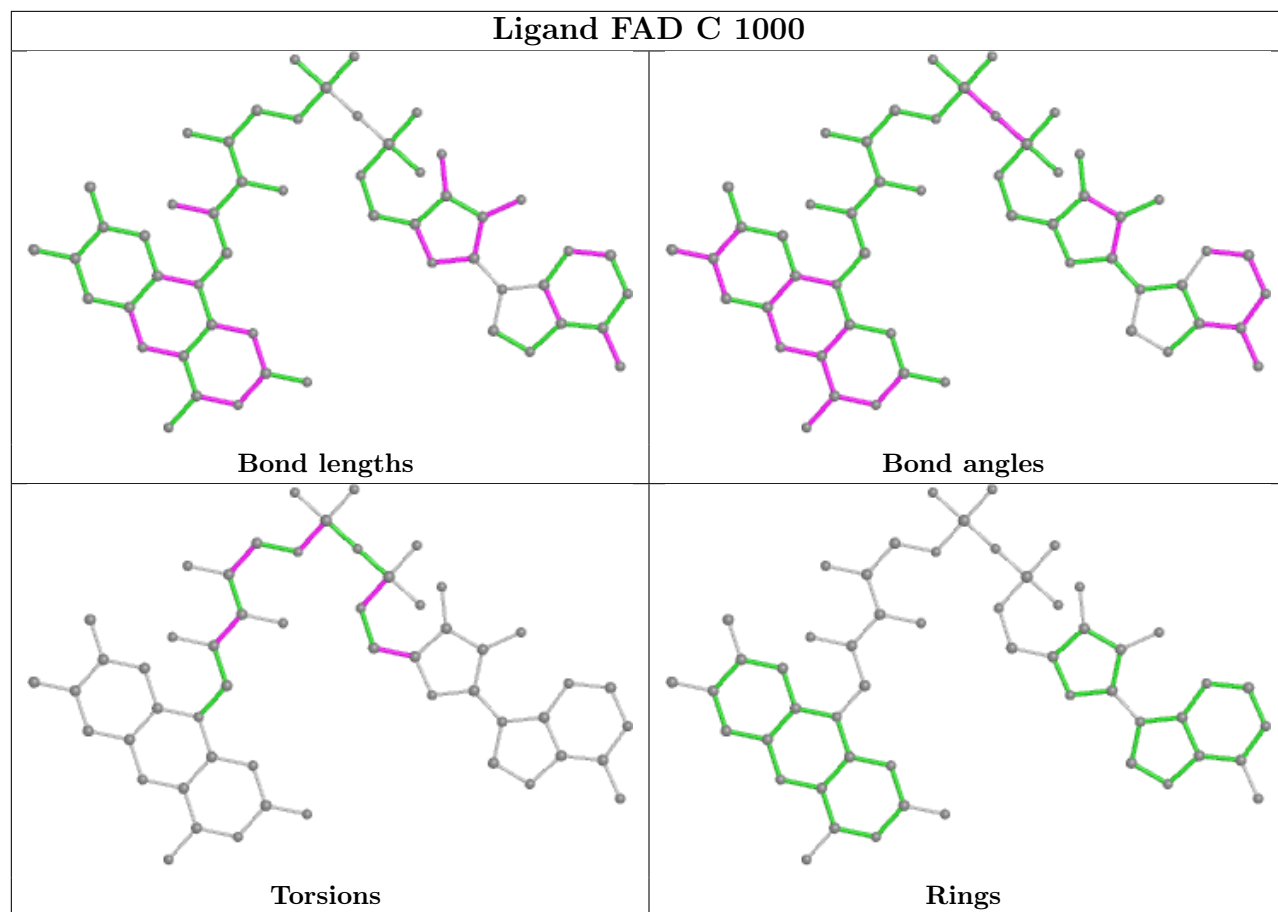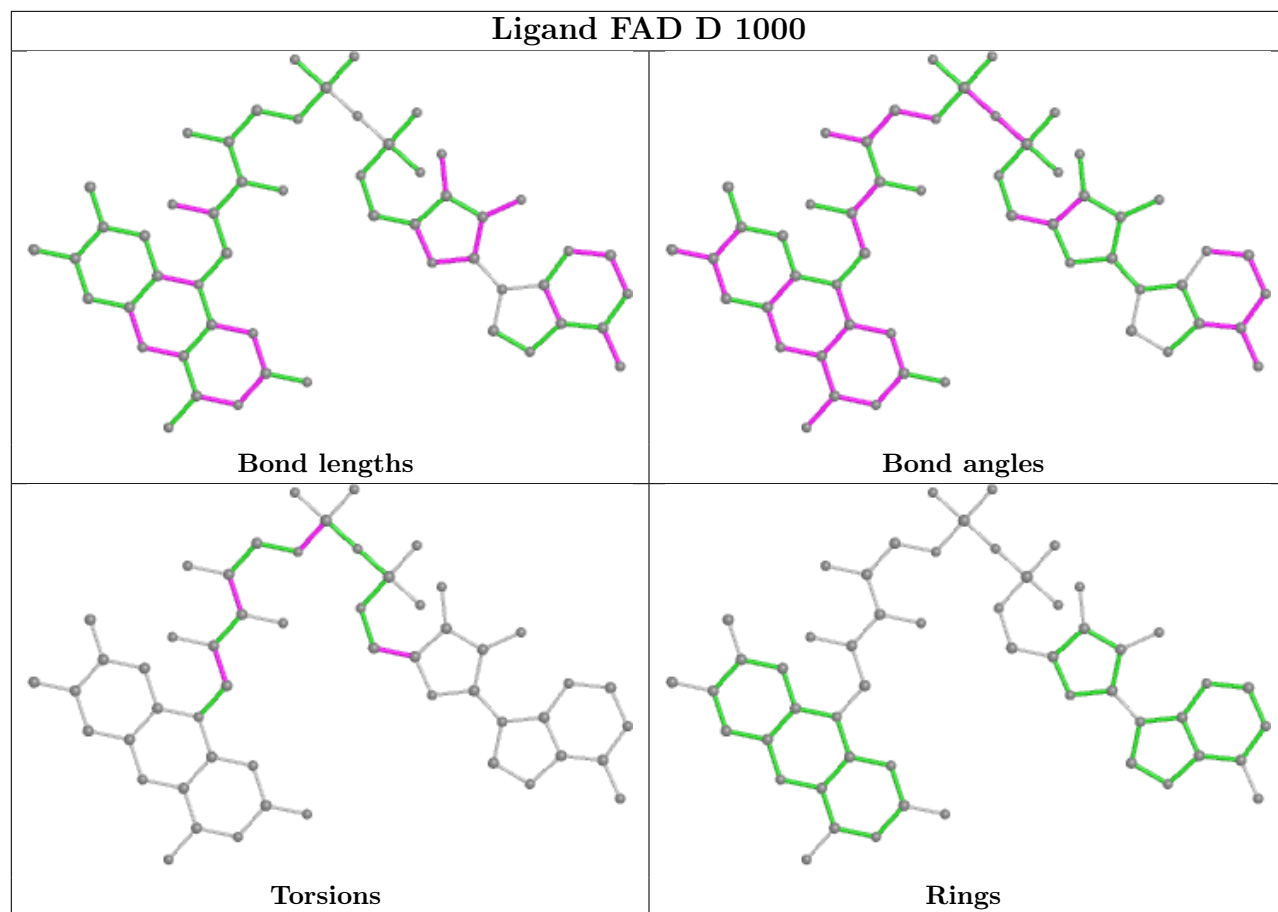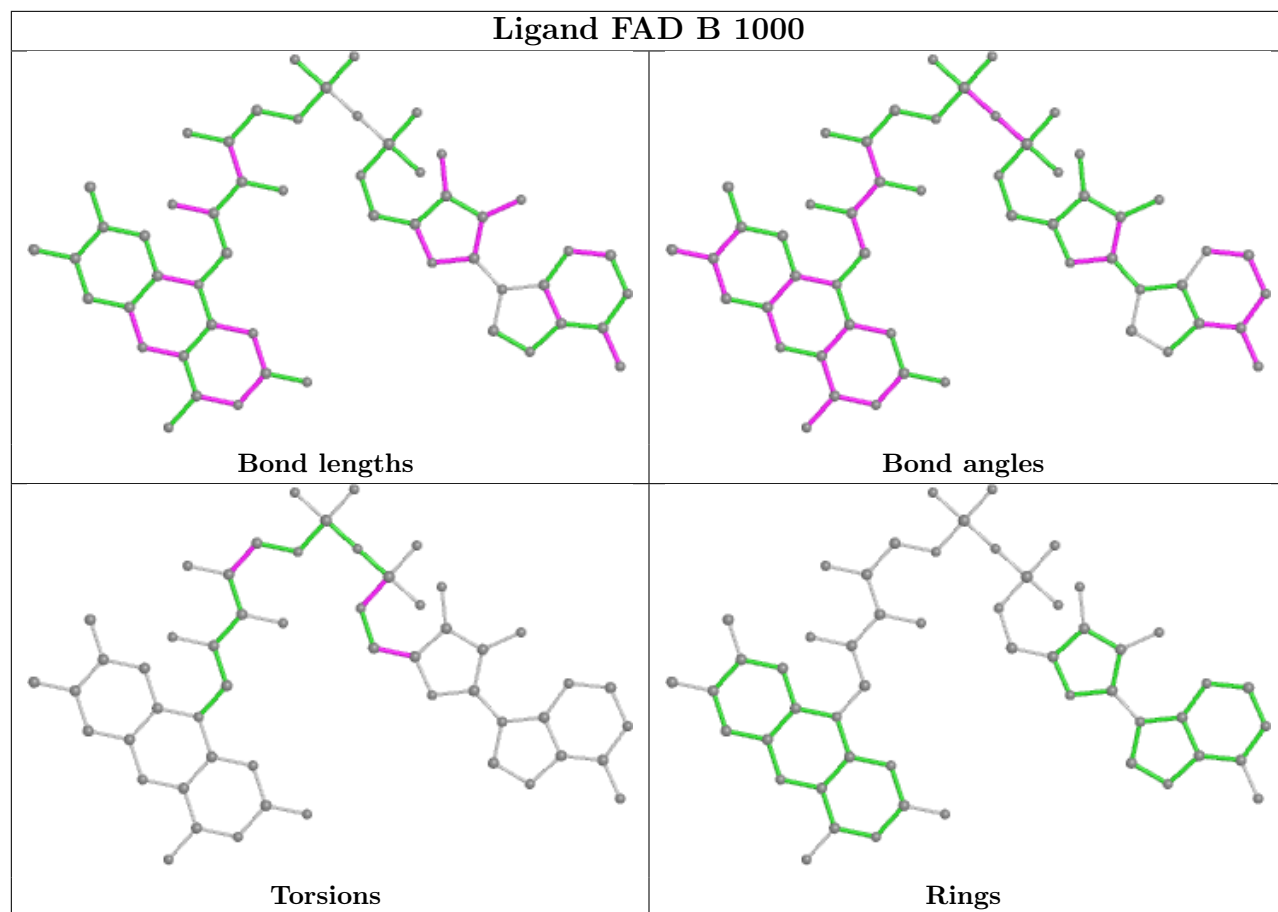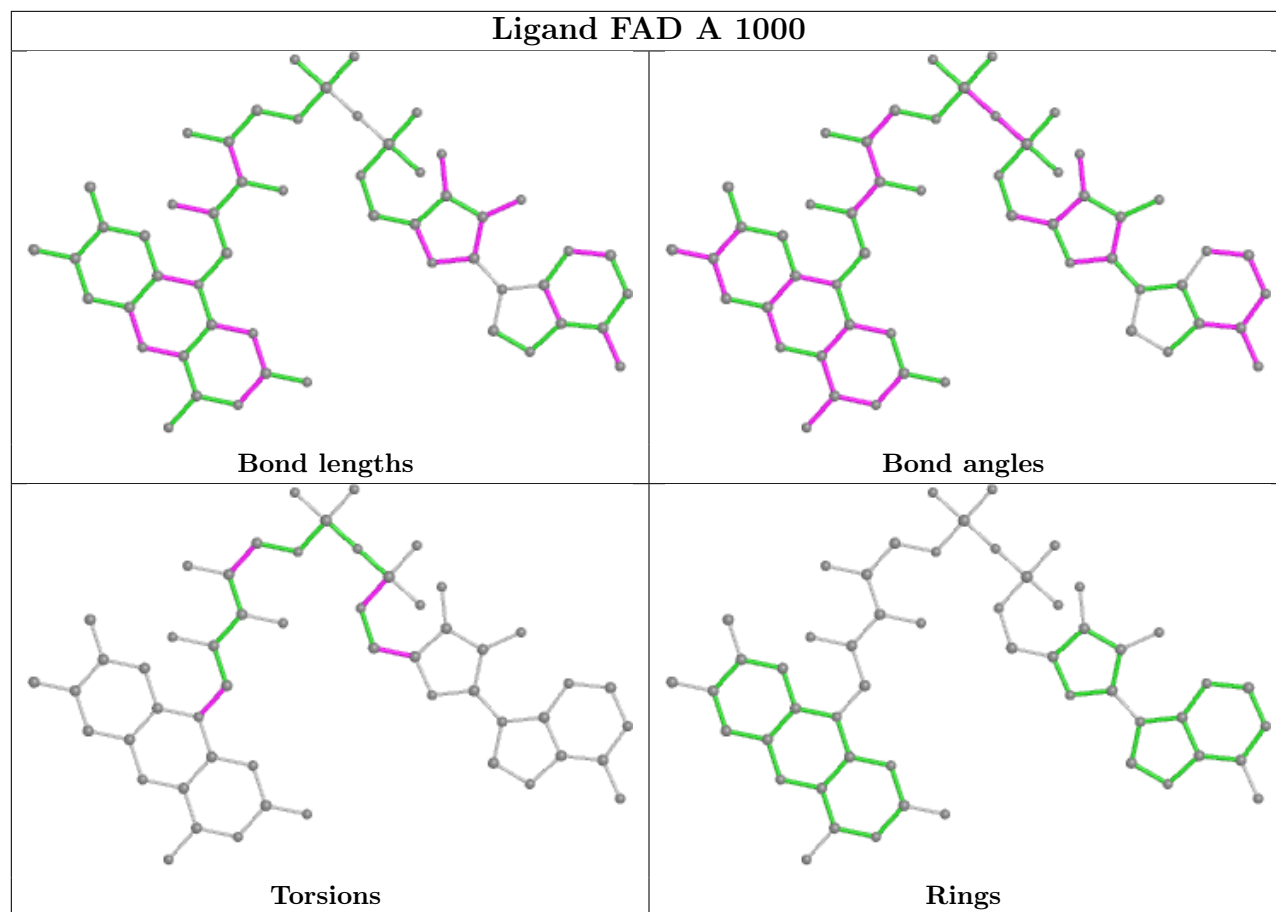
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å²)	Q<0.9
1	A	615/649 (94%)	-0.33	4 (0%)	87	91	23, 33, 52, 72	0
1	B	607/649 (93%)	-0.23	16 (2%)	56	58	23, 36, 70, 104	0
1	C	619/649 (95%)	-0.14	19 (3%)	49	52	29, 41, 65, 109	0
1	D	609/649 (93%)	-0.06	20 (3%)	46	48	37, 55, 72, 121	0
All	All	2450/2596 (94%)	-0.19	59 (2%)	59	61	23, 41, 67, 121	0

All (59) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	636	ALA	5.3
1	A	637	PRO	5.2
1	B	62	ASP	4.9
1	C	640	ALA	4.6
1	B	61	ASN	4.5
1	C	643	PRO	4.3
1	D	355	SER	4.1
1	C	639	PRO	4.1
1	D	338	GLN	4.0
1	C	61	ASN	4.0
1	B	63	GLY	3.5
1	C	641	GLY	3.5
1	D	341	LEU	3.4
1	A	45	ASP	3.3
1	D	637	PRO	3.3
1	D	337	THR	3.1
1	B	527	PHE	3.1
1	C	62	ASP	3.1
1	C	635	HIS	3.0
1	A	65	ASN	3.0
1	C	636	ALA	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	530	SER	2.9
1	D	354	LEU	2.9
1	C	637	PRO	2.9
1	B	46	ASP	2.8
1	D	339	ARG	2.7
1	C	642	LYS	2.7
1	D	352	ALA	2.7
1	D	342	PHE	2.7
1	B	45	ASP	2.6
1	C	341	LEU	2.6
1	D	636	ALA	2.6
1	D	254	ASN	2.5
1	B	347	THR	2.5
1	B	635	HIS	2.5
1	B	529	PRO	2.5
1	D	253	SER	2.4
1	C	254	ASN	2.4
1	D	255	ILE	2.3
1	C	64	VAL	2.3
1	B	526	PRO	2.3
1	C	250	ASN	2.3
1	B	336	ASP	2.3
1	C	255	ILE	2.3
1	D	350	ASN	2.3
1	B	64	VAL	2.2
1	D	635	HIS	2.2
1	D	237	ASN	2.2
1	C	638	VAL	2.2
1	D	235	ASP	2.1
1	B	59	VAL	2.1
1	C	530	SER	2.1
1	D	250	ASN	2.1
1	B	60	PRO	2.1
1	B	352	ALA	2.1
1	C	156	GLY	2.0
1	C	294	ASP	2.0
1	D	3	HIS	2.0
1	D	584	THR	2.0

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

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

6.3 Carbohydrates (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
2	FAD	B	1000	53/53	0.95	0.28	58,58,58,58	0
2	FAD	A	1000	53/53	0.96	0.20	31,31,31,31	0
2	FAD	C	1000	53/53	0.96	0.18	25,25,25,25	0
2	FAD	D	1000	53/53	0.96	0.16	31,31,31,31	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.
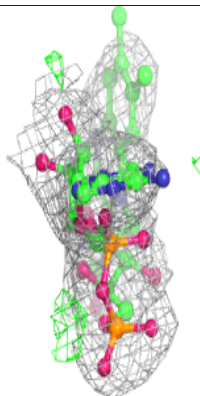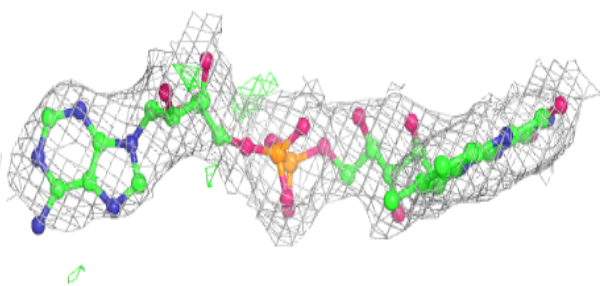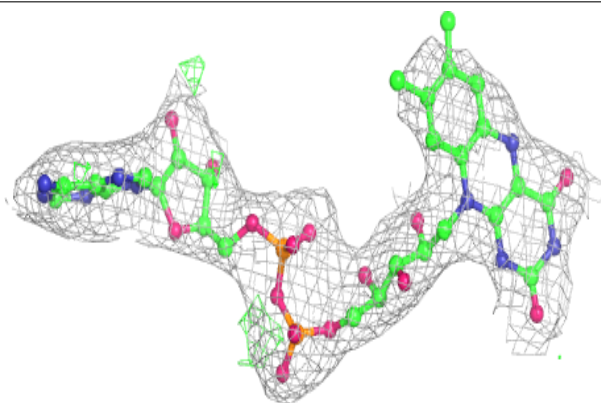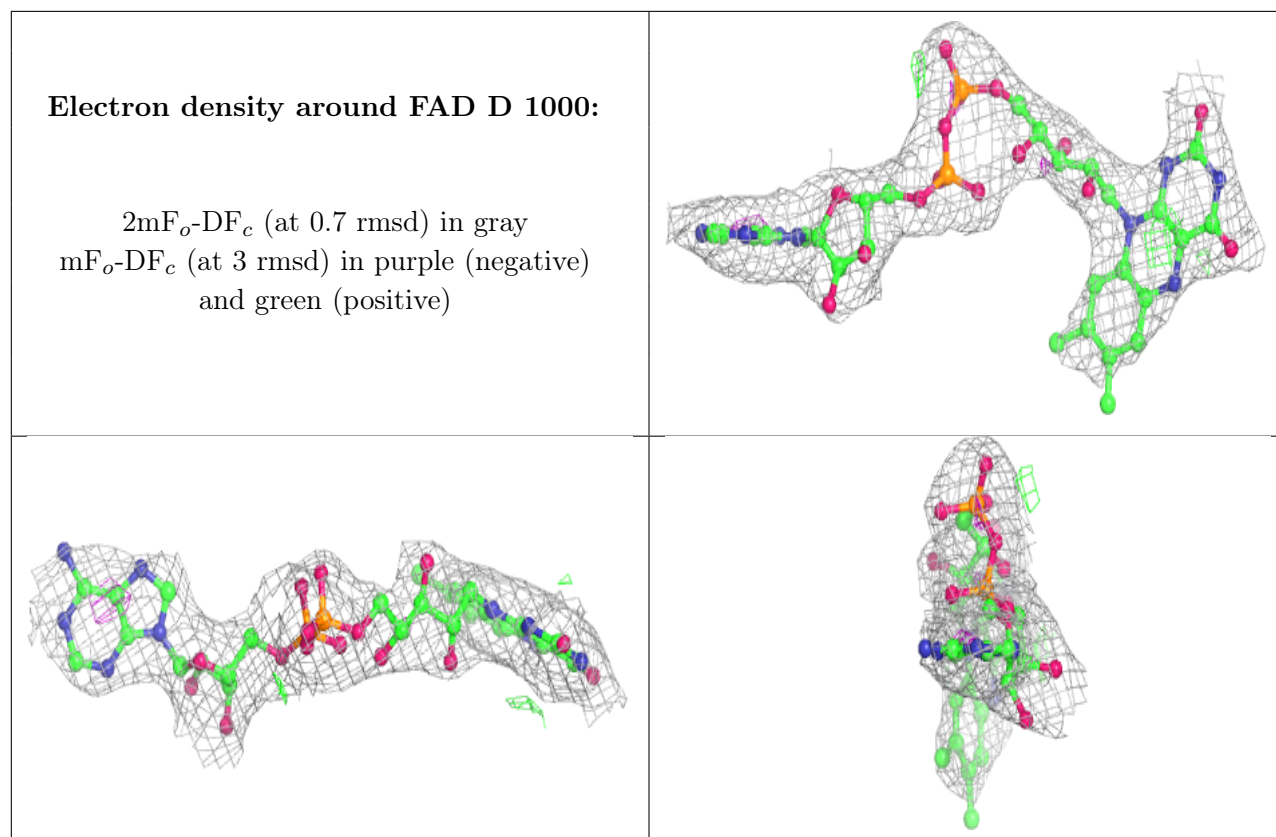

Electron density around FAD B 1000:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative) and green (positive)
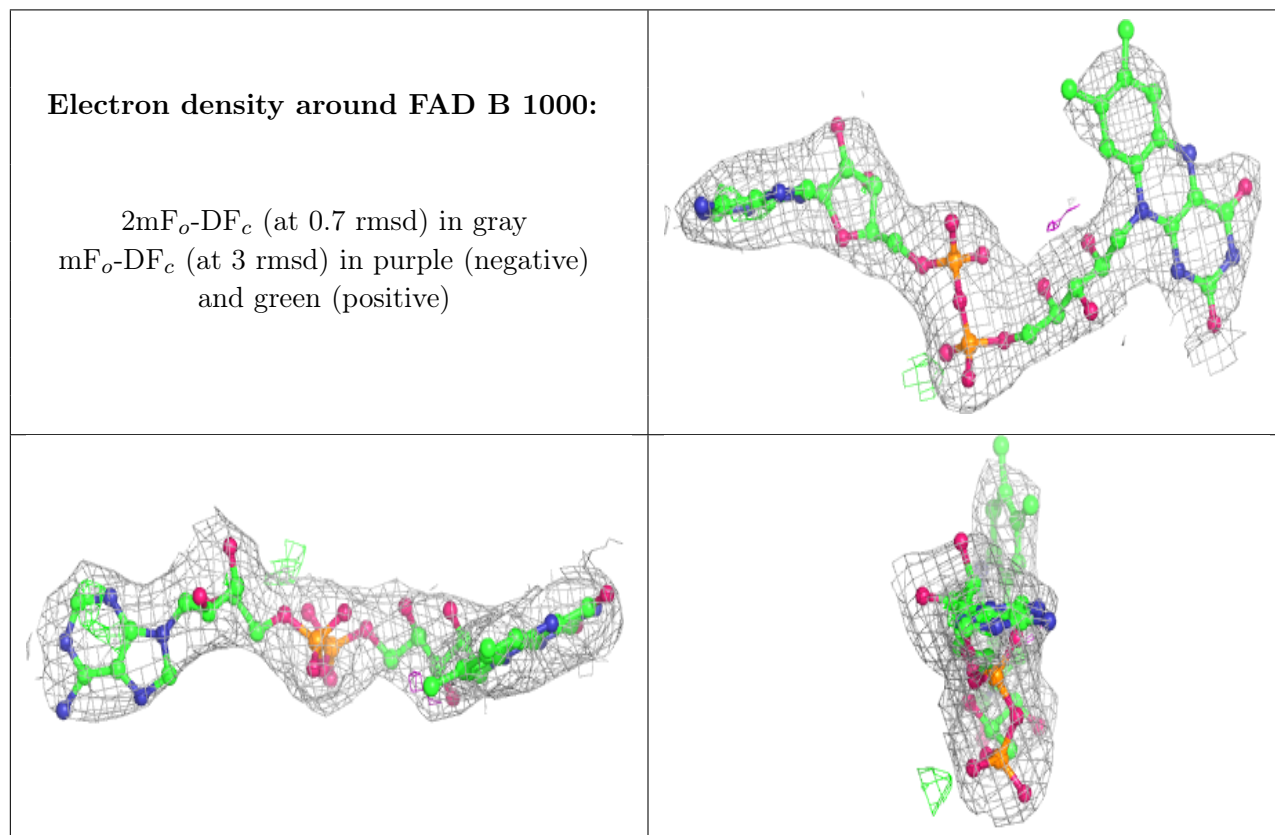
Electron density around FAD A 1000:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
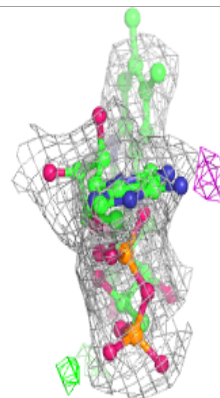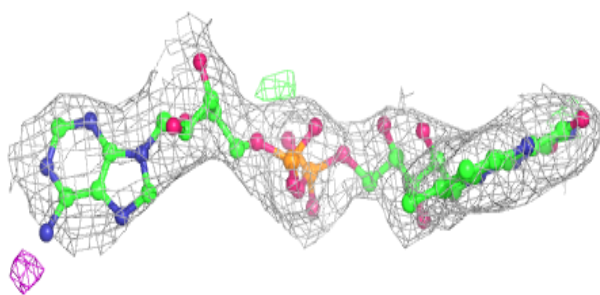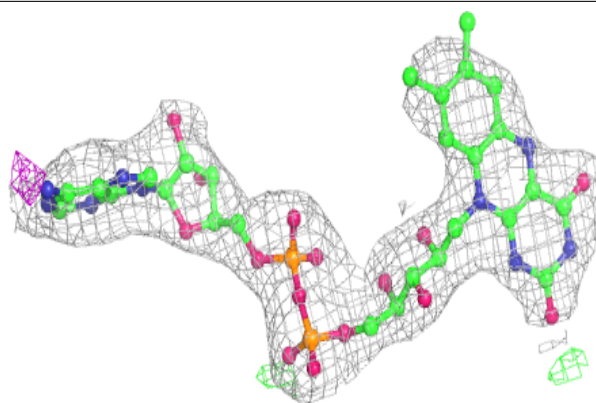
Electron density around FAD C 1000:

$2mF_o$-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 D 1000:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.