



Full wwPDB EM Validation Report ⓘ

Jul 16, 2025 – 02:36 AM JST

PDB ID : 9INF / pdb_00009inf
EMDB ID : EMD-60705
Title : Cryo-EM structure of human XPR1 in closed state in the presence of KIDINS220-1-432 and 10 mM KH₂PO₄
Authors : Yin, Y.; Zuo, P.; Liang, L.
Deposited on : 2024-07-06
Resolution : 3.36 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

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

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

EMDB validation analysis : **FAILED**
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0rc1
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

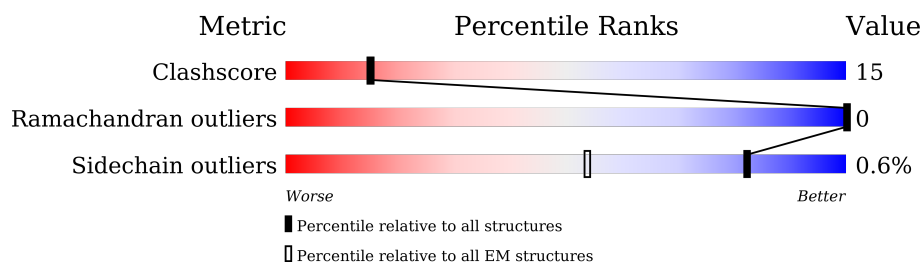
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

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	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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

Mol	Chain	Length	Quality of chain
1	A	704	
1	B	704	

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 7282 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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.

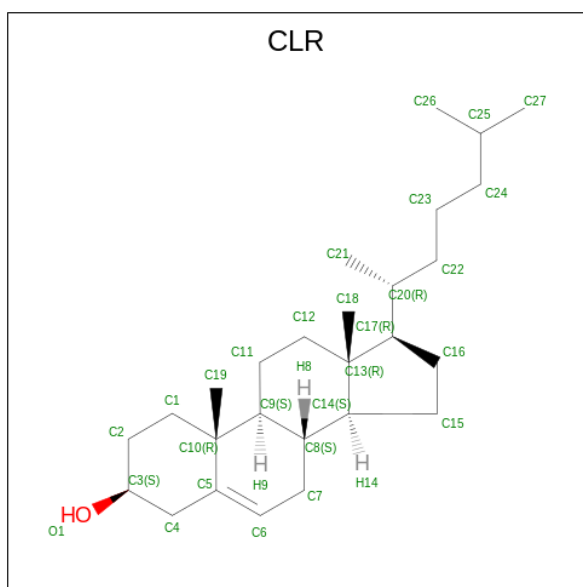
- Molecule 1 is a protein called Solute carrier family 53 member 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	401	Total	C	N	O	S	0	0
			3333	2233	535	549	16		
1	B	401	Total	C	N	O	S	0	0
			3333	2233	535	549	16		

There are 16 discrepancies between the modelled and reference sequences:

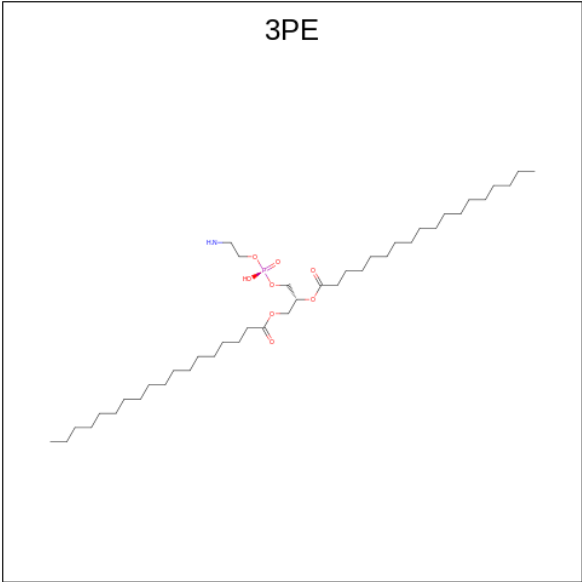
Chain	Residue	Modelled	Actual	Comment	Reference
A	697	SER	-	expression tag	UNP Q9UBH6
A	698	ARG	-	expression tag	UNP Q9UBH6
A	699	GLU	-	expression tag	UNP Q9UBH6
A	700	ASN	-	expression tag	UNP Q9UBH6
A	701	LEU	-	expression tag	UNP Q9UBH6
A	702	TYR	-	expression tag	UNP Q9UBH6
A	703	PHE	-	expression tag	UNP Q9UBH6
A	704	GLN	-	expression tag	UNP Q9UBH6
B	697	SER	-	expression tag	UNP Q9UBH6
B	698	ARG	-	expression tag	UNP Q9UBH6
B	699	GLU	-	expression tag	UNP Q9UBH6
B	700	ASN	-	expression tag	UNP Q9UBH6
B	701	LEU	-	expression tag	UNP Q9UBH6
B	702	TYR	-	expression tag	UNP Q9UBH6
B	703	PHE	-	expression tag	UNP Q9UBH6
B	704	GLN	-	expression tag	UNP Q9UBH6

- Molecule 2 is CHOLESTEROL (CCD ID: CLR) (formula: C₂₇H₄₆O) (labeled as "Ligand of Interest" by depositor).



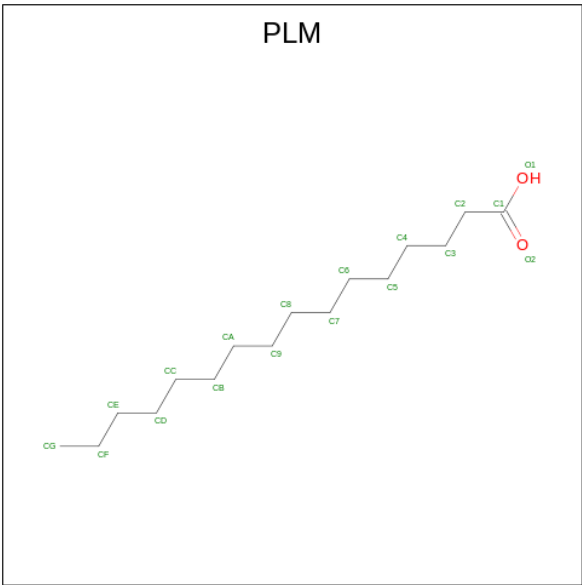
Mol	Chain	Residues	Atoms			AltConf
2	A	1	Total	C	O	0
			28	27	1	
2	A	1	Total	C	O	0
			28	27	1	
2	A	1	Total	C	O	0
			28	27	1	
2	A	1	Total	C	O	0
			28	27	1	
2	A	1	Total	C	O	0
			28	27	1	
2	B	1	Total	C	O	0
			28	27	1	
2	B	1	Total	C	O	0
			28	27	1	
2	B	1	Total	C	O	0
			28	27	1	

- Molecule 3 is 1,2-Distearoyl-sn-glycerophosphoethanolamine (CCD ID: 3PE) (formula: $C_{41}H_{82}NO_8P$) (labeled as "Ligand of Interest" by depositor).



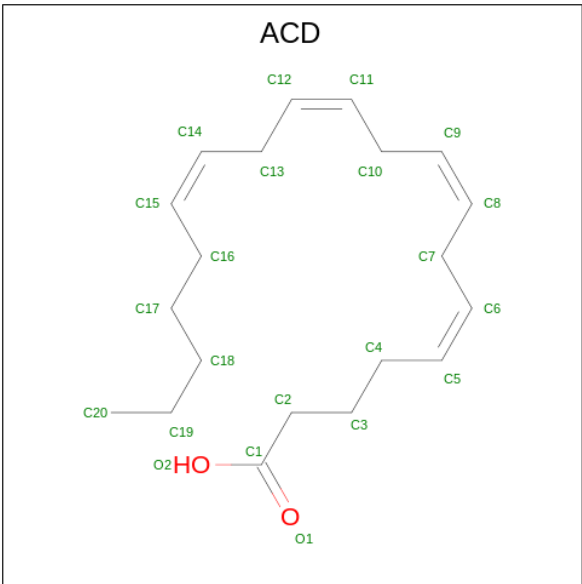
Mol	Chain	Residues	Atoms					AltConf
3	A	1	Total	C	N	O	P	0
			51	41	1	8	1	
3	A	1	Total	C	N	O	P	0
			51	41	1	8	1	
3	A	1	Total	C	N	O	P	0
			51	41	1	8	1	
3	B	1	Total	C	N	O	P	0
			51	41	1	8	1	
3	B	1	Total	C	N	O	P	0
			51	41	1	8	1	
3	B	1	Total	C	N	O	P	0
			51	41	1	8	1	

- Molecule 4 is PALMITIC ACID (CCD ID: PLM) (formula: C₁₆H₃₂O₂) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
4	A	1	Total	C	O	0
			18	16	2	
4	B	1	Total	C	O	0
			18	16	2	

- Molecule 5 is ARACHIDONIC ACID (CCD ID: ACD) (formula: $C_{20}H_{32}O_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
5	A	1	Total	C	O	0
			22	20	2	

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Mol	Chain	Residues	Atoms			AltConf
5	B	1	Total	C	O	0
			22	20	2	

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		AltConf
6	A	3	Total	O	0
			3	3	
6	B	3	Total	O	0
			3	3	

ASN	GLN	P586	K500	F394	R270	GLU
GLN	SER	I592	T507	W395	I271	VAL
ILE	A583	M508	M509	G399	Y272	ALA
LEU	T594	F510	F511	L400	R273	PRO
ARG	R603	A512	Y512	J401	G274	THR
ARG					G275	CYS
PRO	W607	L513	L514	Y412	I279	LVS
ARG	N608	I515	I516	Y417	L282	ILE
LEU	F609	V516				ASN
ALA	F610					GLN
SER	R611			E420	L285	LEU
GLN				L421	Y290	ILE
SER	N614	I519	I520	D424	G291	SER
LVS	E615	I521	I522		W292	GLU
ALA	H616	S621			R293	THR
ARG	L617	S622		K427	Q294	GLU
ASP		C523				VAL
THR	G621	I524	L430		V297	ALA
LVS	E622	T525	E436			VAL
VAL		I526				THR
LEU	W626	I527			V300	ASN
LEU	ARG	W528	Q440		L301	GLN
GLU	ASP	D529			I302	LEU
ASP	ILE	L530	V447			GLU
THR	SER		R448		L306	ASP
VAL	VAL	D533	A449			GLY
ASP	ALA	W534	T450		S312	ASP
GLU	PRO		V451		H313	ARG
ALA	LEU	R548	Q452		Q314	GLN
ASN	ASN	E549	C453			LVS
THR	ALA	E550	I454		A320	ALA
SER	ASP		P455		G321	ALA
ARG	ASP	Q555				MET
GLU	GLN	K556	R459		I325	LVS
ASN	THR	A557				ARG
LEU	LEU	Y558	T470		L331	LEU
TYR	LEU	Y559	A471		L332	ARG
PHE	GLU	Y560	R472			VAL
GLN			A473		Y345	PRO
	MET	I563	F474			PRO
	MET	I564	P475		Y352	LEU
	ASP	E565	H476			GLY
	GLN	D566	L477		F357	ALA
	ASP	V567				A226
	ASP	I568	G481		L359	
	GLY	L569	K482		I360	I243
	VAL	R570	Y483		N361	
	ARG		S484			V246
	ASN	W573	T485		L374	L247
	ARG	T574			L375	
	GLN		K489			T250
	LVS	I577	V490		L378	L251
	ASN	S578	T491			V252
	ARG	I579	F492		T383	L253
	SER		A493			
	TRP	T583			F386	R263
	LVS	I584	Y496			S264
	THR	I585			F261	T265

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	230260	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PLM, CLR, ACD, 3PE

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	0.15	0/3444	0.36	0/4688
1	B	0.15	0/3444	0.39	0/4688
All	All	0.15	0/6888	0.38	0/9376

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3333	0	3317	102	0
1	B	3333	0	3317	104	0
2	A	140	0	229	7	0
2	B	84	0	138	6	0
3	A	153	0	246	11	0
3	B	153	0	246	11	0
4	A	18	0	31	1	0
4	B	18	0	31	0	0
5	A	22	0	31	0	0
5	B	22	0	31	0	0
6	A	3	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	B	3	0	0	0	0
All	All	7282	0	7617	219	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 15.

All (219) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:419:LEU:HG	1:A:420:GLU:HG3	1.61	0.81
1:B:560:TYR:HA	1:B:563:ILE:HD12	1.61	0.80
1:A:374:LEU:HD22	3:A:802:3PE:H241	1.68	0.75
1:B:293:ARG:HH12	1:B:312:SER:HA	1.55	0.72
1:B:374:LEU:HD22	3:B:802:3PE:H241	1.73	0.71
1:A:529:ASP:OD2	1:A:570:ARG:NH2	2.22	0.71
1:A:459:ARG:NH2	1:A:463:CYS:SG	2.65	0.70
1:A:560:TYR:HA	1:A:563:ILE:HD12	1.76	0.67
1:B:560:TYR:O	1:B:564:ILE:HD12	1.94	0.67
1:B:300:VAL:HG23	1:B:305:LEU:HB2	1.77	0.66
1:B:514:TRP:HZ2	1:B:578:SER:HB2	1.60	0.65
1:B:579:ILE:HD12	1:B:592:ILE:HG23	1.78	0.65
1:A:263:ARG:NH2	1:A:425:GLU:OE2	2.28	0.64
1:A:534:TRP:O	1:A:548:ARG:NH1	2.31	0.63
2:A:807:CLR:H231	2:A:807:CLR:H162	1.81	0.62
1:A:411:GLU:HA	1:A:414:ILE:HD12	1.81	0.62
1:A:454:ILE:HG23	1:A:455:PRO:HD3	1.82	0.61
1:B:395:TRP:O	1:B:399:GLN:HG2	2.01	0.61
1:A:548:ARG:NH2	1:A:613:GLU:OE1	2.34	0.60
1:B:401:ASN:HA	1:B:455:PRO:HB2	1.83	0.60
1:A:565:GLU:HB2	2:A:801:CLR:H25	1.84	0.59
1:B:481:GLY:O	1:B:485:THR:HG23	2.02	0.59
1:B:359:LEU:HD13	3:B:802:3PE:H2A2	1.84	0.59
1:B:489:MET:HE1	1:B:518:TYR:HB2	1.85	0.58
1:A:533:ASP:OD1	1:A:611:ARG:NH1	2.37	0.58
1:B:550:GLU:N	1:B:550:GLU:OE1	2.37	0.58
1:B:579:ILE:HA	1:B:583:THR:HB	1.85	0.58
1:A:297:VAL:HG23	1:A:616:HIS:HB2	1.84	0.58
1:B:564:ILE:O	1:B:568:ILE:HG13	2.03	0.57
1:B:585:LEU:HG	1:B:586:PRO:HD3	1.86	0.57
1:A:559:TYR:O	1:A:563:ILE:HG13	2.04	0.57
1:A:559:TYR:OH	1:A:613:GLU:OE2	2.21	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:452:GLN:NE2	1:B:577:ILE:HG23	2.20	0.57
1:B:300:VAL:HA	1:B:305:LEU:HD12	1.87	0.56
1:A:475:PRO:HB2	1:A:528:TRP:CH2	2.39	0.56
1:A:502:ARG:HB2	1:A:504:HIS:CE1	2.40	0.56
1:A:484:SER:HA	1:A:487:PHE:CD2	2.40	0.56
1:B:314:GLN:HE22	3:B:805:3PE:H31	1.71	0.56
1:A:533:ASP:HA	1:A:611:ARG:HH11	1.69	0.56
1:A:526:LEU:HD21	1:A:567:VAL:HG22	1.87	0.55
1:B:522:SER:HB2	1:B:574:THR:HG21	1.88	0.55
1:A:300:VAL:HG23	1:A:305:LEU:HB2	1.88	0.55
3:A:806:3PE:H322	3:A:806:3PE:H241	1.89	0.55
1:A:233:THR:O	1:A:237:VAL:HG13	2.07	0.55
1:A:512:TYR:O	1:A:516:VAL:HG12	2.07	0.55
1:A:573:TRP:O	1:A:577:ILE:HD12	2.07	0.54
1:B:521:SER:O	1:B:525:THR:HG23	2.07	0.54
1:B:530:LEU:HD11	1:B:563:ILE:HG23	1.89	0.54
1:A:395:TRP:O	1:A:399:GLN:HG2	2.07	0.54
1:B:533:ASP:HA	1:B:611:ARG:HH11	1.73	0.54
1:A:236:ARG:NH2	4:A:809:PLM:O2	2.41	0.54
1:A:550:GLU:N	1:A:550:GLU:OE1	2.41	0.54
1:A:359:LEU:HD22	3:A:802:3PE:H2C2	1.90	0.54
1:B:482:LYS:HD2	1:B:525:THR:HA	1.90	0.54
1:B:417:TYR:HA	1:B:421:LEU:HD13	1.90	0.53
1:A:573:TRP:CZ3	1:A:577:ILE:HD11	2.43	0.53
1:B:451:VAL:HA	1:B:454:ILE:HG12	1.88	0.53
1:A:561:CYS:HA	1:A:564:ILE:HD12	1.90	0.53
1:A:271:ILE:O	1:A:352:TYR:OH	2.26	0.53
1:B:285:LEU:HD21	1:B:395:TRP:HH2	1.73	0.52
2:A:805:CLR:H152	1:B:253:LEU:HD21	1.91	0.52
1:A:564:ILE:O	1:A:568:ILE:HG13	2.09	0.52
1:A:555:GLN:HG3	1:A:557:ALA:H	1.75	0.52
1:B:573:TRP:CE2	1:B:577:ILE:HD11	2.44	0.52
1:A:293:ARG:HH22	1:A:312:SER:HA	1.75	0.52
1:A:463:CYS:SG	1:A:479:ASN:ND2	2.83	0.52
1:A:384:ALA:HB1	1:A:462:GLN:HG3	1.92	0.52
1:B:473:ALA:HA	1:B:477:LEU:HD23	1.90	0.51
1:B:282:LEU:HB3	1:B:320:ALA:HB2	1.92	0.51
1:A:467:TYR:HB2	1:A:476:HIS:HB3	1.92	0.51
1:B:493:ALA:HA	1:B:496:TYR:CE1	2.45	0.51
1:A:275:GLY:O	1:A:279:ILE:HG12	2.11	0.51
1:B:500:LYS:HD3	1:B:507:THR:HG21	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:412:TYR:HB2	1:B:448:ARG:HH12	1.76	0.50
1:B:399:GLN:OE1	1:B:608:ASN:ND2	2.44	0.50
1:B:359:LEU:HG	1:B:375:LEU:HD21	1.93	0.50
1:B:275:GLY:O	1:B:279:ILE:HG12	2.12	0.50
1:B:297:VAL:HG23	1:B:616:HIS:HB2	1.94	0.50
1:A:333:ALA:HB2	3:A:803:3PE:H282	1.94	0.50
1:A:412:TYR:HB2	1:A:448:ARG:HH22	1.76	0.49
1:B:293:ARG:HH22	1:B:312:SER:HB3	1.77	0.49
1:B:297:VAL:HG23	1:B:616:HIS:CB	2.43	0.49
1:B:533:ASP:OD1	1:B:611:ARG:NH1	2.45	0.49
1:B:391:PHE:CE1	1:B:615:GLU:HG3	2.47	0.49
1:A:285:LEU:HD21	1:A:395:TRP:HH2	1.77	0.49
1:A:449:ALA:HB1	2:A:804:CLR:H152	1.94	0.49
1:B:383:THR:HB	1:B:386:PHE:HD2	1.77	0.49
1:A:448:ARG:HA	1:A:451:VAL:HG22	1.95	0.49
1:A:576:GLN:NE2	1:A:600:GLU:OE1	2.46	0.49
1:B:559:TYR:O	1:B:563:ILE:HG13	2.13	0.49
1:A:241:CYS:SG	3:A:806:3PE:H381	2.53	0.49
1:A:494:ALA:O	1:A:498:THR:HG23	2.13	0.49
1:A:303:PHE:HE1	1:A:612:LEU:HD11	1.78	0.49
1:A:535:GLY:HA3	1:A:614:ASN:ND2	2.28	0.49
1:B:447:VAL:O	1:B:451:VAL:HG22	2.13	0.48
1:B:420:GLU:OE2	1:B:440:CYS:HB2	2.12	0.48
1:A:339:ILE:HG22	1:A:342:ILE:H	1.77	0.48
1:A:237:VAL:HG12	1:A:318:GLU:HB2	1.96	0.48
1:A:245:ILE:HG13	3:A:806:3PE:H3F1	1.96	0.48
1:A:361:ASN:O	1:A:371:ARG:NH1	2.47	0.48
1:A:410:LEU:O	1:A:414:ILE:HG13	2.13	0.48
1:A:366:PHE:O	1:A:371:ARG:NH2	2.47	0.48
1:A:263:ARG:NH2	1:A:427:LYS:HB2	2.29	0.47
1:B:270:ARG:NH2	1:B:436:GLU:OE2	2.47	0.47
1:A:321:GLY:O	1:A:325:ILE:HG12	2.14	0.47
1:B:517:PHE:HA	1:B:520:ILE:HG12	1.97	0.47
1:A:282:LEU:HB3	1:A:320:ALA:HB2	1.95	0.47
1:B:263:ARG:NH2	1:B:427:LYS:HB2	2.29	0.47
1:B:512:TYR:O	1:B:516:VAL:HG12	2.14	0.47
1:A:517:PHE:HA	1:A:520:ILE:HG12	1.96	0.47
2:A:807:CLR:H25	2:A:807:CLR:H222	1.68	0.47
1:A:560:TYR:O	1:A:564:ILE:HG13	2.15	0.46
1:B:447:VAL:HA	1:B:450:ILE:HD12	1.97	0.46
1:B:514:TRP:CZ2	1:B:578:SER:HB2	2.47	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:338:PRO:HB2	1:A:339:ILE:HD12	1.97	0.46
1:B:459:ARG:HD2	1:B:459:ARG:HA	1.64	0.46
1:B:529:ASP:HA	1:B:533:ASP:HB2	1.96	0.46
1:A:283:PHE:HZ	3:A:806:3PE:H2C1	1.80	0.46
3:A:806:3PE:H352	3:A:806:3PE:H382	1.73	0.46
1:B:548:ARG:HE	1:B:548:ARG:HB2	1.59	0.46
1:B:292:TRP:HE1	1:B:609:PHE:HA	1.81	0.46
1:A:407:LEU:HD12	1:A:407:LEU:H	1.80	0.46
1:B:555:GLN:HG3	1:B:557:ALA:H	1.81	0.46
1:B:569:LEU:HD13	1:B:603:ARG:HB2	1.98	0.46
1:A:272:TYR:HB3	1:A:327:TRP:HE1	1.81	0.46
2:A:801:CLR:H211	2:A:801:CLR:H232	1.81	0.45
1:B:321:GLY:O	1:B:325:ILE:HG12	2.16	0.45
1:B:512:TYR:O	1:B:515:ILE:HG22	2.16	0.45
1:A:475:PRO:HB2	1:A:528:TRP:HH2	1.82	0.45
1:B:578:SER:O	1:B:583:THR:OG1	2.22	0.45
3:B:803:3PE:H3F1	2:B:804:CLR:H25	1.98	0.45
1:A:251:LEU:HD11	1:A:331:LEU:HB3	1.97	0.45
3:B:805:3PE:H3E1	3:B:805:3PE:H2H1	1.99	0.45
1:A:457:TRP:HA	1:A:487:PHE:HZ	1.82	0.45
1:A:360:ILE:HA	1:A:375:LEU:HD11	1.99	0.45
1:B:485:THR:HG21	1:B:524:TYR:HD2	1.82	0.45
1:A:359:LEU:HD13	3:A:802:3PE:H2A2	1.99	0.44
1:A:570:ARG:HH11	1:A:573:TRP:NE1	2.15	0.44
3:B:802:3PE:H362	3:B:802:3PE:H232	1.98	0.44
1:B:357:PHE:HA	1:B:360:ILE:HG22	1.98	0.44
1:B:558:TYR:CE2	2:B:801:CLR:H12	2.53	0.44
1:A:345:TYR:HB3	1:A:429:LEU:HB2	2.00	0.44
2:B:806:CLR:H221	2:B:806:CLR:H162	1.49	0.44
1:B:243:ILE:HG22	1:B:325:ILE:HD12	2.00	0.44
1:B:285:LEU:HD21	3:B:802:3PE:H342	2.00	0.44
3:A:803:3PE:H3E1	1:B:246:VAL:HG22	2.00	0.44
1:B:247:LEU:HD21	3:B:803:3PE:H3C1	1.98	0.44
1:B:265:ILE:HA	1:B:430:LEU:HD22	1.99	0.44
1:B:251:LEU:HD21	1:B:331:LEU:HD23	2.00	0.43
1:A:265:ILE:HA	1:A:430:LEU:HD22	2.00	0.43
1:B:290:TYR:CE1	1:B:294:GLN:HG3	2.53	0.43
1:B:302:ILE:HD11	1:B:616:HIS:HB2	1.99	0.43
1:B:566:ASP:O	1:B:570:ARG:HG2	2.17	0.43
1:A:357:PHE:HA	1:A:360:ILE:HG22	1.99	0.43
1:A:528:TRP:CD1	1:A:528:TRP:C	2.96	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:585:LEU:HG	1:A:586:PRO:HD3	2.00	0.43
1:B:273:ARG:HD3	1:B:594:THR:HG23	2.00	0.43
1:B:533:ASP:HA	1:B:611:ARG:NH1	2.33	0.43
1:A:243:ILE:HG22	1:A:325:ILE:HD12	2.00	0.43
1:B:470:THR:HG23	1:B:472:ARG:H	1.82	0.43
1:B:534:TRP:HE1	1:B:607:TRP:CD1	2.36	0.43
1:B:621:GLY:O	1:B:622:GLU:HG2	2.18	0.43
1:B:271:ILE:O	1:B:352:TYR:OH	2.25	0.43
1:A:585:LEU:N	1:A:586:PRO:HD2	2.34	0.43
1:A:553:TYR:HB2	1:A:559:TYR:CE1	2.54	0.43
1:B:493:ALA:HA	1:B:496:TYR:CD1	2.54	0.43
1:A:226:ALA:HA	1:A:293:ARG:HH11	1.84	0.43
1:B:508:MET:HA	1:B:508:MET:HE2	2.01	0.43
1:B:526:LEU:HB2	1:B:570:ARG:HG3	2.00	0.43
1:A:515:ILE:O	1:A:518:TYR:HB3	2.18	0.42
3:B:803:3PE:H2A1	2:B:804:CLR:H232	2.01	0.42
2:B:806:CLR:H25	2:B:806:CLR:H222	1.93	0.42
1:A:512:TYR:O	1:A:515:ILE:HG22	2.19	0.42
1:B:548:ARG:NH1	1:B:614:ASN:HB2	2.34	0.42
1:A:402:SER:OG	1:A:604:ARG:NE	2.51	0.42
1:A:474:PHE:HA	1:A:475:PRO:HA	1.93	0.42
1:A:491:THR:HA	2:A:804:CLR:H151	2.01	0.42
1:A:292:TRP:HE1	1:A:609:PHE:HA	1.85	0.42
1:A:356:VAL:O	1:A:360:ILE:HG22	2.18	0.42
1:A:453:CYS:HB3	1:A:487:PHE:CD1	2.54	0.42
1:B:250:THR:HG21	3:B:803:3PE:H381	2.01	0.42
1:B:492:PHE:HE1	1:B:510:PHE:HE1	1.67	0.42
2:B:804:CLR:H162	2:B:804:CLR:H221	1.83	0.42
1:B:520:ILE:HG13	1:B:521:SER:N	2.35	0.42
1:A:572:ALA:HA	1:A:575:ILE:HD12	2.01	0.42
1:B:412:TYR:HB2	1:B:448:ARG:HH22	1.84	0.42
1:A:410:LEU:HD23	1:A:414:ILE:HD11	2.00	0.42
1:A:541:ALA:HA	1:A:549:GLU:HA	2.02	0.42
1:A:283:PHE:CZ	1:A:287:ILE:HD11	2.55	0.42
1:A:450:ILE:H	1:A:450:ILE:HG13	1.62	0.41
1:A:473:ALA:HA	1:A:477:LEU:HD23	2.01	0.41
1:A:448:ARG:HE	1:A:448:ARG:HB2	1.78	0.41
1:A:569:LEU:HD21	1:A:599:LEU:HD12	2.02	0.41
3:A:806:3PE:H222	3:A:806:3PE:H251	1.85	0.41
1:B:251:LEU:HD13	1:B:332:LEU:HG	2.02	0.41
1:B:361:ASN:OD1	1:B:361:ASN:C	2.63	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:271:ILE:HG12	1:A:413:MET:HG3	2.03	0.41
1:B:417:TYR:HA	1:B:421:LEU:CD1	2.49	0.41
1:B:474:PHE:HA	1:B:475:PRO:HA	1.92	0.41
1:A:234:THR:O	1:A:237:VAL:HG22	2.20	0.41
1:A:262:ASP:OD1	1:A:262:ASP:N	2.54	0.41
1:B:528:TRP:C	1:B:528:TRP:CD1	2.98	0.41
1:A:534:TRP:HE1	1:A:607:TRP:CD1	2.39	0.41
1:B:263:ARG:HH21	1:B:427:LYS:HB2	1.86	0.41
1:B:331:LEU:HD12	1:B:331:LEU:HA	1.88	0.41
1:B:424:ASP:OD1	1:B:424:ASP:N	2.54	0.41
1:B:452:GLN:HG2	1:B:490:VAL:HG21	2.03	0.41
1:A:486:THR:O	1:A:490:VAL:HG12	2.21	0.41
1:A:496:TYR:HE2	1:A:583:THR:HG23	1.86	0.41
1:B:459:ARG:HB3	1:B:483:TYR:CE2	2.56	0.40
1:B:519:ILE:HD13	1:B:519:ILE:HA	1.98	0.40
1:A:232:TRP:HZ3	3:B:805:3PE:H231	1.86	0.40
1:A:544:ASN:HB3	1:A:547:LEU:HB2	2.03	0.40
1:B:345:TYR:CD1	1:B:345:TYR:C	2.99	0.40
1:B:475:PRO:HB2	1:B:528:TRP:CH2	2.57	0.40
1:B:617:LEU:HD23	1:B:617:LEU:HA	1.87	0.40
1:B:290:TYR:HB2	1:B:313:HIS:CD2	2.56	0.40
1:B:332:LEU:HD23	1:B:332:LEU:HA	1.91	0.40
1:B:450:ILE:H	1:B:450:ILE:HG13	1.62	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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	399/704 (57%)	382 (96%)	17 (4%)	0	100	100
1	B	399/704 (57%)	388 (97%)	11 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	798/1408 (57%)	770 (96%)	28 (4%)	0	100	100

There are no Ramachandran outliers to report.

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 PDB entries followed by that with respect to all EM entries.

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	355/629 (56%)	353 (99%)	2 (1%)	84	91
1	B	355/629 (56%)	353 (99%)	2 (1%)	84	91
All	All	710/1258 (56%)	706 (99%)	4 (1%)	82	91

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	297	VAL
1	A	448	ARG
1	B	378	LEU
1	B	394	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	248	ASN
1	A	288	ASN
1	B	544	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

18 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	CLR	A	808	-	31,31,31	0.36	0	48,48,48	0.53	0
3	3PE	A	803	-	50,50,50	0.51	0	53,55,55	0.53	1 (1%)
3	3PE	B	802	-	50,50,50	0.51	0	53,55,55	0.57	2 (3%)
3	3PE	B	805	-	50,50,50	0.51	0	53,55,55	0.54	1 (1%)
4	PLM	B	807	-	17,17,17	0.91	1 (5%)	17,17,17	0.75	2 (11%)
2	CLR	A	804	-	31,31,31	0.35	0	48,48,48	0.53	0
2	CLR	B	801	-	31,31,31	0.36	0	48,48,48	0.58	0
5	ACD	B	808	-	21,21,21	0.57	0	21,21,21	0.59	0
2	CLR	B	806	-	31,31,31	0.35	0	48,48,48	0.57	0
2	CLR	A	807	-	31,31,31	0.42	0	48,48,48	1.12	5 (10%)
3	3PE	A	802	-	50,50,50	0.51	0	53,55,55	0.58	2 (3%)
5	ACD	A	810	-	21,21,21	0.57	0	21,21,21	0.58	0
2	CLR	B	804	-	31,31,31	0.36	0	48,48,48	0.50	0
2	CLR	A	805	-	31,31,31	0.35	0	48,48,48	0.49	0
2	CLR	A	801	-	31,31,31	0.36	0	48,48,48	0.51	0
3	3PE	B	803	-	50,50,50	0.51	0	53,55,55	0.53	1 (1%)
4	PLM	A	809	-	17,17,17	0.90	1 (5%)	17,17,17	0.75	2 (11%)
3	3PE	A	806	-	50,50,50	0.51	0	53,55,55	0.53	1 (1%)

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	CLR	A	808	-	-	6/10/68/68	0/4/4/4
3	3PE	A	803	-	-	15/54/54/54	-
3	3PE	B	802	-	-	24/54/54/54	-
3	3PE	B	805	-	-	17/54/54/54	-
4	PLM	B	807	-	-	3/15/15/15	-
2	CLR	A	804	-	-	5/10/68/68	0/4/4/4
2	CLR	B	801	-	-	2/10/68/68	0/4/4/4
5	ACD	B	808	-	-	4/19/19/19	-
2	CLR	B	806	-	-	8/10/68/68	0/4/4/4
2	CLR	A	807	-	-	6/10/68/68	0/4/4/4
3	3PE	A	802	-	-	22/54/54/54	-
5	ACD	A	810	-	-	3/19/19/19	-
2	CLR	B	804	-	-	7/10/68/68	0/4/4/4
2	CLR	A	805	-	-	7/10/68/68	0/4/4/4
2	CLR	A	801	-	-	3/10/68/68	0/4/4/4
3	3PE	B	803	-	-	17/54/54/54	-
4	PLM	A	809	-	-	4/15/15/15	-
3	3PE	A	806	-	-	27/54/54/54	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	807	PLM	C2-C1	2.92	1.57	1.50
4	A	809	PLM	C2-C1	2.86	1.57	1.50

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	807	CLR	C13-C17-C20	3.54	125.03	119.49
2	A	807	CLR	C22-C20-C17	3.40	117.30	110.28
2	A	807	CLR	C17-C13-C14	-3.08	96.42	100.07
2	A	807	CLR	C16-C17-C20	2.48	115.98	112.15
3	A	802	3PE	C2-O21-C21	2.38	123.64	117.79
3	B	803	3PE	O12-P-O14	2.34	123.81	112.24
3	A	803	3PE	O12-P-O14	2.34	123.80	112.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	805	3PE	O12-P-O14	2.34	123.79	112.24
3	B	802	3PE	O12-P-O14	2.33	123.78	112.24
3	A	806	3PE	O12-P-O14	2.33	123.77	112.24
3	A	802	3PE	O12-P-O14	2.32	123.71	112.24
3	B	802	3PE	C2-O21-C21	2.30	123.46	117.79
4	B	807	PLM	O1-C1-O2	2.23	128.87	123.30
4	A	809	PLM	O1-C1-O2	2.23	128.85	123.30
2	A	807	CLR	C23-C22-C20	2.11	121.11	115.03
4	A	809	PLM	O2-C1-C2	-2.01	116.61	123.08
4	B	807	PLM	O2-C1-C2	-2.00	116.65	123.08

There are no chirality outliers.

All (180) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	806	CLR	C13-C17-C20-C21
2	B	806	CLR	C13-C17-C20-C22
2	B	806	CLR	C16-C17-C20-C22
3	A	802	3PE	C1-O11-P-O12
3	A	802	3PE	C1-O11-P-O13
3	A	802	3PE	C1-O11-P-O14
3	A	802	3PE	C11-O13-P-O12
3	A	802	3PE	C12-C11-O13-P
3	A	802	3PE	O13-C11-C12-N
3	A	802	3PE	O22-C21-O21-C2
3	A	803	3PE	C11-O13-P-O12
3	A	803	3PE	O13-C11-C12-N
3	A	803	3PE	O22-C21-O21-C2
3	A	806	3PE	O13-C11-C12-N
3	A	806	3PE	C22-C21-O21-C2
3	B	802	3PE	C11-O13-P-O12
3	B	802	3PE	C12-C11-O13-P
3	B	802	3PE	O13-C11-C12-N
3	B	802	3PE	C22-C21-O21-C2
3	B	803	3PE	C11-O13-P-O12
3	B	803	3PE	C11-O13-P-O14
3	B	803	3PE	O13-C11-C12-N
3	B	803	3PE	O22-C21-O21-C2
3	B	805	3PE	O13-C11-C12-N
3	B	805	3PE	O22-C21-O21-C2
3	B	805	3PE	C22-C21-O21-C2
5	B	808	ACD	C12-C13-C14-C15

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Mol	Chain	Res	Type	Atoms
2	B	804	CLR	C21-C20-C22-C23
3	A	803	3PE	O32-C31-O31-C3
3	B	803	3PE	O32-C31-O31-C3
2	B	806	CLR	C16-C17-C20-C21
3	A	806	3PE	O22-C21-O21-C2
3	B	802	3PE	O22-C21-O21-C2
3	A	803	3PE	C32-C31-O31-C3
3	B	803	3PE	C32-C31-O31-C3
3	A	802	3PE	C22-C21-O21-C2
3	A	803	3PE	C22-C21-O21-C2
3	B	803	3PE	C22-C21-O21-C2
2	B	806	CLR	C21-C20-C22-C23
3	A	806	3PE	C35-C36-C37-C38
2	A	805	CLR	C21-C20-C22-C23
2	A	805	CLR	C17-C20-C22-C23
2	A	808	CLR	C21-C20-C22-C23
2	B	801	CLR	C17-C20-C22-C23
3	B	805	3PE	O11-C1-C2-O21
2	A	805	CLR	C22-C23-C24-C25
2	B	804	CLR	C22-C23-C24-C25
3	A	802	3PE	C34-C35-C36-C37
2	A	807	CLR	C13-C17-C20-C22
2	B	804	CLR	C17-C20-C22-C23
2	A	801	CLR	C20-C22-C23-C24
2	A	807	CLR	C22-C23-C24-C25
4	A	809	PLM	C1-C2-C3-C4
2	B	806	CLR	C17-C20-C22-C23
2	A	801	CLR	C22-C23-C24-C25
2	A	807	CLR	C16-C17-C20-C21
2	A	807	CLR	C13-C17-C20-C21
2	B	806	CLR	C20-C22-C23-C24
3	A	802	3PE	C11-O13-P-O11
3	A	803	3PE	C11-O13-P-O11
3	B	802	3PE	C11-O13-P-O11
3	B	803	3PE	C11-O13-P-O11
3	B	802	3PE	C21-C22-C23-C24
2	A	805	CLR	C13-C17-C20-C22
3	A	803	3PE	C27-C28-C29-C2A
3	B	802	3PE	C37-C38-C39-C3A
3	A	806	3PE	C23-C24-C25-C26
4	B	807	PLM	C4-C5-C6-C7
3	A	802	3PE	C37-C38-C39-C3A

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Mol	Chain	Res	Type	Atoms
3	A	803	3PE	C28-C29-C2A-C2B
3	A	803	3PE	C3C-C3D-C3E-C3F
3	B	803	3PE	C28-C29-C2A-C2B
2	A	808	CLR	C13-C17-C20-C22
3	A	806	3PE	C27-C28-C29-C2A
3	B	805	3PE	C23-C24-C25-C26
4	B	807	PLM	C3-C4-C5-C6
2	A	804	CLR	C22-C23-C24-C25
3	A	802	3PE	C22-C23-C24-C25
3	A	806	3PE	C38-C39-C3A-C3B
3	A	802	3PE	C36-C37-C38-C39
3	B	802	3PE	C22-C23-C24-C25
3	B	803	3PE	C36-C37-C38-C39
2	B	804	CLR	C13-C17-C20-C22
3	B	802	3PE	C36-C37-C38-C39
3	A	806	3PE	O11-C1-C2-O21
2	A	805	CLR	C13-C17-C20-C21
2	A	808	CLR	C13-C17-C20-C21
2	A	801	CLR	C21-C20-C22-C23
2	B	801	CLR	C21-C20-C22-C23
3	A	802	3PE	C1-C2-C3-O31
2	A	805	CLR	C16-C17-C20-C22
2	A	805	CLR	C16-C17-C20-C21
4	B	807	PLM	CA-CB-CC-CD
2	A	808	CLR	C16-C17-C20-C22
4	A	809	PLM	CA-CB-CC-CD
2	A	808	CLR	C16-C17-C20-C21
2	B	804	CLR	C16-C17-C20-C21
2	B	804	CLR	C13-C17-C20-C21
2	A	807	CLR	C20-C22-C23-C24
3	B	805	3PE	C27-C28-C29-C2A
2	B	804	CLR	C16-C17-C20-C22
3	B	805	3PE	O11-C1-C2-C3
3	A	806	3PE	C1-C2-C3-O31
3	B	802	3PE	C1-C2-C3-O31
5	A	810	ACD	C6-C7-C8-C9
3	A	806	3PE	C32-C33-C34-C35
3	A	806	3PE	C39-C3A-C3B-C3C
3	B	802	3PE	O11-C1-C2-O21
3	B	802	3PE	C26-C27-C28-C29
3	B	802	3PE	C34-C35-C36-C37
2	A	804	CLR	C20-C22-C23-C24

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Mol	Chain	Res	Type	Atoms
3	A	802	3PE	C26-C27-C28-C29
3	B	803	3PE	C27-C28-C29-C2A
3	A	806	3PE	O11-C1-C2-C3
3	B	802	3PE	O11-C1-C2-C3
3	B	803	3PE	C2D-C2E-C2F-C2G
3	A	806	3PE	C22-C23-C24-C25
3	A	802	3PE	C35-C36-C37-C38
3	A	806	3PE	C32-C31-O31-C3
3	B	805	3PE	C2-C1-O11-P
3	A	802	3PE	C21-C22-C23-C24
3	B	805	3PE	C25-C26-C27-C28
3	B	802	3PE	C3B-C3C-C3D-C3E
3	A	802	3PE	O21-C2-C3-O31
3	A	806	3PE	O21-C2-C3-O31
3	A	802	3PE	C24-C25-C26-C27
3	A	806	3PE	O32-C31-O31-C3
3	A	806	3PE	C2-C1-O11-P
3	A	802	3PE	C2E-C2F-C2G-C2H
2	A	804	CLR	C13-C17-C20-C21
3	A	806	3PE	C1-O11-P-O13
3	B	802	3PE	C1-O11-P-O13
3	B	805	3PE	C1-O11-P-O13
3	B	803	3PE	C32-C33-C34-C35
3	B	805	3PE	C1-C2-C3-O31
3	A	806	3PE	C36-C37-C38-C39
3	A	803	3PE	C36-C37-C38-C39
3	B	802	3PE	C24-C25-C26-C27
3	A	806	3PE	C2D-C2E-C2F-C2G
3	B	805	3PE	C26-C27-C28-C29
2	A	804	CLR	C13-C17-C20-C22
4	A	809	PLM	O2-C1-C2-C3
5	B	808	ACD	C11-C12-C13-C14
3	A	806	3PE	C37-C38-C39-C3A
3	A	803	3PE	C38-C39-C3A-C3B
2	A	808	CLR	C20-C22-C23-C24
3	B	802	3PE	O21-C2-C3-O31
3	A	802	3PE	C2B-C2C-C2D-C2E
3	B	802	3PE	C2B-C2C-C2D-C2E
3	A	802	3PE	C32-C33-C34-C35
3	B	802	3PE	C32-C33-C34-C35
3	B	803	3PE	C1-O11-P-O13
4	A	809	PLM	O1-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
3	A	803	3PE	C2B-C2C-C2D-C2E
3	B	802	3PE	C2E-C2F-C2G-C2H
3	B	805	3PE	C2F-C2G-C2H-C2I
3	B	803	3PE	O21-C21-C22-C23
2	A	804	CLR	C16-C17-C20-C22
3	A	803	3PE	O21-C21-C22-C23
3	B	805	3PE	O21-C21-C22-C23
3	A	806	3PE	O21-C21-C22-C23
2	A	807	CLR	C23-C24-C25-C27
3	B	803	3PE	O22-C21-C22-C23
3	A	806	3PE	C34-C35-C36-C37
3	A	806	3PE	C3D-C3E-C3F-C3G
3	A	803	3PE	O22-C21-C22-C23
3	B	805	3PE	O22-C21-C22-C23
3	B	802	3PE	C35-C36-C37-C38
3	B	805	3PE	C21-C22-C23-C24
3	A	806	3PE	C1-O11-P-O14
3	A	806	3PE	C11-O13-P-O14
3	B	802	3PE	C1-O11-P-O14
3	B	803	3PE	C1-O11-P-O14
5	A	810	ACD	O2-C1-C2-C3
5	B	808	ACD	O2-C1-C2-C3
5	A	810	ACD	O1-C1-C2-C3
2	B	806	CLR	C22-C23-C24-C25
5	B	808	ACD	O1-C1-C2-C3
3	A	806	3PE	O22-C21-C22-C23
3	B	805	3PE	C35-C36-C37-C38

There are no ring outliers.

14 monomers are involved in 34 short contacts:

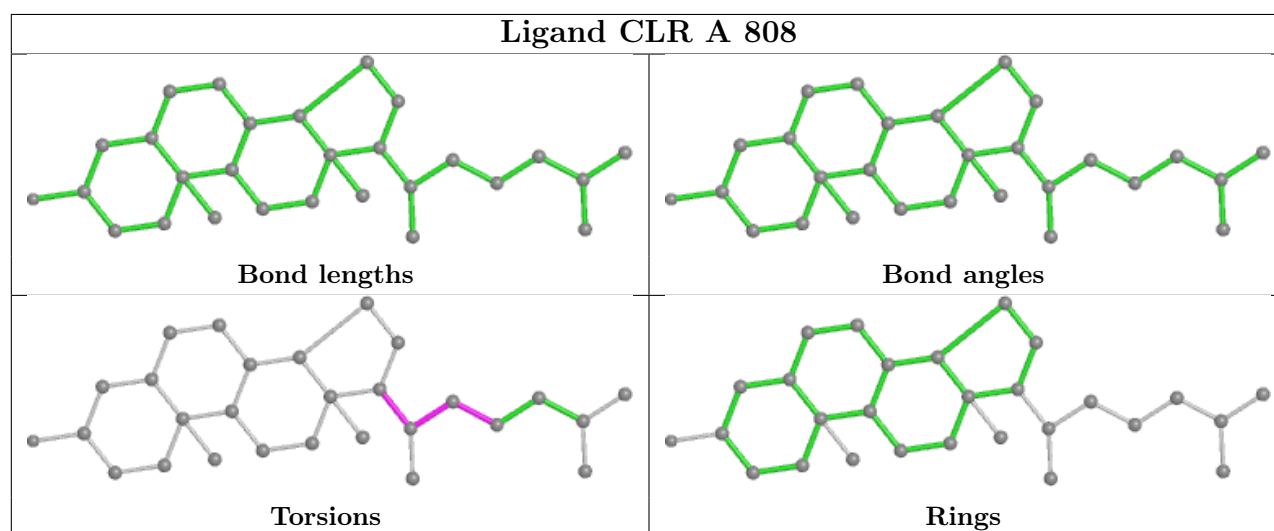
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	803	3PE	2	0
3	B	802	3PE	4	0
3	B	805	3PE	3	0
2	A	804	CLR	2	0
2	B	801	CLR	1	0
2	B	806	CLR	2	0
2	A	807	CLR	2	0
3	A	802	3PE	3	0
2	B	804	CLR	3	0
2	A	805	CLR	1	0

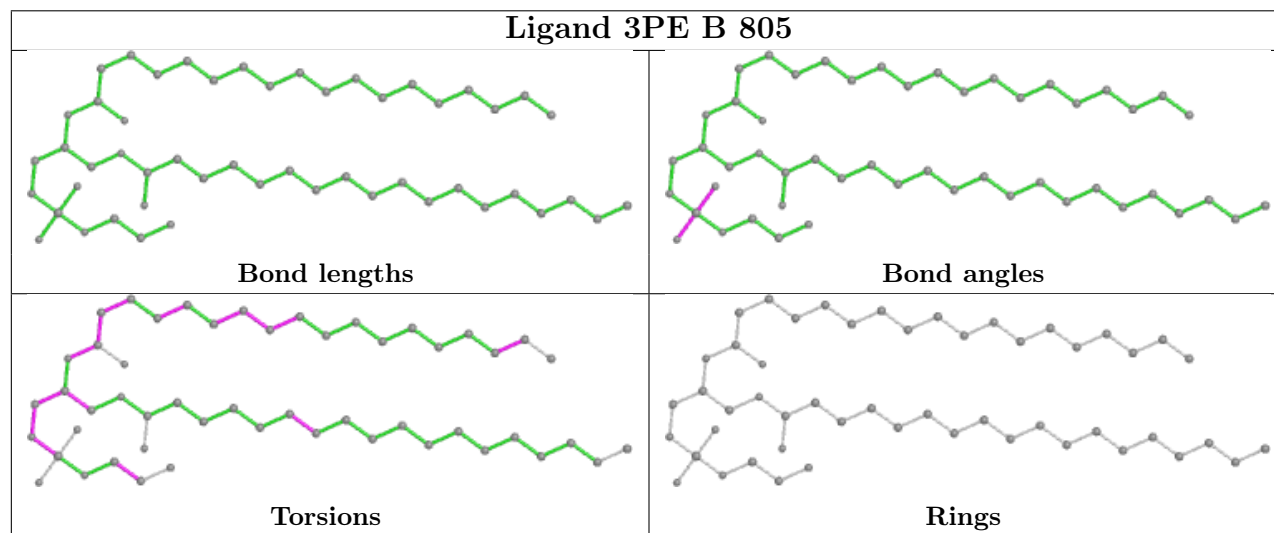
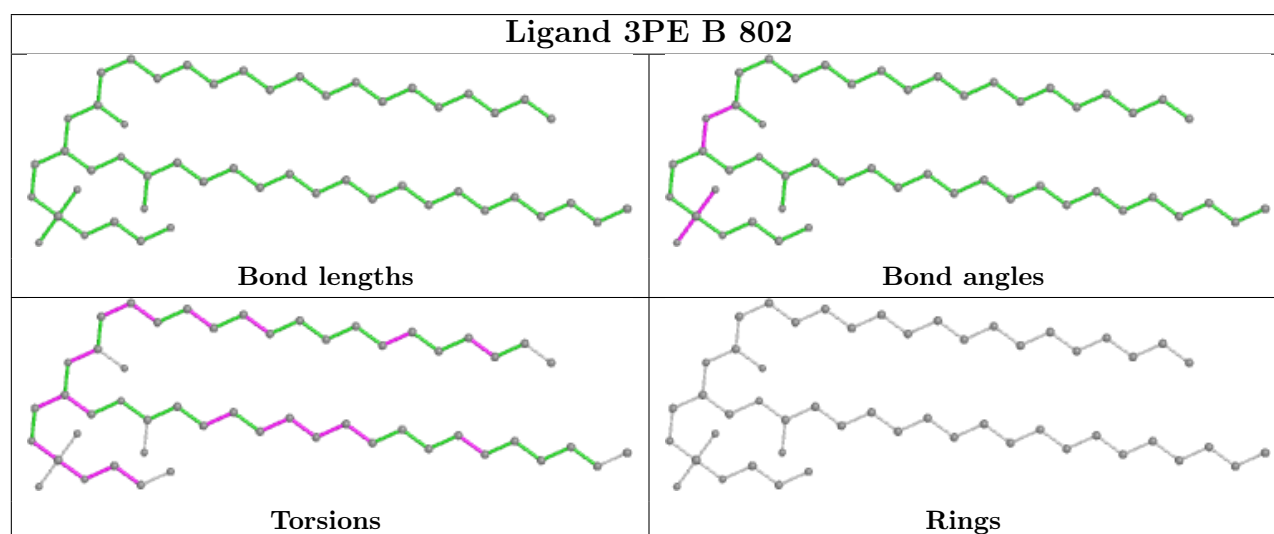
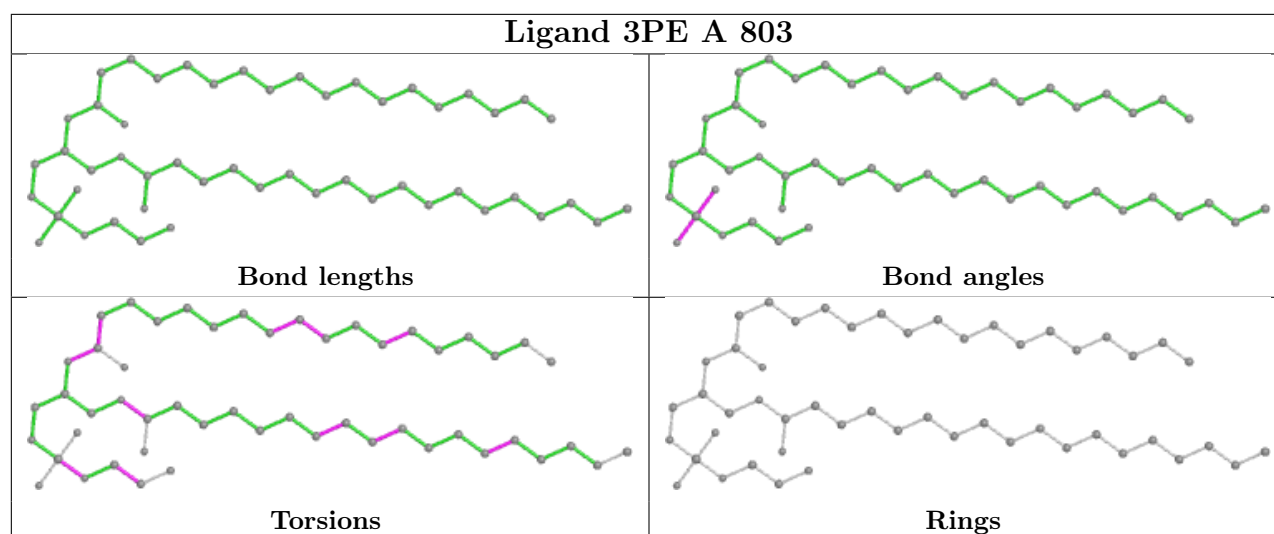
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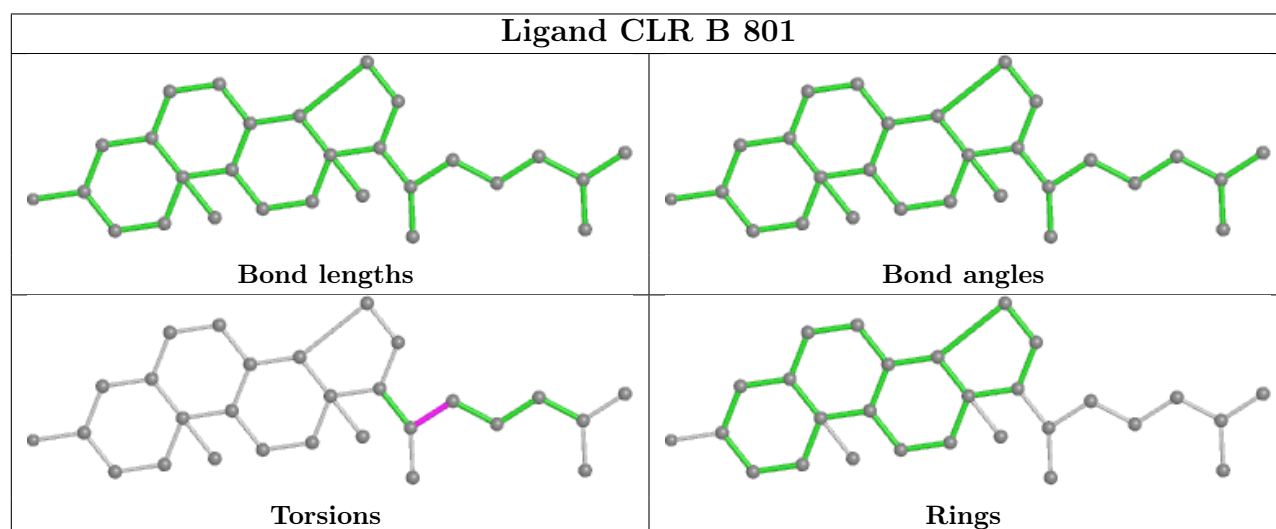
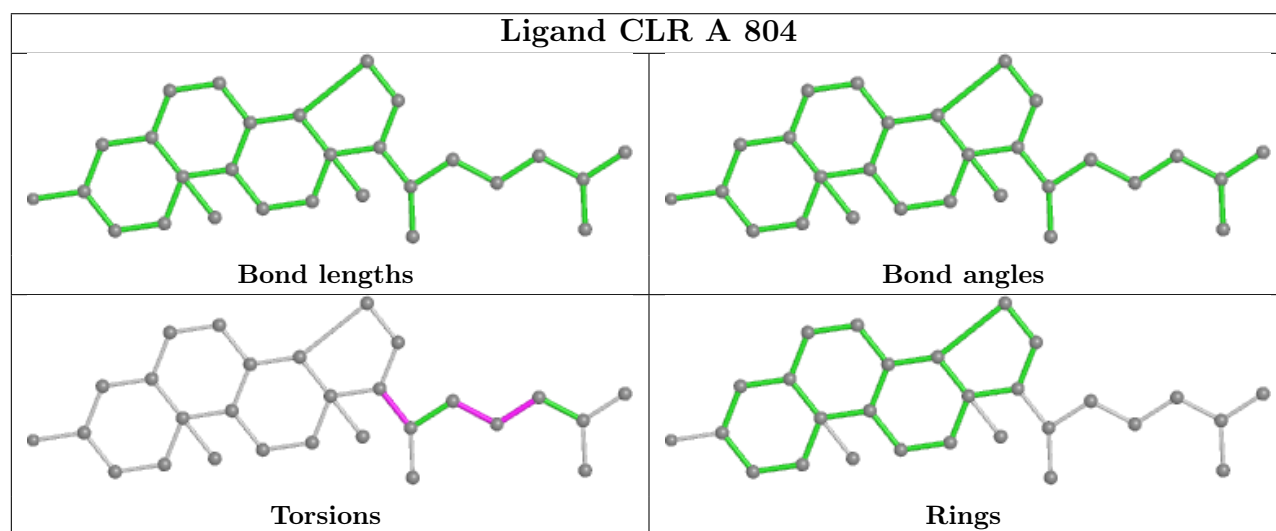
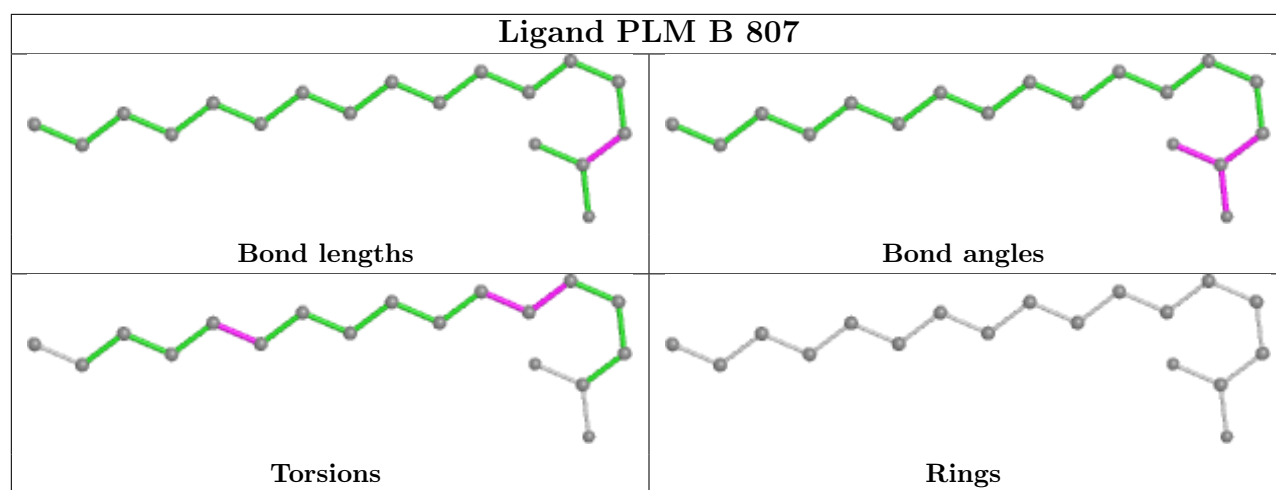
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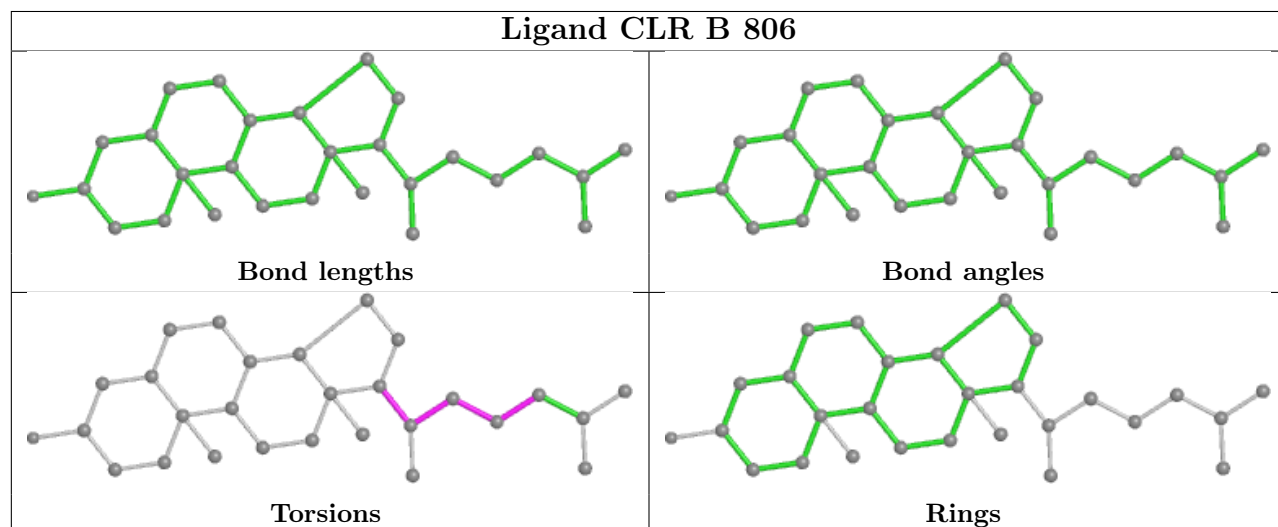
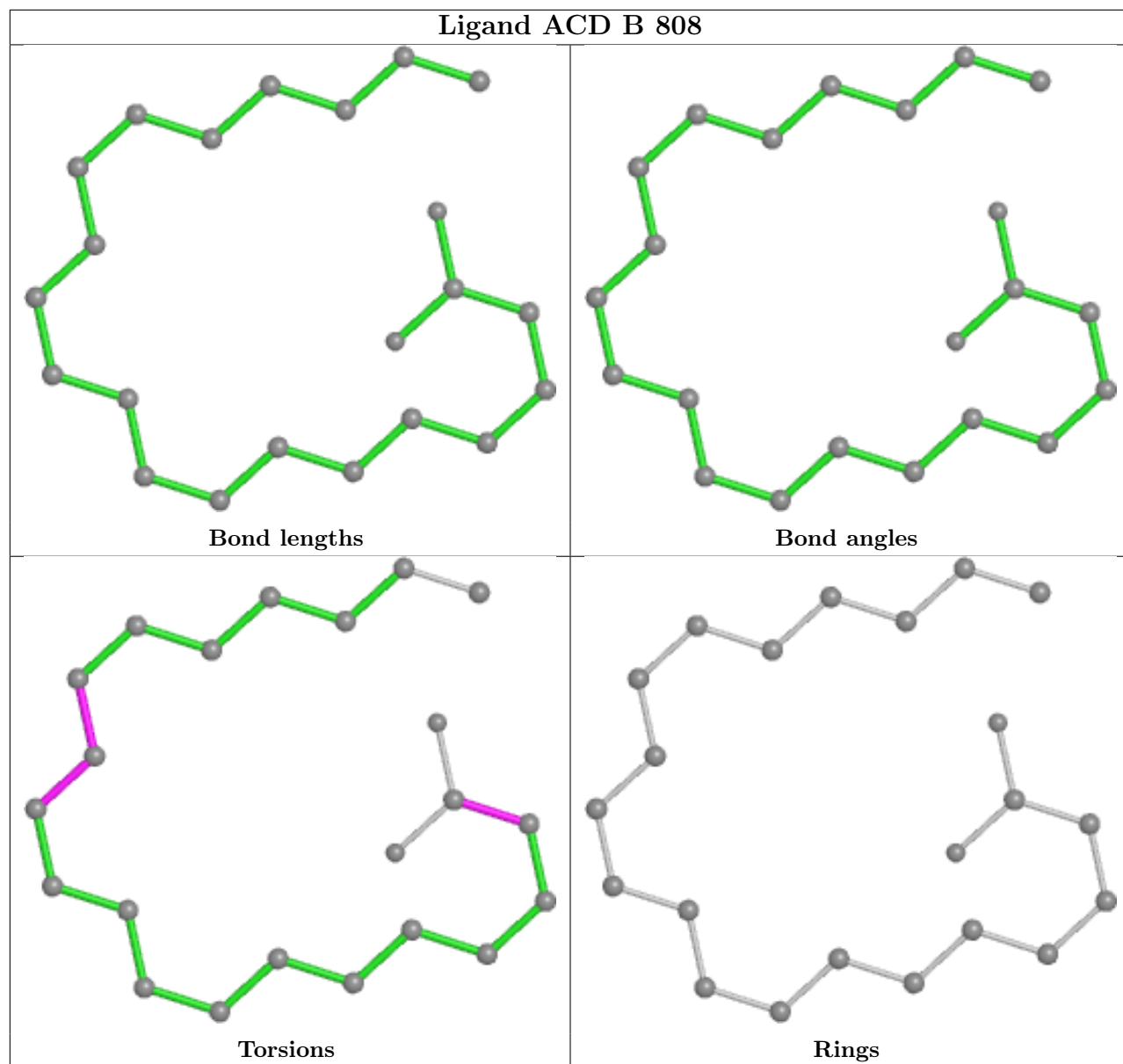
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	801	CLR	2	0
3	B	803	3PE	4	0
4	A	809	PLM	1	0
3	A	806	3PE	6	0

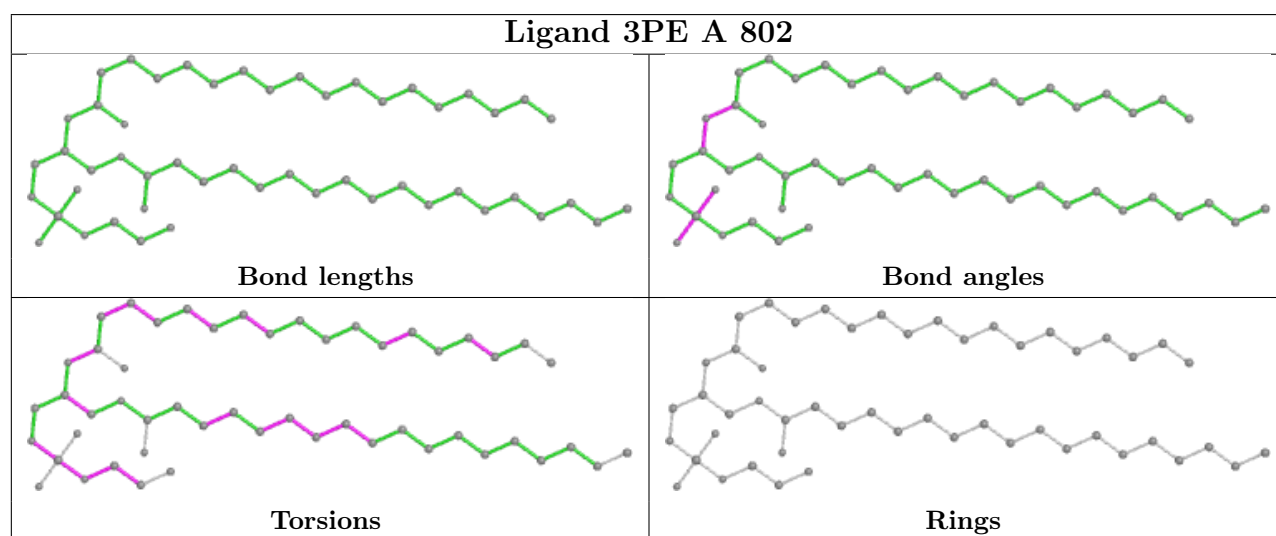
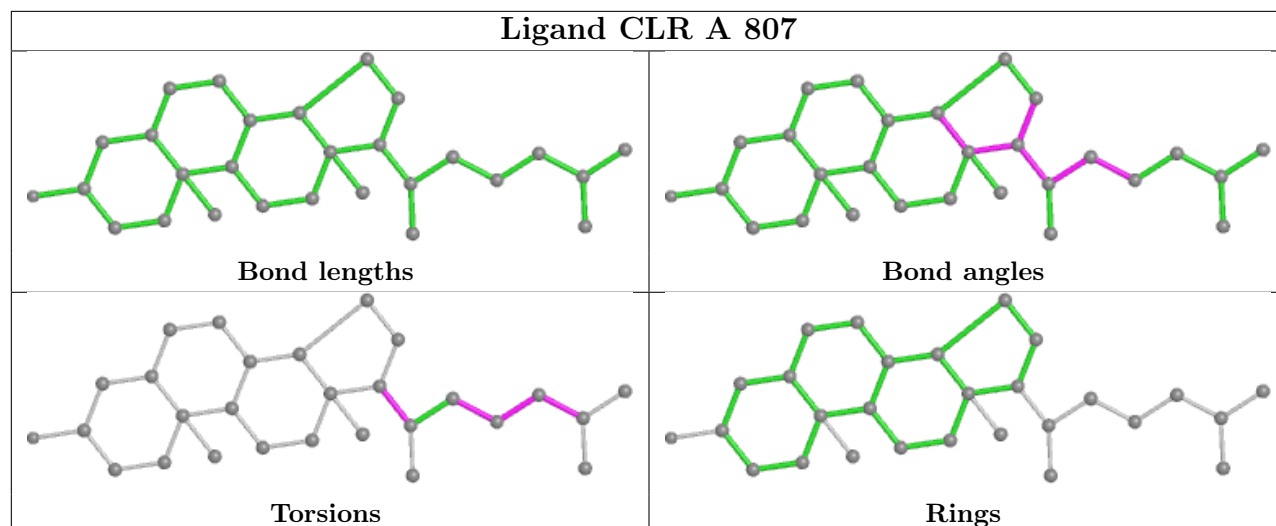
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

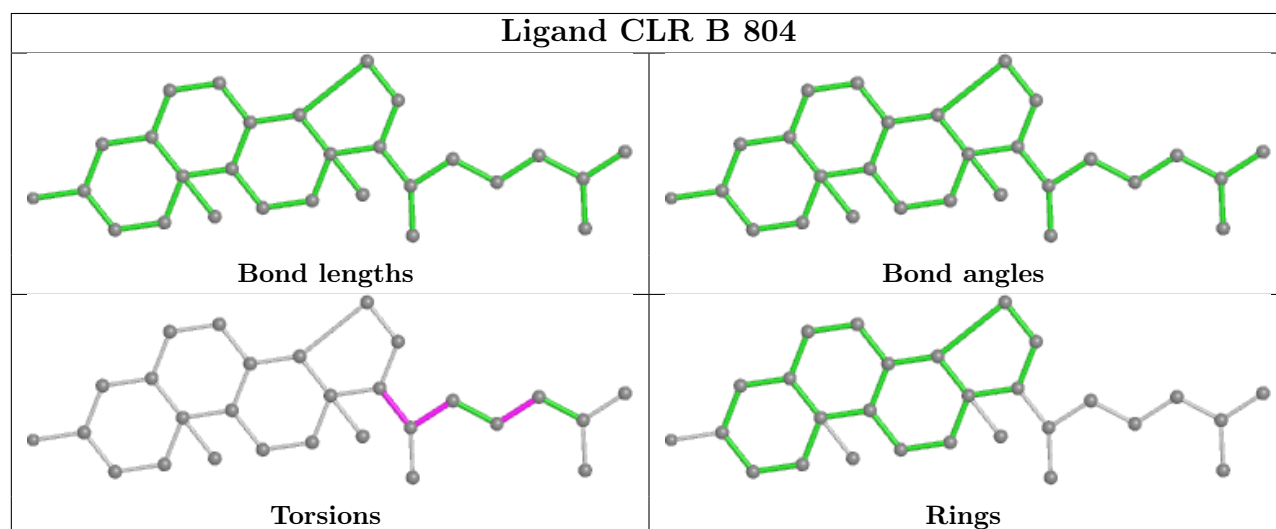
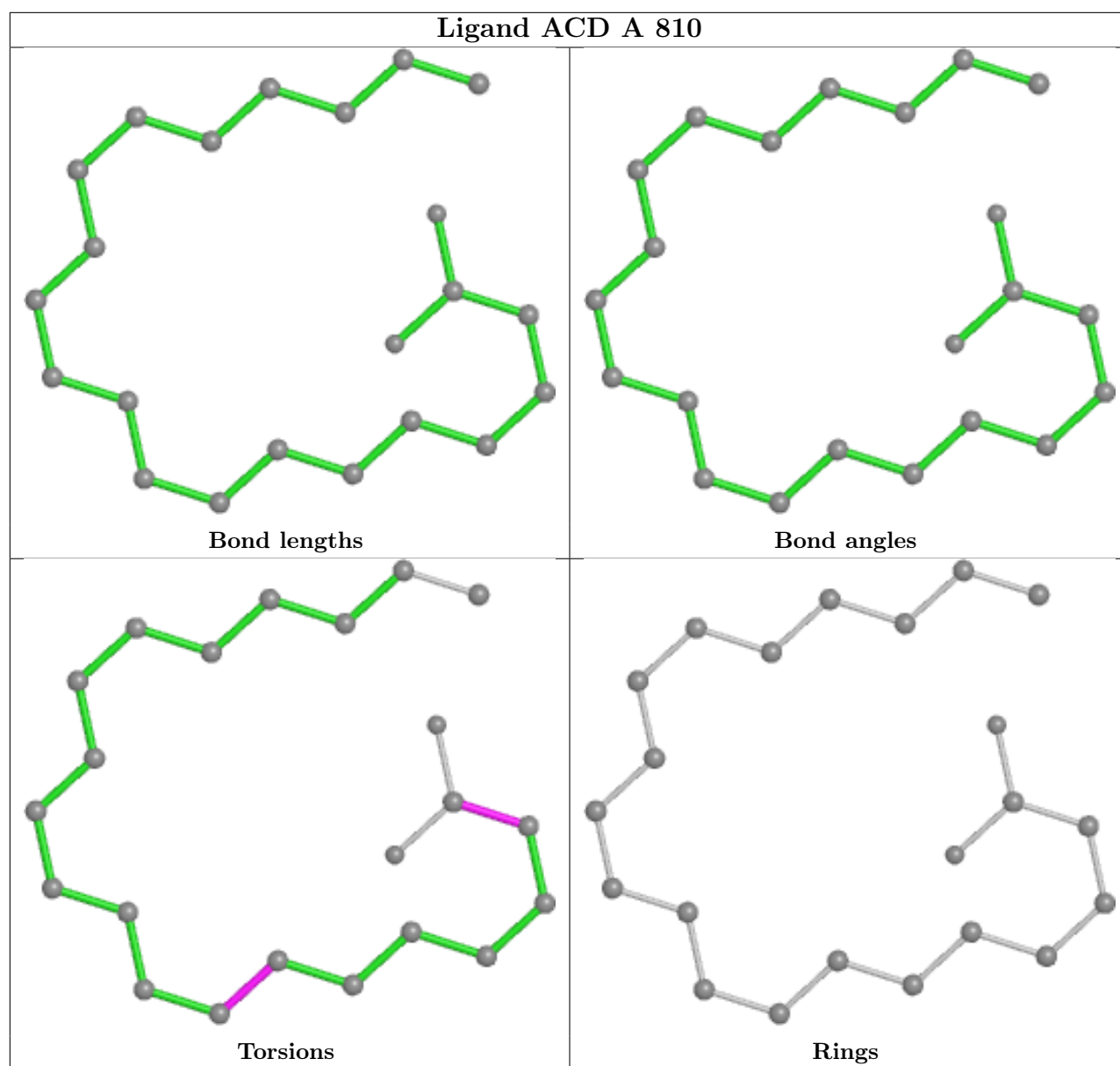


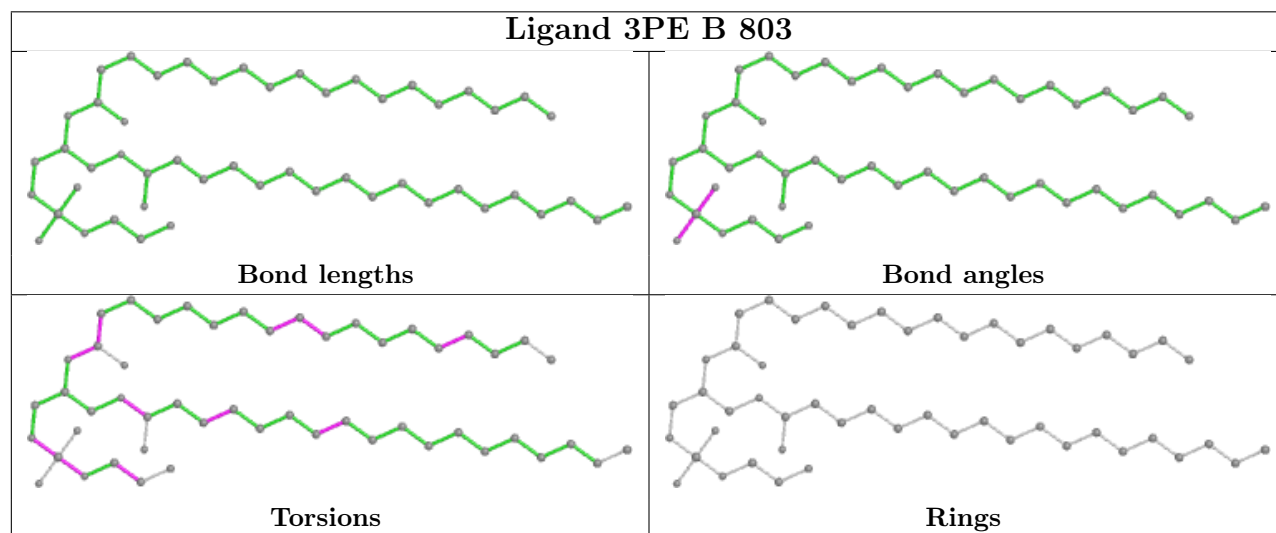
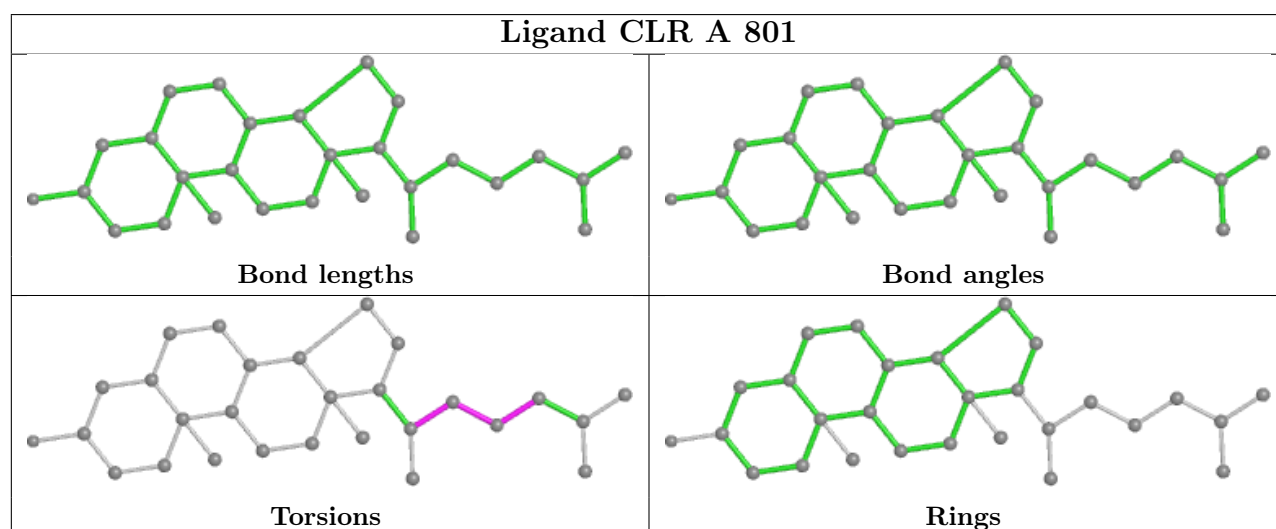
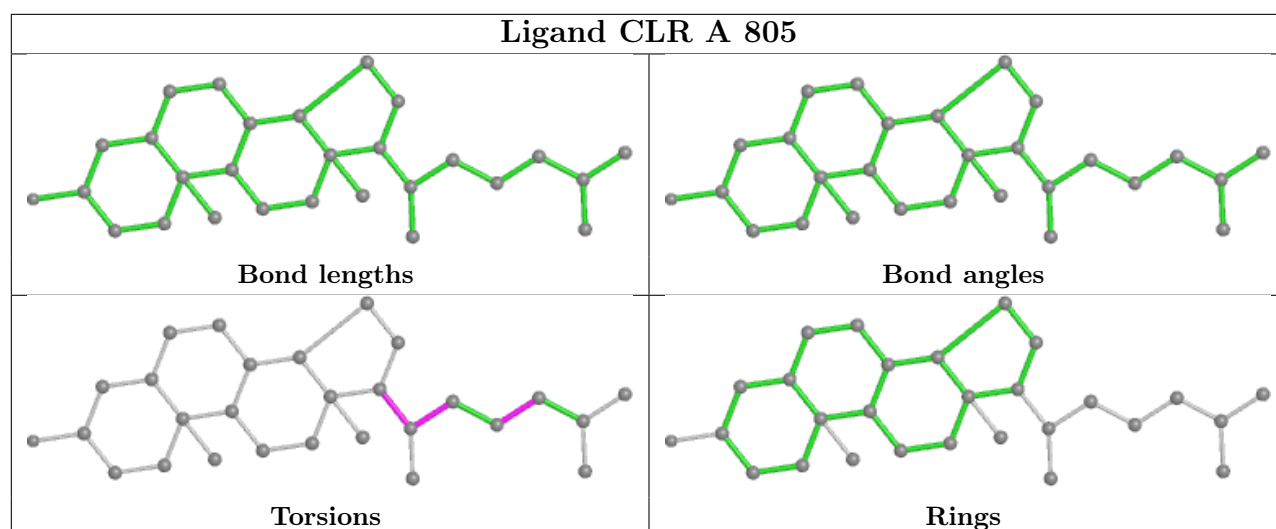


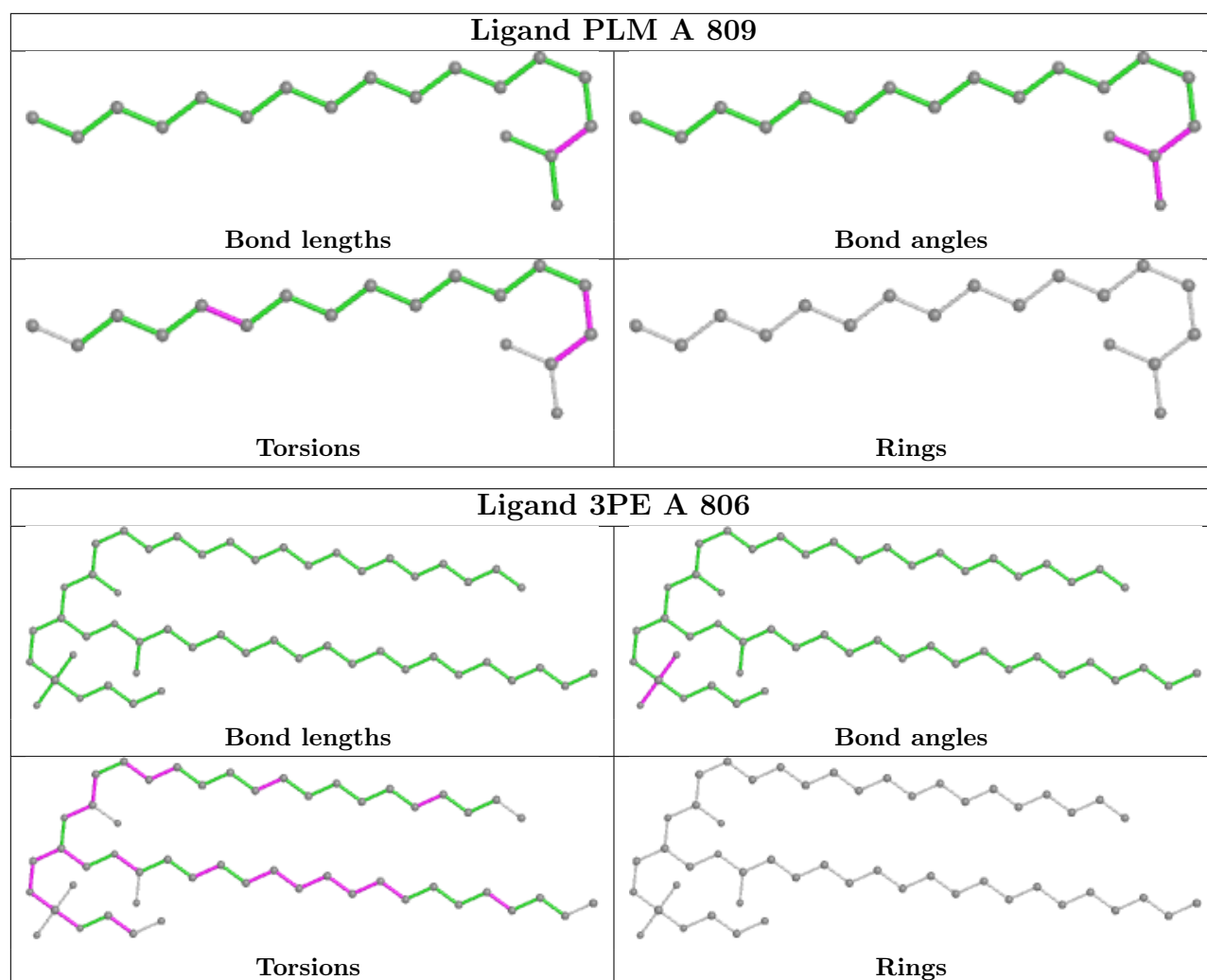












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.