



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 3, 2023 – 04:10 AM EDT

PDB ID : 1G0H
Title : CRYSTAL STRUCTURE OF MJ0109 GENE PRODUCT INOSITOL MONOPHOSPHATASE-FRUCTOSE 1,6 BISPHOSPHATASE
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Deposited on : 2000-10-06
Resolution : 2.30 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 2.34
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) : 2.34

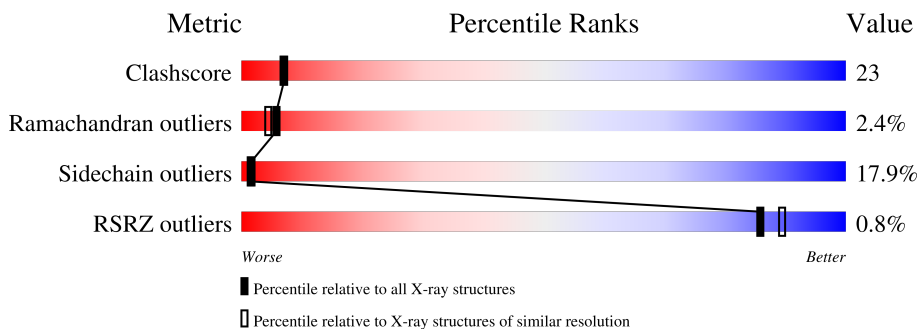
1 Overall quality at a glance

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	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	252	
1	B	252	

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 4150 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.

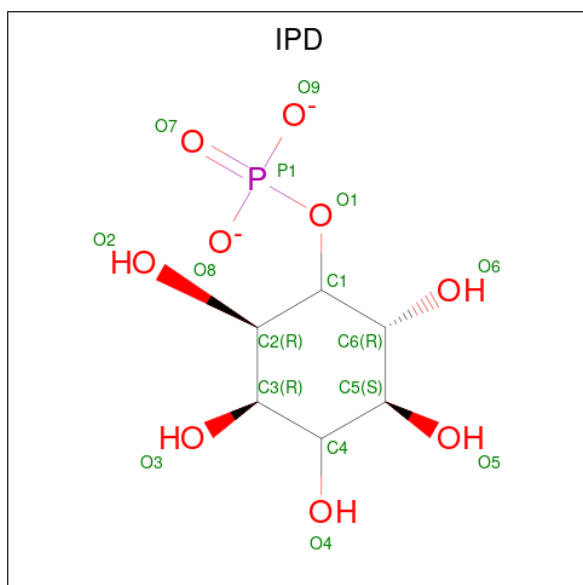
- Molecule 1 is a protein called INOSITOL MONOPHOSPHATASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	252	Total 2018	C 1309	N 321	O 382	S 6	0	0	0
1	B	252	Total 2018	C 1309	N 321	O 382	S 6	0	0	0

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total 2	Ca 2	0	0
2	B	2	Total 2	Ca 2	0	0

- Molecule 3 is D-MYO-INOSITOL-1-PHOSPHATE (three-letter code: IPD) (formula: C₆H₁₁O₉P).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	O	P	0	0
			16	6	9	1		
3	B	1	Total	C	O	P	0	0
			16	6	9	1		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	35	Total	O	0	0
			35	35		
4	B	43	Total	O	0	0
			43	43		

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	65.18Å 75.89Å 131.81Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	12.00 – 2.30 58.43 – 2.23	Depositor EDS
% Data completeness (in resolution range)	97.4 (12.00-2.30) 92.6 (58.43-2.23)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.78 (at 2.25Å)	Xtrriage
Refinement program	SHELXL-97	Depositor
R, R_{free}	0.224 , 0.279 0.215 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	35.6	Xtrriage
Anisotropy	0.232	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 141.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	4150	wwPDB-VP
Average B, all atoms (Å ²)	53.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.96% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

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

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	0.31	0/2058	0.88	0/2774
1	B	0.31	0/2058	0.88	0/2774
All	All	0.31	0/4116	0.88	0/5548

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	2018	0	2035	99	0
1	B	2018	0	2032	88	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
3	A	16	0	11	1	0
3	B	16	0	11	0	0
4	A	35	0	0	1	0
4	B	43	0	0	3	0
All	All	4150	0	4089	186	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 23.

All (186) 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:161:LYS:HB3	1:A:251:LEU:HD21	1.66	0.77
1:B:352:LEU:HD23	1:B:356:LYS:HE2	1.67	0.76
1:A:63:VAL:HG22	1:A:69:VAL:HG22	1.70	0.74
1:A:87:PHE:HB3	4:A:625:HOH:O	1.88	0.72
1:A:193:VAL:HG11	1:A:252:LEU:HD22	1.73	0.71
1:A:243:GLU:O	1:A:246:ASP:HB2	1.91	0.71
1:B:450:SER:HB3	1:B:490:VAL:HG23	1.73	0.71
1:B:493:VAL:HG11	1:B:552:LEU:HD21	1.72	0.70
1:B:426:LYS:HE2	1:B:427:GLY:N	2.07	0.69
1:A:118:THR:HG23	1:A:120:SER:OG	1.92	0.69
1:B:368:GLY:HA2	1:B:530:ALA:HB3	1.75	0.67
1:B:478:GLU:O	1:B:481:TYR:HB2	1.95	0.66
1:B:324:ARG:HD3	1:B:327:LYS:HD3	1.76	0.66
1:A:18:ILE:HD13	1:A:83:ILE:HD11	1.78	0.65
1:B:340:THR:HG23	1:B:366:GLU:HG2	1.79	0.64
1:B:407:GLU:HA	1:B:407:GLU:OE1	1.97	0.64
1:A:26:ASP:OD1	1:A:27:LYS:HG3	1.98	0.64
1:B:334:SER:HB3	1:B:366:GLU:HG3	1.80	0.64
1:A:76:TRP:CZ2	1:A:104:LYS:HG3	2.34	0.63
1:B:313:GLU:HG2	1:B:350:ILE:HG21	1.81	0.62
1:A:194:ARG:NH2	1:A:196:LYS:HB2	2.14	0.62
1:B:448:VAL:HG22	1:B:468:ARG:HB2	1.81	0.62
1:A:193:VAL:O	1:A:195:PRO:HD3	1.99	0.61
1:A:231:THR:O	1:A:232:ASP:HB2	2.01	0.61
1:A:192:ASP:OD1	1:A:194:ARG:HG3	2.00	0.61
1:A:115:GLU:HG2	1:A:118:THR:HG22	1.84	0.60
1:B:518:ASP:HB2	1:B:519:GLU:OE1	2.02	0.59
1:B:461:LYS:O	1:B:465:LYS:HG2	2.03	0.59
1:A:247:ILE:O	1:A:251:LEU:HD12	2.02	0.59
1:A:108:PRO:HB3	1:A:207:ILE:HG12	1.83	0.59
3:A:292:IPD:O8	3:A:292:IPD:O6	2.22	0.58
1:B:315:GLU:HG3	1:B:416:PHE:HD2	1.68	0.58
1:B:381:ASP:HB2	1:B:500:VAL:HG12	1.85	0.58
1:B:305:GLU:O	1:B:309:ASN:HB2	2.04	0.58
1:A:155:LYS:HD2	1:A:155:LYS:H	1.68	0.58
1:B:333:THR:HG23	1:B:337:GLY:HA2	1.84	0.58
1:A:252:LEU:OXT	1:A:252:LEU:HG	2.02	0.58
1:A:8:LYS:HG2	1:A:121:PHE:CE2	2.38	0.57
1:B:388:ASN:HB3	1:B:393:ILE:HB	1.86	0.57
1:A:234:LEU:O	1:A:234:LEU:HD12	2.04	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:150:SER:O	1:A:190:VAL:HA	2.05	0.56
1:A:147:ILE:HA	1:A:188:ASP:OD1	2.06	0.56
1:B:498:ARG:HH11	1:B:498:ARG:HG3	1.71	0.56
1:B:352:LEU:HD23	1:B:356:LYS:CE	2.35	0.56
1:B:324:ARG:HD3	1:B:327:LYS:CD	2.35	0.56
1:B:440:LYS:HD3	1:B:488:ASP:OD2	2.06	0.56
1:B:492:ASP:OD1	1:B:494:ARG:HG3	2.05	0.55
1:B:517:THR:HG21	1:B:545:LEU:HD21	1.88	0.55
1:B:333:THR:CG2	1:B:337:GLY:HA2	2.37	0.55
1:A:194:ARG:O	1:A:194:ARG:HD2	2.07	0.55
1:A:68:GLY:HA2	1:A:230:ALA:CB	2.37	0.55
1:A:47:SER:OG	1:A:82:PRO:HB2	2.08	0.54
1:B:450:SER:CB	1:B:490:VAL:HG23	2.37	0.54
1:B:367:LEU:HD11	1:B:370:ILE:HD11	1.89	0.54
1:B:325:LYS:O	1:B:325:LYS:HG3	2.07	0.54
1:A:24:ARG:HB3	1:A:27:LYS:HD2	1.90	0.53
1:A:55:LEU:CD1	1:A:78:VAL:HG11	2.38	0.53
1:A:18:ILE:O	1:A:89:PHE:HZ	1.90	0.53
1:A:76:TRP:CZ3	1:A:104:LYS:HB2	2.44	0.52
1:B:367:LEU:O	1:B:367:LEU:HG	2.09	0.52
1:A:108:PRO:CB	1:A:207:ILE:HG12	2.39	0.52
1:B:313:GLU:HG2	1:B:350:ILE:CG2	2.39	0.52
1:A:165:LYS:HD2	1:A:247:ILE:HG23	1.91	0.51
1:B:395:PHE:CD1	1:B:472:PHE:HB3	2.46	0.51
1:B:334:SER:CB	1:B:366:GLU:HG3	2.40	0.51
1:A:224:LEU:HG	1:A:225:LYS:N	2.25	0.51
1:B:447:ILE:HG21	1:B:466:VAL:HG12	1.93	0.51
1:B:494:ARG:O	1:B:494:ARG:HD2	2.10	0.51
1:B:384:ASP:O	1:B:396:PHE:HA	2.11	0.50
1:B:447:ILE:HB	1:B:466:VAL:HA	1.93	0.50
1:B:353:LYS:HE2	1:B:354:TYR:CE1	2.46	0.50
1:A:204:SER:O	1:A:208:ILE:HG13	2.12	0.50
1:B:531:THR:O	1:B:532:ASP:O	2.30	0.50
1:A:192:ASP:OD1	1:A:194:ARG:O	2.30	0.50
1:B:386:SER:O	1:B:389:PHE:HB3	2.12	0.49
1:B:322:PHE:CE2	1:B:392:GLY:HA2	2.48	0.49
1:B:412:LEU:HD11	1:B:421:PHE:HD2	1.77	0.49
1:A:139:VAL:HB	1:A:240:ASN:HB2	1.96	0.48
1:A:43:PHE:HE2	1:A:90:ILE:HG12	1.78	0.48
1:A:217:THR:HG21	1:A:245:LEU:HD22	1.95	0.48
1:A:42:ILE:HD12	1:A:42:ILE:O	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:147:ILE:HG21	1:A:166:VAL:HG12	1.95	0.48
1:B:531:THR:HG22	1:B:532:ASP:H	1.78	0.48
1:A:40:THR:OG1	1:A:66:GLU:HG2	2.13	0.47
1:A:94:PRO:CB	1:A:117:LEU:HD12	2.44	0.47
1:A:24:ARG:CB	1:A:27:LYS:HD2	2.43	0.47
1:A:24:ARG:CD	1:A:27:LYS:HD2	2.44	0.47
1:A:104:LYS:O	1:A:105:ASN:HB2	2.14	0.47
1:B:432:LEU:O	1:B:433:ASN:HB2	2.13	0.47
1:A:76:TRP:CH2	1:A:104:LYS:HG3	2.49	0.47
1:B:490:VAL:HG12	1:B:538:VAL:HG22	1.95	0.47
1:A:33:THR:HA	1:A:38:ASP:O	2.15	0.47
1:A:245:LEU:HG	1:A:249:LEU:HD12	1.97	0.47
1:B:376:TRP:CZ3	1:B:404:LYS:HB2	2.50	0.47
1:A:68:GLY:HA2	1:A:230:ALA:HB3	1.97	0.47
1:A:24:ARG:HE	1:A:27:LYS:HD2	1.80	0.46
1:B:537:ILE:HG21	1:B:545:LEU:HD13	1.97	0.46
1:A:203:ALA:O	1:A:206:TYR:HB3	2.15	0.46
1:A:138:LYS:HA	1:A:138:LYS:HD2	1.79	0.46
1:A:131:TYR:HA	1:A:135:ARG:O	2.16	0.46
1:A:138:LYS:HD2	1:A:212:ALA:O	2.16	0.46
1:A:233:ARG:HH21	1:A:233:ARG:HG2	1.80	0.46
1:B:360:VAL:HG21	1:B:378:VAL:HG23	1.98	0.46
1:A:194:ARG:HH21	1:A:196:LYS:HB2	1.80	0.46
1:B:388:ASN:CB	1:B:393:ILE:HB	2.46	0.46
1:A:155:LYS:H	1:A:155:LYS:CD	2.29	0.46
1:B:454:SER:HB3	1:B:493:VAL:O	2.16	0.46
1:A:142:PHE:HE1	1:A:144:PRO:HB3	1.81	0.45
1:A:55:LEU:HD11	1:A:78:VAL:HG11	1.98	0.45
1:A:122:TYR:CE2	1:A:132:LEU:HG	2.51	0.45
1:A:197:VAL:CG2	1:A:201:ASP:HB2	2.46	0.45
1:A:244:MET:HE3	1:A:248:ILE:HG13	1.99	0.45
1:B:340:THR:CG2	1:B:366:GLU:HG2	2.45	0.45
1:B:341:GLU:O	1:B:344:ASP:HB2	2.16	0.45
1:A:3:TRP:CD2	1:A:102:VAL:HG11	2.52	0.45
1:A:246:ASP:O	1:A:249:LEU:N	2.50	0.45
1:A:120:SER:HB3	1:A:132:LEU:HD21	1.98	0.45
1:A:160:GLU:O	1:A:164:ASN:HB2	2.17	0.45
1:B:519:GLU:OE1	1:B:519:GLU:N	2.50	0.45
1:A:8:LYS:HG2	1:A:121:PHE:CD2	2.51	0.44
1:A:16:LYS:NZ	1:A:17:GLU:OE2	2.48	0.44
1:B:529:ASN:ND2	1:B:531:THR:O	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:336:SER:OG	1:B:337:GLY:N	2.50	0.44
1:B:365:GLU:HB2	1:B:500:VAL:HG11	1.98	0.44
1:B:531:THR:HG22	1:B:532:ASP:N	2.33	0.44
1:A:25:LYS:HB3	1:A:25:LYS:HE3	1.58	0.44
1:B:457:ILE:HD12	1:B:457:ILE:N	2.33	0.44
1:B:438:LYS:NZ	4:B:649:HOH:O	2.50	0.44
1:B:358:LEU:N	1:B:358:LEU:HD23	2.32	0.44
1:B:506:TYR:CD1	1:B:516:ILE:HD13	2.53	0.44
1:A:8:LYS:NZ	1:A:123:GLU:OE2	2.50	0.43
1:B:363:VAL:HB	1:B:379:VAL:HG22	1.99	0.43
1:B:546:ASP:O	1:B:549:LEU:N	2.50	0.43
1:B:324:ARG:HH11	1:B:324:ARG:HB3	1.82	0.43
1:A:55:LEU:HD13	1:A:78:VAL:HG11	2.00	0.43
1:A:182:VAL:HG11	1:A:238:VAL:HG12	2.00	0.43
1:B:314:ILE:HD13	1:B:347:SER:HB2	1.99	0.43
1:B:324:ARG:NH1	1:B:326:ASP:OD2	2.51	0.43
1:A:3:TRP:CE2	1:A:102:VAL:HG11	2.54	0.43
1:A:55:LEU:HD13	1:A:62:ILE:HG23	1.99	0.43
1:A:171:ILE:O	1:B:470:ARG:HA	2.18	0.43
1:B:360:VAL:HB	1:B:376:TRP:O	2.18	0.43
1:B:367:LEU:HD21	1:B:370:ILE:HG13	2.01	0.43
1:B:438:LYS:HB3	1:B:438:LYS:HE2	1.48	0.43
1:A:31:VAL:HG11	1:A:42:ILE:HA	2.01	0.43
1:A:171:ILE:O	1:A:171:ILE:HG22	2.19	0.43
1:B:532:ASP:O	1:B:532:ASP:OD2	2.35	0.43
1:A:159:LEU:HD13	4:B:669:HOH:O	2.19	0.43
1:B:467:LYS:HG3	1:B:467:LYS:O	2.19	0.43
1:A:4:ASP:HA	1:A:110:TYR:CE1	2.53	0.43
1:B:415:GLU:HG3	1:B:477:LEU:CD1	2.49	0.43
1:B:497:VAL:HG21	1:B:536:ILE:HG21	2.00	0.43
1:A:24:ARG:NE	1:A:27:LYS:HD2	2.35	0.42
1:A:170:ARG:HB3	1:A:172:PHE:CZ	2.55	0.42
1:B:468:ARG:NH2	4:B:623:HOH:O	2.52	0.42
1:A:48:GLU:HG3	1:A:52:LEU:HD13	2.00	0.42
1:A:237:ILE:HD13	1:A:248:ILE:HG21	2.00	0.42
1:A:197:VAL:HG22	1:A:198:ARG:N	2.34	0.42
1:A:50:ILE:HG22	1:A:51:ALA:N	2.33	0.42
1:A:110:TYR:OH	1:A:123:GLU:OE1	2.30	0.42
1:A:209:CYS:O	1:A:212:ALA:HB3	2.20	0.42
1:B:418:THR:HG22	1:B:420:SER:OG	2.19	0.42
1:B:488:ASP:O	1:B:489:ALA:HB2	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:424:ALA:HB1	1:B:511:GLU:HG3	2.02	0.42
1:A:80:ILE:HA	1:A:99:CYS:O	2.20	0.42
1:B:386:SER:O	1:B:389:PHE:N	2.52	0.42
1:A:157:ILE:HD11	1:A:193:VAL:HG21	2.00	0.42
1:A:42:ILE:O	1:A:46:ILE:HD12	2.20	0.41
1:A:75:GLU:O	1:A:105:ASN:N	2.49	0.41
1:B:447:ILE:CG2	1:B:466:VAL:HG12	2.50	0.41
1:B:454:SER:H	1:B:493:VAL:HG23	1.86	0.41
1:B:360:VAL:HG12	1:B:376:TRP:HB2	2.02	0.41
1:B:498:ARG:HG3	1:B:498:ARG:NH1	2.34	0.41
1:A:235:ASN:H	1:A:235:ASN:HD22	1.69	0.41
1:A:18:ILE:CD1	1:A:83:ILE:HD11	2.48	0.41
1:A:34:SER:N	1:A:38:ASP:O	2.50	0.41
1:A:167:LYS:HG2	1:A:168:ARG:HG3	2.02	0.41
1:A:233:ARG:HG2	1:A:233:ARG:NH2	2.35	0.41
1:B:315:GLU:HG3	1:B:416:PHE:CD2	2.51	0.41
1:A:148:VAL:HG21	1:B:387:PHE:HZ	1.85	0.40
1:A:233:ARG:H	1:A:233:ARG:HG3	1.59	0.40
1:B:310:ILE:O	1:B:314:ILE:HG13	2.21	0.40
1:B:367:LEU:HD21	1:B:370:ILE:CD1	2.51	0.40
1:A:196:LYS:HA	1:A:196:LYS:HD3	1.64	0.40
1:A:184:LYS:HE3	1:A:186:THR:OG1	2.21	0.40
1:B:457:ILE:HD12	1:B:457:ILE:H	1.86	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	250/252 (99%)	214 (86%)	30 (12%)	6 (2%)	6 4
1	B	250/252 (99%)	227 (91%)	17 (7%)	6 (2%)	6 4

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	500/504 (99%)	441 (88%)	47 (9%)	12 (2%)	6 4

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	336	SER
1	B	532	ASP
1	B	337	GLY
1	B	367	LEU
1	B	495	PRO
1	A	65	GLU
1	A	67	LEU
1	A	232	ASP
1	A	246	ASP
1	B	335	PRO
1	A	156	LYS
1	A	247	ILE

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	221/221 (100%)	177 (80%)	44 (20%)	1 1
1	B	221/221 (100%)	186 (84%)	35 (16%)	2 2
All	All	442/442 (100%)	363 (82%)	79 (18%)	2 1

All (79) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	LYS
1	A	9	ASN
1	A	16	LYS
1	A	19	LEU
1	A	25	LYS
1	A	26	ASP

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Mol	Chain	Res	Type
1	A	27	LYS
1	A	33	THR
1	A	34	SER
1	A	38	ASP
1	A	39	GLU
1	A	42	ILE
1	A	45	LYS
1	A	48	GLU
1	A	49	ASP
1	A	56	LYS
1	A	59	ASN
1	A	62	ILE
1	A	67	LEU
1	A	79	VAL
1	A	80	ILE
1	A	90	ILE
1	A	104	LYS
1	A	105	ASN
1	A	132	LEU
1	A	137	ILE
1	A	138	LYS
1	A	141	ASP
1	A	146	ASN
1	A	155	LYS
1	A	162	LEU
1	A	167	LYS
1	A	184	LYS
1	A	194	ARG
1	A	196	LYS
1	A	198	ARG
1	A	219	GLU
1	A	222	ASP
1	A	224	LEU
1	A	225	LYS
1	A	229	ASN
1	A	233	ARG
1	A	251	LEU
1	A	252	LEU
1	B	309	ASN
1	B	316	LYS
1	B	319	LEU
1	B	324	ARG

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Mol	Chain	Res	Type
1	B	325	LYS
1	B	328	SER
1	B	331	VAL
1	B	336	SER
1	B	338	ASP
1	B	352	LEU
1	B	353	LYS
1	B	364	SER
1	B	367	LEU
1	B	374	SER
1	B	375	GLU
1	B	383	ILE
1	B	395	PHE
1	B	405	ASN
1	B	407	GLU
1	B	420	SER
1	B	426	LYS
1	B	428	LYS
1	B	436	LYS
1	B	438	LYS
1	B	460	GLU
1	B	465	LYS
1	B	487	LEU
1	B	494	ARG
1	B	519	GLU
1	B	529	ASN
1	B	533	ARG
1	B	534	LEU
1	B	538	VAL
1	B	551	LEU
1	B	552	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	59	ASN
1	A	220	ASN
1	A	229	ASN
1	A	235	ASN
1	B	372	ASN
1	B	445	ASN
1	B	446	ASN

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Mol	Chain	Res	Type
1	B	529	ASN
1	B	535	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 [i](#)

Of 6 ligands modelled in this entry, 4 are monoatomic - leaving 2 for Mogul analysis.

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
3	IPD	A	292	2	16,16,16	1.16	2 (12%)	24,25,25	0.65	0
3	IPD	B	592	2	16,16,16	1.14	2 (12%)	24,25,25	0.82	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	IPD	A	292	2	-	1/5/29/29	0/1/1/1
3	IPD	B	592	2	-	0/5/29/29	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	592	IPD	C2-C1	2.50	1.59	1.52
3	A	292	IPD	C2-C1	2.48	1.59	1.52
3	A	292	IPD	C6-C1	2.07	1.57	1.52
3	B	592	IPD	C6-C1	2.04	1.57	1.52

There are no bond angle outliers.

There are no chirality outliers.

All (1) torsion outliers are listed below:

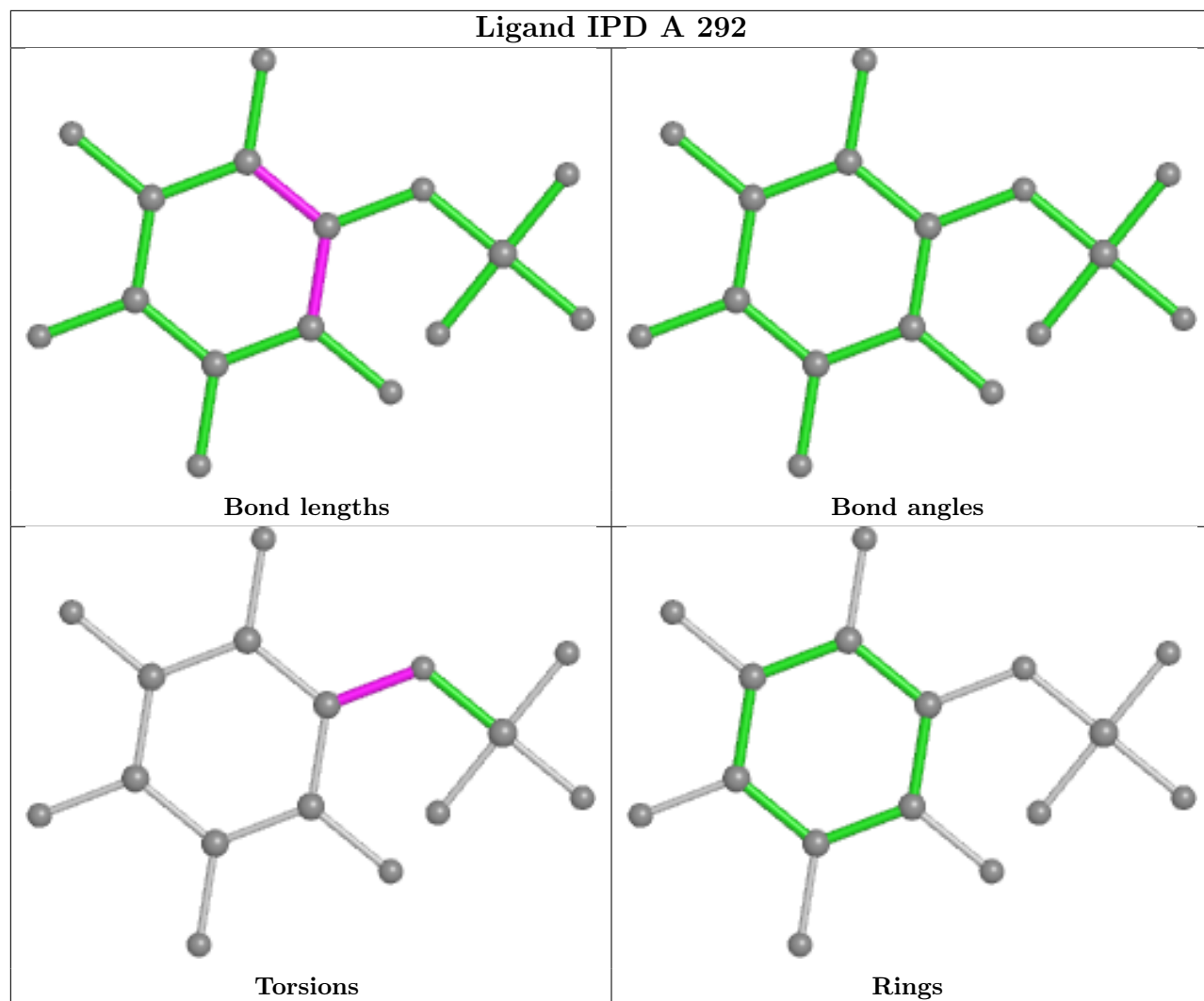
Mol	Chain	Res	Type	Atoms
3	A	292	IPD	C6-C1-O1-P1

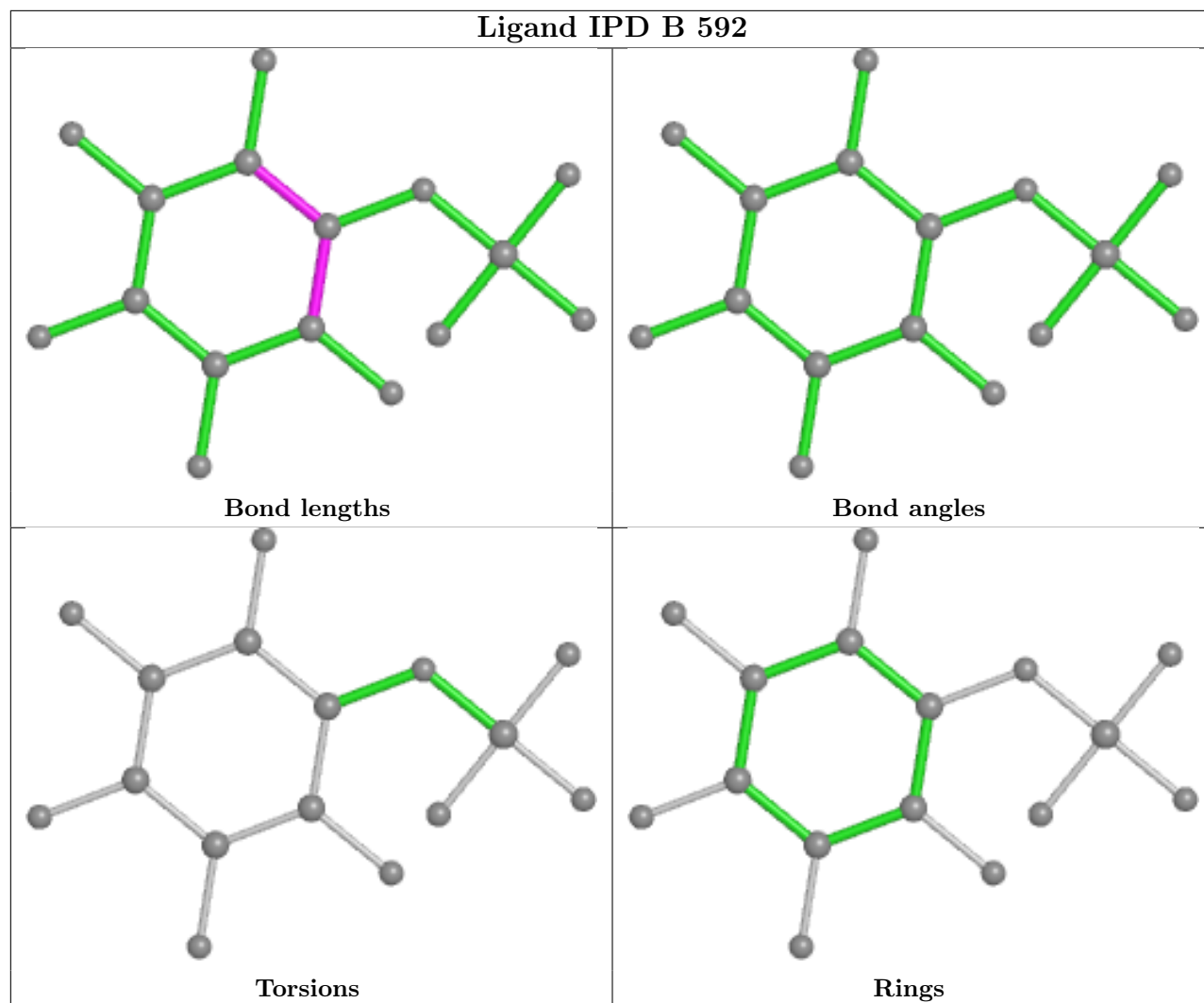
There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	292	IPD	1	0

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





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

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

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	252/252 (100%)	-0.14	2 (0%) 86 89	18, 49, 91, 113	0
1	B	252/252 (100%)	-0.07	2 (0%) 86 89	22, 47, 90, 126	0
All	All	504/504 (100%)	-0.11	4 (0%) 86 89	18, 48, 91, 126	0

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	334	SER	3.0
1	B	552	LEU	2.5
1	A	162	LEU	2.5
1	A	197	VAL	2.2

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

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

6.3 Carbohydrates [i](#)

There are no 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.

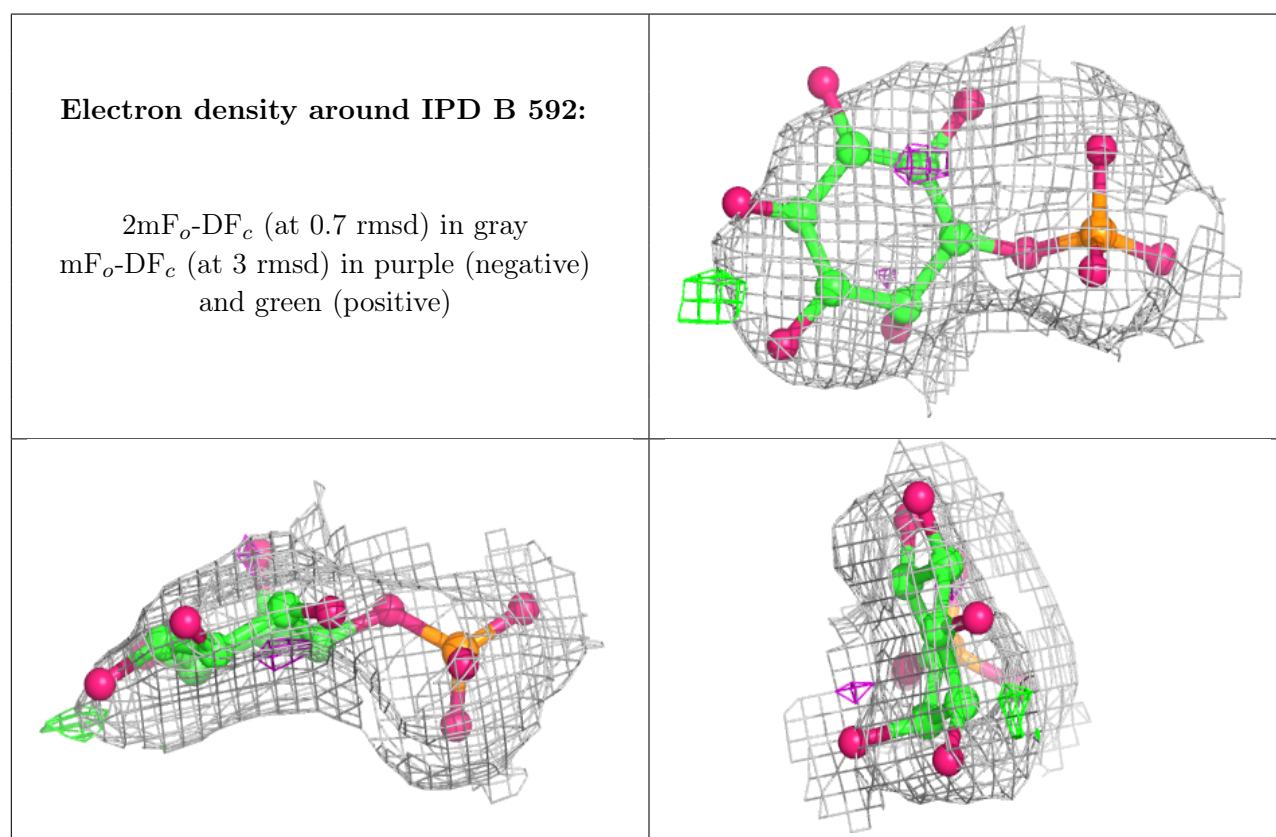
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	IPD	B	592	16/16	0.89	0.20	51,70,97,98	0

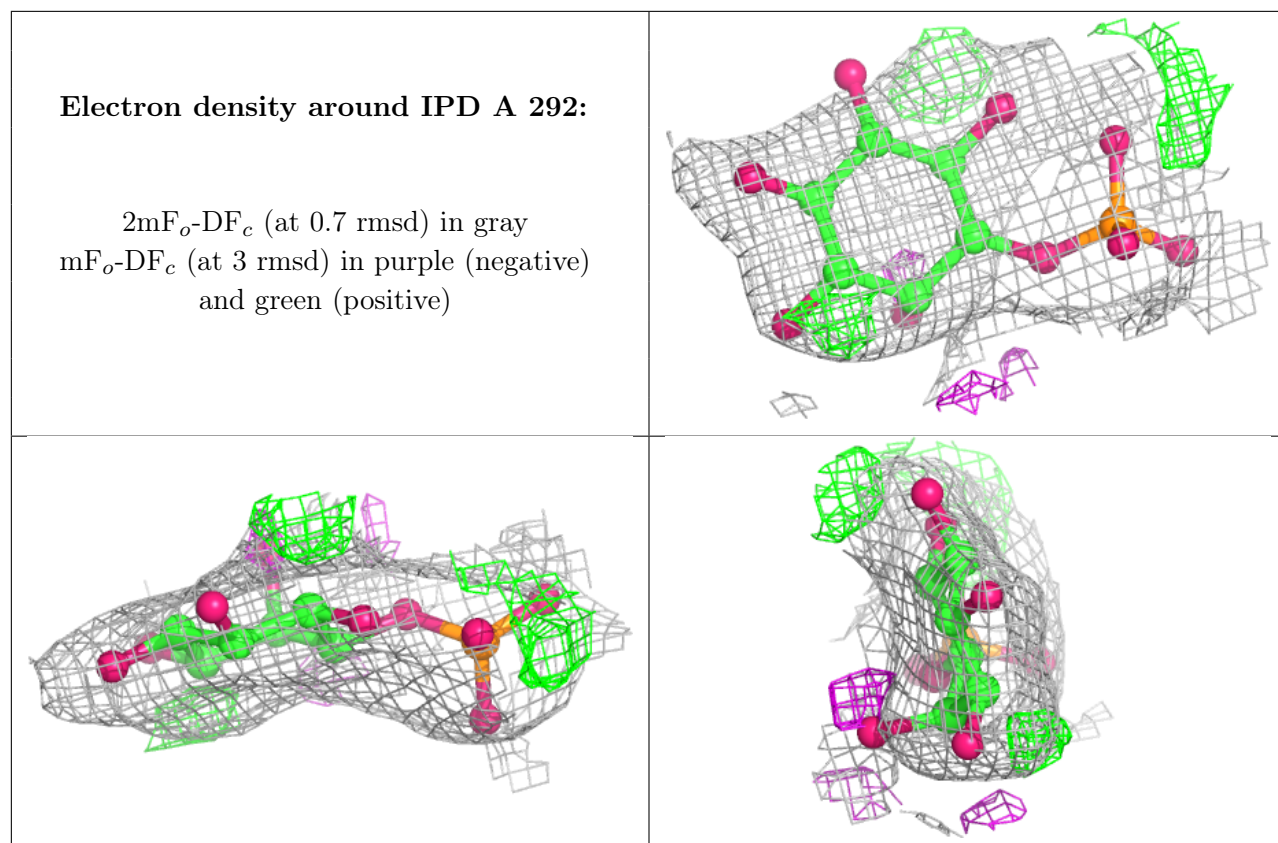
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	IPD	A	292	16/16	0.94	0.17	37,64,81,92	0
2	CA	A	291	1/1	0.97	0.12	36,36,36,36	0
2	CA	B	590	1/1	0.97	0.11	46,46,46,46	0
2	CA	A	290	1/1	0.99	0.07	39,39,39,39	0
2	CA	B	591	1/1	0.99	0.06	43,43,43,43	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.





6.5 Other polymers [i](#)

There are no such residues in this entry.