Full wwPDB X-ray Structure Validation Report ⓘ

Aug 8, 2023 – 02:18 AM EDT

PDB ID	:	1OQN
Title	:	Crystal structure of the phosphotyrosine binding domain (PTB) of mouse Disabled 1 (Dab1)
Authors	:	Yun, M.; Keshvara, L.; Park, C.-G.; Zhang, Y.-M.; Dickerson, J.B.; Zheng, J.; Rock, C.O.; Curran, T.; Park, H.-W.
Deposited on	:	2003-03-10
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:

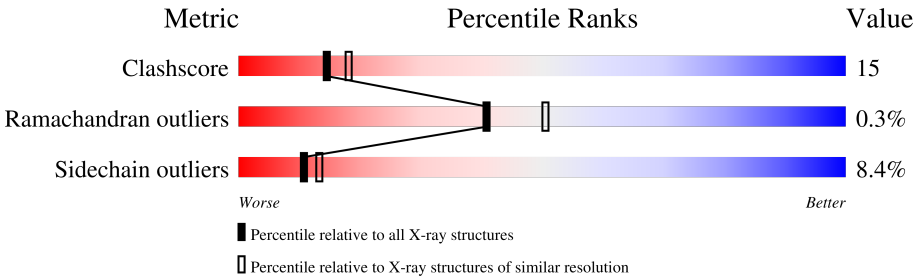
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

1 Overall quality at a glance (i)

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)

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%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	159	67% 25% • 6%
1	B	159	70% 21% • 5%
2	C	9	22% 67% 11%
2	D	9	78% 22%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 2803 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.

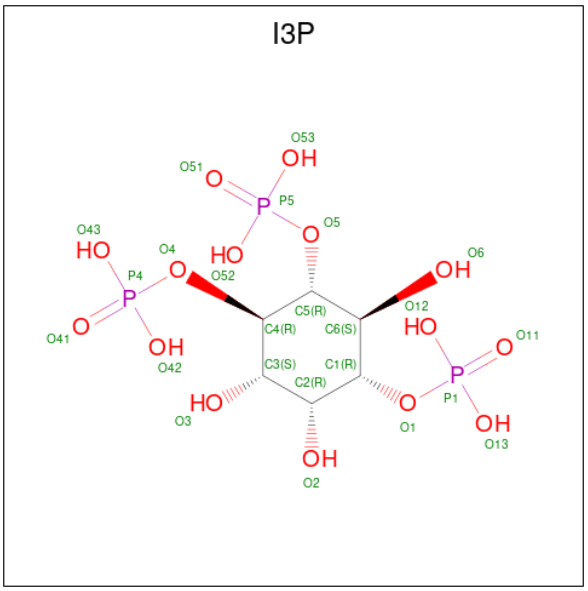
- Molecule 1 is a protein called Disabled homolog 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	150	Total	C	N	O	S	0	0	0
			1188	754	217	213	4			
1	B	151	Total	C	N	O	S	0	0	0
			1196	758	218	216	4			

- Molecule 2 is a protein called Alzheimer's disease amyloid A4 protein homolog.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	C	9	Total	C	N	O	0	0	0
			77	48	12	17			
2	D	9	Total	C	N	O	0	0	0
			77	48	12	17			

- Molecule 3 is D-MYO-INOSITOL-1,4,5-TRIPHOSPHATE (three-letter code: I3P) (formula: $C_6H_{15}O_{15}P_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	O	P	0	0
			24	6	15	3		
3	B	1	Total	C	O	P	0	0
			24	6	15	3		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	99	Total	O	0	0
			99	99		
4	B	102	Total	O	0	0
			102	102		
4	C	6	Total	O	0	0
			6	6		
4	D	10	Total	O	0	0
			10	10		

3 Residue-property plots (i)

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. 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. 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.

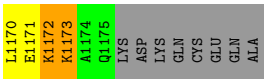
Note EDS was not executed.

• Molecule 1: Disabled homolog 1

Chain A:

• Molecule 1: Disabled homolog 1

Chain B:



• Molecule 2: Alzheimer's disease amyloid A4 protein homolog

Chain C:

• Molecule 2: Alzheimer's disease amyloid A4 protein homolog

Chain D:

4 Data and refinement statistics (i)

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	59.11Å 66.48Å 90.53Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.30	Depositor
% Data completeness (in resolution range)	(Not available) (20.00-2.30)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	0.08	Depositor
Refinement program	CNS	Depositor
R, R_{free}	0.246 , 0.303	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	2803	wwPDB-VP
Average B, all atoms (Å^2)	47.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: I3P

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	0.50	2/1206 (0.2%)	0.62	0/1608
1	B	0.46	2/1214 (0.2%)	0.64	0/1619
2	C	0.49	0/79	0.57	0/105
2	D	0.43	0/79	0.59	0/105
All	All	0.48	4/2578 (0.2%)	0.63	0/3437

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	1130	CYS	CB-SG	7.14	1.94	1.82
1	B	1130	CYS	CB-SG	6.62	1.93	1.82
1	A	1061	CYS	CB-SG	6.27	1.93	1.82
1	B	1061	CYS	CB-SG	5.78	1.92	1.82

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	1188	0	1225	38	0
1	B	1196	0	1229	31	0
2	C	77	0	65	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	77	0	65	6	0
3	A	24	0	9	0	0
3	B	24	0	9	1	0
4	A	99	0	0	4	0
4	B	102	0	0	1	0
4	C	6	0	0	0	0
4	D	10	0	0	0	0
All	All	2803	0	2602	80	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 (80) 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)
2:C:1509:LYS:HA	2:C:1509:LYS:HE2	1.51	0.92
2:C:1501:ASN:HD22	2:C:1502:GLY:H	1.21	0.84
1:A:1075:ALA:HB1	1:A:1080:GLU:HG3	1.59	0.84
2:C:1501:ASN:HD22	2:C:1502:GLY:N	1.78	0.82
2:C:1501:ASN:ND2	2:C:1502:GLY:H	1.78	0.80
1:B:1034:ARG:HH11	1:B:1034:ARG:HG3	1.49	0.77
1:A:1028:GLU:O	1:A:1032:ILE:HG13	1.89	0.73
1:B:1173:LYS:HG3	1:B:1173:LYS:O	1.87	0.72
1:A:1132:LYS:HE3	2:C:1509:LYS:HZ1	1.55	0.71
1:A:1050:ASP:HB2	1:A:1068:LEU:HD21	1.71	0.70
1:A:1067:LYS:O	1:A:1071:VAL:HG23	1.90	0.70
2:C:1508:TYR:O	2:C:1509:LYS:HB2	1.93	0.69
1:B:1133:GLU:HG2	2:D:1509:LYS:NZ	2.06	0.69
1:B:1133:GLU:HB3	4:B:6185:HOH:O	1.95	0.66
1:B:1096:ILE:HB	1:B:1106:HIS:HB2	1.79	0.65
2:C:1509:LYS:HA	2:C:1509:LYS:CE	2.26	0.64
1:A:1132:LYS:HE3	2:C:1509:LYS:NZ	2.11	0.64
1:A:1133:GLU:OE2	2:C:1509:LYS:HD2	1.98	0.64
1:B:1025:ASP:HB3	1:B:1028:GLU:HG2	1.80	0.63
1:A:1059:LYS:HB3	1:B:1076:ARG:HH12	1.63	0.63
1:A:1111:HIS:HB3	4:A:6120:HOH:O	1.97	0.63
1:A:1120:ILE:HD12	1:A:1121:THR:H	1.64	0.62
2:D:1508:TYR:CZ	2:D:1509:LYS:HD3	2.35	0.61
1:A:1047:ILE:HD13	1:A:1069:LYS:HD3	1.83	0.61
1:B:1148:GLU:O	1:B:1152:LEU:HD22	2.01	0.61
1:B:1115:TYR:O	1:B:1116:ILE:HD12	2.01	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1166:GLN:O	1:B:1170:LEU:HD23	2.00	0.60
1:A:1167:ARG:O	1:A:1171:GLU:HG3	2.02	0.59
1:B:1171:GLU:C	1:B:1173:LYS:H	2.06	0.59
1:A:1155:ARG:NH2	2:C:1503:TYR:HB2	2.18	0.59
1:A:1126:PHE:HB2	1:A:1151:ILE:HD11	1.85	0.59
1:B:1034:ARG:HG3	1:B:1034:ARG:NH1	2.17	0.56
1:A:1075:ALA:HB1	1:A:1080:GLU:CG	2.34	0.55
1:A:1155:ARG:HH21	2:C:1503:TYR:HB2	1.72	0.55
2:D:1508:TYR:O	2:D:1509:LYS:HB2	2.08	0.53
2:C:1501:ASN:ND2	2:C:1502:GLY:N	2.48	0.53
1:B:1089:ILE:HD12	1:B:1154:LEU:HD21	1.91	0.53
1:A:1140:ALA:C	1:A:1141:ILE:HD12	2.29	0.52
1:B:1078:LYS:O	1:B:1078:LYS:HG2	2.09	0.52
1:A:1139:VAL:HG12	1:A:1141:ILE:HD11	1.90	0.52
1:B:1115:TYR:C	1:B:1116:ILE:HD12	2.31	0.51
1:B:1133:GLU:HG2	2:D:1509:LYS:HZ1	1.73	0.51
1:A:1120:ILE:HD12	1:A:1121:THR:N	2.25	0.50
1:B:1076:ARG:NH2	3:B:1602:I3P:O1	2.43	0.49
1:A:1063:ASP:OD1	1:B:1076:ARG:HD3	2.13	0.49
1:A:1040:VAL:O	1:A:1088:THR:HA	2.13	0.48
1:A:1126:PHE:CB	1:A:1151:ILE:HD11	2.44	0.48
1:B:1041:ARG:NH2	1:B:1086:PHE:CZ	2.82	0.48
1:A:1132:LYS:HE2	1:A:1132:LYS:HB3	1.62	0.47
1:A:1066:MET:HE2	4:A:6081:HOH:O	2.15	0.47
1:A:1129:VAL:HA	1:A:1137:ARG:O	2.15	0.46
1:B:1148:GLU:N	1:B:1149:PRO:HD2	2.31	0.45
1:A:1120:ILE:HD13	1:A:1121:THR:HG23	1.98	0.45
1:B:1060:LEU:H	1:B:1060:LEU:HD22	1.81	0.45
1:A:1120:ILE:CD1	1:A:1121:THR:HG23	2.46	0.45
1:A:1028:GLU:CD	1:A:1167:ARG:HH22	2.18	0.45
1:A:1139:VAL:HG12	1:A:1141:ILE:CD1	2.47	0.45
1:B:1172:LYS:O	1:B:1172:LYS:HG2	2.17	0.45
1:A:1028:GLU:OE1	1:A:1167:ARG:NH1	2.49	0.45
1:A:1118:LYS:NZ	4:A:6201:HOH:O	2.49	0.45
1:A:1118:LYS:H	1:A:1118:LYS:HG2	1.52	0.44
1:A:1147:ALA:O	1:A:1151:ILE:HG12	2.17	0.44
2:C:1508:TYR:O	2:C:1509:LYS:CB	2.61	0.44
1:B:1171:GLU:O	1:B:1173:LYS:N	2.51	0.43
1:B:1089:ILE:HD12	1:B:1154:LEU:CD2	2.49	0.43
1:B:1171:GLU:CG	1:B:1172:LYS:N	2.82	0.42
1:B:1161:ILE:CG2	1:B:1165:LYS:HE3	2.49	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:1161:ILE:HG23	1:B:1165:LYS:CE	2.49	0.42
1:B:1169:GLU:O	1:B:1173:LYS:HB3	2.20	0.42
1:A:1165:LYS:O	1:A:1169:GLU:HB2	2.20	0.41
1:B:1047:ILE:HA	1:B:1082:LYS:HD2	2.02	0.41
2:D:1508:TYR:O	2:D:1509:LYS:CB	2.66	0.41
2:D:1508:TYR:CD2	2:D:1509:LYS:HG2	2.55	0.41
1:A:1075:ALA:HB1	1:A:1080:GLU:CB	2.50	0.41
2:C:1504:GLU:O	2:C:1506:PRO:HD3	2.20	0.41
1:A:1155:ARG:CZ	2:C:1503:TYR:HB2	2.51	0.40
1:A:1161:ILE:O	1:A:1165:LYS:HB2	2.20	0.40
1:B:1026:ARG:NE	1:B:1026:ARG:HA	2.35	0.40
1:A:1155:ARG:NH1	4:A:6201:HOH:O	2.53	0.40
1:B:1171:GLU:C	1:B:1173:LYS:N	2.72	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	148/159 (93%)	144 (97%)	4 (3%)	0	100	100
1	B	149/159 (94%)	139 (93%)	9 (6%)	1 (1%)	22	26
2	C	7/9 (78%)	7 (100%)	0	0	100	100
2	D	7/9 (78%)	7 (100%)	0	0	100	100
All	All	311/336 (93%)	297 (96%)	13 (4%)	1 (0%)	41	50

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	1172	LYS

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	122/130 (94%)	113 (93%)	9 (7%)	13 17
1	B	123/130 (95%)	111 (90%)	12 (10%)	8 9
2	C	8/8 (100%)	7 (88%)	1 (12%)	4 5
2	D	8/8 (100%)	8 (100%)	0	100 100
All	All	261/276 (95%)	239 (92%)	22 (8%)	11 13

All (22) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1026	ARG
1	A	1060	LEU
1	A	1069	LYS
1	A	1123	HIS
1	A	1130	CYS
1	A	1148	GLU
1	A	1152	LEU
1	A	1165	LYS
1	A	1172	LYS
1	B	1027	SER
1	B	1053	SER
1	B	1056	ARG
1	B	1059	LYS
1	B	1120	ILE
1	B	1130	CYS
1	B	1142	LYS
1	B	1152	LEU
1	B	1163	GLU
1	B	1165	LYS
1	B	1168	GLU
1	B	1173	LYS
2	C	1501	ASN

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

Mol	Chain	Res	Type
1	A	1145	GLN
1	B	1107	HIS
1	B	1166	GLN
2	C	1501	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)

2 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
3	I3P	A	1601	-	24,24,24	1.29	2 (8%)	36,39,39	1.15	3 (8%)
3	I3P	B	1602	-	24,24,24	1.28	3 (12%)	36,39,39	1.13	3 (8%)

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	I3P	A	1601	-	-	0/15/39/39	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	I3P	B	1602	-	-	1/15/39/39	0/1/1/1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1601	I3P	P5-O53	-2.54	1.45	1.54
3	B	1602	I3P	P4-O42	-2.15	1.46	1.54
3	B	1602	I3P	P5-O53	-2.12	1.46	1.54
3	A	1601	I3P	C5-C4	2.11	1.56	1.52
3	B	1602	I3P	P1-O13	-2.01	1.47	1.54

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	B	1602	I3P	O4-P4-O41	-2.95	98.00	109.39
3	A	1601	I3P	O4-P4-O41	-2.92	98.11	109.39
3	B	1602	I3P	O53-P5-O52	2.23	116.16	107.64
3	A	1601	I3P	O5-P5-O51	-2.13	101.16	109.39
3	A	1601	I3P	O53-P5-O52	2.06	115.51	107.64
3	B	1602	I3P	O5-P5-O51	-2.02	101.61	109.39

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	1602	I3P	C2-C1-O1-P1

There are no ring outliers.

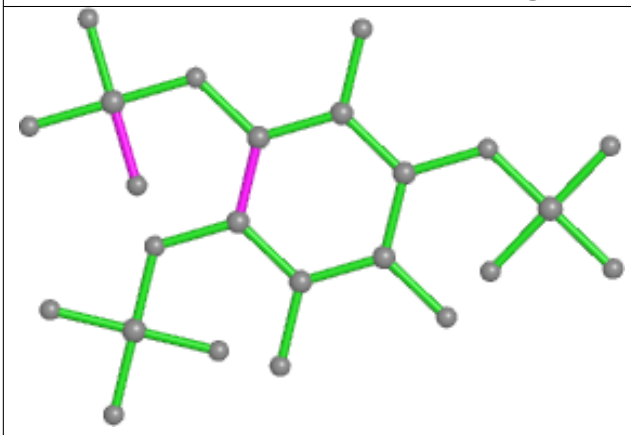
1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	1602	I3P	1	0

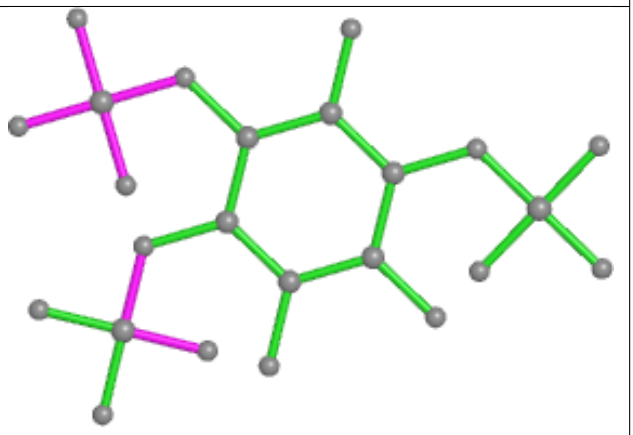
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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.

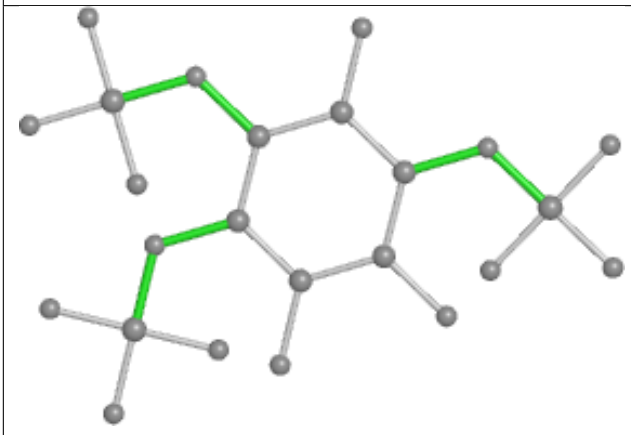
Ligand I3P A 1601



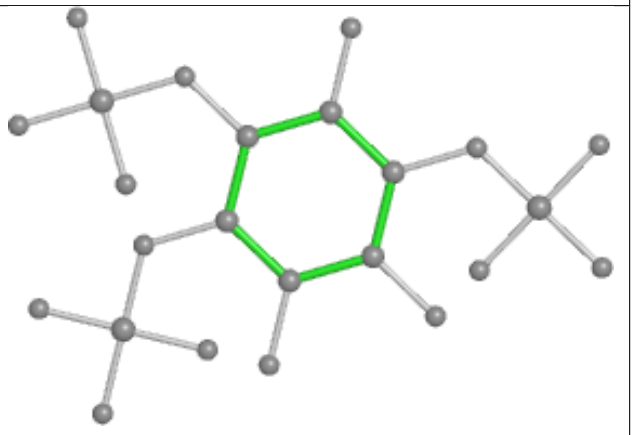
Bond lengths



Bond angles

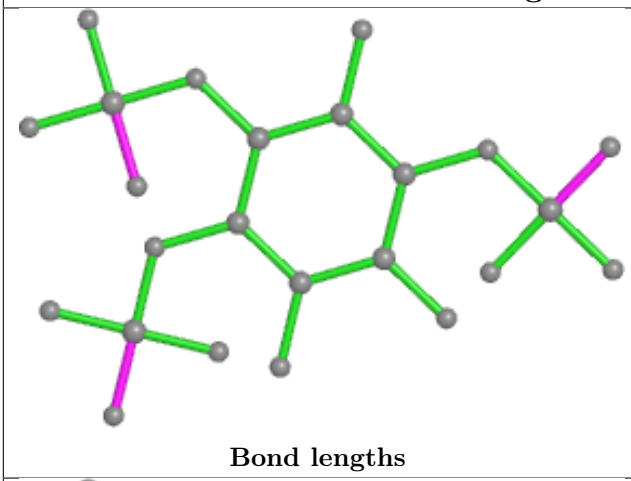


Torsions

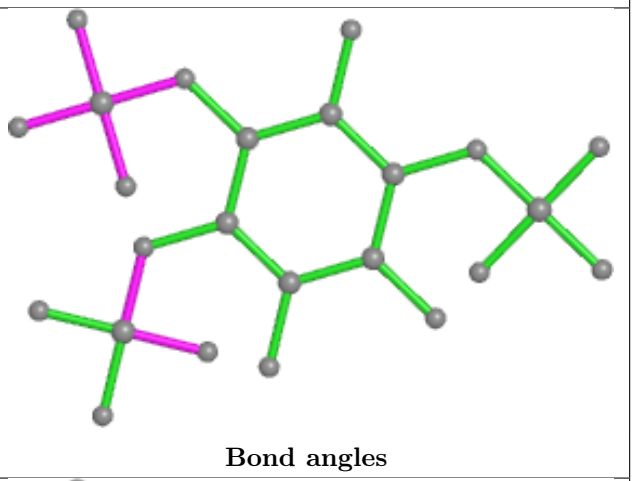


Rings

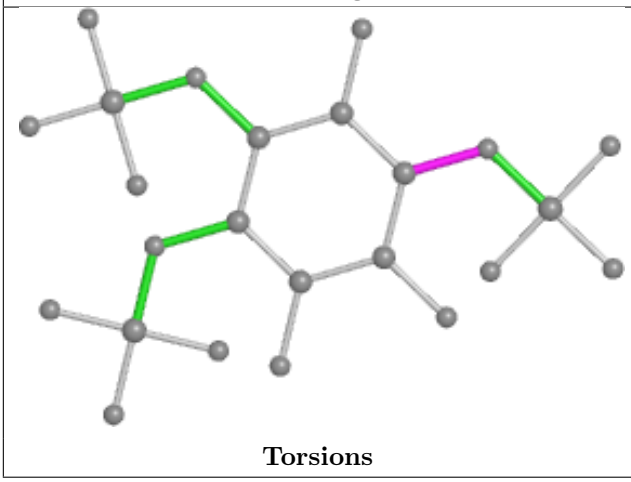
Ligand I3P B 1602



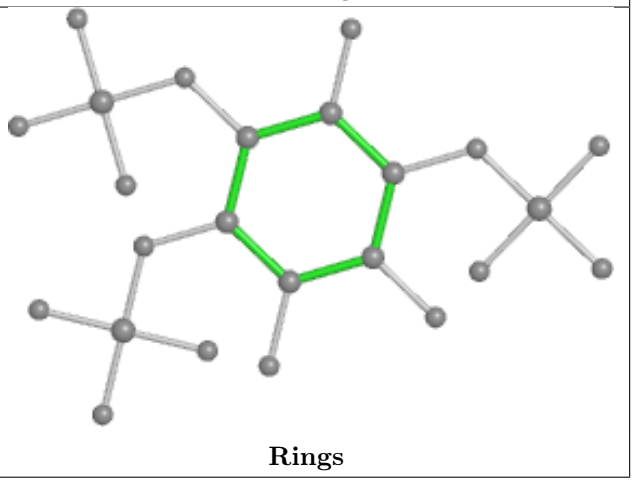
Bond lengths



Bond angles



Torsions



Rings

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

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.