Full wwPDB X-ray Structure Validation Report (i)

Mar 20, 2026 – 12:39 PM UTC

PDB ID	:	9R0V / pdb_00009r0v
Title	:	CutC IN COMPLEX WITH Inhibitor
Authors	:	Petersen, J.
Deposited on	:	2025-04-24
Resolution	:	1.34 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 (i) 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 (i)) were used in the production of this report:

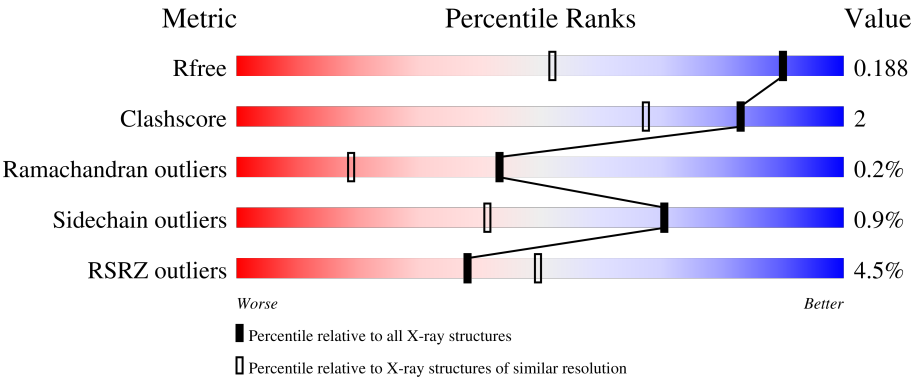
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

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 1.34 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))
R_{free}	180053	2194 (1.36-1.32)
Clashscore	190562	2222 (1.36-1.32)
Ramachandran outliers	187476	2197 (1.36-1.32)
Sidechain outliers	187428	2197 (1.36-1.32)
RSRZ outliers	180081	2193 (1.36-1.32)

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	801	3% 96% .
1	B	801	7% 94% 5% .
1	C	801	4% 94% 6%
1	D	801	4% 93% 6% .

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 28041 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 Choline trimethylamine-lyase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	798	Total	C	N	O	S	0	7	0
			6317	4006	1068	1194	49			
1	B	794	Total	C	N	O	S	0	5	0
			6285	3986	1063	1188	48			
1	C	800	Total	C	N	O	S	0	5	0
			6315	4004	1069	1194	48			
1	D	794	Total	C	N	O	S	0	6	0
			6289	3988	1064	1189	48			

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	46	MET	-	initiating methionine	UNP Q30W70
A	47	HIS	-	expression tag	UNP Q30W70
A	48	HIS	-	expression tag	UNP Q30W70
A	49	ALA	-	expression tag	UNP Q30W70
A	50	ALA	-	expression tag	UNP Q30W70
A	51	ALA	-	expression tag	UNP Q30W70
A	52	ALA	-	expression tag	UNP Q30W70
B	46	MET	-	initiating methionine	UNP Q30W70
B	47	HIS	-	expression tag	UNP Q30W70
B	48	HIS	-	expression tag	UNP Q30W70
B	49	ALA	-	expression tag	UNP Q30W70
B	50	ALA	-	expression tag	UNP Q30W70
B	51	ALA	-	expression tag	UNP Q30W70
B	52	ALA	-	expression tag	UNP Q30W70
C	46	MET	-	initiating methionine	UNP Q30W70
C	47	HIS	-	expression tag	UNP Q30W70
C	48	HIS	-	expression tag	UNP Q30W70
C	49	ALA	-	expression tag	UNP Q30W70
C	50	ALA	-	expression tag	UNP Q30W70
C	51	ALA	-	expression tag	UNP Q30W70
C	52	ALA	-	expression tag	UNP Q30W70

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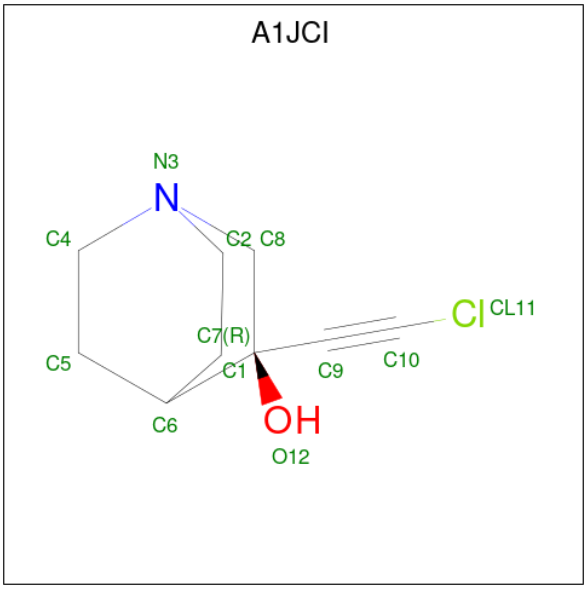
Chain	Residue	Modelled	Actual	Comment	Reference
D	46	MET	-	initiating methionine	UNP Q30W70
D	47	HIS	-	expression tag	UNP Q30W70
D	48	HIS	-	expression tag	UNP Q30W70
D	49	ALA	-	expression tag	UNP Q30W70
D	50	ALA	-	expression tag	UNP Q30W70
D	51	ALA	-	expression tag	UNP Q30W70
D	52	ALA	-	expression tag	UNP Q30W70

- Molecule 2 is (3 {R})-3-(2-chloranylethynyl)-1-azabicyclo[2.2.2]octan-3-ol (CCD ID: A1JCI) (formula: $C_9H_{12}ClNO$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	Cl	N	O	0	0
			12	9	1	1	1		
2	B	1	Total	C	Cl	N	O	0	0
			12	9	1	1	1		
2	C	1	Total	C	Cl	N	O	0	0
			12	9	1	1	1		
2	D	1	Total	C	Cl	N	O	0	0
			12	9	1	1	1		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	729	Total	O	0	0
			729	729		

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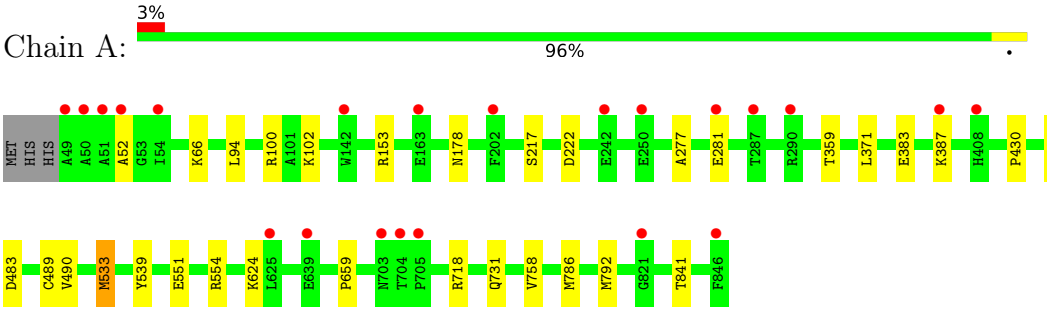
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	584	Total O 584 584	0	0
3	C	761	Total O 761 761	0	0
3	D	713	Total O 713 713	0	0

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 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.

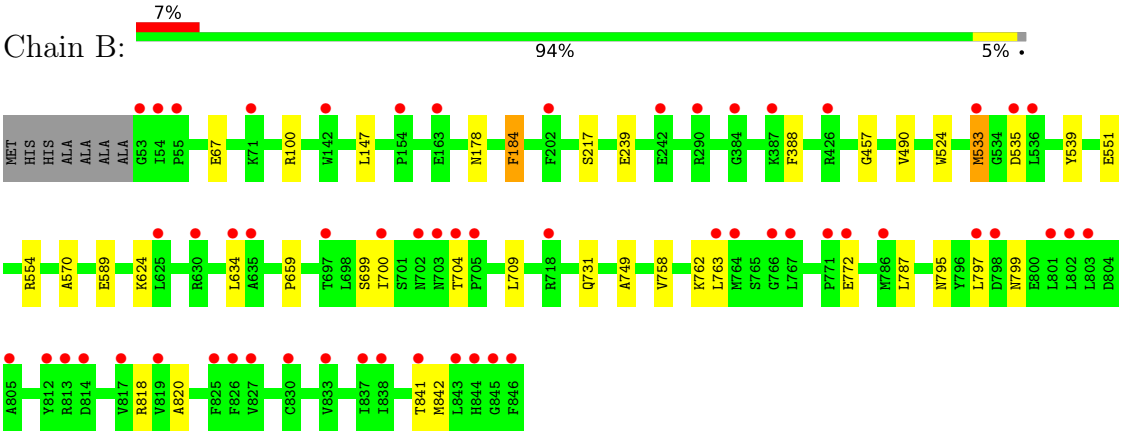
• Molecule 1: Choline trimethylamine-lyase

Chain A:



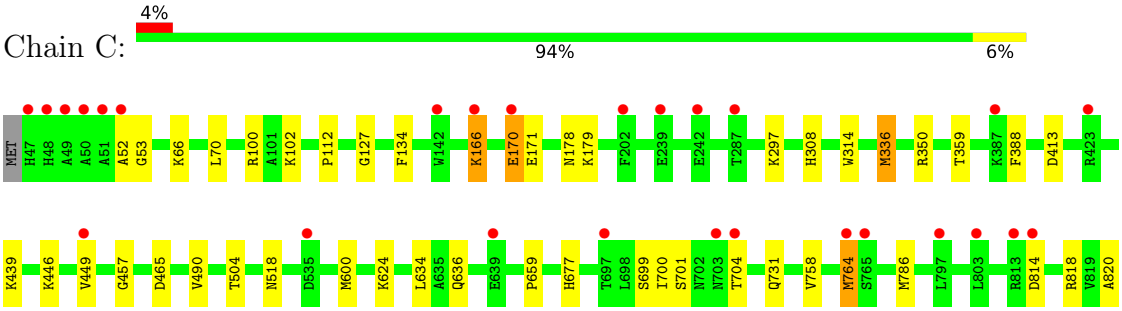
• Molecule 1: Choline trimethylamine-lyase

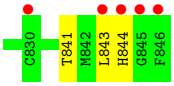
Chain B:



• Molecule 1: Choline trimethylamine-lyase

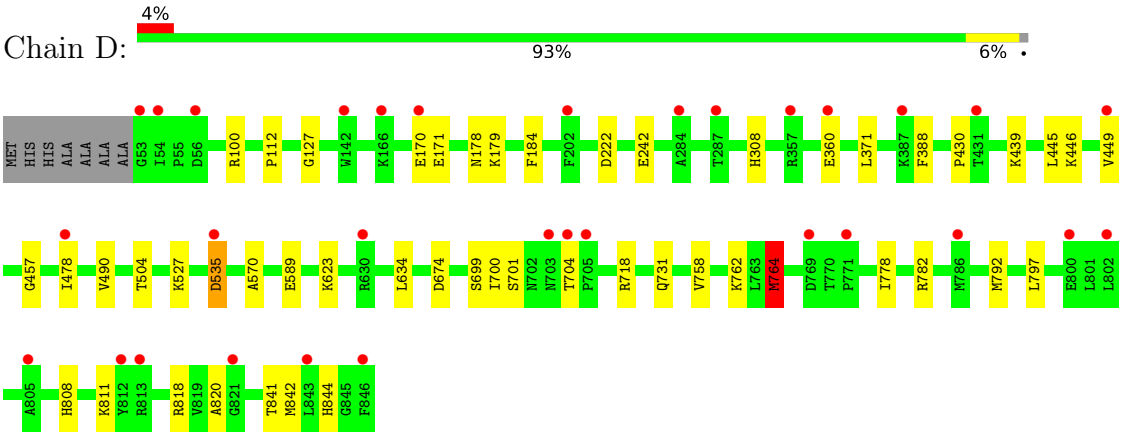
Chain C:





• Molecule 1: Choline trimethylamine-lyase

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	80.05Å 231.71Å 105.89Å 90.00° 111.08° 90.00°	Depositor
Resolution (Å)	46.95 – 1.34 46.95 – 1.34	Depositor EDS
% Data completeness (in resolution range)	86.8 (46.95-1.34) 86.8 (46.95-1.34)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.04 (at 1.34Å)	Xtriage
Refinement program	BUSTER 2.11.8 (8-JUN-2022) PACIOREK	Depositor
R, R_{free}	0.176 , 0.194 0.170 , 0.188	Depositor DCC
R_{free} test set	34469 reflections (4.31%)	wwPDB-VP
Wilson B-factor (Å^2)	17.6	Xtriage
Anisotropy	0.071	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 35.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.005 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	28041	wwPDB-VP
Average B, all atoms (Å^2)	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.77% of the height of the origin peak. No significant pseudotranslation is detected.*

[1]Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: A1JCI

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	0.87	1/6477 (0.0%)	0.98	3/8771 (0.0%)
1	B	0.87	0/6442	0.98	6/8723 (0.1%)
1	C	0.97	3/6472 (0.0%)	0.98	2/8765 (0.0%)
1	D	0.88	2/6446 (0.0%)	0.97	5/8728 (0.1%)
All	All	0.90	6/25837 (0.0%)	0.98	16/34987 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	1
1	C	0	1
1	D	0	1
All	All	0	4

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	336	MET	SD-CE	-31.43	1.00	1.79
1	D	792	MET	SD-CE	-7.48	1.60	1.79
1	A	792	MET	SD-CE	-6.70	1.62	1.79
1	D	764	MET	SD-CE	-5.77	1.65	1.79
1	C	600	MET	SD-CE	-5.37	1.66	1.79
1	C	134	PHE	C-N	5.08	1.40	1.33

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	535	ASP	CA-CB-CG	6.14	118.74	112.60
1	D	504	THR	N-CA-C	-5.76	106.29	113.55
1	B	749	ALA	N-CA-C	-5.75	97.87	107.99
1	C	170	GLU	CB-CG-CD	-5.69	102.93	112.60
1	C	504	THR	N-CA-C	-5.60	106.50	113.55
1	B	67	GLU	CB-CG-CD	5.50	121.95	112.60
1	D	674	ASP	CA-CB-CG	5.50	118.10	112.60
1	A	483	ASP	CA-CB-CG	5.47	118.07	112.60
1	D	222	ASP	CA-CB-CG	5.44	118.04	112.60
1	B	589	GLU	CB-CG-CD	5.42	121.82	112.60
1	A	217	SER	N-CA-C	5.26	117.67	109.52
1	B	388	PHE	CA-CB-CG	5.21	119.01	113.80
1	D	589	GLU	CB-CG-CD	5.17	121.38	112.60
1	A	222	ASP	CA-CB-CG	5.09	117.69	112.60
1	B	217	SER	N-CA-C	5.04	117.33	109.52
1	B	184	PHE	CA-CB-CG	5.01	118.81	113.80

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	100	ARG	Sidechain
1	B	100	ARG	Sidechain
1	C	100	ARG	Sidechain
1	D	100	ARG	Sidechain

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	6317	0	6204	23	0
1	B	6285	0	6169	19	0
1	C	6315	0	6193	47	0
1	D	6289	0	6171	41	0
2	A	12	0	0	0	0
2	B	12	0	0	0	0
2	C	12	0	0	0	0
2	D	12	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	729	0	0	6	0
3	B	584	0	0	2	0
3	C	761	0	0	7	0
3	D	713	0	0	7	0
All	All	28041	0	24737	118	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 2.

All (118) 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:336:MET:CE	1:C:336:MET:CG	2.01	1.39
1:C:336:MET:CE	1:C:336:MET:SD	1.01	1.10
1:C:336:MET:SD	1:C:336:MET:HE3	1.61	1.00
1:C:336:MET:SD	1:C:336:MET:HE2	1.61	1.00
1:C:336:MET:SD	1:C:336:MET:HE1	1.61	0.99
1:C:764:MET:HE2	1:C:844:HIS:HD2	1.31	0.93
1:C:465:ASP:HB3	3:C:1343:HOH:O	1.67	0.92
1:D:764:MET:HE3	1:D:844:HIS:CD2	2.07	0.89
1:C:53:GLY:HA3	3:C:1621:HOH:O	1.72	0.88
1:D:445:LEU:HD23	1:D:778:ILE:HG23	1.56	0.88
1:D:731:GLN:HE22	1:D:841:THR:H	1.21	0.88
1:A:52:ALA:HB1	1:A:359:THR:HB	1.56	0.87
1:B:787:LEU:HD23	1:D:439:LYS:HD3	1.57	0.87
1:C:731:GLN:HE22	1:C:841:THR:H	1.19	0.85
1:A:731:GLN:HE22	1:A:841:THR:H	1.24	0.84
1:B:731:GLN:HE22	1:B:841:THR:H	1.23	0.83
1:C:764:MET:HE2	1:C:844:HIS:CD2	2.14	0.82
1:C:336:MET:CE	1:C:336:MET:HG3	2.11	0.79
1:C:446:LYS:O	1:C:449:VAL:HG22	1.84	0.77
1:A:786:MET:SD	1:C:786:MET:SD	2.85	0.74
1:D:360:GLU:HG2	3:D:1001:HOH:O	1.89	0.72
1:D:446:LYS:O	1:D:449:VAL:HG22	1.89	0.71
1:D:445:LEU:HD22	1:D:782:ARG:CZ	2.20	0.71
1:D:762:LYS:NZ	1:D:797:LEU:HB2	2.07	0.70
1:C:179:LYS:HE3	1:D:179:LYS:HZ3	1.55	0.70
1:A:52:ALA:HB1	1:A:359:THR:CB	2.23	0.69
1:A:479:GLU:HG3	3:A:1164:HOH:O	1.93	0.68
1:C:179:LYS:CE	1:D:179:LYS:HZ3	2.07	0.68
1:C:764:MET:CE	1:C:844:HIS:HD2	2.03	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:166:LYS:HE3	1:C:170:GLU:OE1	1.93	0.67
1:B:787:LEU:HD23	1:D:439:LYS:CD	2.26	0.66
1:D:762:LYS:HZ2	1:D:797:LEU:HB2	1.60	0.66
1:D:699:SER:HB2	1:D:758:VAL:HG11	1.79	0.65
1:D:700:ILE:HD12	1:D:704:THR:HG21	1.78	0.64
1:A:489[B]:CYS:SG	1:A:758:VAL:HG21	2.38	0.63
1:B:700:ILE:HD12	1:B:704:THR:HG21	1.80	0.63
1:D:764:MET:HE2	1:D:842:MET:HE3	1.81	0.63
1:B:551:GLU:OE2	1:B:554:ARG:NH1	2.32	0.63
1:B:787:LEU:HA	1:D:439:LYS:HD3	1.81	0.63
1:D:439:LYS:HD2	3:D:1295:HOH:O	2.00	0.62
1:B:731:GLN:NE2	1:B:841:THR:H	1.97	0.61
1:C:336:MET:CG	1:C:336:MET:HE2	2.04	0.61
1:D:242:GLU:HG3	3:D:1388:HOH:O	2.01	0.61
1:A:479:GLU:HG3	3:A:1549:HOH:O	1.99	0.60
1:C:336:MET:HE2	1:C:336:MET:HG3	1.78	0.59
1:A:153:ARG:HD2	1:A:383:GLU:HG3	1.85	0.58
1:D:308:HIS:HD2	3:D:1666:HOH:O	1.86	0.58
1:C:179:LYS:NZ	1:D:179:LYS:HZ3	2.02	0.57
1:C:336:MET:CG	1:C:336:MET:HE3	2.04	0.57
1:D:764:MET:CE	1:D:844:HIS:CD2	2.85	0.56
1:D:445:LEU:HD22	1:D:782:ARG:NE	2.21	0.55
1:A:624:LYS:HD2	1:A:659:PRO:HD3	1.87	0.55
1:B:795:ASN:OD1	1:B:818:ARG:HB3	2.06	0.55
1:A:731:GLN:NE2	1:A:841:THR:H	2.01	0.55
1:B:799:ASN:ND2	1:B:842:MET:HE1	2.22	0.54
1:C:171:GLU:OE1	3:C:1001:HOH:O	2.18	0.54
1:D:731:GLN:NE2	1:D:841:THR:H	2.00	0.54
1:A:551:GLU:OE2	1:A:554:ARG:NH1	2.41	0.54
1:B:762:LYS:HE2	1:B:797:LEU:HD12	1.90	0.53
1:B:624:LYS:HD2	1:B:659:PRO:HD3	1.91	0.53
1:B:239:GLU:HG3	3:B:1396:HOH:O	2.09	0.53
1:A:489[B]:CYS:SG	1:A:758:VAL:CG2	2.97	0.52
1:C:179:LYS:NZ	1:D:179:LYS:NZ	2.58	0.52
1:D:808:HIS:CD2	1:D:811:LYS:NZ	2.78	0.52
1:B:699:SER:HB2	1:B:758:VAL:HG11	1.91	0.52
1:B:457:GLY:HA3	1:B:818:ARG:HB2	1.92	0.52
1:A:479:GLU:OE1	1:C:677:HIS:HE1	1.94	0.51
1:C:701:SER:O	1:C:704:THR:HG23	2.11	0.50
1:D:478:ILE:HG23	3:D:1448:HOH:O	2.10	0.50
1:D:699:SER:CB	1:D:758:VAL:HG11	2.41	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:360:GLU:HG2	3:D:1583:HOH:O	2.13	0.48
1:D:623:LYS:HE2	3:D:1111:HOH:O	2.12	0.48
1:A:281:GLU:CD	3:A:1452:HOH:O	2.56	0.48
1:D:701:SER:O	1:D:704:THR:HG23	2.13	0.48
1:A:387:LYS:HD3	3:A:1623:HOH:O	2.15	0.47
1:A:438:ASN:HB3	1:C:786:MET:HE3	1.97	0.47
1:C:446:LYS:O	1:C:449:VAL:CG2	2.60	0.47
1:A:281:GLU:OE2	3:A:1001:HOH:O	2.20	0.47
1:D:112:PRO:HG2	1:D:127:GLY:HA2	1.97	0.47
1:D:388:PHE:HA	1:D:704:THR:HG22	1.97	0.47
1:D:371:LEU:HD22	1:D:430:PRO:HD2	1.97	0.46
1:B:700:ILE:CD1	1:B:704:THR:HG21	2.46	0.46
1:B:533:MET:HB2	1:B:539:TYR:OH	2.15	0.46
1:C:70:LEU:HD11	1:C:814:ASP:HB3	1.97	0.46
1:C:699:SER:HB2	1:C:758:VAL:HG11	1.97	0.46
1:C:700:ILE:HD12	1:C:704:THR:HG21	1.98	0.45
1:D:700:ILE:CD1	1:D:704:THR:HG21	2.45	0.45
1:A:371:LEU:HD22	1:A:430:PRO:HD2	1.98	0.45
1:C:52:ALA:HB1	1:C:359:THR:HB	1.98	0.45
1:C:308:HIS:HD2	3:C:1691:HOH:O	2.00	0.44
1:C:388:PHE:HA	1:C:704:THR:HG22	1.98	0.44
1:C:518:ASN:HB3	3:C:1603:HOH:O	2.17	0.44
1:C:624:LYS:HD2	1:C:659:PRO:HD3	1.99	0.44
1:D:170:GLU:HG3	1:D:171:GLU:HG2	2.00	0.44
1:D:764:MET:CE	1:D:844:HIS:NE2	2.80	0.44
1:A:281:GLU:HG2	3:A:1452:HOH:O	2.17	0.44
1:C:336:MET:HE3	1:C:336:MET:CB	2.48	0.44
1:A:786:MET:HG3	1:C:439:LYS:HE2	2.00	0.43
1:C:179:LYS:CE	1:D:179:LYS:NZ	2.79	0.43
1:A:94:LEU:HD21	1:A:102:LYS:HD3	2.00	0.43
1:C:457:GLY:HA3	1:C:818:ARG:HB2	2.00	0.43
1:B:533:MET:HG2	3:B:1159:HOH:O	2.19	0.43
1:C:449:VAL:CG2	3:C:1042:HOH:O	2.66	0.43
1:C:297:LYS:HG2	1:C:314:TRP:CZ3	2.54	0.42
1:C:350:ARG:NH2	1:C:413:ASP:OD2	2.50	0.42
1:A:533[A]:MET:HB2	1:A:539:TYR:OH	2.20	0.42
1:C:449:VAL:HG23	3:C:1042:HOH:O	2.20	0.41
1:D:457:GLY:HA3	1:D:818:ARG:HB2	2.02	0.41
1:D:445:LEU:CD2	1:D:782:ARG:NE	2.84	0.41
1:C:699:SER:CB	1:C:758:VAL:HG11	2.50	0.41
1:A:277:ALA:O	1:A:281:GLU:HG3	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:764:MET:HB3	1:C:843:LEU:O	2.20	0.41
1:B:524:TRP:CD1	1:B:709:LEU:HB3	2.56	0.41
1:C:731:GLN:NE2	1:C:841:THR:H	2.01	0.41
1:D:808:HIS:CG	1:D:811:LYS:HZ2	2.39	0.41
1:C:112:PRO:HG2	1:C:127:GLY:HA2	2.03	0.40
1:D:184:PHE:CD1	1:D:570:ALA:HB2	2.56	0.40
1:B:184:PHE:CD1	1:B:570:ALA:HB2	2.57	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	803/801 (100%)	786 (98%)	16 (2%)	1 (0%)	48	20
1	B	797/801 (100%)	777 (98%)	18 (2%)	2 (0%)	36	16
1	C	803/801 (100%)	785 (98%)	16 (2%)	2 (0%)	43	19
1	D	798/801 (100%)	784 (98%)	12 (2%)	2 (0%)	36	16
All	All	3201/3204 (100%)	3132 (98%)	62 (2%)	7 (0%)	43	19

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	490	VAL
1	B	490	VAL
1	C	490	VAL
1	D	490	VAL
1	B	820	ALA
1	C	820	ALA
1	D	820	ALA

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	676/672 (101%)	671 (99%)	5 (1%)	76	51
1	B	674/672 (100%)	667 (99%)	7 (1%)	68	37
1	C	674/672 (100%)	667 (99%)	7 (1%)	68	37
1	D	674/672 (100%)	668 (99%)	6 (1%)	70	41
All	All	2698/2688 (100%)	2673 (99%)	25 (1%)	70	41

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	66	LYS
1	A	178	ASN
1	A	533[A]	MET
1	A	533[B]	MET
1	A	718	ARG
1	B	147	LEU
1	B	178	ASN
1	B	533	MET
1	B	535	ASP
1	B	634	LEU
1	B	763	LEU
1	B	772	GLU
1	C	66	LYS
1	C	102	LYS
1	C	166	LYS
1	C	178	ASN
1	C	634	LEU
1	C	636	GLN
1	C	764	MET
1	D	178	ASN
1	D	527	LYS
1	D	535	ASP
1	D	634	LEU
1	D	718	ARG
1	D	764	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (40) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	68	ASN
1	A	218	ASN
1	A	308	HIS
1	A	602	ASN
1	A	638	ASN
1	A	731	GLN
1	A	750	ASN
1	B	308	HIS
1	B	438	ASN
1	B	493	GLN
1	B	650	GLN
1	B	702	ASN
1	B	731	GLN
1	B	750	ASN
1	B	808	HIS
1	C	68	ASN
1	C	116	GLN
1	C	144	GLN
1	C	308	HIS
1	C	702	ASN
1	C	731	GLN
1	C	750	ASN
1	C	806	GLN
1	C	844	HIS
1	D	68	ASN
1	D	116	GLN
1	D	144	GLN
1	D	178	ASN
1	D	188	GLN
1	D	218	ASN
1	D	308	HIS
1	D	438	ASN
1	D	602	ASN
1	D	702	ASN
1	D	731	GLN
1	D	750	ASN
1	D	760	ASN
1	D	806	GLN
1	D	808	HIS
1	D	834	GLN

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

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	A1JCI	A	901	-	10,13,13	1.21	1 (10%)	13,19,19	2.03	3 (23%)
2	A1JCI	D	901	-	10,13,13	1.22	1 (10%)	13,19,19	1.35	2 (15%)
2	A1JCI	B	901	-	10,13,13	0.91	0	13,19,19	1.44	2 (15%)
2	A1JCI	C	901	-	10,13,13	1.12	1 (10%)	13,19,19	1.61	2 (15%)

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	A1JCI	A	901	-	-	0/0/25/25	0/3/2/2
2	A1JCI	D	901	-	-	0/0/25/25	0/3/2/2
2	A1JCI	B	901	-	-	0/0/25/25	0/3/2/2
2	A1JCI	C	901	-	-	0/0/25/25	0/3/2/2

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	901	A1JCI	C8-C7	2.26	1.57	1.54
2	A	901	A1JCI	C8-C7	2.16	1.57	1.54
2	D	901	A1JCI	C8-C7	2.11	1.57	1.54

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	901	A1JCI	C5-C6-C7	-4.72	106.79	109.46
2	C	901	A1JCI	C6-C7-C9	-3.68	107.42	111.00
2	A	901	A1JCI	C6-C7-C9	-3.67	107.43	111.00
2	A	901	A1JCI	C1-C6-C7	-3.17	107.66	109.46
2	C	901	A1JCI	C2-N3-C8	-3.17	104.73	109.46
2	D	901	A1JCI	C5-C6-C7	-2.98	107.78	109.46
2	D	901	A1JCI	C6-C7-C9	-2.79	108.29	111.00
2	B	901	A1JCI	C1-C6-C7	-2.64	107.97	109.46
2	B	901	A1JCI	C6-C7-C9	-2.64	108.43	111.00

There are no chirality outliers.

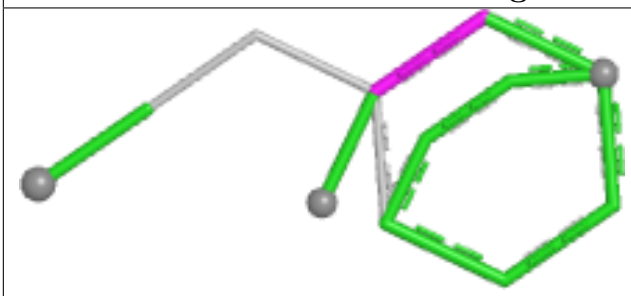
There are no torsion outliers.

There are no ring outliers.

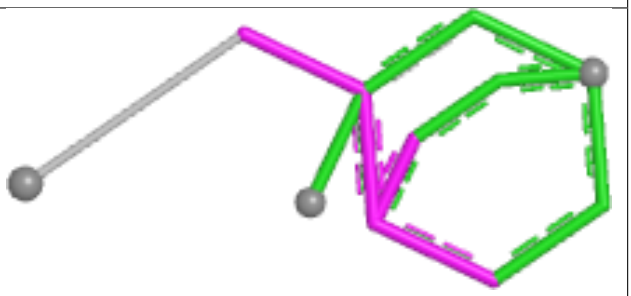
No monomer is involved in short contacts.

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.

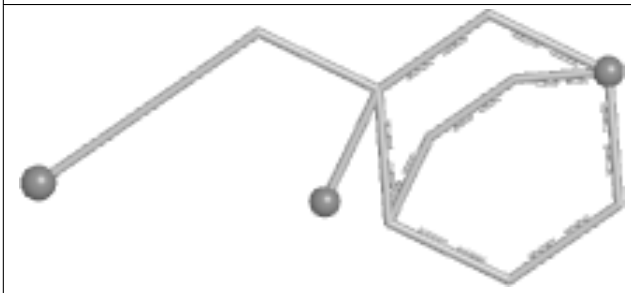
Ligand A1JCI A 901



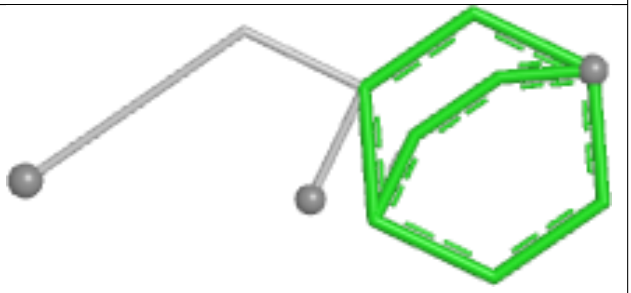
Bond lengths



Bond angles

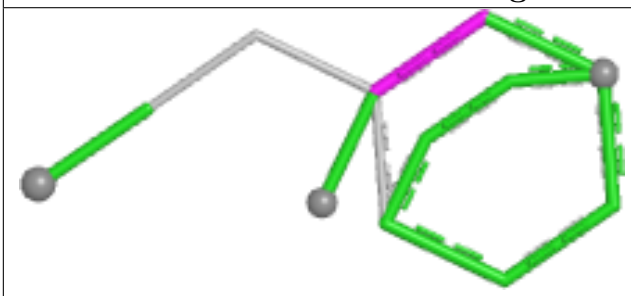


Torsions

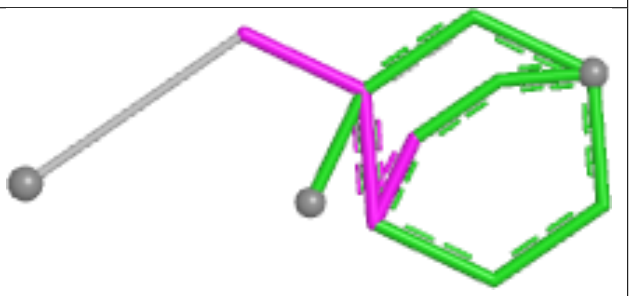


Rings

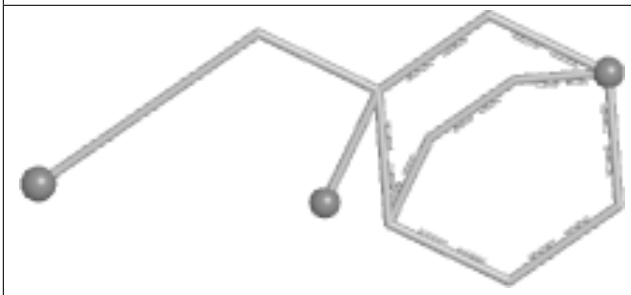
Ligand A1JCI D 901



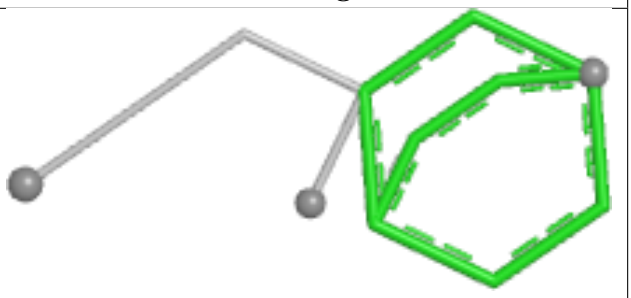
Bond lengths



Bond angles

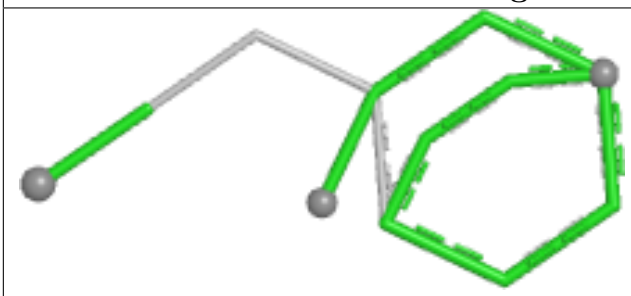


Torsions

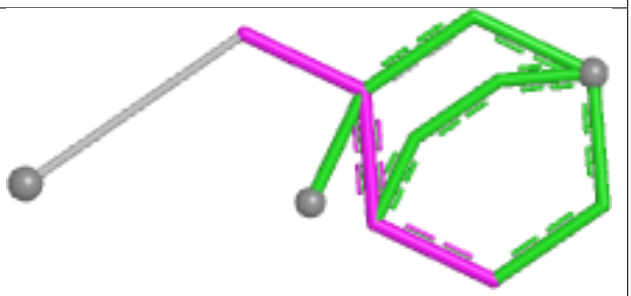


Rings

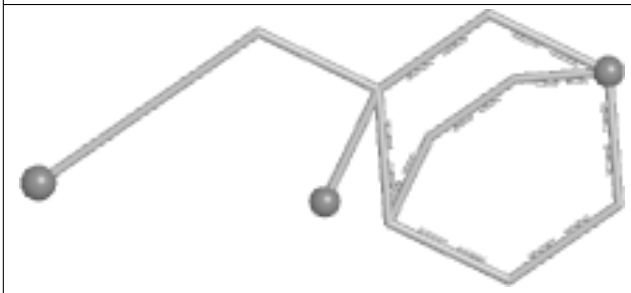
Ligand A1JCI B 901



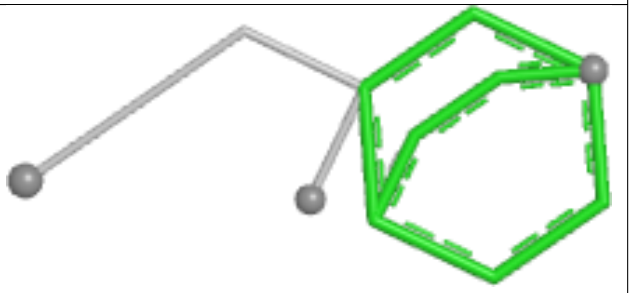
Bond lengths



Bond angles

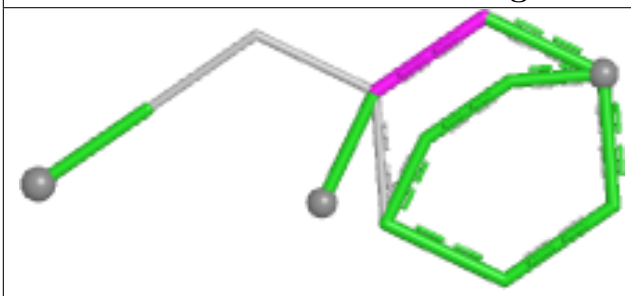


Torsions

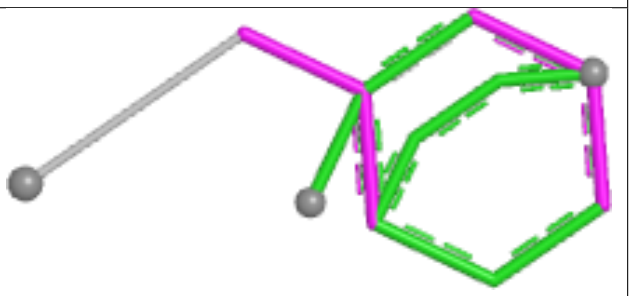


Rings

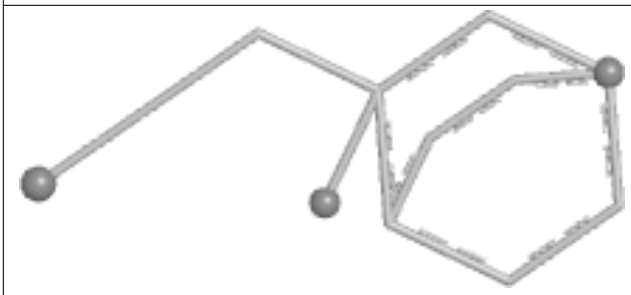
Ligand A1JCI C 901



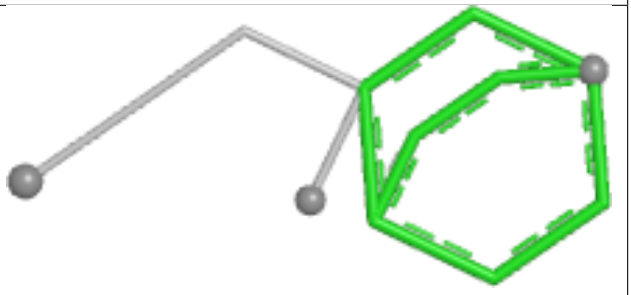
Bond lengths



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

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, 95^{th} 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	798/801 (99%)	0.17	22 (2%)	55	64	8, 19, 31, 41	7 (0%)
1	B	794/801 (99%)	0.44	57 (7%)	21	30	9, 21, 36, 46	5 (0%)
1	C	800/801 (99%)	0.19	32 (4%)	42	54	8, 18, 32, 44	5 (0%)
1	D	794/801 (99%)	0.29	31 (3%)	43	55	8, 20, 33, 46	6 (0%)
All	All	3186/3204 (99%)	0.27	142 (4%)	38	49	8, 19, 33, 46	23 (0%)

All (142) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	53	GLY	6.5
1	B	54	ILE	5.5
1	B	797	LEU	4.6
1	B	846	PHE	4.5
1	C	846	PHE	4.4
1	C	843	LEU	4.3
1	D	142	TRP	3.9
1	C	797	LEU	3.9
1	C	51	ALA	3.9
1	C	48	HIS	3.9
1	B	703	ASN	3.7
1	B	843	LEU	3.6
1	A	142	TRP	3.6
1	B	802	LEU	3.5
1	C	535	ASP	3.5
1	A	50	ALA	3.5
1	D	703	ASN	3.4
1	C	142	TRP	3.4
1	C	170	GLU	3.4
1	B	535	ASP	3.4
1	C	242	GLU	3.4

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Mol	Chain	Res	Type	RSRZ
1	A	49	ALA	3.4
1	C	49	ALA	3.4
1	B	387	LYS	3.4
1	C	287	THR	3.3
1	B	704	THR	3.3
1	B	803	LEU	3.3
1	A	202	PHE	3.2
1	D	478	ILE	3.2
1	D	846	PHE	3.2
1	B	705	PRO	3.2
1	B	845	GLY	3.2
1	C	52	ALA	3.1
1	A	846	PHE	3.1
1	B	533	MET	3.1
1	B	837	ILE	3.0
1	D	704	THR	3.0
1	D	170	GLU	3.0
1	B	702	ASN	3.0
1	C	50	ALA	2.9
1	B	838	ILE	2.9
1	D	769	ASP	2.9
1	B	841	THR	2.9
1	A	51	ALA	2.9
1	D	535	ASP	2.9
1	A	387	LYS	2.9
1	C	166	LYS	2.9
1	A	281	GLU	2.8
1	B	202	PHE	2.8
1	B	242	GLU	2.8
1	C	765	SER	2.8
1	B	767	LEU	2.8
1	A	705	PRO	2.8
1	D	813	ARG	2.8
1	C	697	THR	2.7
1	C	239	GLU	2.7
1	D	821	GLY	2.7
1	C	764	MET	2.7
1	B	55	PRO	2.7
1	D	843	LEU	2.7
1	B	71	LYS	2.7
1	B	384	GLY	2.7
1	C	47	HIS	2.7

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Mol	Chain	Res	Type	RSRZ
1	B	817	VAL	2.7
1	D	800	GLU	2.7
1	A	821	GLY	2.6
1	D	166	LYS	2.6
1	B	844	HIS	2.6
1	B	764	MET	2.6
1	A	52	ALA	2.6
1	A	287	THR	2.6
1	A	408	HIS	2.6
1	A	250	GLU	2.6
1	B	163	GLU	2.6
1	B	812	TYR	2.6
1	A	163	GLU	2.6
1	D	56	ASP	2.5
1	B	625	LEU	2.5
1	B	813	ARG	2.5
1	A	703	ASN	2.5
1	B	833	VAL	2.5
1	B	798	ASP	2.5
1	B	766	GLY	2.5
1	D	786	MET	2.5
1	D	805	ALA	2.5
1	B	718	ARG	2.4
1	A	704	THR	2.4
1	D	431	THR	2.4
1	B	826	PHE	2.4
1	C	639	GLU	2.4
1	A	625	LEU	2.4
1	B	827	VAL	2.4
1	C	830	CYS	2.4
1	B	805	ALA	2.4
1	B	819	VAL	2.4
1	B	772	GLU	2.4
1	B	814	ASP	2.4
1	B	154	PRO	2.4
1	B	830	CYS	2.4
1	B	426	ARG	2.3
1	B	630	ARG	2.3
1	A	54	ILE	2.3
1	D	54	ILE	2.3
1	B	697	THR	2.3
1	B	771	PRO	2.3

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Mol	Chain	Res	Type	RSRZ
1	D	202	PHE	2.3
1	C	704	THR	2.3
1	C	703	ASN	2.3
1	D	812	TYR	2.3
1	A	639	GLU	2.3
1	B	700	ILE	2.3
1	B	763	LEU	2.3
1	C	844	HIS	2.3
1	B	786	MET	2.2
1	B	536	LEU	2.2
1	B	634	LEU	2.2
1	C	803	LEU	2.2
1	B	290	ARG	2.2
1	C	813	ARG	2.2
1	A	242	GLU	2.2
1	C	814	ASP	2.2
1	B	142	TRP	2.2
1	C	202	PHE	2.2
1	D	53	GLY	2.2
1	D	705	PRO	2.2
1	B	801	LEU	2.1
1	D	357	ARG	2.1
1	D	360	GLU	2.1
1	D	449	VAL	2.1
1	C	387	LYS	2.1
1	B	825	PHE	2.1
1	B	635	ALA	2.1
1	C	449	VAL	2.1
1	D	771	PRO	2.1
1	D	387	LYS	2.1
1	A	290	ARG	2.1
1	D	287	THR	2.1
1	D	802	LEU	2.1
1	D	284	ALA	2.1
1	D	630	ARG	2.0
1	C	845	GLY	2.0
1	C	423	ARG	2.0

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

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

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

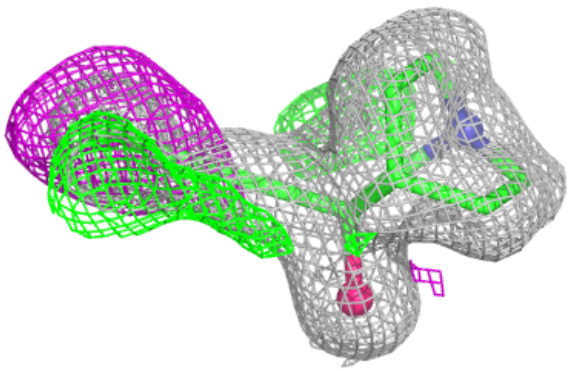
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

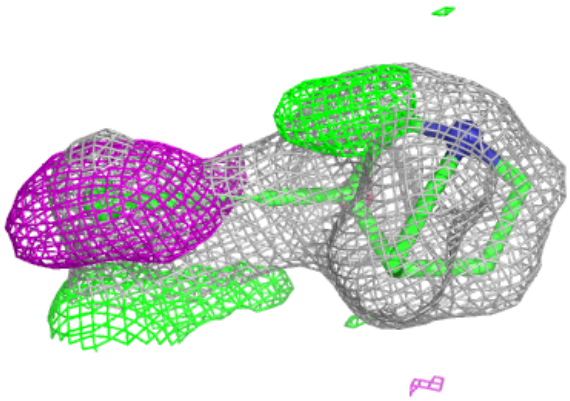
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	A1JCI	B	901	12/12	0.82	0.14	22,24,32,34	0
2	A1JCI	C	901	12/12	0.82	0.14	19,20,30,34	0
2	A1JCI	D	901	12/12	0.85	0.12	19,21,28,31	0
2	A1JCI	A	901	12/12	0.89	0.11	17,19,26,28	0

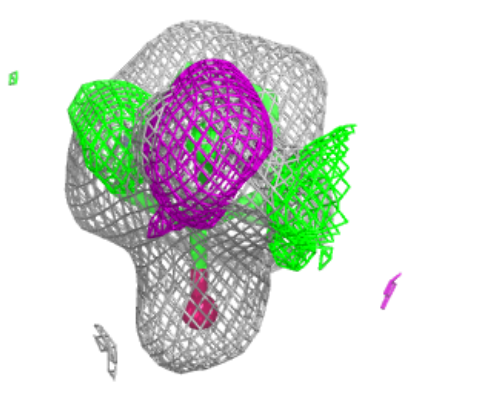
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around A1JCI B 901:

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

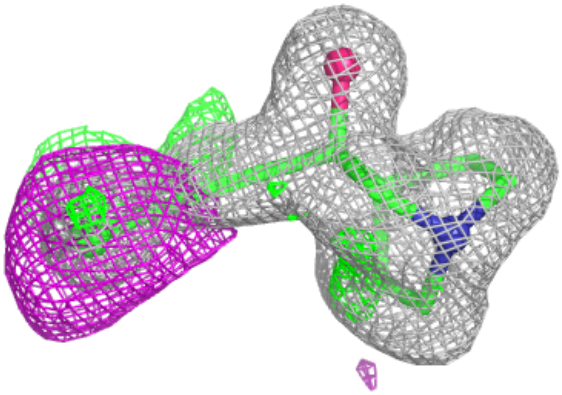


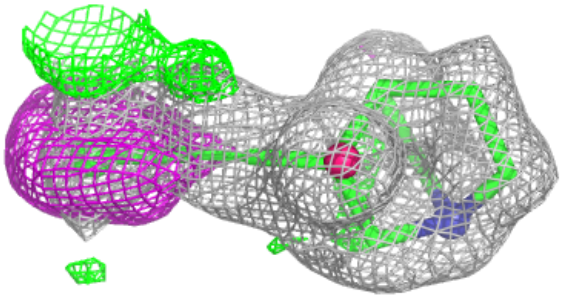


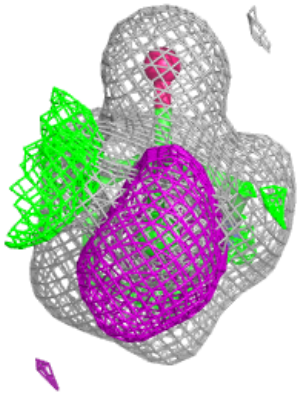


Electron density around A1JCI C 901:

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

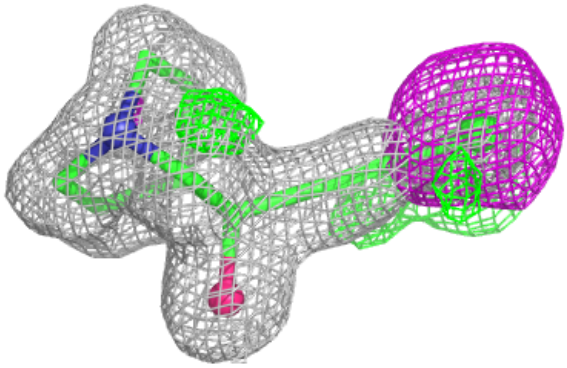


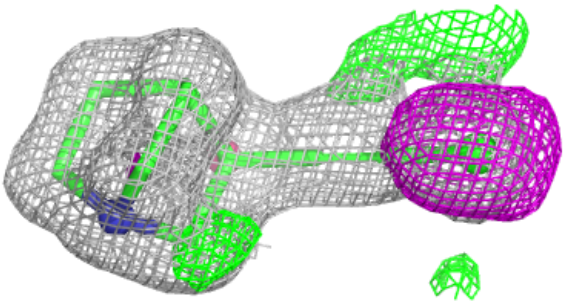


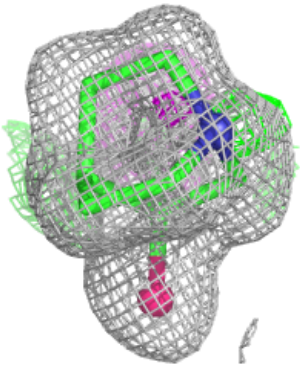


Electron density around A1JCI D 901:

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

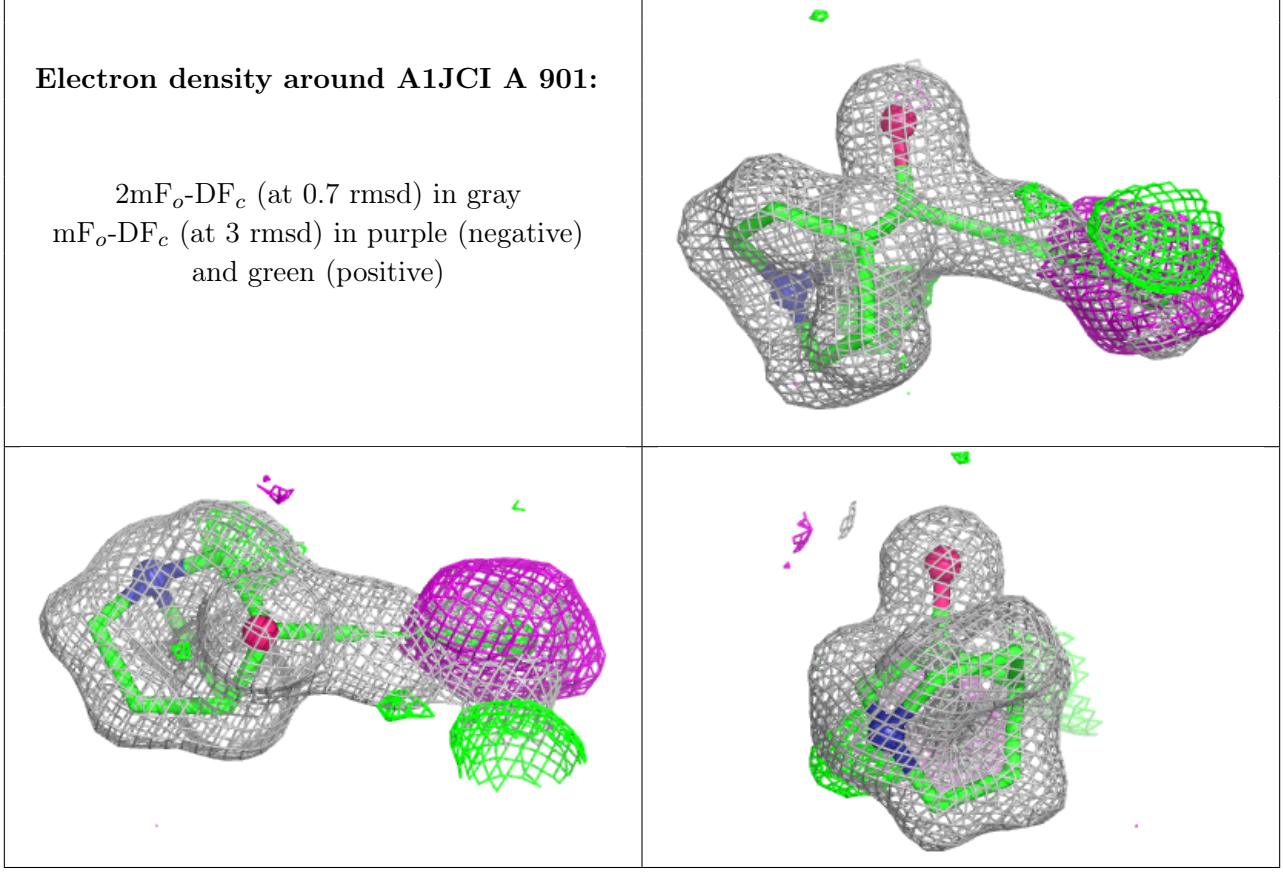






Electron density around A1JCI A 901:

$2mF_o$-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 (i)

There are no such residues in this entry.