Full wwPDB X-ray Structure Validation Report ⓘ

Jun 24, 2025 – 05:24 pm BST

PDB ID	:	5L47 / pdb_00005l47
Title	:	X-ray structure of the 2-22' locally-closed mutant of GLIC in complex with cyanoselenobarbital (seleniated barbiturate)
Authors	:	Reinholds Ruza, R.; Fourati, Z.; Delarue, M.
Deposited on	:	2016-05-25
Resolution	:	3.30 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:

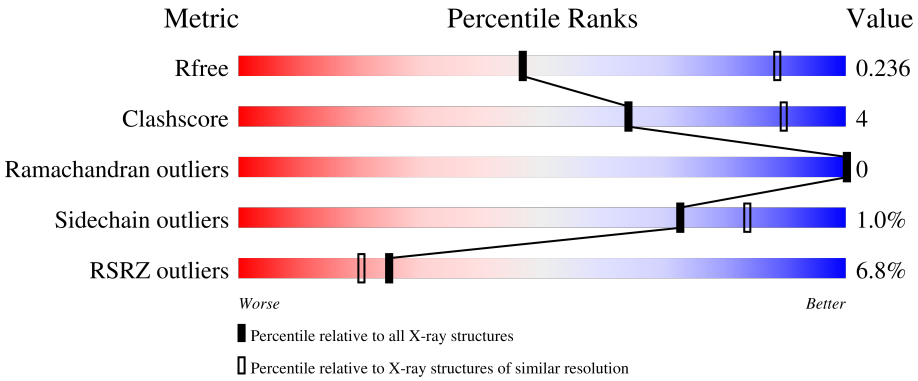
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.30 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))
R_{free}	164625	1085 (3.32-3.28)
Clashscore	180529	1128 (3.32-3.28)
Ramachandran outliers	177936	1125 (3.32-3.28)
Sidechain outliers	177891	1124 (3.32-3.28)
RSRZ outliers	164620	1085 (3.32-3.28)

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	317	7% 91% 7% ·
1	B	317	6% 91% 7% ·
1	C	317	7% 87% 11% ·
1	D	317	7% 88% 10% ·
1	E	317	6% 89% 9% ··

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	ACT	A	402	-	-	X	-
3	ACT	B	403	-	-	X	-
3	ACT	D	403	-	-	X	-
3	ACT	E	402	-	-	X	-
4	NA	C	403	-	-	-	X
4	NA	D	404	-	-	-	X
5	6JA	B	402	-	-	X	-

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 12779 atoms, of which 15 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 Proton-gated ion channel.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	311	Total	C	N	O	S	0	0	0
			2520	1658	403	454	5			
1	B	311	Total	C	N	O	S	0	0	0
			2520	1658	403	454	5			
1	C	311	Total	C	N	O	S	0	0	0
			2520	1658	403	454	5			
1	D	311	Total	C	N	O	S	0	0	0
			2520	1658	403	454	5			
1	E	311	Total	C	N	O	S	0	0	0
			2520	1658	403	454	5			

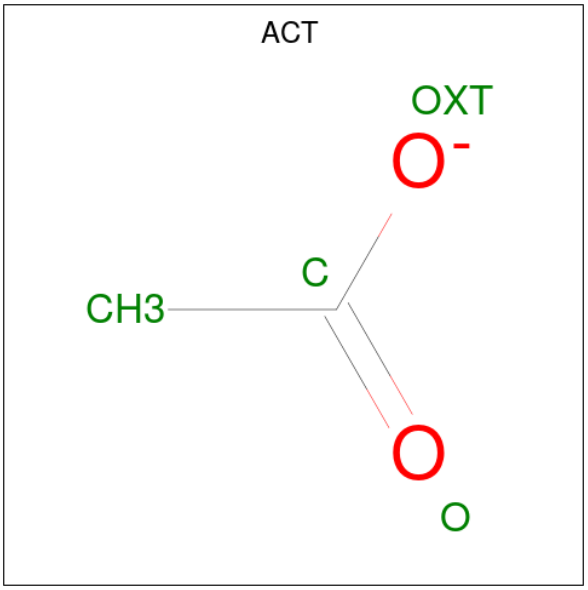
There are 15 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	27	SER	CYS	conflict	UNP Q7NDN8
A	33	CYS	LYS	conflict	UNP Q7NDN8
A	246	CYS	LEU	conflict	UNP Q7NDN8
B	27	SER	CYS	conflict	UNP Q7NDN8
B	33	CYS	LYS	conflict	UNP Q7NDN8
B	246	CYS	LEU	conflict	UNP Q7NDN8
C	27	SER	CYS	conflict	UNP Q7NDN8
C	33	CYS	LYS	conflict	UNP Q7NDN8
C	246	CYS	LEU	conflict	UNP Q7NDN8
D	27	SER	CYS	conflict	UNP Q7NDN8
D	33	CYS	LYS	conflict	UNP Q7NDN8
D	246	CYS	LEU	conflict	UNP Q7NDN8
E	27	SER	CYS	conflict	UNP Q7NDN8
E	33	CYS	LYS	conflict	UNP Q7NDN8
E	246	CYS	LEU	conflict	UNP Q7NDN8

- Molecule 2 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Cl 1 1	0	0
2	B	1	Total Cl 1 1	0	0
2	C	1	Total Cl 1 1	0	0
2	D	1	Total Cl 1 1	0	0
2	E	1	Total Cl 1 1	0	0

- Molecule 3 is ACETATE ION (CCD ID: ACT) (formula: $C_2H_3O_2$).

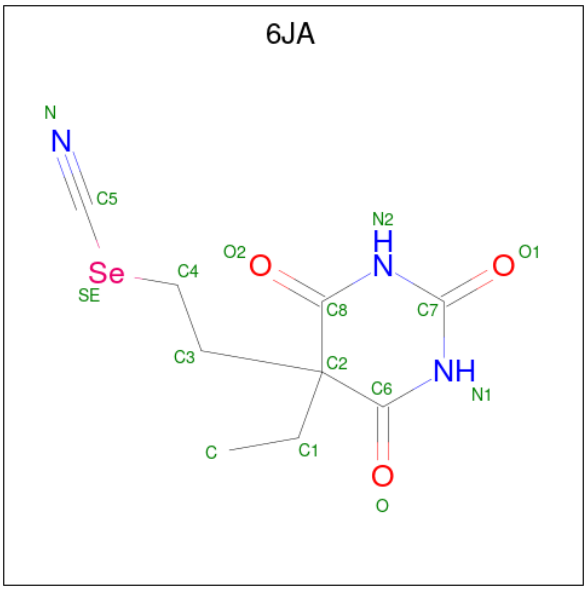


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C H O 7 2 3 2	0	0
3	B	1	Total C H O 7 2 3 2	0	0
3	C	1	Total C H O 7 2 3 2	0	0
3	D	1	Total C H O 7 2 3 2	0	0
3	E	1	Total C H O 7 2 3 2	0	0

- Molecule 4 is SODIUM ION (CCD ID: NA) (formula: Na).

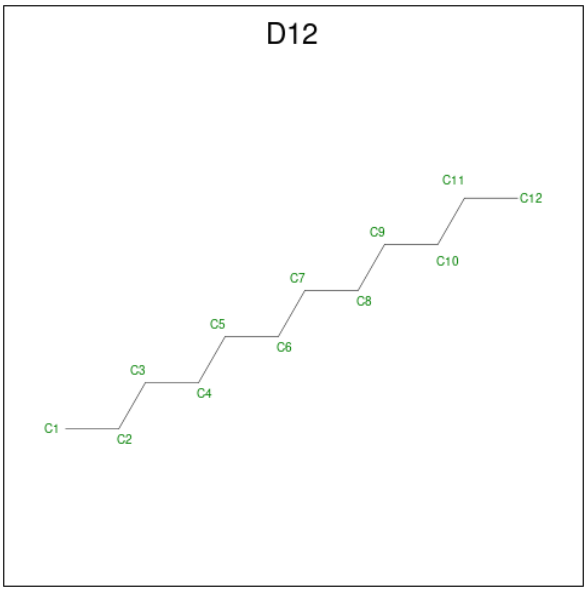
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total Na 1 1	0	0
4	C	1	Total Na 1 1	0	0
4	D	1	Total Na 1 1	0	0
4	E	1	Total Na 1 1	0	0

- Molecule 5 is 2-[5-ethyl-2,4,6-tris(oxidanylidene)-1,3-diazinan-5-yl]ethyl selenocyanate (CCD ID: 6JA) (formula: $C_9H_{11}N_3O_3Se$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	B	1	Total C N O Se 16 9 3 3 1	0	0

- Molecule 6 is DODECANE (CCD ID: D12) (formula: $C_{12}H_{26}$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	D	1	Total C 12 12	0	0

- Molecule 7 is water.

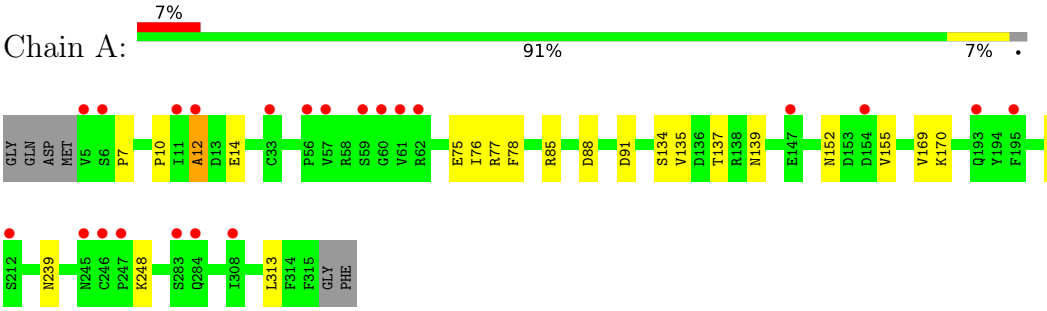
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	28	Total O 28 28	0	0
7	B	29	Total O 29 29	0	0
7	C	19	Total O 19 19	0	0
7	D	15	Total O 15 15	0	0
7	E	16	Total O 16 16	0	0

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.

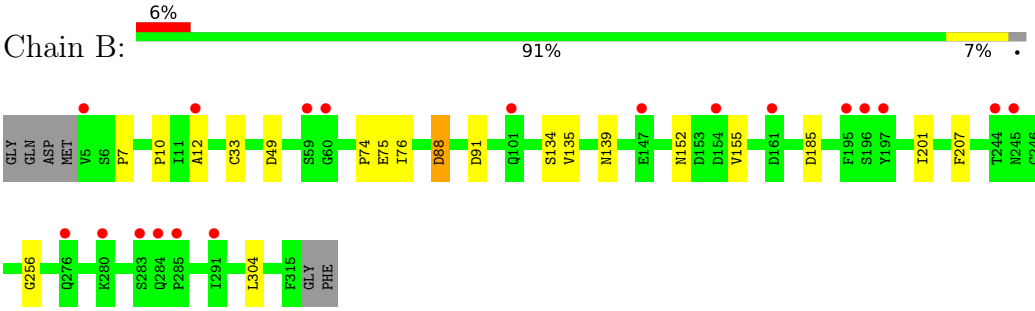
• Molecule 1: Proton-gated ion channel

Chain A:



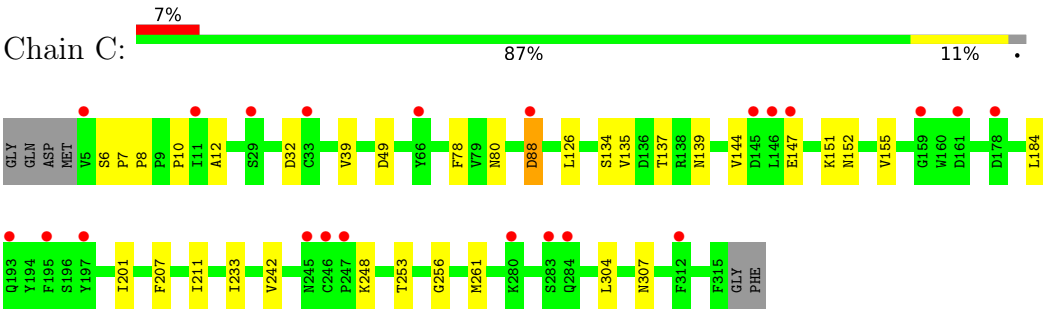
• Molecule 1: Proton-gated ion channel

Chain B:



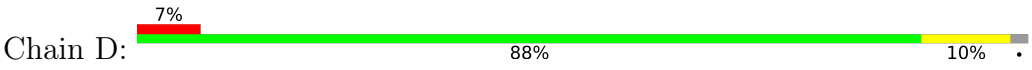
• Molecule 1: Proton-gated ion channel

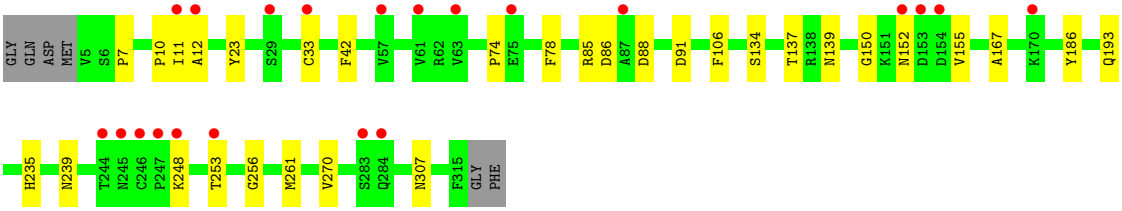
Chain C:



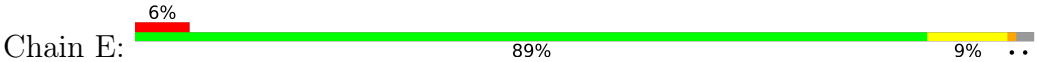
• Molecule 1: Proton-gated ion channel

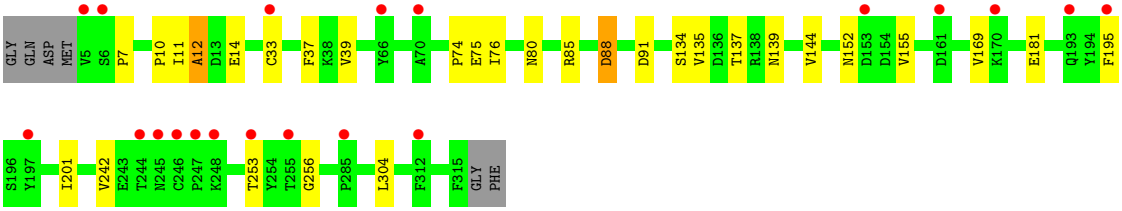
Chain D:





• Molecule 1: Proton-gated ion channel





4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	181.16Å 128.12Å 162.19Å 90.00° 102.72° 90.00°	Depositor
Resolution (Å)	49.00 – 3.30 49.00 – 3.30	Depositor EDS
% Data completeness (in resolution range)	99.3 (49.00-3.30) 99.9 (49.00-3.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.11 (at 3.12Å)	Xtriage
Refinement program	BUSTER 2.10.2	Depositor
R, R_{free}	0.210 , 0.230 0.216 , 0.236	Depositor DCC
R_{free} test set	2753 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å^2)	81.4	Xtriage
Anisotropy	0.203	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 55.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	12779	wwPDB-VP
Average B, all atoms (Å^2)	89.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.61% 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: 6JA, CL, ACT, NA, D12

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	0.82	0/2588	1.19	4/3539 (0.1%)
1	B	0.83	0/2588	1.21	5/3539 (0.1%)
1	C	0.86	0/2588	1.22	6/3539 (0.2%)
1	D	0.81	0/2588	1.19	5/3539 (0.1%)
1	E	0.85	1/2588 (0.0%)	1.23	5/3539 (0.1%)
All	All	0.83	1/12940 (0.0%)	1.21	25/17695 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	80	ASN	CA-C	5.09	1.59	1.53

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	E	91	ASP	CA-CB-CG	9.34	121.94	112.60
1	D	88	ASP	CA-CB-CG	6.80	119.40	112.60
1	C	78	PHE	CA-CB-CG	6.78	120.58	113.80
1	A	88	ASP	CA-CB-CG	6.49	119.09	112.60
1	E	195	PHE	CA-CB-CG	6.42	120.22	113.80
1	E	88	ASP	CA-CB-CG	6.00	118.60	112.60
1	C	88	ASP	CA-CB-CG	5.92	118.52	112.60
1	E	12	ALA	N-CA-C	-5.85	98.34	110.80
1	A	91	ASP	CA-CB-CG	5.63	118.23	112.60
1	B	207	PHE	CA-CB-CG	5.56	119.36	113.80
1	C	80	ASN	CA-CB-CG	5.54	118.14	112.60
1	D	42	PHE	CA-CB-CG	5.42	119.22	113.80
1	D	91	ASP	CA-CB-CG	5.34	117.94	112.60
1	A	12	ALA	N-CA-C	-5.30	99.51	110.80
1	D	11	ILE	CA-C-N	5.30	129.15	122.16

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	11	ILE	C-N-CA	5.30	129.15	122.16
1	B	91	ASP	CA-CB-CG	5.22	117.82	112.60
1	B	185	ASP	CA-CB-CG	5.22	117.82	112.60
1	C	207	PHE	CA-CB-CG	5.16	118.96	113.80
1	B	49	ASP	CA-CB-CG	5.12	117.72	112.60
1	C	32	ASP	CA-CB-CG	5.09	117.69	112.60
1	B	88	ASP	CA-CB-CG	5.09	117.69	112.60
1	E	181	GLU	CB-CG-CD	5.03	121.15	112.60
1	C	185	ASP	CA-CB-CG	5.03	117.62	112.60
1	A	207	PHE	CA-CB-CG	5.00	118.80	113.80

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2520	0	2529	17	0
1	B	2520	0	2529	12	0
1	C	2520	0	2529	32	0
1	D	2520	0	2529	17	0
1	E	2520	0	2529	23	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
3	A	4	3	3	3	0
3	B	4	3	3	5	0
3	C	4	3	3	0	0
3	D	4	3	3	2	0
3	E	4	3	3	6	0
4	A	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	B	16	0	0	7	0
6	D	12	0	26	0	0
7	A	28	0	0	1	0
7	B	29	0	0	0	0
7	C	19	0	0	1	0
7	D	15	0	0	0	0
7	E	16	0	0	0	0
All	All	12764	15	12686	97	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 4.

All (97) 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:7:PRO:CG	1:C:137:THR:HG21	1.90	1.01
1:C:135:VAL:HG23	1:C:137:THR:HG22	1.47	0.96
1:C:135:VAL:CG2	1:C:137:THR:HG22	1.96	0.93
1:C:7:PRO:HG3	1:C:137:THR:CG2	2.01	0.91
5:B:402:6JA:SE	1:C:233:ILE:HD13	2.22	0.89
5:B:402:6JA:SE	5:B:402:6JA:C1	2.73	0.86
1:B:7:PRO:HG3	1:B:135:VAL:HG21	1.61	0.82
5:B:402:6JA:SE	5:B:402:6JA:O	2.49	0.81
1:C:147:GLU:HB3	7:C:508:HOH:O	1.80	0.81
1:D:10:PRO:HB2	1:D:12:ALA:O	1.81	0.81
1:C:7:PRO:CG	1:C:137:THR:CG2	2.56	0.80
1:E:37:PHE:CE2	1:E:39:VAL:HG21	2.15	0.80
1:C:7:PRO:HG3	1:C:137:THR:HG21	1.58	0.80
1:A:10:PRO:HB2	1:A:12:ALA:O	1.80	0.80
1:B:10:PRO:HB2	1:B:12:ALA:O	1.82	0.79
1:E:76:ILE:H	3:E:402:ACT:H2	1.48	0.78
1:B:74:PRO:O	3:B:403:ACT:H2	1.85	0.76
1:A:77:ARG:NH1	7:A:501:HOH:O	2.19	0.75
1:E:10:PRO:HB2	1:E:12:ALA:O	1.87	0.73
1:C:135:VAL:CG2	1:C:137:THR:CG2	2.69	0.70
1:E:37:PHE:CE2	1:E:39:VAL:CG2	2.75	0.70
1:C:10:PRO:HB2	1:C:12:ALA:O	1.91	0.69
1:E:37:PHE:HE2	1:E:39:VAL:HG21	1.56	0.69
1:A:76:ILE:H	3:A:402:ACT:CH3	2.07	0.68
1:B:76:ILE:H	3:B:403:ACT:H2	1.59	0.67
1:C:135:VAL:HG21	1:C:137:THR:HG22	1.76	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:7:PRO:CD	1:C:137:THR:HG21	2.25	0.65
1:E:7:PRO:HG3	1:E:135:VAL:HG21	1.79	0.64
1:B:75:GLU:HA	3:B:403:ACT:CH3	2.27	0.64
1:D:261:MET:HE1	1:D:307:ASN:OD1	1.98	0.62
1:B:74:PRO:O	3:B:403:ACT:CH3	2.47	0.61
1:B:75:GLU:HA	3:B:403:ACT:H1	1.82	0.61
1:C:261:MET:HE1	1:C:307:ASN:OD1	2.04	0.58
1:C:135:VAL:HG21	1:C:137:THR:CG2	2.34	0.57
1:E:152:ASN:HB3	1:E:155:VAL:HG23	1.88	0.56
1:C:7:PRO:HG3	1:C:137:THR:HG23	1.88	0.55
1:C:152:ASN:HB3	1:C:155:VAL:HG23	1.87	0.55
1:C:242:VAL:HG12	1:D:248:LYS:HE3	1.89	0.55
1:E:37:PHE:CD2	1:E:39:VAL:HG23	2.43	0.54
1:A:75:GLU:HA	3:A:402:ACT:H2	1.90	0.54
1:A:248:LYS:NZ	1:E:242:VAL:HA	2.24	0.53
1:D:235:HIS:CE1	1:D:239:ASN:HD21	2.26	0.53
1:E:37:PHE:CD2	1:E:39:VAL:CG2	2.91	0.53
1:C:7:PRO:HG2	1:C:137:THR:CG2	2.39	0.53
1:A:152:ASN:HB3	1:A:155:VAL:HG23	1.91	0.52
1:C:201:ILE:HD11	1:D:248:LYS:HD2	1.89	0.52
1:D:152:ASN:HB3	1:D:155:VAL:HG23	1.90	0.51
1:D:78:PHE:CE2	1:D:85:ARG:HD3	2.46	0.51
1:E:85:ARG:NH2	3:E:402:ACT:OXT	2.43	0.51
1:B:152:ASN:HB3	1:B:155:VAL:HG23	1.93	0.50
1:D:193:GLN:HG3	1:D:193:GLN:O	2.12	0.50
5:B:402:6JA:SE	5:B:402:6JA:C6	3.07	0.50
1:E:144:VAL:CG1	1:E:169:VAL:HA	2.42	0.50
1:E:75:GLU:HA	3:E:402:ACT:CH3	2.42	0.49
1:E:12:ALA:O	1:E:14:GLU:OE1	2.32	0.48
1:C:7:PRO:HG2	1:C:137:THR:HG21	1.86	0.48
1:A:248:LYS:HZ1	1:E:242:VAL:HA	1.79	0.48
1:D:85:ARG:NH2	3:D:403:ACT:OXT	2.47	0.47
1:A:248:LYS:HD3	1:E:201:ILE:HD11	1.96	0.47
1:B:201:ILE:HD11	1:C:248:LYS:HD2	1.95	0.47
1:A:76:ILE:H	3:A:402:ACT:H3	1.80	0.47
1:D:134:SER:HB3	1:D:139:ASN:HA	1.97	0.47
1:A:134:SER:HB3	1:A:139:ASN:HA	1.97	0.46
1:D:7:PRO:HG2	1:D:137:THR:OG1	2.15	0.46
1:C:126:LEU:HD12	1:C:188:LEU:HD23	1.98	0.45
1:C:135:VAL:HG23	1:C:137:THR:CG2	2.29	0.45
1:D:23:TYR:HA	1:D:150:GLY:O	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:B:402:6JA:SE	1:C:233:ILE:CD1	3.07	0.45
1:A:201:ILE:HD11	1:B:248:LYS:HD3	1.99	0.45
1:C:7:PRO:CG	1:C:137:THR:HG23	2.44	0.45
1:A:248:LYS:HE2	1:E:242:VAL:HG12	1.98	0.45
1:E:75:GLU:HA	3:E:402:ACT:H2	1.98	0.45
1:B:134:SER:HB3	1:B:139:ASN:HA	1.99	0.45
1:E:76:ILE:N	3:E:402:ACT:H2	2.26	0.45
1:A:7:PRO:HG2	1:A:137:THR:OG1	2.17	0.44
1:E:74:PRO:O	3:E:402:ACT:H2	2.17	0.44
1:A:78:PHE:CE2	1:A:85:ARG:HD3	2.53	0.44
1:C:8:PRO:HB3	1:C:49:ASP:OD1	2.17	0.44
1:E:134:SER:HB3	1:E:139:ASN:HA	2.00	0.43
1:D:74:PRO:O	3:D:403:ACT:H2	2.17	0.43
1:C:253:THR:HG23	1:C:256:GLY:H	1.84	0.42
5:B:402:6JA:C	5:B:402:6JA:C5	2.97	0.42
1:C:144:VAL:HG22	1:C:184:LEU:HD13	2.01	0.42
1:D:86:ASP:O	1:D:106:PHE:HA	2.19	0.42
1:C:134:SER:HB3	1:C:139:ASN:HA	2.01	0.42
1:D:253:THR:HG23	1:D:256:GLY:H	1.85	0.42
1:C:7:PRO:HG3	1:C:135:VAL:HG21	2.01	0.42
1:C:211:ILE:HG23	1:D:270:VAL:HG11	2.01	0.42
1:A:7:PRO:HG3	1:A:135:VAL:HG21	2.01	0.41
1:D:167:ALA:HB2	1:D:186:TYR:CE1	2.55	0.41
5:B:402:6JA:C1	5:B:402:6JA:C5	2.97	0.41
1:A:169:VAL:HG23	1:A:170:LYS:HD2	2.02	0.41
1:B:253:THR:HG23	1:B:256:GLY:H	1.85	0.41
1:C:6:SER:HB2	1:C:7:PRO:HD2	2.03	0.41
1:E:253:THR:HG23	1:E:256:GLY:H	1.86	0.40
1:A:12:ALA:O	1:A:14:GLU:OE1	2.39	0.40
1:E:7:PRO:HG2	1:E:137:THR:OG1	2.21	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	309/317 (98%)	297 (96%)	12 (4%)	0	100	100
1	B	309/317 (98%)	298 (96%)	11 (4%)	0	100	100
1	C	309/317 (98%)	296 (96%)	13 (4%)	0	100	100
1	D	309/317 (98%)	297 (96%)	12 (4%)	0	100	100
1	E	309/317 (98%)	299 (97%)	10 (3%)	0	100	100
All	All	1545/1585 (98%)	1487 (96%)	58 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	280/284 (99%)	278 (99%)	2 (1%)	81	88
1	B	280/284 (99%)	277 (99%)	3 (1%)	70	82
1	C	280/284 (99%)	276 (99%)	4 (1%)	62	78
1	D	280/284 (99%)	279 (100%)	1 (0%)	89	93
1	E	280/284 (99%)	276 (99%)	4 (1%)	62	78
All	All	1400/1420 (99%)	1386 (99%)	14 (1%)	73	84

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	239	ASN
1	A	313	LEU
1	B	33	CYS
1	B	88	ASP
1	B	304	LEU
1	C	39	VAL
1	C	88	ASP

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Mol	Chain	Res	Type
1	C	151	LYS
1	C	304	LEU
1	D	33	CYS
1	E	11	ILE
1	E	33	CYS
1	E	88	ASP
1	E	304	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	277	HIS
1	A	307	ASN
1	B	235	HIS
1	B	239	ASN
1	B	277	HIS
1	C	193	GLN
1	C	277	HIS
1	D	239	ASN
1	D	277	HIS
1	E	193	GLN
1	E	307	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 16 ligands modelled in this entry, 9 are monoatomic - leaving 7 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	ACT	E	402	-	3,3,3	1.17	0	3,3,3	1.51	1 (33%)
3	ACT	C	402	-	3,3,3	0.86	0	3,3,3	1.90	2 (66%)
3	ACT	A	402	-	3,3,3	1.04	0	3,3,3	1.74	1 (33%)
3	ACT	B	403	-	3,3,3	1.87	1 (33%)	3,3,3	1.36	0
5	6JA	B	402	-	16,16,16	0.99	1 (6%)	20,22,22	0.40	0
6	D12	D	401	-	11,11,11	0.51	0	10,10,10	0.75	0
3	ACT	D	403	-	3,3,3	1.20	0	3,3,3	1.98	1 (33%)

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
6	D12	D	401	-	-	1/9/9/9	-
5	6JA	B	402	-	-	3/8/29/29	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	402	6JA	SE-C5	-3.86	1.75	1.84
3	B	403	ACT	OXT-C	-2.61	1.18	1.30

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	403	ACT	OXT-C-O	2.88	132.65	122.05
3	C	402	ACT	OXT-C-O	2.50	131.27	122.05
3	A	402	ACT	OXT-C-O	2.45	131.08	122.05
3	E	402	ACT	OXT-C-O	2.15	129.98	122.05
3	C	402	ACT	O-C-CH3	-2.14	113.98	122.33

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	402	6JA	C2-C3-C4-SE
5	B	402	6JA	C8-C2-C3-C4
5	B	402	6JA	C-C1-C2-C6
6	D	401	D12	C11-C10-C9-C8

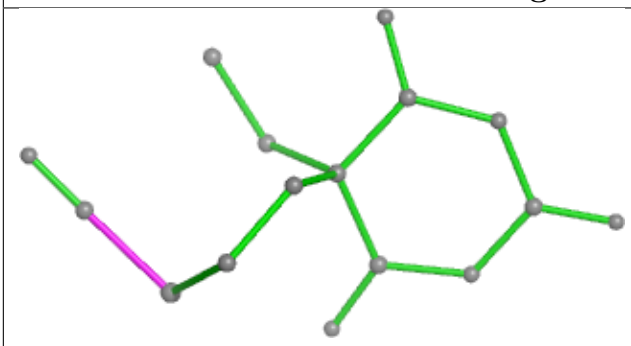
There are no ring outliers.

5 monomers are involved in 23 short contacts:

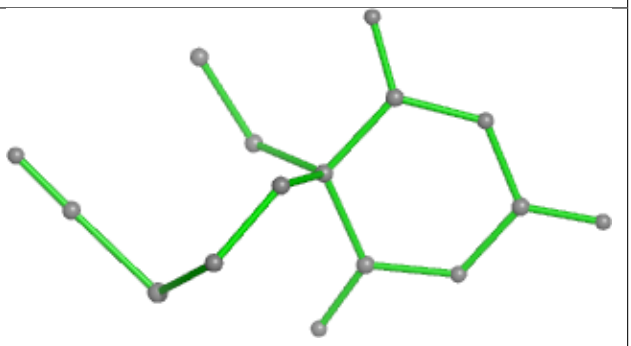
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	402	ACT	6	0
3	A	402	ACT	3	0
3	B	403	ACT	5	0
5	B	402	6JA	7	0
3	D	403	ACT	2	0

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.

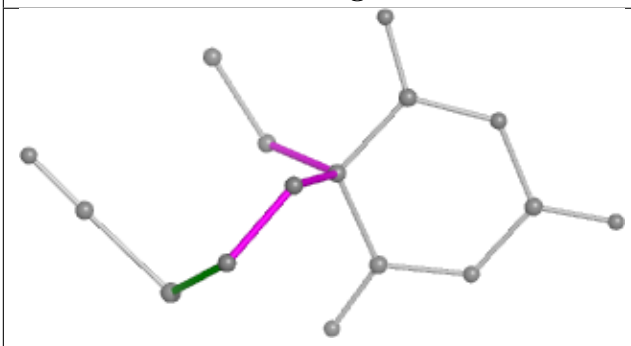
Ligand 6JA B 402



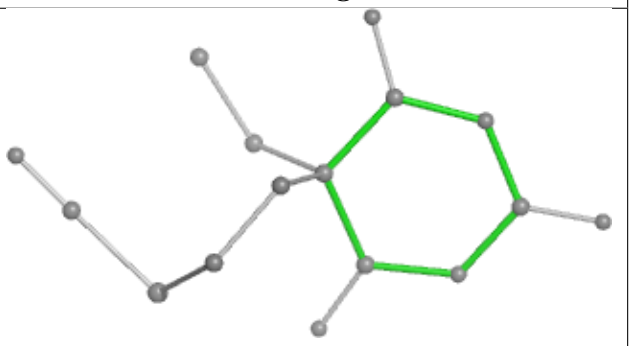
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	311/317 (98%)	0.52	22 (7%)	23	20	58, 91, 128, 153	0
1	B	311/317 (98%)	0.58	20 (6%)	27	22	60, 88, 125, 150	0
1	C	311/317 (98%)	0.47	22 (7%)	23	20	53, 85, 119, 152	0
1	D	311/317 (98%)	0.55	21 (6%)	25	20	61, 90, 125, 154	0
1	E	311/317 (98%)	0.52	20 (6%)	27	22	50, 86, 118, 152	0
All	All	1555/1585 (98%)	0.53	105 (6%)	25	20	50, 88, 124, 154	0

All (105) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	195	PHE	6.2
1	A	195	PHE	5.9
1	E	248	LYS	4.9
1	C	195	PHE	4.9
1	A	245	ASN	4.7
1	C	245	ASN	4.7
1	D	245	ASN	4.5
1	E	5	VAL	4.3
1	C	161	ASP	4.3
1	D	154	ASP	4.0
1	B	284	GLN	4.0
1	C	197	TYR	3.9
1	A	61	VAL	3.9
1	A	154	ASP	3.7
1	A	56	PRO	3.7
1	D	153	ASP	3.7
1	E	253	THR	3.7
1	E	161	ASP	3.5
1	C	283	SER	3.5
1	E	247	PRO	3.4

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Mol	Chain	Res	Type	RSRZ
1	B	197	TYR	3.4
1	D	152	ASN	3.4
1	A	57	VAL	3.4
1	D	244	THR	3.2
1	C	5	VAL	3.1
1	E	245	ASN	3.1
1	E	70	ALA	3.1
1	D	12	ALA	3.1
1	A	60	GLY	3.0
1	C	284	GLN	3.0
1	E	244	THR	3.0
1	B	12	ALA	3.0
1	E	197	TYR	3.0
1	A	247	PRO	3.0
1	E	153	ASP	2.9
1	B	247	PRO	2.9
1	A	5	VAL	2.9
1	A	283	SER	2.8
1	D	246	CYS	2.8
1	D	253	THR	2.8
1	A	59	SER	2.8
1	B	147	GLU	2.7
1	B	5	VAL	2.7
1	B	161	ASP	2.7
1	B	154	ASP	2.6
1	D	283	SER	2.6
1	C	247	PRO	2.6
1	D	247	PRO	2.6
1	B	244	THR	2.6
1	B	245	ASN	2.6
1	E	195	PHE	2.6
1	E	33	CYS	2.6
1	B	285	PRO	2.5
1	E	255	THR	2.5
1	C	193	GLN	2.5
1	C	29	SER	2.5
1	D	284	GLN	2.5
1	D	33	CYS	2.4
1	E	285	PRO	2.4
1	C	280	LYS	2.4
1	B	283	SER	2.4
1	B	291	ILE	2.4

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Mol	Chain	Res	Type	RSRZ
1	C	33	CYS	2.4
1	C	246	CYS	2.3
1	A	246	CYS	2.3
1	C	312	PHE	2.3
1	B	59	SER	2.3
1	D	11	ILE	2.3
1	A	147	GLU	2.3
1	C	88	ASP	2.3
1	E	193	GLN	2.3
1	A	212	SER	2.3
1	E	6	SER	2.3
1	B	196	SER	2.2
1	D	29	SER	2.2
1	D	61	VAL	2.2
1	D	248	LYS	2.2
1	E	246	CYS	2.2
1	A	12	ALA	2.2
1	A	11	ILE	2.2
1	C	11	ILE	2.2
1	A	62	ARG	2.2
1	B	280	LYS	2.2
1	C	159	GLY	2.2
1	C	147	GLU	2.2
1	D	75	GLU	2.2
1	C	146	LEU	2.2
1	D	57	VAL	2.2
1	B	60	GLY	2.1
1	A	193	GLN	2.1
1	D	87	ALA	2.1
1	D	170	LYS	2.1
1	E	170	LYS	2.1
1	A	308	ILE	2.1
1	C	178	ASP	2.1
1	B	101	GLN	2.1
1	B	276	GLN	2.1
1	A	33	CYS	2.1
1	A	6	SER	2.0
1	C	66	TYR	2.0
1	E	66	TYR	2.0
1	A	284	GLN	2.0
1	E	312	PHE	2.0
1	C	145	ASP	2.0

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Mol	Chain	Res	Type	RSRZ
1	D	63	VAL	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)

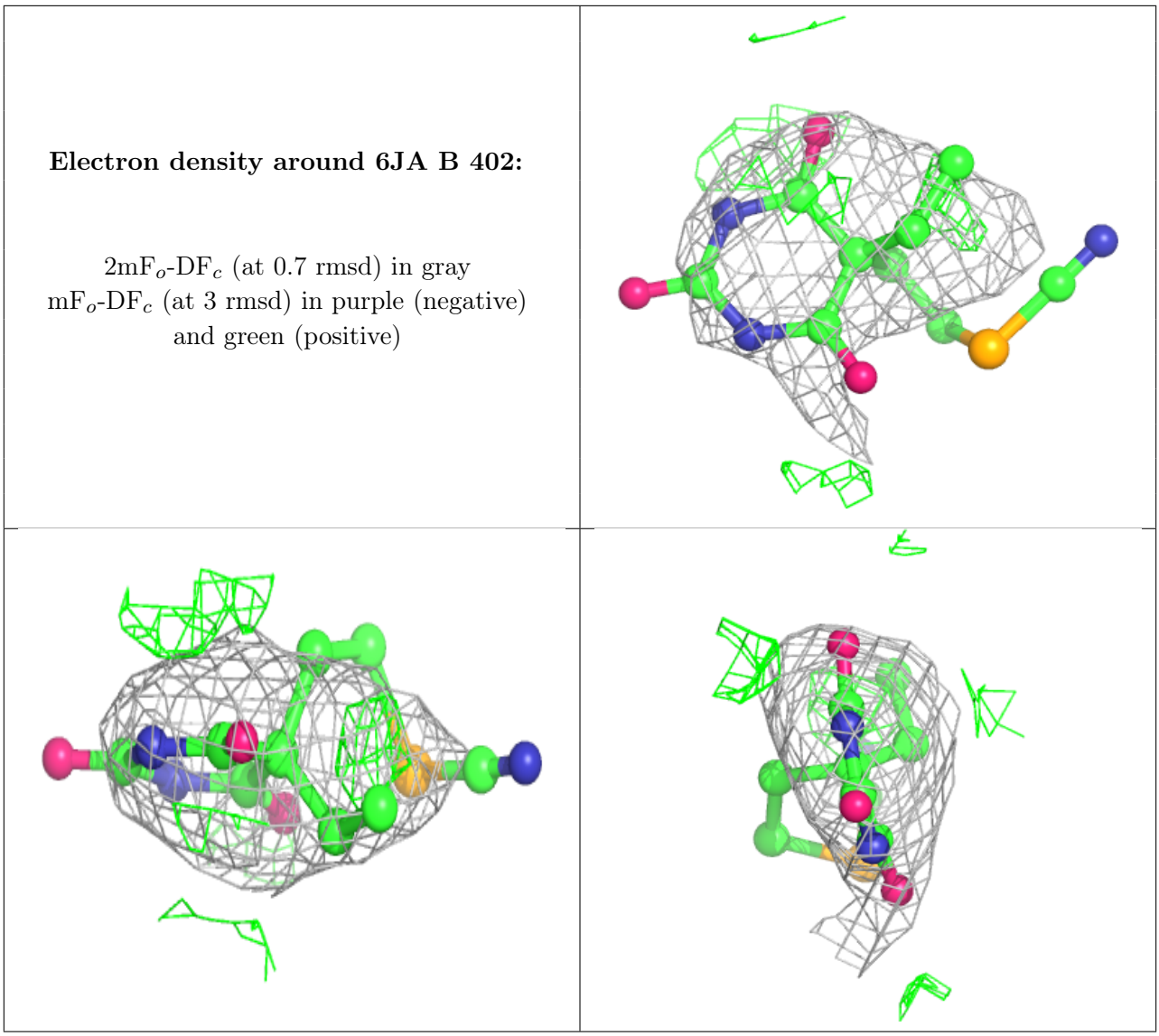
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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
4	NA	D	404	1/1	0.25	0.65	120,120,120,120	0
4	NA	C	403	1/1	0.57	0.41	98,98,98,98	0
4	NA	A	403	1/1	0.76	0.39	94,94,94,94	0
6	D12	D	401	12/12	0.85	0.27	70,74,76,77	0
3	ACT	A	402	4/4	0.87	0.16	60,62,74,81	0
5	6JA	B	402	16/16	0.88	0.35	174,180,183,184	1
3	ACT	E	402	4/4	0.89	0.18	55,57,69,82	0
4	NA	E	403	1/1	0.92	0.16	82,82,82,82	0
3	ACT	B	403	4/4	0.92	0.12	53,54,61,70	0
3	ACT	D	403	4/4	0.92	0.17	53,54,74,76	0
3	ACT	C	402	4/4	0.93	0.14	62,62,65,66	0
2	CL	B	401	1/1	0.94	0.09	72,72,72,72	0
2	CL	E	401	1/1	0.96	0.12	70,70,70,70	0
2	CL	A	401	1/1	0.97	0.08	71,71,71,71	0
2	CL	C	401	1/1	0.97	0.08	84,84,84,84	0
2	CL	D	402	1/1	0.97	0.13	73,73,73,73	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 6JA B 402:

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



6.5 Other polymers

There are no such residues in this entry.