



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 4, 2024 – 08:13 PM EDT

PDB ID : 8W07
Title : Crystal Structure of the ER-alpha Ligand-binding Domain (L372S, L536S) in complex with k-402
Authors : Min, C.K.; Nwachukwu, J.C.; Hou, Y.; Russo, R.J.; Papa, A.; Min, J.; Peng, R.; Kim, S.H.; Ziegler, Y.; Rangarajan, E.S.; Izard, T.; Katzenellenbogen, B.S.; Katzenellenbogen, J.K.; Nettles, K.W.
Deposited on : 2024-02-13
Resolution : 1.83 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](#) ①) 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 : 2.36.2
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) : 2.36.2

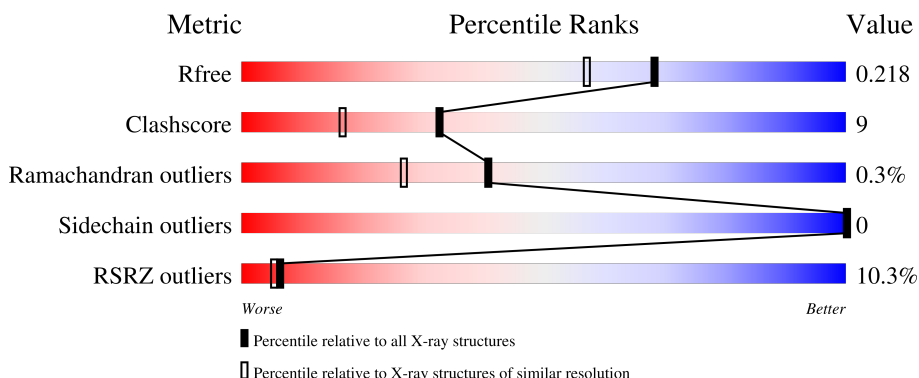
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.83 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}	130704	4003 (1.86-1.82)
Clashscore	141614	4233 (1.86-1.82)
Ramachandran outliers	138981	4185 (1.86-1.82)
Sidechain outliers	138945	4186 (1.86-1.82)
RSRZ outliers	127900	3957 (1.86-1.82)

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	242	<div style="display: flex; align-items: center;"> <div style="width: 9%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 80%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 15%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">9% 80% 15% • •</p>
1	B	242	<div style="display: flex; align-items: center;"> <div style="width: 12%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 81%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 12%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">12% 81% 12% • 5%</p>
1	C	242	<div style="display: flex; align-items: center;"> <div style="width: 7%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 82%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 13%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">7% 82% 13% •</p>
1	D	242	<div style="display: flex; align-items: center;"> <div style="width: 12%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 76%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 14%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 9%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">12% 76% 14% • 9%</p>

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 15119 atoms, of which 7425 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.

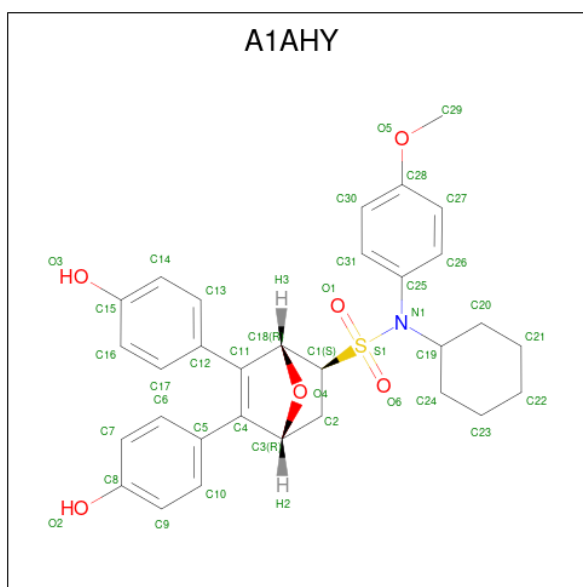
- Molecule 1 is a protein called Estrogen receptor.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	H	N	O	S			
1	A	233	3691	1177	1853	314	330	17	0	2	0
1	B	229	3622	1150	1826	306	323	17	0	0	0
1	C	232	3690	1174	1855	315	329	17	0	2	0
1	D	221	3498	1115	1759	297	310	17	0	0	0

There are 8 discrepancies between the modelled and reference sequences:

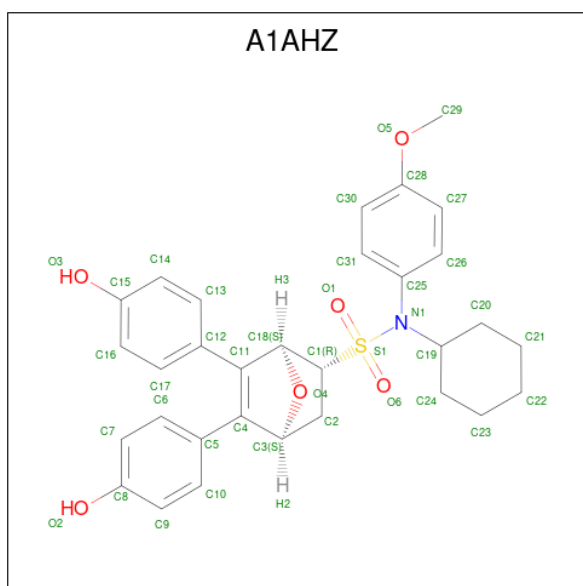
Chain	Residue	Modelled	Actual	Comment	Reference
A	372	SER	LEU	engineered mutation	UNP P03372
A	536	SER	LEU	engineered mutation	UNP P03372
B	372	SER	LEU	engineered mutation	UNP P03372
B	536	SER	LEU	engineered mutation	UNP P03372
C	372	SER	LEU	engineered mutation	UNP P03372
C	536	SER	LEU	engineered mutation	UNP P03372
D	372	SER	LEU	engineered mutation	UNP P03372
D	536	SER	LEU	engineered mutation	UNP P03372

- Molecule 2 is (1R,2S,4R)-N-cyclohexyl-5,6-bis(4-hydroxyphenyl)-N-(4-methoxyphenyl)-7-oxabicyclo[2.2.1]hept-5-ene-2-sulfonamide (three-letter code: A1AHY) (formula: C₃₁H₃₃NO₆S) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	H	N	O			S
2	A	1	72	31	33	1	6	1	0	0

- Molecule 3 is (1S,2R,4S)-N-cyclohexyl-5,6-bis(4-hydroxyphenyl)-N-(4-methoxyphenyl)-7-oxabicyclo[2.2.1]hept-5-ene-2-sulfonamide (three-letter code: A1AHZ) (formula: C₃₁H₃₃NO₆S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	H	N	O			S
3	B	1	72	31	33	1	6	1	0	0
3	C	1	72	31	33	1	6	1	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	H	N	O			S
3	D	1	72	31	33	1	6	1	0	0

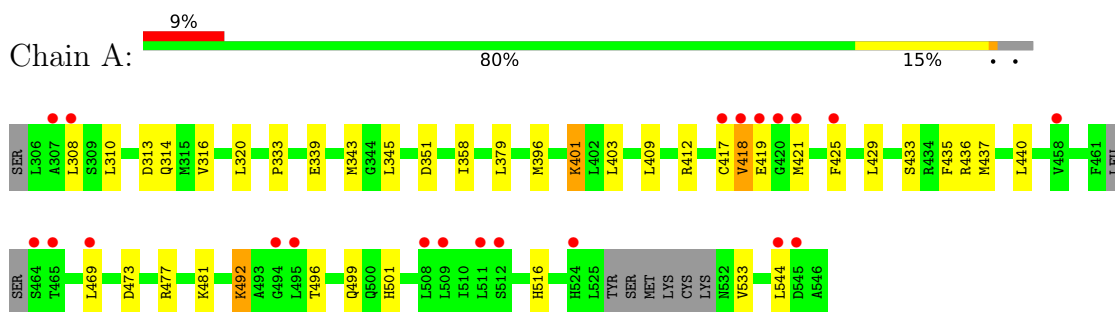
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	88	Total 88	O 88	0	0
4	B	87	Total 87	O 87	0	0
4	C	77	Total 77	O 77	0	0
4	D	78	Total 78	O 78	0	0

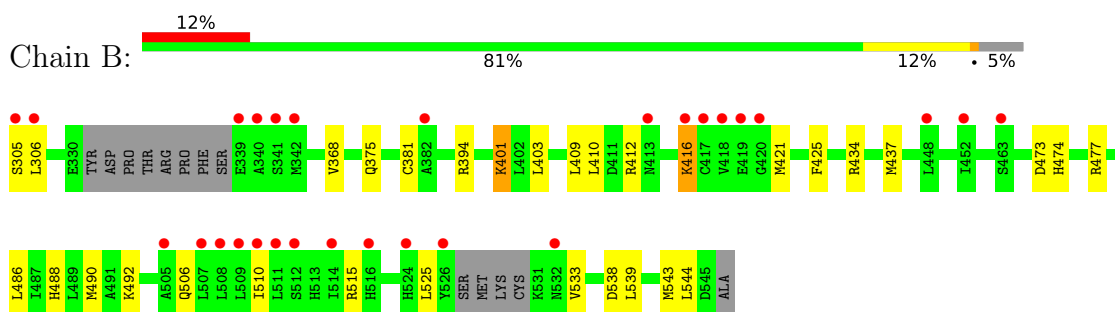
3 Residue-property plots [i](#)

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.

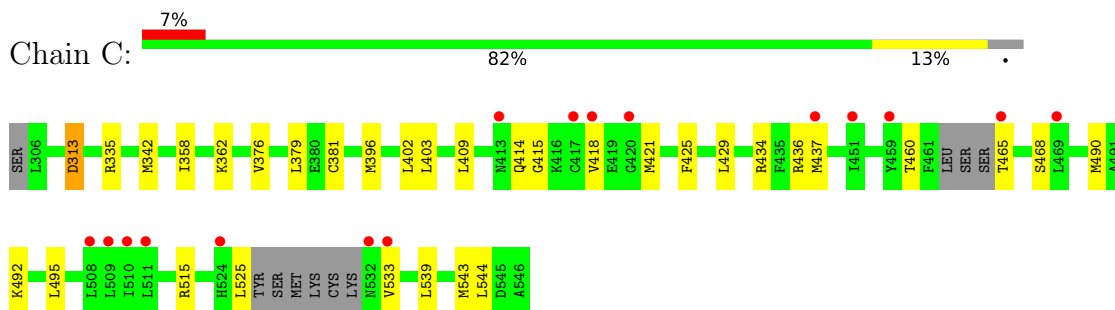
- Molecule 1: Estrogen receptor



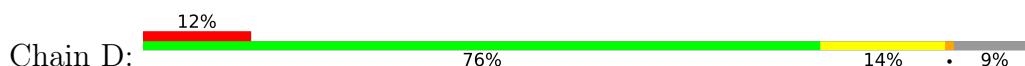
- Molecule 1: Estrogen receptor

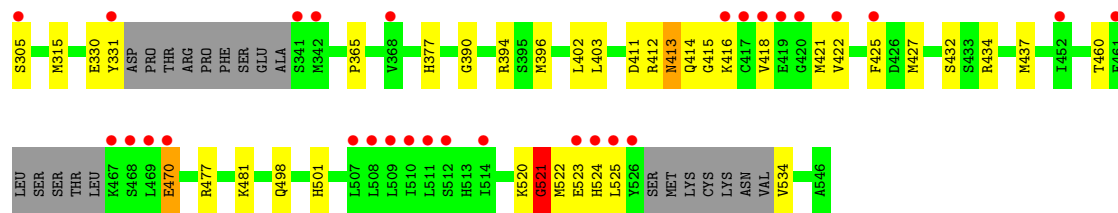


- Molecule 1: Estrogen receptor



- Molecule 1: Estrogen receptor





4 Data and refinement statistics i

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	53.58Å 59.03Å 93.75Å 86.59° 75.01° 63.14°	Depositor
Resolution (Å)	37.54 – 1.83 38.42 – 1.83	Depositor EDS
% Data completeness (in resolution range)	71.4 (37.54-1.83) 71.4 (38.42-1.83)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.51 (at 1.83Å)	Xtrriage
Refinement program	PHENIX 1.18.2_3874	Depositor
R, R_{free}	0.179 , 0.218 0.179 , 0.218	Depositor DCC
R_{free} test set	3117 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	30.9	Xtrriage
Anisotropy	0.012	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.42 , 49.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	0.110 for h,h-k,h-l	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	15119	wwPDB-VP
Average B, all atoms (Å ²)	47.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.26% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: A1AHY, A1AHZ

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	0.45	2/1883 (0.1%)	0.68	3/2549 (0.1%)
1	B	0.57	4/1826 (0.2%)	0.73	3/2467 (0.1%)
1	C	0.41	2/1880 (0.1%)	0.70	4/2545 (0.2%)
1	D	0.51	3/1768 (0.2%)	0.82	8/2387 (0.3%)
All	All	0.49	11/7357 (0.1%)	0.73	18/9948 (0.2%)

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	C	0	1
1	D	0	4
All	All	0	5

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	416	LYS	CE-NZ	12.79	1.81	1.49
1	A	401	LYS	CE-NZ	-8.09	1.28	1.49
1	B	401	LYS	CB-CG	-7.89	1.31	1.52
1	B	401	LYS	CE-NZ	7.88	1.68	1.49
1	D	522	MET	CG-SD	7.24	2.00	1.81
1	B	416	LYS	CD-CE	6.75	1.68	1.51
1	A	401	LYS	CB-CG	-5.89	1.36	1.52
1	C	492	LYS	CE-NZ	-5.70	1.34	1.49
1	D	521	GLY	C-N	-5.31	1.21	1.34
1	C	515	ARG	CG-CD	5.31	1.65	1.51
1	D	470	GLU	CG-CD	-5.24	1.44	1.51

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	416	LYS	CD-CE-NZ	-14.36	78.67	111.70
1	D	522	MET	CG-SD-CE	-13.71	78.26	100.20
1	C	313	ASP	CB-CG-OD1	12.75	129.77	118.30
1	D	470	GLU	OE1-CD-OE2	-11.88	109.05	123.30
1	D	522	MET	CA-CB-CG	10.97	131.96	113.30
1	C	313	ASP	CB-CG-OD2	-7.19	111.83	118.30
1	B	416	LYS	CA-CB-CG	-6.67	98.73	113.40
1	C	492	LYS	CD-CE-NZ	6.40	126.42	111.70
1	D	522	MET	N-CA-CB	-6.37	99.14	110.60
1	A	469	LEU	CB-CG-CD2	5.99	121.18	111.00
1	A	492	LYS	CG-CD-CE	-5.48	95.46	111.90
1	D	522	MET	CB-CG-SD	-5.44	96.08	112.40
1	D	413	ASN	N-CA-CB	5.41	120.34	110.60
1	C	313	ASP	OD1-CG-OD2	-5.34	113.16	123.30
1	B	401	LYS	CD-CE-NZ	-5.32	99.46	111.70
1	D	524	HIS	N-CA-CB	-5.28	101.09	110.60
1	D	522	MET	O-C-N	5.12	130.88	122.70
1	A	401	LYS	CD-CE-NZ	5.08	123.38	111.70

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	313	ASP	Sidechain
1	D	412	ARG	Peptide
1	D	413	ASN	Sidechain
1	D	470	GLU	Sidechain
1	D	521	GLY	Mainchain

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	1838	1853	1843	46	1
1	B	1796	1826	1826	33	1
1	C	1835	1855	1845	25	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	1739	1759	1767	25	0
2	A	39	33	0	5	0
3	B	39	33	0	2	0
3	C	39	33	0	3	0
3	D	39	33	0	3	0
4	A	88	0	0	6	0
4	B	87	0	0	4	0
4	C	77	0	0	3	0
4	D	78	0	0	1	0
All	All	7694	7425	7281	128	1

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 9.

All (128) 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:B:401:LYS:CE	1:B:401:LYS:NZ	1.68	1.52
1:B:416:LYS:CE	1:B:416:LYS:NZ	1.81	1.40
1:B:416:LYS:NZ	1:B:416:LYS:CD	2.21	1.03
1:B:473:ASP:OD1	1:B:477:ARG:NH1	1.95	0.99
1:C:381:CYS:SG	4:C:773:HOH:O	2.23	0.94
1:B:381:CYS:SG	4:B:777:HOH:O	2.26	0.93
1:A:396:MET:O	1:A:436:ARG:NH1	2.04	0.91
1:D:520:LYS:NZ	1:D:523:GLU:OE1	2.05	0.90
1:B:401:LYS:NZ	1:B:401:LYS:CD	2.36	0.87
1:C:533:VAL:HG11	3:C:601:A1AHZ:O3	1.77	0.84
1:A:501[A]:HIS:NE2	4:A:702:HOH:O	2.12	0.82
1:D:305:SER:O	4:D:701:HOH:O	1.99	0.79
1:A:477:ARG:NH1	4:A:704:HOH:O	2.15	0.78
1:D:411:ASP:OD1	1:D:414:GLN:NE2	2.16	0.78
1:B:305:SER:N	4:B:701:HOH:O	2.20	0.74
1:C:362:LYS:NZ	4:C:701:HOH:O	2.21	0.73
1:A:351:ASP:OD2	4:A:701:HOH:O	2.06	0.73
1:A:417:CYS:SG	4:A:773:HOH:O	2.48	0.72
1:A:403:LEU:HD13	1:A:409:LEU:HD13	1.70	0.71
1:D:377:HIS:CE1	1:D:460:THR:HG23	2.27	0.70
1:D:415:GLY:O	1:D:421:MET:HG2	1.92	0.69
1:A:418:VAL:HG12	1:A:418:VAL:O	1.93	0.68
1:A:313:ASP:O	4:A:703:HOH:O	2.13	0.66
1:B:525:LEU:C	1:B:525:LEU:HD23	2.17	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:339:GLU:HG2	1:A:418:VAL:HA	1.77	0.65
1:C:415:GLY:O	1:C:421:MET:HG2	1.96	0.65
1:A:436:ARG:NH2	4:A:705:HOH:O	2.27	0.64
1:D:534:VAL:HG22	3:D:601:A1AHZ:C29	2.29	0.63
1:A:496:THR:HG23	1:A:499:GLN:H	1.64	0.63
1:C:376:VAL:HG22	1:C:544:LEU:HD12	1.80	0.63
1:C:418:VAL:HB	1:C:421:MET:SD	2.39	0.63
1:D:315:MET:SD	1:D:365:PRO:HG2	2.39	0.62
1:B:416:LYS:NZ	1:B:416:LYS:HD3	2.14	0.61
1:C:533:VAL:CG1	3:C:601:A1AHZ:O3	2.49	0.59
1:C:434:ARG:HD2	1:C:437:MET:HE2	1.83	0.59
1:A:533:VAL:CG1	2:A:601:A1AHY:O2	2.51	0.58
1:B:412:ARG:HH11	1:B:412:ARG:HG2	1.68	0.58
1:A:339:GLU:HG2	1:A:418:VAL:H	1.68	0.57
1:C:425:PHE:O	1:C:429:LEU:HD23	2.05	0.56
1:B:434:ARG:NH1	1:B:437:MET:SD	2.74	0.55
1:A:421:MET:HA	2:A:601:A1AHY:C24	2.36	0.55
1:B:525:LEU:HD23	1:B:525:LEU:O	2.08	0.54
2:A:601:A1AHY:C26	2:A:601:A1AHY:O4	2.55	0.54
1:A:403:LEU:CD1	1:A:409:LEU:HD13	2.36	0.54
1:B:525:LEU:HD13	3:B:601:A1AHZ:C28	2.39	0.53
1:A:339:GLU:HG2	1:A:418:VAL:CA	2.39	0.53
1:A:316:VAL:HG12	1:A:320:LEU:CD1	2.38	0.53
1:B:486:LEU:O	1:B:490:MET:HG3	2.09	0.52
1:A:308:LEU:HD11	1:A:477:ARG:HE	1.75	0.52
1:C:402:LEU:HD21	1:C:429:LEU:HD22	1.92	0.51
1:B:403:LEU:O	1:B:403:LEU:HD23	2.10	0.51
1:A:333:PRO:HB3	1:A:345:LEU:HD21	1.91	0.51
1:C:358:ILE:HD12	1:C:379:LEU:HD13	1.93	0.51
1:C:403:LEU:HD13	1:C:409:LEU:HD13	1.93	0.51
1:A:418:VAL:HG11	1:A:421:MET:HE3	1.92	0.50
1:A:343:MET:SD	1:A:418:VAL:HG11	2.51	0.50
1:A:310:LEU:HD22	1:A:314:GLN:HB3	1.93	0.50
1:A:339:GLU:HG2	1:A:418:VAL:N	2.27	0.50
1:B:306:LEU:H	1:B:306:LEU:HD23	1.77	0.49
1:D:434:ARG:NH1	1:D:437:MET:SD	2.84	0.49
1:B:409:LEU:C	1:B:410:LEU:HD12	2.33	0.49
1:C:335:ARG:NH2	4:C:707:HOH:O	2.45	0.49
1:B:412:ARG:HG2	1:B:412:ARG:NH1	2.27	0.49
1:B:474:HIS:ND1	4:B:702:HOH:O	2.35	0.49
1:C:460:THR:HG21	1:D:427:MET:HE3	1.94	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:376:VAL:CG2	1:C:544:LEU:HD12	2.43	0.48
1:C:490:MET:HB3	1:C:495:LEU:HD12	1.96	0.48
1:A:435:PHE:CD1	1:A:440:LEU:HD22	2.49	0.48
1:A:316:VAL:HG12	1:A:320:LEU:HD12	1.96	0.47
1:D:498:GLN:HA	1:D:501:HIS:CE1	2.49	0.47
3:D:601:A1AHZ:C26	3:D:601:A1AHZ:C24	2.92	0.47
1:C:460:THR:CG2	1:D:427:MET:HE3	2.45	0.47
1:A:473:ASP:O	1:A:477:ARG:HG3	2.15	0.47
1:D:411:ASP:H	1:D:414:GLN:NE2	2.12	0.47
1:D:396:MET:HA	1:D:432:SER:OG	2.16	0.46
1:A:412:ARG:HA	1:A:425:PHE:CZ	2.51	0.46
1:C:539:LEU:HD11	1:C:543:MET:HE2	1.96	0.46
1:D:525:LEU:HD22	3:D:601:A1AHZ:C28	2.45	0.46
1:A:496:THR:HG22	1:A:499:GLN:CG	2.46	0.46
1:C:465:THR:HG23	1:C:468:SER:OG	2.16	0.46
1:D:390:GLY:O	1:D:394:ARG:HG3	2.16	0.46
1:A:358:ILE:HD12	1:A:379:LEU:HD13	1.97	0.46
1:A:533:VAL:HG12	2:A:601:A1AHY:O2	2.16	0.46
1:A:401:LYS:NZ	1:A:409:LEU:HD21	2.31	0.45
1:D:377:HIS:NE2	1:D:460:THR:HG23	2.31	0.45
1:A:516:HIS:CG	1:B:515:ARG:NH1	2.85	0.45
1:A:358:ILE:HG23	1:A:544:LEU:HD23	1.99	0.44
1:A:425:PHE:HD2	2:A:601:A1AHY:O5	2.00	0.44
1:A:308:LEU:HD11	1:A:477:ARG:NE	2.33	0.44
1:B:394:ARG:HB3	1:B:403:LEU:HD22	2.00	0.44
1:A:433:SER:O	1:A:437:MET:HG2	2.19	0.43
1:D:411:ASP:H	1:D:414:GLN:HE21	1.65	0.43
1:A:492:LYS:HE2	1:A:492:LYS:CA	2.48	0.43
1:A:343:MET:SD	1:A:421:MET:HE3	2.58	0.43
1:B:421:MET:HE2	1:B:425:PHE:CE1	2.54	0.43
1:B:488:HIS:CD2	1:B:492:LYS:HD3	2.54	0.43
1:A:308:LEU:HD11	1:A:477:ARG:HH21	1.84	0.43
1:A:492:LYS:HE2	1:A:492:LYS:HA	2.00	0.43
1:A:418:VAL:HB	1:A:421:MET:SD	2.59	0.43
1:B:539:LEU:O	1:B:543:MET:HG3	2.19	0.42
1:D:418:VAL:O	1:D:421:MET:HB3	2.19	0.42
1:B:525:LEU:CD1	3:B:601:A1AHZ:C28	2.98	0.42
1:C:525:LEU:HD22	3:C:601:A1AHZ:O5	2.20	0.42
1:A:308:LEU:CD1	1:A:477:ARG:HE	2.32	0.42
1:A:418:VAL:O	1:A:418:VAL:CG1	2.63	0.42
1:D:402:LEU:HD12	1:D:425:PHE:CE2	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:403:LEU:HD23	1:D:403:LEU:O	2.19	0.41
1:A:316:VAL:HG12	1:A:320:LEU:HD11	2.01	0.41
1:B:434:ARG:O	1:B:437:MET:HB3	2.21	0.41
1:D:520:LYS:O	1:D:521:GLY:C	2.58	0.41
1:B:375:GLN:HB3	1:B:544:LEU:HD21	2.02	0.41
1:B:416:LYS:CD	1:B:416:LYS:HZ2	2.23	0.41
1:C:434:ARG:HH11	1:C:437:MET:HE3	1.84	0.41
1:D:330:GLU:O	1:D:331:TYR:CB	2.68	0.41
1:B:473:ASP:OD1	1:B:477:ARG:CZ	2.64	0.41
1:B:306:LEU:HD23	1:B:306:LEU:N	2.35	0.41
1:C:396:MET:O	1:C:436:ARG:HD3	2.20	0.41
1:A:425:PHE:CD1	1:A:429:LEU:HD13	2.56	0.41
1:C:342:MET:HE1	1:C:414:GLN:O	2.21	0.41
1:D:477:ARG:O	1:D:481:LYS:HG2	2.21	0.41
1:A:425:PHE:CE1	1:A:429:LEU:CD1	3.04	0.40
1:B:506:GLN:O	1:B:510:ILE:HG13	2.21	0.40
1:C:415:GLY:O	1:C:421:MET:CG	2.65	0.40
1:C:335:ARG:HH12	1:C:414:GLN:HE22	1.69	0.40
1:D:520:LYS:HD2	1:D:520:LYS:HA	1.94	0.40
1:B:416:LYS:NZ	1:B:416:LYS:HD2	2.27	0.40
1:B:368:VAL:HG22	4:B:713:HOH:O	2.20	0.40
1:D:416:LYS:HG3	1:D:422:VAL:HB	2.03	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:481:LYS:NZ	1:B:538:ASP:OD2[1_655]	2.19	0.01

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	229/242 (95%)	226 (99%)	1 (0%)	2 (1%)	17	6
1	B	223/242 (92%)	219 (98%)	3 (1%)	1 (0%)	34	20
1	C	228/242 (94%)	227 (100%)	1 (0%)	0	100	100
1	D	213/242 (88%)	208 (98%)	5 (2%)	0	100	100
All	All	893/968 (92%)	880 (98%)	10 (1%)	3 (0%)	41	27

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	419	GLU
1	B	533	VAL
1	A	418	VAL

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	203/218 (93%)	203 (100%)	0	100	100
1	B	199/218 (91%)	199 (100%)	0	100	100
1	C	204/218 (94%)	204 (100%)	0	100	100
1	D	192/218 (88%)	192 (100%)	0	100	100
All	All	798/872 (92%)	798 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	441	GLN
1	A	513	HIS
1	D	413	ASN
1	D	414	GLN
1	D	501	HIS

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](#)

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
3	A1AHZ	B	601	-	41,44,44	1.64	4 (9%)	49,65,65	1.33	4 (8%)
3	A1AHZ	D	601	-	41,44,44	1.74	4 (9%)	49,65,65	1.28	5 (10%)
3	A1AHZ	C	601	-	41,44,44	1.49	4 (9%)	49,65,65	1.38	6 (12%)
2	A1AHY	A	601	-	41,44,44	1.62	5 (12%)	49,65,65	1.48	10 (20%)

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	A1AHZ	B	601	-	-	4/28/62/62	0/7/6/6
3	A1AHZ	D	601	-	-	6/28/62/62	0/7/6/6
3	A1AHZ	C	601	-	-	4/28/62/62	0/7/6/6
2	A1AHY	A	601	-	-	2/28/62/62	0/7/6/6

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	601	A1AHZ	S1-N1	6.42	1.80	1.67
2	A	601	A1AHY	O6-S1	6.27	1.48	1.43
3	B	601	A1AHZ	S1-N1	5.84	1.79	1.67
3	D	601	A1AHZ	O6-S1	5.59	1.48	1.43
3	B	601	A1AHZ	O6-S1	5.28	1.48	1.43
3	D	601	A1AHZ	O1-S1	5.06	1.47	1.43
3	C	601	A1AHZ	S1-N1	4.87	1.77	1.67
2	A	601	A1AHY	S1-N1	4.84	1.77	1.67
3	B	601	A1AHZ	O1-S1	4.83	1.47	1.43
3	C	601	A1AHZ	O1-S1	4.42	1.47	1.43
3	C	601	A1AHZ	O6-S1	4.36	1.47	1.43
2	A	601	A1AHY	O4-C18	-3.55	1.38	1.43
2	A	601	A1AHY	O1-S1	3.01	1.46	1.43
3	C	601	A1AHZ	O4-C18	-2.67	1.40	1.43
3	D	601	A1AHZ	C25-N1	-2.60	1.40	1.44
3	B	601	A1AHZ	C25-N1	-2.39	1.41	1.44
2	A	601	A1AHY	O4-C3	-2.14	1.39	1.44

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	601	A1AHZ	O6-S1-O1	5.37	122.67	119.22
3	C	601	A1AHZ	O6-S1-O1	4.91	122.38	119.22
3	D	601	A1AHZ	C3-C2-C1	-4.37	96.75	100.61
3	B	601	A1AHZ	C3-C2-C1	-3.86	97.20	100.61
3	B	601	A1AHZ	O4-C3-C2	-3.43	97.89	104.64
3	D	601	A1AHZ	O6-S1-O1	3.29	121.33	119.22
2	A	601	A1AHY	C24-C19-C20	-3.26	103.68	111.19
2	A	601	A1AHY	C22-C21-C20	3.26	118.06	111.42
2	A	601	A1AHY	C21-C20-C19	3.25	117.29	110.82
2	A	601	A1AHY	C3-C2-C1	-3.19	97.79	100.61
3	C	601	A1AHZ	C3-C2-C1	-3.18	97.80	100.61
3	D	601	A1AHZ	C23-C24-C19	2.89	116.57	110.82
3	C	601	A1AHZ	C23-C24-C19	2.77	116.33	110.82
2	A	601	A1AHY	C26-C25-N1	2.74	123.56	120.08
3	D	601	A1AHZ	O4-C3-C2	-2.73	99.26	104.64
2	A	601	A1AHY	C12-C11-C4	2.46	135.17	128.81
2	A	601	A1AHY	O6-S1-N1	2.42	111.82	106.94
3	C	601	A1AHZ	O4-C3-C2	-2.35	100.01	104.64
3	D	601	A1AHZ	C6-C5-C4	-2.30	117.93	120.91
3	C	601	A1AHZ	C16-C15-C14	2.27	123.58	119.77
2	A	601	A1AHY	C5-C4-C3	-2.22	117.81	121.44

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	601	A1AHY	C27-C26-C25	2.18	123.19	120.32
2	A	601	A1AHY	O6-S1-O1	2.17	120.61	119.22
3	B	601	A1AHZ	C17-C12-C11	-2.04	118.27	120.91
3	C	601	A1AHZ	C17-C16-C15	-2.04	117.64	119.88

There are no chirality outliers.

All (16) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	601	A1AHZ	C19-N1-S1-O1
3	C	601	A1AHZ	C25-N1-S1-O1
2	A	601	A1AHY	C30-C28-O5-C29
2	A	601	A1AHY	C27-C28-O5-C29
3	D	601	A1AHZ	C24-C19-N1-S1
3	B	601	A1AHZ	C25-N1-S1-O1
3	D	601	A1AHZ	C25-N1-S1-O1
3	B	601	A1AHZ	C30-C28-O5-C29
3	D	601	A1AHZ	C19-N1-S1-O1
3	C	601	A1AHZ	C27-C28-O5-C29
3	C	601	A1AHZ	C30-C28-O5-C29
3	B	601	A1AHZ	C18-C11-C12-C13
3	B	601	A1AHZ	C18-C11-C12-C17
3	D	601	A1AHZ	C20-C19-N1-S1
3	D	601	A1AHZ	C18-C11-C12-C17
3	D	601	A1AHZ	C27-C28-O5-C29

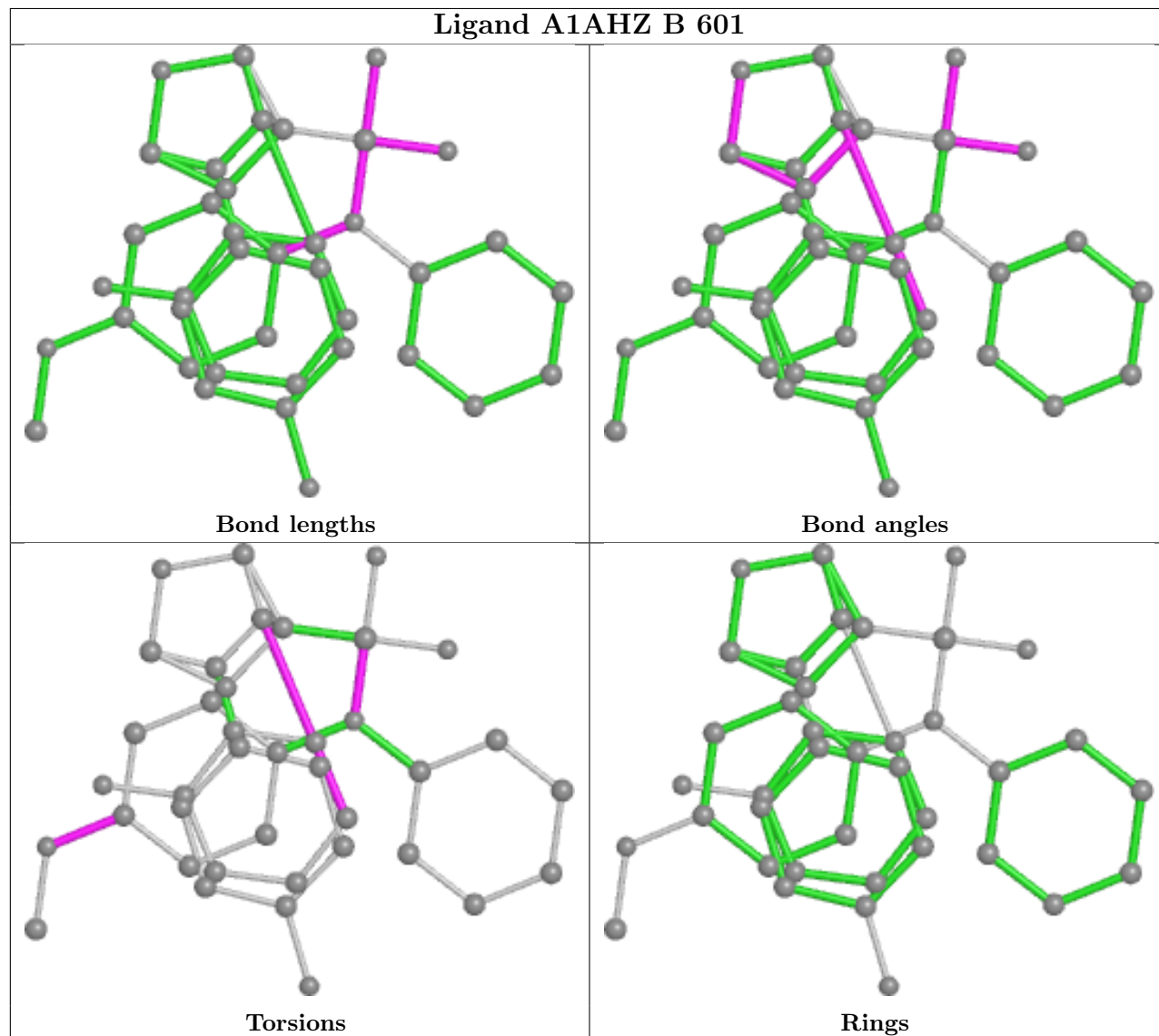
There are no ring outliers.

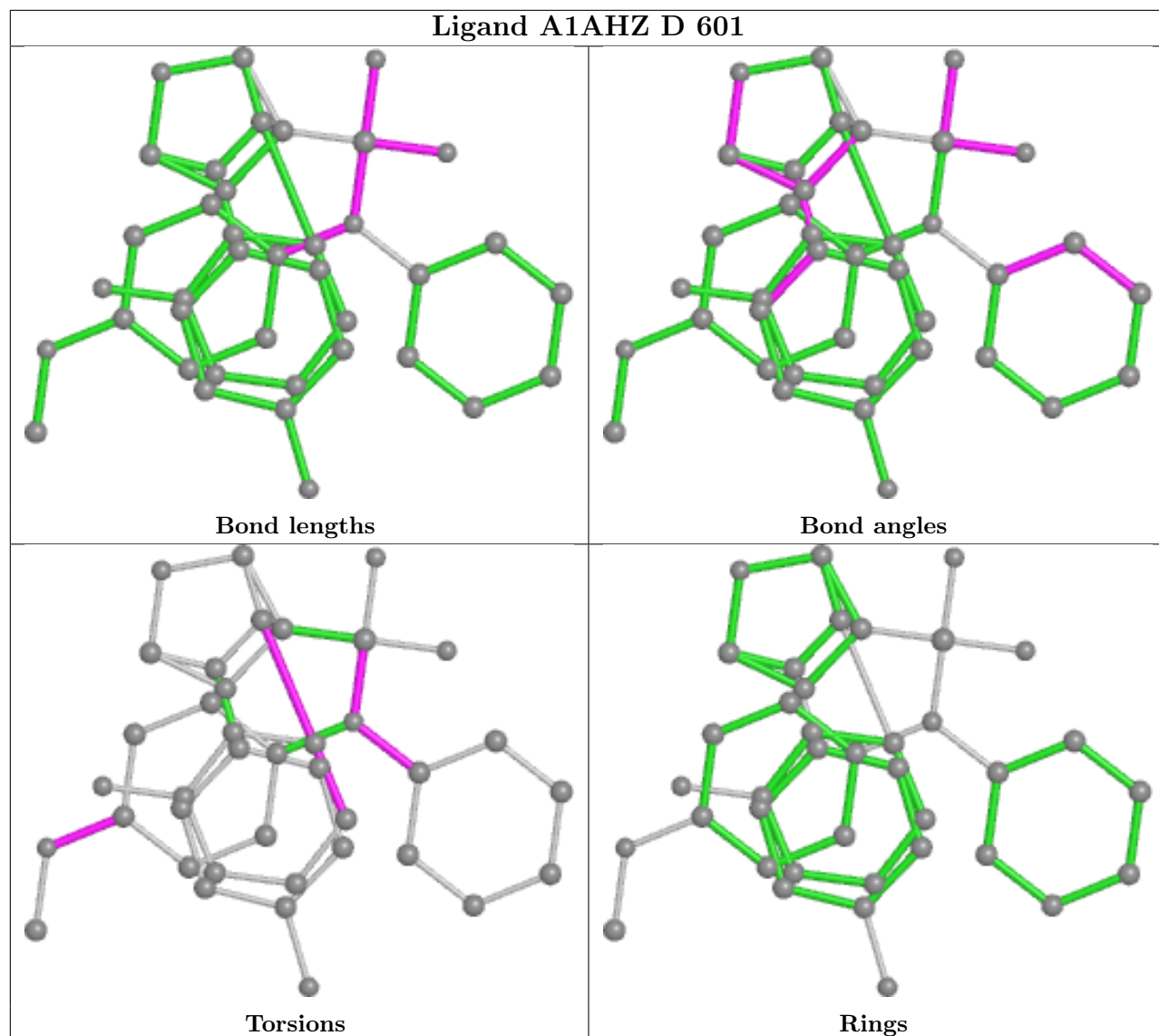
4 monomers are involved in 13 short contacts:

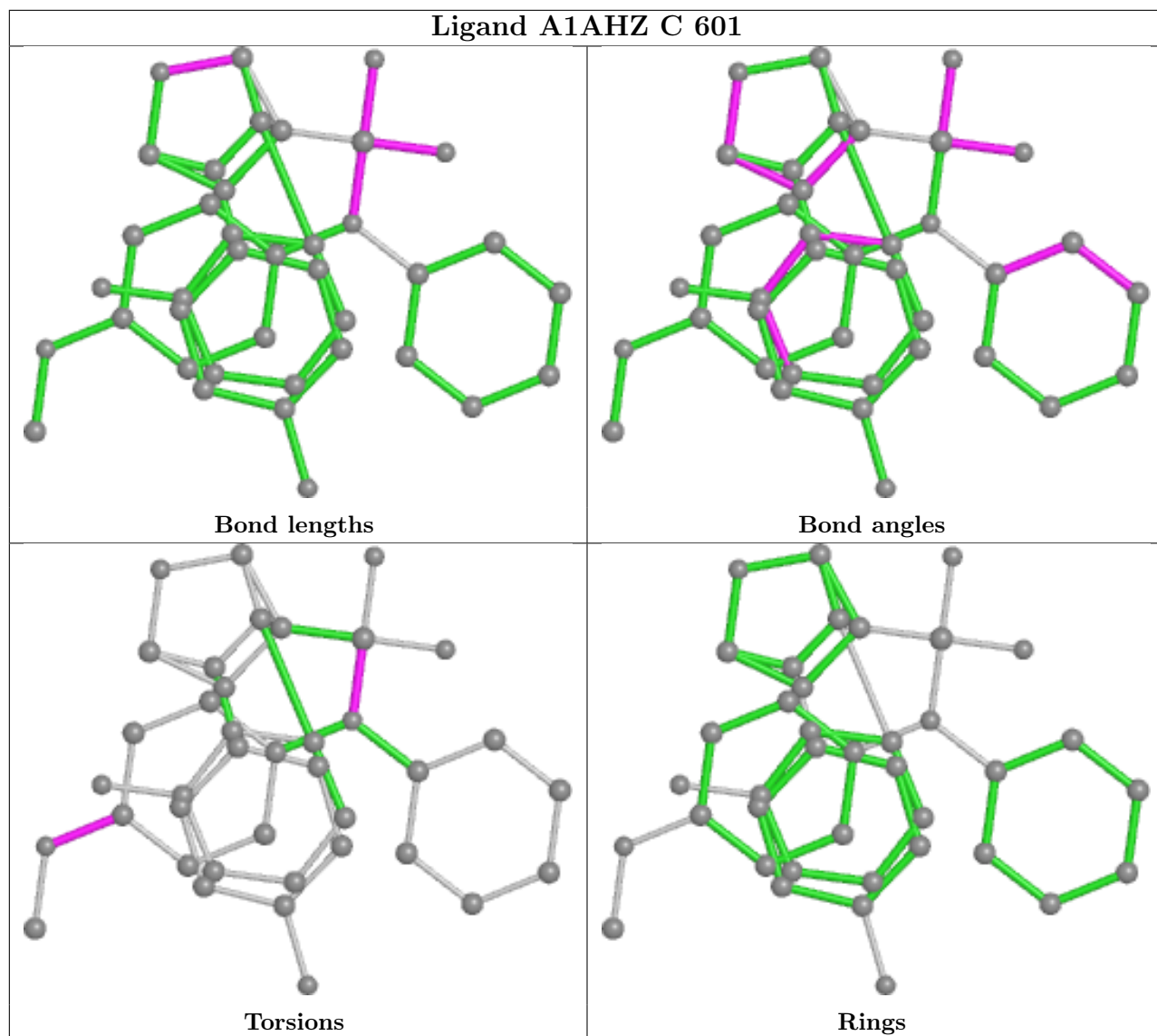
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	601	A1AHZ	2	0
3	D	601	A1AHZ	3	0
3	C	601	A1AHZ	3	0
2	A	601	A1AHY	5	0

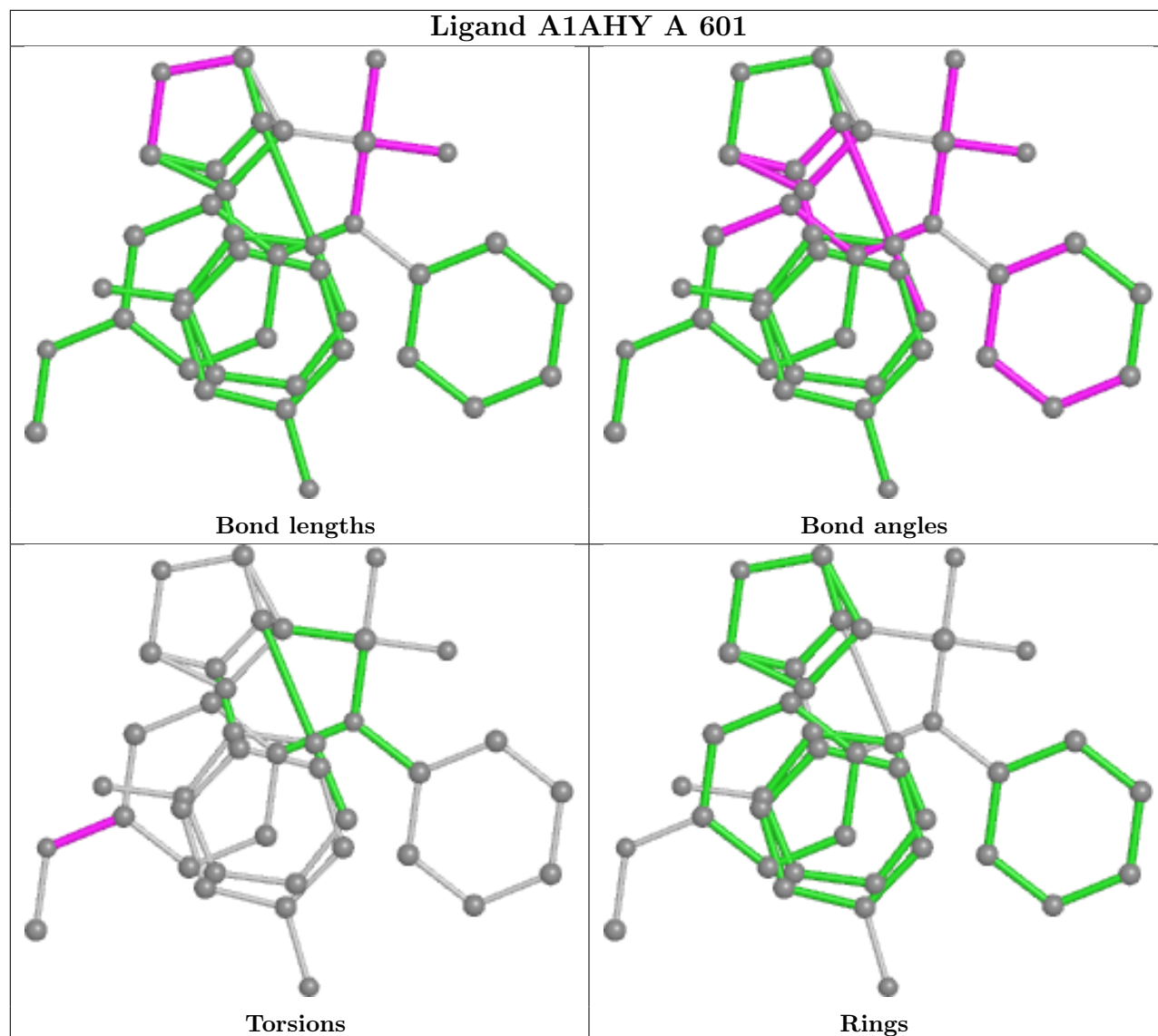
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

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, 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	233/242 (96%)	0.51	21 (9%) 9 8	24, 41, 69, 91	0
1	B	229/242 (94%)	0.66	28 (12%) 4 3	23, 38, 76, 94	0
1	C	232/242 (95%)	0.40	16 (6%) 16 15	23, 37, 69, 92	0
1	D	221/242 (91%)	0.67	29 (13%) 3 2	22, 38, 78, 105	0
All	All	915/968 (94%)	0.56	94 (10%) 6 5	22, 39, 73, 105	0

All (94) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	468	SER	7.8
1	D	417	CYS	7.5
1	B	417	CYS	6.7
1	D	418	VAL	6.5
1	D	526	TYR	6.3
1	B	526	TYR	5.9
1	D	469	LEU	5.6
1	B	418	VAL	5.4
1	B	339	GLU	5.4
1	A	418	VAL	5.1
1	B	306	LEU	5.0
1	B	340	ALA	4.9
1	B	420	GLY	4.9
1	B	532	ASN	4.3
1	C	524	HIS	4.2
1	D	331	TYR	4.2
1	C	418	VAL	4.1
1	D	524	HIS	4.1
1	D	419	GLU	4.0
1	C	465	THR	4.0
1	B	341	SER	3.9

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Mol	Chain	Res	Type	RSRZ
1	D	510	ILE	3.8
1	D	511	LEU	3.8
1	D	342	MET	3.6
1	B	514	ILE	3.5
1	B	416	LYS	3.4
1	A	421	MET	3.3
1	B	511	LEU	3.3
1	C	533	VAL	3.2
1	B	524	HIS	3.2
1	D	420	GLY	3.2
1	A	469	LEU	3.2
1	C	469	LEU	3.1
1	D	509	LEU	3.0
1	B	510	ILE	3.0
1	A	494	GLY	3.0
1	C	417	CYS	3.0
1	D	461	PHE	3.0
1	D	305	SER	2.9
1	B	452	ILE	2.9
1	A	545	ASP	2.9
1	B	509	LEU	2.8
1	C	509	LEU	2.8
1	C	511	LEU	2.8
1	A	417	CYS	2.7
1	B	419	GLU	2.7
1	B	342	MET	2.7
1	A	419	GLU	2.7
1	A	420	GLY	2.6
1	C	532	ASN	2.6
1	D	523	GLU	2.6
1	D	452	ILE	2.6
1	D	508	LEU	2.5
1	C	413	ASN	2.5
1	A	495	LEU	2.5
1	A	508	LEU	2.5
1	A	465	THR	2.4
1	B	463	SER	2.4
1	B	512	SER	2.4
1	D	514	ILE	2.4
1	D	467	LYS	2.4
1	D	416	LYS	2.4
1	B	507	LEU	2.4

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Mol	Chain	Res	Type	RSRZ
1	C	508	LEU	2.3
1	B	505	ALA	2.3
1	A	425	PHE	2.3
1	C	451	ILE	2.3
1	D	425	PHE	2.3
1	D	470	GLU	2.3
1	A	464	SER	2.3
1	A	511	LEU	2.3
1	A	512	SER	2.3
1	D	512	SER	2.3
1	C	420	GLY	2.2
1	C	459	TYR	2.2
1	A	458	VAL	2.2
1	B	305	SER	2.2
1	C	437	MET	2.2
1	A	524	HIS	2.2
1	A	509	LEU	2.2
1	B	448	LEU	2.1
1	B	508	LEU	2.1
1	D	525	LEU	2.1
1	A	544	LEU	2.1
1	D	341	SER	2.1
1	D	368	VAL	2.1
1	D	422	VAL	2.1
1	A	307	ALA	2.1
1	D	507	LEU	2.1
1	B	516	HIS	2.0
1	B	413	ASN	2.0
1	B	382	ALA	2.0
1	A	308	LEU	2.0
1	C	510	ILE	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](#)

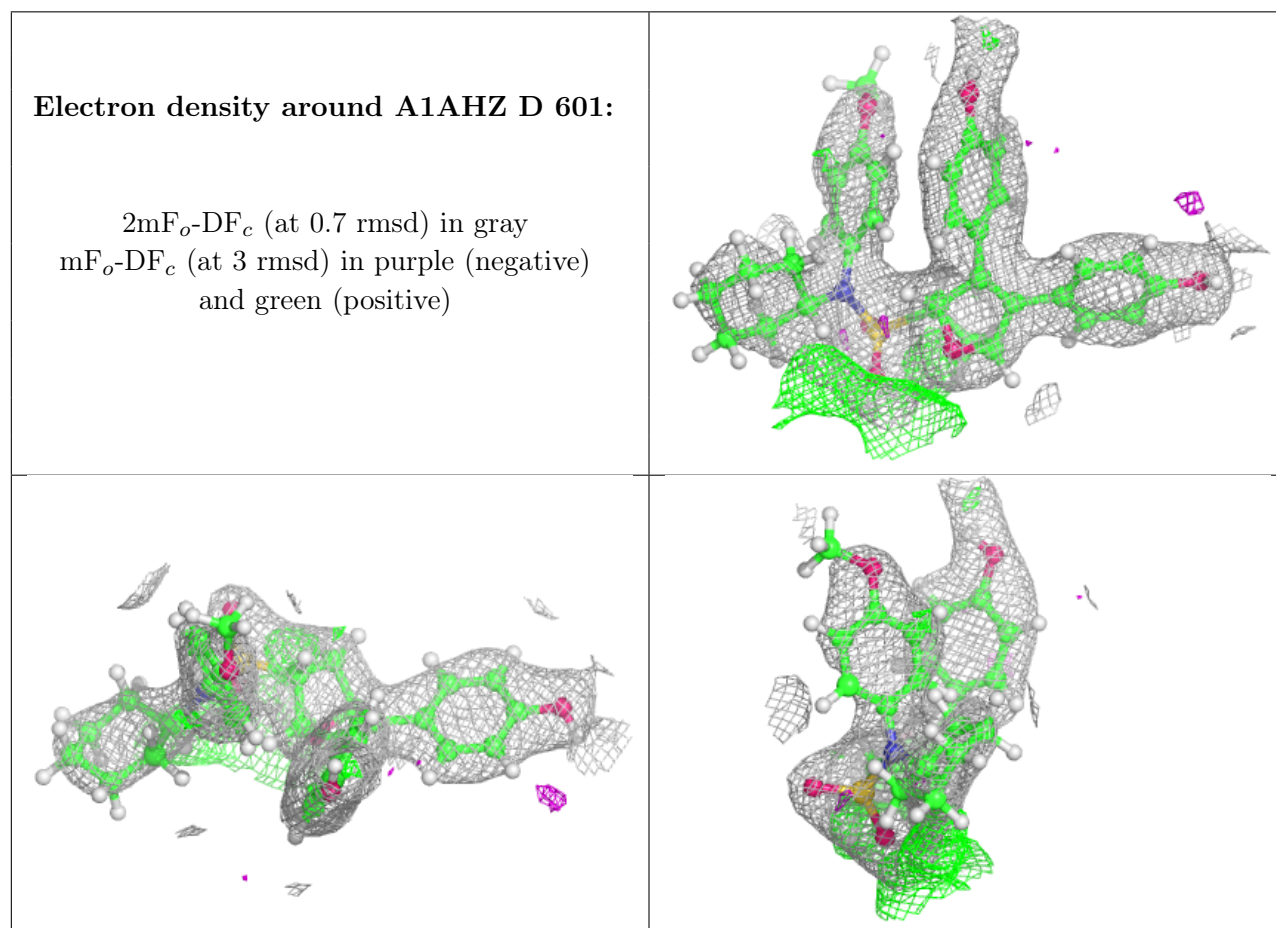
There are no monosaccharides in this entry.

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.

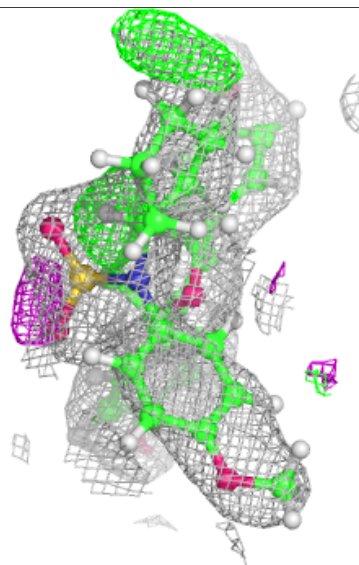
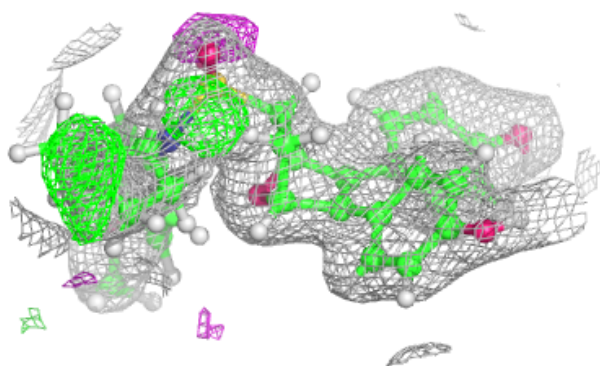
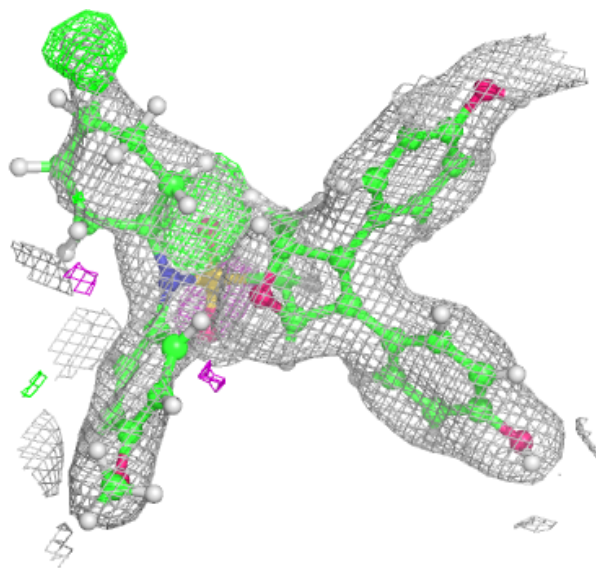
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	A1AHZ	D	601	39/39	0.88	0.18	28,55,84,99	0
2	A1AHY	A	601	39/39	0.89	0.17	29,55,79,87	0
3	A1AHZ	B	601	39/39	0.91	0.17	29,53,83,93	0
3	A1AHZ	C	601	39/39	0.92	0.15	24,50,80,96	0

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.



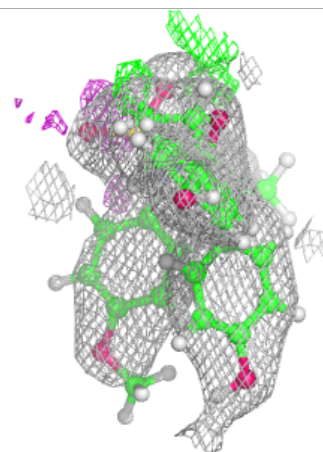
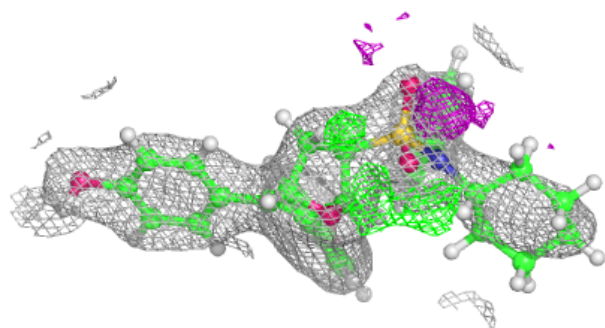
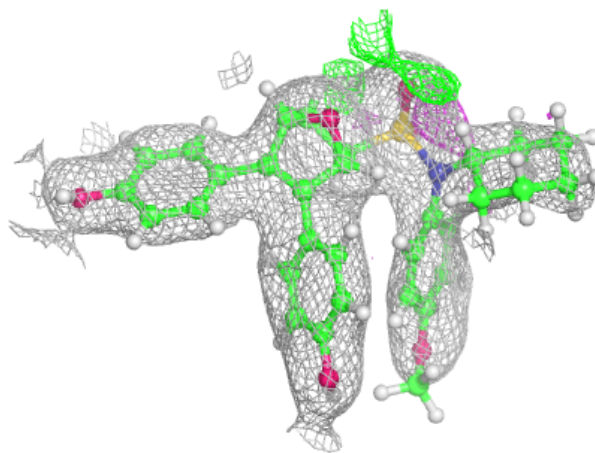
Electron density around A1AHY A 601:

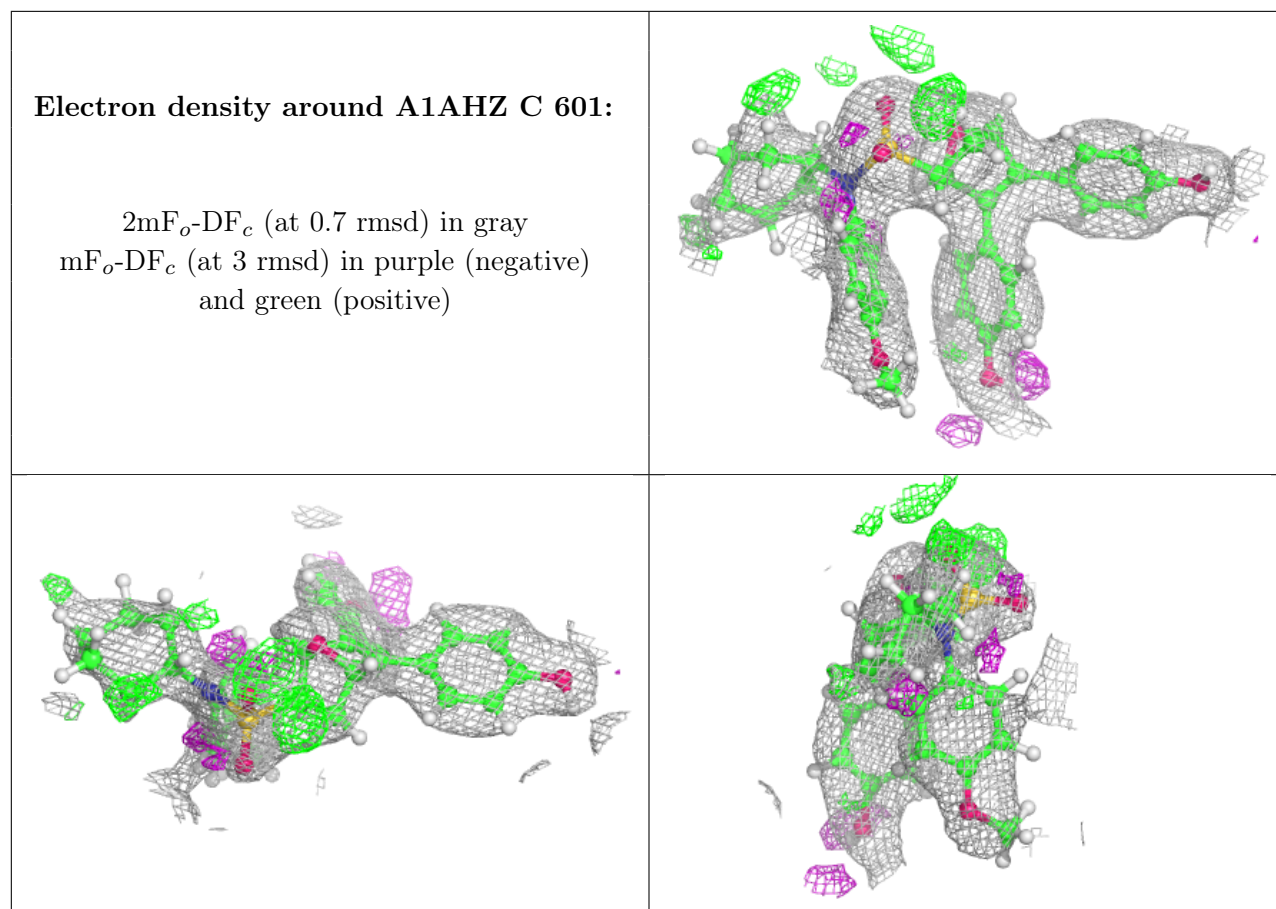
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around A1AHZ B 601:

$2mF_o-DF_c$ (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.