Full wwPDB X-ray Structure Validation Report ⓘ

Mar 14, 2026 – 10:10 AM UTC

PDB ID	:	4GID / pdb_00004gid
Title	:	Structure of beta-secretase complexed with inhibitor
Authors	:	Ghosh, A.; Tang, J.; Venkateswara, R.K.; Yadav, N.; Anderson, D.; Gavande, N.; Huang, X.; Terzyan, S.
Deposited on	:	2012-08-08
Resolution	:	2.00 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:

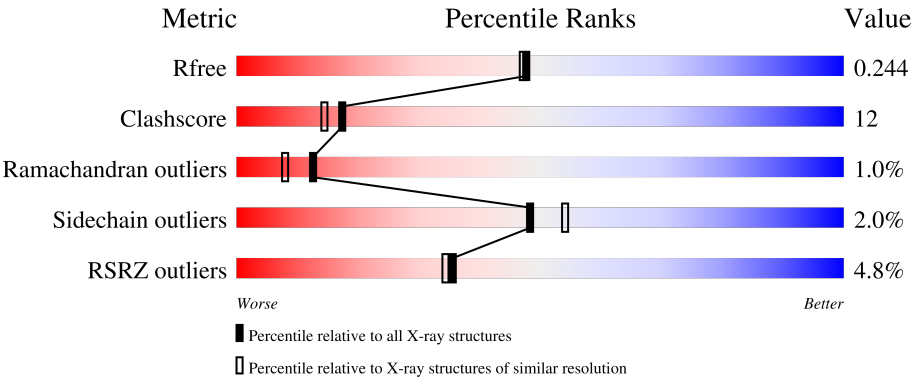
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal 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 2.00 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	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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	388	5% 75% 21%
1	B	388	5% 79% 18%
1	C	388	5% 80% 18%
1	D	388	4% 75% 21%

2 Entry composition

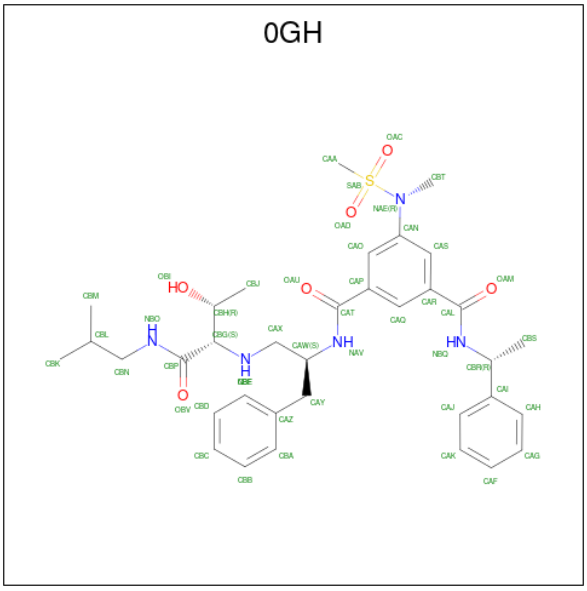
There are 4 unique types of molecules in this entry. The entry contains 13617 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Beta-secretase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	387	Total	C	N	O	S	6	0	0
			3043	1948	505	576	14			
1	B	387	Total	C	N	O	S	10	0	0
			3043	1948	505	576	14			
1	C	388	Total	C	N	O	S	14	0	0
			3049	1951	506	578	14			
1	D	387	Total	C	N	O	S	18	0	0
			3043	1948	505	576	14			

- Molecule 2 is N-[(2S)-1-({(2S,3R)-3-hydroxy-1-[(2-methylpropyl)amino]-1-oxobutan-2-yl}amino)-3-phenylpropan-2-yl]-5-[methyl(methylsulfonyl)amino]-N'-[(1R)-1-phenylethyl]benzene-1,3-dicarboxamide (CCD ID: 0GH) (formula: $C_{35}H_{47}N_5O_6S$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			47	35	5	6	1		

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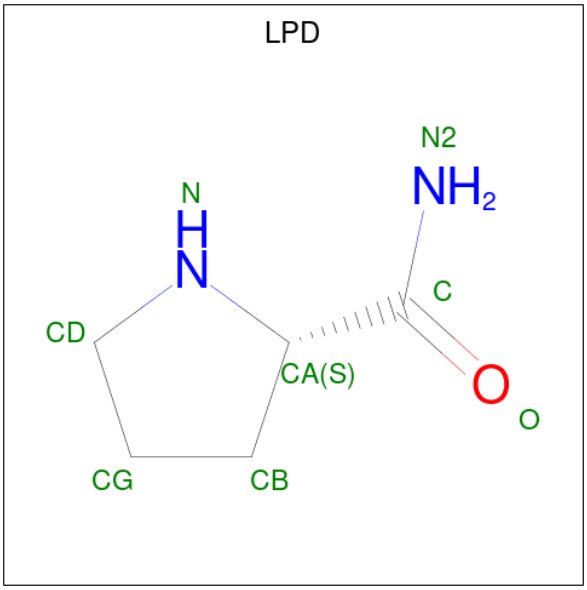
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	1	Total C N O S 47 35 5 6 1	0	0
2	C	1	Total C N O S 47 35 5 6 1	0	0
2	D	1	Total C N O S 47 35 5 6 1	0	0

- Molecule 3 is L-PROLINAMIDE (CCD ID: LPD) (formula: $C_5H_{10}N_2O$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O 8 5 2 1	0	0
3	B	1	Total C N O 8 5 2 1	0	0
3	C	1	Total C N O 8 5 2 1	0	0
3	D	1	Total C N O 8 5 2 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	316	Total O 316 316	0	0
4	B	279	Total O 279 279	0	0

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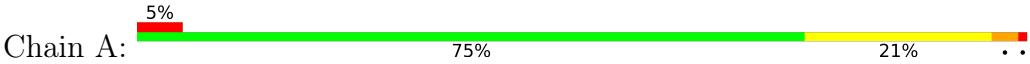
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	C	330	Total O 330 330	0	0
4	D	294	Total O 294 294	0	0

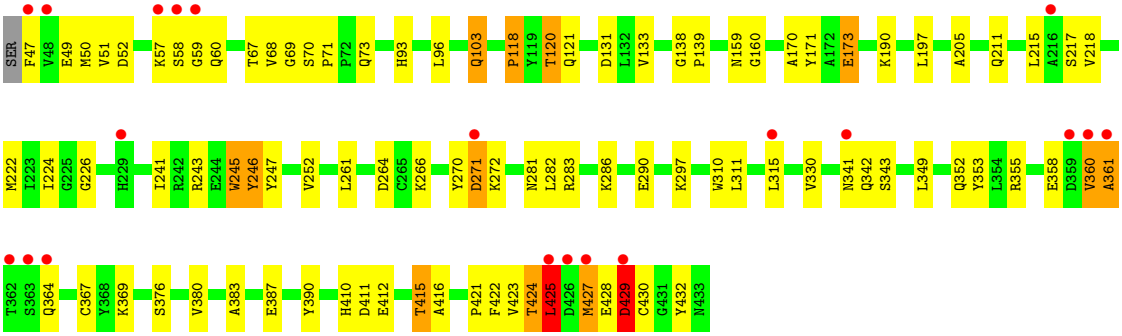
3 Residue-property plots (i)

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: Beta-secretase 1

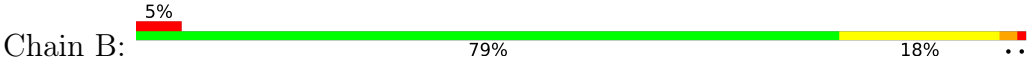
Chain A:

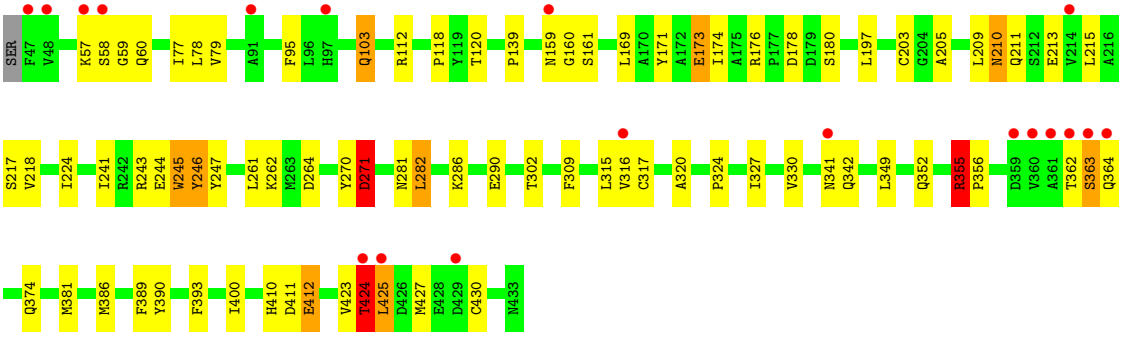




• Molecule 1: Beta-secretase 1

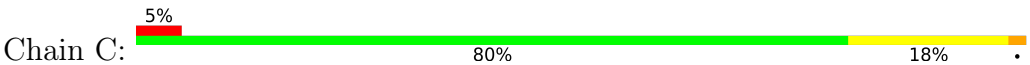
Chain B:

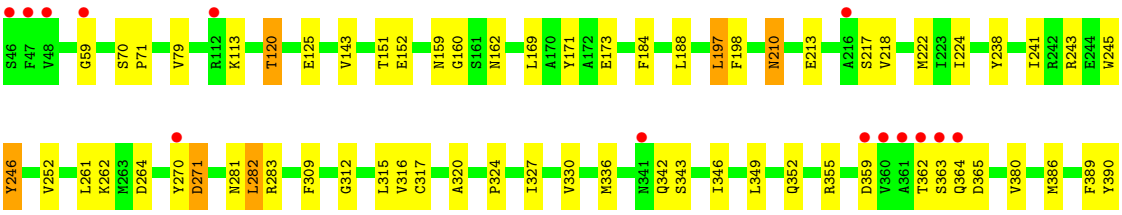


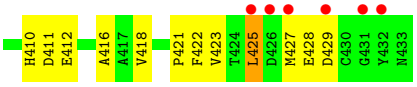


• Molecule 1: Beta-secretase 1

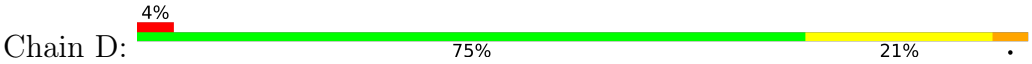
Chain C:

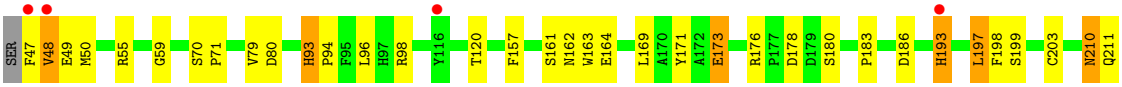


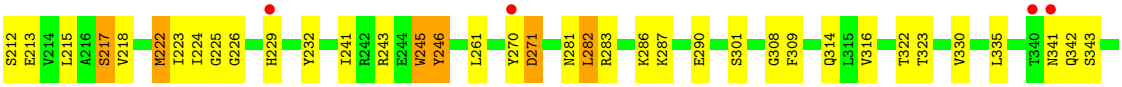


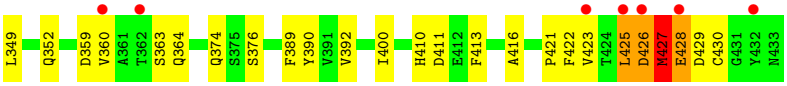


• Molecule 1: Beta-secretase 1









4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	86.43Å 130.35Å 88.40Å 90.00° 97.50° 90.00°	Depositor
Resolution (Å)	34.49 – 2.00 34.49 – 2.00	Depositor EDS
% Data completeness (in resolution range)	95.1 (34.49-2.00) 95.1 (34.49-2.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.46 (at 2.00Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.216 , 0.252 0.208 , 0.244	Depositor DCC
R_{free} test set	9185 reflections (7.04%)	wwPDB-VP
Wilson B-factor (Å^2)	24.8	Xtriage
Anisotropy	0.701	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 53.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.011 for l,-k,h	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	13617	wwPDB-VP
Average B, all atoms (Å^2)	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 41.31 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 2.4066e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: LPD, 0GH

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	0.65	0/3121	1.14	18/4243 (0.4%)
1	B	0.65	1/3121 (0.0%)	1.10	24/4243 (0.6%)
1	C	0.67	0/3127	1.11	17/4251 (0.4%)
1	D	0.66	1/3121 (0.0%)	1.12	19/4243 (0.4%)
All	All	0.66	2/12490 (0.0%)	1.12	78/16980 (0.5%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	381	MET	SD-CE	-5.47	1.65	1.79
1	D	222	MET	SD-CE	-5.08	1.66	1.79

All (78) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	429	ASP	N-CA-C	-10.18	89.12	110.80
1	A	282	LEU	N-CA-C	-9.71	93.52	108.96
1	B	281	ASN	N-CA-C	9.10	122.27	110.53
1	B	425	LEU	N-CA-C	9.00	123.56	110.42
1	D	281	ASN	N-CA-C	8.72	121.78	110.53
1	C	246	TYR	N-CA-C	-8.64	96.97	110.36
1	B	282	LEU	N-CA-C	-8.61	93.47	108.20
1	B	246	TYR	N-CA-C	-8.57	97.07	110.36
1	C	282	LEU	N-CA-C	-8.41	93.82	108.20
1	D	282	LEU	N-CA-C	-8.14	94.27	108.20
1	A	241	ILE	N-CA-C	-8.13	96.50	108.54
1	A	427	MET	N-CA-C	8.08	122.42	110.46
1	D	390	TYR	N-CA-C	-7.84	96.49	108.96
1	A	246	TYR	N-CA-C	-7.84	98.20	110.36
1	D	246	TYR	N-CA-C	-7.74	98.37	110.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	281	ASN	N-CA-C	7.60	121.61	110.59
1	C	241	ILE	N-CA-C	-7.49	97.45	108.54
1	B	355	ARG	CA-C-N	7.40	127.82	119.83
1	B	355	ARG	C-N-CA	7.40	127.82	119.83
1	A	171	TYR	N-CA-C	7.25	120.34	110.55
1	D	427	MET	N-CA-C	7.08	125.87	110.80
1	D	430	CYS	N-CA-C	-6.99	104.75	113.28
1	A	390	TYR	N-CA-C	-6.92	97.95	108.96
1	A	330	VAL	N-CA-C	-6.92	102.51	110.05
1	A	281	ASN	N-CA-C	6.88	120.57	110.59
1	C	330	VAL	N-CA-C	-6.84	102.59	110.05
1	C	390	TYR	N-CA-C	-6.83	98.09	108.96
1	A	361	ALA	N-CA-C	6.80	122.68	113.97
1	C	264	ASP	N-CA-C	-6.57	100.31	110.10
1	B	241	ILE	N-CA-C	-6.50	98.29	108.23
1	B	171	TYR	N-CA-C	6.49	119.31	110.55
1	D	376	SER	N-CA-C	-6.48	104.52	112.88
1	A	264	ASP	N-CA-C	-6.34	100.45	109.96
1	C	171	TYR	N-CA-C	6.30	119.05	110.55
1	A	425	LEU	N-CA-C	6.24	119.42	110.24
1	D	241	ILE	N-CA-C	-6.11	99.50	108.54
1	D	171	TYR	N-CA-C	6.08	119.52	110.52
1	D	416	ALA	N-CA-C	-6.03	102.57	110.53
1	C	386	MET	N-CA-C	6.03	118.64	111.71
1	B	386	MET	N-CA-C	5.98	118.59	111.71
1	D	301	SER	N-CA-C	5.94	119.63	112.38
1	B	264	ASP	N-CA-C	-5.94	101.25	110.10
1	B	176	ARG	N-CA-C	-5.92	101.94	110.40
1	C	418	VAL	N-CA-C	-5.89	99.01	107.78
1	B	174	ILE	N-CA-C	5.84	117.78	112.29
1	C	120	THR	N-CA-C	-5.79	104.32	111.33
1	B	389	PHE	N-CA-C	5.79	118.49	109.52
1	A	353	TYR	N-CA-C	5.73	120.27	113.28
1	B	430	CYS	N-CA-C	-5.71	105.58	112.54
1	D	245	TRP	N-CA-C	-5.68	98.69	110.80
1	B	390	TYR	N-CA-C	-5.68	99.93	108.96
1	C	416	ALA	N-CA-C	-5.59	103.15	110.53
1	A	120	THR	N-CA-C	-5.58	105.20	111.28
1	A	245	TRP	N-CA-C	-5.51	99.07	110.80
1	B	77	ILE	N-CA-C	5.46	115.72	107.80
1	C	184	PHE	N-CA-C	5.39	116.84	111.07
1	C	262	LYS	N-CA-C	5.38	119.00	111.74

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	262	LYS	N-CA-C	5.37	118.81	111.39
1	B	363	SER	N-CA-C	-5.34	99.42	110.80
1	B	425	LEU	CA-C-N	5.33	130.16	122.16
1	B	425	LEU	C-N-CA	5.33	130.16	122.16
1	D	413	PHE	N-CA-C	5.30	119.84	112.90
1	B	203	CYS	N-CA-C	5.28	117.33	107.99
1	D	330	VAL	N-CA-C	-5.28	104.30	110.05
1	C	355	ARG	CA-C-N	5.27	125.52	119.83
1	C	355	ARG	C-N-CA	5.27	125.52	119.83
1	D	80	ASP	N-CA-C	5.26	117.38	108.02
1	D	203	CYS	N-CA-C	5.25	117.28	107.99
1	B	271	ASP	N-CA-C	-5.25	99.62	110.80
1	A	424	THR	N-CA-C	-5.23	106.90	113.28
1	B	330	VAL	N-CA-C	-5.19	104.39	110.05
1	B	244	GLU	N-CA-C	5.13	117.48	108.56
1	A	376	SER	N-CA-C	-5.12	106.27	112.88
1	C	238	TYR	N-CA-C	5.10	117.80	109.59
1	D	93	HIS	CA-C-N	5.09	125.12	119.32
1	D	93	HIS	C-N-CA	5.09	125.12	119.32
1	A	430	CYS	N-CA-C	-5.07	106.26	112.90
1	D	389	PHE	N-CA-C	5.05	117.35	109.52

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	3043	0	2951	87	0
1	B	3043	0	2951	69	0
1	C	3049	0	2956	62	0
1	D	3043	0	2951	79	0
2	A	47	0	47	5	0
2	B	47	0	47	5	0
2	C	47	0	47	4	0
2	D	47	0	47	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	8	0	10	3	0
3	B	8	0	10	3	0
3	C	8	0	10	2	0
3	D	8	0	10	2	0
4	A	316	0	0	7	0
4	B	279	0	0	10	0
4	C	330	0	0	5	0
4	D	294	0	0	7	0
All	All	13617	0	12037	304	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 12.

All (304) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:501:0GH:CBN	2:D:501:0GH:CBL	1.76	1.56
1:A:343:SER:HB3	1:A:427:MET:HE1	1.17	1.15
1:A:360:VAL:HG12	1:A:361:ALA:H	1.29	0.96
1:B:60:GLN:HE21	1:B:161:SER:HA	1.33	0.93
1:A:103:GLN:H	1:A:103:GLN:HE21	1.16	0.93
1:B:103:GLN:H	1:B:103:GLN:HE21	1.18	0.91
1:B:412:GLU:H	1:B:412:GLU:CD	1.77	0.90
1:A:343:SER:HB3	1:A:427:MET:CE	2.02	0.89
1:B:57:LYS:HE3	4:B:806:HOH:O	1.70	0.89
1:A:355:ARG:HH21	1:A:369:LYS:HD3	1.39	0.88
1:A:425:LEU:HD12	1:A:425:LEU:O	1.76	0.85
1:C:210:ASN:HD22	1:C:210:ASN:C	1.85	0.85
1:B:159:ASN:HD22	1:B:160:GLY:N	1.77	0.82
1:A:266:LYS:HG3	1:A:429:ASP:O	1.79	0.82
1:C:422:PHE:O	1:C:425:LEU:HD11	1.80	0.80
1:D:210:ASN:C	1:D:210:ASN:HD22	1.89	0.80
1:A:50:MET:HG2	1:A:138:GLY:HA2	1.63	0.80
1:D:210:ASN:ND2	1:D:213:GLU:H	1.81	0.79
1:A:355:ARG:NH2	1:A:369:LYS:HD3	1.98	0.79
1:D:270:TYR:O	1:D:271:ASP:HB3	1.83	0.78
1:C:210:ASN:ND2	1:C:213:GLU:HG3	1.97	0.78
1:A:222:MET:HE3	1:A:224:ILE:HD11	1.67	0.76
2:D:501:0GH:CBL	2:D:501:0GH:NBO	2.49	0.76
1:C:120:THR:OG1	2:C:501:0GH:H14	1.85	0.76
2:B:501:0GH:H15	4:B:879:HOH:O	1.87	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:243:ARG:HD3	4:D:718:HOH:O	1.87	0.74
2:D:501:0GH:CBN	2:D:501:0GH:CBM	2.64	0.74
1:A:252:VAL:HG21	1:A:427:MET:HE2	1.70	0.73
1:A:349:LEU:H	1:A:352:GLN:HE21	1.36	0.73
1:A:103:GLN:H	1:A:103:GLN:NE2	1.86	0.73
1:A:415:THR:HG23	1:A:416:ALA:O	1.88	0.73
1:A:425:LEU:HD22	1:A:427:MET:HE3	1.71	0.73
1:D:425:LEU:HD22	1:D:427:MET:SD	2.29	0.73
1:D:120:THR:OG1	2:D:501:0GH:H14	1.87	0.73
1:B:210:ASN:C	1:B:210:ASN:HD22	1.97	0.73
1:A:315:LEU:HD23	1:A:315:LEU:H	1.54	0.72
1:A:360:VAL:HG12	1:A:361:ALA:N	2.03	0.72
1:B:286:LYS:NZ	1:B:374:GLN:HE22	1.87	0.72
1:A:286:LYS:HE3	1:A:290:GLU:OE2	1.90	0.71
1:B:112:ARG:NH1	4:B:770:HOH:O	2.22	0.70
1:D:343:SER:OG	1:D:425:LEU:HD23	1.90	0.70
1:B:286:LYS:HZ3	1:B:374:GLN:HE22	1.37	0.70
1:B:217:SER:HB3	3:B:502:LPD:H	1.56	0.69
1:C:359:ASP:OD2	1:C:365:ASP:HB2	1.91	0.69
1:A:120:THR:OG1	2:A:501:0GH:H14	1.93	0.68
1:D:349:LEU:H	1:D:352:GLN:HE21	1.40	0.68
1:B:349:LEU:H	1:B:352:GLN:HE21	1.41	0.68
1:C:349:LEU:H	1:C:352:GLN:HE21	1.41	0.68
1:D:270:TYR:O	1:D:271:ASP:CB	2.42	0.67
1:A:425:LEU:HD22	1:A:427:MET:CE	2.25	0.67
1:A:410:HIS:HD2	1:A:411:ASP:O	1.78	0.66
1:D:426:ASP:O	1:D:427:MET:HB2	1.95	0.65
1:D:193:HIS:H	1:D:193:HIS:CD2	2.14	0.65
1:B:120:THR:OG1	2:B:501:0GH:H14	1.96	0.64
1:B:210:ASN:ND2	1:B:213:GLU:HG3	2.12	0.64
1:B:60:GLN:HE21	1:B:161:SER:CA	2.07	0.64
1:B:423:VAL:HG23	1:B:424:THR:N	2.13	0.63
1:D:349:LEU:H	1:D:352:GLN:NE2	1.97	0.63
1:A:211:GLN:O	1:A:215:LEU:HG	1.98	0.63
2:C:501:0GH:H15	4:C:701:HOH:O	1.98	0.63
1:A:60:GLN:HA	1:A:60:GLN:NE2	2.14	0.62
1:A:271:ASP:OD1	1:A:272:LYS:HG2	2.00	0.62
1:C:428:GLU:HG3	1:C:429:ASP:OD1	2.00	0.61
1:D:55:ARG:HH21	1:D:215:LEU:HA	1.65	0.61
1:A:217:SER:HB3	3:A:502:LPD:H	1.64	0.61
1:B:423:VAL:HG23	1:B:424:THR:H	1.65	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:55:ARG:HD3	4:D:760:HOH:O	1.99	0.61
1:B:349:LEU:H	1:B:352:GLN:NE2	1.98	0.61
1:D:222:MET:HE3	1:D:224:ILE:HD11	1.81	0.61
1:D:341:ASN:O	1:D:425:LEU:HD11	2.00	0.61
1:D:342:GLN:HG3	1:D:421:PRO:HB2	1.83	0.61
1:A:159:ASN:HD22	1:A:160:GLY:N	1.99	0.61
1:A:349:LEU:H	1:A:352:GLN:NE2	1.99	0.61
1:C:343:SER:HB3	1:C:425:LEU:HD13	1.83	0.61
1:B:410:HIS:HD2	1:B:411:ASP:O	1.83	0.60
1:C:349:LEU:H	1:C:352:GLN:NE2	1.99	0.60
1:B:159:ASN:HD22	1:B:159:ASN:C	2.08	0.60
1:B:286:LYS:HD3	1:B:374:GLN:OE1	2.02	0.60
1:C:343:SER:HB3	1:C:427:MET:HE3	1.82	0.60
1:D:217:SER:HB2	3:D:502:LPD:H	1.66	0.60
1:C:309:PHE:CD1	1:C:316:VAL:HG23	2.37	0.60
1:D:197:LEU:C	1:D:197:LEU:HD23	2.26	0.60
1:C:197:LEU:HD23	1:C:197:LEU:C	2.27	0.59
1:C:218:VAL:O	3:C:502:LPD:HA	2.02	0.59
1:D:218:VAL:O	3:D:502:LPD:HA	2.02	0.59
1:D:245:TRP:CG	1:D:246:TYR:H	2.21	0.59
1:C:343:SER:HB3	1:C:427:MET:CE	2.33	0.58
1:D:229:HIS:HA	1:D:232:TYR:CE1	2.38	0.58
1:B:103:GLN:HE21	1:B:103:GLN:N	1.96	0.58
1:C:210:ASN:ND2	1:C:213:GLU:H	2.02	0.58
1:A:139:PRO:HD3	1:A:224:ILE:HB	1.86	0.57
1:C:336:MET:HA	1:C:427:MET:HE1	1.86	0.57
1:B:412:GLU:CD	1:B:412:GLU:N	2.55	0.57
1:B:210:ASN:HD21	1:B:213:GLU:HG3	1.69	0.57
1:B:218:VAL:O	3:B:502:LPD:HA	2.05	0.56
1:C:113:LYS:NZ	4:C:703:HOH:O	2.33	0.56
1:A:341:ASN:O	1:A:425:LEU:HD11	2.06	0.56
1:A:422:PHE:O	1:A:425:LEU:HD21	2.05	0.56
1:D:193:HIS:H	1:D:193:HIS:HD2	1.53	0.56
1:D:213:GLU:O	1:D:217:SER:OG	2.23	0.56
1:B:393:PHE:HE2	4:B:817:HOH:O	1.89	0.56
1:A:315:LEU:HD12	1:A:367:CYS:HB3	1.88	0.56
1:A:360:VAL:CG1	1:A:361:ALA:H	2.12	0.56
1:A:358:GLU:HG3	1:A:360:VAL:O	2.05	0.55
1:D:425:LEU:N	1:D:425:LEU:HD12	2.21	0.55
1:C:210:ASN:C	1:C:210:ASN:ND2	2.57	0.55
1:D:93:HIS:CG	1:D:94:PRO:HD2	2.42	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:60:GLN:NE2	1:B:161:SER:HA	2.13	0.55
2:A:501:0GH:H15	4:A:692:HOH:O	2.07	0.55
1:D:422:PHE:O	1:D:425:LEU:HD21	2.07	0.55
1:A:245:TRP:CG	1:A:246:TYR:H	2.24	0.54
1:D:210:ASN:HD21	1:D:213:GLU:H	1.54	0.54
1:B:342:GLN:N	1:B:427:MET:HE1	2.23	0.54
1:A:59:GLY:C	1:A:60:GLN:HE21	2.15	0.54
1:C:428:GLU:HG3	1:C:429:ASP:N	2.23	0.54
1:B:363:SER:HB2	4:B:749:HOH:O	2.08	0.53
1:D:176:ARG:HD2	4:D:752:HOH:O	2.08	0.53
1:A:270:TYR:O	1:A:271:ASP:HB3	2.09	0.53
1:C:312:GLY:HA3	4:C:725:HOH:O	2.08	0.53
1:C:359:ASP:OD2	1:C:363:SER:OG	2.26	0.53
1:A:315:LEU:H	1:A:315:LEU:CD2	2.21	0.53
1:B:103:GLN:H	1:B:103:GLN:NE2	1.97	0.53
1:D:286:LYS:HD3	1:D:374:GLN:OE1	2.08	0.53
1:B:362:THR:HG22	1:B:362:THR:O	2.09	0.53
1:C:59:GLY:C	2:C:501:0GH:H44	2.33	0.53
1:A:103:GLN:HE21	1:A:103:GLN:N	1.98	0.53
1:A:205:ALA:HB2	3:A:502:LPD:HB3	1.90	0.53
1:A:297:LYS:HE2	1:A:310:TRP:CD1	2.44	0.53
1:D:428:GLU:N	4:D:787:HOH:O	2.42	0.53
2:B:501:0GH:CBJ	4:B:879:HOH:O	2.51	0.52
1:C:243:ARG:HD3	4:C:780:HOH:O	2.07	0.52
1:B:341:ASN:C	1:B:427:MET:HE1	2.34	0.52
1:D:308:GLY:C	1:D:314:GLN:HG2	2.35	0.52
1:A:173:GLU:OE2	1:A:243:ARG:NH1	2.43	0.52
1:D:423:VAL:HG12	1:D:423:VAL:O	2.10	0.52
1:B:320:ALA:HB2	1:B:364:GLN:O	2.09	0.52
1:A:60:GLN:HG3	4:A:849:HOH:O	2.10	0.51
1:A:364:GLN:OE1	1:A:364:GLN:HA	2.11	0.51
1:C:410:HIS:HD2	1:C:411:ASP:O	1.93	0.51
1:B:60:GLN:NE2	1:B:160:GLY:O	2.44	0.51
1:C:197:LEU:HD23	1:C:198:PHE:N	2.26	0.51
1:C:336:MET:HA	1:C:427:MET:CE	2.40	0.50
1:D:93:HIS:ND1	1:D:94:PRO:HD2	2.26	0.50
1:D:286:LYS:NZ	1:D:290:GLU:OE2	2.36	0.50
1:B:247:TYR:HB3	1:B:400:ILE:HD11	1.92	0.50
1:D:335:LEU:O	1:D:343:SER:HB2	2.11	0.50
1:C:315:LEU:HD13	1:C:317:CYS:SG	2.51	0.50
1:D:79:VAL:HG13	1:D:169:LEU:HD11	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:48:VAL:HG23	1:D:49:GLU:N	2.27	0.50
1:B:178:ASP:OD2	1:B:180:SER:N	2.44	0.50
1:B:364:GLN:C	4:B:769:HOH:O	2.55	0.49
1:B:211:GLN:O	1:B:215:LEU:HG	2.12	0.49
1:C:245:TRP:CG	1:C:246:TYR:H	2.30	0.49
1:D:199:SER:OG	1:D:223:ILE:HB	2.13	0.49
1:C:222:MET:SD	1:C:224:ILE:HD11	2.52	0.49
1:D:59:GLY:C	2:D:501:0GH:H44	2.37	0.49
1:D:286:LYS:CD	1:D:374:GLN:OE1	2.60	0.49
1:C:362:THR:O	1:C:362:THR:HG22	2.12	0.49
1:C:423:VAL:HG12	1:C:423:VAL:O	2.12	0.49
1:B:95:PHE:CE1	1:B:159:ASN:HB2	2.47	0.48
1:D:98:ARG:HG2	1:D:164:GLU:OE2	2.12	0.48
1:C:315:LEU:C	1:C:315:LEU:HD12	2.38	0.48
1:A:50:MET:CG	1:A:138:GLY:HA2	2.38	0.48
1:D:309:PHE:CD1	1:D:316:VAL:HG23	2.48	0.48
1:C:270:TYR:O	1:C:271:ASP:CB	2.61	0.48
2:D:501:0GH:CBN	2:D:501:0GH:CBK	2.80	0.48
1:C:210:ASN:HD21	1:C:213:GLU:HG3	1.75	0.48
1:D:47:PHE:CZ	1:D:226:GLY:HA3	2.49	0.48
2:D:501:0GH:H15	4:D:713:HOH:O	2.13	0.48
1:B:58:SER:HA	4:B:739:HOH:O	2.13	0.47
1:A:266:LYS:HZ2	1:A:429:ASP:C	2.22	0.47
1:A:270:TYR:O	1:A:271:ASP:CB	2.62	0.47
1:B:178:ASP:OD2	1:B:180:SER:CB	2.63	0.47
1:C:342:GLN:HG2	1:C:421:PRO:HB2	1.97	0.47
1:A:159:ASN:HD22	1:A:160:GLY:H	1.63	0.47
1:B:57:LYS:NZ	1:B:209:LEU:H	2.12	0.47
1:D:210:ASN:C	1:D:210:ASN:ND2	2.63	0.47
1:A:412:GLU:CD	1:C:423:VAL:H	2.22	0.47
1:C:125:GLU:OE2	1:C:152:GLU:OE1	2.33	0.47
1:D:261:LEU:HD12	1:D:261:LEU:HA	1.79	0.47
1:A:423:VAL:N	1:C:412:GLU:OE2	2.36	0.47
1:B:59:GLY:H	2:B:501:0GH:H45	1.79	0.47
1:B:245:TRP:CG	1:B:246:TYR:H	2.32	0.47
1:B:423:VAL:O	1:B:424:THR:C	2.57	0.47
1:A:197:LEU:HD23	1:A:197:LEU:C	2.40	0.47
1:B:302:THR:HG23	4:B:702:HOH:O	2.15	0.47
1:B:315:LEU:HD13	1:B:317:CYS:SG	2.54	0.47
1:B:210:ASN:ND2	1:B:213:GLU:H	2.13	0.47
1:C:79:VAL:HG13	1:C:169:LEU:CD1	2.45	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:79:VAL:HG13	1:D:169:LEU:CD1	2.44	0.47
1:D:410:HIS:HD2	1:D:411:ASP:O	1.97	0.47
1:B:324:PRO:O	1:B:327:ILE:HG12	2.15	0.47
1:D:161:SER:HB2	1:D:163:TRP:CD1	2.50	0.47
1:D:197:LEU:HD23	1:D:198:PHE:N	2.30	0.47
1:A:59:GLY:O	1:A:60:GLN:NE2	2.47	0.46
1:A:60:GLN:HB3	4:A:672:HOH:O	2.15	0.46
1:A:93:HIS:HB3	1:A:96:LEU:HG	1.96	0.46
1:C:261:LEU:HD12	1:C:261:LEU:HA	1.78	0.46
1:B:341:ASN:HA	1:B:427:MET:HE3	1.98	0.46
1:C:252:VAL:HG11	1:C:427:MET:HE2	1.97	0.46
1:C:283:ARG:HB2	1:C:380:VAL:HB	1.97	0.46
1:D:55:ARG:NH2	1:D:215:LEU:O	2.48	0.46
1:A:218:VAL:O	3:A:502:LPD:HA	2.16	0.46
1:A:252:VAL:HG11	1:A:427:MET:HE2	1.98	0.46
1:A:173:GLU:HG2	1:A:245:TRP:HB2	1.97	0.46
1:A:342:GLN:HG3	1:A:421:PRO:HB2	1.98	0.46
1:A:422:PHE:O	1:A:425:LEU:CD2	2.64	0.46
1:C:343:SER:CB	1:C:425:LEU:HD13	2.45	0.46
1:A:360:VAL:CG1	1:A:361:ALA:N	2.77	0.45
1:B:57:LYS:HG2	1:B:60:GLN:OE1	2.16	0.45
1:C:422:PHE:HB2	1:C:425:LEU:HD21	1.96	0.45
1:D:211:GLN:O	1:D:215:LEU:HG	2.16	0.45
1:A:315:LEU:HD23	1:A:315:LEU:N	2.29	0.45
1:A:383:ALA:O	1:A:387:GLU:HG3	2.16	0.45
1:B:79:VAL:HG13	1:B:169:LEU:CD1	2.46	0.45
1:B:425:LEU:N	1:B:425:LEU:CD1	2.79	0.45
1:D:178:ASP:OD1	1:D:180:SER:OG	2.25	0.45
1:D:427:MET:O	1:D:428:GLU:C	2.59	0.45
1:C:346:ILE:HB	1:C:389:PHE:CZ	2.51	0.45
1:A:57:LYS:HG2	1:A:58:SER:N	2.32	0.45
1:A:69:GLY:HA2	1:A:131:ASP:OD1	2.16	0.45
1:C:151:THR:O	1:C:152:GLU:HG3	2.16	0.45
1:D:283:ARG:HD2	2:D:501:0GH:H33	1.99	0.44
1:A:49:GLU:HG2	4:A:798:HOH:O	2.18	0.44
1:D:359:ASP:OD2	1:D:363:SER:OG	2.35	0.44
1:A:266:LYS:NZ	1:A:429:ASP:O	2.46	0.44
1:D:173:GLU:O	1:D:173:GLU:HG3	2.15	0.44
1:B:270:TYR:O	1:B:271:ASP:CB	2.65	0.44
1:C:217:SER:HB2	3:C:502:LPD:H	1.83	0.44
1:D:193:HIS:CD2	1:D:193:HIS:N	2.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:178:ASP:OD2	1:B:180:SER:HB3	2.18	0.44
1:D:47:PHE:HB3	1:D:50:MET:HE3	1.99	0.44
1:D:161:SER:O	1:D:162:ASN:HB2	2.18	0.44
1:A:283:ARG:HD2	2:A:501:0GH:H33	1.98	0.44
1:D:98:ARG:HE	1:D:164:GLU:CD	2.26	0.44
1:B:261:LEU:HD12	1:B:261:LEU:HA	1.91	0.43
1:D:427:MET:HB3	1:D:428:GLU:H	1.38	0.43
1:A:121:GLN:O	2:A:501:0GH:H27	2.19	0.43
1:D:359:ASP:OD1	1:D:360:VAL:N	2.51	0.43
1:A:70:SER:HA	1:A:71:PRO:C	2.43	0.43
1:A:425:LEU:H	1:A:425:LEU:HG	1.49	0.43
1:B:423:VAL:CG2	1:B:424:THR:H	2.30	0.43
1:B:425:LEU:N	1:B:425:LEU:HD12	2.33	0.43
1:A:425:LEU:HB2	1:A:427:MET:HE3	2.01	0.43
1:D:47:PHE:HD2	1:D:50:MET:CE	2.31	0.43
1:D:425:LEU:O	1:D:426:ASP:O	2.36	0.43
1:B:173:GLU:HG2	1:B:245:TRP:HB3	2.00	0.43
1:C:428:GLU:HG3	1:C:429:ASP:H	1.82	0.43
1:D:245:TRP:CG	1:D:246:TYR:N	2.87	0.43
1:D:392:VAL:O	1:D:400:ILE:HA	2.19	0.43
1:A:432:TYR:HB2	4:A:892:HOH:O	2.19	0.42
1:B:423:VAL:CG2	1:B:424:THR:N	2.81	0.42
1:A:51:VAL:O	1:A:52:ASP:HB2	2.19	0.42
1:B:355:ARG:HA	1:B:356:PRO:HD3	1.67	0.42
1:A:245:TRP:CD1	1:A:246:TYR:H	2.36	0.42
1:C:423:VAL:O	1:C:423:VAL:CG1	2.67	0.42
1:D:245:TRP:CD1	1:D:246:TYR:H	2.36	0.42
1:A:283:ARG:HB2	1:A:380:VAL:HB	2.02	0.42
1:B:59:GLY:C	2:B:501:0GH:H44	2.44	0.42
1:B:270:TYR:O	1:B:271:ASP:HB2	2.19	0.42
1:A:261:LEU:HD12	1:A:261:LEU:HA	1.94	0.42
1:C:159:ASN:HD22	1:C:160:GLY:N	2.18	0.42
1:D:322:THR:O	1:D:323:THR:C	2.62	0.42
1:B:309:PHE:CD1	1:B:316:VAL:HG23	2.53	0.42
1:C:70:SER:HA	1:C:71:PRO:C	2.44	0.42
1:C:270:TYR:O	1:C:271:ASP:HB3	2.20	0.42
1:C:324:PRO:O	1:C:327:ILE:HG12	2.19	0.42
1:A:59:GLY:N	2:A:501:0GH:H45	2.35	0.42
1:B:205:ALA:HB2	3:B:502:LPD:HB3	2.02	0.42
1:B:374:GLN:HG2	4:B:783:HOH:O	2.20	0.42
1:C:320:ALA:HB2	1:C:364:GLN:O	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:210:ASN:HD22	1:D:213:GLU:H	1.62	0.42
1:D:183:PRO:HB2	1:D:186:ASP:OD1	2.19	0.42
1:A:68:VAL:HG12	1:A:133:VAL:HG22	2.01	0.42
1:B:79:VAL:HG13	1:B:169:LEU:HD12	2.02	0.42
1:D:96:LEU:HD21	1:D:157:PHE:CD1	2.54	0.42
1:A:67:THR:HA	1:A:73:GLN:O	2.20	0.41
1:A:424:THR:HG23	1:C:412:GLU:OE1	2.21	0.41
1:B:286:LYS:NZ	1:B:290:GLU:OE2	2.47	0.41
1:A:60:GLN:NE2	1:A:60:GLN:CA	2.82	0.41
1:C:79:VAL:HG13	1:C:169:LEU:HD11	2.01	0.41
1:B:197:LEU:C	1:B:197:LEU:HD23	2.44	0.41
1:D:55:ARG:NH2	4:D:869:HOH:O	2.53	0.41
1:A:47:PHE:CZ	1:A:226:GLY:HA3	2.56	0.41
1:A:266:LYS:HG2	4:A:892:HOH:O	2.19	0.41
1:C:143:VAL:HG11	1:C:188:LEU:HD12	2.02	0.41
1:C:429:ASP:OD1	1:C:429:ASP:N	2.52	0.41
1:D:197:LEU:O	1:D:225:GLY:N	2.53	0.41
1:C:342:GLN:CG	1:C:421:PRO:HB2	2.51	0.41
2:C:501:0GH:CBJ	4:C:701:HOH:O	2.63	0.41
1:A:118:PRO:O	1:A:118:PRO:HG2	2.21	0.41
1:D:47:PHE:CD1	1:D:47:PHE:N	2.88	0.41
1:A:170:ALA:HA	1:A:247:TYR:CE2	2.55	0.40
1:A:355:ARG:HH21	1:A:369:LYS:CD	2.23	0.40
1:C:173:GLU:OE2	1:C:243:ARG:NH1	2.54	0.40
1:C:315:LEU:HD12	1:C:315:LEU:O	2.21	0.40
1:D:210:ASN:HD21	1:D:212:SER:HB2	1.85	0.40
1:A:190:LYS:NZ	4:A:746:HOH:O	2.55	0.40
1:C:422:PHE:O	1:C:425:LEU:CD1	2.62	0.40
1:D:70:SER:HA	1:D:71:PRO:C	2.46	0.40
1:D:287:LYS:HE3	4:D:839:HOH:O	2.21	0.40
1:A:311:LEU:HD23	1:A:311:LEU:HA	1.93	0.40
1:B:139:PRO:HD3	1:B:224:ILE:HB	2.02	0.40
1:D:342:GLN:CG	1:D:421:PRO:HB2	2.51	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	385/388 (99%)	369 (96%)	11 (3%)	5 (1%)	9 5
1	B	385/388 (99%)	372 (97%)	10 (3%)	3 (1%)	16 11
1	C	386/388 (100%)	373 (97%)	12 (3%)	1 (0%)	36 35
1	D	385/388 (99%)	370 (96%)	9 (2%)	6 (2%)	7 3
All	All	1541/1552 (99%)	1484 (96%)	42 (3%)	15 (1%)	12 8

All (15) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	271	ASP
1	A	360	VAL
1	A	428	GLU
1	A	429	ASP
1	B	271	ASP
1	B	424	THR
1	C	271	ASP
1	D	271	ASP
1	D	426	ASP
1	D	427	MET
1	D	428	GLU
1	D	429	ASP
1	D	48	VAL
1	B	118	PRO
1	A	118	PRO

5.3.2 Protein sidechains

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	330/331 (100%)	326 (99%)	4 (1%)	63	70
1	B	330/331 (100%)	320 (97%)	10 (3%)	36	38
1	C	331/331 (100%)	326 (98%)	5 (2%)	57	64
1	D	330/331 (100%)	322 (98%)	8 (2%)	43	47
All	All	1321/1324 (100%)	1294 (98%)	27 (2%)	48	54

All (27) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	103	GLN
1	A	173	GLU
1	A	415	THR
1	A	425	LEU
1	B	78	LEU
1	B	103	GLN
1	B	173	GLU
1	B	210	ASN
1	B	243	ARG
1	B	245	TRP
1	B	282	LEU
1	B	355	ARG
1	B	412	GLU
1	B	424	THR
1	C	162	ASN
1	C	197	LEU
1	C	210	ASN
1	C	282	LEU
1	C	425	LEU
1	D	173	GLU
1	D	193	HIS
1	D	197	LEU
1	D	210	ASN
1	D	217	SER
1	D	282	LEU
1	D	364	GLN
1	D	425	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (37) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	60	GLN
1	A	76	ASN
1	A	103	GLN
1	A	137	HIS
1	A	159	ASN
1	A	352	GLN
1	A	410	HIS
1	B	60	GLN
1	B	76	ASN
1	B	103	GLN
1	B	159	ASN
1	B	210	ASN
1	B	341	ASN
1	B	352	GLN
1	B	374	GLN
1	B	410	HIS
1	B	433	ASN
1	C	76	ASN
1	C	121	GLN
1	C	137	HIS
1	C	146	ASN
1	C	159	ASN
1	C	162	ASN
1	C	210	ASN
1	C	314	GLN
1	C	352	GLN
1	C	410	HIS
1	D	60	GLN
1	D	76	ASN
1	D	97	HIS
1	D	121	GLN
1	D	137	HIS
1	D	193	HIS
1	D	210	ASN
1	D	352	GLN
1	D	410	HIS
1	D	433	ASN

5.3.3 RNA

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)

8 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	0GH	C	501	-	48,49,49	2.11	7 (14%)	64,68,68	1.49	5 (7%)
2	0GH	B	501	-	48,49,49	2.14	7 (14%)	64,68,68	1.64	5 (7%)
3	LPD	C	502	-	8,8,8	0.85	0	10,10,10	1.84	1 (10%)
2	0GH	D	501	-	48,49,49	2.34	9 (18%)	64,68,68	2.05	9 (14%)
3	LPD	A	502	-	8,8,8	1.16	1 (12%)	10,10,10	1.40	1 (10%)
3	LPD	B	502	-	8,8,8	1.30	2 (25%)	10,10,10	1.38	1 (10%)
3	LPD	D	502	-	8,8,8	0.92	1 (12%)	10,10,10	1.77	1 (10%)
2	0GH	A	501	-	48,49,49	2.15	7 (14%)	64,68,68	1.62	6 (9%)

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	0GH	C	501	-	-	10/52/52/52	0/3/3/3
2	0GH	B	501	-	-	12/52/52/52	0/3/3/3
3	LPD	C	502	-	-	2/4/11/11	0/1/1/1
2	0GH	D	501	-	-	11/52/52/52	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	LPD	A	502	-	-	3/4/11/11	0/1/1/1
3	LPD	B	502	-	-	3/4/11/11	0/1/1/1
3	LPD	D	502	-	-	2/4/11/11	0/1/1/1
2	0GH	A	501	-	-	11/52/52/52	0/3/3/3

All (34) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	0GH	OAD-SAB	6.64	1.53	1.43
2	D	501	0GH	OAC-SAB	6.60	1.53	1.43
2	D	501	0GH	OAD-SAB	6.58	1.53	1.43
2	C	501	0GH	OAC-SAB	6.58	1.53	1.43
2	B	501	0GH	OAD-SAB	6.56	1.53	1.43
2	A	501	0GH	OAC-SAB	6.52	1.53	1.43
2	B	501	0GH	OAC-SAB	6.49	1.53	1.43
2	C	501	0GH	OAD-SAB	6.48	1.53	1.43
2	A	501	0GH	CBP-NBO	5.97	1.47	1.33
2	D	501	0GH	CBP-NBO	5.96	1.47	1.33
2	B	501	0GH	CBP-NBO	5.87	1.47	1.33
2	D	501	0GH	CBN-CBL	5.60	1.76	1.50
2	C	501	0GH	CBP-NBO	5.25	1.45	1.33
2	B	501	0GH	CAY-CAZ	-5.05	1.39	1.51
2	C	501	0GH	CAY-CAZ	-4.98	1.39	1.51
2	A	501	0GH	CAR-CAL	-4.91	1.39	1.50
2	D	501	0GH	CAY-CAZ	-4.90	1.39	1.51
2	A	501	0GH	CAY-CAZ	-4.86	1.39	1.51
2	C	501	0GH	CAR-CAL	-4.85	1.39	1.50
2	B	501	0GH	CAR-CAL	-4.82	1.39	1.50
2	C	501	0GH	CAI-CBR	-4.81	1.39	1.52
2	D	501	0GH	CAI-CBR	-4.80	1.39	1.52
2	D	501	0GH	CAR-CAL	-4.80	1.39	1.50
2	C	501	0GH	CAP-CAT	-4.79	1.39	1.50
2	B	501	0GH	CAI-CBR	-4.78	1.39	1.52
2	A	501	0GH	CAP-CAT	-4.78	1.39	1.50
2	D	501	0GH	CAP-CAT	-4.76	1.39	1.50
2	B	501	0GH	CAP-CAT	-4.71	1.39	1.50
2	A	501	0GH	CAI-CBR	-4.71	1.39	1.52
2	D	501	0GH	CBN-NBO	3.22	1.55	1.46
3	B	502	LPD	C-N2	2.88	1.39	1.32
3	A	502	LPD	C-N2	2.81	1.39	1.32
3	D	502	LPD	C-N2	2.16	1.38	1.32
3	B	502	LPD	CA-C	2.03	1.56	1.52

All (29) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	501	0GH	CBN-NBO-CBP	-10.60	102.45	122.65
2	B	501	0GH	CBN-NBO-CBP	-8.63	106.21	122.65
2	A	501	0GH	CBN-NBO-CBP	-6.79	109.72	122.65
2	A	501	0GH	OAD-SAB-OAC	-6.20	109.19	118.46
2	C	501	0GH	CBN-NBO-CBP	-6.16	110.91	122.65
2	B	501	0GH	OAD-SAB-OAC	-6.03	109.44	118.46
2	D	501	0GH	OAD-SAB-OAC	-5.78	109.81	118.46
2	C	501	0GH	OAD-SAB-OAC	-5.62	110.06	118.46
3	C	502	LPD	CB-CA-C	5.49	119.90	111.37
2	A	501	0GH	CBT-NAE-SAB	-5.30	110.61	118.23
3	D	502	LPD	CB-CA-C	5.27	119.55	111.37
2	D	501	0GH	CBT-NAE-SAB	-5.21	110.74	118.23
2	D	501	0GH	CBL-CBN-NBO	-5.20	97.18	113.57
2	D	501	0GH	OAD-SAB-NAE	4.69	112.51	107.14
2	B	501	0GH	CBT-NAE-SAB	-4.12	112.31	118.23
2	C	501	0GH	CBT-NAE-SAB	-4.09	112.35	118.23
3	B	502	LPD	CB-CA-C	3.99	117.56	111.37
3	A	502	LPD	CB-CA-C	3.97	117.53	111.37
2	C	501	0GH	OAD-SAB-NAE	3.65	111.31	107.14
2	A	501	0GH	OAD-SAB-NAE	3.42	111.06	107.14
2	B	501	0GH	OAD-SAB-NAE	2.89	110.45	107.14
2	B	501	0GH	OAC-SAB-NAE	2.76	110.30	107.14
2	A	501	0GH	OAC-SAB-NAE	2.71	110.25	107.14
2	D	501	0GH	CBG-CBP-NBO	-2.61	112.08	116.38
2	D	501	0GH	OAC-SAB-NAE	2.56	110.07	107.14
2	C	501	0GH	OAC-SAB-NAE	2.55	110.06	107.14
2	A	501	0GH	CBG-CBP-NBO	-2.42	112.39	116.38
2	D	501	0GH	OBI-CBH-CBG	2.30	113.71	109.07
2	D	501	0GH	CAX-NBF-CBG	-2.12	110.06	114.00

There are no chirality outliers.

All (54) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	0GH	CAW-CAX-NBF-CBG
2	A	501	0GH	CAO-CAN-NAE-CBT
2	A	501	0GH	CAO-CAN-NAE-SAB
2	A	501	0GH	CAS-CAN-NAE-CBT
2	B	501	0GH	CAW-CAX-NBF-CBG
2	B	501	0GH	CAO-CAN-NAE-CBT
2	B	501	0GH	CAO-CAN-NAE-SAB

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Mol	Chain	Res	Type	Atoms
2	B	501	0GH	CAS-CAN-NAE-CBT
2	B	501	0GH	CAS-CAN-NAE-SAB
2	B	501	0GH	CBT-NAE-SAB-OAD
2	C	501	0GH	CAW-CAX-NBF-CBG
2	C	501	0GH	CAO-CAN-NAE-CBT
2	C	501	0GH	CAO-CAN-NAE-SAB
2	C	501	0GH	CAS-CAN-NAE-CBT
2	D	501	0GH	CAW-CAX-NBF-CBG
2	D	501	0GH	CAO-CAN-NAE-CBT
2	D	501	0GH	CAO-CAN-NAE-SAB
2	D	501	0GH	CAS-CAN-NAE-CBT
3	A	502	LPD	O-C-CA-CB
3	B	502	LPD	O-C-CA-CB
3	C	502	LPD	O-C-CA-CB
3	C	502	LPD	N2-C-CA-CB
3	D	502	LPD	O-C-CA-CB
3	D	502	LPD	N2-C-CA-CB
2	B	501	0GH	OBV-CBP-NBO-CBN
2	A	501	0GH	CAS-CAN-NAE-SAB
2	C	501	0GH	CAS-CAN-NAE-SAB
2	D	501	0GH	CAS-CAN-NAE-SAB
3	A	502	LPD	N2-C-CA-CB
3	B	502	LPD	N2-C-CA-CB
2	B	501	0GH	CBP-CBG-CBH-CBJ
2	A	501	0GH	CAW-CAY-CAZ-CBE
2	A	501	0GH	CBT-NAE-SAB-OAC
2	A	501	0GH	CBT-NAE-SAB-OAD
2	C	501	0GH	CBT-NAE-SAB-OAD
2	D	501	0GH	CBT-NAE-SAB-OAC
2	D	501	0GH	CBT-NAE-SAB-OAD
2	C	501	0GH	OAM-CAL-CAR-CAS
2	D	501	0GH	OAM-CAL-CAR-CAS
2	A	501	0GH	CBP-CBG-CBH-CBJ
2	C	501	0GH	CBP-CBG-CBH-CBJ
2	D	501	0GH	CBP-CBG-CBH-CBJ
2	D	501	0GH	CAW-CAY-CAZ-CBE
2	A	501	0GH	CAW-CAY-CAZ-CBA
2	B	501	0GH	CAW-CAY-CAZ-CBE
2	B	501	0GH	CAW-CAY-CAZ-CBA
2	A	501	0GH	OBV-CBP-NBO-CBN
2	B	501	0GH	CBT-NAE-SAB-CAA
2	D	501	0GH	CAW-CAY-CAZ-CBA

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Mol	Chain	Res	Type	Atoms
2	B	501	0GH	CBT-NAE-SAB-OAC
2	C	501	0GH	CBT-NAE-SAB-OAC
2	C	501	0GH	CAW-CAY-CAZ-CBE
3	A	502	LPD	O-C-CA-N
3	B	502	LPD	O-C-CA-N

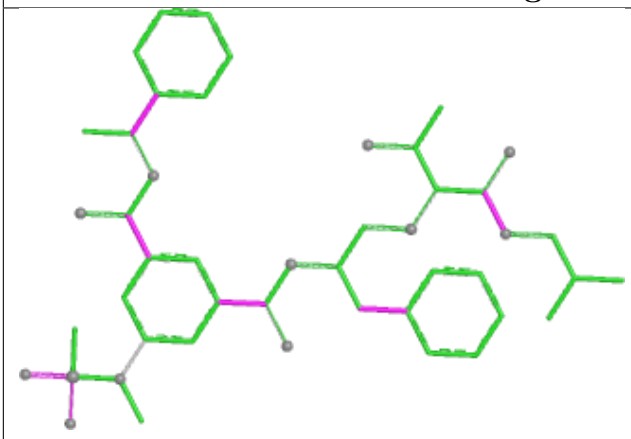
There are no ring outliers.

8 monomers are involved in 32 short contacts:

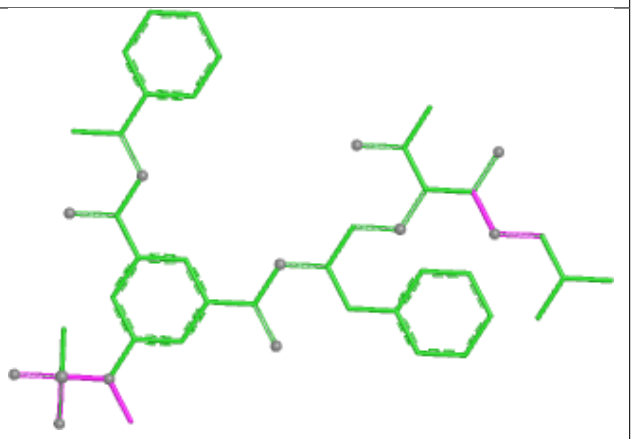
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	501	0GH	4	0
2	B	501	0GH	5	0
3	C	502	LPD	2	0
2	D	501	0GH	8	0
3	A	502	LPD	3	0
3	B	502	LPD	3	0
3	D	502	LPD	2	0
2	A	501	0GH	5	0

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 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.

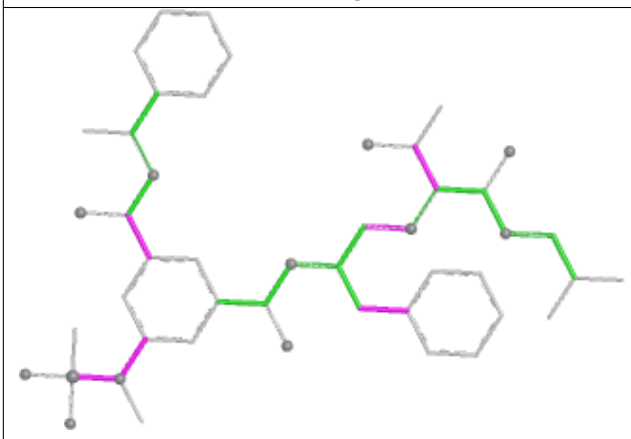
Ligand 0GH C 501



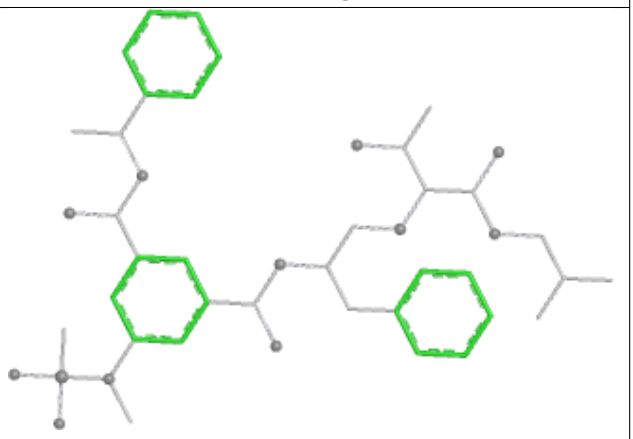
Bond lengths



Bond angles

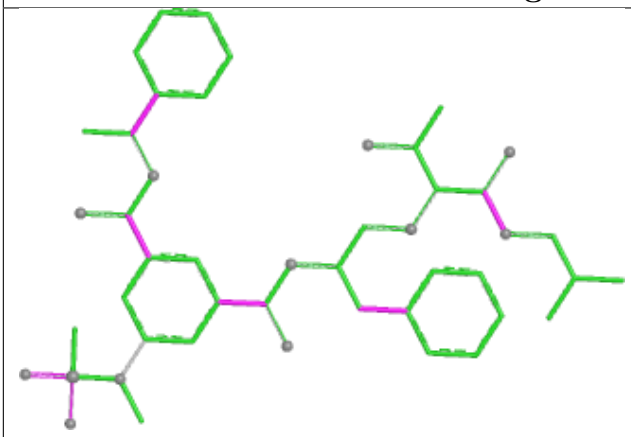


Torsions

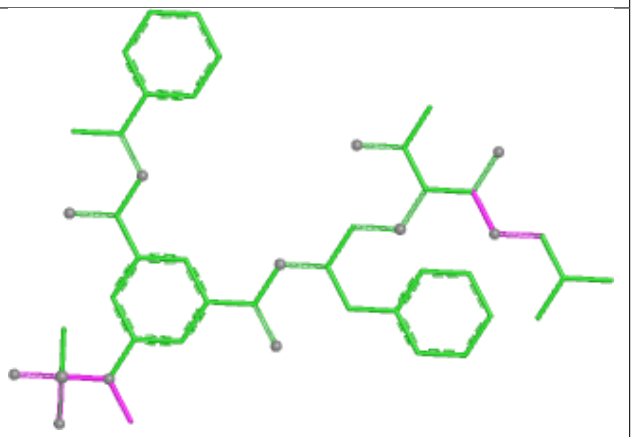


Rings

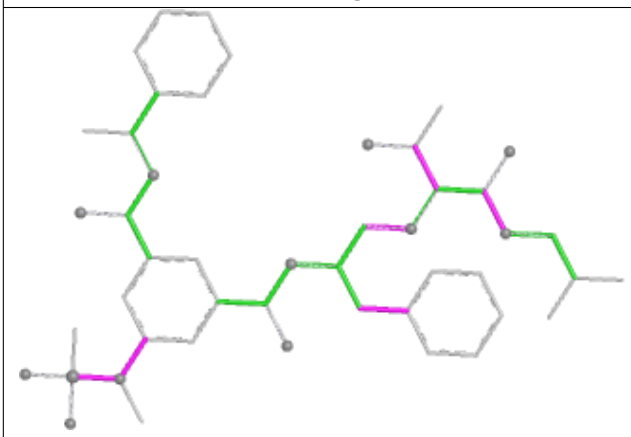
Ligand 0GH B 501



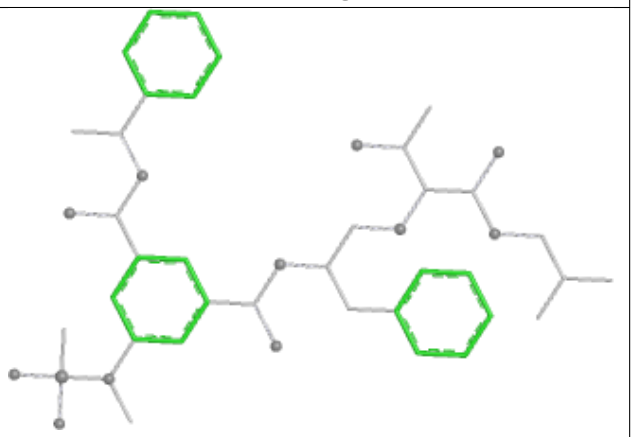
Bond lengths



Bond angles

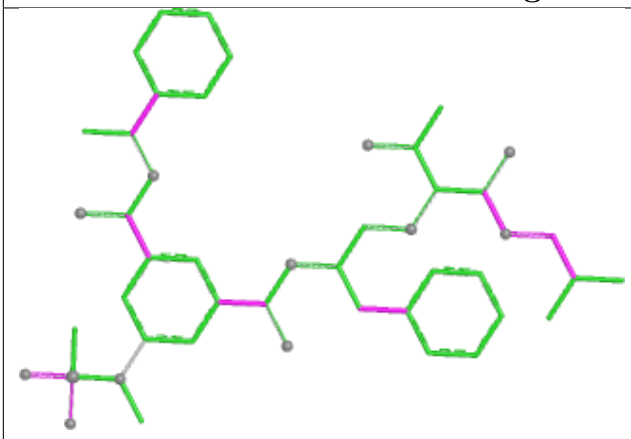


Torsions

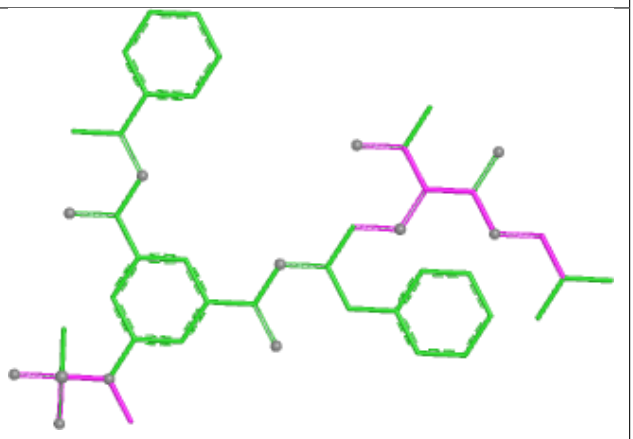


Rings

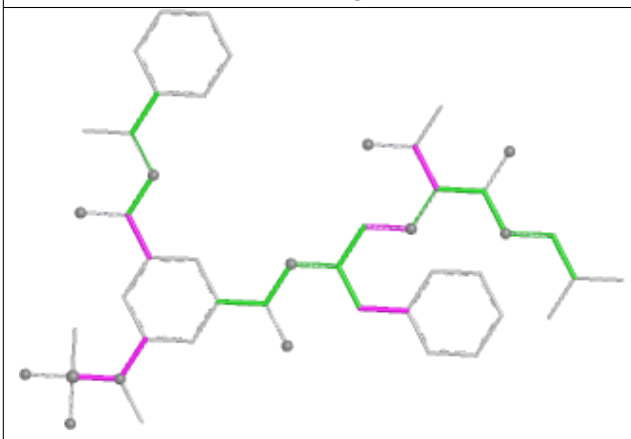
Ligand 0GH D 501



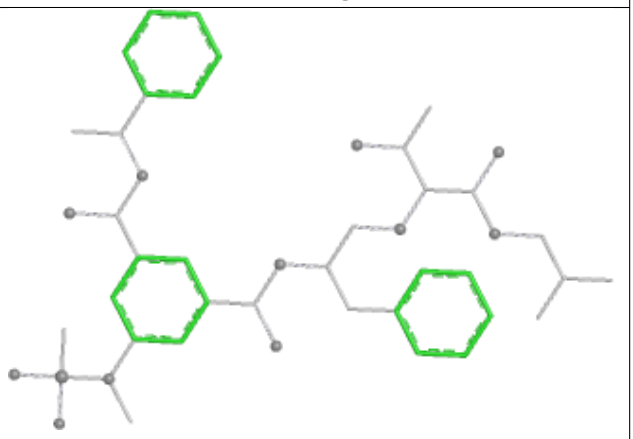
Bond lengths



Bond angles

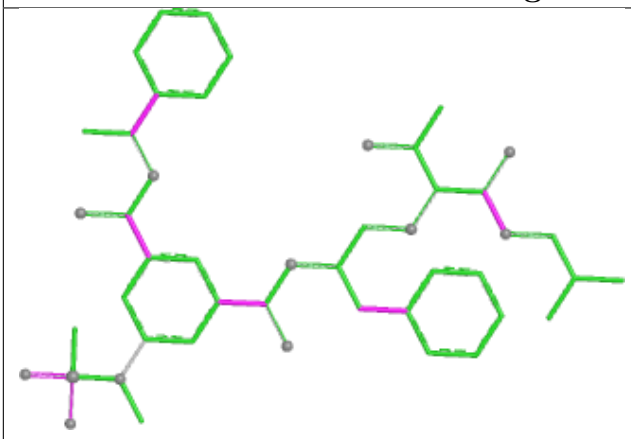


Torsions

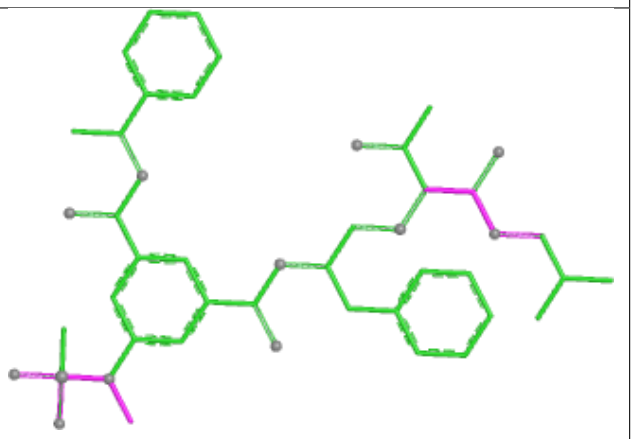


Rings

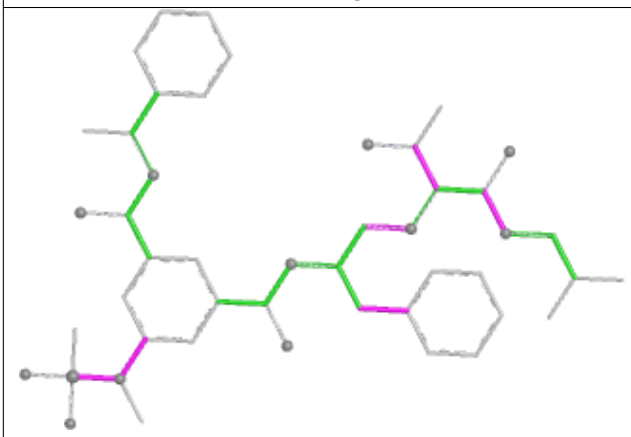
Ligand 0GH A 501



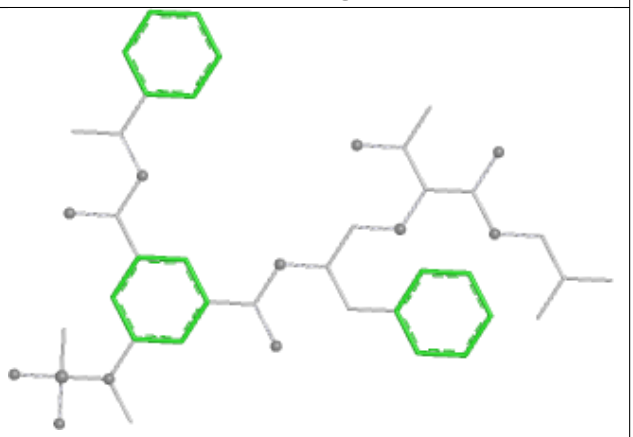
Bond lengths



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	387/388 (99%)	0.34	20 (5%)	33	31	17, 28, 43, 59	3 (0%)
1	B	387/388 (99%)	0.31	19 (4%)	35	34	18, 28, 44, 59	8 (2%)
1	C	388/388 (100%)	0.17	20 (5%)	33	31	16, 25, 40, 58	7 (1%)
1	D	387/388 (99%)	0.29	15 (3%)	43	42	18, 27, 40, 58	7 (1%)
All	All	1549/1552 (99%)	0.28	74 (4%)	35	34	16, 27, 42, 59	25 (1%)

All (74) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	362	THR	10.2
1	A	360	VAL	5.9
1	C	361	ALA	5.8
1	B	362	THR	5.5
1	C	360	VAL	5.5
1	B	360	VAL	5.1
1	A	362	THR	5.0
1	D	362	THR	4.6
1	A	425	LEU	4.4
1	B	361	ALA	4.3
1	A	359	ASP	4.3
1	C	112	ARG	4.0
1	A	364	GLN	3.9
1	D	426	ASP	3.9
1	C	425	LEU	3.9
1	D	425	LEU	3.9
1	C	363	SER	3.8
1	A	429	ASP	3.7
1	A	57	LYS	3.7
1	A	59	GLY	3.6
1	C	59	GLY	3.6

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Mol	Chain	Res	Type	RSRZ
1	B	47	PHE	3.5
1	D	193	HIS	3.5
1	A	58	SER	3.4
1	A	361	ALA	3.4
1	C	432	TYR	3.3
1	B	425	LEU	3.3
1	C	47	PHE	3.3
1	B	363	SER	3.2
1	C	46	SER	3.2
1	D	360	VAL	3.2
1	A	216	ALA	3.1
1	A	315	LEU	3.1
1	D	423	VAL	3.1
1	A	363	SER	3.0
1	D	432	TYR	3.0
1	C	427	MET	2.9
1	D	48	VAL	2.8
1	B	424	THR	2.8
1	D	340	THR	2.7
1	B	214	VAL	2.7
1	A	427	MET	2.7
1	B	429	ASP	2.7
1	D	47	PHE	2.6
1	B	359	ASP	2.6
1	A	426	ASP	2.4
1	B	58	SER	2.4
1	D	270	TYR	2.4
1	C	429	ASP	2.4
1	D	428	GLU	2.3
1	B	364	GLN	2.3
1	C	341	ASN	2.3
1	C	270	TYR	2.3
1	C	216	ALA	2.3
1	B	91	ALA	2.2
1	D	116	TYR	2.2
1	A	47	PHE	2.2
1	A	48	VAL	2.2
1	C	48	VAL	2.2
1	C	359	ASP	2.2
1	B	97	HIS	2.2
1	C	364	GLN	2.2
1	B	159	ASN	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	316	VAL	2.2
1	B	57	LYS	2.2
1	B	341	ASN	2.1
1	D	341	ASN	2.1
1	A	229	HIS	2.1
1	A	271	ASP	2.1
1	C	431	GLY	2.1
1	B	48	VAL	2.1
1	D	229	HIS	2.1
1	A	341	ASN	2.0
1	C	426	ASP	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)

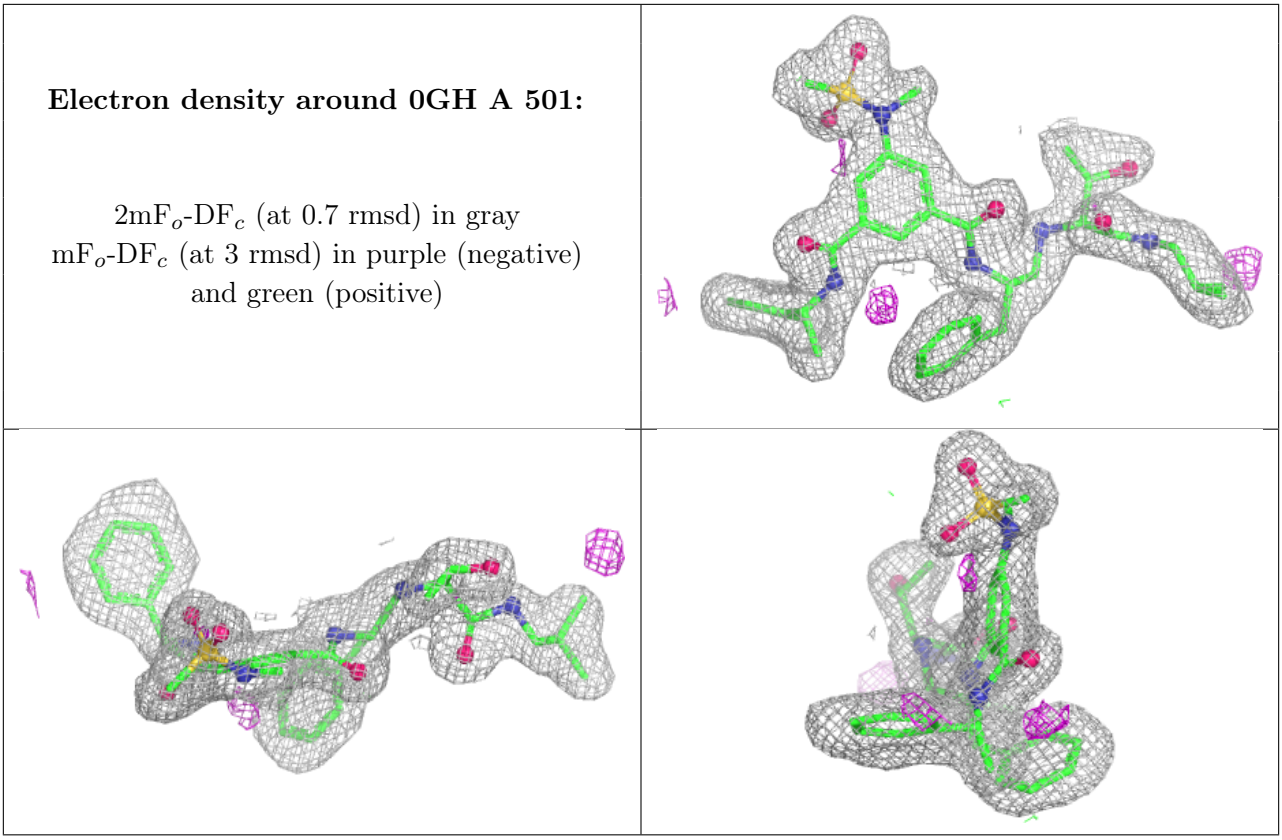
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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
3	LPD	A	502	8/8	0.65	0.25	49,49,50,50	0
3	LPD	D	502	8/8	0.66	0.21	38,38,38,39	0
3	LPD	B	502	8/8	0.73	0.19	42,42,43,43	0
3	LPD	C	502	8/8	0.76	0.18	35,36,36,36	0
2	0GH	A	501	47/47	0.94	0.09	22,26,29,31	0
2	0GH	C	501	47/47	0.94	0.09	20,23,27,28	0
2	0GH	B	501	47/47	0.95	0.08	20,25,29,30	0
2	0GH	D	501	47/47	0.95	0.08	22,25,29,30	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.

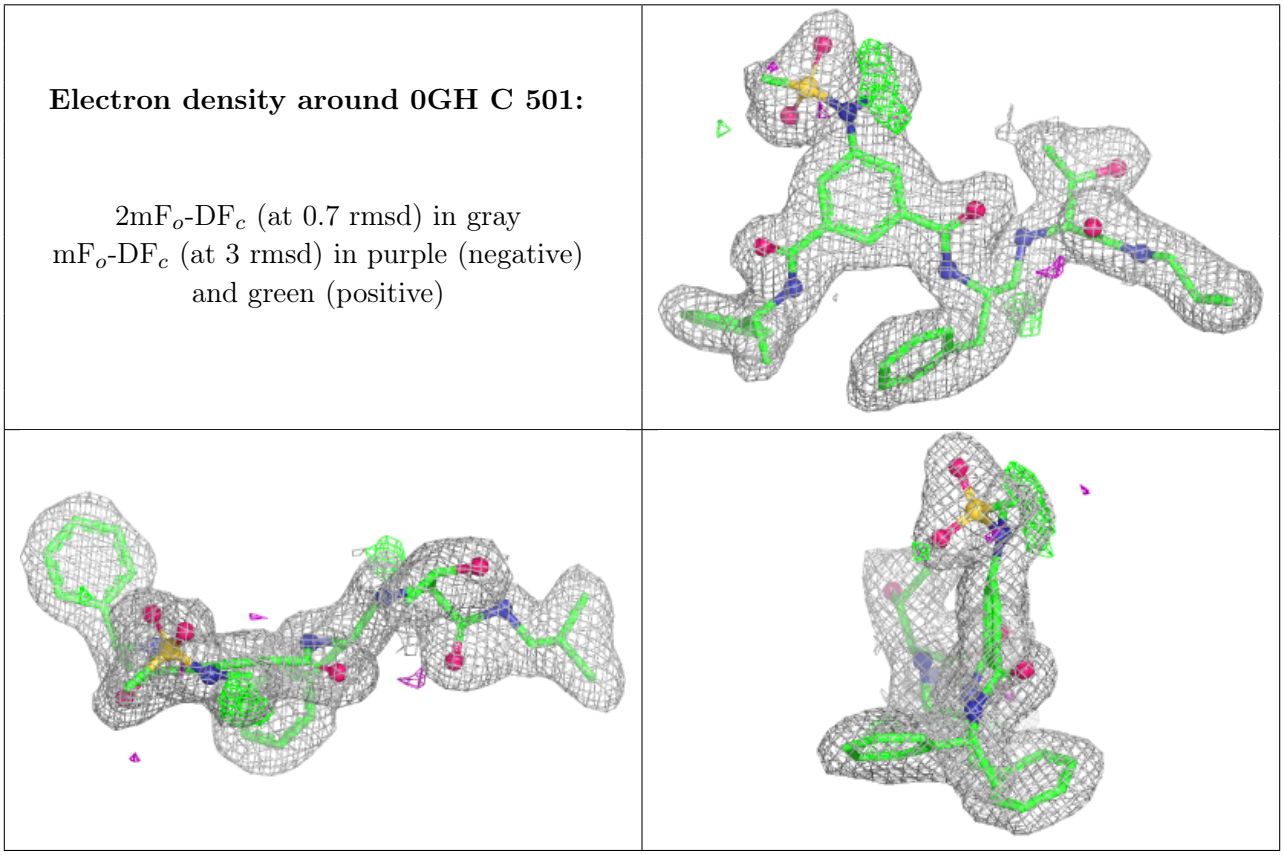
Electron density around 0GH A 501:

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



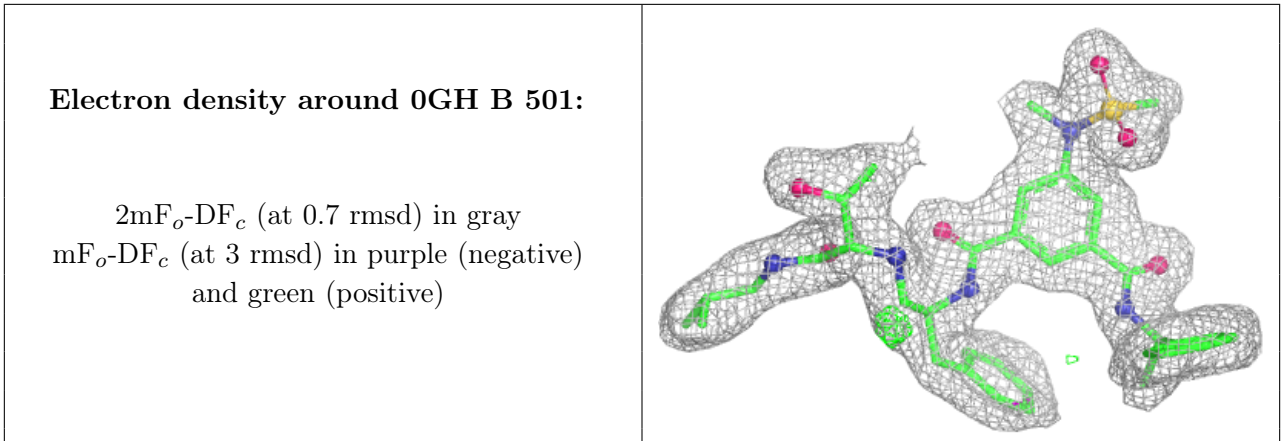
Electron density around 0GH C 501:

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



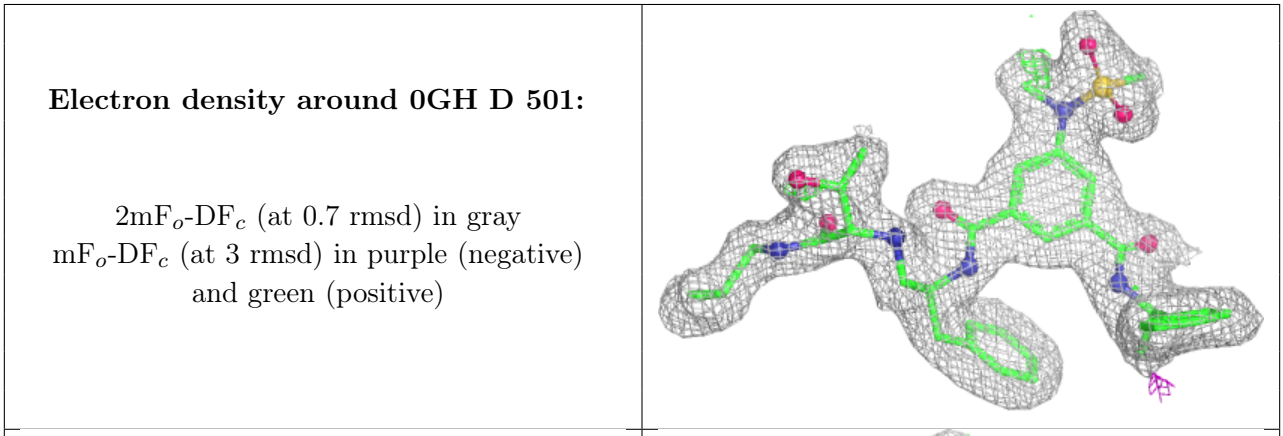
Electron density around 0GH B 501:

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



Electron density around 0GH D 501:

$2mF_o$-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.