



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 06:45 AM UTC

PDB ID : 1GNO / pdb_00001gno
Title : HIV-1 PROTEASE (WILD TYPE) COMPLEXED WITH U89360E (INHIBITOR)
Authors : Hong, L.; Treharne, A.; Hartsuck, J.A.; Foundling, S.; Tang, J.
Deposited on : 1996-05-04
Resolution : 2.30 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

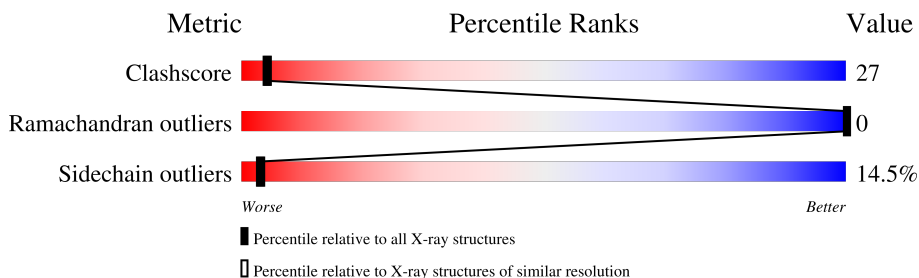
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 Å.

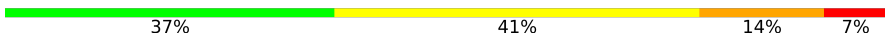
Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	99	
1	B	99	

2 Entry composition [i](#)

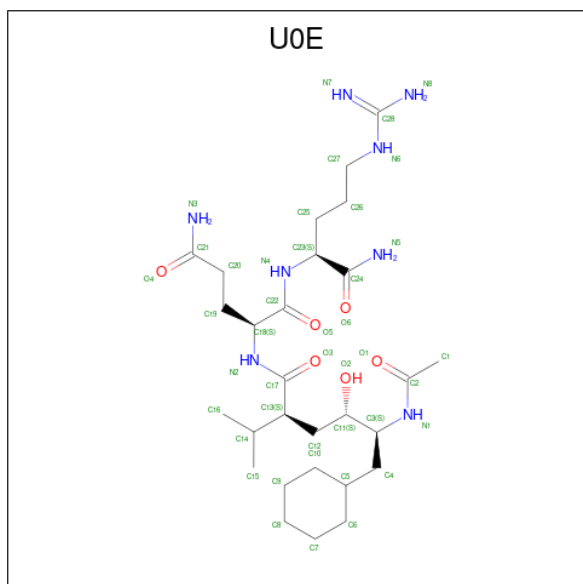
There are 3 unique types of molecules in this entry. The entry contains 1679 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 HIV-1 PROTEASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	99	Total	C	N	O	S	0	0	0
			758	489	130	135	4			
1	B	99	Total	C	N	O	S	0	1	0
			764	492	133	135	4			

- Molecule 2 is N-[[1-[N-ACETAMIDYL]-[1-CYCLOHEXYLMETHYL-2-HYDROXY-4-ISO PROPYL]-BUT-4-YL]-CARBONYL]-GLUTAMINYL-ARGINYL-AMIDE (CCD ID: U0E) (formula: C₂₈H₅₂N₈O₆).



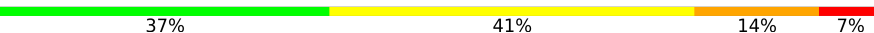
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	33	Total 33	O 33	0	0
3	B	40	Total 40	O 40	0	0

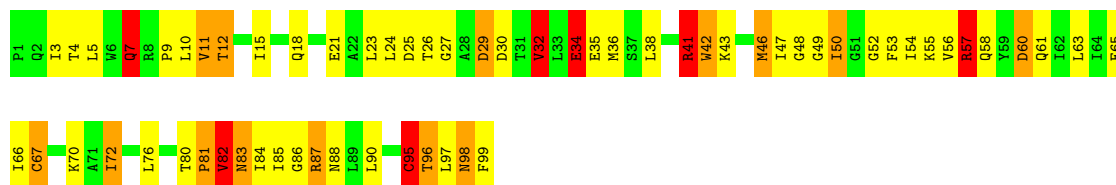
3 Residue-property plots [i](#)

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. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

Note EDS was not executed.

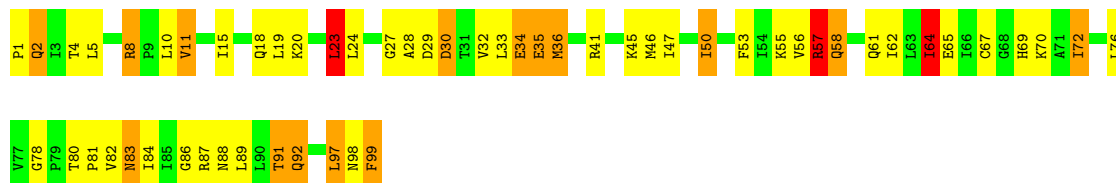
• Molecule 1: HIV-1 PROTEASE

Chain A: 



• Molecule 1: HIV-1 PROTEASE

Chain B: 



4 Data and refinement statistics

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

Property	Value	Source
Space group	P 61	Depositor
Cell constants a, b, c, α , β , γ	63.16Å 63.16Å 83.59Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	8.00 – 2.30	Depositor
% Data completeness (in resolution range)	90.7 (8.00-2.30)	Depositor
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	PROLSQ	Depositor
R, R_{free}	0.174 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	1679	wwPDB-VP
Average B, all atoms (Å ²)	21.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: U0E

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.87	0/771	2.46	52/1043 (5.0%)
1	B	0.91	0/782	2.41	38/1058 (3.6%)
All	All	0.89	0/1553	2.44	90/2101 (4.3%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
1	B	0	3
All	All	0	5

There are no bond length outliers.

All (90) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	98	ASN	CA-CB-CG	-11.37	101.23	112.60
1	B	34	GLU	CB-CG-CD	10.62	130.65	112.60
1	B	98	ASN	OD1-CG-ND2	10.54	133.14	122.60
1	A	96	THR	CA-C-O	9.67	132.80	121.58
1	B	57	ARG	NE-CZ-NH2	9.33	127.60	119.20
1	A	34	GLU	CB-CG-CD	8.72	127.42	112.60
1	A	50	ILE	CA-C-O	-8.56	111.55	121.05
1	B	11	VAL	N-CA-CB	-8.51	98.14	112.44
1	B	64	ILE	CA-C-O	-8.33	111.64	120.39
1	A	57	ARG	NE-CZ-NH1	8.32	129.82	121.50
1	A	46	MET	CA-C-O	8.14	130.30	120.28
1	A	3	ILE	CA-C-O	8.12	129.22	120.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	10	LEU	CA-C-N	-7.88	111.49	122.69
1	A	10	LEU	C-N-CA	-7.88	111.49	122.69
1	B	86	GLY	CA-C-O	-7.86	112.09	122.23
1	A	52	GLY	N-CA-C	7.61	120.12	110.38
1	B	64	ILE	CB-CA-C	-7.59	99.40	110.63
1	A	98	ASN	OD1-CG-ND2	-7.54	115.06	122.60
1	B	99	PHE	CA-CB-CG	7.50	121.30	113.80
1	B	72	ILE	CB-CA-C	-7.46	99.02	110.50
1	B	35	GLU	CA-C-O	7.40	128.35	120.95
1	B	11	VAL	CB-CA-C	7.36	121.74	110.55
1	A	65	GLU	CB-CG-CD	-7.34	100.12	112.60
1	A	67	CYS	O-C-N	-7.18	113.97	122.58
1	A	12	THR	CB-CA-C	7.12	121.47	109.80
1	A	97	LEU	CB-CA-C	7.08	121.91	110.16
1	A	4	THR	CA-C-O	7.01	130.08	121.81
1	B	2	GLN	CB-CG-CD	-6.99	100.71	112.60
1	A	90	LEU	O-C-N	-6.97	114.06	122.22
1	A	85	ILE	CA-C-O	-6.97	112.66	120.74
1	A	50	ILE	N-CA-C	6.65	116.78	110.53
1	A	72	ILE	CB-CG1-CD1	6.64	127.75	113.80
1	A	38	LEU	CA-C-O	6.59	126.42	119.69
1	B	23	LEU	O-C-N	-6.59	115.33	123.04
1	A	41	ARG	NE-CZ-NH2	6.57	125.11	119.20
1	A	7	GLN	OE1-CD-NE2	6.51	129.11	122.60
1	A	57	ARG	NH1-CZ-NH2	-6.50	110.84	119.30
1	A	96	THR	O-C-N	-6.39	114.19	122.94
1	A	4	THR	N-CA-CB	6.36	120.12	110.45
1	A	53	PHE	CA-CB-CG	6.36	120.16	113.80
1	A	57	ARG	CB-CA-C	-6.24	99.80	110.16
1	B	53	PHE	CA-CB-CG	6.17	119.97	113.80
1	A	88	ASN	CA-C-O	-6.12	113.19	120.10
1	B	57	ARG	NE-CZ-NH1	-6.06	115.44	121.50
1	B	29	ASP	CB-CA-C	-6.02	99.11	110.67
1	A	86	GLY	O-C-N	6.00	128.58	122.88
1	A	29	ASP	CA-CB-CG	5.95	118.55	112.60
1	B	36	MET	N-CA-C	5.91	117.50	108.52
1	A	95	CYS	CB-CA-C	5.87	119.34	109.48
1	B	18	GLN	O-C-N	5.86	130.85	123.23
1	B	83	ASN	CA-CB-CG	5.86	118.46	112.60
1	A	36	MET	O-C-N	5.85	129.76	122.92
1	A	4	THR	CA-CB-OG1	5.84	118.36	109.60
1	B	50	ILE	N-CA-CB	-5.82	102.62	110.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	30	ASP	CB-CA-C	-5.76	99.58	111.22
1	A	18	GLN	OE1-CD-NE2	5.71	128.31	122.60
1	B	20	LYS	CA-C-N	-5.71	114.38	122.94
1	B	20	LYS	C-N-CA	-5.71	114.38	122.94
1	A	18	GLN	CA-C-O	-5.69	114.55	120.70
1	A	42	TRP	CB-CA-C	-5.65	97.58	109.38
1	A	12	THR	N-CA-CB	-5.63	100.87	110.16
1	A	84	ILE	N-CA-CB	-5.61	103.67	111.41
1	A	87	ARG	NE-CZ-NH1	5.53	127.03	121.50
1	B	50	ILE	O-C-N	-5.53	116.51	121.87
1	B	83	ASN	N-CA-C	-5.52	100.99	109.76
1	A	83	ASN	CB-CG-ND2	5.51	124.67	116.40
1	A	60	ASP	CA-C-N	5.45	129.88	122.19
1	A	60	ASP	C-N-CA	5.45	129.88	122.19
1	A	87	ARG	CA-C-O	-5.43	112.70	119.38
1	B	92	GLN	OE1-CD-NE2	5.41	128.01	122.60
1	A	41	ARG	NH1-CZ-NH2	-5.41	112.27	119.30
1	B	10	LEU	CA-C-N	-5.40	114.15	122.68
1	B	10	LEU	C-N-CA	-5.40	114.15	122.68
1	B	32	VAL	CA-C-N	-5.37	114.38	122.81
1	B	32	VAL	C-N-CA	-5.37	114.38	122.81
1	B	58	GLN	CG-CD-OE1	-5.37	110.07	120.80
1	A	70	LYS	CB-CG-CD	5.31	123.50	111.30
1	B	97	LEU	CB-CA-C	-5.30	100.44	109.51
1	A	43	LYS	CA-CB-CG	5.29	124.68	114.10
1	A	58	GLN	CA-CB-CG	-5.25	103.60	114.10
1	B	97	LEU	N-CA-C	-5.22	102.02	110.32
1	B	45	LYS	CA-C-O	-5.15	115.08	121.06
1	B	84	ILE	CB-CG1-CD1	-5.14	103.00	113.80
1	A	81	PRO	CA-C-N	5.13	129.62	122.23
1	A	81	PRO	C-N-CA	5.13	129.62	122.23
1	B	91	THR	OG1-CB-CG2	-5.13	99.04	109.30
1	A	82	VAL	CB-CA-C	-5.06	102.06	111.18
1	B	62	ILE	O-C-N	-5.02	117.22	122.95
1	A	25	ASP	N-CA-C	5.02	116.95	108.02
1	A	32	VAL	CB-CA-C	5.00	116.92	110.12

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	41	ARG	Sidechain

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Mol	Chain	Res	Type	Group
1	A	57	ARG	Sidechain
1	B	57	ARG	Sidechain
1	B	8[A]	ARG	Sidechain
1	B	8[B]	ARG	Sidechain

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	758	0	806	54	0
1	B	764	0	815	60	0
2	B	84	0	57	21	0
3	A	33	0	0	2	0
3	B	40	0	0	0	0
All	All	1679	0	1678	88	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 27.

All (88) 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:A:49:GLY:HA3	1:B:50:ILE:HG22	1.21	1.18
1:A:49:GLY:HA3	1:B:50:ILE:CG2	1.86	1.05
1:A:98:ASN:ND2	1:B:2:GLN:HG3	1.72	1.04
1:A:99:PHE:O	1:B:1:PRO:HD2	1.64	0.96
1:B:81:PRO:HG2	2:B:100:U0E:H72	1.60	0.81
1:A:98:ASN:HD21	1:B:2:GLN:HG3	1.45	0.80
1:A:49:GLY:CA	1:B:50:ILE:HG22	2.11	0.77
1:B:33:LEU:HD12	1:B:36:MET:HE2	1.69	0.74
1:A:60:ASP:HB3	1:A:61:GLN:HE21	1.52	0.73
1:A:47:ILE:HB	2:B:101:U0E:HN31	1.51	0.72
1:B:81:PRO:HG2	2:B:100:U0E:C7	2.19	0.72
1:B:47:ILE:HD12	2:B:100:U0E:HN31	1.57	0.70
1:A:99:PHE:C	1:B:1:PRO:HD2	2.17	0.68
1:B:30:ASP:HB2	2:B:100:U0E:O4	1.93	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:15:ILE:HD12	1:B:64:ILE:HD13	1.77	0.67
1:B:47:ILE:HD12	2:B:100:U0E:N3	2.10	0.66
1:A:95:CYS:HB2	1:B:99:PHE:HB3	1.76	0.66
1:A:7:GLN:H	1:A:7:GLN:HE21	1.43	0.65
1:A:98:ASN:HD22	1:B:2:GLN:HG3	1.63	0.62
1:B:30:ASP:CB	2:B:100:U0E:O4	2.48	0.62
1:A:57:ARG:HH11	1:A:57:ARG:HG3	1.65	0.61
1:B:34:GLU:HG2	1:B:83:ASN:OD1	2.00	0.60
1:A:47:ILE:HD11	1:A:54:ILE:HD11	1.84	0.60
1:A:98:ASN:HD22	1:B:2:GLN:HA	1.64	0.60
1:A:49:GLY:CA	1:B:50:ILE:CG2	2.72	0.60
1:A:32:VAL:HA	1:A:76:LEU:O	2.02	0.59
1:A:7:GLN:H	1:A:7:GLN:NE2	2.01	0.59
1:B:58:GLN:HG3	1:B:76:LEU:CD2	2.32	0.59
1:A:42:TRP:CE3	1:A:57:ARG:HB3	2.39	0.58
1:B:46:MET:CE	1:B:55:LYS:HD3	2.32	0.58
1:A:26:THR:HG22	1:B:5:LEU:CD1	2.33	0.58
1:A:30:ASP:HB3	3:A:107:HOH:O	2.04	0.57
1:A:80:THR:HB	1:B:50:ILE:HD11	1.86	0.56
1:B:47:ILE:HB	2:B:100:U0E:O6	2.05	0.56
1:B:61:GLN:HA	1:B:72:ILE:HG22	1.88	0.56
1:A:29:ASP:OD2	1:B:8[A]:ARG:NH2	2.38	0.56
1:B:28:ALA:HB1	2:B:100:U0E:H202	1.86	0.56
1:A:82:VAL:HG21	2:B:101:U0E:H92	1.88	0.55
1:B:58:GLN:HG3	1:B:76:LEU:HD21	1.87	0.55
1:A:96:THR:HG22	1:B:4:THR:HG22	1.89	0.54
1:A:80:THR:CB	1:B:50:ILE:HD11	2.38	0.54
1:B:46:MET:HG2	1:B:55:LYS:CD	2.37	0.54
1:A:49:GLY:HA3	1:B:50:ILE:HG21	1.86	0.53
1:B:46:MET:HG2	1:B:55:LYS:HD2	1.90	0.53
1:A:47:ILE:CB	2:B:101:U0E:HN31	2.21	0.52
1:B:81:PRO:CG	2:B:100:U0E:C7	2.88	0.52
1:A:5:LEU:HB2	1:B:91:THR:HG22	1.92	0.52
1:B:65:GLU:HG2	1:B:70:LYS:HG2	1.91	0.52
1:A:26:THR:HG22	1:B:5:LEU:HD13	1.91	0.51
1:B:15:ILE:HG12	1:B:36:MET:HE1	1.91	0.51
1:A:66:ILE:O	1:A:67:CYS:HB2	2.10	0.50
1:B:65:GLU:HA	1:B:69:HIS:O	2.11	0.50
1:A:7:GLN:HE21	1:A:7:GLN:N	2.07	0.50
1:B:27:GLY:O	2:B:100:U0E:H162	2.11	0.49
1:B:87:ARG:O	1:B:91:THR:HG23	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:47:ILE:HG13	1:A:54:ILE:HG13	1.94	0.49
1:A:47:ILE:CG2	2:B:101:U0E:N3	2.76	0.48
1:A:56:VAL:HG21	1:A:76:LEU:HD13	1.95	0.48
1:B:30:ASP:CG	2:B:100:U0E:O4	2.56	0.48
1:A:87:ARG:NH2	1:B:8[A]:ARG:HG3	2.28	0.48
1:B:57:ARG:HH11	1:B:57:ARG:HD3	1.52	0.48
1:A:9:PRO:HD2	1:A:23:LEU:HD11	1.97	0.47
1:A:99:PHE:HE1	1:B:69:HIS:CE1	2.33	0.46
1:B:72:ILE:H	1:B:92:GLN:HE22	1.63	0.46
1:A:81:PRO:HD2	1:B:50:ILE:HD12	1.97	0.46
1:A:87:ARG:NE	3:A:105:HOH:O	2.42	0.46
1:A:96:THR:CG2	1:B:4:THR:HG22	2.47	0.44
1:A:87:ARG:HH21	1:B:8[A]:ARG:HG3	1.82	0.44
1:B:46:MET:HE2	1:B:55:LYS:HD3	2.00	0.44
1:B:81:PRO:CG	2:B:100:U0E:H71	2.48	0.44
1:A:26:THR:HG22	1:B:5:LEU:HD11	1.99	0.43
1:A:47:ILE:CG2	2:B:101:U0E:HN31	2.32	0.43
1:A:48:GLY:O	2:B:101:U0E:H262	2.18	0.43
1:A:82:VAL:CG2	2:B:101:U0E:H92	2.48	0.43
1:A:27:GLY:HA2	1:B:23:LEU:HD11	2.00	0.42
1:B:35:GLU:OE2	1:B:57:ARG:NH1	2.52	0.42
1:B:56:VAL:HG12	1:B:78:GLY:HA3	2.02	0.42
1:B:46:MET:HE3	1:B:55:LYS:HD3	2.00	0.42
1:A:11:VAL:O	1:A:21:GLU:HA	2.19	0.42
1:B:27:GLY:O	2:B:100:U0E:C16	2.68	0.42
1:A:34:GLU:O	1:A:35:GLU:C	2.63	0.41
1:A:46:MET:HA	1:A:54:ILE:O	2.20	0.41
1:A:42:TRP:CD2	1:A:57:ARG:HB3	2.55	0.41
1:B:88:ASN:ND2	1:B:89:LEU:HD23	2.35	0.41
1:A:49:GLY:HA2	2:B:101:U0E:O3	2.20	0.41
1:A:47:ILE:CG1	1:A:54:ILE:HG13	2.51	0.41
1:A:34:GLU:HG3	1:A:83:ASN:OD1	2.20	0.41
1:B:80:THR:OG1	1:B:81:PRO:HD2	2.21	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	97/99 (98%)	96 (99%)	1 (1%)	0	100	100
1	B	98/99 (99%)	95 (97%)	3 (3%)	0	100	100
All	All	195/198 (98%)	191 (98%)	4 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	83/83 (100%)	68 (82%)	15 (18%)	2	2
1	B	84/83 (101%)	75 (89%)	9 (11%)	6	8
All	All	167/166 (101%)	143 (86%)	24 (14%)	3	3

All (24) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	7	GLN
1	A	11	VAL
1	A	12	THR
1	A	15	ILE
1	A	24	LEU
1	A	32	VAL
1	A	34	GLU
1	A	41	ARG

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Mol	Chain	Res	Type
1	A	50	ILE
1	A	55	LYS
1	A	57	ARG
1	A	63	LEU
1	A	72	ILE
1	A	82	VAL
1	A	95	CYS
1	B	11	VAL
1	B	19	LEU
1	B	23	LEU
1	B	24	LEU
1	B	41	ARG
1	B	64	ILE
1	B	67	CYS
1	B	82	VAL
1	B	97	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	7	GLN
1	A	18	GLN
1	A	58	GLN
1	A	61	GLN
1	A	88	ASN
1	A	98	ASN
1	B	92	GLN
1	B	98	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

2 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
2	U0E	B	101	2	42,42,42	0.70	0	49,55,55	2.21	10 (20%)
2	U0E	B	100	2	42,42,42	0.55	0	49,55,55	1.46	5 (10%)

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	U0E	B	101	2	-	3/52/60/60	0/1/1/1
2	U0E	B	100	2	-	19/52/60/60	0/1/1/1

There are no bond length outliers.

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	101	U0E	C4-C3-C11	-9.28	98.53	112.55
2	B	100	U0E	C4-C3-C11	-7.44	101.31	112.55
2	B	101	U0E	C13-C17-N2	-5.34	109.55	116.01
2	B	101	U0E	C4-C3-N1	4.52	115.99	110.20
2	B	101	U0E	O1-C2-N1	4.36	129.69	121.98
2	B	101	U0E	O3-C17-N2	4.00	130.12	122.96
2	B	101	U0E	C1-C2-N1	-2.92	111.28	116.12
2	B	100	U0E	O6-C24-N5	-2.80	118.09	123.04
2	B	101	U0E	C3-N1-C2	2.71	126.54	122.90
2	B	101	U0E	O6-C24-N5	-2.54	118.56	123.04
2	B	100	U0E	C23-C24-N5	2.45	120.94	116.76
2	B	100	U0E	C4-C3-N1	2.20	113.02	110.20
2	B	101	U0E	C23-C24-N5	2.20	120.51	116.76
2	B	101	U0E	C22-C18-N2	-2.10	105.43	111.11

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	100	UOE	N8-C28-N6	2.07	123.98	119.27

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	100	UOE	C12-C11-C3-C4
2	B	100	UOE	O2-C11-C3-C4
2	B	100	UOE	O2-C11-C3-N1
2	B	100	UOE	C12-C13-C14-C15
2	B	100	UOE	C12-C13-C14-C16
2	B	100	UOE	C17-C13-C14-C15
2	B	101	UOE	C3-C4-C5-C6
2	B	101	UOE	C25-C26-C27-N6
2	B	100	UOE	C25-C26-C27-N6
2	B	101	UOE	C3-C4-C5-C10
2	B	100	UOE	C22-C18-C19-C20
2	B	100	UOE	C18-C19-C20-C21
2	B	100	UOE	C17-C13-C14-C16
2	B	100	UOE	N2-C18-C19-C20
2	B	100	UOE	N7-C28-N6-C27
2	B	100	UOE	O2-C11-C12-C13
2	B	100	UOE	C3-C4-C5-C6
2	B	100	UOE	C19-C20-C21-N3
2	B	100	UOE	C12-C11-C3-N1
2	B	100	UOE	C12-C13-C17-O3
2	B	100	UOE	N8-C28-N6-C27
2	B	100	UOE	C19-C20-C21-O4

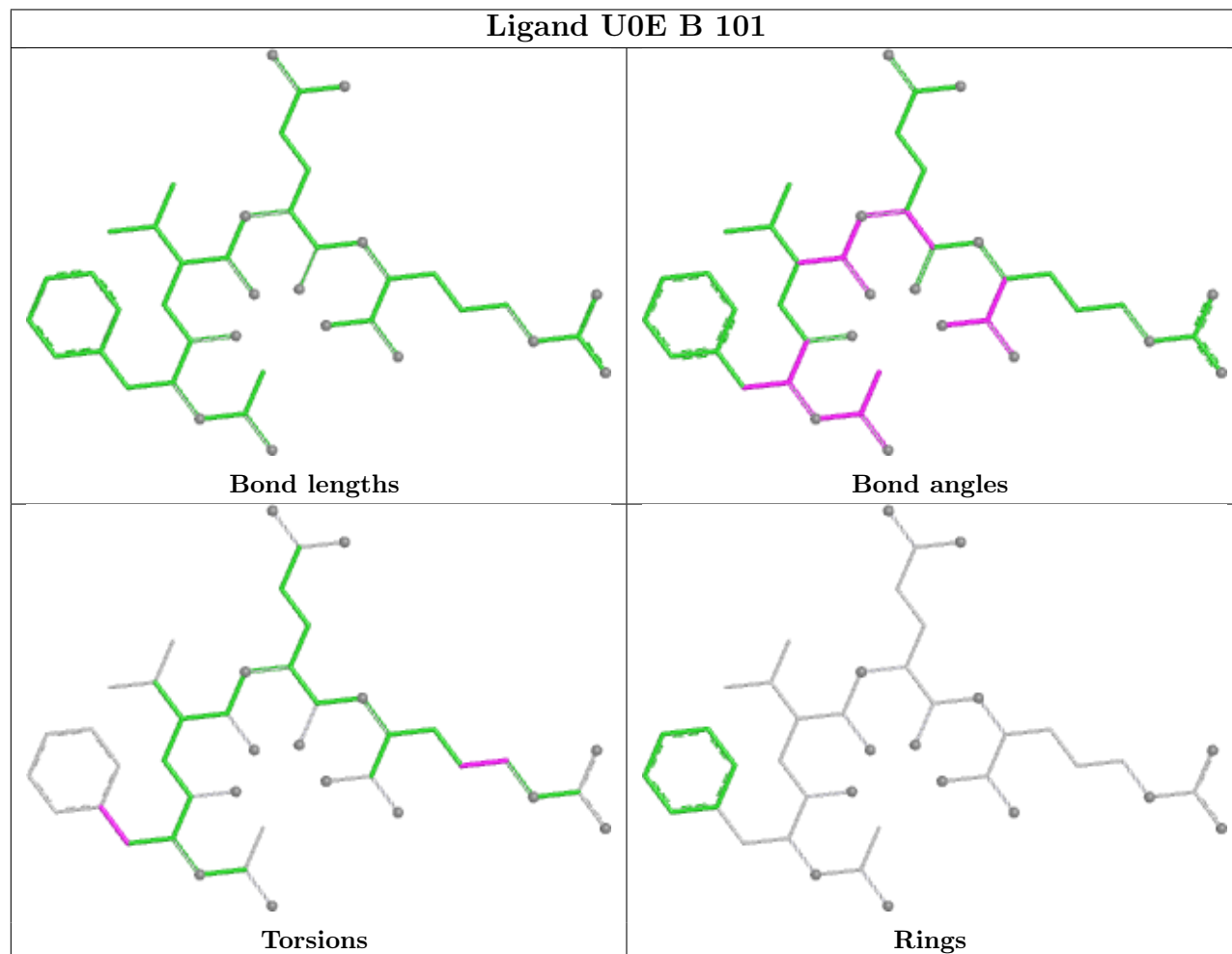
There are no ring outliers.

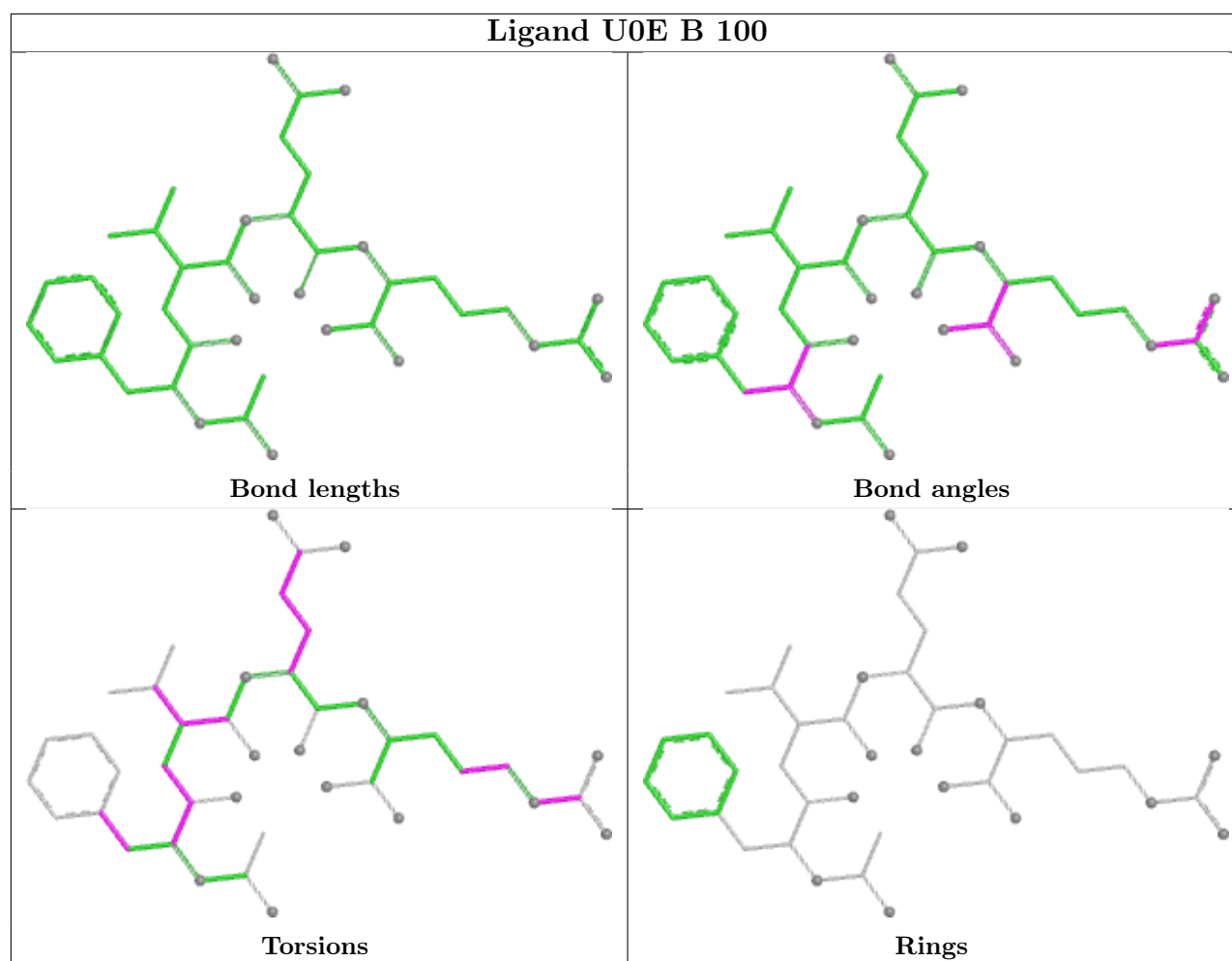
2 monomers are involved in 21 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	101	UOE	8	0
2	B	100	UOE	13	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

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.