



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 01:16 PM UTC

PDB ID : 3DUF / pdb_00003duf
Title : Snapshots of catalysis in the E1 subunit of the pyruvate dehydrogenase multi-enzyme complex
Authors : Pei, X.Y.; Titman, C.M.; Frank, R.A.W.; Leeper, F.J.; Luisi, B.F.
Deposited on : 2008-07-17
Resolution : 2.50 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

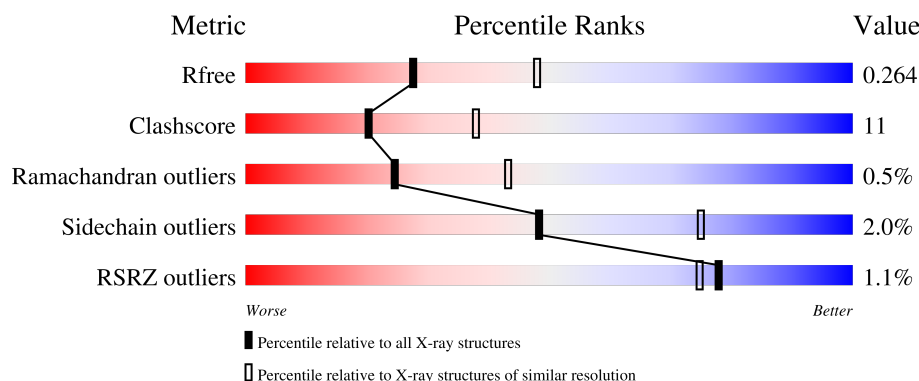
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (2.50-2.50)

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	369	 80% 18% ..
1	C	369	 78% 19% ..
1	E	369	 73% 23% ..
1	G	369	 72% 24% ..
2	B	325	 79% 19% .

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Mol	Chain	Length	Quality of chain
2	D	325	81%18%.
2	F	325	% 72%27%. .
2	H	325	% 76%22%. .
3	I	428	2%5% . . 91%
3	J	428	2% . . . 92%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 22480 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 Pyruvate dehydrogenase E1 component subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	365	Total	C	N	O	S	0	0	0
			2866	1832	488	538	8			
1	C	365	Total	C	N	O	S	0	0	0
			2845	1818	485	534	8			
1	E	365	Total	C	N	O	S	0	0	0
			2868	1832	488	540	8			
1	G	365	Total	C	N	O	S	0	0	0
			2881	1843	489	541	8			

- Molecule 2 is a protein called Pyruvate dehydrogenase E1 component subunit beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	324	Total	C	N	O	S	0	0	0
			2488	1586	424	470	8			
2	D	324	Total	C	N	O	S	0	0	0
			2488	1586	424	470	8			
2	F	324	Total	C	N	O	S	0	0	0
			2486	1583	424	471	8			
2	H	324	Total	C	N	O	S	0	0	0
			2488	1586	424	470	8			

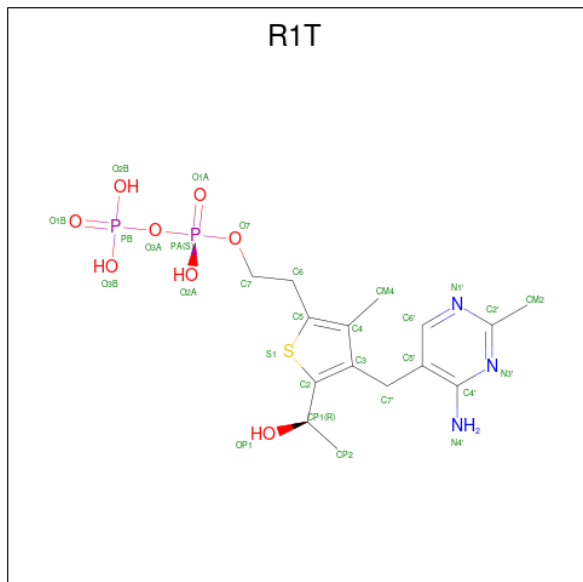
- Molecule 3 is a protein called Dihydrolipoyllysine-residue acetyltransferase component of pyruvate dehydrogenase complex.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	I	38	Total	C	N	O	S	0	0	0
			277	168	59	49	1			
3	J	36	Total	C	N	O	S	0	0	0
			263	160	51	51	1			

- Molecule 4 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

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

- Molecule 5 is 2-{4-[(4-AMINO-2-METHYLPYRIMIDIN-5-YL)METHYL]-5-[(1R)-1-HYDROXYETHYL]-3-METHYL-2-THIENYL}ETHYL TRIHYDROGEN DIPHOSPHATE (CCD ID: R1T) (formula: C₁₅H₂₃N₃O₈P₂S).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
5	A	1	Total 29	C 15	N 3	O 8	P 2	S 1	0	0
5	C	1	Total 29	C 15	N 3	O 8	P 2	S 1	0	0
5	E	1	Total 29	C 15	N 3	O 8	P 2	S 1	0	0
5	G	1	Total 29	C 15	N 3	O 8	P 2	S 1	0	0

- Molecule 6 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	B	1	Total K 1 1	0	0
6	D	1	Total K 1 1	0	0

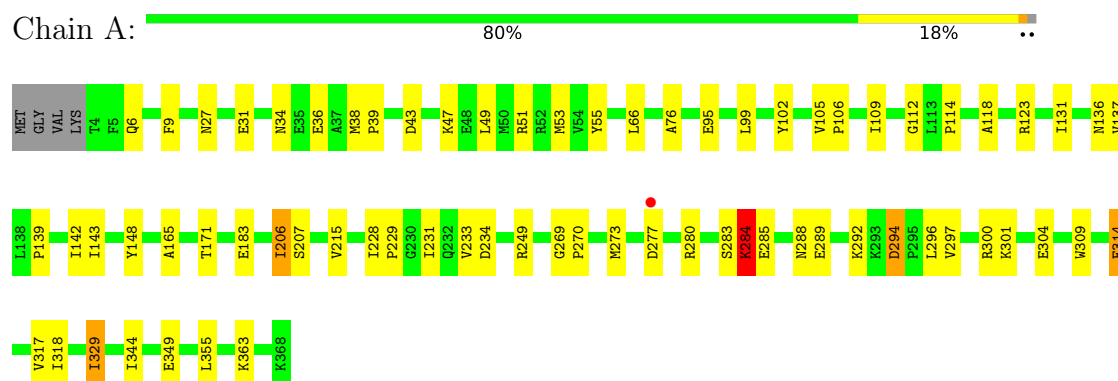
- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	51	Total O 51 51	0	0
7	B	43	Total O 43 43	0	0
7	C	56	Total O 56 56	0	0
7	D	48	Total O 48 48	0	0
7	I	5	Total O 5 5	0	0
7	E	54	Total O 54 54	0	0
7	F	40	Total O 40 40	0	0
7	G	47	Total O 47 47	0	0
7	H	55	Total O 55 55	0	0
7	J	8	Total O 8 8	0	0

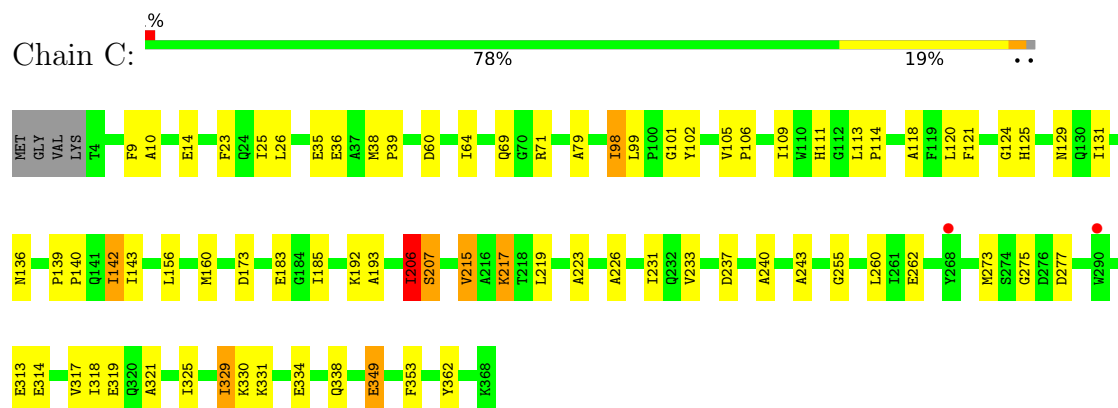
3 Residue-property plots

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.

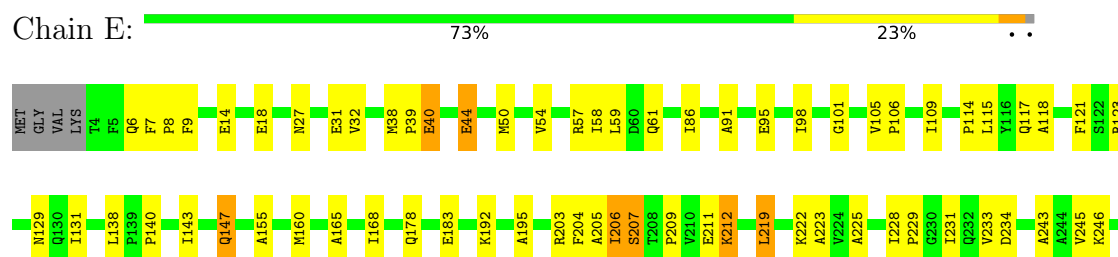
- Molecule 1: Pyruvate dehydrogenase E1 component subunit alpha



- Molecule 1: Pyruvate dehydrogenase E1 component subunit alpha

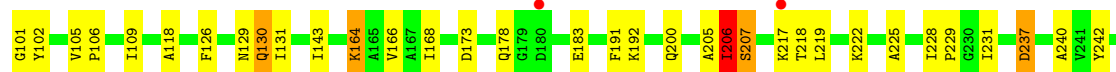
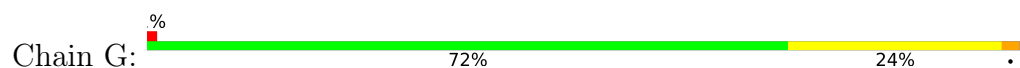


- Molecule 1: Pyruvate dehydrogenase E1 component subunit alpha

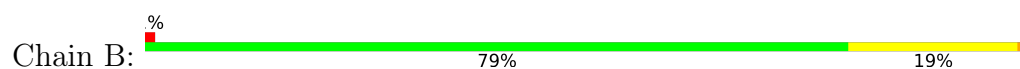




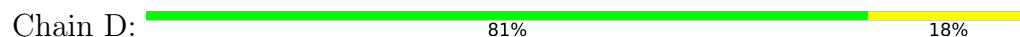
- Molecule 1: Pyruvate dehydrogenase E1 component subunit alpha



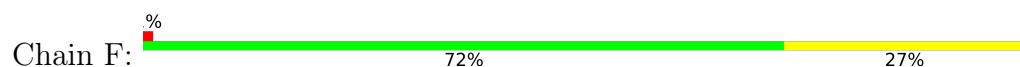
- Molecule 2: Pyruvate dehydrogenase E1 component subunit beta

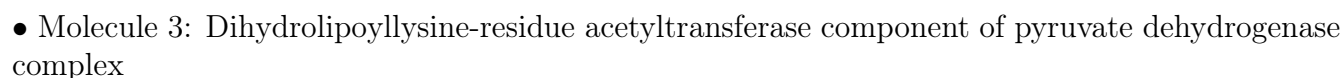
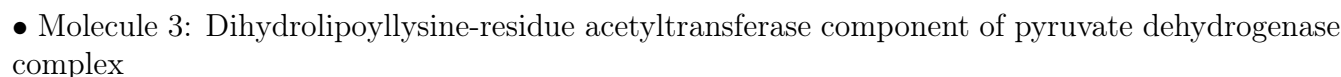


- Molecule 2: Pyruvate dehydrogenase E1 component subunit beta



- Molecule 2: Pyruvate dehydrogenase E1 component subunit beta





[illegible]

4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	69.25Å 232.00Å 92.61Å 90.00° 90.74° 90.00°	Depositor
Resolution (Å)	59.44 – 2.50 59.44 – 2.50	Depositor EDS
% Data completeness (in resolution range)	98.9 (59.44-2.50) 98.8 (59.44-2.50)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	0.11	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.25 (at 2.51Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.188 , 0.263 0.189 , 0.264	Depositor DCC
R_{free} test set	5027 reflections (1.08%)	wwPDB-VP
Wilson B-factor (Å ²)	43.0	Xtriage
Anisotropy	0.402	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 40.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.40$, $\langle L^2 \rangle = 0.23$	Xtriage
Estimated twinning fraction	0.074 for h,-k,-l	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	22480	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.68% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: R1T, MG, K

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	0.46	0/2929	0.94	12/3961 (0.3%)
1	C	0.45	0/2908	0.94	10/3937 (0.3%)
1	E	0.42	0/2930	0.90	7/3963 (0.2%)
1	G	0.42	0/2944	0.98	18/3980 (0.5%)
2	B	0.47	0/2534	0.99	16/3437 (0.5%)
2	D	0.50	0/2534	1.00	12/3437 (0.3%)
2	F	0.43	0/2532	0.94	9/3433 (0.3%)
2	H	0.45	0/2534	0.95	5/3437 (0.1%)
3	I	0.40	0/278	1.13	3/369 (0.8%)
3	J	0.35	0/264	1.36	7/351 (2.0%)
All	All	0.45	0/22387	0.96	99/30305 (0.3%)

There are no bond length outliers.

All (99) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	207	SER	N-CA-C	12.50	128.01	113.02
2	D	123	HIS	N-CA-C	9.69	124.82	111.74
2	F	123	HIS	N-CA-C	8.37	122.94	111.39
3	J	155	ASN	N-CA-C	8.28	122.51	110.42
3	J	152	THR	N-CA-C	-7.96	103.30	113.16
2	B	123	HIS	N-CA-C	7.83	121.85	111.28
2	H	75	ARG	CA-C-N	7.82	127.83	119.78
2	H	75	ARG	C-N-CA	7.82	127.83	119.78
1	A	349	GLU	N-CA-C	-7.73	101.97	111.40
1	C	353	PHE	N-CA-C	7.50	120.11	111.11
2	H	4	THR	N-CA-C	-7.44	99.80	110.59
3	J	155	ASN	CB-CA-C	-7.44	99.37	109.71
1	E	207	SER	N-CA-CB	-7.33	99.84	110.47
2	D	75	ARG	CA-C-N	7.25	127.23	119.76

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	75	ARG	C-N-CA	7.25	127.23	119.76
2	H	96	GLN	N-CA-C	7.15	126.02	110.80
3	I	152	THR	N-CA-C	-6.74	104.00	111.82
1	G	277	ASP	CA-C-N	6.74	127.00	119.32
1	G	277	ASP	C-N-CA	6.74	127.00	119.32
2	B	75	ARG	CA-C-N	6.72	126.70	119.78
2	B	75	ARG	C-N-CA	6.72	126.70	119.78
1	A	284	LYS	CB-CA-C	-6.69	97.10	110.42
1	G	206	ILE	N-CA-C	-6.62	95.58	109.34
2	D	236	ARG	CB-CA-C	-6.59	97.30	110.42
1	E	349	GLU	N-CA-C	-6.54	104.95	113.12
3	I	135	VAL	N-CA-C	-6.53	103.96	110.62
2	B	236	ARG	CB-CA-C	-6.50	97.48	110.42
2	D	100	ILE	N-CA-C	6.48	117.23	110.62
2	B	80	ILE	N-CA-C	-6.46	98.56	107.99
1	E	101	GLY	N-CA-C	-6.44	103.39	112.60
2	B	299	PRO	N-CA-C	6.41	121.40	111.21
1	C	277	ASP	CA-C-N	6.40	126.89	119.47
1	C	277	ASP	C-N-CA	6.40	126.89	119.47
3	I	159	LEU	N-CA-C	-6.33	104.25	112.23
1	G	351	LEU	N-CA-C	6.32	118.58	109.48
2	B	4	THR	N-CA-C	-6.23	101.56	110.59
1	C	207	SER	N-CA-C	6.20	120.85	113.28
3	J	154	LYS	N-CA-C	-6.17	106.16	113.38
3	J	159	LEU	N-CA-C	-6.12	105.85	113.38
2	D	97	MET	N-CA-C	6.10	118.73	111.71
2	F	75	ARG	CA-C-N	6.03	125.94	119.85
2	F	75	ARG	C-N-CA	6.03	125.94	119.85
2	B	252	LYS	N-CA-C	-5.91	107.89	114.62
1	G	101	GLY	N-CA-C	-5.83	104.58	112.57
1	A	363	LYS	N-CA-C	-5.83	104.61	110.97
1	A	76	ALA	CA-C-N	5.81	125.83	119.90
1	A	76	ALA	C-N-CA	5.81	125.83	119.90
2	B	298	TYR	CA-C-N	5.81	125.76	119.78
2	B	298	TYR	C-N-CA	5.81	125.76	119.78
1	G	99	LEU	CA-C-N	5.80	125.78	120.03
1	G	99	LEU	C-N-CA	5.80	125.78	120.03
1	G	207	SER	N-CA-C	5.76	120.15	113.18
1	C	193	ALA	CA-C-N	5.74	127.02	119.84
1	C	193	ALA	C-N-CA	5.74	127.02	119.84
1	A	136	ASN	N-CA-C	5.74	118.51	108.52
2	B	256	ALA	N-CA-C	5.68	117.10	108.07

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	71	LEU	N-CA-C	-5.67	105.62	112.54
2	D	300	PHE	N-CA-C	-5.60	102.60	110.50
2	H	236	ARG	CB-CA-C	-5.56	99.35	110.42
1	C	206	ILE	N-CA-C	-5.55	97.79	109.34
1	G	353	PHE	N-CA-C	5.53	117.00	110.97
2	B	73	GLY	N-CA-C	5.52	122.70	115.36
1	C	136	ASN	N-CA-C	5.52	118.13	108.52
1	A	294	ASP	N-CA-C	5.51	116.35	109.57
1	E	304	GLU	N-CA-C	-5.49	104.94	111.69
1	C	349	GLU	N-CA-C	-5.45	104.98	111.69
1	A	269	GLY	CA-C-N	5.45	125.75	119.92
1	A	269	GLY	C-N-CA	5.45	125.75	119.92
1	G	228	ILE	N-CA-C	5.43	113.87	107.84
2	F	26	PHE	N-CA-C	5.39	116.99	108.96
2	B	112	ILE	N-CA-C	5.38	116.33	108.53
1	G	291	ALA	N-CA-C	-5.37	105.59	111.82
2	F	305	SER	N-CA-C	5.37	117.13	111.28
1	G	363	LYS	N-CA-C	-5.36	105.60	111.82
2	B	127	LEU	N-CA-C	5.34	119.37	112.86
3	J	161	GLU	N-CA-C	-5.30	105.67	111.82
1	A	99	LEU	CA-C-N	5.29	125.76	120.52
1	A	99	LEU	C-N-CA	5.29	125.76	120.52
1	A	139	PRO	N-CA-C	-5.28	104.26	110.70
2	D	73	GLY	N-CA-C	5.25	122.33	115.40
2	D	298	TYR	CA-C-N	5.22	125.16	119.78
2	D	298	TYR	C-N-CA	5.22	125.16	119.78
2	D	299	PRO	N-CA-C	5.21	119.50	111.21
1	C	101	GLY	N-CA-C	-5.17	104.42	112.58
2	F	298	TYR	CA-C-N	5.15	126.28	119.84
2	F	298	TYR	C-N-CA	5.15	126.28	119.84
1	E	351	LEU	N-CA-C	5.14	115.89	109.57
1	G	237	ASP	CA-C-N	5.14	126.27	119.84
1	G	237	ASP	C-N-CA	5.14	126.27	119.84
2	B	100	ILE	N-CA-C	5.11	115.32	110.42
1	G	257	GLY	CA-C-N	5.09	125.56	120.52
1	G	257	GLY	C-N-CA	5.09	125.56	120.52
2	F	203	ASP	N-CA-C	5.08	117.94	111.69
1	G	306	LYS	N-CA-C	-5.08	108.35	114.75
1	G	26	LEU	N-CA-C	-5.07	101.13	109.40
1	E	219	LEU	N-CA-C	-5.07	107.23	113.41
2	F	53	PHE	N-CA-C	5.07	117.86	109.85
3	J	137	LYS	N-CA-C	-5.02	107.29	113.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	26	PHE	N-CA-C	5.00	116.41	108.96

There are no chirality outliers.

There are no planarity outliers.

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	2866	0	2818	55	0
1	C	2845	0	2776	56	0
1	E	2868	0	2825	93	0
1	G	2881	0	2844	76	0
2	B	2488	0	2515	45	0
2	D	2488	0	2515	43	0
2	F	2486	0	2506	64	0
2	H	2488	0	2515	61	0
3	I	277	0	277	28	0
3	J	263	0	259	25	0
4	A	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
4	G	1	0	0	0	0
5	A	29	0	20	2	0
5	C	29	0	20	2	0
5	E	29	0	20	6	0
5	G	29	0	20	6	0
6	B	1	0	0	0	0
6	D	1	0	0	0	0
7	A	51	0	0	2	0
7	B	43	0	0	3	0
7	C	56	0	0	1	0
7	D	48	0	0	3	0
7	E	54	0	0	7	0
7	F	40	0	0	2	0
7	G	47	0	0	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	H	55	0	0	2	0
7	I	5	0	0	0	0
7	J	8	0	0	0	0
All	All	22480	0	21930	497	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 11.

All (497) 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)
5:E:1370:R1T:N4'	5:E:1370:R1T:HP22	1.35	1.41
5:E:1370:R1T:H4'2	5:E:1370:R1T:CP2	1.64	1.08
1:E:115:LEU:HD21	1:E:325:ILE:HD13	1.36	1.03
1:E:206:ILE:HG22	1:E:207:SER:H	1.23	1.01
1:E:143:ILE:HD11	2:H:127:LEU:HD13	1.45	0.98
1:E:109:ILE:HD11	1:E:118:ALA:HB2	1.51	0.93
1:E:147:GLN:H	1:E:147:GLN:NE2	1.70	0.90
2:F:90:MET:HE2	2:H:90:MET:HE2	1.54	0.90
1:E:58:ILE:HD11	1:E:318:ILE:HG12	1.53	0.90
1:E:147:GLN:H	1:E:147:GLN:HE21	1.15	0.89
2:H:238:VAL:HB	2:H:268:ILE:HD13	1.54	0.87
5:E:1370:R1T:N4'	5:E:1370:R1T:CP2	2.30	0.85
3:I:154:LYS:HE2	3:I:154:LYS:N	1.95	0.82
1:G:69:GLN:HG3	1:G:71:ARG:HG3	1.62	0.81
1:A:277:ASP:HA	1:A:280:ARG:HG2	1.62	0.81
1:A:9:PHE:HZ	1:C:231:ILE:HD11	1.44	0.80
1:A:131:ILE:HD13	1:A:137:VAL:HG23	1.61	0.80
1:E:270:PRO:HG3	1:E:278:PRO:HB3	1.66	0.78
2:H:2:GLN:HG3	2:H:180:ARG:HH21	1.49	0.78
2:H:207:ILE:HD13	2:H:233:VAL:HG11	1.65	0.78
3:I:132:MET:HE3	3:I:133:PRO:HD3	1.67	0.77
1:E:95:GLU:HG3	1:E:165:ALA:HB2	1.67	0.77
5:G:1370:R1T:H7'2	5:G:1370:R1T:OP1	1.83	0.77
1:E:9:PHE:CE1	1:G:231:ILE:HD11	2.20	0.76
2:B:228:ILE:HG23	2:B:322:MET:HE2	1.65	0.76
1:E:294:ASP:HB3	1:E:297:VAL:HG23	1.68	0.76
1:E:300:ARG:O	1:E:304:GLU:HG3	1.86	0.75
2:D:264:ARG:HD3	7:D:1327:HOH:O	1.86	0.75
5:E:1370:R1T:HP22	5:E:1370:R1T:H4'2	0.77	0.75
1:A:183:GLU:OE1	2:B:58:ALA:HB1	1.86	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:I:157:ARG:HE	3:I:158:VAL:HG13	1.53	0.73
2:B:117:PRO:HA	2:B:171:GLU:O	1.89	0.73
1:G:28:GLU:CD	1:G:28:GLU:H	1.97	0.73
2:D:281:ILE:HG23	2:D:282:LEU:HD12	1.71	0.73
3:I:130:ILE:HD12	3:I:154:LYS:HD2	1.71	0.72
1:E:147:GLN:HE21	1:E:147:GLN:N	1.87	0.72
2:F:5:MET:O	2:F:9:ILE:HG12	1.90	0.72
3:J:155:ASN:HB2	3:J:158:VAL:HG22	1.71	0.71
1:C:129:ASN:O	1:C:131:ILE:HD12	1.90	0.71
1:C:314:GLU:O	1:C:318:ILE:HG12	1.90	0.70
5:E:1370:R1T:H7'2	5:E:1370:R1T:OP1	1.90	0.70
2:D:146:ILE:HG12	2:D:170:LEU:HB2	1.71	0.70
2:B:29:ASP:HB2	7:B:1340:HOH:O	1.91	0.70
1:E:325:ILE:HG13	7:E:1418:HOH:O	1.91	0.69
1:G:277:ASP:HB3	1:G:280:ARG:HD3	1.75	0.69
1:C:142:ILE:HD13	1:C:142:ILE:O	1.93	0.69
1:G:131:ILE:HD12	1:G:131:ILE:H	1.57	0.69
2:B:311:PHE:O	2:B:315:ILE:HG12	1.93	0.69
2:F:120:GLY:HA3	2:F:298:TYR:OH	1.93	0.69
1:E:206:ILE:HG22	1:E:207:SER:N	1.98	0.69
1:C:60:ASP:OD2	1:C:79:ALA:HB2	1.92	0.68
2:F:127:LEU:HD13	1:G:143:ILE:HD11	1.76	0.68
2:D:177:ARG:HD3	7:D:1346:HOH:O	1.93	0.67
1:C:98:ILE:HD13	1:C:111:HIS:CD2	2.29	0.67
2:F:243:ILE:HG21	2:F:279:ARG:NH1	2.10	0.67
1:A:109:ILE:HD11	1:A:118:ALA:HB2	1.75	0.67
2:H:207:ILE:HD13	2:H:233:VAL:CG1	2.25	0.66
2:F:122:VAL:HG23	2:F:124:THR:HG23	1.77	0.66
2:H:2:GLN:HG3	2:H:180:ARG:NH2	2.08	0.66
2:F:20:ASP:HB3	2:F:23:VAL:HG23	1.78	0.66
1:A:206:ILE:HG22	1:A:207:SER:H	1.60	0.66
2:D:122:VAL:HG23	2:D:124:THR:HG23	1.78	0.66
1:C:38:MET:HE3	1:C:39:PRO:HD2	1.78	0.65
2:F:33:ASN:ND2	2:F:38:ARG:HH12	1.94	0.65
1:G:109:ILE:HD11	1:G:118:ALA:HB2	1.76	0.65
1:A:27:ASN:HD21	1:A:31:GLU:HB2	1.61	0.65
1:G:217:LYS:HD2	1:G:218:THR:HG23	1.77	0.65
3:J:155:ASN:C	3:J:157:ARG:H	2.05	0.65
2:H:122:VAL:HG23	2:H:124:THR:HG23	1.77	0.65
2:H:286:ALA:HB1	2:H:287:PRO:HD2	1.78	0.64
1:A:6:GLN:CD	1:A:6:GLN:H	2.06	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:I:155:ASN:HA	3:I:158:VAL:CG2	2.28	0.64
3:I:133:PRO:CD	3:I:134:SER:H	2.10	0.64
3:I:154:LYS:HE2	3:I:154:LYS:H	1.63	0.64
1:A:49:LEU:O	1:A:53:MET:HG3	1.98	0.64
1:E:270:PRO:CG	1:E:278:PRO:HB3	2.27	0.64
1:A:231:ILE:HD11	1:C:9:PHE:CZ	2.33	0.63
1:C:142:ILE:HD13	1:C:142:ILE:C	2.23	0.63
2:B:1:ALA:HB3	2:B:182:GLU:OE1	1.98	0.63
1:E:129:ASN:O	1:E:131:ILE:HD12	1.99	0.63
1:E:223:ALA:HB2	1:E:260:LEU:HD23	1.80	0.63
3:J:152:THR:HB	3:J:155:ASN:HD22	1.62	0.63
2:B:102:TYR:OH	2:D:299:PRO:HA	1.99	0.63
1:C:109:ILE:HD11	1:C:118:ALA:HB2	1.81	0.63
2:D:159:SER:OG	2:D:189:THR:HB	1.99	0.63
3:J:159:LEU:C	3:J:159:LEU:HD12	2.23	0.63
2:H:78:PRO:HG2	2:H:114:ILE:HD13	1.80	0.62
1:A:34:ASN:OD1	1:A:36:GLU:HG3	1.98	0.62
2:D:277:ASN:O	2:D:281:ILE:HB	1.99	0.62
2:B:59:GLU:H	2:B:59:GLU:CD	2.07	0.62
2:D:89:VAL:O	2:D:89:VAL:HG22	1.99	0.62
1:E:321:ALA:O	1:E:325:ILE:HG12	1.99	0.62
2:B:299:PRO:HA	2:D:102:TYR:OH	2.00	0.62
1:E:57:ARG:O	1:E:61:GLN:HG3	1.99	0.62
1:E:300:ARG:HA	7:E:1417:HOH:O	1.99	0.62
2:H:38:ARG:HG2	2:H:38:ARG:HH11	1.64	0.62
3:I:157:ARG:C	3:I:157:ARG:HD2	2.24	0.62
1:E:246:LYS:HG3	7:E:1393:HOH:O	1.99	0.62
1:E:115:LEU:HD21	1:E:325:ILE:CD1	2.22	0.62
5:A:1370:R1T:OP1	5:A:1370:R1T:N4'	2.30	0.61
1:A:206:ILE:HG22	1:A:207:SER:N	2.16	0.61
2:H:125:PRO:HG2	2:H:128:HIS:CE1	2.35	0.61
1:E:352:PRO:HD2	1:E:355:LEU:HD12	1.80	0.61
1:C:113:LEU:HD12	1:C:114:PRO:HD2	1.83	0.61
1:E:59:LEU:HA	7:E:1418:HOH:O	2.00	0.61
3:J:152:THR:HB	3:J:155:ASN:ND2	2.14	0.61
2:F:82:PHE:HB2	2:F:85:PHE:CE2	2.36	0.60
2:F:117:PRO:HA	2:F:171:GLU:O	2.01	0.60
2:F:299:PRO:HA	2:H:102:TYR:OH	2.01	0.60
2:F:58:ALA:HA	1:G:178:GLN:NE2	2.16	0.60
2:D:11:ASP:O	2:D:15:ILE:HG12	2.01	0.60
1:G:69:GLN:HG3	1:G:71:ARG:CG	2.31	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:I:152:THR:OG1	3:I:158:VAL:HG11	2.02	0.60
2:H:96:GLN:O	2:H:100:ILE:HG12	2.01	0.60
1:C:321:ALA:O	1:C:325:ILE:HG12	2.02	0.60
1:A:123:ARG:HB3	2:D:302:GLN:HE21	1.68	0.59
1:E:40:GLU:CD	1:E:40:GLU:H	2.09	0.59
1:A:95:GLU:HG3	1:A:165:ALA:HB2	1.83	0.59
2:B:128:HIS:HE1	1:C:142:ILE:HD11	1.67	0.59
1:C:10:ALA:O	1:C:14:GLU:HG3	2.02	0.59
2:H:228:ILE:HD12	2:H:228:ILE:N	2.17	0.59
3:I:133:PRO:HD2	3:I:134:SER:H	1.67	0.59
2:F:123:HIS:HD2	2:F:304:GLU:OE1	1.86	0.59
3:I:155:ASN:CG	3:I:158:VAL:HG23	2.28	0.59
3:I:157:ARG:NE	3:I:158:VAL:HG13	2.17	0.58
1:G:330:LYS:O	1:G:334:GLU:HG3	2.02	0.58
1:E:270:PRO:CB	1:E:278:PRO:HB3	2.32	0.58
1:C:192:LYS:HE2	1:C:255:GLY:O	2.04	0.58
1:G:85:GLN:HG2	1:G:200:GLN:HE22	1.67	0.58
1:G:105:VAL:O	1:G:109:ILE:HG12	2.04	0.58
1:A:284:LYS:O	1:A:284:LYS:HG2	2.03	0.58
2:D:117:PRO:HB2	2:D:173:LEU:HD21	1.85	0.58
1:E:50:MET:HE3	1:E:54:VAL:CG2	2.32	0.58
1:G:56:THR:CB	1:G:86:ILE:HD11	2.34	0.58
2:B:120:GLY:HA3	2:B:298:TYR:OH	2.04	0.58
2:B:127:LEU:HD13	1:C:143:ILE:HD11	1.86	0.58
3:I:155:ASN:HA	3:I:158:VAL:HG22	1.84	0.58
1:A:301:LYS:HE2	7:A:1394:HOH:O	2.03	0.57
1:G:92:LEU:HD11	1:G:168:ILE:HG21	1.84	0.57
2:F:36:VAL:HG23	2:F:37:PHE:CD2	2.39	0.57
2:B:38:ARG:HD2	2:B:41:GLU:OE1	2.05	0.57
2:D:155:GLY:HA3	2:D:190:ILE:HG12	1.87	0.57
3:I:157:ARG:HE	3:I:158:VAL:CG1	2.18	0.57
1:E:44:GLU:HB2	7:E:1407:HOH:O	2.05	0.57
1:E:326:LYS:O	1:E:329:ILE:HG22	2.04	0.57
2:F:235:LEU:C	2:F:237:THR:H	2.12	0.57
2:F:296:THR:HG21	1:G:344:ILE:HD13	1.85	0.57
1:G:66:LEU:HD13	1:G:329:ILE:HD11	1.87	0.57
1:G:105:VAL:N	1:G:106:PRO:CD	2.68	0.57
1:A:284:LYS:O	1:A:288:ASN:ND2	2.38	0.57
3:I:155:ASN:ND2	3:I:158:VAL:HG23	2.20	0.57
1:G:304:GLU:HA	7:G:1384:HOH:O	2.04	0.57
1:E:362:TYR:O	1:E:366:GLU:HB2	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:54:ASP:HB3	7:G:1379:HOH:O	2.04	0.56
1:A:344:ILE:HG23	1:A:355:LEU:HD22	1.85	0.56
1:A:109:ILE:HD11	1:A:118:ALA:CB	2.35	0.56
1:C:330:LYS:O	1:C:334:GLU:HG3	2.05	0.56
1:E:211:GLU:C	1:E:212:LYS:HE2	2.30	0.56
3:J:152:THR:HB	3:J:158:VAL:HG11	1.87	0.56
1:E:155:ALA:HB2	1:E:195:ALA:HB2	1.88	0.56
1:E:280:ARG:NH2	2:H:36:VAL:HA	2.21	0.56
1:G:192:LYS:HE2	1:G:255:GLY:O	2.05	0.56
1:E:313:GLU:O	1:E:317:VAL:HG23	2.06	0.56
1:G:60:ASP:OD2	1:G:79:ALA:HB2	2.06	0.56
2:H:120:GLY:HA3	2:H:298:TYR:OH	2.05	0.56
2:H:277:ASN:O	2:H:281:ILE:HB	2.05	0.56
1:A:38:MET:SD	1:A:39:PRO:HD2	2.46	0.56
1:C:98:ILE:HD12	1:C:98:ILE:N	2.21	0.56
1:G:109:ILE:HD11	1:G:118:ALA:CB	2.36	0.56
2:F:124:THR:HB	2:F:125:PRO:HD2	1.88	0.55
1:E:50:MET:HE3	1:E:54:VAL:HG23	1.87	0.55
2:F:57:LEU:HD11	5:G:1370:R1T:HM42	1.88	0.55
1:E:32:VAL:HG23	7:E:1422:HOH:O	2.06	0.55
2:F:89:VAL:HG22	2:F:89:VAL:O	2.06	0.55
1:C:102:TYR:OH	5:C:1370:R1T:H71	2.06	0.55
1:E:339:LYS:HB3	1:E:366:GLU:OE2	2.07	0.55
1:A:102:TYR:OH	5:A:1370:R1T:H71	2.07	0.55
2:H:157:LEU:O	2:H:161:ILE:HG12	2.07	0.55
1:E:9:PHE:CD1	1:G:229:PRO:HB3	2.42	0.55
2:B:127:LEU:HD13	1:C:143:ILE:CD1	2.36	0.55
1:E:192:LYS:NZ	1:E:192:LYS:HB3	2.22	0.55
5:E:1370:R1T:HM42	2:H:57:LEU:HD11	1.88	0.55
2:F:77:VAL:HG12	2:F:77:VAL:O	2.06	0.55
1:C:105:VAL:O	1:C:109:ILE:HG12	2.07	0.55
1:G:277:ASP:OD2	1:G:280:ARG:HG3	2.07	0.55
1:G:357:GLU:O	1:G:361:ILE:HG12	2.07	0.55
3:J:138:TYR:OH	3:J:160:LYS:HD3	2.07	0.55
1:A:148:TYR:CE1	1:A:171:THR:HB	2.42	0.54
2:D:117:PRO:HA	2:D:171:GLU:O	2.08	0.54
3:I:130:ILE:CD1	3:I:154:LYS:HD2	2.36	0.54
2:B:90:MET:HG3	2:D:90:MET:HG3	1.90	0.54
1:E:98:ILE:HG12	1:E:168:ILE:HG22	1.90	0.54
2:F:134:GLY:HA3	2:H:138:GLN:HE22	1.72	0.54
2:F:296:THR:CG2	1:G:344:ILE:HD13	2.37	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:39:PRO:HG3	1:E:243:ALA:HB2	1.89	0.54
1:E:58:ILE:CD1	1:E:318:ILE:HG23	2.38	0.54
1:A:215:VAL:O	1:A:215:VAL:HG22	2.08	0.54
1:E:304:GLU:C	1:E:306:LYS:H	2.13	0.53
2:H:89:VAL:HG22	2:H:89:VAL:O	2.09	0.53
2:H:117:PRO:HA	2:H:171:GLU:O	2.08	0.53
1:E:109:ILE:HD11	1:E:118:ALA:CB	2.33	0.53
2:F:100:ILE:HG21	2:F:110:MET:HE3	1.90	0.53
1:G:51:ARG:HG3	1:G:51:ARG:HH11	1.74	0.53
2:H:246:ILE:O	2:H:250:VAL:HG23	2.09	0.53
1:G:271:HIS:CD2	1:G:272:THR:HG23	2.43	0.53
1:G:131:ILE:HD12	1:G:131:ILE:N	2.22	0.53
1:A:51:ARG:HG2	1:A:317:VAL:HG21	1.90	0.53
2:B:181:GLN:HG2	2:B:182:GLU:N	2.22	0.53
3:I:135:VAL:HG11	3:I:155:ASN:HB3	1.91	0.53
3:I:160:LYS:HE2	3:I:160:LYS:HA	1.91	0.53
1:E:98:ILE:HG12	1:E:168:ILE:CG2	2.38	0.53
2:H:109:HIS:ND1	2:H:111:PRO:HD3	2.23	0.53
2:B:5:MET:O	2:B:9:ILE:HG12	2.08	0.53
1:C:223:ALA:HB2	1:C:260:LEU:HD23	1.90	0.53
1:E:270:PRO:HB3	1:E:278:PRO:HB3	1.91	0.52
3:I:130:ILE:O	3:I:154:LYS:HB3	2.09	0.52
1:E:138:LEU:HD11	2:F:71:LEU:HD11	1.91	0.52
2:F:32:VAL:HG23	2:F:33:ASN:N	2.24	0.52
1:C:64:ILE:HG23	1:C:273:MET:HE2	1.92	0.52
1:E:38:MET:SD	1:E:39:PRO:HD2	2.50	0.52
1:E:203:ARG:HH11	1:E:203:ARG:HG2	1.74	0.52
3:J:130:ILE:O	3:J:154:LYS:HB3	2.09	0.52
1:G:26:LEU:HB2	1:G:237:ASP:OD1	2.10	0.52
1:G:38:MET:SD	1:G:39:PRO:HD2	2.50	0.52
1:G:130:GLN:HE21	2:H:105:GLY:HA3	1.75	0.52
3:J:153:GLY:C	3:J:155:ASN:H	2.16	0.52
1:A:131:ILE:HD13	1:A:137:VAL:CG2	2.36	0.52
1:E:209:PRO:HG2	1:E:212:LYS:HD2	1.92	0.52
2:H:112:ILE:O	2:H:166:PRO:HA	2.10	0.52
2:D:117:PRO:HB2	2:D:173:LEU:CD2	2.40	0.52
1:G:304:GLU:C	1:G:306:LYS:H	2.18	0.52
2:B:25:ILE:HD13	2:B:77:VAL:HB	1.92	0.51
1:C:183:GLU:OE1	2:D:58:ALA:HB1	2.09	0.51
2:H:180:ARG:HB3	7:H:349:HOH:O	2.09	0.51
1:G:129:ASN:O	1:G:131:ILE:HD12	2.10	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:J:138:TYR:CE1	3:J:159:LEU:HD11	2.46	0.51
1:G:206:ILE:HG22	1:G:207:SER:H	1.75	0.51
2:B:302:GLN:HB2	1:C:338:GLN:NE2	2.25	0.51
1:C:105:VAL:N	1:C:106:PRO:CD	2.73	0.51
3:I:133:PRO:CD	3:I:134:SER:N	2.73	0.51
1:E:329:ILE:HD13	1:E:329:ILE:O	2.11	0.51
2:F:300:PHE:CE2	1:G:126:PHE:HB3	2.46	0.51
3:J:152:THR:CB	3:J:158:VAL:HG11	2.40	0.51
1:G:69:GLN:CG	1:G:71:ARG:HG3	2.38	0.51
2:B:219:ALA:HA	2:B:315:ILE:HD11	1.93	0.51
1:A:9:PHE:CZ	1:C:231:ILE:HD11	2.35	0.50
1:E:205:ALA:O	1:E:206:ILE:HB	2.11	0.50
2:H:194:LYS:HD3	7:H:361:HOH:O	2.11	0.50
2:H:12:ALA:HB3	2:H:157:LEU:HD23	1.93	0.50
2:F:125:PRO:HG2	2:F:128:HIS:CE1	2.47	0.50
2:D:298:TYR:CG	2:D:299:PRO:HD2	2.47	0.50
2:F:311:PHE:O	2:F:315:ILE:HG12	2.10	0.50
3:J:153:GLY:C	3:J:155:ASN:N	2.70	0.50
1:A:143:ILE:HD11	2:D:127:LEU:HD13	1.93	0.50
2:B:324:PHE:HZ	2:D:282:LEU:HD11	1.76	0.50
2:F:79:GLU:O	2:F:80:ILE:HD13	2.12	0.50
1:G:43:ASP:O	1:G:47:LYS:HG3	2.12	0.50
2:B:115:ARG:HD3	7:B:1332:HOH:O	2.12	0.50
2:F:3:MET:HB2	2:F:7:GLN:HB2	1.94	0.50
2:F:11:ASP:O	2:F:15:ILE:HG12	2.12	0.50
1:G:131:ILE:H	1:G:131:ILE:CD1	2.24	0.50
1:G:15:LYS:O	1:G:18:GLU:HB3	2.12	0.49
1:E:7:PHE:HB3	1:E:8:PRO:HD2	1.94	0.49
2:D:92:SER:O	2:D:96:GLN:HB2	2.13	0.49
1:A:280:ARG:NE	1:A:280:ARG:HA	2.28	0.49
2:H:2:GLN:CG	2:H:180:ARG:HH21	2.20	0.49
3:J:153:GLY:C	3:J:154:LYS:HG2	2.38	0.49
1:A:289:GLU:O	1:A:292:LYS:HG2	2.12	0.49
1:E:192:LYS:HB3	1:E:192:LYS:HZ3	1.76	0.49
2:F:114:ILE:HD12	2:F:114:ILE:N	2.28	0.49
1:G:183:GLU:OE1	2:H:58:ALA:HB1	2.13	0.49
2:D:286:ALA:HB1	2:D:287:PRO:HD2	1.95	0.49
2:H:318:ALA:O	2:H:322:MET:HG2	2.13	0.49
2:F:268:ILE:C	2:F:268:ILE:HD12	2.38	0.48
2:H:255:ARG:NH1	2:H:321:VAL:O	2.45	0.48
3:J:155:ASN:C	3:J:157:ARG:N	2.71	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:J:159:LEU:HD12	3:J:159:LEU:O	2.12	0.48
2:B:277:ASN:O	2:B:281:ILE:HB	2.14	0.48
1:E:223:ALA:HB2	1:E:260:LEU:CD2	2.44	0.48
1:E:228:ILE:HB	1:E:229:PRO:HD2	1.96	0.48
2:F:219:ALA:HA	2:F:315:ILE:HD11	1.94	0.48
2:F:97:MET:HA	2:F:100:ILE:HG12	1.96	0.48
2:F:204:ILE:HD11	2:F:257:ILE:HG23	1.95	0.48
2:F:247:ILE:HD11	2:F:279:ARG:HD2	1.95	0.48
3:I:157:ARG:HG2	3:I:157:ARG:HH21	1.78	0.48
2:H:38:ARG:HG2	2:H:38:ARG:NH1	2.28	0.48
2:H:228:ILE:HD12	2:H:228:ILE:H	1.76	0.48
2:H:285:GLU:OE2	3:J:136:ARG:HD3	2.13	0.48
3:J:132:MET:SD	3:J:135:VAL:HG21	2.53	0.48
1:A:105:VAL:N	1:A:106:PRO:CD	2.76	0.48
2:B:124:THR:HB	2:B:125:PRO:HD2	1.95	0.48
2:B:235:LEU:HD21	2:B:246:ILE:HD11	1.94	0.48
1:E:143:ILE:CD1	2:H:127:LEU:HD13	2.32	0.48
1:A:233:VAL:HG22	1:A:234:ASP:N	2.27	0.48
2:D:118:PHE:O	2:D:172:HIS:HA	2.14	0.48
2:F:281:ILE:HD12	3:J:133:PRO:HB2	1.96	0.48
1:G:71:ARG:HH22	1:G:329:ILE:HG21	1.79	0.48
1:A:277:ASP:HA	1:A:280:ARG:CG	2.36	0.48
2:F:57:LEU:HD11	5:G:1370:R1T:CM4	2.44	0.48
1:A:27:ASN:ND2	1:A:31:GLU:HB2	2.28	0.47
3:I:132:MET:HG3	3:I:132:MET:O	2.14	0.47
1:A:231:ILE:HD11	1:C:9:PHE:CE1	2.49	0.47
2:D:264:ARG:NH1	7:D:1327:HOH:O	2.47	0.47
2:B:4:THR:OG1	2:B:7:GLN:HG3	2.14	0.47
1:E:9:PHE:HE1	1:G:231:ILE:HD11	1.77	0.47
2:D:299:PRO:HD3	2:D:307:TRP:CE2	2.49	0.47
2:F:219:ALA:O	2:F:223:LEU:HG	2.14	0.47
1:G:293:LYS:HD2	7:G:1385:HOH:O	2.14	0.47
1:A:277:ASP:CA	1:A:280:ARG:HG2	2.41	0.47
1:A:309:TRP:HE1	1:A:314:GLU:CD	2.22	0.47
2:D:120:GLY:HA3	2:D:298:TYR:OH	2.14	0.47
1:E:7:PHE:CD1	1:E:7:PHE:N	2.83	0.47
1:E:212:LYS:HE2	1:E:212:LYS:CA	2.44	0.47
1:C:185:ILE:HG13	1:C:226:ALA:HB2	1.95	0.47
1:E:219:LEU:HB2	1:E:262:GLU:CD	2.39	0.47
1:A:300:ARG:O	1:A:304:GLU:HG3	2.14	0.47
2:B:294:PRO:HG3	1:C:362:TYR:CZ	2.50	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:98:ILE:HD13	1:C:111:HIS:NE2	2.29	0.47
1:A:231:ILE:HD11	1:C:9:PHE:HZ	1.75	0.46
1:E:212:LYS:HE2	1:E:212:LYS:N	2.30	0.46
2:H:297:VAL:O	2:H:298:TYR:C	2.59	0.46
2:B:20:ASP:HB3	2:B:23:VAL:HG23	1.96	0.46
1:E:58:ILE:HD13	1:E:318:ILE:HG23	1.97	0.46
1:E:203:ARG:HG2	1:E:203:ARG:NH1	2.30	0.46
2:F:102:TYR:OH	2:H:299:PRO:HA	2.15	0.46
2:D:257:ILE:CG2	2:D:321:VAL:HG21	2.44	0.46
1:A:102:TYR:HB3	1:A:142:ILE:HD13	1.98	0.46
1:A:112:GLY:O	1:A:114:PRO:HD3	2.16	0.46
2:F:93:ILE:HA	2:F:97:MET:HG2	1.98	0.46
1:G:53:MET:HB3	1:G:296:LEU:HD21	1.97	0.46
1:E:91:ALA:HB3	1:E:245:VAL:CG1	2.46	0.46
2:H:2:GLN:HB3	2:H:180:ARG:HD3	1.98	0.46
1:E:233:VAL:HG12	1:E:234:ASP:N	2.30	0.46
2:F:202:LYS:HD3	2:F:202:LYS:C	2.41	0.46
3:I:128:ARG:HH11	3:I:128:ARG:HG2	1.81	0.46
2:B:203:ASP:HB3	2:B:322:MET:HE1	1.98	0.46
2:H:60:SER:HA	2:H:89:VAL:HG23	1.96	0.46
1:A:6:GLN:CD	1:A:6:GLN:N	2.71	0.45
1:E:304:GLU:C	1:E:306:LYS:N	2.74	0.45
1:C:64:ILE:HG23	1:C:273:MET:CE	2.47	0.45
1:E:27:ASN:OD1	1:E:31:GLU:HB2	2.16	0.45
1:E:105:VAL:N	1:E:106:PRO:CD	2.79	0.45
7:A:1371:HOH:O	1:C:215:VAL:HG22	2.15	0.45
1:G:42:SER:OG	1:G:45:GLN:HG3	2.16	0.45
2:H:133:GLU:CD	2:H:133:GLU:H	2.23	0.45
1:A:283:SER:C	1:A:285:GLU:H	2.23	0.45
2:B:89:VAL:O	2:B:89:VAL:HG22	2.16	0.45
1:C:23:PHE:CZ	1:C:25:ILE:HD11	2.51	0.45
1:E:212:LYS:HE2	1:E:212:LYS:HA	1.97	0.45
2:H:59:GLU:HB2	2:H:88:GLU:HB3	1.98	0.45
3:J:152:THR:OG1	3:J:158:VAL:HG11	2.17	0.45
2:B:128:HIS:CE1	1:C:142:ILE:HD11	2.49	0.45
1:C:99:LEU:N	1:C:99:LEU:HD12	2.31	0.45
2:F:202:LYS:HD3	2:F:202:LYS:O	2.16	0.45
1:G:56:THR:OG1	1:G:86:ILE:HD11	2.17	0.45
5:G:1370:R1T:OP1	5:G:1370:R1T:C7'	2.59	0.45
3:J:132:MET:HB2	3:J:135:VAL:HG23	1.98	0.45
1:A:249:ARG:HG2	1:A:249:ARG:HH11	1.81	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:20:ASP:HB3	2:F:23:VAL:CG2	2.45	0.45
2:B:17:LEU:HD13	2:B:47:PHE:CD2	2.52	0.45
1:C:69:GLN:HG3	7:C:1379:HOH:O	2.17	0.45
1:C:125:HIS:HA	1:C:338:GLN:NE2	2.31	0.45
1:C:217:LYS:HD3	2:F:1:ALA:HB2	1.99	0.45
1:E:225:ALA:O	1:G:222:LYS:HE2	2.17	0.45
1:E:294:ASP:HB3	1:E:297:VAL:CG2	2.41	0.45
2:H:206:ILE:HG12	2:H:257:ILE:HD11	1.98	0.45
3:J:154:LYS:HD3	3:J:154:LYS:N	2.32	0.45
2:D:146:ILE:HD11	2:D:170:LEU:HD12	1.99	0.45
1:G:96:ASP:OD1	1:G:166:VAL:HG22	2.17	0.45
1:G:206:ILE:HG22	1:G:207:SER:N	2.31	0.45
2:F:112:ILE:O	2:F:166:PRO:HA	2.17	0.44
1:G:277:ASP:HB3	1:G:280:ARG:CD	2.45	0.44
2:B:179:PHE:HE2	7:B:1343:HOH:O	2.00	0.44
2:D:70:ALA:HB1	2:D:111:PRO:HD2	2.00	0.44
2:D:299:PRO:HD3	2:D:307:TRP:CD2	2.51	0.44
1:C:156:LEU:O	1:C:160:MET:HG3	2.18	0.44
2:F:243:ILE:HG21	2:F:279:ARG:HH11	1.78	0.44
1:A:66:LEU:HD13	1:A:329:ILE:HG13	1.98	0.44
2:H:2:GLN:NE2	2:H:182:GLU:OE1	2.50	0.44
2:B:203:ASP:HB3	2:B:322:MET:CE	2.48	0.44
2:D:223:LEU:HB3	2:D:228:ILE:HB	2.00	0.44
1:G:77:PRO:CG	1:G:273:MET:HE3	2.48	0.44
2:H:233:VAL:HG13	2:H:233:VAL:O	2.18	0.44
2:B:136:VAL:HG23	2:B:144:VAL:HG21	2.00	0.44
2:D:315:ILE:O	2:D:319:LYS:HG2	2.18	0.44
1:G:270:PRO:HG2	1:G:273:MET:HE1	2.00	0.44
2:B:282:LEU:HA	3:I:134:SER:HB3	1.99	0.44
1:C:219:LEU:HB2	1:C:262:GLU:CD	2.43	0.44
1:E:192:LYS:NZ	1:E:255:GLY:O	2.49	0.44
2:F:142:LEU:HD22	2:F:168:ILE:HD11	1.99	0.44
1:G:79:ALA:HB3	7:G:1372:HOH:O	2.18	0.43
3:J:138:TYR:O	3:J:142:LYS:HG2	2.18	0.43
2:F:59:GLU:OE1	5:G:1370:R1T:HM23	2.17	0.43
1:C:36:GLU:OE2	1:C:36:GLU:N	2.51	0.43
1:E:183:GLU:OE1	2:F:58:ALA:HB1	2.18	0.43
2:F:14:ARG:HG3	2:F:14:ARG:HH11	1.83	0.43
2:H:58:ALA:O	2:H:62:ILE:HG13	2.18	0.43
1:A:228:ILE:HB	1:A:229:PRO:HD2	2.00	0.43
1:C:39:PRO:HG3	1:C:243:ALA:HB2	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:6:VAL:HG13	2:F:7:GLN:N	2.33	0.43
1:G:71:ARG:NH2	1:G:329:ILE:HG21	2.34	0.43
1:C:313:GLU:O	1:C:317:VAL:HG23	2.17	0.43
2:D:282:LEU:HA	3:I:132:MET:HB3	2.00	0.43
1:G:205:ALA:O	1:G:206:ILE:HB	2.19	0.43
2:F:299:PRO:HD3	2:F:307:TRP:CE2	2.53	0.43
3:J:135:VAL:HG22	3:J:156:GLY:HA3	2.00	0.43
1:A:95:GLU:HG3	1:A:165:ALA:CB	2.46	0.43
1:A:270:PRO:HG2	1:A:273:MET:HE1	2.00	0.43
3:I:138:TYR:OH	3:I:160:LYS:HD2	2.18	0.43
1:E:14:GLU:O	1:E:18:GLU:HG3	2.18	0.43
1:C:131:ILE:HD11	1:C:139:PRO:HG3	2.00	0.43
2:D:2:GLN:HE22	2:D:182:GLU:HB2	1.84	0.43
1:E:58:ILE:HD11	1:E:318:ILE:HG23	2.00	0.43
1:E:206:ILE:CG2	1:E:207:SER:N	2.69	0.43
1:G:318:ILE:CG2	1:G:322:LYS:HE2	2.49	0.43
2:H:235:LEU:O	2:H:236:ARG:HB2	2.19	0.43
1:A:280:ARG:HH22	2:D:38:ARG:HH22	1.65	0.43
2:D:268:ILE:O	2:D:272:VAL:HG23	2.19	0.43
1:E:9:PHE:CZ	1:G:231:ILE:HD11	2.53	0.43
1:E:204:PHE:HB3	1:E:206:ILE:O	2.19	0.43
2:F:189:THR:HG23	7:F:341:HOH:O	2.18	0.43
1:G:41:LEU:HD21	1:G:242:TYR:CZ	2.52	0.43
2:B:142:LEU:HD23	2:B:166:PRO:HB2	2.01	0.42
1:C:121:PHE:CZ	1:C:140:PRO:HB2	2.54	0.42
1:G:313:GLU:HA	1:G:316:ASN:HD22	1.83	0.42
1:E:58:ILE:CD1	1:E:318:ILE:HG12	2.39	0.42
1:E:86:ILE:HD12	1:E:86:ILE:N	2.34	0.42
1:E:178:GLN:HE21	2:H:57:LEU:CD2	2.32	0.42
1:A:283:SER:O	1:A:285:GLU:N	2.51	0.42
3:I:146:ILE:O	3:I:149:VAL:HG22	2.19	0.42
2:F:79:GLU:HG2	2:F:80:ILE:N	2.34	0.42
2:F:228:ILE:HD13	2:F:322:MET:HG3	2.02	0.42
1:G:219:LEU:HB2	1:G:262:GLU:CD	2.44	0.42
1:G:348:PHE:CZ	2:H:141:GLY:HA2	2.54	0.42
2:D:5:MET:O	2:D:9:ILE:HG13	2.19	0.42
1:E:50:MET:HE2	7:E:1417:HOH:O	2.20	0.42
2:H:78:PRO:CG	2:H:114:ILE:HD13	2.48	0.42
1:A:314:GLU:O	1:A:318:ILE:HG13	2.20	0.42
1:C:349:GLU:CD	2:D:164:ASN:HD22	2.28	0.42
1:E:267:ARG:HG2	1:E:267:ARG:HH11	1.85	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:69:GLN:HE21	1:G:71:ARG:CD	2.33	0.42
2:B:235:LEU:C	2:B:237:THR:H	2.26	0.42
3:I:135:VAL:HG22	3:I:156:GLY:HA2	2.01	0.42
1:E:362:TYR:CE2	2:H:294:PRO:HG3	2.54	0.42
1:G:283:SER:HB2	1:G:285:GLU:OE1	2.20	0.42
2:H:117:PRO:HB3	2:H:176:TYR:OH	2.20	0.42
1:C:206:ILE:HG22	1:C:207:SER:N	2.35	0.42
1:E:58:ILE:CD1	1:E:318:ILE:HA	2.50	0.42
2:F:118:PHE:CE1	2:F:170:LEU:HB3	2.55	0.42
2:H:3:MET:HE3	2:H:183:VAL:HB	2.02	0.42
2:B:302:GLN:HB2	1:C:124:GLY:O	2.20	0.42
1:C:217:LYS:CD	2:F:1:ALA:HB2	2.50	0.42
1:E:59:LEU:HD13	1:E:325:ILE:HD11	2.02	0.42
1:G:307:GLY:HA2	7:G:1384:HOH:O	2.19	0.42
2:H:238:VAL:CB	2:H:268:ILE:HD13	2.39	0.42
1:A:294:ASP:HB3	1:A:297:VAL:HG23	2.02	0.41
2:D:281:ILE:CG2	2:D:282:LEU:HD12	2.45	0.41
1:G:164:LYS:HE3	1:G:164:LYS:HA	2.02	0.41
2:H:145:VAL:HG21	2:H:192:ILE:HD12	2.01	0.41
3:J:138:TYR:HE1	3:J:159:LEU:HD11	1.82	0.41
1:A:55:TYR:CD1	1:A:55:TYR:C	2.98	0.41
2:B:287:PRO:HB3	2:D:281:ILE:HG21	2.01	0.41
1:E:222:LYS:HA	1:G:225:ALA:HA	2.02	0.41
2:F:324:PHE:HA	7:F:360:HOH:O	2.19	0.41
2:H:124:THR:HB	2:H:125:PRO:HD2	2.01	0.41
1:E:160:MET:HE1	2:F:24:LEU:HD11	2.02	0.41
1:C:331:LYS:HE2	1:C:331:LYS:HB3	1.83	0.41
1:G:31:GLU:OE1	1:G:31:GLU:N	2.53	0.41
2:B:324:PHE:CZ	2:D:282:LEU:HD11	2.55	0.41
1:G:35:GLU:OE1	1:G:36:GLU:N	2.54	0.41
1:G:102:TYR:OH	5:G:1370:R1T:H71	2.20	0.41
1:G:237:ASP:OD2	1:G:240:ALA:HB2	2.20	0.41
1:C:25:ILE:HG12	1:C:240:ALA:HB2	2.03	0.41
1:C:120:LEU:HD23	1:C:120:LEU:HA	1.93	0.41
2:D:308:LEU:HA	2:D:309:PRO:HD3	1.88	0.41
1:E:123:ARG:HD3	2:H:302:GLN:HE22	1.84	0.41
1:G:27:ASN:C	1:G:27:ASN:OD1	2.63	0.41
1:A:294:ASP:OD2	1:A:296:LEU:N	2.51	0.41
2:B:116:SER:O	2:B:170:LEU:HA	2.21	0.41
1:C:26:LEU:N	1:C:237:ASP:OD2	2.50	0.41
2:H:93:ILE:HA	2:H:97:MET:HG2	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:87:TYR:HA	2:B:90:MET:HG2	2.03	0.40
2:F:308:LEU:HA	2:F:309:PRO:HD3	1.94	0.40
1:G:11:GLU:O	1:G:14:GLU:HB3	2.21	0.40
1:A:294:ASP:HB3	1:A:297:VAL:CG2	2.51	0.40
1:E:114:PRO:HD2	1:E:117:GLN:OE1	2.21	0.40
1:E:121:PHE:CZ	1:E:140:PRO:HB2	2.56	0.40
2:F:91:ASP:O	2:F:96:GLN:HG2	2.22	0.40
1:G:191:PHE:O	1:G:192:LYS:C	2.64	0.40
1:A:43:ASP:O	1:A:47:LYS:HG3	2.22	0.40
1:G:250:GLU:O	1:G:254:ASN:ND2	2.54	0.40
2:B:81:GLN:OE1	5:C:1370:R1T:H7'1	2.22	0.40
1:C:329:ILE:HD13	1:C:329:ILE:HA	1.93	0.40
1:G:267:ARG:HG3	1:G:267:ARG:O	2.21	0.40
2:H:299:PRO:HD3	2:H:307:TRP:CD2	2.56	0.40
2:B:59:GLU:CD	2:B:59:GLU:N	2.77	0.40
3:J:152:THR:HG22	3:J:152:THR:O	2.22	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	363/369 (98%)	351 (97%)	10 (3%)	2 (1%)	21	38
1	C	363/369 (98%)	350 (96%)	11 (3%)	2 (1%)	21	38
1	E	363/369 (98%)	344 (95%)	17 (5%)	2 (1%)	21	38
1	G	363/369 (98%)	349 (96%)	13 (4%)	1 (0%)	36	55
2	B	322/325 (99%)	308 (96%)	13 (4%)	1 (0%)	36	55
2	D	322/325 (99%)	307 (95%)	14 (4%)	1 (0%)	36	55
2	F	322/325 (99%)	307 (95%)	13 (4%)	2 (1%)	21	38

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	H	322/325 (99%)	307 (95%)	15 (5%)	0	100	100
3	I	36/428 (8%)	29 (81%)	6 (17%)	1 (3%)	4	6
3	J	34/428 (8%)	31 (91%)	2 (6%)	1 (3%)	3	5
All	All	2810/3632 (77%)	2683 (96%)	114 (4%)	13 (0%)	24	43

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	284	LYS
2	B	236	ARG
3	I	133	PRO
1	G	206	ILE
3	J	153	GLY
1	A	206	ILE
1	C	206	ILE
1	C	275	GLY
1	E	206	ILE
2	F	236	ARG
2	D	236	ARG
2	F	31	GLY
1	E	278	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	294/305 (96%)	292 (99%)	2 (1%)	76	89
1	C	289/305 (95%)	279 (96%)	10 (4%)	32	58
1	E	295/305 (97%)	286 (97%)	9 (3%)	35	62
1	G	297/305 (97%)	291 (98%)	6 (2%)	48	75
2	B	263/264 (100%)	260 (99%)	3 (1%)	65	84
2	D	263/264 (100%)	261 (99%)	2 (1%)	73	88

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
2	F	262/264 (99%)	257 (98%)	5 (2%)	50 76
2	H	263/264 (100%)	258 (98%)	5 (2%)	50 76
3	I	25/341 (7%)	22 (88%)	3 (12%)	5 10
3	J	25/341 (7%)	25 (100%)	0	100 100
All	All	2276/2958 (77%)	2231 (98%)	45 (2%)	48 75

All (45) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	314	GLU
1	A	329	ILE
2	B	171	GLU
2	B	173	LEU
2	B	196	ASP
1	C	35	GLU
1	C	71	ARG
1	C	98	ILE
1	C	142	ILE
1	C	173	ASP
1	C	215	VAL
1	C	217	LYS
1	C	233	VAL
1	C	319	GLU
1	C	329	ILE
2	D	32	VAL
2	D	233	VAL
3	I	132	MET
3	I	133	PRO
3	I	157	ARG
1	E	6	GLN
1	E	40	GLU
1	E	44	GLU
1	E	147	GLN
1	E	212	LYS
1	E	231	ILE
1	E	254	ASN
1	E	282	ARG
1	E	329	ILE
2	F	136	VAL
2	F	200	GLU
2	F	244	GLU

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Mol	Chain	Res	Type
2	F	246	ILE
2	F	281	ILE
1	G	4	THR
1	G	35	GLU
1	G	71	ARG
1	G	130	GLN
1	G	164	LYS
1	G	173	ASP
2	H	19	ASN
2	H	80	ILE
2	H	180	ARG
2	H	187	GLU
2	H	277	ASN

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

Mol	Chain	Res	Type
1	A	19	GLN
1	A	24	GLN
1	A	200	GLN
1	A	271	HIS
1	A	288	ASN
1	A	320	GLN
2	B	2	GLN
2	B	139	GLN
1	C	338	GLN
2	D	2	GLN
2	D	19	ASN
2	D	72	GLN
2	D	271	ASN
2	D	302	GLN
1	E	6	GLN
1	E	69	GLN
1	E	147	GLN
1	E	178	GLN
1	E	254	ASN
1	E	315	ASN
2	F	7	GLN
2	F	33	ASN
2	F	123	HIS
2	F	138	GLN
2	F	239	GLN

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Mol	Chain	Res	Type
1	G	19	GLN
1	G	69	GLN
1	G	130	GLN
1	G	200	GLN
1	G	254	ASN
1	G	288	ASN
1	G	316	ASN
2	H	19	ASN
2	H	72	GLN
2	H	123	HIS
2	H	138	GLN
2	H	139	GLN
2	H	214	HIS
2	H	302	GLN
3	J	155	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 11 ligands modelled in this entry, 7 are monoatomic - leaving 4 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	R1T	E	1370	4	27,30,30	6.26	16 (59%)	36,45,45	3.09	17 (47%)
5	R1T	G	1370	4	27,30,30	6.31	18 (66%)	36,45,45	2.84	13 (36%)
5	R1T	C	1370	4	27,30,30	1.41	3 (11%)	36,45,45	2.59	12 (33%)
5	R1T	A	1370	4	27,30,30	1.40	3 (11%)	36,45,45	2.44	12 (33%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	R1T	E	1370	4	-	1/21/21/21	0/2/2/2
5	R1T	G	1370	4	-	6/21/21/21	0/2/2/2
5	R1T	C	1370	4	-	1/21/21/21	0/2/2/2
5	R1T	A	1370	4	-	2/21/21/21	0/2/2/2

All (40) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	E	1370	R1T	C2-S1	-23.35	1.34	1.73
5	G	1370	R1T	C5-S1	-20.05	1.33	1.74
5	G	1370	R1T	C2-S1	-19.34	1.41	1.73
5	E	1370	R1T	C5-S1	-15.13	1.43	1.74
5	G	1370	R1T	C7'-C5'	-9.04	1.39	1.51
5	E	1370	R1T	C7'-C5'	-8.05	1.40	1.51
5	E	1370	R1T	PA-O3A	-7.82	1.51	1.59
5	G	1370	R1T	PA-O3A	-6.72	1.52	1.59
5	G	1370	R1T	CM2-C2'	-5.09	1.35	1.49
5	E	1370	R1T	CM2-C2'	-4.99	1.36	1.49
5	G	1370	R1T	PB-O1B	-4.44	1.36	1.50
5	E	1370	R1T	PB-O3B	-4.39	1.38	1.54
5	G	1370	R1T	PA-O2A	-4.17	1.36	1.55
5	E	1370	R1T	PB-O1B	-4.16	1.37	1.50
5	E	1370	R1T	PB-O2B	-4.14	1.39	1.54
5	G	1370	R1T	PA-O7	-4.05	1.43	1.59
5	G	1370	R1T	PB-O2B	-3.92	1.40	1.54
5	E	1370	R1T	PA-O2A	-3.66	1.38	1.55
5	G	1370	R1T	PB-O3B	-3.51	1.41	1.54
5	A	1370	R1T	PB-O1B	3.51	1.61	1.50
5	C	1370	R1T	PB-O1B	3.50	1.61	1.50
5	E	1370	R1T	C7'-C3	3.33	1.55	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	G	1370	R1T	CP1-C2	3.23	1.54	1.50
5	G	1370	R1T	C4'-N3'	-3.08	1.30	1.35
5	G	1370	R1T	C3-C4	-2.97	1.31	1.38
5	C	1370	R1T	CP1-C2	2.96	1.53	1.50
5	A	1370	R1T	CP1-C2	2.77	1.53	1.50
5	E	1370	R1T	C3-C4	-2.74	1.31	1.38
5	G	1370	R1T	C5'-C4'	-2.66	1.38	1.42
5	E	1370	R1T	C4'-N3'	-2.62	1.31	1.35
5	E	1370	R1T	PA-O1A	-2.61	1.41	1.50
5	E	1370	R1T	PA-O7	-2.58	1.49	1.59
5	G	1370	R1T	PA-O1A	-2.53	1.42	1.50
5	E	1370	R1T	C6-C5	2.53	1.56	1.50
5	G	1370	R1T	C2'-N3'	-2.30	1.30	1.34
5	G	1370	R1T	C6-C5	2.29	1.55	1.50
5	E	1370	R1T	C5'-C4'	-2.20	1.39	1.42
5	A	1370	R1T	C5'-C4'	-2.13	1.39	1.42
5	C	1370	R1T	C5'-C4'	-2.11	1.39	1.42
5	G	1370	R1T	C7'-C3	2.03	1.54	1.51

All (54) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	1370	R1T	C4-C5-S1	-13.01	106.36	113.50
5	C	1370	R1T	C4-C5-S1	-11.44	107.22	113.50
5	A	1370	R1T	C4-C5-S1	-10.27	107.86	113.50
5	G	1370	R1T	C4-C5-S1	-9.81	108.12	113.50
5	G	1370	R1T	C2-C3-C4	-7.39	107.40	113.24
5	E	1370	R1T	C2-C3-C4	-6.46	108.13	113.24
5	C	1370	R1T	C5-C4-C3	4.60	115.92	112.43
5	G	1370	R1T	CP1-C2-C3	-4.46	123.21	129.05
5	E	1370	R1T	O3A-PB-O1B	-4.22	88.86	111.04
5	A	1370	R1T	C5-C4-C3	4.08	115.52	112.43
5	G	1370	R1T	C6-C5-C4	-3.90	125.59	130.78
5	G	1370	R1T	C5'-C6'-N1'	-3.71	117.80	123.83
5	G	1370	R1T	C6'-N1'-C2'	3.41	121.68	116.07
5	E	1370	R1T	C7'-C5'-C4'	3.36	126.71	122.07
5	E	1370	R1T	CP1-C2-C3	-3.23	124.82	129.05
5	G	1370	R1T	C6-C5-S1	3.22	126.20	119.29
5	G	1370	R1T	CM2-C2'-N1'	3.21	120.61	117.20
5	A	1370	R1T	N1'-C2'-N3'	-3.11	120.36	125.53
5	A	1370	R1T	C6'-N1'-C2'	3.10	121.16	116.07
5	C	1370	R1T	N1'-C2'-N3'	-3.04	120.47	125.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	1370	R1T	C6'-N1'-C2'	3.00	120.99	116.07
5	G	1370	R1T	O3B-PB-O2B	2.99	119.00	107.80
5	E	1370	R1T	C6-C5-S1	2.98	125.69	119.29
5	E	1370	R1T	C7'-C5'-C6'	-2.94	117.56	122.19
5	E	1370	R1T	C6'-N1'-C2'	2.81	120.69	116.07
5	A	1370	R1T	O3B-PB-O3A	2.76	113.90	104.64
5	E	1370	R1T	O3B-PB-O2B	2.74	118.09	107.80
5	G	1370	R1T	O3A-PB-O1B	-2.73	96.67	111.04
5	C	1370	R1T	O3B-PB-O3A	2.71	113.71	104.64
5	C	1370	R1T	C7'-C5'-C6'	-2.58	118.12	122.19
5	C	1370	R1T	CM2-C2'-N1'	2.58	119.94	117.20
5	E	1370	R1T	C5-C4-C3	-2.56	110.49	112.43
5	A	1370	R1T	CM2-C2'-N1'	2.53	119.89	117.20
5	E	1370	R1T	C5'-C6'-N1'	-2.52	119.73	123.83
5	C	1370	R1T	C5'-C7'-C3	-2.50	109.91	114.05
5	A	1370	R1T	C7'-C5'-C6'	-2.45	118.32	122.19
5	E	1370	R1T	N1'-C2'-N3'	-2.42	121.50	125.53
5	G	1370	R1T	N1'-C2'-N3'	-2.39	121.55	125.53
5	G	1370	R1T	C7-C6-C5	2.34	120.09	112.73
5	A	1370	R1T	N4'-C4'-N3'	2.33	120.17	117.03
5	E	1370	R1T	CM2-C2'-N1'	2.26	119.61	117.20
5	A	1370	R1T	CP1-C2-C3	-2.26	126.09	129.05
5	G	1370	R1T	C5'-C4'-N4'	-2.25	119.11	122.14
5	A	1370	R1T	C7'-C3-C4	-2.19	123.44	126.60
5	E	1370	R1T	O3A-PA-O1A	-2.17	104.19	110.70
5	A	1370	R1T	C5'-C7'-C3	-2.16	110.47	114.05
5	C	1370	R1T	N4'-C4'-N3'	2.16	119.94	117.03
5	E	1370	R1T	C6-C5-C4	-2.13	127.95	130.78
5	E	1370	R1T	C5'-C4'-N4'	-2.09	119.33	122.14
5	A	1370	R1T	C5'-C6'-N1'	-2.08	120.44	123.83
5	C	1370	R1T	CP1-C2-C3	-2.08	126.33	129.05
5	C	1370	R1T	C5'-C6'-N1'	-2.05	120.49	123.83
5	E	1370	R1T	O2B-PB-O1B	2.04	118.78	110.83
5	C	1370	R1T	C7'-C3-C4	-2.02	123.69	126.60

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	1370	R1T	S1-C2-CP1-OP1
5	C	1370	R1T	S1-C2-CP1-OP1
5	G	1370	R1T	PA-O3A-PB-O3B

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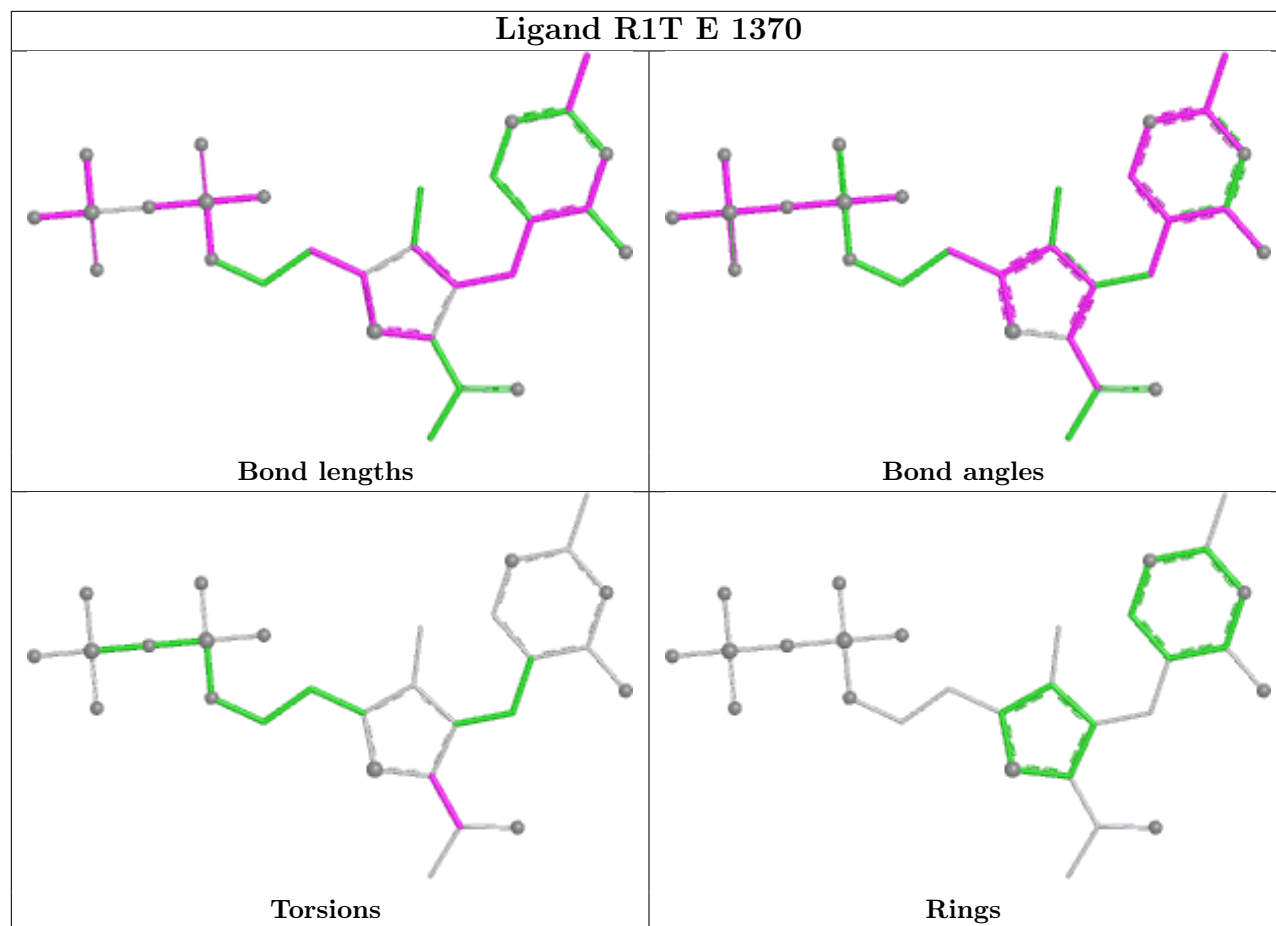
Mol	Chain	Res	Type	Atoms
5	A	1370	R1T	C3-C2-CP1-CP2
5	E	1370	R1T	S1-C2-CP1-OP1
5	G	1370	R1T	S1-C2-CP1-OP1
5	G	1370	R1T	C3-C2-CP1-OP1
5	G	1370	R1T	PB-O3A-PA-O1A
5	G	1370	R1T	PA-O3A-PB-O2B
5	G	1370	R1T	PB-O3A-PA-O2A

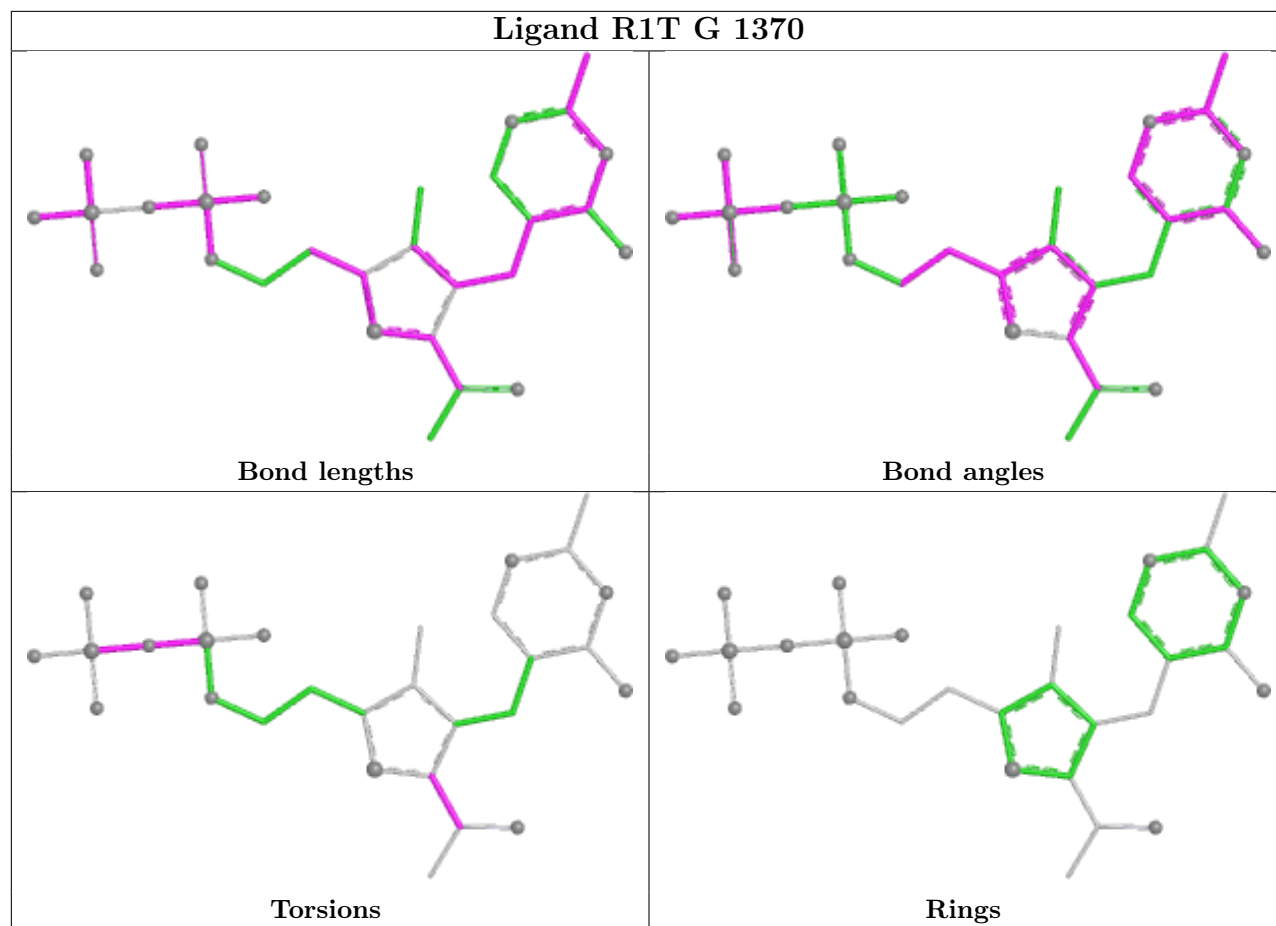
There are no ring outliers.

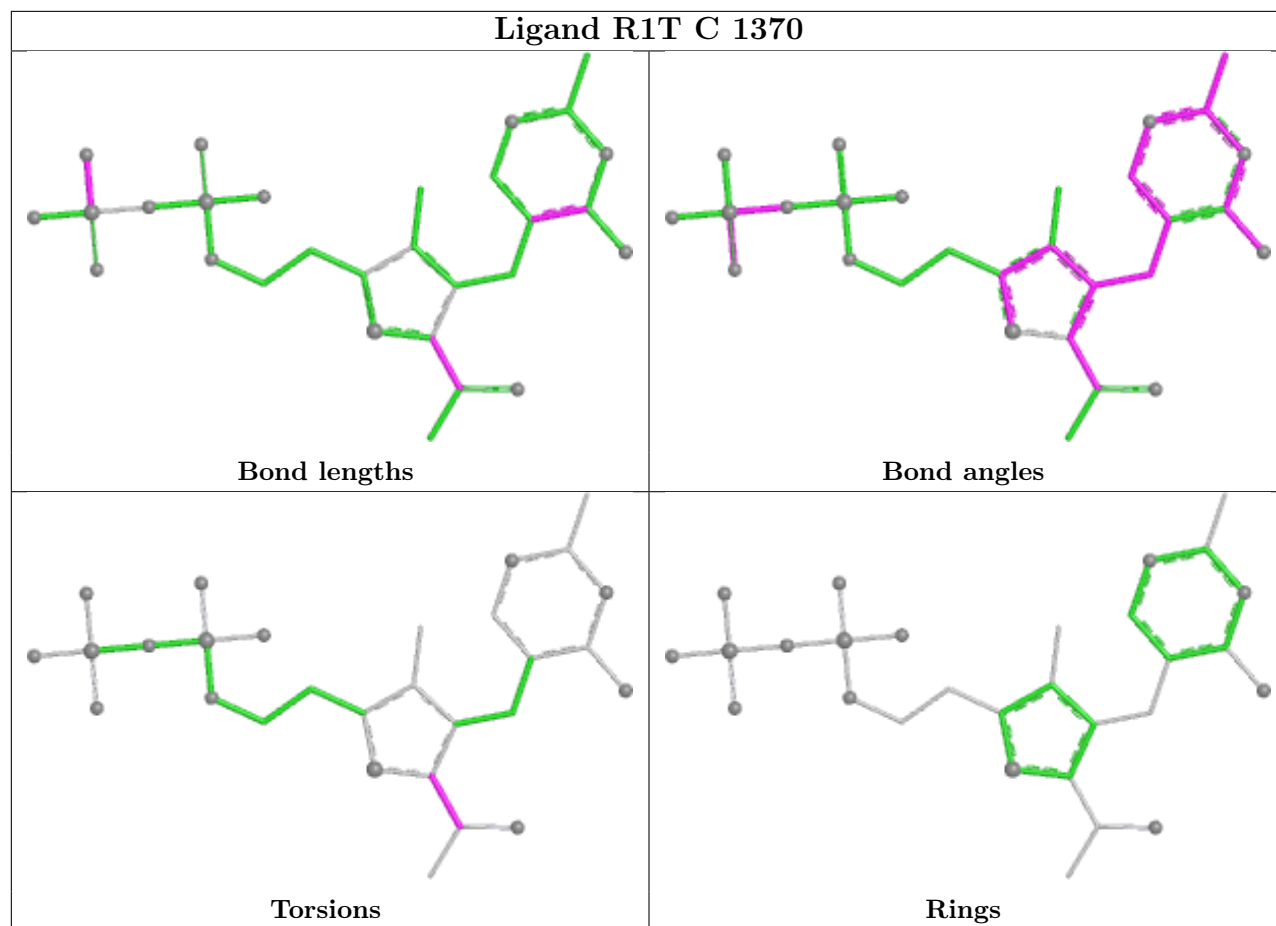
4 monomers are involved in 16 short contacts:

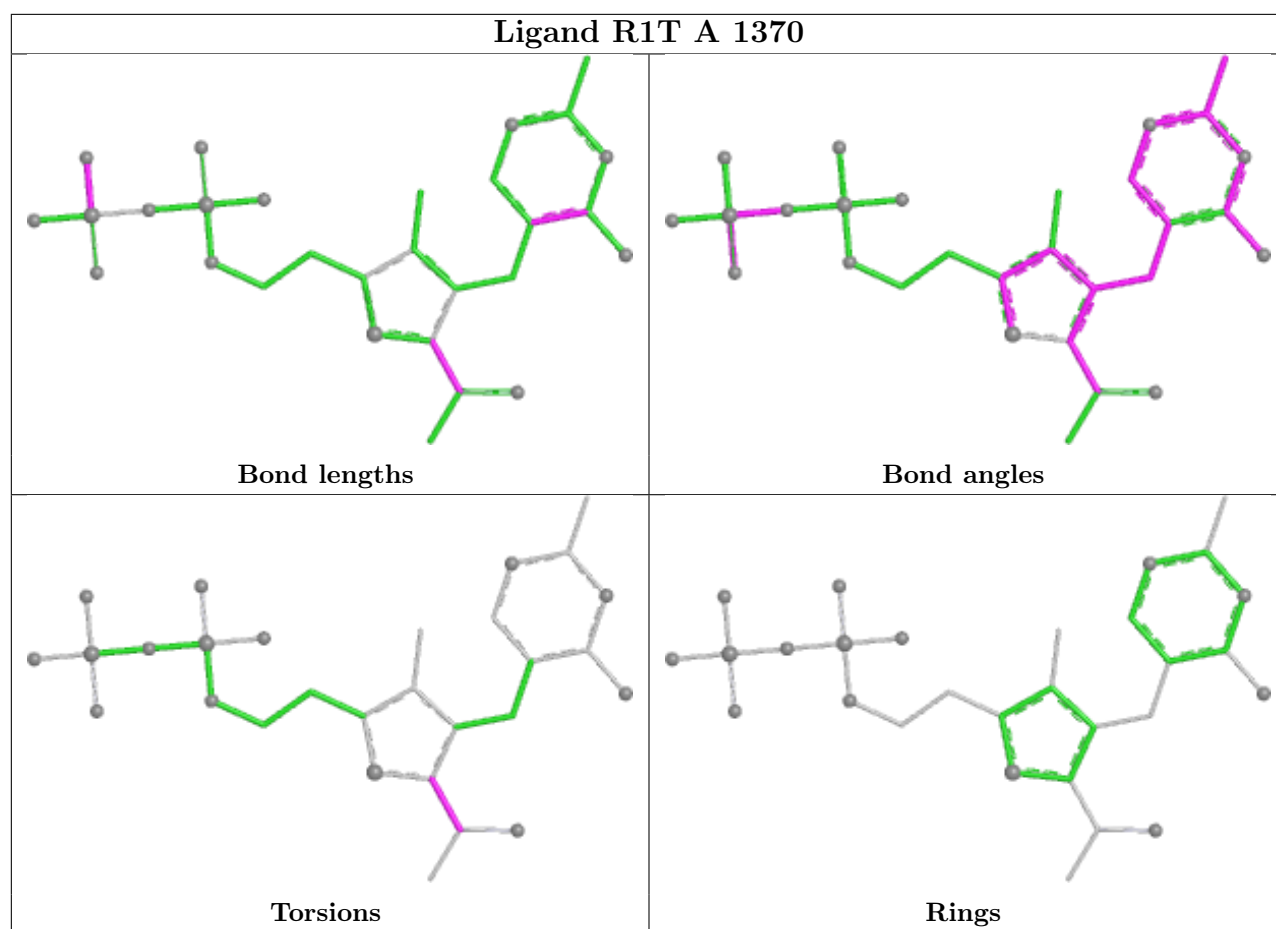
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	E	1370	R1T	6	0
5	G	1370	R1T	6	0
5	C	1370	R1T	2	0
5	A	1370	R1T	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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	365/369 (98%)	-0.22	1 (0%) 90 87	23, 37, 63, 80	2 (0%)
1	C	365/369 (98%)	-0.19	2 (0%) 87 85	18, 37, 63, 90	2 (0%)
1	E	365/369 (98%)	-0.10	1 (0%) 90 87	24, 45, 75, 96	2 (0%)
1	G	365/369 (98%)	-0.09	3 (0%) 82 80	27, 42, 66, 81	2 (0%)
2	B	324/325 (99%)	-0.20	2 (0%) 85 83	21, 38, 57, 65	0
2	D	324/325 (99%)	-0.26	1 (0%) 90 87	22, 34, 50, 61	0
2	F	324/325 (99%)	-0.08	3 (0%) 81 78	28, 43, 60, 69	0
2	H	324/325 (99%)	-0.12	3 (0%) 81 78	24, 38, 53, 63	0
3	I	38/428 (8%)	1.06	7 (18%) 3 2	52, 68, 84, 93	0
3	J	36/428 (8%)	1.22	7 (19%) 3 2	54, 71, 89, 96	0
All	All	2830/3632 (77%)	-0.12	30 (1%) 78 75	18, 40, 65, 96	8 (0%)

All (30) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	I	132	MET	7.0
3	J	145	ASP	5.5
3	J	146	ILE	3.8
2	B	196	ASP	3.7
3	I	165	ALA	3.4
1	G	180	ASP	3.1
3	J	149	VAL	3.1
1	G	217	LYS	3.1
3	J	154	LYS	3.0
1	C	290	TRP	2.9
3	J	136	ARG	2.9
1	C	268	TYR	2.9
3	I	133	PRO	2.9

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Mol	Chain	Res	Type	RSRZ
2	B	295	ASP	2.7
2	F	223	LEU	2.7
2	D	203	ASP	2.6
2	H	196	ASP	2.6
2	H	295	ASP	2.6
2	F	295	ASP	2.4
3	I	155	ASN	2.4
1	E	298	ARG	2.3
2	F	224	GLU	2.3
1	A	277	ASP	2.3
3	I	158	VAL	2.3
2	H	180	ARG	2.2
3	J	147	ARG	2.2
1	G	343	LEU	2.1
3	I	157	ARG	2.1
3	J	165	ALA	2.1
3	I	154	LYS	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, 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.

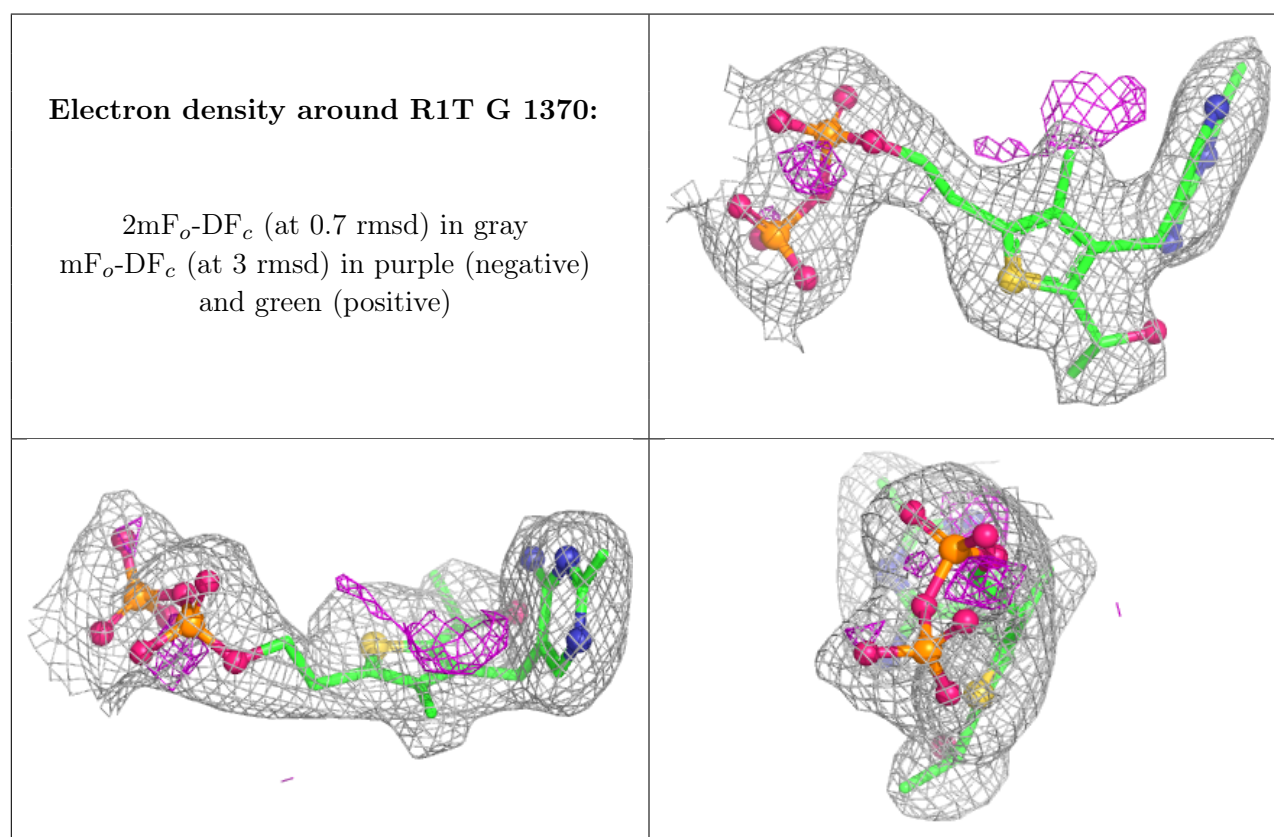
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	MG	D	1326	1/1	0.89	0.35	64,64,64,64	0
5	R1T	G	1370	29/29	0.96	0.07	20,34,45,63	0
5	R1T	A	1370	29/29	0.97	0.06	15,27,37,43	0
5	R1T	C	1370	29/29	0.97	0.07	19,31,38,43	0
5	R1T	E	1370	29/29	0.97	0.07	25,36,50,54	0
4	MG	E	1371	1/1	0.97	0.07	37,37,37,37	0

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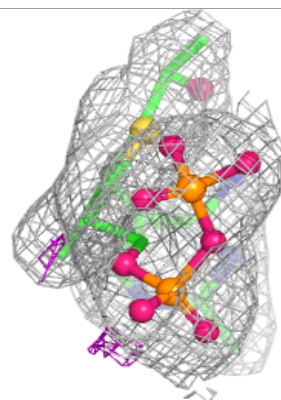
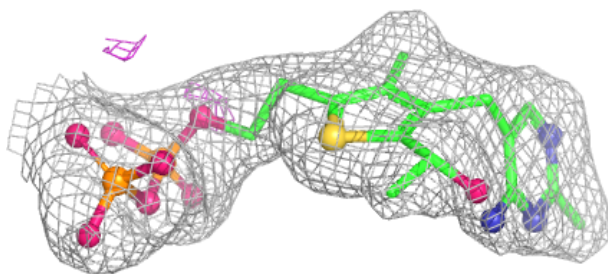
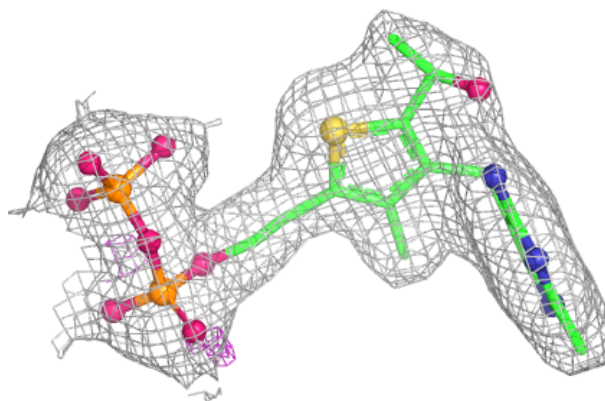
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
6	K	B	1325	1/1	0.97	0.05	52,52,52,52	0
4	MG	C	1368	1/1	0.98	0.11	33,33,33,33	0
4	MG	G	1371	1/1	0.99	0.03	23,23,23,23	0
4	MG	A	1368	1/1	0.99	0.06	17,17,17,17	0
6	K	D	1325	1/1	0.99	0.02	32,32,32,32	0

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.

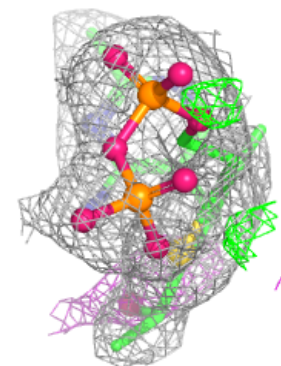
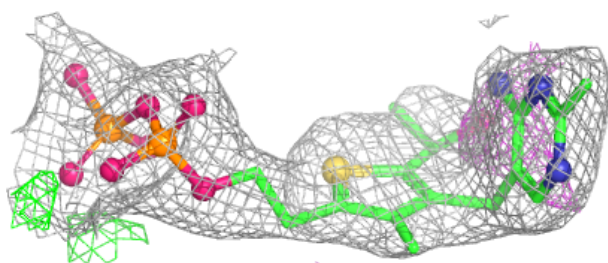
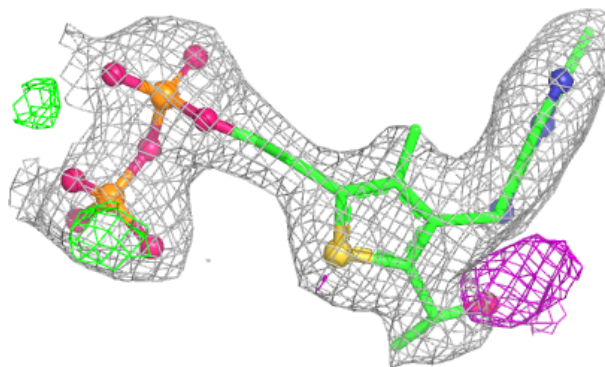


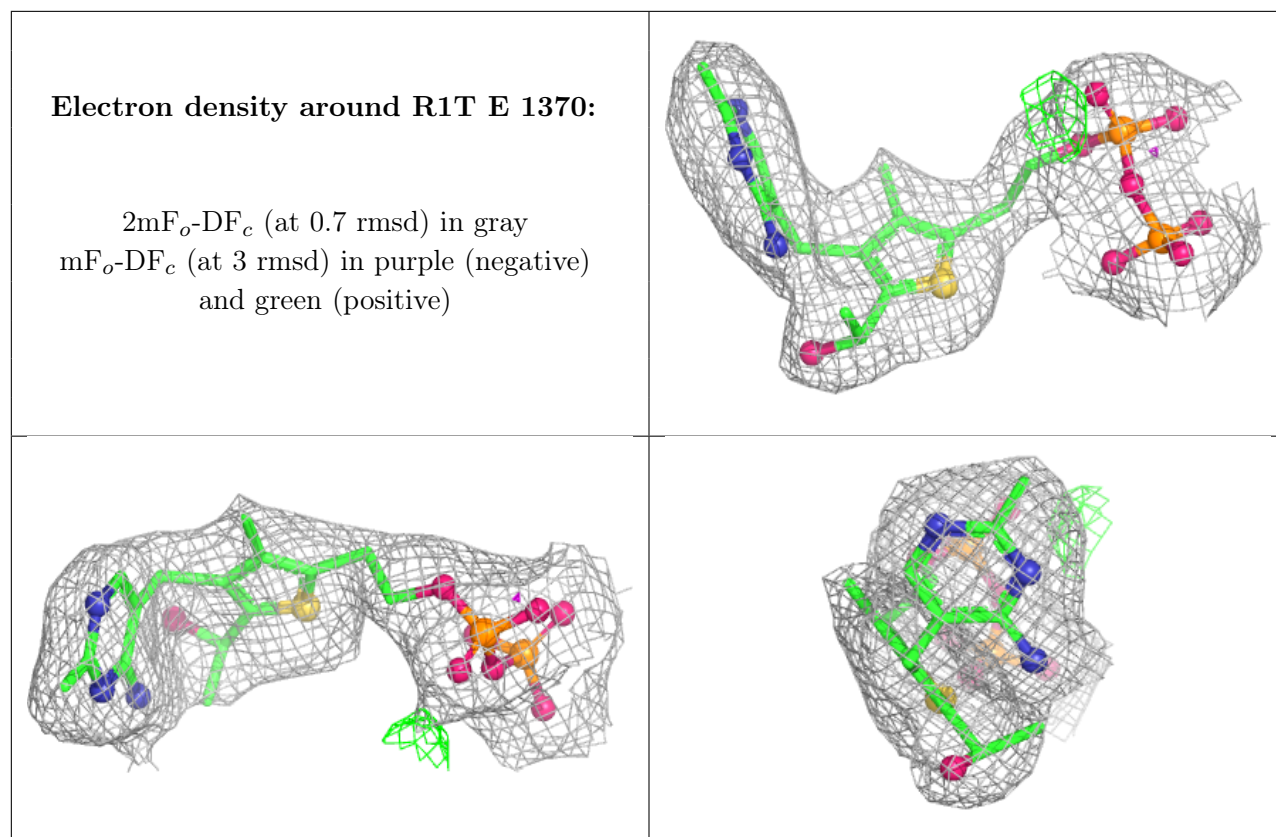
Electron density around R1T A 1370:

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

**Electron density around R1T C 1370:**

$2mF_o-DF_c$ (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.