



# Full wwPDB X-ray Structure Validation Report ⓘ

May 9, 2022 – 12:40 PM JST

PDB ID : 7ER3  
Title : Crystal structure of beta-lactoglobulin complexed with chloroquine  
Authors : Yao, Q.; Ma, J.; Xing, Y.; Zang, J.  
Deposited on : 2021-05-05  
Resolution : 2.60 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](mailto: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.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.28.1  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.28.1

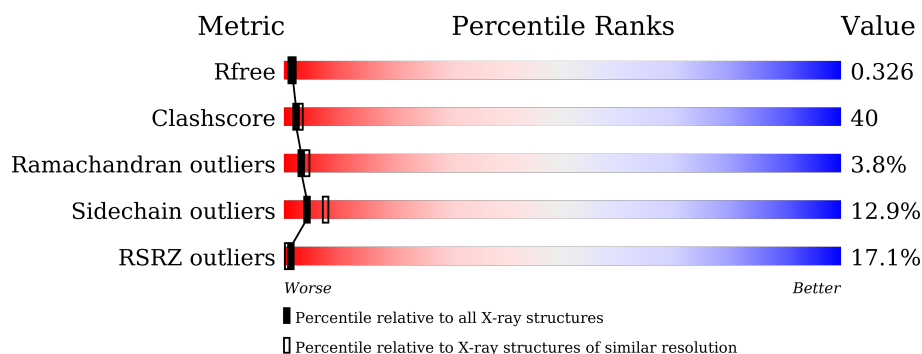
# 1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.60 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	3163 (2.60-2.60)
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)
RSRZ outliers	127900	3104 (2.60-2.60)

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  $\geq 3$ , 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	162	<div> <div>14%</div> <div>48%</div> <div>40%</div> <div>12%</div> </div>
1	B	162	<div> <div>13%</div> <div>46%</div> <div>45%</div> <div>9%</div> </div>
1	C	162	<div> <div>20%</div> <div>40%</div> <div>50%</div> <div>9%</div> </div>
1	D	162	<div> <div>22%</div> <div>40%</div> <div>49%</div> <div>11%</div> </div>

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

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	OTX	A	201	-	X	X	-
2	OTX	B	201	-	-	X	-
2	OTX	C	201	-	-	X	-
2	OTX	D	201	-	-	X	-

## 2 Entry composition [i](#)

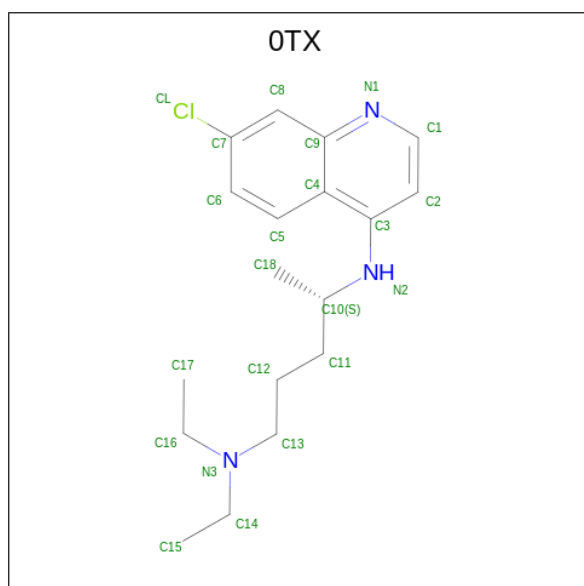
There are 3 unique types of molecules in this entry. The entry contains 10598 atoms, of which 5343 are hydrogens and 0 are deuteriums.

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 Major allergen beta-lactoglobulin.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	162	Total	C	H	N	O	S	1	1	0
			2596	821	1310	206	250	9			
1	B	162	Total	C	H	N	O	S	0	1	0
			2596	821	1310	206	250	9			
1	C	162	Total	C	H	N	O	S	0	0	0
			2595	821	1309	206	250	9			
1	D	162	Total	C	H	N	O	S	0	1	0
			2596	821	1310	206	250	9			

- Molecule 2 is (4S)-N 4 -(7-chloroquinolin-4-yl)-N 1 ,N 1 -diethylpentane-1,4-diamine (three-letter code: OTX) (formula: C<sub>18</sub>H<sub>26</sub>ClN<sub>3</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	Cl	H	N	0	0
			48	18	1	26	3		

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	B	1	Total	C	Cl	H	N	0	0
			48	18	1	26	3		
2	C	1	Total	C	Cl	H	N	0	0
			48	18	1	26	3		
2	D	1	Total	C	Cl	H	N	0	0
			48	18	1	26	3		

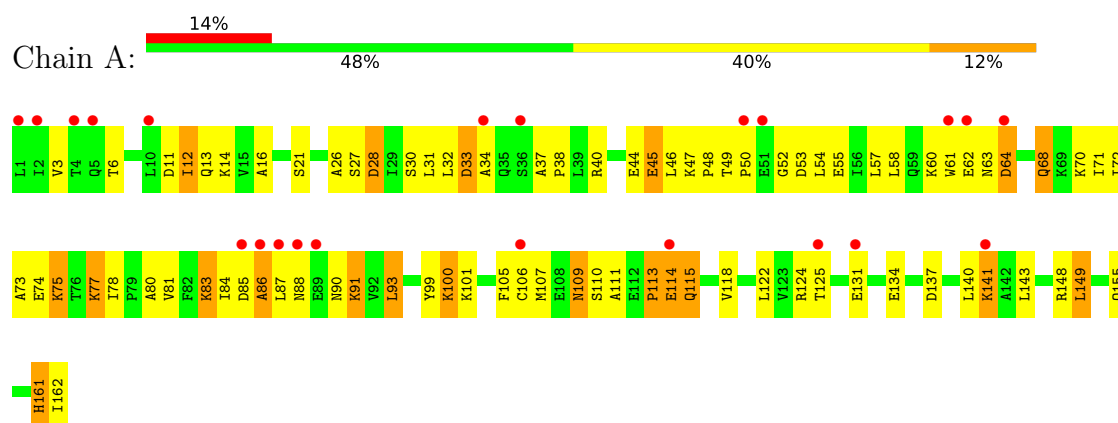
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	6	Total	O	0	0
			6	6		
3	B	4	Total	O	0	0
			4	4		
3	C	10	Total	O	0	0
			10	10		
3	D	3	Total	O	0	0
			3	3		

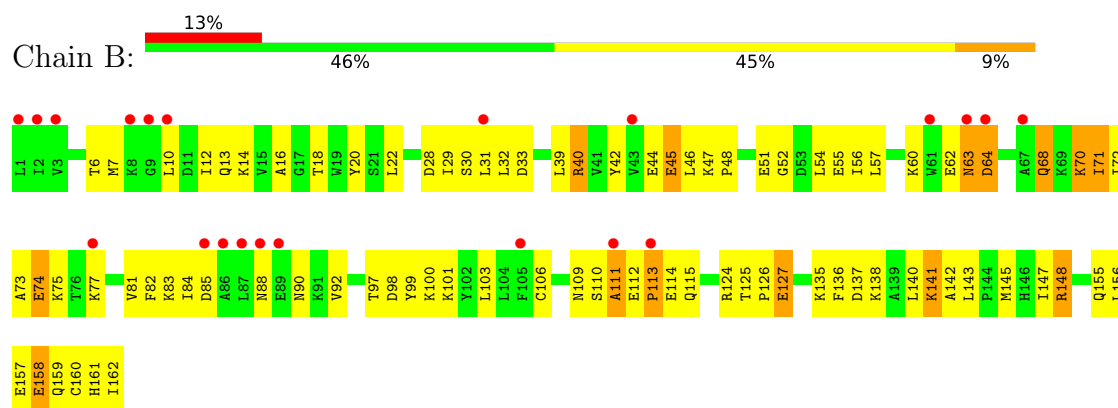
### 3 Residue-property plots

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.

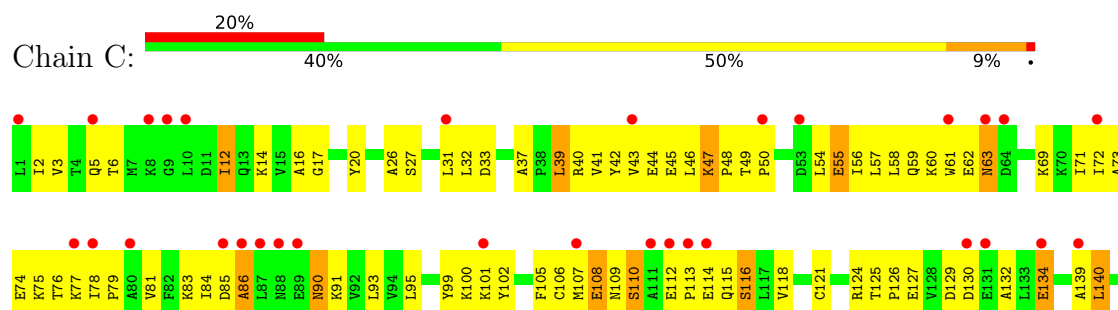
#### • Molecule 1: Major allergen beta-lactoglobulin

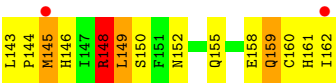


#### • Molecule 1: Major allergen beta-lactoglobulin

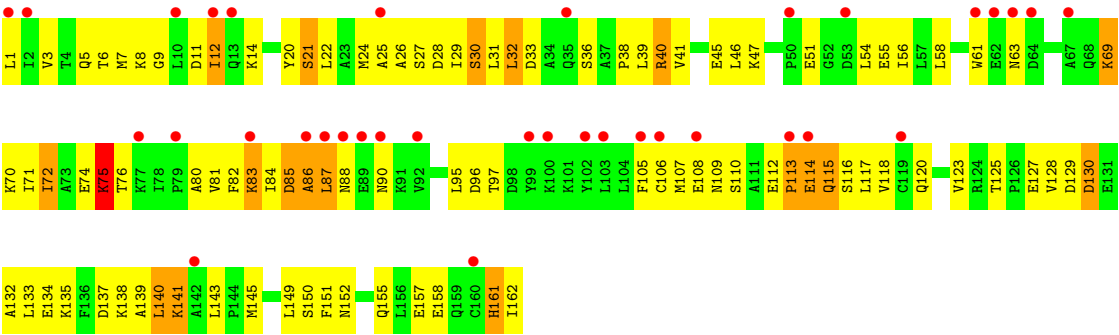


#### • Molecule 1: Major allergen beta-lactoglobulin





● Molecule 1: Major allergen beta-lactoglobulin



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	150.12Å 66.95Å 78.04Å 90.00° 111.74° 90.00°	Depositor
Resolution (Å)	29.59 – 2.60 29.59 – 2.60	Depositor EDS
% Data completeness (in resolution range)	97.6 (29.59-2.60) 97.6 (29.59-2.60)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	4.11 (at 2.61Å)	Xtriage
Refinement program	PHENIX v1.10.1	Depositor
R, $R_{free}$	0.247 , 0.324 0.249 , 0.326	Depositor DCC
$R_{free}$ test set	1098 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	46.1	Xtriage
Anisotropy	0.756	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.41 , 84.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	10598	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	66.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 12.73% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: 0TX

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	2/1316 (0.2%)	0.94	0/1781
1	B	0.94	7/1316 (0.5%)	0.99	2/1781 (0.1%)
1	C	0.80	2/1307 (0.2%)	0.94	4/1769 (0.2%)
1	D	0.79	1/1316 (0.1%)	0.89	2/1781 (0.1%)
All	All	0.85	12/5255 (0.2%)	0.94	8/7112 (0.1%)

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	1
1	B	0	1
1	D	0	1
All	All	0	3

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	106	CYS	CB-SG	-8.73	1.67	1.82
1	B	160	CYS	CB-SG	-7.84	1.69	1.82
1	B	74	GLU	CG-CD	6.67	1.61	1.51
1	B	106	CYS	CB-SG	-6.53	1.71	1.82
1	B	143	LEU	C-N	-6.45	1.22	1.34
1	B	74	GLU	CB-CG	6.25	1.64	1.52
1	C	143	LEU	C-N	6.11	1.45	1.34
1	A	143	LEU	C-N	-6.02	1.22	1.34
1	B	45	GLU	CG-CD	5.69	1.60	1.51
1	D	157	GLU	CG-CD	5.68	1.60	1.51
1	C	44	GLU	CG-CD	5.42	1.60	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	42	TYR	CD1-CE1	-5.27	1.31	1.39

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	40	ARG	NE-CZ-NH2	-9.73	115.43	120.30
1	C	149	LEU	CB-CG-CD1	-6.94	99.21	111.00
1	D	31	LEU	CA-CB-CG	5.99	129.08	115.30
1	C	149	LEU	CB-CG-CD2	5.96	121.14	111.00
1	C	43	VAL	CG1-CB-CG2	-5.75	101.69	110.90
1	B	148	ARG	NE-CZ-NH1	5.34	122.97	120.30
1	C	148	ARG	NE-CZ-NH1	-5.15	117.72	120.30
1	D	40	ARG	CG-CD-NE	5.13	122.57	111.80

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	91	LYS	Peptide
1	B	64	ASP	Peptide
1	D	87	LEU	Peptide

## 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	1286	1310	1303	103	0
1	B	1286	1310	1303	94	0
1	C	1286	1309	1309	102	0
1	D	1286	1310	1303	107	0
2	A	22	26	26	28	0
2	B	22	26	26	12	0
2	C	22	26	26	20	0
2	D	22	26	26	23	0
3	A	6	0	0	6	0
3	B	4	0	0	2	0
3	C	10	0	0	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	D	3	0	0	2	0
All	All	5255	5343	5322	416	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 40.

All (416) 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:137:ASP:O	1:A:141:LYS:NZ	1.77	1.18
1:D:137:ASP:O	1:D:141:LYS:NZ	1.95	0.98
1:D:109:ASN:N	2:D:201:0TX:CL	2.34	0.97
1:A:113:PRO:O	1:A:115:GLN:N	2.02	0.91
1:D:90:ASN:OD1	2:D:201:0TX:H51	1.71	0.91
1:D:28:ASP:OD2	1:D:30:SER:OG	1.91	0.88
1:B:90:ASN:CB	2:B:201:0TX:H111	2.06	0.85
1:B:51:GLU:N	1:B:51:GLU:OE1	2.11	0.84
1:A:52:GLY:O	1:A:75:LYS:HD3	1.79	0.81
1:C:59:GLN:NE2	3:C:303:HOH:O	2.14	0.81
1:C:130:ASP:OD1	3:C:301:HOH:O	1.98	0.81
1:B:13:GLN:O	3:B:301:HOH:O	2.00	0.80
1:A:52:GLY:O	1:A:75:LYS:NZ	2.14	0.79
1:D:39:LEU:CD2	2:D:201:0TX:H11	2.12	0.79
1:C:129:ASP:OD1	1:C:132:ALA:N	2.15	0.77
1:A:83:LYS:NZ	3:A:301:HOH:O	2.00	0.77
1:C:90:ASN:ND2	1:C:108:GLU:O	2.18	0.77
1:D:86:ALA:HB2	2:D:201:0TX:H172	1.67	0.75
1:A:90:ASN:OD1	2:A:201:0TX:H162	1.86	0.74
1:C:116:SER:HB2	2:C:201:0TX:H61	1.70	0.74
2:A:201:0TX:N2	2:A:201:0TX:H161	2.04	0.72
1:B:147:ILE:O	1:B:148:ARG:HG2	1.89	0.71
1:B:140:LEU:HD23	1:B:145:MET:HG3	1.72	0.70
1:C:33:ASP:O	3:C:302:HOH:O	2.10	0.70
1:C:95:LEU:HD21	1:C:106:CYS:SG	2.32	0.70
1:D:39:LEU:CD1	2:D:201:0TX:H11	2.22	0.70
1:A:88:ASN:ND2	1:A:109:ASN:OD1	2.24	0.69
1:D:90:ASN:HA	2:D:201:0TX:H61	1.72	0.69
2:D:201:0TX:H173	2:D:201:0TX:H152	1.73	0.69
1:B:138:LYS:O	1:B:141:LYS:HD2	1.92	0.69
1:D:125:THR:O	1:D:127:GLU:N	2.24	0.69
1:A:125:THR:OG1	3:A:302:HOH:O	2.10	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:90:ASN:HD21	2:C:201:0TX:H81	1.58	0.68
1:D:11:ASP:HB2	1:D:14:LYS:HE2	1.74	0.68
1:D:24:MET:HE1	1:D:40:ARG:HD3	1.75	0.68
1:C:39:LEU:HG	1:C:118:VAL:HG11	1.76	0.67
1:A:38:PRO:HA	2:A:201:0TX:CL	2.32	0.67
1:B:56:ILE:HB	1:B:71:ILE:HG23	1.76	0.67
1:D:113:PRO:O	1:D:115:GLN:N	2.27	0.66
1:C:130:ASP:HA	3:C:301:HOH:O	1.95	0.66
1:B:90:ASN:HB3	2:B:201:0TX:H111	1.77	0.66
1:A:33:ASP:OD1	3:A:303:HOH:O	2.14	0.65
1:A:49:THR:HB	1:A:50:PRO:HD2	1.79	0.65
1:B:136:PHE:O	1:B:140:LEU:CD1	2.45	0.65
1:A:85:ASP:O	1:A:86:ALA:HB2	1.96	0.65
1:C:148:ARG:HD3	1:C:148:ARG:C	2.17	0.65
1:B:141:LYS:HD3	1:B:142:ALA:H	1.60	0.65
1:B:136:PHE:O	1:B:140:LEU:HD12	1.96	0.65
1:D:39:LEU:HD22	2:D:201:0TX:H11	1.79	0.65
1:D:71:ILE:HG13	1:D:84:ILE:HD11	1.79	0.64
1:B:84:ILE:HD13	1:B:92:VAL:HG23	1.79	0.64
1:C:108:GLU:C	2:C:201:0TX:CL	2.73	0.64
1:A:90:ASN:OD1	2:A:201:0TX:C16	2.46	0.63
1:A:122:LEU:HD22	1:A:122:LEU:N	2.13	0.63
1:A:155:GLN:O	1:A:161:HIS:HA	1.99	0.63
1:B:54:LEU:O	1:B:72:ILE:HD12	1.97	0.63
1:C:109:ASN:OD1	1:C:110:SER:N	2.32	0.63
1:D:76:THR:HG22	1:D:81:VAL:O	1.98	0.63
1:B:47:LYS:HD3	1:B:55:GLU:OE1	1.98	0.62
1:A:38:PRO:CA	2:A:201:0TX:CL	2.84	0.62
1:A:87:LEU:HB3	2:A:201:0TX:C10	2.30	0.62
1:C:152:ASN:OD1	1:C:155:GLN:HG3	2.00	0.62
1:D:105:PHE:CE2	1:D:120:GLN:HB2	2.34	0.61
1:C:109:ASN:ND2	2:C:201:0TX:H171	2.16	0.61
1:B:145:MET:O	1:B:148:ARG:NH1	2.34	0.61
1:D:12:ILE:HD11	1:D:54:LEU:HD12	1.82	0.61
1:D:88:ASN:HB3	1:D:109:ASN:HD21	1.65	0.61
1:D:84:ILE:HG23	1:D:90:ASN:HB2	1.82	0.61
1:D:152:ASN:N	1:D:155:GLN:OE1	2.27	0.60
1:B:46:LEU:HD23	1:B:56:ILE:HD13	1.84	0.60
1:A:13:GLN:N	1:A:13:GLN:OE1	2.35	0.60
2:C:201:0TX:H152	2:C:201:0TX:C1	2.31	0.60
1:C:109:ASN:N	2:C:201:0TX:CL	2.72	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:201:0TX:H161	2:A:201:0TX:C10	2.32	0.59
1:C:114:GLU:HB2	3:C:304:HOH:O	2.02	0.59
1:D:114:GLU:O	1:D:115:GLN:HB2	2.03	0.59
1:A:87:LEU:HB3	2:A:201:0TX:H101	1.85	0.59
1:C:27:SER:OG	1:C:114:GLU:O	2.06	0.59
1:A:114:GLU:O	1:A:114:GLU:HG3	2.02	0.59
1:B:46:LEU:CD2	1:B:56:ILE:HD13	2.31	0.59
1:D:114:GLU:O	1:D:114:GLU:HG2	2.02	0.59
1:A:70:LYS:O	1:A:71:ILE:HD13	2.03	0.58
1:C:47:LYS:O	1:C:55:GLU:OE1	2.21	0.58
1:C:31:LEU:O	1:C:32:LEU:HD23	2.03	0.58
1:D:39:LEU:CD1	1:D:118:VAL:HG21	2.34	0.58
1:A:12:ILE:HD11	1:A:54:LEU:HD12	1.85	0.58
1:B:83:LYS:C	1:B:84:ILE:HD12	2.23	0.58
1:A:45:GLU:HG2	1:A:57:LEU:HD12	1.86	0.58
1:A:11:ASP:CG	1:A:13:GLN:HE22	2.07	0.58
1:B:12:ILE:HD11	1:B:54:LEU:HB2	1.86	0.58
1:A:62:GLU:O	1:A:64:ASP:N	2.36	0.57
2:B:201:0TX:HN21	2:B:201:0TX:H173	1.69	0.57
1:C:140:LEU:HD11	1:C:145:MET:SD	2.44	0.57
1:D:6:THR:HG23	1:D:80:ALA:HB3	1.84	0.57
1:A:87:LEU:HD23	2:A:201:0TX:H182	1.87	0.57
1:B:73:ALA:CB	1:B:84:ILE:HD11	2.35	0.57
1:A:12:ILE:CD1	1:A:54:LEU:HD12	2.34	0.57
1:A:77:LYS:H	1:A:77:LYS:CD	2.17	0.57
1:A:88:ASN:O	1:A:90:ASN:ND2	2.38	0.57
1:B:29:ILE:HG22	1:B:147:ILE:HB	1.86	0.57
1:B:68:GLN:NE2	1:D:128:VAL:O	2.37	0.57
1:B:85:ASP:O	2:B:201:0TX:C15	2.53	0.57
1:A:125:THR:N	3:A:302:HOH:O	2.10	0.56
1:B:62:GLU:C	1:B:64:ASP:H	2.08	0.56
1:A:140:LEU:H	1:A:141:LYS:HZ3	1.53	0.56
1:C:90:ASN:OD1	2:C:201:0TX:H172	2.05	0.56
1:D:12:ILE:HD11	1:D:54:LEU:HB2	1.88	0.56
1:D:21:SER:HB3	1:D:120:GLN:OE1	2.05	0.56
1:D:46:LEU:HD22	1:D:56:ILE:HD13	1.88	0.56
1:D:47:LYS:HD3	1:D:55:GLU:OE1	2.06	0.56
1:D:58:LEU:HD12	1:D:69:LYS:HB2	1.88	0.56
1:A:87:LEU:O	1:A:87:LEU:HD12	2.05	0.56
1:B:29:ILE:HD12	1:B:30:SER:N	2.20	0.56
1:D:113:PRO:N	3:D:302:HOH:O	2.38	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:86:ALA:CB	2:A:201:0TX:C2	2.84	0.56
1:A:30:SER:HA	1:A:33:ASP:OD1	2.06	0.55
1:A:74:GLU:HG3	1:A:83:LYS:HE3	1.87	0.55
1:B:83:LYS:O	1:B:84:ILE:HD12	2.07	0.55
1:D:107:MET:C	2:D:201:0TX:CL	2.82	0.55
1:D:158:GLU:CD	1:D:162:ILE:HD13	2.27	0.55
1:B:12:ILE:HD12	1:B:82:PHE:CZ	2.41	0.55
1:D:24:MET:HE1	1:D:40:ARG:CD	2.37	0.55
1:D:152:ASN:O	1:D:155:GLN:HG2	2.07	0.55
1:B:110:SER:O	1:B:112:GLU:N	2.40	0.55
1:A:86:ALA:HB3	2:A:201:0TX:H21	1.88	0.55
1:D:112:GLU:O	1:D:116:SER:HB3	2.06	0.55
1:C:57:LEU:HD12	1:C:57:LEU:O	2.07	0.54
1:D:109:ASN:CA	2:D:201:0TX:CL	2.93	0.54
1:D:117:LEU:HD21	1:D:143:LEU:HD23	1.90	0.54
1:D:71:ILE:CG1	1:D:84:ILE:HD11	2.36	0.54
1:A:6:THR:HG23	1:A:80:ALA:HB3	1.90	0.54
1:A:12:ILE:HD11	1:A:54:LEU:HB2	1.89	0.54
1:B:161:HIS:O	1:B:162:ILE:HG12	2.07	0.54
1:A:11:ASP:HB3	1:A:14:LYS:HE2	1.90	0.54
1:A:86:ALA:CB	2:A:201:0TX:H21	2.37	0.54
1:D:129:ASP:OD1	1:D:132:ALA:N	2.22	0.54
1:A:33:ASP:OD2	1:A:34:ALA:N	2.29	0.54
1:A:53:ASP:OD1	1:A:75:LYS:HG2	2.08	0.54
1:A:85:ASP:O	1:A:86:ALA:CB	2.56	0.54
1:B:46:LEU:CD2	1:B:56:ILE:CD1	2.85	0.54
1:D:155:GLN:O	1:D:161:HIS:HA	2.07	0.54
1:B:84:ILE:CD1	1:B:92:VAL:HG23	2.38	0.54
1:B:88:ASN:CB	1:B:109:ASN:HD21	2.21	0.54
1:B:83:LYS:HD3	1:B:90:ASN:O	2.09	0.53
1:A:58:LEU:O	1:A:58:LEU:HD12	2.09	0.53
1:B:156:LEU:HD23	1:B:161:HIS:NE2	2.23	0.53
1:D:90:ASN:CG	2:D:201:0TX:H51	2.28	0.53
1:B:90:ASN:CG	2:B:201:0TX:H111	2.28	0.53
1:C:73:ALA:HB2	1:C:84:ILE:HD11	1.91	0.53
1:D:24:MET:CE	1:D:32:LEU:HD21	2.39	0.53
1:A:131:GLU:O	1:A:134:GLU:HB2	2.09	0.53
1:A:30:SER:O	3:A:303:HOH:O	2.18	0.53
1:D:85:ASP:O	1:D:86:ALA:CB	2.55	0.53
1:D:151:PHE:HB3	1:D:155:GLN:HG3	1.90	0.53
1:B:125:THR:O	1:B:127:GLU:N	2.41	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:107:MET:O	1:D:117:LEU:HA	2.08	0.53
1:A:90:ASN:ND2	2:A:201:0TX:H162	2.24	0.53
1:B:90:ASN:CG	2:B:201:0TX:H101	2.29	0.53
1:B:109:ASN:O	1:B:112:GLU:O	2.27	0.53
1:C:85:ASP:O	1:C:86:ALA:HB2	2.09	0.53
1:A:30:SER:O	1:A:33:ASP:OD1	2.27	0.53
1:A:100:LYS:O	1:A:124:ARG:HG3	2.08	0.52
1:A:90:ASN:CG	2:A:201:0TX:H162	2.29	0.52
1:A:140:LEU:HD12	1:A:141:LYS:HZ2	1.74	0.52
1:C:158:GLU:HG2	1:C:162:ILE:HD13	1.92	0.52
1:B:20:TYR:CE2	1:B:126:PRO:HD3	2.43	0.52
1:B:155:GLN:O	1:B:161:HIS:HA	2.09	0.52
1:C:125:THR:O	1:C:127:GLU:N	2.41	0.52
1:B:109:ASN:OD1	1:B:110:SER:N	2.43	0.52
1:C:42:TYR:O	1:C:58:LEU:HB2	2.10	0.52
1:B:47:LYS:CG	1:B:55:GLU:OE1	2.58	0.52
1:B:111:ALA:O	1:B:112:GLU:HG2	2.10	0.51
1:D:39:LEU:HD13	1:D:118:VAL:HG21	1.92	0.51
1:D:54:LEU:CD2	1:D:56:ILE:HD13	2.39	0.51
1:D:86:ALA:CB	2:D:201:0TX:H172	2.39	0.51
1:B:52:GLY:O	1:B:75:LYS:HE3	2.10	0.51
1:C:45:GLU:CB	1:C:57:LEU:HD11	2.40	0.51
1:A:161:HIS:O	1:A:162:ILE:HG13	2.11	0.51
1:B:90:ASN:ND2	2:B:201:0TX:H101	2.25	0.51
1:A:87:LEU:HB3	2:A:201:0TX:H182	1.92	0.51
1:A:6:THR:CG2	1:A:80:ALA:HB3	2.41	0.51
1:B:47:LYS:CD	1:B:55:GLU:OE1	2.58	0.51
1:B:55:GLU:HG2	1:B:57:LEU:CD1	2.41	0.51
1:C:46:LEU:HD22	1:C:54:LEU:HD21	1.93	0.51
1:A:38:PRO:C	2:A:201:0TX:CL	2.86	0.51
1:A:84:ILE:HG13	1:A:90:ASN:CB	2.41	0.51
1:A:38:PRO:O	2:A:201:0TX:CL	2.66	0.50
1:A:52:GLY:O	1:A:75:LYS:CD	2.56	0.50
1:A:90:ASN:HD21	2:A:201:0TX:H162	1.76	0.50
1:A:11:ASP:CB	1:A:14:LYS:HE2	2.41	0.50
1:B:113:PRO:HB3	3:B:304:HOH:O	2.11	0.50
1:D:38:PRO:C	1:D:39:LEU:HD23	2.32	0.50
1:D:161:HIS:O	1:D:162:ILE:HG12	2.11	0.50
2:A:201:0TX:H181	2:A:201:0TX:C5	2.42	0.50
1:B:7:MET:HE2	1:B:10:LEU:HD13	1.93	0.50
1:C:14:LYS:HB2	1:C:99:TYR:CE2	2.47	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:39:LEU:HD21	2:C:201:0TX:C5	2.42	0.49
1:D:8:LYS:HG3	1:D:9:GLY:N	2.27	0.49
1:D:87:LEU:O	1:D:88:ASN:OD1	2.29	0.49
1:A:16:ALA:HB2	1:A:48:PRO:CG	2.42	0.49
1:A:21:SER:O	1:A:161:HIS:NE2	2.26	0.49
1:A:60:LYS:HE2	2:A:201:0TX:CL	2.49	0.49
1:A:32:LEU:O	1:A:33:ASP:C	2.50	0.49
1:A:46:LEU:HD22	1:A:54:LEU:HD21	1.95	0.49
1:D:36:SER:HB3	1:D:61:TRP:HD1	1.78	0.49
1:D:12:ILE:CD1	1:D:54:LEU:HD12	2.43	0.49
1:B:22:LEU:HA	1:B:156:LEU:HD21	1.95	0.49
1:D:55:GLU:HG3	1:D:72:ILE:HG22	1.95	0.49
1:A:88:ASN:HB2	1:A:109:ASN:OD1	2.14	0.48
1:B:97:THR:HB	1:B:103:LEU:HG	1.94	0.48
1:A:114:GLU:O	1:A:115:GLN:HG3	2.13	0.48
1:C:161:HIS:O	1:C:162:ILE:HG12	2.12	0.48
1:D:39:LEU:HD13	2:D:201:0TX:H11	1.95	0.48
1:A:87:LEU:HB3	2:A:201:0TX:C18	2.43	0.48
1:D:114:GLU:O	1:D:115:GLN:CB	2.62	0.48
2:A:201:0TX:N2	2:A:201:0TX:C16	2.76	0.48
1:C:90:ASN:OD1	2:C:201:0TX:C8	2.62	0.48
1:C:109:ASN:HD22	2:C:201:0TX:H171	1.75	0.48
1:D:74:GLU:N	1:D:83:LYS:O	2.43	0.48
1:D:32:LEU:HD22	1:D:149:LEU:HD11	1.94	0.48
1:C:144:PRO:HG3	3:C:304:HOH:O	2.13	0.48
1:A:105:PHE:CE2	1:A:122:LEU:HD21	2.49	0.48
1:B:136:PHE:O	1:B:140:LEU:HD13	2.14	0.48
1:A:72:ILE:HD12	1:A:73:ALA:H	1.79	0.47
1:C:116:SER:O	2:C:201:0TX:CL	2.69	0.47
1:C:27:SER:O	1:C:146:HIS:HB2	2.13	0.47
1:D:32:LEU:HD22	1:D:149:LEU:CD1	2.44	0.47
1:A:11:ASP:OD2	1:A:13:GLN:OE1	2.32	0.47
1:D:25:ALA:O	1:D:118:VAL:HG13	2.15	0.47
1:D:88:ASN:CB	1:D:109:ASN:HD21	2.25	0.47
1:D:56:ILE:HB	1:D:71:ILE:HG23	1.97	0.47
1:A:63:ASN:O	1:A:64:ASP:HB3	2.12	0.47
1:A:87:LEU:HD23	2:A:201:0TX:H111	1.95	0.47
1:B:100:LYS:O	1:B:124:ARG:HD2	2.15	0.47
1:B:157:GLU:HB3	1:D:152:ASN:ND2	2.29	0.47
1:C:49:THR:HB	1:C:50:PRO:HD2	1.96	0.47
1:A:3:VAL:HG21	1:A:93:LEU:HG	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:52:GLY:C	1:A:75:LYS:HD3	2.35	0.47
1:C:56:ILE:HD12	1:C:71:ILE:HD11	1.97	0.47
2:C:201:0TX:H51	2:C:201:0TX:H181	1.95	0.47
1:D:130:ASP:O	1:D:134:GLU:N	2.45	0.47
1:B:54:LEU:HD23	1:B:55:GLU:C	2.35	0.47
1:D:109:ASN:HB2	2:D:201:0TX:C6	2.44	0.47
1:B:135:LYS:HG2	1:B:138:LYS:HE2	1.97	0.47
1:C:45:GLU:HB2	1:C:57:LEU:HD11	1.97	0.47
1:D:107:MET:O	2:D:201:0TX:H81	2.15	0.47
1:A:12:ILE:HG12	1:A:48:PRO:HB3	1.97	0.46
1:A:85:ASP:HB2	3:A:301:HOH:O	2.15	0.46
1:B:12:ILE:HD12	1:B:82:PHE:CE2	2.51	0.46
1:B:16:ALA:HB2	1:B:48:PRO:CG	2.45	0.46
1:B:32:LEU:HB2	1:B:147:ILE:HG21	1.96	0.46
1:B:71:ILE:HD12	1:B:72:ILE:N	2.28	0.46
1:B:73:ALA:HB2	1:B:84:ILE:HD11	1.96	0.46
1:C:47:LYS:HG3	1:C:55:GLU:OE1	2.16	0.46
1:D:54:LEU:HD22	1:D:56:ILE:CD1	2.45	0.46
1:D:22:LEU:CD2	1:D:133:LEU:HD21	2.45	0.46
1:B:54:LEU:C	1:B:72:ILE:HD12	2.35	0.46
1:C:47:LYS:HG3	1:C:55:GLU:CD	2.36	0.46
1:C:112:GLU:HB3	1:C:115:GLN:HB2	1.97	0.46
1:A:77:LYS:HD3	1:A:77:LYS:N	2.31	0.46
1:A:109:ASN:HD22	1:A:111:ALA:H	1.63	0.46
1:B:158:GLU:OE2	1:B:162:ILE:HA	2.16	0.46
1:C:148:ARG:C	1:C:148:ARG:CD	2.83	0.46
1:D:134:GLU:OE1	1:D:138:LYS:HG2	2.16	0.46
1:A:148:ARG:O	1:A:149:LEU:HD13	2.16	0.46
1:C:121:CYS:SG	1:C:132:ALA:HB1	2.55	0.46
1:C:12:ILE:HD12	1:C:12:ILE:O	2.16	0.45
1:C:90:ASN:ND2	2:C:201:0TX:H81	2.29	0.45
1:C:90:ASN:OD1	2:C:201:0TX:C17	2.64	0.45
1:D:26:ALA:C	1:D:145:MET:SD	2.95	0.45
1:A:57:LEU:CD2	1:A:70:LYS:HG2	2.46	0.45
1:D:32:LEU:O	1:D:32:LEU:HD23	2.17	0.45
1:D:54:LEU:HD22	1:D:56:ILE:HD13	1.97	0.45
1:A:33:ASP:O	1:C:33:ASP:OD1	2.34	0.45
1:B:99:TYR:O	1:B:124:ARG:NH2	2.49	0.45
1:D:88:ASN:OD1	2:D:201:0TX:H181	2.16	0.45
1:A:77:LYS:H	1:A:77:LYS:HD3	1.79	0.45
1:B:88:ASN:CG	2:B:201:0TX:H11	2.35	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:39:LEU:HD12	1:D:118:VAL:HG21	1.98	0.45
1:C:47:LYS:HG3	1:C:55:GLU:CG	2.46	0.45
1:C:63:ASN:CG	1:C:63:ASN:O	2.54	0.45
1:D:107:MET:HB3	2:D:201:OTX:C8	2.47	0.45
1:B:82:PHE:CD1	1:B:82:PHE:N	2.85	0.45
1:C:93:LEU:O	1:C:106:CYS:N	2.45	0.45
1:C:107:MET:HG2	1:C:107:MET:O	2.15	0.45
1:A:140:LEU:H	1:A:141:LYS:NZ	2.14	0.45
1:C:14:LYS:HE3	1:C:99:TYR:CD1	2.52	0.45
1:A:47:LYS:HD2	1:A:55:GLU:OE1	2.17	0.45
1:B:31:LEU:HB3	1:B:39:LEU:HD23	1.98	0.45
1:C:39:LEU:HD11	2:C:201:OTX:C4	2.47	0.45
1:C:148:ARG:HD3	1:C:149:LEU:N	2.31	0.45
1:D:54:LEU:HD23	1:D:54:LEU:C	2.36	0.45
1:D:140:LEU:CD1	1:D:145:MET:HG3	2.47	0.45
1:C:54:LEU:C	1:C:54:LEU:HD23	2.38	0.44
1:D:22:LEU:HD23	1:D:133:LEU:HD21	2.00	0.44
1:D:95:LEU:HD11	1:D:106:CYS:SG	2.57	0.44
1:B:73:ALA:O	1:B:74:GLU:C	2.53	0.44
1:B:98:ASP:O	1:B:99:TYR:HB2	2.18	0.44
1:C:159:GLN:O	1:C:161:HIS:N	2.50	0.44
1:B:100:LYS:HG2	1:B:101:LYS:HG3	2.00	0.44
1:B:138:LYS:O	1:B:141:LYS:CD	2.61	0.44
1:C:16:ALA:HB2	1:C:48:PRO:CD	2.48	0.44
1:B:81:VAL:C	1:B:82:PHE:CD1	2.91	0.44
1:C:155:GLN:O	1:C:161:HIS:HA	2.17	0.44
1:D:47:LYS:CD	1:D:55:GLU:OE1	2.65	0.44
1:B:90:ASN:ND2	2:B:201:OTX:C10	2.81	0.44
1:C:158:GLU:O	1:C:159:GLN:C	2.56	0.44
1:D:107:MET:HB3	2:D:201:OTX:H81	1.99	0.44
1:C:72:ILE:O	1:C:84:ILE:HD13	2.18	0.43
1:C:95:LEU:N	1:C:95:LEU:CD1	2.81	0.43
1:C:140:LEU:HD21	1:C:145:MET:HG3	2.00	0.43
1:D:88:ASN:OD1	2:D:201:OTX:C18	2.66	0.43
1:A:61:TRP:CZ2	1:A:64:ASP:O	2.71	0.43
1:B:54:LEU:HD23	1:B:54:LEU:C	2.38	0.43
2:B:201:OTX:C3	2:B:201:OTX:H122	2.48	0.43
1:C:26:ALA:C	1:C:145:MET:HE2	2.39	0.43
1:D:39:LEU:HD21	2:D:201:OTX:H11	1.96	0.43
1:A:28:ASP:OD2	1:A:31:LEU:HG	2.18	0.43
1:B:14:LYS:HB2	1:B:99:TYR:CD2	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:140:LEU:CG	1:C:145:MET:HG3	2.49	0.43
1:A:6:THR:HG23	1:A:80:ALA:CB	2.48	0.43
1:C:130:ASP:O	1:C:134:GLU:OE2	2.37	0.43
1:C:148:ARG:NH2	1:C:150:SER:HB2	2.34	0.43
1:B:98:ASP:O	1:B:100:LYS:N	2.48	0.43
1:C:95:LEU:HD13	1:C:105:PHE:HA	2.01	0.43
1:C:47:LYS:O	1:C:47:LYS:CG	2.66	0.43
1:D:116:SER:O	1:D:118:VAL:HG23	2.18	0.43
1:C:161:HIS:O	1:C:162:ILE:CB	2.67	0.43
1:C:162:ILE:O	1:C:162:ILE:HG22	2.19	0.43
1:B:55:GLU:OE2	1:B:70:LYS:NZ	2.47	0.43
1:D:30:SER:CB	3:D:301:HOH:O	2.66	0.43
1:D:38:PRO:O	1:D:39:LEU:HD23	2.19	0.43
1:B:73:ALA:HB1	1:B:84:ILE:HD11	2.00	0.42
1:C:95:LEU:HD11	1:C:106:CYS:SG	2.59	0.42
1:D:51:GLU:OE1	1:D:51:GLU:N	2.44	0.42
1:A:88:ASN:ND2	2:A:201:OTX:H121	2.34	0.42
1:C:5:GLN:OE1	1:C:139:ALA:HB1	2.18	0.42
1:B:28:ASP:O	1:B:29:ILE:C	2.58	0.42
1:B:63:ASN:CG	1:B:63:ASN:O	2.57	0.42
1:D:158:GLU:OE1	1:D:162:ILE:HD13	2.20	0.42
1:A:44:GLU:CD	1:A:68:GLN:HE21	2.23	0.42
1:B:155:GLN:HG2	1:B:162:ILE:CG1	2.50	0.42
1:C:62:GLU:OE2	1:C:69:LYS:HE3	2.19	0.42
1:C:90:ASN:OD1	2:C:201:OTX:C9	2.68	0.42
1:C:100:LYS:O	1:C:124:ARG:HG3	2.19	0.42
1:D:81:VAL:C	1:D:82:PHE:CD1	2.93	0.42
1:B:110:SER:O	1:B:111:ALA:C	2.58	0.42
1:A:137:ASP:O	1:A:141:LYS:CE	2.64	0.42
1:B:44:GLU:OE1	1:D:127:GLU:OE1	2.37	0.42
1:C:39:LEU:HD11	2:C:201:OTX:C9	2.50	0.42
1:C:50:PRO:CA	3:C:305:HOH:O	2.67	0.42
1:D:71:ILE:HD11	1:D:84:ILE:CD1	2.49	0.42
1:A:14:LYS:HB2	1:A:99:TYR:CD2	2.55	0.42
1:B:28:ASP:OD1	1:B:30:SER:OG	2.31	0.42
1:C:86:ALA:HB3	2:C:201:OTX:H141	2.02	0.42
1:C:102:TYR:CD2	1:C:102:TYR:C	2.92	0.41
1:D:12:ILE:O	1:D:12:ILE:HG13	2.20	0.41
1:D:151:PHE:CG	1:D:161:HIS:HD2	2.38	0.41
2:A:201:OTX:C5	2:A:201:OTX:C18	2.98	0.41
1:A:88:ASN:HD22	2:A:201:OTX:H121	1.84	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:112:GLU:OE1	1:B:115:GLN:HG3	2.20	0.41
1:B:141:LYS:CG	1:B:142:ALA:N	2.84	0.41
1:C:140:LEU:HD11	1:C:145:MET:HG3	2.01	0.41
1:D:55:GLU:OE2	1:D:70:LYS:NZ	2.50	0.41
1:A:16:ALA:HA	1:A:46:LEU:O	2.20	0.41
1:D:32:LEU:O	1:D:33:ASP:C	2.57	0.41
1:D:130:ASP:O	1:D:133:LEU:N	2.54	0.41
1:B:73:ALA:HA	1:B:83:LYS:O	2.20	0.41
1:C:3:VAL:HG11	1:C:93:LEU:HD13	2.03	0.41
1:C:20:TYR:CZ	1:C:126:PRO:HG3	2.55	0.41
1:C:31:LEU:O	1:C:37:ALA:HB1	2.20	0.41
1:C:161:HIS:C	1:C:162:ILE:HG12	2.40	0.41
1:D:134:GLU:OE1	1:D:138:LYS:HE3	2.20	0.41
1:B:141:LYS:HG2	1:B:142:ALA:N	2.35	0.41
2:B:201:OTX:H122	2:B:201:OTX:C2	2.51	0.41
1:C:78:ILE:HG13	1:C:79:PRO:HD2	2.02	0.41
1:C:161:HIS:O	1:C:162:ILE:HB	2.21	0.41
1:D:139:ALA:O	1:D:143:LEU:HD13	2.21	0.41
1:B:156:LEU:HD23	1:B:161:HIS:HE2	1.85	0.41
1:C:14:LYS:HB2	1:C:99:TYR:CD2	2.55	0.41
1:D:74:GLU:O	1:D:75:LYS:O	2.38	0.41
1:A:26:ALA:HB2	1:A:118:VAL:HG23	2.02	0.41
1:A:78:ILE:HB	1:A:81:VAL:HG22	2.02	0.41
1:A:84:ILE:CG1	1:A:90:ASN:CB	2.98	0.41
1:B:12:ILE:HG12	1:B:12:ILE:O	2.20	0.41
1:C:56:ILE:HB	1:C:71:ILE:HG13	2.03	0.41
1:C:60:LYS:NZ	1:C:61:TRP:O	2.52	0.41
1:C:63:ASN:O	1:C:63:ASN:OD1	2.39	0.41
1:C:73:ALA:HA	1:C:83:LYS:O	2.20	0.41
1:C:90:ASN:OD1	2:C:201:OTX:N1	2.54	0.41
1:C:148:ARG:CZ	1:C:150:SER:HB2	2.51	0.41
1:D:7:MET:CE	1:D:97:THR:HG22	2.51	0.41
1:A:122:LEU:N	1:A:122:LEU:CD2	2.83	0.41
1:C:106:CYS:HA	1:C:118:VAL:O	2.21	0.41
1:D:46:LEU:HD22	1:D:56:ILE:CD1	2.51	0.41
1:C:116:SER:OG	2:C:201:OTX:CL	2.63	0.40
1:B:71:ILE:HD11	1:B:84:ILE:HG13	2.02	0.40
1:C:41:VAL:HB	1:C:58:LEU:HD13	2.03	0.40
1:C:74:GLU:O	1:C:83:LYS:HG2	2.22	0.40
1:A:58:LEU:HD12	1:A:58:LEU:C	2.42	0.40
1:B:85:ASP:O	2:B:201:OTX:H152	2.20	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:47:LYS:O	1:C:47:LYS:HD2	2.22	0.40
1:D:22:LEU:HD22	1:D:123:VAL:HG11	2.02	0.40
1:A:31:LEU:O	1:A:37:ALA:HB1	2.22	0.40
1:A:87:LEU:CD2	2:A:201:OTX:H182	2.51	0.40
1:A:90:ASN:ND2	2:A:201:OTX:C17	2.85	0.40
1:B:7:MET:CE	1:B:97:THR:HG22	2.51	0.40
1:C:17:GLY:O	1:C:45:GLU:HG2	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	161/162 (99%)	135 (84%)	20 (12%)	6 (4%)	3	4
1	B	161/162 (99%)	136 (84%)	21 (13%)	4 (2%)	5	9
1	C	160/162 (99%)	139 (87%)	14 (9%)	7 (4%)	2	3
1	D	161/162 (99%)	135 (84%)	19 (12%)	7 (4%)	2	3
All	All	643/648 (99%)	545 (85%)	74 (12%)	24 (4%)	3	4

All (24) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	33	ASP
1	A	86	ALA
1	A	113	PRO
1	A	114	GLU
1	A	115	GLN
1	B	111	ALA
1	C	86	ALA
1	C	113	PRO

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Mol	Chain	Res	Type
1	D	29	ILE
1	D	75	LYS
1	D	86	ALA
1	D	113	PRO
1	D	114	GLU
1	D	115	GLN
1	C	75	LYS
1	C	159	GLN
1	C	160	CYS
1	A	75	LYS
1	C	116	SER
1	B	114	GLU
1	B	159	GLN
1	B	113	PRO
1	D	96	ASP
1	C	2	ILE

### 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	146/145 (101%)	128 (88%)	18 (12%)	4	9
1	B	146/145 (101%)	131 (90%)	15 (10%)	7	13
1	C	145/145 (100%)	126 (87%)	19 (13%)	4	7
1	D	146/145 (101%)	122 (84%)	24 (16%)	2	3
All	All	583/580 (100%)	507 (87%)	76 (13%)	4	7

All (76) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	12	ILE
1	A	27	SER
1	A	28	ASP
1	A	40	ARG
1	A	45	GLU

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Mol	Chain	Res	Type
1	A	64	ASP
1	A	68	GLN
1	A	77	LYS
1	A	83	LYS
1	A	93	LEU
1	A	100	LYS
1	A	101	LYS
1	A	107	MET
1	A	109	ASN
1	A	110	SER
1	A	141	LYS
1	A	149	LEU
1	A	161	HIS
1	B	6	THR
1	B	18	THR
1	B	33	ASP
1	B	40	ARG
1	B	45	GLU
1	B	60	LYS
1	B	63	ASN
1	B	68	GLN
1	B	70	LYS
1	B	71	ILE
1	B	77	LYS
1	B	127	GLU
1	B	137	ASP
1	B	141	LYS
1	B	158	GLU
1	C	6	THR
1	C	12	ILE
1	C	39	LEU
1	C	40	ARG
1	C	47	LYS
1	C	55	GLU
1	C	63	ASN
1	C	76	THR
1	C	77	LYS
1	C	81	VAL
1	C	90	ASN
1	C	91	LYS
1	C	101	LYS
1	C	108	GLU

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Mol	Chain	Res	Type
1	C	110	SER
1	C	134	GLU
1	C	140	LEU
1	C	145	MET
1	C	148	ARG
1	D	5	GLN
1	D	12	ILE
1	D	20	TYR
1	D	21	SER
1	D	27	SER
1	D	30	SER
1	D	32	LEU
1	D	41	VAL
1	D	45	GLU
1	D	63	ASN
1	D	69	LYS
1	D	72	ILE
1	D	75	LYS
1	D	83	LYS
1	D	85	ASP
1	D	108[A]	GLU
1	D	108[B]	GLU
1	D	110	SER
1	D	130	ASP
1	D	135	LYS
1	D	140	LEU
1	D	141	LYS
1	D	150	SER
1	D	161	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 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 [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

4 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z  > 2$	Counts	RMSZ	# $ Z  > 2$
2	0TX	B	201	-	23,23,23	1.86	5 (21%)	28,30,30	1.90	7 (25%)
2	0TX	A	201	-	23,23,23	1.63	5 (21%)	28,30,30	3.22	17 (60%)
2	0TX	D	201	-	23,23,23	1.70	6 (26%)	28,30,30	3.11	7 (25%)
2	0TX	C	201	-	23,23,23	1.18	3 (13%)	28,30,30	1.86	9 (32%)

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	0TX	B	201	-	-	5/14/14/14	0/2/2/2
2	0TX	A	201	-	-	7/14/14/14	0/2/2/2
2	0TX	D	201	-	-	6/14/14/14	0/2/2/2
2	0TX	C	201	-	-	5/14/14/14	0/2/2/2

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	201	0TX	C10-N2	-5.06	1.41	1.47
2	A	201	0TX	C3-C4	-4.92	1.33	1.43
2	B	201	0TX	C3-C4	-4.31	1.34	1.43
2	D	201	0TX	C4-C9	-3.58	1.36	1.42
2	A	201	0TX	C4-C9	-3.57	1.36	1.42
2	D	201	0TX	C3-C4	-3.43	1.36	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	201	0TX	C4-C9	-3.28	1.37	1.42
2	C	201	0TX	C3-N2	3.22	1.47	1.38
2	D	201	0TX	C3-N2	3.13	1.47	1.38
2	D	201	0TX	C8-C9	-2.90	1.37	1.41
2	D	201	0TX	C5-C4	-2.86	1.36	1.42
2	A	201	0TX	C8-C7	2.51	1.41	1.36
2	C	201	0TX	C4-C9	-2.50	1.38	1.42
2	D	201	0TX	C9-N1	-2.46	1.33	1.37
2	C	201	0TX	C3-C4	-2.44	1.38	1.43
2	B	201	0TX	C7-CL	2.35	1.79	1.74
2	A	201	0TX	C1-N1	2.21	1.37	1.32
2	B	201	0TX	C8-C7	2.18	1.40	1.36
2	A	201	0TX	C10-N2	-2.14	1.45	1.47

All (40) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	201	0TX	C3-C4-C9	11.77	125.52	118.06
2	D	201	0TX	C18-C10-N2	-6.95	104.32	110.48
2	A	201	0TX	C5-C4-C9	6.53	125.63	118.33
2	A	201	0TX	C6-C7-CL	-5.97	110.02	119.35
2	A	201	0TX	C8-C9-N1	5.84	124.62	117.97
2	A	201	0TX	C5-C4-C3	-5.52	114.21	123.00
2	D	201	0TX	C5-C4-C3	-5.29	114.58	123.00
2	A	201	0TX	C4-C3-N2	-4.64	109.68	119.33
2	A	201	0TX	C4-C9-N1	-3.90	118.67	122.83
2	B	201	0TX	C5-C4-C9	3.82	122.60	118.33
2	A	201	0TX	C7-C8-C9	-3.80	116.29	119.50
2	D	201	0TX	C7-C8-C9	-3.74	116.35	119.50
2	B	201	0TX	C5-C4-C3	-3.73	117.06	123.00
2	A	201	0TX	C8-C7-CL	3.59	124.14	119.64
2	C	201	0TX	C3-C4-C9	3.58	120.32	118.06
2	B	201	0TX	C3-C4-C9	3.58	120.32	118.06
2	A	201	0TX	C2-C1-N1	-3.51	119.15	124.58
2	A	201	0TX	C3-C4-C9	3.32	120.16	118.06
2	C	201	0TX	C8-C7-CL	-3.27	115.55	119.64
2	A	201	0TX	C6-C7-C8	3.26	125.85	121.99
2	B	201	0TX	C4-C9-N1	-3.24	119.39	122.83
2	B	201	0TX	C11-C12-C13	-3.12	103.60	113.28
2	B	201	0TX	C8-C9-N1	3.04	121.44	117.97
2	C	201	0TX	C11-C12-C13	-2.98	104.05	113.28
2	C	201	0TX	C12-C13-N3	-2.86	106.64	113.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	201	0TX	C2-C1-N1	-2.71	120.39	124.58
2	D	201	0TX	C2-C3-C4	-2.69	114.41	119.68
2	C	201	0TX	C2-C1-N1	-2.67	120.45	124.58
2	C	201	0TX	C18-C10-C11	-2.59	106.57	111.47
2	A	201	0TX	C2-C3-N2	2.58	127.51	123.00
2	D	201	0TX	C6-C7-CL	-2.56	115.34	119.35
2	A	201	0TX	C8-C9-C4	-2.56	116.70	119.65
2	A	201	0TX	C1-N1-C9	2.51	120.82	116.93
2	A	201	0TX	C18-C10-N2	2.43	112.63	110.48
2	A	201	0TX	C1-C2-C3	-2.43	118.39	119.60
2	C	201	0TX	C5-C4-C3	-2.19	119.52	123.00
2	C	201	0TX	C7-C8-C9	-2.11	117.71	119.50
2	C	201	0TX	C4-C9-N1	-2.07	120.63	122.83
2	D	201	0TX	C4-C9-N1	-2.06	120.64	122.83
2	A	201	0TX	C6-C5-C4	-2.05	118.28	121.13

There are no chirality outliers.

All (23) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	201	0TX	C2-C3-N2-C10
2	A	201	0TX	C4-C3-N2-C10
2	A	201	0TX	C18-C10-N2-C3
2	B	201	0TX	N2-C10-C11-C12
2	B	201	0TX	C18-C10-C11-C12
2	C	201	0TX	C2-C3-N2-C10
2	C	201	0TX	C4-C3-N2-C10
2	C	201	0TX	C11-C10-N2-C3
2	A	201	0TX	C12-C13-N3-C16
2	A	201	0TX	C11-C12-C13-N3
2	A	201	0TX	C17-C16-N3-C14
2	D	201	0TX	C12-C13-N3-C14
2	B	201	0TX	C10-C11-C12-C13
2	D	201	0TX	C15-C14-N3-C16
2	B	201	0TX	C12-C13-N3-C14
2	C	201	0TX	C12-C13-N3-C14
2	C	201	0TX	C12-C13-N3-C16
2	D	201	0TX	C12-C13-N3-C16
2	D	201	0TX	C15-C14-N3-C13
2	D	201	0TX	C10-C11-C12-C13
2	B	201	0TX	C12-C13-N3-C16
2	A	201	0TX	C17-C16-N3-C13

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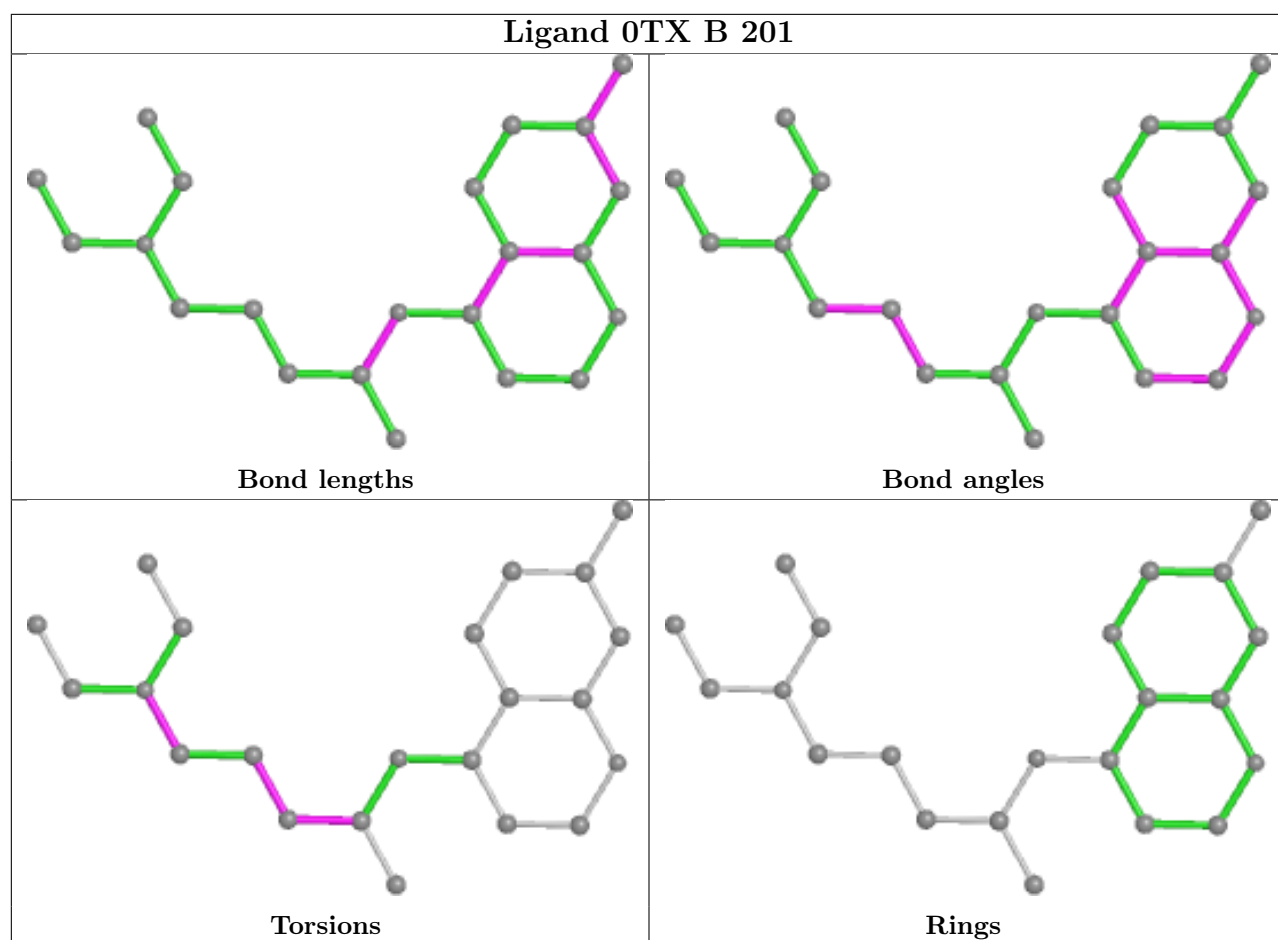
Mol	Chain	Res	Type	Atoms
2	D	201	0TX	C11-C12-C13-N3

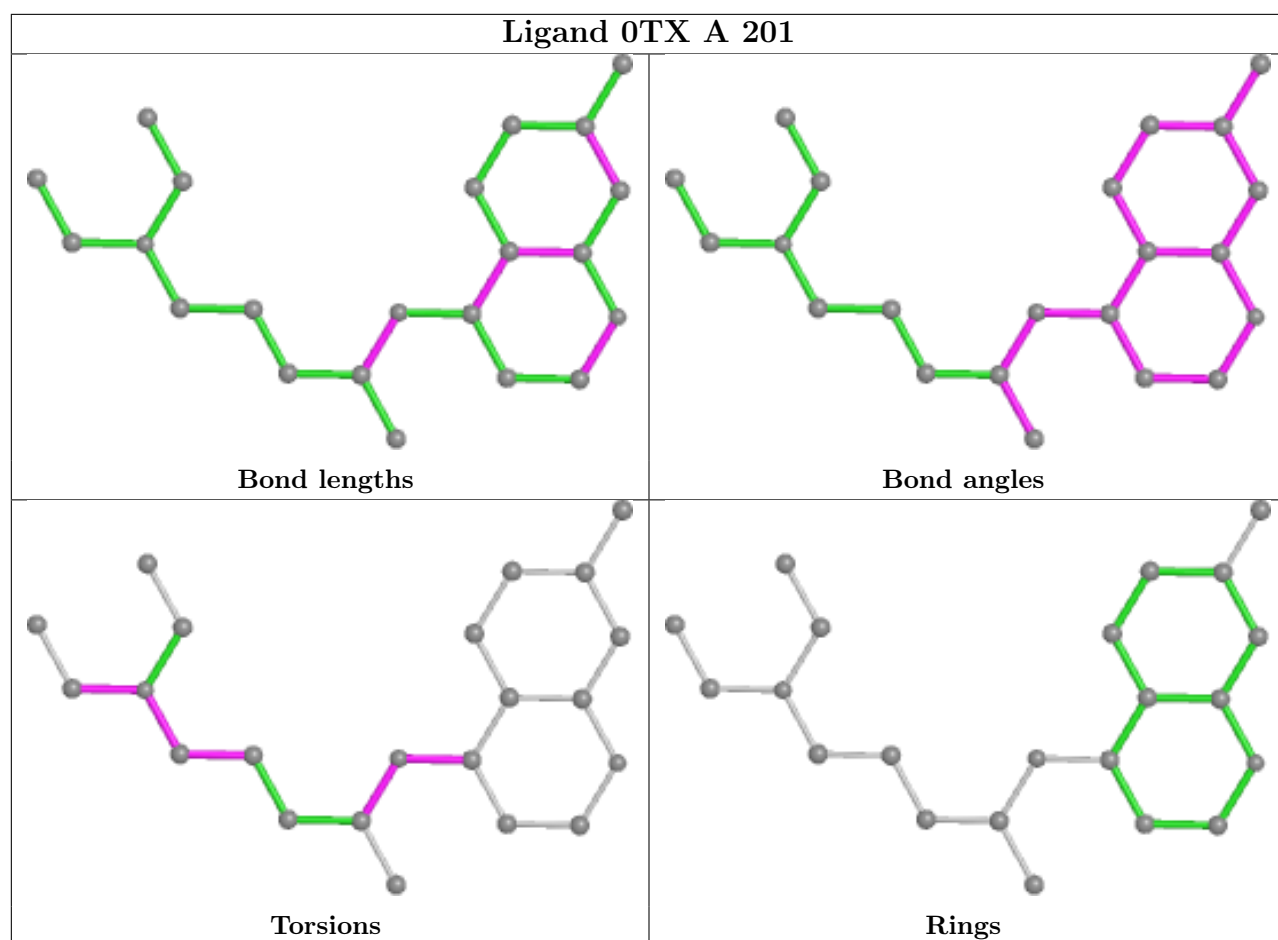
There are no ring outliers.

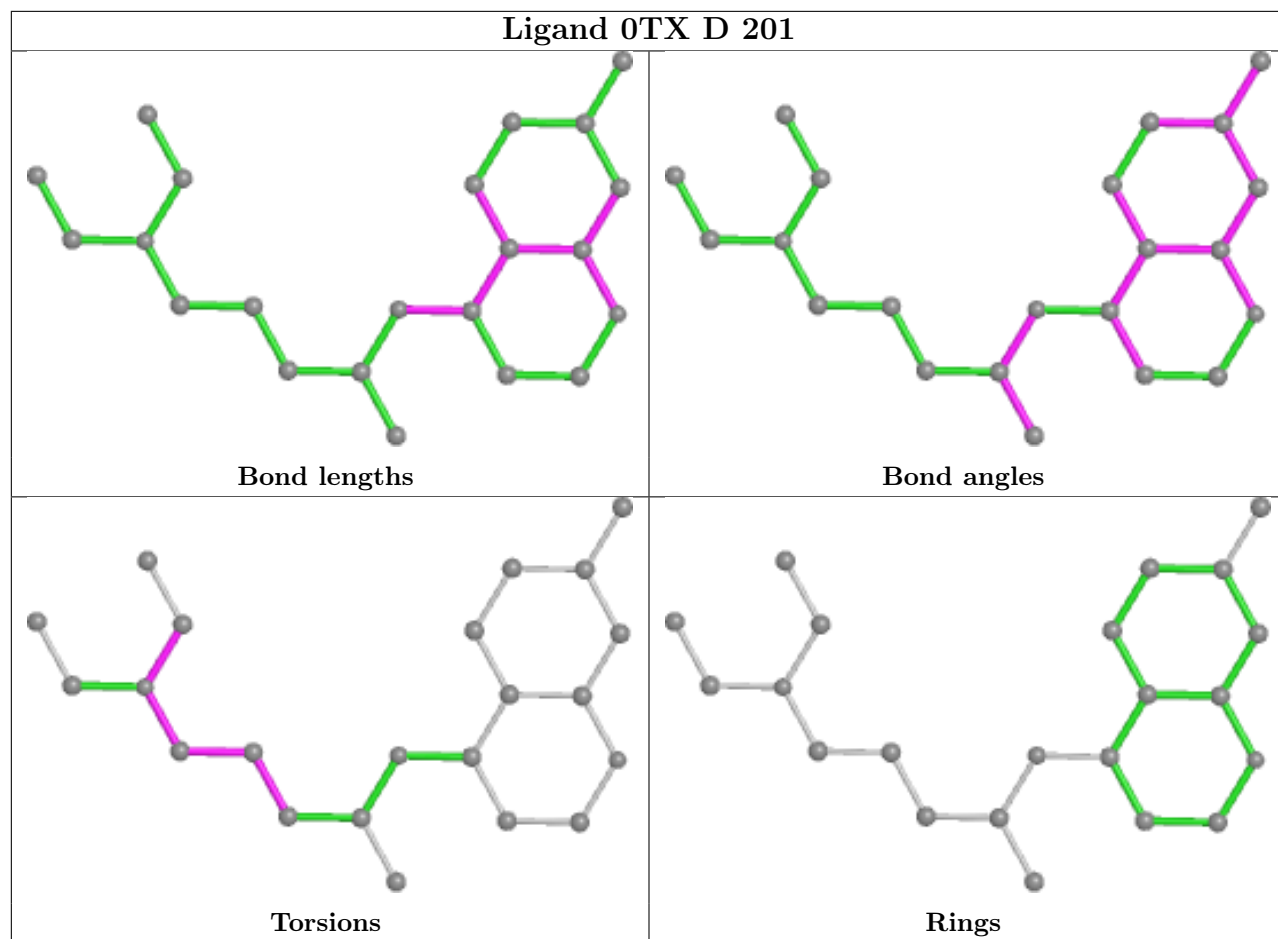
4 monomers are involved in 83 short contacts:

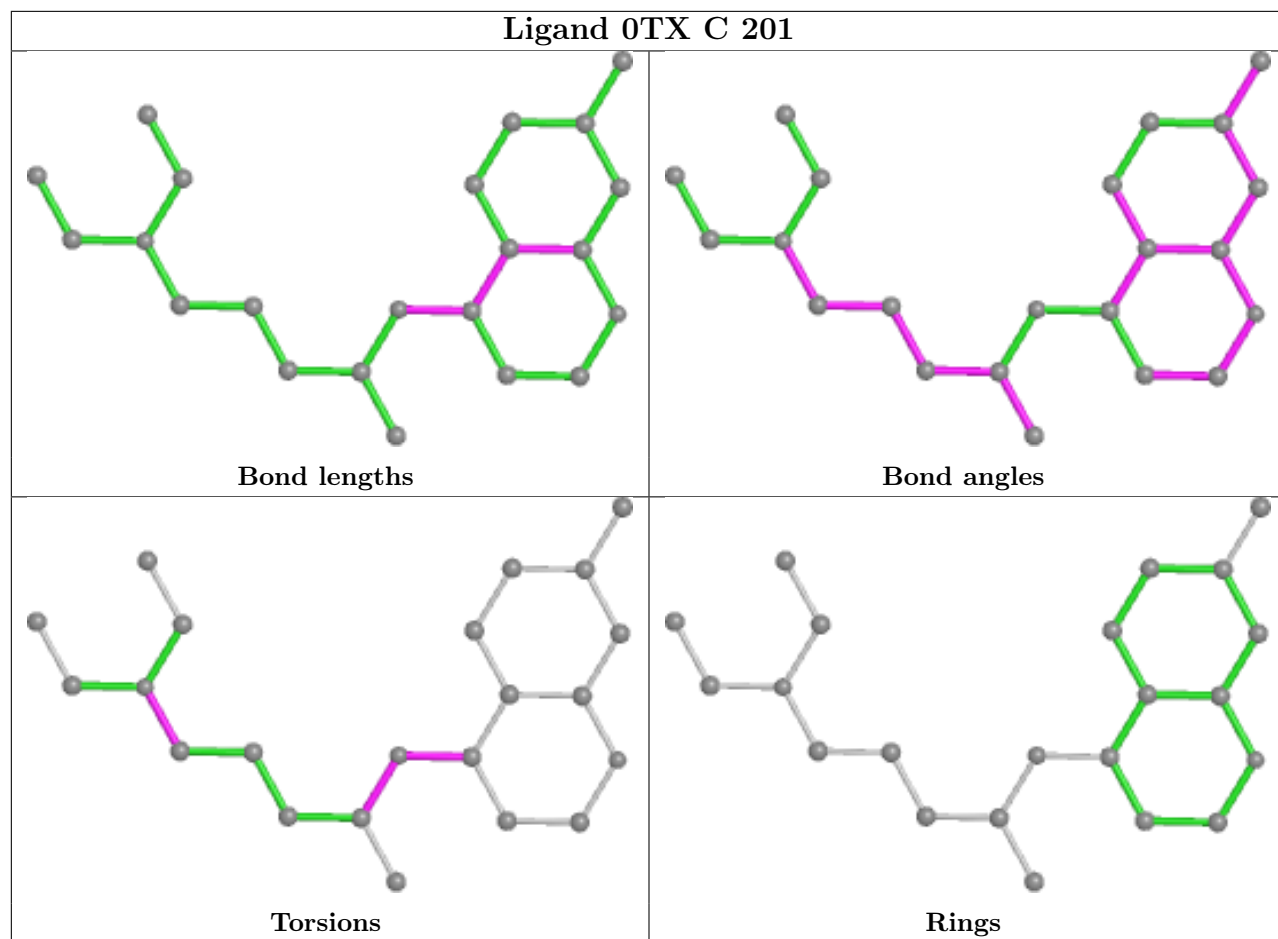
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	201	0TX	12	0
2	A	201	0TX	28	0
2	D	201	0TX	23	0
2	C	201	0TX	20	0

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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	162/162 (100%)	1.10	22 (13%)	3	1	30, 52, 95, 135	0
1	B	162/162 (100%)	1.09	21 (12%)	3	2	27, 53, 91, 122	0
1	C	162/162 (100%)	1.40	33 (20%)	1	0	29, 59, 94, 126	0
1	D	162/162 (100%)	1.50	35 (21%)	0	0	33, 65, 101, 131	0
All	All	648/648 (100%)	1.27	111 (17%)	1	1	27, 58, 98, 135	0

All (111) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	87	LEU	18.3
1	A	1	LEU	16.8
1	D	88	ASN	15.7
1	C	88	ASN	13.8
1	A	87	LEU	13.0
1	C	87	LEU	12.3
1	A	88	ASN	12.0
1	C	1	LEU	10.8
1	B	87	LEU	10.5
1	A	86	ALA	9.9
1	D	1	LEU	8.9
1	B	86	ALA	8.6
1	A	2	ILE	8.2
1	D	89	GLU	8.0
1	A	89	GLU	7.7
1	C	9	GLY	7.7
1	C	89	GLU	7.5
1	D	86	ALA	7.4
1	B	88	ASN	6.8
1	D	61	TRP	6.8
1	B	8	LYS	6.2

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Mol	Chain	Res	Type	RSRZ
1	C	10	LEU	6.1
1	C	86	ALA	5.8
1	B	1	LEU	5.7
1	B	2	ILE	5.5
1	C	113	PRO	5.3
1	B	89	GLU	4.8
1	A	4	THR	4.8
1	B	113	PRO	4.6
1	D	53	ASP	4.4
1	A	50	PRO	4.3
1	B	85	ASP	4.3
1	D	50	PRO	4.2
1	D	113	PRO	4.2
1	C	78	ILE	4.1
1	C	61	TRP	4.0
1	B	64	ASP	3.9
1	C	72	ILE	3.9
1	D	2	ILE	3.8
1	D	108[A]	GLU	3.7
1	D	114	GLU	3.7
1	C	77	LYS	3.6
1	D	105	PHE	3.5
1	C	31	LEU	3.5
1	D	64	ASP	3.4
1	D	102	TYR	3.4
1	D	79	PRO	3.4
1	A	5	GLN	3.4
1	C	8	LYS	3.4
1	B	63	ASN	3.4
1	B	43	VAL	3.3
1	D	90	ASN	3.3
1	A	61	TRP	3.3
1	D	106	CYS	3.2
1	B	10	LEU	3.2
1	D	10	LEU	3.2
1	D	99	TYR	3.1
1	A	131	GLU	3.1
1	C	50	PRO	3.0
1	C	111	ALA	3.0
1	D	142	ALA	3.0
1	A	141	LYS	3.0
1	B	105	PHE	3.0

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Mol	Chain	Res	Type	RSRZ
1	C	112	GLU	3.0
1	C	64	ASP	3.0
1	D	92	VAL	2.9
1	B	111	ALA	2.8
1	D	62	GLU	2.8
1	D	63	ASN	2.8
1	C	101	LYS	2.8
1	A	85	ASP	2.7
1	D	35	GLN	2.7
1	C	53	ASP	2.6
1	A	51	GLU	2.6
1	C	107	MET	2.6
1	A	64	ASP	2.5
1	D	119	CYS	2.5
1	C	162	ILE	2.5
1	B	3	VAL	2.5
1	B	77	LYS	2.5
1	C	134	GLU	2.5
1	A	34	ALA	2.4
1	A	125	THR	2.4
1	D	103	LEU	2.4
1	C	130	ASP	2.4
1	D	77	LYS	2.3
1	C	63	ASN	2.3
1	B	67	ALA	2.3
1	B	9	GLY	2.3
1	C	114	GLU	2.3
1	A	114	GLU	2.3
1	D	12	ILE	2.3
1	B	31	LEU	2.2
1	D	25	ALA	2.2
1	C	43	VAL	2.2
1	A	10	LEU	2.2
1	A	36	SER	2.2
1	D	100	LYS	2.2
1	A	106	CYS	2.2
1	D	160	CYS	2.2
1	C	85	ASP	2.1
1	D	83	LYS	2.1
1	A	62	GLU	2.1
1	C	5	GLN	2.1
1	D	13	GLN	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	131	GLU	2.1
1	C	139	ALA	2.1
1	B	61	TRP	2.1
1	C	145	MET	2.0
1	D	67	ALA	2.0
1	C	80	ALA	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

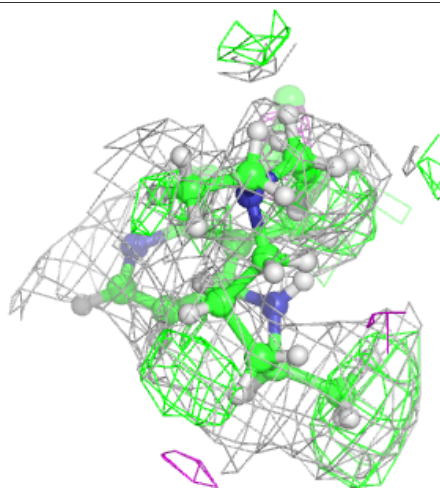
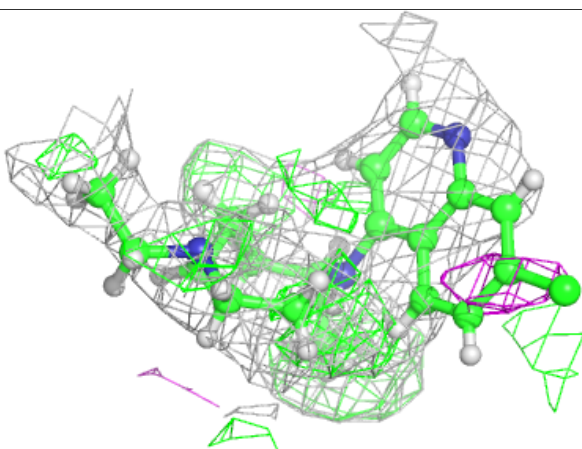
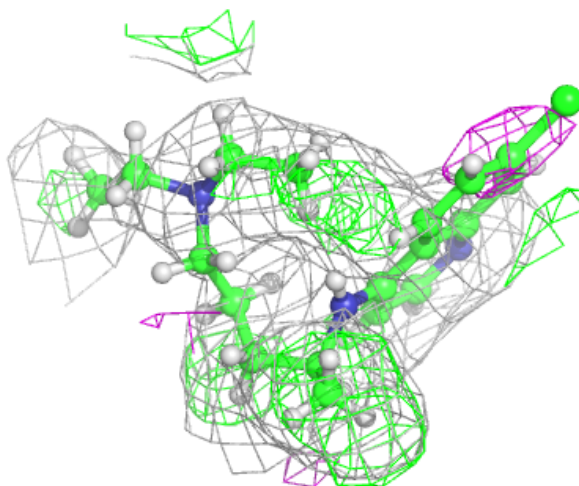
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 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
2	OTX	B	201	22/22	0.45	0.33	47,84,106,116	0
2	OTX	C	201	22/22	0.56	0.35	68,96,123,126	0
2	OTX	A	201	22/22	0.65	0.33	42,80,99,101	0
2	OTX	D	201	22/22	0.68	0.34	60,87,111,116	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.

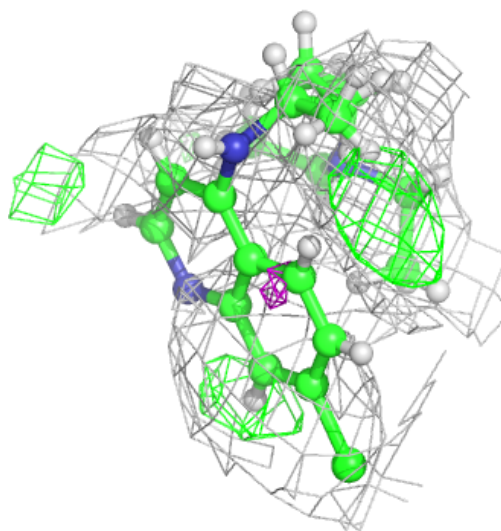
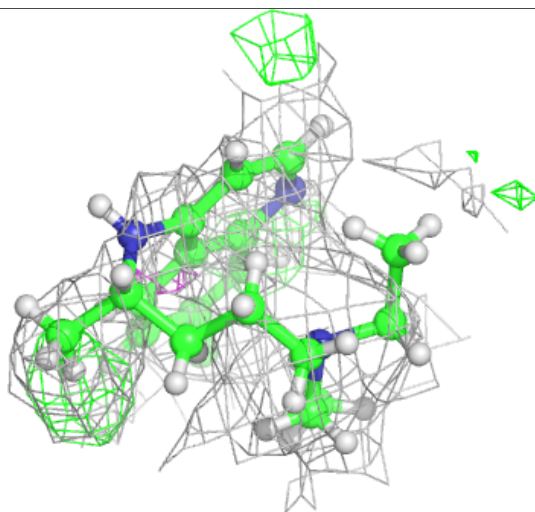
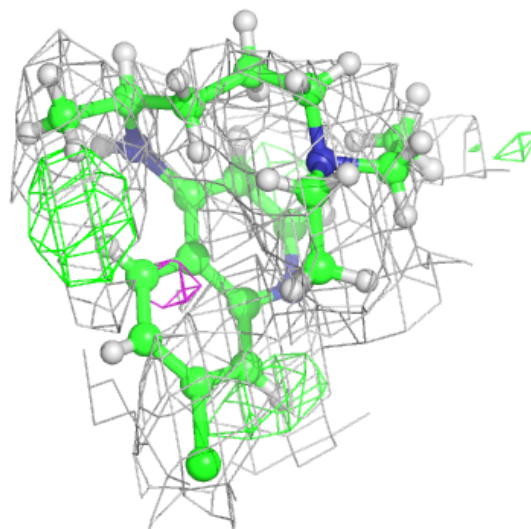
**Electron density around 0TX B 201:**

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



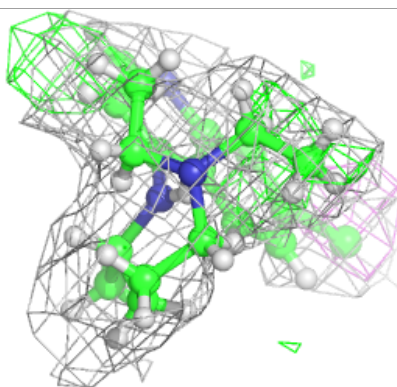
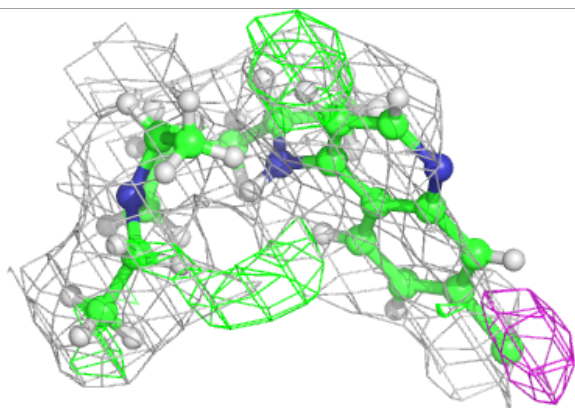
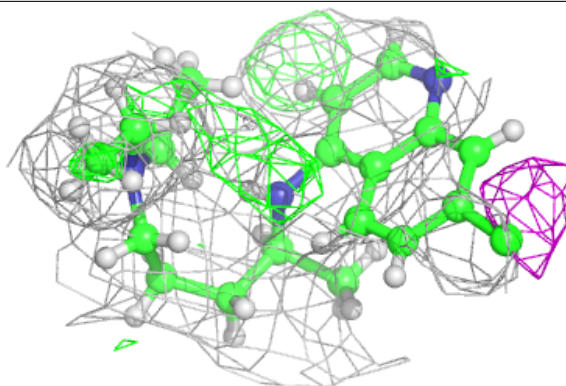
**Electron density around 0TX C 201:**

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

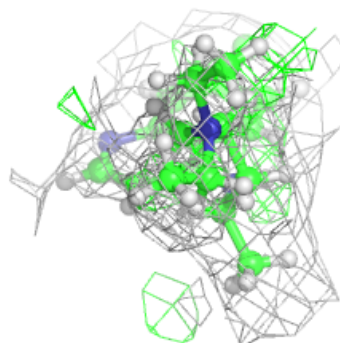
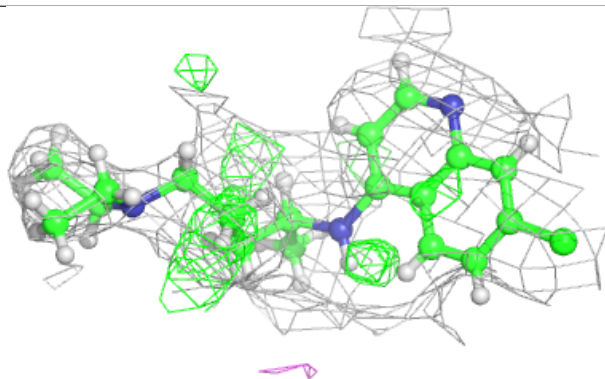
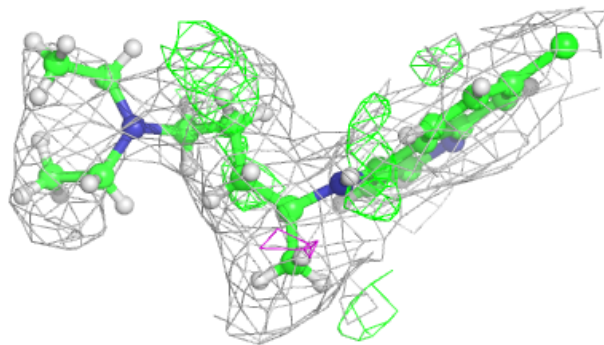


**Electron density around 0TX A 201:**

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

**Electron density around 0TX D 201:**

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



## 6.5 Other polymers ⓘ

There are no such residues in this entry.