Full wwPDB X-ray Structure Validation Report ⓘ

Feb 6, 2024 – 01:39 pm GMT

PDB ID	:	8PEC
Title	:	OXA-48_Q5-CAZ. Epistasis Arises from Shifting the Rate-Limiting Step during Enzyme Evolution
Authors	:	Leiros, H.-K.S.; Frohlich, C.
Deposited on	:	2023-06-13
Resolution	:	2.66 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:

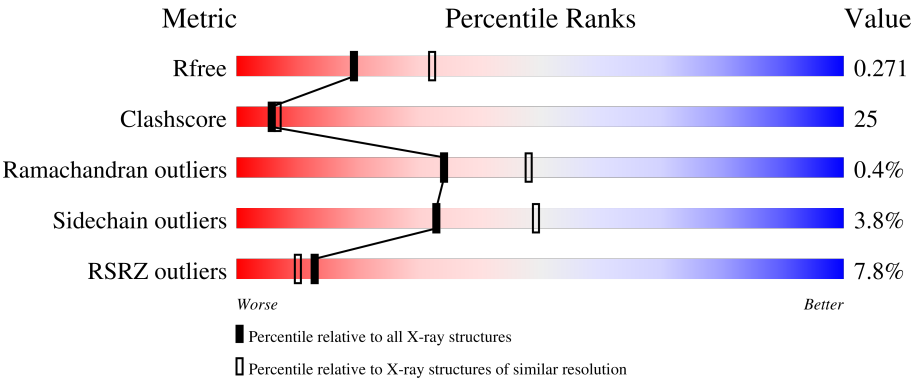
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.66 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	1332 (2.68-2.64)
Clashscore	141614	1374 (2.68-2.64)
Ramachandran outliers	138981	1349 (2.68-2.64)
Sidechain outliers	138945	1349 (2.68-2.64)
RSRZ outliers	127900	1318 (2.68-2.64)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	242	4% 66% 27% • 6%
1	B	242	4% 59% 33% • 5%
1	C	242	12% 49% 41% • 6%
1	D	242	10% 45% 48% • 6%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 7736 atoms, of which 67 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

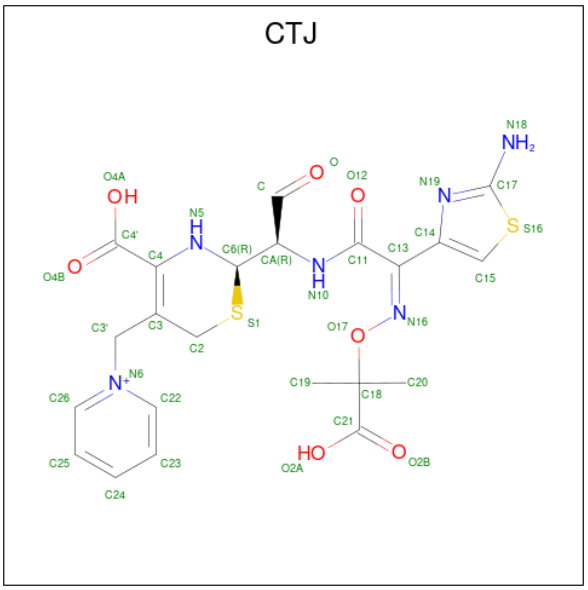
- Molecule 1 is a protein called Beta-lactamase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	228	Total	C	N	O	S	27	0	0
			1867	1190	332	338	7			
1	B	230	Total	C	N	O	S	9	0	0
			1879	1196	334	342	7			
1	C	227	Total	C	N	O	S	17	0	0
			1863	1188	331	337	7			
1	D	227	Total	C	N	O	S	20	0	0
			1863	1188	331	337	7			

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	33	VAL	ALA	engineered mutation	UNP Q6XEC0
A	51	GLU	LYS	engineered mutation	UNP Q6XEC0
A	72	LEU	PHE	engineered mutation	UNP Q6XEC0
A	212	ALA	SER	engineered mutation	UNP Q6XEC0
A	213	ALA	THR	engineered mutation	UNP Q6XEC0
B	33	VAL	ALA	engineered mutation	UNP Q6XEC0
B	51	GLU	LYS	engineered mutation	UNP Q6XEC0
B	72	LEU	PHE	engineered mutation	UNP Q6XEC0
B	212	ALA	SER	engineered mutation	UNP Q6XEC0
B	213	ALA	THR	engineered mutation	UNP Q6XEC0
C	33	VAL	ALA	engineered mutation	UNP Q6XEC0
C	51	GLU	LYS	engineered mutation	UNP Q6XEC0
C	72	LEU	PHE	engineered mutation	UNP Q6XEC0
C	212	ALA	SER	engineered mutation	UNP Q6XEC0
C	213	ALA	THR	engineered mutation	UNP Q6XEC0
D	33	VAL	ALA	engineered mutation	UNP Q6XEC0
D	51	GLU	LYS	engineered mutation	UNP Q6XEC0
D	72	LEU	PHE	engineered mutation	UNP Q6XEC0
D	212	ALA	SER	engineered mutation	UNP Q6XEC0
D	213	ALA	THR	engineered mutation	UNP Q6XEC0

- Molecule 2 is 1-({(2R)-2-[(1R)-1-{[(2Z)-2-(2-amino-1,3-thiazol-4-yl)-2-{[(2-carboxypropan-2-yl)oxy]imino}acetyl]amino}-2-oxoethyl]-4-carboxy-3,6-dihydro-2H-1,3-thiazin-5-yl}methyl)pyridinium (three-letter code: CTJ) (formula: $C_{22}H_{25}N_6O_7S_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C H N O S 58 22 21 6 7 2	22	0
2	C	1	Total C H N O S 60 22 23 6 7 2	29	0
2	D	1	Total C H N O S 60 22 23 6 7 2	23	0

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Cl 1 1	0	0
3	C	1	Total Cl 1 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	25	Total O 25 25	0	0
4	B	33	Total O 33 33	0	0

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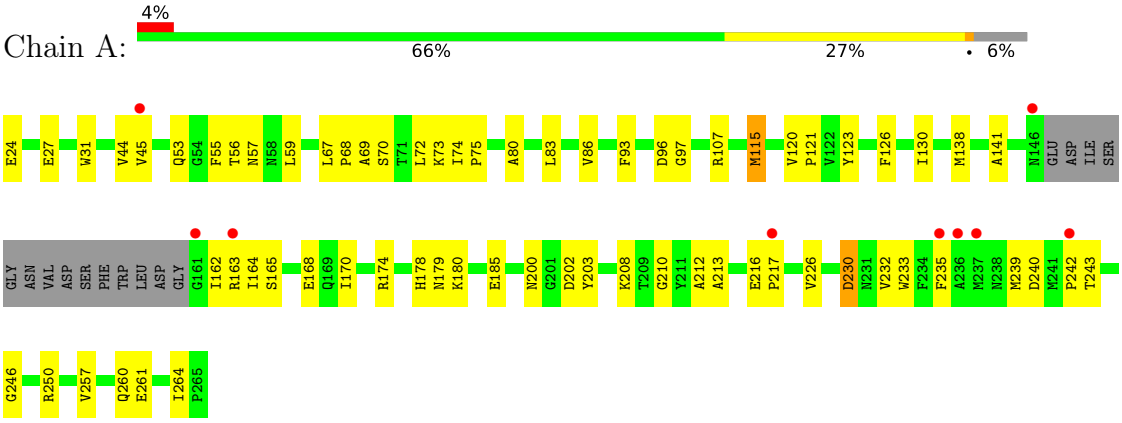
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	C	11	Total O 11 11	0	0
4	D	15	Total O 15 15	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

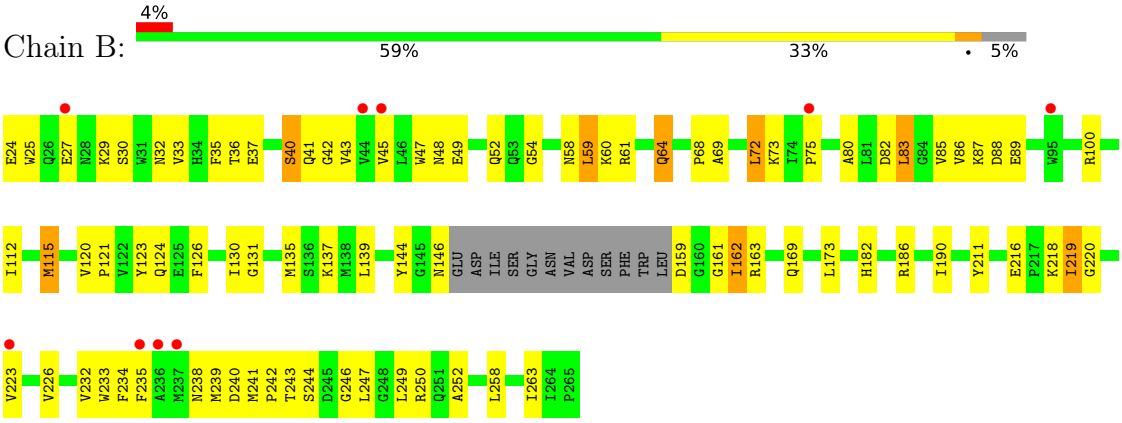
• Molecule 1: Beta-lactamase

Chain A:



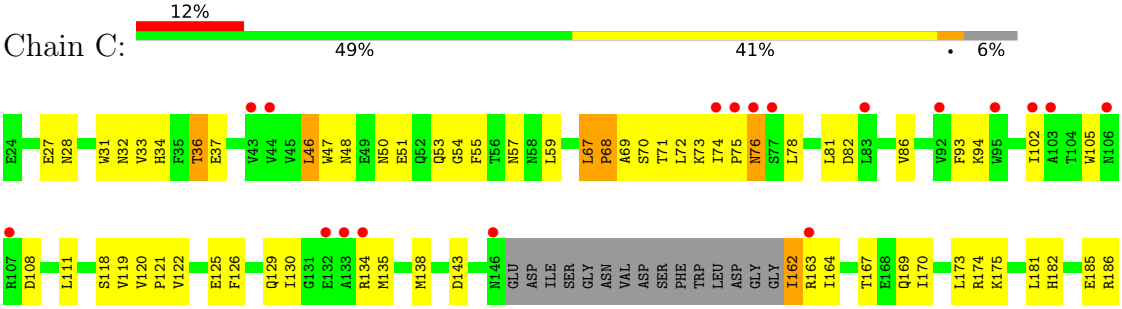
• Molecule 1: Beta-lactamase

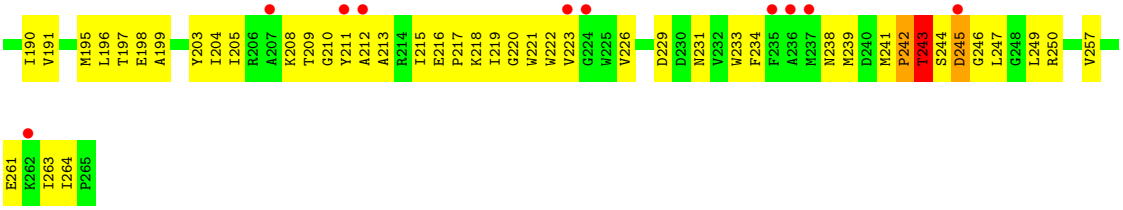
Chain B:



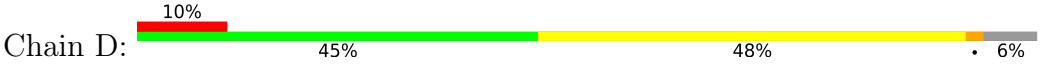
• Molecule 1: Beta-lactamase

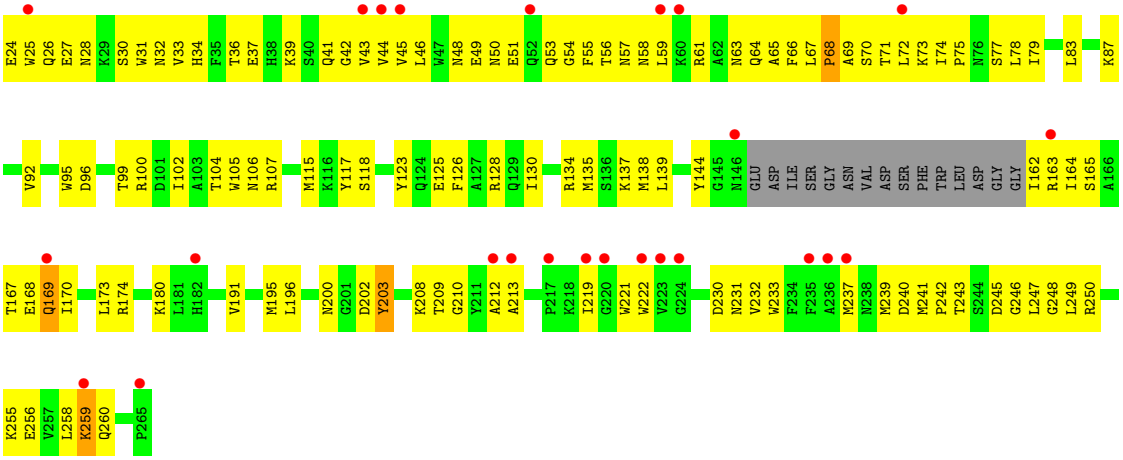
Chain C:





• Molecule 1: Beta-lactamase





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 61	Depositor
Cell constants a, b, c, α, β, γ	202.15Å 202.15Å 55.70Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	24.39 – 2.66 24.39 – 2.66	Depositor EDS
% Data completeness (in resolution range)	98.2 (24.39-2.66) 86.8 (24.39-2.66)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.01 (at 2.68Å)	Xtriage
Refinement program	PHENIX 1.18.2_3874	Depositor
R, R_{free}	0.202 , 0.271 0.202 , 0.271	Depositor DCC
R_{free} test set	1809 reflections (4.87%)	wwPDB-VP
Wilson B-factor (Å^2)	64.2	Xtriage
Anisotropy	0.277	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 70.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.022 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	7736	wwPDB-VP
Average B, all atoms (Å^2)	95.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.78% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

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

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	0.47	0/1911	0.61	0/2583
1	B	0.46	0/1923	0.60	0/2599
1	C	0.43	0/1907	0.60	0/2578
1	D	0.42	0/1907	0.57	0/2578
All	All	0.44	0/7648	0.60	0/10338

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	C	0	2
1	D	0	1
All	All	0	5

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	68	PRO	Peptide
1	B	68	PRO	Peptide
1	C	243	THR	Peptide
1	C	68	PRO	Peptide
1	D	68	PRO	Peptide

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1867	0	1839	53	0
1	B	1879	0	1847	73	0
1	C	1863	0	1835	105	0
1	D	1863	0	1834	138	0
2	A	37	21	22	12	0
2	C	37	23	23	11	0
2	D	37	23	23	9	0
3	A	1	0	0	0	0
3	C	1	0	0	0	0
4	A	25	0	0	0	0
4	B	33	0	0	0	0
4	C	11	0	0	3	0
4	D	15	0	0	1	0
All	All	7669	67	7423	374	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 25.

All (374) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:301:CTJ:C4	2:D:301:CTJ:C3	1.74	1.60
2:C:301:CTJ:C3	2:C:301:CTJ:C4	1.75	1.57
2:A:301:CTJ:C3	2:A:301:CTJ:C4	1.74	1.56
1:B:43:VAL:HB	1:B:61:ARG:HD3	1.35	1.07
1:A:212:ALA:HA	2:A:301:CTJ:H19B	1.40	0.98
1:B:169:GLN:HG2	1:B:223:VAL:HG11	1.49	0.92
1:B:126:PHE:O	1:B:130:ILE:HG13	1.70	0.92
1:D:212:ALA:HA	2:D:301:CTJ:H19B	1.59	0.85
1:C:212:ALA:HA	2:C:301:CTJ:H19B	1.58	0.83
1:D:34:HIS:HA	1:D:37:GLU:OE2	1.78	0.83
1:D:31:TRP:CH2	1:D:46:LEU:HG	2.15	0.82
1:C:164:ILE:HD13	1:C:169:GLN:HG2	1.61	0.81
1:C:169:GLN:OE1	1:C:223:VAL:HG11	1.79	0.81
1:C:27:GLU:HB2	1:C:59:LEU:HD11	1.64	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:170:ILE:O	1:A:174:ARG:HG3	1.82	0.79
1:A:213:ALA:H	2:A:301:CTJ:H19A	1.48	0.79
1:D:100:ARG:H	1:D:106:ASN:HD21	1.30	0.79
1:A:212:ALA:CA	2:A:301:CTJ:H19B	2.11	0.78
1:D:130:ILE:HD12	1:D:135:MET:CE	2.13	0.78
1:B:137:LYS:HD3	1:C:37:GLU:OE2	1.84	0.78
1:D:28:ASN:O	1:D:57:ASN:HA	1.83	0.78
1:D:241:MET:HE3	1:D:247:LEU:HA	1.65	0.77
1:C:229:ASP:OD1	1:D:117:TYR:OH	2.02	0.77
1:C:213:ALA:H	2:C:301:CTJ:C19	1.98	0.77
1:D:256:GLU:O	1:D:259:LYS:HE3	1.86	0.75
1:B:85:VAL:HG21	1:B:130:ILE:HG12	1.67	0.75
1:D:200:ASN:HD21	1:D:203:TYR:HE1	1.36	0.74
1:B:182:HIS:O	1:C:36:THR:HB	1.88	0.73
1:D:78:LEU:HD23	1:D:191:VAL:HG21	1.69	0.73
1:B:218:LYS:HD2	1:B:242:PRO:HA	1.71	0.72
1:C:208:LYS:HD2	4:C:404:HOH:O	1.88	0.72
1:C:203:TYR:HB2	1:C:226:VAL:HG23	1.72	0.72
1:B:61:ARG:HA	1:B:64:GLN:HB2	1.71	0.72
1:C:27:GLU:HB2	1:C:59:LEU:CD1	2.19	0.72
1:D:125:GLU:OE1	1:D:128:ARG:NH2	2.22	0.71
1:B:27:GLU:OE1	1:B:59:LEU:HD12	1.89	0.71
1:A:213:ALA:H	2:A:301:CTJ:C19	2.04	0.71
1:B:120:VAL:O	1:B:124:GLN:HG3	1.91	0.70
1:D:32:ASN:O	1:D:36:THR:HG23	1.92	0.70
1:A:70:SER:HB2	1:A:210:GLY:HA2	1.73	0.70
1:B:29:LYS:HE2	1:B:29:LYS:HA	1.73	0.70
1:D:72:LEU:HA	1:D:75:PRO:HD2	1.72	0.69
1:D:144:TYR:O	1:D:164:ILE:HD12	1.92	0.69
1:A:180:LYS:HA	1:A:180:LYS:HE2	1.75	0.69
1:C:213:ALA:H	2:C:301:CTJ:H19B	1.57	0.68
1:D:130:ILE:HD12	1:D:135:MET:HE3	1.75	0.68
1:D:137:LYS:HG2	1:D:138:MET:HE2	1.76	0.68
1:B:60:LYS:HD2	1:B:60:LYS:O	1.94	0.67
2:C:301:CTJ:C4	2:C:301:CTJ:C2	2.64	0.67
1:C:213:ALA:N	2:C:301:CTJ:H19B	2.10	0.66
1:A:72:LEU:HD12	1:A:75:PRO:HG2	1.78	0.65
1:D:63:ASN:OD1	1:D:167:THR:HG21	1.95	0.65
1:D:70:SER:N	2:D:301:CTJ:O	2.30	0.65
1:D:138:MET:HA	1:D:138:MET:CE	2.26	0.65
1:C:209:THR:OG1	2:C:301:CTJ:O4A	2.13	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:44:VAL:HG22	1:D:237:MET:HB2	1.79	0.65
1:C:102:ILE:HD12	1:C:105:TRP:CZ2	2.32	0.65
1:A:260:GLN:O	1:A:260:GLN:HG2	1.97	0.64
1:D:49:GLU:CB	1:D:232:VAL:HG13	2.27	0.64
1:D:209:THR:HB	1:D:250:ARG:NH2	2.11	0.64
1:C:241:MET:HE3	1:C:242:PRO:HD2	1.80	0.64
1:D:44:VAL:HG22	1:D:237:MET:CB	2.27	0.64
1:A:230:ASP:N	1:A:230:ASP:OD1	2.29	0.64
1:D:95:TRP:HB2	1:D:107:ARG:O	1.97	0.64
1:A:212:ALA:HA	2:A:301:CTJ:C19	2.24	0.63
1:D:31:TRP:HH2	1:D:46:LEU:HG	1.60	0.63
1:D:48:ASN:HB2	1:D:233:TRP:CH2	2.33	0.63
1:D:241:MET:HE3	1:D:247:LEU:CA	2.28	0.63
1:A:162:ILE:HD12	1:A:162:ILE:N	2.13	0.63
1:D:104:THR:HA	1:D:107:ARG:HH11	1.64	0.63
1:B:161:GLY:C	1:B:162:ILE:HD13	2.20	0.63
1:C:138:MET:HA	1:C:138:MET:CE	2.29	0.62
1:B:24:GLU:HG3	1:B:25:TRP:CD1	2.35	0.62
1:D:126:PHE:O	1:D:130:ILE:HG13	2.00	0.62
1:D:246:GLY:O	1:D:249:LEU:N	2.22	0.62
1:B:169:GLN:HG2	1:B:223:VAL:CG1	2.27	0.62
1:C:167:THR:HB	4:C:405:HOH:O	1.99	0.62
1:D:72:LEU:H	1:D:72:LEU:HD23	1.65	0.61
1:D:162:ILE:HD12	1:D:162:ILE:N	2.15	0.61
1:C:130:ILE:HA	1:C:134:ARG:HH11	1.65	0.61
1:C:219:ILE:HG13	1:C:219:ILE:O	2.00	0.61
1:A:226:VAL:CG1	1:A:233:TRP:HB2	2.31	0.61
1:B:33:VAL:O	1:B:37:GLU:HG2	2.01	0.60
1:C:211:TYR:CE1	1:C:241:MET:HG3	2.36	0.60
1:C:86:VAL:HG22	1:C:93:PHE:CZ	2.37	0.60
1:D:241:MET:HG3	1:D:243:THR:O	2.01	0.60
1:D:56:THR:HG21	1:D:59:LEU:CD2	2.31	0.60
1:C:191:VAL:O	1:C:195:MET:HG3	2.01	0.59
1:C:53:GLN:HG3	1:C:55:PHE:CE1	2.38	0.59
1:C:32:ASN:O	1:C:36:THR:HG23	2.02	0.59
1:C:246:GLY:HA3	1:C:249:LEU:HD23	1.84	0.59
1:D:200:ASN:ND2	1:D:203:TYR:HE1	2.01	0.58
1:D:256:GLU:HA	1:D:259:LYS:HG3	1.85	0.58
1:B:233:TRP:CD2	1:B:263:ILE:HD13	2.38	0.58
1:C:68:PRO:HD3	1:C:162:ILE:O	2.04	0.58
1:C:130:ILE:HA	1:C:134:ARG:NH1	2.19	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:31:TRP:O	1:C:33:VAL:O	2.22	0.58
1:B:226:VAL:CG1	1:B:233:TRP:HB2	2.33	0.57
1:A:24:GLU:OE2	1:A:24:GLU:N	2.36	0.57
1:B:211:TYR:OH	1:B:243:THR:O	2.14	0.57
1:B:35:PHE:CE1	1:B:42:GLY:HA3	2.39	0.57
1:B:131:GLY:O	1:B:135:MET:HG2	2.05	0.57
1:C:125:GLU:O	1:C:129:GLN:NE2	2.37	0.57
1:A:73:LYS:HD3	1:A:123:TYR:CE1	2.41	0.56
1:A:239:MET:HE2	1:A:250:ARG:CG	2.35	0.56
1:D:56:THR:HG21	1:D:59:LEU:HD23	1.86	0.56
1:C:120:VAL:N	1:C:121:PRO:HD2	2.20	0.56
1:C:78:LEU:HD11	1:C:181:LEU:HD12	1.86	0.56
1:C:86:VAL:HG22	1:C:93:PHE:HZ	1.69	0.56
1:D:70:SER:HB2	1:D:210:GLY:HA2	1.87	0.56
1:D:203:TYR:N	1:D:203:TYR:HD1	2.04	0.56
1:C:105:TRP:CD1	1:C:119:VAL:HG22	2.41	0.55
1:D:39:LYS:HG3	1:D:39:LYS:O	2.07	0.55
1:C:186:ARG:O	1:C:190:ILE:HG13	2.05	0.55
1:C:220:GLY:O	1:C:238:ASN:HA	2.06	0.55
1:A:226:VAL:HG13	1:A:233:TRP:HB2	1.88	0.55
1:C:197:THR:HB	1:C:205:ILE:HG22	1.89	0.55
1:D:64:GLN:HB3	1:D:66:PHE:CE2	2.42	0.55
1:D:170:ILE:O	1:D:174:ARG:HG3	2.07	0.55
1:A:67:LEU:HD22	1:A:163:ARG:HD2	1.88	0.54
1:A:239:MET:HE2	1:A:250:ARG:HG3	1.87	0.54
1:B:32:ASN:O	1:B:36:THR:HG23	2.08	0.54
1:D:191:VAL:O	1:D:195:MET:HG3	2.08	0.54
1:B:80:ALA:HB1	1:B:86:VAL:HG23	1.88	0.54
1:C:213:ALA:N	2:C:301:CTJ:C19	2.67	0.54
1:B:29:LYS:HE2	1:B:32:ASN:HD21	1.72	0.54
1:C:102:ILE:HD12	1:C:105:TRP:CE2	2.43	0.54
1:D:41:GLN:HG3	1:D:42:GLY:N	2.23	0.54
1:D:256:GLU:O	1:D:260:GLN:HB2	2.08	0.54
1:D:213:ALA:CB	2:D:301:CTJ:HN1A	2.21	0.53
1:A:200:ASN:OD1	1:A:202:ASP:N	2.33	0.53
1:C:212:ALA:CA	2:C:301:CTJ:H19B	2.34	0.53
1:D:66:PHE:CD1	1:D:219:ILE:HD13	2.42	0.53
1:D:78:LEU:HD23	1:D:191:VAL:CG2	2.36	0.53
1:D:243:THR:HG23	1:D:245:ASP:H	1.73	0.53
1:A:67:LEU:HD22	1:A:163:ARG:CD	2.38	0.53
2:D:301:CTJ:O4B	4:D:401:HOH:O	2.18	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:243:THR:OG1	1:C:244:SER:N	2.40	0.53
1:D:41:GLN:HG3	1:D:42:GLY:H	1.73	0.53
1:B:47:TRP:HB3	1:B:234:PHE:HB2	1.91	0.53
1:C:50:ASN:HB2	1:C:231:ASN:ND2	2.24	0.53
1:A:165:SER:OG	1:A:168:GLU:HG3	2.09	0.53
1:D:209:THR:HG22	1:D:222:TRP:CD1	2.43	0.53
1:D:203:TYR:N	1:D:203:TYR:CD1	2.77	0.53
1:D:96:ASP:CG	1:D:100:ARG:HH12	2.12	0.52
1:C:138:MET:HA	1:C:138:MET:HE2	1.89	0.52
1:B:115:MET:HE2	1:B:123:TYR:OH	2.09	0.52
1:A:74:ILE:HB	1:A:75:PRO:CD	2.40	0.52
1:D:78:LEU:CD2	1:D:191:VAL:HG21	2.39	0.52
1:D:259:LYS:HD2	1:D:260:GLN:N	2.24	0.52
1:B:45:VAL:O	1:B:235:PHE:HA	2.09	0.52
1:C:134:ARG:O	1:C:138:MET:HG2	2.10	0.52
1:A:31:TRP:HB2	1:A:57:ASN:HB3	1.92	0.52
1:C:203:TYR:HB2	1:C:226:VAL:CG2	2.40	0.52
1:C:48:ASN:HB2	1:C:233:TRP:CZ3	2.46	0.51
1:C:119:VAL:HG12	1:C:122:VAL:HB	1.92	0.51
1:D:43:VAL:CG1	1:D:61:ARG:HG3	2.40	0.51
1:D:27:GLU:HB2	1:D:59:LEU:HD12	1.92	0.51
1:D:96:ASP:OD2	1:D:100:ARG:NH1	2.43	0.51
1:B:75:PRO:HG3	1:B:144:TYR:CE2	2.45	0.51
1:C:48:ASN:HB2	1:C:233:TRP:CH2	2.45	0.51
1:D:138:MET:HE2	1:D:138:MET:HA	1.92	0.51
1:C:53:GLN:HG3	1:C:55:PHE:HE1	1.74	0.51
1:D:167:THR:HG23	1:D:168:GLU:N	2.25	0.51
1:A:257:VAL:O	1:A:261:GLU:HG2	2.11	0.51
1:C:53:GLN:CG	1:C:55:PHE:HE1	2.23	0.51
1:C:111:LEU:O	1:C:111:LEU:HG	2.10	0.51
1:A:45:VAL:HG12	1:A:170:ILE:CD1	2.41	0.50
1:B:29:LYS:HE2	1:B:32:ASN:ND2	2.26	0.50
1:D:212:ALA:CA	2:D:301:CTJ:H19B	2.37	0.50
1:B:249:LEU:HA	1:B:252:ALA:HB3	1.93	0.50
1:D:56:THR:CG2	1:D:59:LEU:HG	2.41	0.50
1:C:47:TRP:HB3	1:C:234:PHE:HB2	1.91	0.50
1:D:130:ILE:HA	1:D:134:ARG:HH11	1.77	0.50
1:B:24:GLU:HG3	1:B:25:TRP:N	2.27	0.50
1:B:226:VAL:HG12	1:B:233:TRP:HB2	1.92	0.50
1:B:130:ILE:HG21	1:B:135:MET:CE	2.42	0.50
1:A:86:VAL:HG13	1:A:93:PHE:HZ	1.76	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:241:MET:CE	1:B:246:GLY:H	2.24	0.50
1:D:31:TRP:HB2	1:D:57:ASN:HB3	1.93	0.50
1:D:30:SER:O	1:D:33:VAL:HG23	2.12	0.50
1:B:58:ASN:OD1	1:B:61:ARG:N	2.34	0.50
1:B:49:GLU:CB	1:B:232:VAL:HG13	2.42	0.49
1:D:79:ILE:O	1:D:83:LEU:HG	2.12	0.49
1:C:239:MET:HE3	1:C:241:MET:SD	2.52	0.49
1:B:216:GLU:OE2	1:B:218:LYS:HE2	2.12	0.49
1:D:66:PHE:HD1	1:D:219:ILE:HD13	1.77	0.49
1:D:74:ILE:HB	1:D:75:PRO:CD	2.42	0.49
1:A:178:HIS:O	1:A:180:LYS:HG2	2.13	0.49
1:B:244:SER:O	1:B:247:LEU:HG	2.13	0.49
1:C:211:TYR:CD2	1:C:247:LEU:HD21	2.47	0.49
1:C:213:ALA:H	2:C:301:CTJ:H19	1.77	0.49
1:D:72:LEU:HA	1:D:75:PRO:CD	2.43	0.49
1:D:115:MET:CE	1:D:208:LYS:HD3	2.43	0.49
1:D:230:ASP:OD2	1:D:230:ASP:N	2.45	0.49
1:D:104:THR:HA	1:D:107:ARG:NH1	2.27	0.48
1:B:73:LYS:HG2	1:B:123:TYR:CD2	2.48	0.48
1:B:135:MET:O	1:B:139:LEU:HD13	2.12	0.48
1:C:170:ILE:O	1:C:174:ARG:HG3	2.12	0.48
1:D:50:ASN:HD21	1:D:231:ASN:HA	1.78	0.48
1:D:165:SER:OG	1:D:167:THR:HG22	2.13	0.48
1:D:102:ILE:O	1:D:105:TRP:HB2	2.13	0.48
1:B:49:GLU:HB2	1:B:232:VAL:HG13	1.96	0.48
1:C:28:ASN:OD1	1:C:31:TRP:NE1	2.46	0.48
1:B:41:GLN:O	1:B:239:MET:HB2	2.14	0.48
1:C:196:LEU:HD21	1:D:196:LEU:HD11	1.96	0.48
1:D:51:GLU:O	1:D:53:GLN:HG3	2.13	0.48
1:C:67:LEU:CD2	1:C:163:ARG:HD2	2.44	0.47
1:D:73:LYS:O	1:D:77:SER:OG	2.27	0.47
1:B:219:ILE:HG22	1:B:240:ASP:HA	1.96	0.47
1:B:72:LEU:O	1:B:75:PRO:HD2	2.14	0.47
1:C:182:HIS:HB3	4:C:409:HOH:O	2.15	0.47
1:A:240:ASP:O	1:A:242:PRO:HD3	2.14	0.47
1:D:49:GLU:HB3	1:D:232:VAL:HG13	1.96	0.47
2:A:301:CTJ:C4	2:A:301:CTJ:C2	2.69	0.47
1:B:73:LYS:HG2	1:B:123:TYR:CG	2.49	0.47
1:C:130:ILE:CG2	1:C:135:MET:HG2	2.45	0.47
1:D:31:TRP:CZ3	1:D:56:THR:HA	2.49	0.47
1:C:215:ILE:HG23	1:C:217:PRO:O	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:263:ILE:HG22	1:C:264:ILE:HG23	1.96	0.47
1:A:83:LEU:HD12	1:A:130:ILE:HG12	1.97	0.47
2:A:301:CTJ:C4	2:A:301:CTJ:C3'	2.82	0.47
1:B:135:MET:O	1:B:139:LEU:CD1	2.62	0.47
1:C:215:ILE:HD12	1:C:216:GLU:H	1.79	0.47
1:D:65:ALA:HA	1:D:165:SER:HA	1.97	0.47
1:D:95:TRP:HB2	1:D:107:ARG:C	2.34	0.47
2:A:301:CTJ:C3	2:A:301:CTJ:C4'	2.81	0.47
1:D:95:TRP:CE2	1:D:106:ASN:HA	2.50	0.47
1:A:239:MET:CE	1:A:250:ARG:HG3	2.45	0.47
1:A:96:ASP:OD1	1:A:97:GLY:N	2.48	0.46
1:D:43:VAL:HB	1:D:61:ARG:CG	2.45	0.46
1:C:78:LEU:CD1	1:C:181:LEU:HD12	2.44	0.46
1:D:54:GLY:C	1:D:55:PHE:HD1	2.18	0.46
1:D:68:PRO:HB2	1:D:72:LEU:HD22	1.96	0.46
1:A:213:ALA:N	2:A:301:CTJ:C19	2.75	0.46
1:B:120:VAL:HB	1:B:121:PRO:HD3	1.97	0.46
1:D:66:PHE:HB3	1:D:219:ILE:CD1	2.46	0.46
1:A:243:THR:HG23	1:A:246:GLY:H	1.81	0.46
1:B:241:MET:HE2	1:B:246:GLY:H	1.80	0.46
1:D:130:ILE:HD12	1:D:135:MET:HE2	1.93	0.46
1:A:115:MET:O	1:A:208:LYS:HE2	2.16	0.46
1:C:50:ASN:HB2	1:C:231:ASN:HD21	1.80	0.46
1:C:198:GLU:HG2	1:C:199:ALA:N	2.30	0.46
1:D:43:VAL:HG21	1:D:58:ASN:O	2.16	0.46
1:D:259:LYS:HD2	1:D:259:LYS:C	2.36	0.46
1:A:80:ALA:HA	1:A:130:ILE:HD11	1.97	0.46
1:D:246:GLY:O	1:D:249:LEU:HD23	2.15	0.46
1:B:42:GLY:HA3	1:B:239:MET:HB3	1.97	0.46
1:B:239:MET:HE2	1:B:250:ARG:N	2.32	0.45
2:C:301:CTJ:S1	2:C:301:CTJ:C11	3.03	0.45
1:D:87:LYS:HA	1:D:87:LYS:HD3	1.77	0.45
2:A:301:CTJ:S1	2:A:301:CTJ:C11	3.04	0.45
1:B:162:ILE:HD13	1:B:162:ILE:N	2.31	0.45
1:D:44:VAL:HG22	1:D:237:MET:HB3	1.98	0.45
1:B:35:PHE:HB3	1:B:40:SER:O	2.16	0.45
1:B:83:LEU:HD12	1:B:83:LEU:HA	1.80	0.45
1:D:45:VAL:C	1:D:46:LEU:HD23	2.37	0.45
1:C:74:ILE:HB	1:C:75:PRO:CD	2.47	0.45
1:A:123:TYR:O	1:A:126:PHE:HB2	2.16	0.45
1:D:46:LEU:O	1:D:54:GLY:HA2	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:203:TYR:CD2	1:A:264:ILE:HG22	2.52	0.45
1:B:29:LYS:HA	1:B:29:LYS:CE	2.46	0.45
1:C:67:LEU:HD22	1:C:162:ILE:O	2.16	0.45
1:C:67:LEU:HD23	1:C:163:ARG:HD2	1.99	0.45
1:C:164:ILE:CD1	1:C:169:GLN:HG2	2.39	0.45
1:A:45:VAL:O	1:A:235:PHE:HA	2.17	0.45
1:C:130:ILE:HG22	1:C:135:MET:HG2	1.99	0.45
1:A:27:GLU:HA	1:A:56:THR:O	2.17	0.44
1:D:213:ALA:HB3	2:D:301:CTJ:N19	2.32	0.44
1:C:246:GLY:O	1:C:249:LEU:HB2	2.17	0.44
1:C:94:LYS:HA	1:C:108:ASP:OD1	2.17	0.44
1:B:25:TRP:CE3	1:B:54:GLY:HA3	2.52	0.44
1:C:175:LYS:HB2	1:C:181:LEU:HD21	1.99	0.44
1:C:105:TRP:CH2	1:C:120:VAL:HG23	2.53	0.44
1:D:213:ALA:H	2:D:301:CTJ:C19	2.30	0.44
1:D:246:GLY:O	1:D:247:LEU:C	2.55	0.44
1:B:48:ASN:O	1:B:52:GLN:N	2.44	0.44
1:B:163:ARG:NH2	1:B:163:ARG:HG3	2.32	0.44
1:C:46:LEU:HA	1:C:46:LEU:HD12	1.63	0.44
1:A:120:VAL:N	1:A:121:PRO:HD2	2.32	0.44
1:B:169:GLN:CG	1:B:223:VAL:HG11	2.34	0.44
1:D:83:LEU:CD1	1:D:130:ILE:HG23	2.48	0.44
1:B:258:LEU:HD23	1:B:263:ILE:HD12	2.00	0.44
1:D:73:LYS:HE3	1:D:118:SER:HA	2.00	0.44
1:D:79:ILE:HG12	1:D:138:MET:HB3	2.00	0.44
1:D:43:VAL:HA	1:D:57:ASN:OD1	2.18	0.43
1:A:138:MET:O	1:A:141:ALA:N	2.50	0.43
1:B:87:LYS:NZ	1:B:88:ASP:OD2	2.48	0.43
1:D:27:GLU:HB2	1:D:59:LEU:CD1	2.47	0.43
1:D:43:VAL:CG2	1:D:58:ASN:HB3	2.48	0.43
1:C:33:VAL:HG22	1:C:34:HIS:N	2.34	0.43
1:A:27:GLU:HB3	1:A:59:LEU:HG	2.00	0.43
1:D:24:GLU:HG2	1:D:25:TRP:N	2.34	0.43
1:A:53:GLN:HG3	1:A:55:PHE:CZ	2.52	0.43
1:A:179:ASN:ND2	1:A:185:GLU:HG3	2.33	0.43
1:A:239:MET:HE2	1:A:250:ARG:HG2	2.00	0.43
1:B:130:ILE:HD12	1:B:135:MET:HE3	2.01	0.43
1:A:216:GLU:OE1	1:A:217:PRO:HA	2.19	0.43
1:D:72:LEU:CA	1:D:75:PRO:HD2	2.44	0.43
1:D:256:GLU:HA	1:D:259:LYS:CG	2.47	0.43
1:D:95:TRP:NE1	1:D:106:ASN:HA	2.34	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:180:LYS:HA	1:D:180:LYS:HD2	1.89	0.43
1:B:49:GLU:O	1:B:52:GLN:HG2	2.19	0.43
1:C:196:LEU:HD12	1:C:197:THR:N	2.33	0.43
1:D:99:THR:HA	1:D:106:ASN:ND2	2.34	0.43
1:A:164:ILE:HA	1:A:168:GLU:OE1	2.19	0.43
1:B:30:SER:O	1:B:33:VAL:HG12	2.19	0.43
1:D:246:GLY:O	1:D:248:GLY:N	2.51	0.43
1:A:162:ILE:HD12	1:A:162:ILE:H	1.83	0.42
1:B:146:ASN:CG	1:B:162:ILE:HG22	2.39	0.42
1:B:163:ARG:HG3	1:B:163:ARG:HH21	1.82	0.42
1:B:220:GLY:O	1:B:238:ASN:HA	2.19	0.42
1:C:209:THR:HG22	1:C:222:TRP:CD1	2.54	0.42
1:C:210:GLY:O	1:C:250:ARG:NH2	2.53	0.42
1:D:26:GLN:HE22	1:D:53:GLN:HB3	1.83	0.42
1:D:61:ARG:O	1:D:64:GLN:HB2	2.19	0.42
1:D:69:ALA:O	1:D:72:LEU:HD23	2.19	0.42
1:D:115:MET:HE2	1:D:208:LYS:HD3	2.01	0.42
1:C:48:ASN:ND2	1:C:51:GLU:HG2	2.34	0.42
1:C:54:GLY:O	1:C:55:PHE:HD1	2.02	0.42
1:A:162:ILE:C	1:A:163:ARG:HD3	2.40	0.42
1:B:43:VAL:HG12	1:B:238:ASN:OD1	2.20	0.42
1:C:120:VAL:N	1:C:121:PRO:CD	2.83	0.42
1:C:169:GLN:O	1:C:173:LEU:HG	2.19	0.42
1:D:139:LEU:HD23	1:D:139:LEU:HA	1.87	0.42
1:B:159:ASP:OD1	1:B:159:ASP:N	2.50	0.42
1:D:239:MET:HE3	1:D:241:MET:HE1	2.01	0.42
1:C:242:PRO:O	1:C:243:THR:C	2.57	0.42
1:D:66:PHE:HB3	1:D:219:ILE:HD11	2.00	0.42
1:D:202:ASP:HB2	1:D:203:TYR:CD1	2.55	0.42
1:C:126:PHE:CD2	1:C:126:PHE:N	2.87	0.42
1:C:53:GLN:CG	1:C:55:PHE:CE1	3.00	0.42
1:C:71:THR:HG21	1:C:221:TRP:HB3	2.01	0.42
1:D:79:ILE:HG12	1:D:138:MET:CB	2.50	0.42
1:D:169:GLN:O	1:D:173:LEU:HG	2.20	0.42
1:C:219:ILE:HA	1:C:239:MET:O	2.20	0.41
1:C:67:LEU:HD23	1:C:163:ARG:CD	2.50	0.41
1:C:204:ILE:HD13	1:D:196:LEU:HD23	2.01	0.41
1:C:241:MET:HE1	1:C:247:LEU:HA	2.02	0.41
1:A:44:VAL:O	1:A:56:THR:HA	2.20	0.41
1:C:239:MET:CE	1:C:241:MET:SD	3.09	0.41
1:D:70:SER:CA	2:D:301:CTJ:O	2.66	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:89:GLU:HB2	1:B:112:ILE:HG13	2.01	0.41
1:B:27:GLU:OE2	1:B:29:LYS:HE3	2.21	0.41
1:B:186:ARG:O	1:B:190:ILE:HG13	2.20	0.41
1:D:73:LYS:HD3	1:D:123:TYR:CE1	2.56	0.41
1:D:69:ALA:O	1:D:72:LEU:CD2	2.69	0.41
1:C:31:TRP:HB2	1:C:57:ASN:HB3	2.03	0.41
1:C:33:VAL:O	1:C:34:HIS:CB	2.68	0.41
1:A:162:ILE:N	1:A:162:ILE:CD1	2.81	0.41
1:C:68:PRO:HB3	1:C:164:ILE:HG22	2.01	0.41
1:C:245:ASP:OD1	1:C:245:ASP:N	2.32	0.41
1:D:65:ALA:HA	1:D:165:SER:CA	2.51	0.41
1:D:163:ARG:N	1:D:163:ARG:HD2	2.36	0.41
1:D:50:ASN:ND2	1:D:231:ASN:HA	2.35	0.41
1:D:138:MET:HE2	1:D:138:MET:CA	2.51	0.41
1:D:255:LYS:HA	1:D:258:LEU:HD12	2.03	0.41
1:B:58:ASN:OD1	1:B:61:ARG:CB	2.68	0.40
1:C:126:PHE:N	1:C:126:PHE:HD2	2.19	0.40
1:D:33:VAL:O	1:D:37:GLU:OE1	2.39	0.40
1:D:67:LEU:O	1:D:221:TRP:NE1	2.37	0.40
1:A:212:ALA:CB	2:A:301:CTJ:H19B	2.51	0.40
1:C:130:ILE:CA	1:C:134:ARG:HH11	2.32	0.40
1:C:143:ASP:OD1	1:C:143:ASP:O	2.39	0.40
1:D:66:PHE:CD1	1:D:219:ILE:CD1	3.04	0.40
1:D:74:ILE:HB	1:D:75:PRO:HD3	2.02	0.40
1:D:219:ILE:HG13	1:D:219:ILE:O	2.21	0.40
1:B:173:LEU:HD23	1:B:173:LEU:HA	1.85	0.40
1:C:70:SER:C	1:C:72:LEU:N	2.72	0.40
1:C:73:LYS:HA	1:C:76:ASN:HB2	2.03	0.40
1:C:257:VAL:O	1:C:261:GLU:HG2	2.21	0.40
1:D:137:LYS:CG	1:D:138:MET:HE2	2.48	0.40
1:D:240:ASP:O	1:D:242:PRO:HD3	2.21	0.40
1:C:81:LEU:HD23	1:C:86:VAL:HG12	2.04	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries

of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	224/242 (93%)	213 (95%)	10 (4%)	1 (0%)	34 48
1	B	226/242 (93%)	216 (96%)	9 (4%)	1 (0%)	34 48
1	C	223/242 (92%)	206 (92%)	15 (7%)	2 (1%)	17 26
1	D	223/242 (92%)	198 (89%)	25 (11%)	0	100 100
All	All	896/968 (93%)	833 (93%)	59 (7%)	4 (0%)	34 48

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	69	ALA
1	B	69	ALA
1	C	69	ALA
1	C	242	PRO

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	198/210 (94%)	194 (98%)	4 (2%)	55 73
1	B	199/210 (95%)	189 (95%)	10 (5%)	24 38
1	C	198/210 (94%)	187 (94%)	11 (6%)	21 33
1	D	198/210 (94%)	193 (98%)	5 (2%)	47 66
All	All	793/840 (94%)	763 (96%)	30 (4%)	33 49

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	107	ARG
1	A	115	MET

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Mol	Chain	Res	Type
1	A	230	ASP
1	A	232	VAL
1	B	40	SER
1	B	59	LEU
1	B	64	GLN
1	B	72	LEU
1	B	82	ASP
1	B	83	LEU
1	B	100	ARG
1	B	115	MET
1	B	162	ILE
1	B	219	ILE
1	C	36	THR
1	C	46	LEU
1	C	67	LEU
1	C	76	ASN
1	C	82	ASP
1	C	118	SER
1	C	162	ILE
1	C	185	GLU
1	C	218	LYS
1	C	243	THR
1	C	245	ASP
1	D	71	THR
1	D	92	VAL
1	D	169	GLN
1	D	203	TYR
1	D	259	LYS

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

Mol	Chain	Res	Type
1	A	129	GLN
1	A	178	HIS
1	B	32	ASN
1	C	28	ASN
1	C	53	GLN
1	D	32	ASN
1	D	50	ASN
1	D	106	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 monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 5 ligands modelled in this entry, 2 are monoatomic - leaving 3 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	$\#\|Z\| > 2$
2	CTJ	C	301	1	31,39,39	4.52	13 (41%)	35,55,55	3.21	11 (31%)
2	CTJ	D	301	1	31,39,39	4.45	13 (41%)	35,55,55	2.12	9 (25%)
2	CTJ	A	301	1	31,39,39	4.50	14 (45%)	35,55,55	2.25	6 (17%)

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	CTJ	C	301	1	-	7/26/51/51	0/2/3/3
2	CTJ	D	301	1	-	7/26/51/51	0/2/3/3
2	CTJ	A	301	1	-	8/26/51/51	0/2/3/3

All (40) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	301	CTJ	C3-C4	17.55	1.75	1.34
2	A	301	CTJ	C3-C4	17.32	1.74	1.34
2	D	301	CTJ	C3-C4	17.21	1.74	1.34
2	A	301	CTJ	C15-S16	-12.12	1.51	1.70
2	C	301	CTJ	C15-S16	-11.95	1.51	1.70
2	D	301	CTJ	C15-S16	-11.79	1.52	1.70
2	C	301	CTJ	C11-N10	6.35	1.46	1.34
2	C	301	CTJ	C14-N19	6.23	1.56	1.37
2	A	301	CTJ	C14-N19	6.13	1.56	1.37
2	D	301	CTJ	C11-N10	6.13	1.46	1.34
2	D	301	CTJ	C14-N19	6.11	1.56	1.37
2	A	301	CTJ	C11-N10	5.27	1.44	1.34
2	D	301	CTJ	O17-C18	-3.80	1.39	1.46
2	A	301	CTJ	O17-C18	-3.80	1.39	1.46
2	C	301	CTJ	O17-C18	-3.66	1.39	1.46
2	A	301	CTJ	C17-N18	3.62	1.45	1.35
2	C	301	CTJ	C17-N18	3.60	1.45	1.35
2	C	301	CTJ	C2-S1	-3.60	1.74	1.82
2	D	301	CTJ	C14-C13	3.56	1.53	1.48
2	D	301	CTJ	C17-N18	3.55	1.45	1.35
2	A	301	CTJ	C18-C21	-3.48	1.49	1.53
2	D	301	CTJ	C13-N16	-3.48	1.23	1.29
2	A	301	CTJ	CA-N10	-3.44	1.41	1.46
2	A	301	CTJ	C13-N16	-3.42	1.23	1.29
2	A	301	CTJ	C4-C4'	3.40	1.53	1.48
2	C	301	CTJ	C14-C13	3.35	1.53	1.48
2	D	301	CTJ	C2-S1	-2.90	1.75	1.82
2	A	301	CTJ	C2-S1	-2.89	1.75	1.82
2	C	301	CTJ	C13-C11	2.82	1.56	1.50
2	C	301	CTJ	C2-C3	-2.78	1.40	1.50
2	C	301	CTJ	O12-C11	-2.71	1.18	1.23
2	A	301	CTJ	C2-C3	-2.70	1.40	1.50
2	C	301	CTJ	C13-N16	-2.60	1.25	1.29
2	C	301	CTJ	C4-C4'	2.52	1.52	1.48
2	D	301	CTJ	C4-C4'	2.45	1.52	1.48
2	D	301	CTJ	CA-N10	-2.44	1.43	1.46
2	D	301	CTJ	O12-C11	-2.31	1.19	1.23
2	D	301	CTJ	C2-C3	-2.25	1.42	1.50
2	A	301	CTJ	O12-C11	-2.23	1.19	1.23
2	A	301	CTJ	C14-C13	2.20	1.51	1.48

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	301	CTJ	O17-N16-C13	10.61	128.36	111.87
2	C	301	CTJ	C2-S1-C6	8.50	111.13	94.47
2	A	301	CTJ	C2-S1-C6	8.26	110.68	94.47
2	C	301	CTJ	C18-O17-N16	-7.39	103.77	110.33
2	D	301	CTJ	C2-S1-C6	6.24	106.71	94.47
2	D	301	CTJ	O17-N16-C13	5.79	120.87	111.87
2	C	301	CTJ	C6-N5-C4	-5.08	106.38	118.32
2	A	301	CTJ	C18-O17-N16	-4.94	105.95	110.33
2	A	301	CTJ	O17-N16-C13	4.83	119.37	111.87
2	C	301	CTJ	C13-C11-N10	4.75	122.26	114.38
2	A	301	CTJ	C14-C15-S16	-4.07	106.79	111.79
2	D	301	CTJ	C18-O17-N16	-3.82	106.94	110.33
2	C	301	CTJ	CA-N10-C11	3.74	128.10	122.26
2	D	301	CTJ	C14-C15-S16	-3.37	107.65	111.79
2	C	301	CTJ	C3-C2-S1	-3.17	109.20	115.08
2	D	301	CTJ	O-C-CA	-3.14	116.07	124.83
2	C	301	CTJ	C2-C3-C4	-3.10	113.85	123.64
2	D	301	CTJ	C6-N5-C4	-3.01	111.25	118.32
2	D	301	CTJ	C13-C11-N10	2.80	119.03	114.38
2	C	301	CTJ	C14-C15-S16	-2.76	108.40	111.79
2	C	301	CTJ	O12-C11-N10	-2.70	118.35	123.08
2	D	301	CTJ	O4A-C4'-C4	2.51	120.89	116.76
2	D	301	CTJ	C6-CA-N10	-2.35	104.84	109.98
2	A	301	CTJ	C3-C4-C4'	-2.34	117.61	125.96
2	C	301	CTJ	O-C-CA	-2.20	118.71	124.83
2	A	301	CTJ	O4A-C4'-C4	2.04	120.13	116.76

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	301	CTJ	C-CA-N10-C11
2	C	301	CTJ	N5-C4-C4'-O4A
2	D	301	CTJ	N5-C4-C4'-O4A
2	D	301	CTJ	N5-C4-C4'-O4B
2	D	301	CTJ	C19-C18-O17-N16
2	A	301	CTJ	C3-C3'-N6-C26
2	C	301	CTJ	C3-C3'-N6-C26
2	C	301	CTJ	C3-C3'-N6-C22
2	A	301	CTJ	O12-C11-C13-N16
2	C	301	CTJ	O12-C11-C13-C14
2	A	301	CTJ	C3-C3'-N6-C22
2	A	301	CTJ	C6-CA-N10-C11

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Mol	Chain	Res	Type	Atoms
2	A	301	CTJ	C3-C4-C4'-O4B
2	C	301	CTJ	C3-C4-C4'-O4A
2	C	301	CTJ	N10-C11-C13-N16
2	D	301	CTJ	C3-C4-C4'-O4B
2	D	301	CTJ	O12-C11-C13-N16
2	A	301	CTJ	N10-C11-C13-N16
2	D	301	CTJ	N10-C11-C13-N16
2	A	301	CTJ	O12-C11-C13-C14
2	D	301	CTJ	O12-C11-C13-C14
2	C	301	CTJ	O12-C11-C13-N16

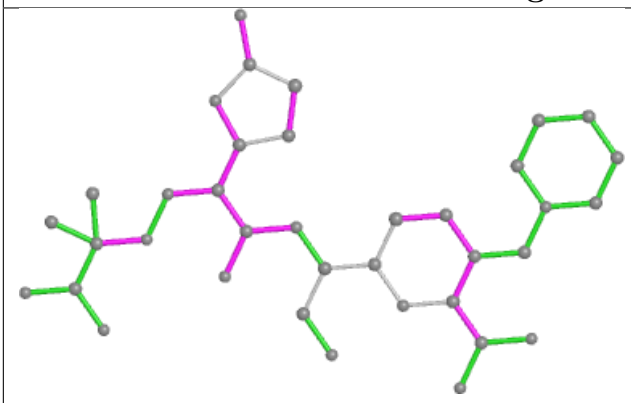
There are no ring outliers.

3 monomers are involved in 32 short contacts:

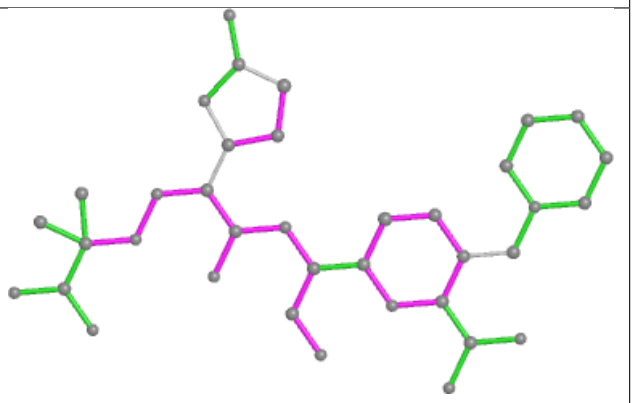
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	301	CTJ	11	0
2	D	301	CTJ	9	0
2	A	301	CTJ	12	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

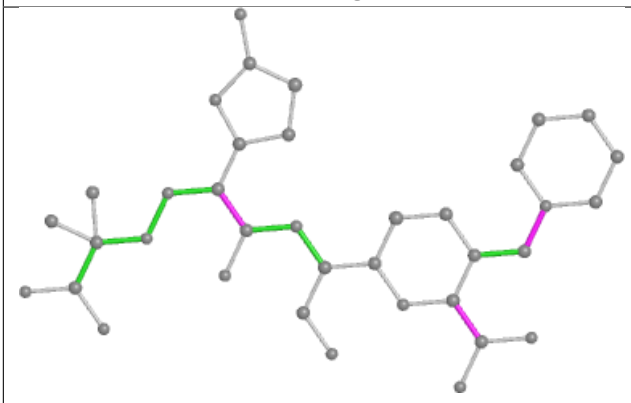
Ligand CTJ C 301



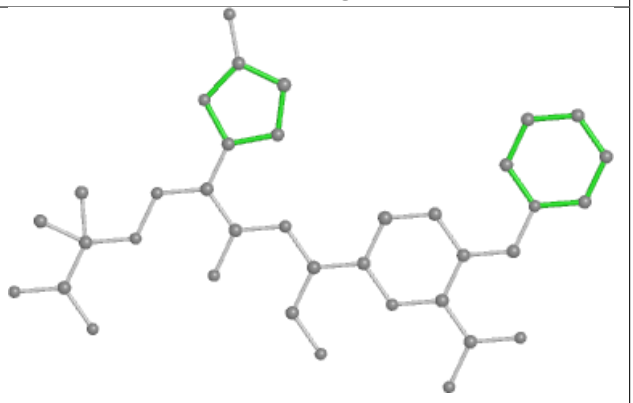
Bond lengths



Bond angles

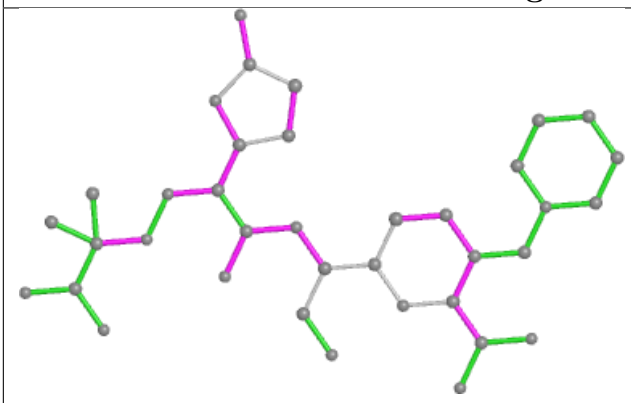


Torsions

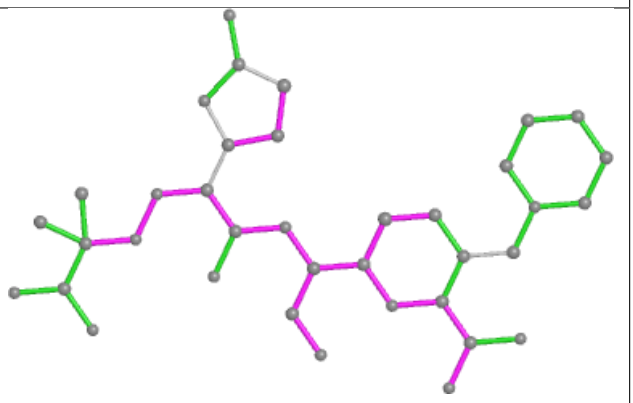


Rings

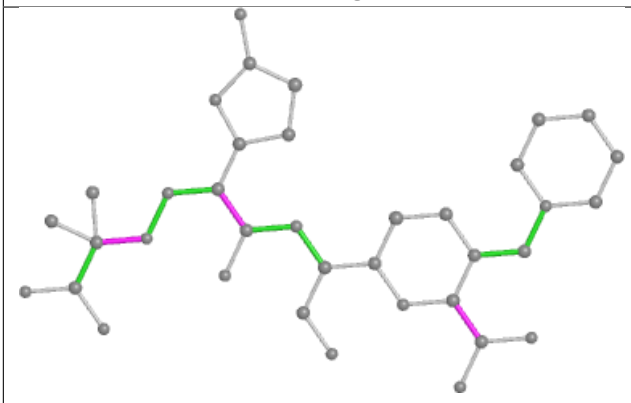
Ligand CTJ D 301



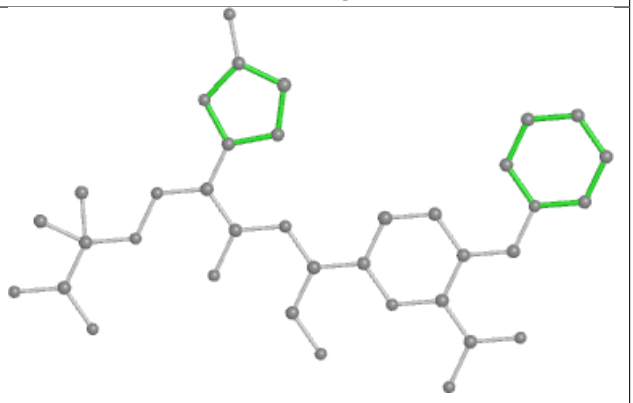
Bond lengths



Bond angles

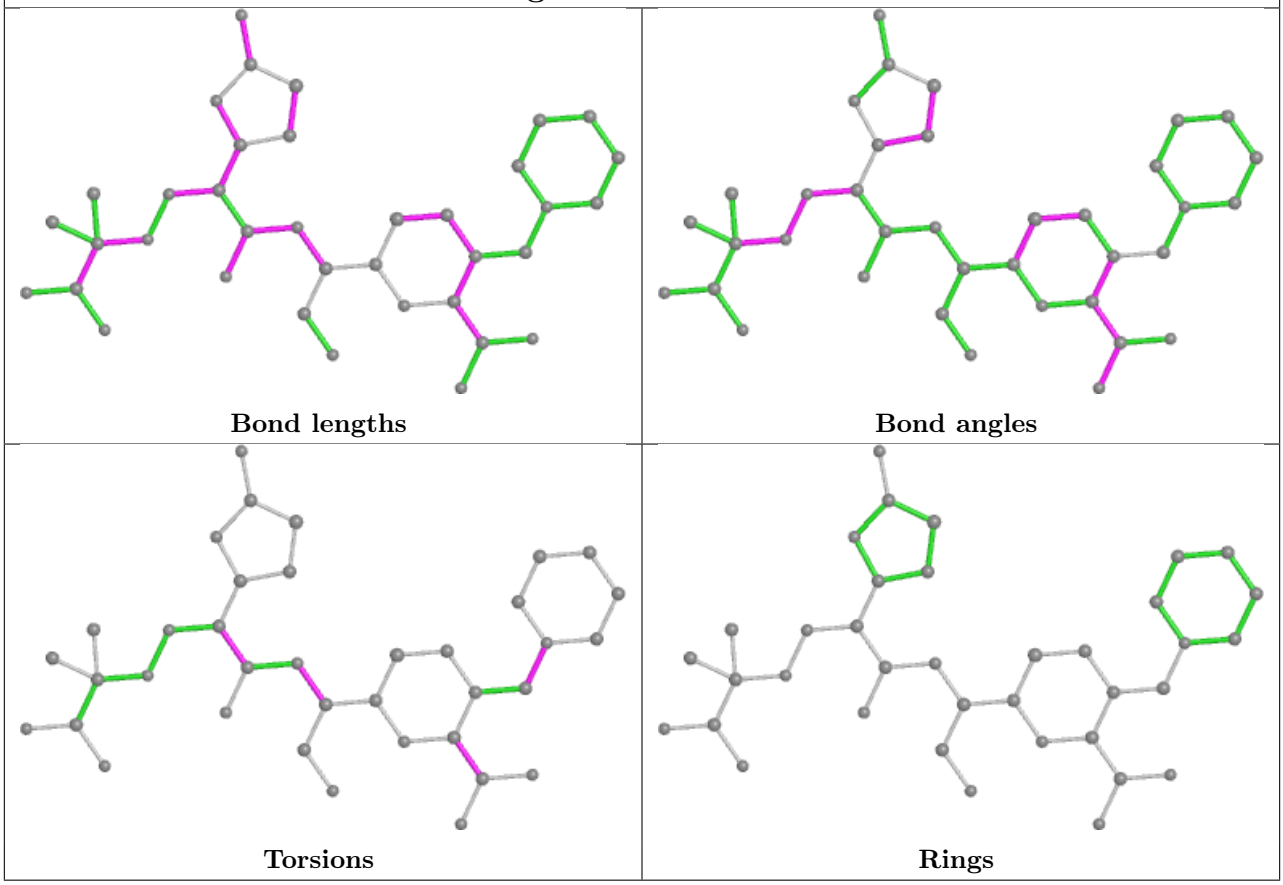


Torsions



Rings

Ligand CTJ A 301



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	228/242 (94%)	0.03	9 (3%) 39 35	55, 80, 111, 166	10 (4%)
1	B	230/242 (95%)	0.10	9 (3%) 39 35	57, 88, 120, 142	5 (2%)
1	C	227/242 (93%)	0.50	28 (12%) 4 2	74, 98, 148, 169	3 (1%)
1	D	227/242 (93%)	0.58	25 (11%) 5 4	72, 107, 148, 180	5 (2%)
All	All	912/968 (94%)	0.30	71 (7%) 13 10	55, 92, 139, 180	23 (2%)

All (71) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	236	ALA	5.9
1	D	44	VAL	5.2
1	D	224	GLY	4.8
1	D	237	MET	4.8
1	D	212	ALA	4.6
1	D	222	TRP	4.6
1	D	235	PHE	4.3
1	D	45	VAL	4.3
1	A	236	ALA	4.2
1	B	236	ALA	4.2
1	D	59	LEU	4.2
1	A	146	ASN	4.0
1	C	211	TYR	3.8
1	C	106	ASN	3.8
1	D	219	ILE	3.7
1	D	213	ALA	3.7
1	D	217	PRO	3.7
1	C	223	VAL	3.6
1	C	107	ARG	3.6
1	A	161	GLY	3.4
1	C	44	VAL	3.4

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Mol	Chain	Res	Type	RSRZ
1	C	235	PHE	3.4
1	C	83	LEU	3.4
1	B	44	VAL	3.3
1	D	52	GLN	3.1
1	B	223	VAL	3.0
1	D	182	HIS	2.9
1	D	223	VAL	2.9
1	D	265	PRO	2.8
1	D	220	GLY	2.8
1	C	237	MET	2.8
1	D	43	VAL	2.7
1	C	92	VAL	2.7
1	C	95	TRP	2.7
1	A	235	PHE	2.6
1	B	237	MET	2.5
1	C	102	ILE	2.5
1	C	262	LYS	2.5
1	A	242	PRO	2.5
1	C	245	ASP	2.5
1	B	27	GLU	2.4
1	D	163	ARG	2.4
1	C	76	ASN	2.4
1	C	207	ALA	2.4
1	C	212	ALA	2.4
1	C	132	GLU	2.4
1	A	217	PRO	2.4
1	C	74	ILE	2.4
1	D	169	GLN	2.3
1	C	146	ASN	2.3
1	D	60	LYS	2.3
1	A	45	VAL	2.3
1	C	133	ALA	2.3
1	C	163	ARG	2.3
1	D	25	TRP	2.2
1	D	72	LEU	2.2
1	C	77	SER	2.2
1	D	146	ASN	2.2
1	D	259	LYS	2.2
1	C	103	ALA	2.2
1	C	224	GLY	2.2
1	B	75	PRO	2.2
1	A	237	MET	2.2

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Mol	Chain	Res	Type	RSRZ
1	C	236	ALA	2.2
1	B	95	TRP	2.1
1	C	75	PRO	2.1
1	B	235	PHE	2.1
1	B	45	VAL	2.1
1	C	43	VAL	2.1
1	C	134	ARG	2.1
1	A	163	ARG	2.1

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)

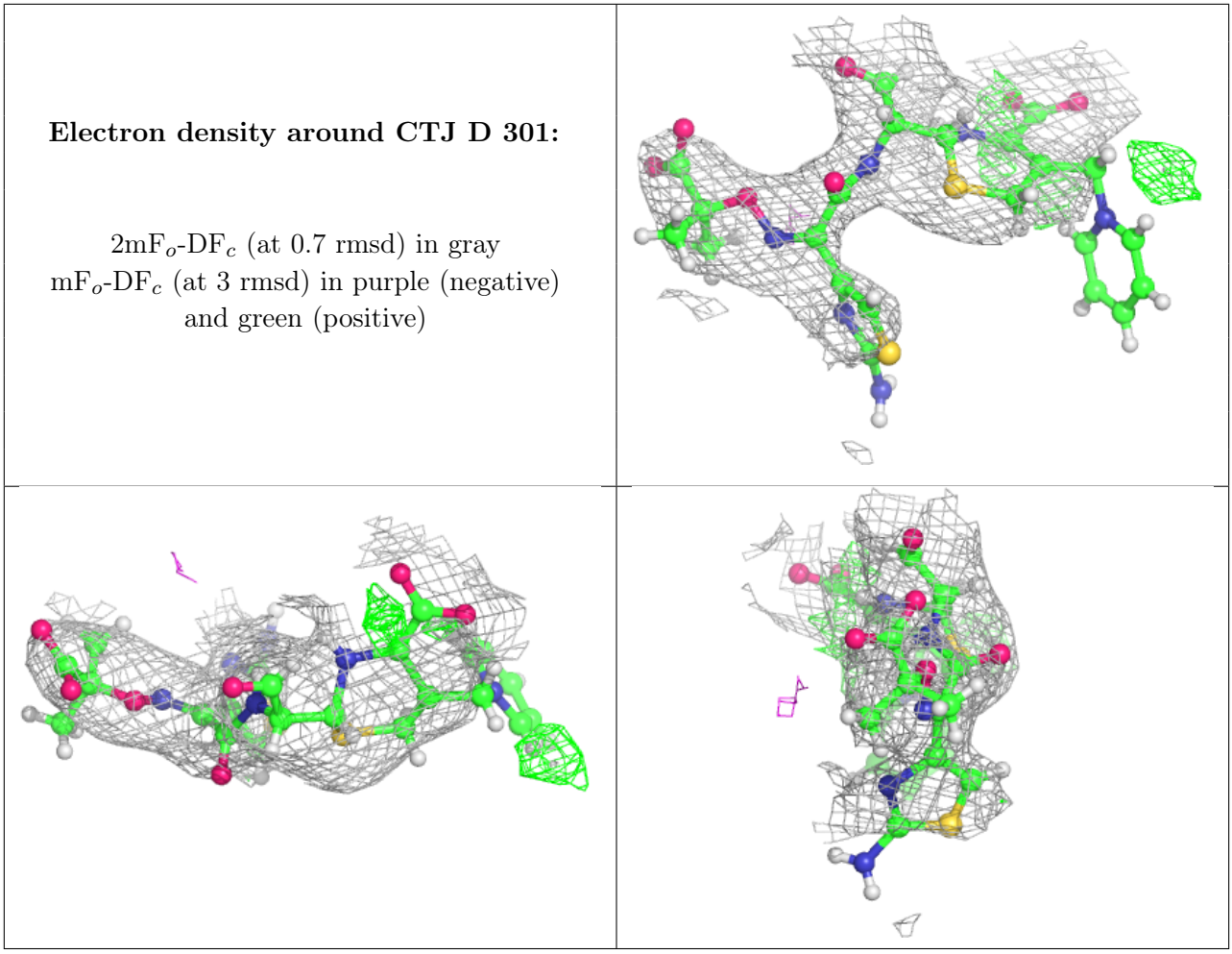
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	CTJ	D	301	37/37	0.81	0.30	94,116,153,163	59
2	CTJ	C	301	37/37	0.82	0.23	84,96,121,126	54
3	CL	C	302	1/1	0.88	0.10	83,83,83,83	0
2	CTJ	A	301	37/37	0.93	0.20	69,85,117,122	50
3	CL	A	302	1/1	0.97	0.06	65,65,65,65	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.

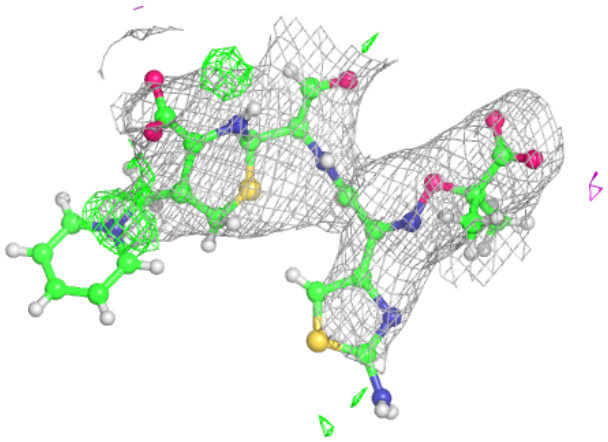
Electron density around CTJ D 301:

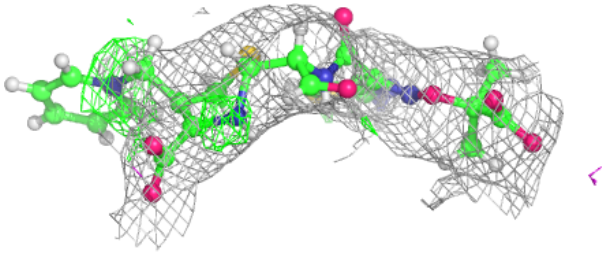
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

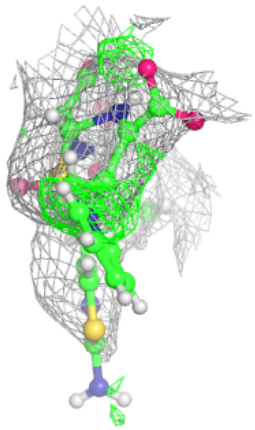


Electron density around CTJ C 301:

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

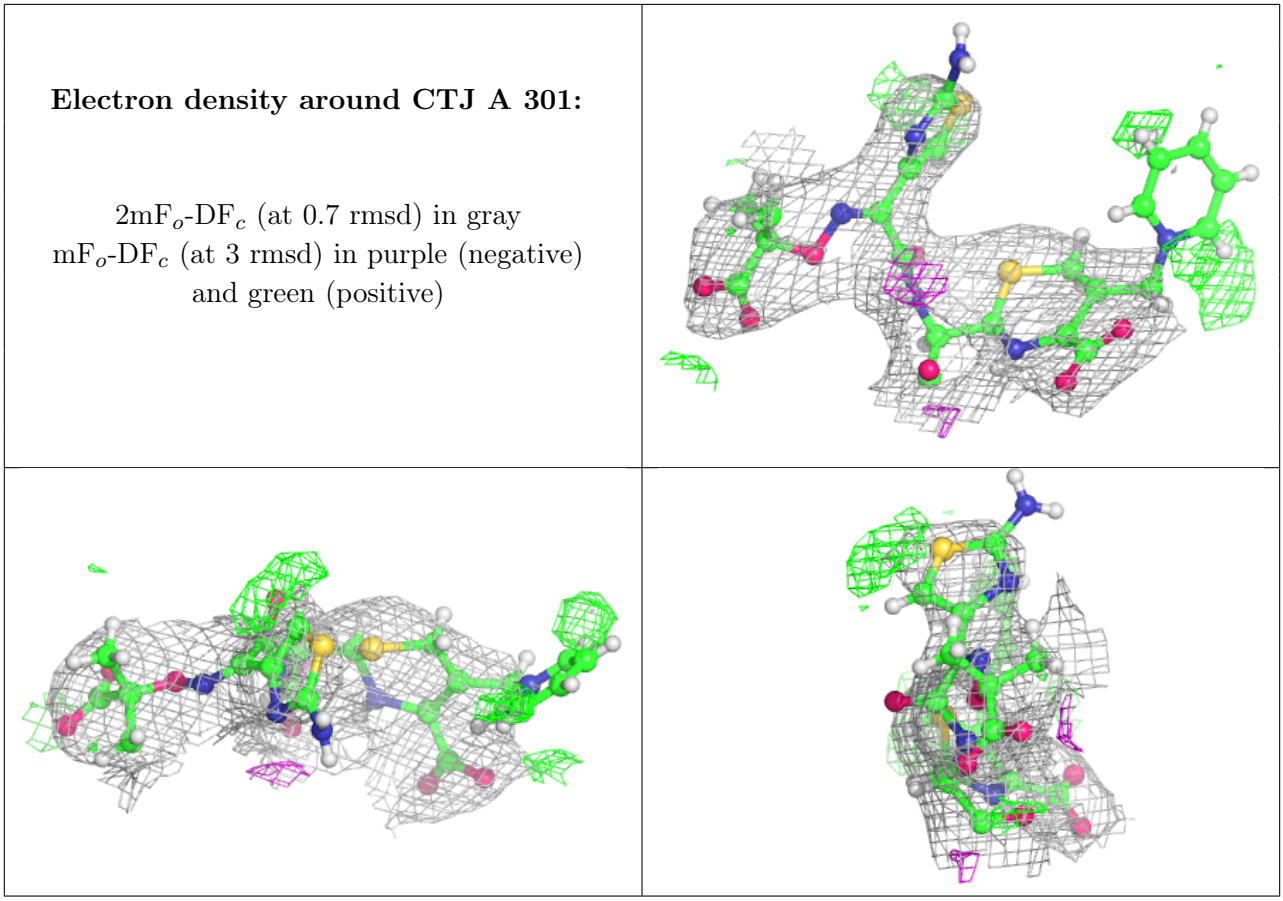






Electron density around CTJ A 301:

$2mF_o$-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.