



Full wwPDB X-ray Structure Validation Report ⓘ

Jul 11, 2024 – 12:09 PM JST

PDB ID : 8Y7G
Title : Crystal structure of the *Marinitoga* sp. Csx1-Crn2 H495A mutant in complex with cyclic-tetraadenylate (cA4)
Authors : Zhang, D.; Yuan, C.; Lin, Z.
Deposited on : 2024-02-04
Resolution : 3.15 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 : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.37.1
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) : 2.37.1

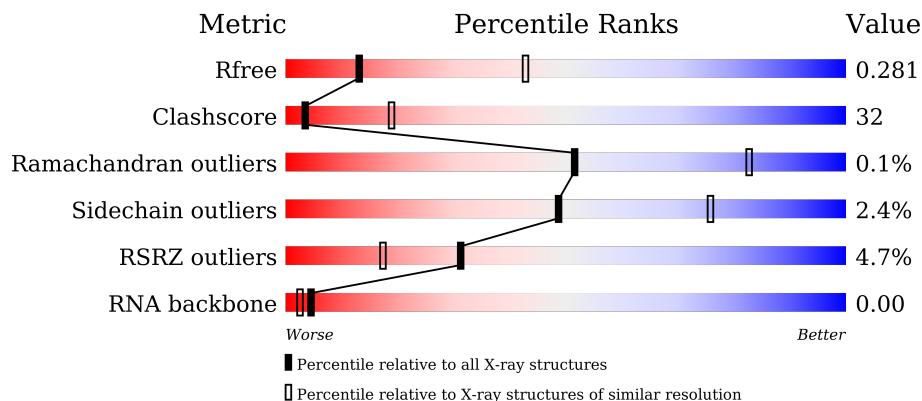
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.15 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	1665 (3.20-3.12)
Clashscore	141614	1804 (3.20-3.12)
Ramachandran outliers	138981	1770 (3.20-3.12)
Sidechain outliers	138945	1769 (3.20-3.12)
RSRZ outliers	127900	1616 (3.20-3.12)
RNA backbone	3102	1073 (3.50-2.82)

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

Mol	Chain	Length	Quality of chain
1	A	563	
1	B	563	
2	C	4	
3	D	2	

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Mol	Chain	Length	Quality of chain
3	E	2	

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 criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	ACT	A	601	-	X	-	-
4	ACT	B	601	-	X	-	-

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 8875 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called CRISPR-associated protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	534	4281	2783	676	808	14	0	0	0
1	B	543	4410	2876	701	818	15	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	495	ALA	HIS	engineered mutation	UNP A0A0H2SHM8
B	495	ALA	HIS	engineered mutation	UNP A0A0H2SHM8

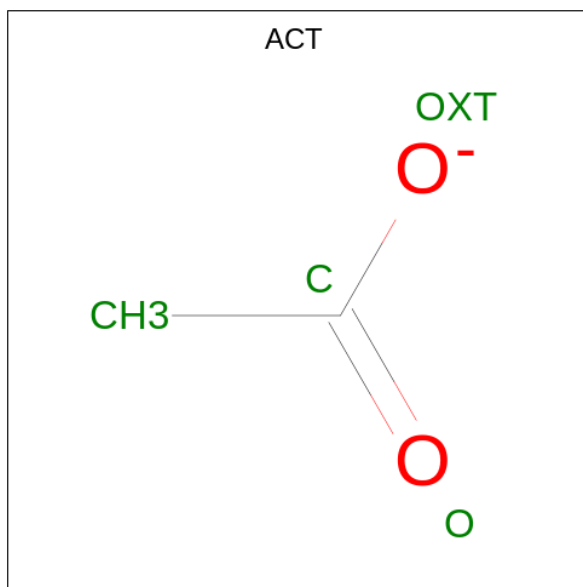
- Molecule 2 is a RNA chain called RNA (5'-R(P*AP*AP*AP*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	C	4	88	40	20	24	4	0	0	0

- Molecule 3 is a RNA chain called RNA (5'-R(P*AP*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
3	D	2	44	20	10	12	2	0	0	0
3	E	2	44	20	10	12	2	0	0	0

- Molecule 4 is ACETATE ION (three-letter code: ACT) (formula: C₂H₃O₂) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			4	2	2		
4	B	1	Total	C	O	0	0
			4	2	2		

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	73.50Å 119.56Å 196.38Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	52.79 – 3.15 52.79 – 3.15	Depositor EDS
% Data completeness (in resolution range)	99.9 (52.79-3.15) 99.9 (52.79-3.15)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.43 (at 3.13Å)	Xtrriage
Refinement program	PHENIX (1.20.1_4487: ???)	Depositor
R, R_{free}	0.212 , 0.280 0.216 , 0.281	Depositor DCC
R_{free} test set	1997 reflections (6.51%)	wwPDB-VP
Wilson B-factor (Å ²)	70.1	Xtrriage
Anisotropy	0.649	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 76.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	8875	wwPDB-VP
Average B, all atoms (Å ²)	102.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.50% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality i

5.1 Standard geometry i

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

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	0.51	0/4351	0.71	0/5866
1	B	0.59	2/4482 (0.0%)	0.76	4/6026 (0.1%)
2	C	1.33	1/99 (1.0%)	2.39	9/152 (5.9%)
3	D	0.83	0/49	1.92	2/74 (2.7%)
3	E	1.14	0/49	1.42	0/74
All	All	0.57	3/9030 (0.0%)	0.79	15/12192 (0.1%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	400	TRP	CB-CG	-5.59	1.40	1.50
1	B	196	GLU	CB-CG	-5.52	1.41	1.52
2	C	4	A	N9-C4	-5.00	1.34	1.37

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	4	A	C2-N3-C4	-9.82	105.69	110.60
2	C	4	A	N1-C6-N6	9.05	124.03	118.60
2	C	4	A	N3-C4-C5	7.40	131.98	126.80
2	C	4	A	C4-C5-N7	6.12	113.76	110.70
1	B	337	TYR	CB-CG-CD1	-5.84	117.50	121.00
3	D	1	A	N1-C6-N6	5.81	122.09	118.60
2	C	4	A	O4'-C1'-N9	-5.80	103.56	108.20
2	C	4	A	N9-C4-C5	-5.80	103.48	105.80
3	D	1	A	C5-N7-C8	-5.66	101.07	103.90
2	C	2	A	N1-C6-N6	5.55	121.93	118.60
1	B	435	LEU	CA-CB-CG	5.39	127.71	115.30
1	B	338	SER	N-CA-CB	-5.36	102.47	110.50
2	C	2	A	C5-C6-N6	-5.23	119.51	123.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	460	ASP	CB-CG-OD1	-5.20	113.62	118.30
2	C	4	A	C5-C6-N1	-5.07	115.17	117.70

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4281	0	4258	285	2
1	B	4410	0	4494	280	2
2	C	88	0	45	19	0
3	D	44	0	23	9	0
3	E	44	0	23	8	1
4	A	4	0	3	0	0
4	B	4	0	3	0	0
All	All	8875	0	8849	569	4

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 32.

All (569) 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:B:345:ARG:HE	1:B:398:LYS:HE2	1.14	1.11
1:A:65:LEU:HD22	1:A:77:LEU:HD21	1.32	1.11
1:A:166:ILE:HG13	1:A:178:PRO:HD2	1.45	0.97
1:A:258:ILE:HD13	1:A:303:LEU:CD2	1.95	0.96
1:B:17:GLU:HA	1:B:33:ARG:HA	1.45	0.96
1:A:209:ILE:O	1:A:213:ASN:HB2	1.69	0.92
1:A:390:ILE:HD11	1:A:437:MET:HE1	1.54	0.89
1:A:17:GLU:OE2	1:A:75:ASN:ND2	2.05	0.89
1:B:276:SER:HB3	1:B:277:LYS:NZ	1.87	0.89
1:A:348:LEU:HB3	1:A:394:LEU:HD11	1.52	0.88
1:A:11:GLY:HA2	3:D:1:A:C8	2.09	0.87

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:345:ARG:NE	1:B:398:LYS:HE2	1.87	0.87
2:C:2:A:H3'	2:C:3:A:H5'	1.53	0.87
1:A:245:LEU:HD22	1:A:331:LEU:HD21	1.57	0.87
1:B:10:LEU:HD12	1:B:56:VAL:HG22	1.56	0.87
1:A:158:LYS:HA	1:A:183:THR:CG2	2.06	0.85
1:A:195:LEU:HD22	1:A:207:MET:HE1	1.58	0.85
1:A:9:PHE:CZ	1:A:134:MET:HB3	2.14	0.83
1:B:348:LEU:HB3	1:B:394:LEU:CD1	2.08	0.83
1:A:251:PRO:HB3	1:A:324:MET:CE	2.09	0.82
1:B:477:LYS:HE2	1:B:481:GLU:OE2	1.78	0.82
1:B:159:ILE:H	1:B:183:THR:CG2	1.93	0.82
1:B:95:ILE:HD12	1:B:134:MET:HE1	1.61	0.81
1:B:393:LEU:O	1:B:397:VAL:HG23	1.80	0.81
1:A:345:ARG:HD3	1:A:401:ARG:HD3	1.63	0.81
1:A:79:GLU:O	1:A:82:GLU:HG3	1.81	0.81
1:A:258:ILE:HD13	1:A:303:LEU:HD21	1.60	0.81
1:A:99:LYS:HE2	1:A:100:ASN:ND2	1.95	0.80
1:A:324:MET:HB3	1:A:347:LEU:HD12	1.62	0.80
1:B:12:LYS:HE3	3:E:1:A:C8	2.16	0.80
1:A:274:LEU:HD23	1:A:274:LEU:O	1.82	0.80
1:A:472:THR:HG23	1:A:475:GLU:OE1	1.83	0.79
1:A:245:LEU:HD22	1:A:331:LEU:CD2	2.12	0.79
1:A:16:TYR:O	1:A:33:ARG:HA	1.83	0.79
1:A:65:LEU:HB3	1:A:77:LEU:HD11	1.64	0.79
1:A:104:LEU:HD13	1:A:137:PHE:CE1	2.17	0.79
1:B:317:THR:O	1:B:321:VAL:HG23	1.83	0.79
1:B:278:ASN:C	1:B:282:LEU:HD13	2.03	0.78
1:A:12:LYS:N	3:D:1:A:O2'	2.17	0.78
1:B:159:ILE:H	1:B:183:THR:HG22	1.48	0.78
1:A:97:LYS:HG3	1:A:99:LYS:HB3	1.64	0.78
1:A:195:LEU:HD22	1:A:207:MET:CE	2.13	0.77
1:B:258:ILE:HD13	1:B:303:LEU:CD2	2.15	0.77
1:A:18:THR:HG21	3:D:2:A:N1	2.00	0.77
1:A:24:GLU:O	1:A:25:HIS:ND1	2.18	0.76
1:A:348:LEU:HB3	1:A:394:LEU:CD1	2.14	0.76
1:A:481:GLU:HG3	1:A:508:LEU:HD21	1.67	0.76
1:B:195:LEU:O	1:B:199:GLU:HG3	1.85	0.76
1:A:239:LYS:O	1:A:243:GLU:HG3	1.86	0.76
1:A:35:SER:OG	1:A:128:THR:HG21	1.86	0.76
1:B:276:SER:HB3	1:B:277:LYS:HZ2	1.50	0.75
1:B:229:LEU:O	1:B:268:SER:HB3	1.86	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:355:GLU:OE2	1:B:387:PRO:HG3	1.86	0.74
1:A:54:PHE:HB2	1:A:92:TYR:CD1	2.22	0.74
1:A:307:LYS:HD3	1:A:307:LYS:N	2.03	0.74
1:A:112:GLU:HA	1:A:115:LEU:HD12	1.68	0.73
1:B:51:GLU:OE2	1:B:89:LYS:HD3	1.88	0.73
1:A:315:ILE:HG12	1:A:475:GLU:HG2	1.72	0.72
1:B:385:GLU:HA	1:B:388:LYS:HE2	1.72	0.72
1:A:364:ASN:O	1:A:368:ARG:HG3	1.90	0.72
1:A:181:ASP:O	1:A:182:ILE:HD13	1.89	0.72
1:B:3:LYS:HG3	1:B:49:ASP:HB3	1.70	0.72
1:B:277:LYS:O	1:B:282:LEU:N	2.23	0.72
1:B:348:LEU:HB3	1:B:394:LEU:HD12	1.71	0.72
1:B:54:PHE:HB2	1:B:92:TYR:HD1	1.55	0.71
1:A:251:PRO:HB3	1:A:324:MET:HE2	1.71	0.71
1:B:32:LYS:HE3	1:B:41:ILE:HD12	1.71	0.71
1:B:241:PHE:CZ	1:B:258:ILE:HD11	2.26	0.71
1:A:33:ARG:O	1:A:34:LEU:HD23	1.90	0.71
1:A:39:ASN:HD21	1:A:160:VAL:HG21	1.56	0.71
1:A:482:ASN:OD1	1:A:485:LYS:HE2	1.91	0.71
2:C:1:A:OP2	2:C:4:A:O3'	2.07	0.71
1:A:54:PHE:HB2	1:A:92:TYR:HD1	1.55	0.70
1:A:290:LYS:O	1:A:293:VAL:HG12	1.91	0.70
1:B:386:LEU:HB3	1:B:387:PRO:HD3	1.74	0.70
1:A:35:SER:HB2	1:A:36:PRO:HD3	1.73	0.70
1:B:220:LYS:HG3	1:B:221:ASN:N	2.06	0.70
1:A:99:LYS:HE2	1:A:100:ASN:HD22	1.54	0.70
1:B:345:ARG:HD3	1:B:401:ARG:HD2	1.73	0.69
1:B:448:TYR:CG	1:B:517:ILE:HD13	2.27	0.69
1:A:21:TYR:CZ	1:A:178:PRO:HB3	2.26	0.69
1:A:386:LEU:CD2	1:A:440:LEU:HD13	2.22	0.69
1:B:345:ARG:NH2	1:B:372:TRP:HA	2.07	0.69
1:B:84:LYS:HE3	1:B:90:VAL:HG12	1.75	0.68
1:B:248:PRO:HD3	1:B:339:GLU:HG3	1.73	0.68
1:A:386:LEU:HD23	1:A:440:LEU:HD13	1.75	0.68
1:A:452:SER:HB2	2:C:3:A:P	2.32	0.68
1:A:234:LEU:HD13	1:A:264:ILE:HG22	1.75	0.68
1:B:446:LYS:HD3	1:B:448:TYR:CE1	2.27	0.68
1:A:32:LYS:HE3	1:A:82:GLU:OE2	1.93	0.68
1:B:345:ARG:HD3	1:B:401:ARG:CD	2.24	0.68
1:A:258:ILE:CD1	1:A:303:LEU:HD21	2.24	0.67
1:A:450:LEU:HD21	1:A:517:ILE:HD13	1.77	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:337:TYR:O	1:B:341:VAL:HG23	1.95	0.67
1:B:505:LYS:NZ	1:B:546:ASP:OD1	2.27	0.67
1:B:345:ARG:HE	1:B:398:LYS:CE	2.02	0.67
1:A:2:LYS:HA	1:A:48:ASN:OD1	1.94	0.67
1:A:195:LEU:CD2	1:A:207:MET:HE1	2.25	0.67
1:B:500:GLU:HG3	1:B:542:LYS:HD2	1.75	0.67
1:B:546:ASP:O	1:B:550:GLU:HG2	1.93	0.67
1:A:501:PHE:HZ	1:A:549:GLU:HG3	1.59	0.66
1:B:258:ILE:HD13	1:B:303:LEU:HD21	1.76	0.66
1:B:65:LEU:HB3	1:B:77:LEU:HD11	1.76	0.66
1:B:348:LEU:HB3	1:B:394:LEU:HD11	1.77	0.66
1:A:296:GLN:O	1:A:301:GLU:HB2	1.95	0.66
1:B:21:TYR:CZ	1:B:178:PRO:HB3	2.30	0.66
1:A:258:ILE:HD13	1:A:303:LEU:HD23	1.78	0.66
1:B:202:GLY:O	1:B:242:GLU:HG3	1.95	0.66
1:B:127:LEU:HB3	1:B:135:ALA:HB1	1.78	0.66
1:B:32:LYS:HD2	1:B:37:LEU:CD2	2.26	0.65
1:A:251:PRO:HA	1:A:324:MET:HE3	1.79	0.65
1:B:91:SER:HB2	1:B:93:ARG:HH12	1.62	0.65
1:A:131:LEU:HG	3:D:1:A:C8	2.32	0.65
1:A:312:TYR:CE1	1:A:478:VAL:HG21	2.31	0.65
1:B:278:ASN:HA	1:B:282:LEU:N	2.11	0.65
1:B:451:ASN:O	2:C:4:A:H4'	1.96	0.65
1:A:499:ILE:HD12	1:A:510:VAL:O	1.96	0.65
1:B:163:ALA:O	1:B:177:VAL:HG13	1.96	0.65
1:A:71:GLU:O	1:A:74:LYS:HG2	1.96	0.65
1:B:239:LYS:O	1:B:243:GLU:HG3	1.97	0.65
1:B:246:LYS:HG2	1:B:336:MET:CE	2.26	0.64
1:A:12:LYS:O	1:A:12:LYS:HG2	1.96	0.64
1:A:345:ARG:CD	1:A:401:ARG:HD3	2.28	0.64
1:B:214:ILE:HD12	1:B:288:ILE:HG12	1.78	0.64
1:B:111:ILE:HD12	1:B:141:THR:HG21	1.77	0.64
1:B:312:TYR:CE2	1:B:478:VAL:HG21	2.33	0.64
1:B:97:LYS:HE2	1:B:99:LYS:HD3	1.80	0.64
1:B:10:LEU:HD12	1:B:56:VAL:CG2	2.27	0.64
1:B:184:GLN:HA	1:B:187:GLU:HB2	1.80	0.64
1:B:312:TYR:HE2	1:B:478:VAL:HG21	1.63	0.64
1:A:474:ASN:O	1:A:478:VAL:HG23	1.97	0.63
1:B:449:LEU:HG	1:B:493:ILE:HD11	1.81	0.63
1:A:111:ILE:CG2	1:A:115:LEU:HD11	2.29	0.62
1:A:166:ILE:HG13	1:A:178:PRO:CD	2.27	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:272:PHE:O	1:B:275:CYS:HB2	1.99	0.62
1:B:504:ASP:OD2	1:B:542:LYS:NZ	2.29	0.62
1:A:390:ILE:HD11	1:A:437:MET:CE	2.26	0.62
1:B:277:LYS:HD3	1:B:277:LYS:N	2.14	0.62
1:A:120:GLY:O	1:A:155:LEU:HD21	1.99	0.62
1:A:516:GLU:OE2	1:B:532:LYS:HA	1.99	0.62
1:A:335:LYS:HA	1:A:337:TYR:CZ	2.35	0.61
1:B:449:LEU:HD23	1:B:510:VAL:HG11	1.81	0.61
1:A:103:GLU:HA	1:A:106:ILE:HD12	1.82	0.61
1:A:147:ASN:C	1:A:148:LEU:HD12	2.20	0.61
1:B:513:LYS:HG3	1:B:515:LYS:HG2	1.82	0.61
1:A:143:PHE:O	1:A:147:ASN:ND2	2.34	0.61
1:B:191:LEU:O	1:B:195:LEU:HD23	2.01	0.61
1:A:477:LYS:HE2	1:A:481:GLU:OE2	2.01	0.61
1:B:79:GLU:O	1:B:83:ILE:HG13	2.01	0.61
1:A:245:LEU:CD2	1:A:331:LEU:HD21	2.30	0.60
1:B:545:MET:HA	1:B:548:MET:HG3	1.83	0.60
2:C:3:A:O2'	2:C:4:A:OP2	2.19	0.60
1:B:552:ASN:O	1:B:553:LEU:HD23	2.01	0.60
1:B:441:LYS:HD2	1:B:441:LYS:N	2.17	0.60
1:A:11:GLY:HA2	3:D:1:A:H8	1.64	0.60
1:A:339:GLU:OE1	1:A:339:GLU:N	2.29	0.60
1:B:341:VAL:HG22	1:B:419:LEU:HD11	1.84	0.60
1:A:328:ILE:HG21	1:A:427:LEU:HD21	1.84	0.60
1:A:131:LEU:HD12	1:A:131:LEU:H	1.66	0.60
1:A:118:PHE:CZ	1:A:120:GLY:HA3	2.37	0.60
1:A:496:GLU:OE1	1:A:512:LEU:HD12	2.01	0.60
1:A:195:LEU:O	1:A:199:GLU:HB2	2.01	0.59
1:B:5:LEU:HD12	1:B:6:ILE:N	2.15	0.59
1:A:293:VAL:O	1:A:296:GLN:HB3	2.01	0.59
1:A:18:THR:O	1:A:31:LYS:HA	2.02	0.59
1:A:163:ALA:HB3	1:A:166:ILE:HD11	1.83	0.59
1:A:214:ILE:CD1	1:A:288:ILE:HD12	2.32	0.59
1:B:199:GLU:OE2	1:B:294:ASP:OD2	2.20	0.59
1:A:182:ILE:HG22	1:A:182:ILE:O	2.03	0.59
1:B:309:ILE:HG23	1:B:320:LYS:HG2	1.85	0.59
1:A:9:PHE:HB2	1:A:130:GLY:HA3	1.84	0.59
1:A:158:LYS:HA	1:A:183:THR:HG22	1.84	0.59
1:A:444:SER:O	1:A:488:VAL:HG11	2.03	0.59
1:A:293:VAL:HA	1:A:296:GLN:HB3	1.85	0.59
1:A:32:LYS:HA	1:A:79:GLU:OE2	2.03	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:215:GLN:HG3	1:B:231:PHE:HB2	1.84	0.58
1:A:65:LEU:HD22	1:A:77:LEU:CD2	2.19	0.58
1:B:44:LYS:HG2	1:B:50:VAL:HB	1.83	0.58
1:B:345:ARG:HH21	1:B:398:LYS:HE2	1.67	0.58
1:A:44:LYS:HD2	1:A:87:GLY:O	2.03	0.58
1:B:51:GLU:HG3	1:B:89:LYS:HB3	1.86	0.58
1:B:429:MET:O	1:B:433:ILE:HG13	2.03	0.58
1:A:303:LEU:O	1:A:305:LEU:HG	2.04	0.58
1:A:545:MET:CE	2:C:2:A:H62	2.17	0.58
1:A:226:LEU:O	1:A:227:ASN:HB2	2.04	0.58
1:A:46:ASN:HB2	1:A:48:ASN:ND2	2.18	0.57
1:B:72:TYR:O	1:B:76:ILE:HG12	2.03	0.57
1:B:289:GLN:O	1:B:293:VAL:HG12	2.04	0.57
1:A:34:LEU:HG	1:A:76:ILE:HD11	1.86	0.57
1:A:42:LEU:O	1:A:45:GLU:HB2	2.04	0.57
1:B:12:LYS:N	3:E:1:A:O2'	2.29	0.57
1:B:461:ASN:N	1:B:461:ASN:HD22	2.02	0.57
1:A:35:SER:H	1:A:129:HIS:CD2	2.23	0.57
1:A:194:ALA:HB1	1:A:207:MET:SD	2.45	0.57
1:B:226:LEU:C	1:B:228:GLU:H	2.07	0.57
1:A:52:ILE:N	1:A:89:LYS:O	2.31	0.57
1:B:348:LEU:CD1	1:B:397:VAL:HG21	2.34	0.56
1:B:168:GLU:H	1:B:175:LYS:CB	2.18	0.56
1:A:312:TYR:HE1	1:A:478:VAL:HG21	1.66	0.56
1:B:37:LEU:HD12	1:B:37:LEU:O	2.05	0.56
1:A:55:PHE:CZ	1:A:114:LEU:HD11	2.40	0.56
1:A:447:ILE:O	1:A:489:LEU:HD12	2.06	0.56
1:B:9:PHE:CE2	1:B:134:MET:HB3	2.41	0.56
1:A:144:TYR:O	1:A:148:LEU:HD13	2.06	0.56
1:A:494:GLY:HA2	1:A:514:ARG:HB2	1.87	0.56
1:B:132:ARG:HG2	1:B:136:ILE:HD11	1.86	0.56
1:B:32:LYS:NZ	1:B:37:LEU:HD21	2.21	0.56
1:A:461:ASN:O	1:B:470:LYS:HE3	2.06	0.56
1:B:215:GLN:O	1:B:218:VAL:HG22	2.06	0.56
1:B:471:LEU:HD21	1:B:558:TYR:HB2	1.88	0.56
1:B:258:ILE:HG21	1:B:303:LEU:HD23	1.88	0.55
1:B:448:TYR:CD2	1:B:517:ILE:HD13	2.41	0.55
1:A:552:ASN:O	1:A:553:LEU:HD23	2.06	0.55
1:B:159:ILE:N	1:B:183:THR:HG22	2.21	0.55
1:B:164:TYR:HB2	3:E:2:A:N3	2.22	0.55
2:C:1:A:P	2:C:4:A:O3'	2.64	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:32:LYS:HE3	1:B:41:ILE:CD1	2.36	0.55
1:A:234:LEU:HD13	1:A:264:ILE:CG2	2.36	0.55
1:B:84:LYS:HD3	1:B:88:ILE:O	2.07	0.55
1:A:552:ASN:C	1:A:553:LEU:HD23	2.27	0.55
1:A:42:LEU:HD23	1:A:45:GLU:OE1	2.07	0.55
1:A:530:LEU:HB2	2:C:2:A:O2'	2.06	0.55
1:A:14:ARG:HG2	1:A:14:ARG:HH11	1.71	0.54
1:A:79:GLU:O	1:A:83:ILE:HG13	2.07	0.54
1:B:159:ILE:H	1:B:183:THR:HG23	1.70	0.54
1:A:500:GLU:C	1:A:542:LYS:HD2	2.28	0.54
1:B:392:GLU:OE2	1:B:395:LYS:HD3	2.07	0.54
1:B:107:ILE:HD11	1:B:134:MET:HE1	1.87	0.54
1:B:118:PHE:CZ	1:B:120:GLY:HA3	2.43	0.54
1:A:21:TYR:O	1:A:178:PRO:HA	2.07	0.54
1:A:53:ILE:HA	1:A:91:SER:O	2.07	0.54
1:A:254:ILE:HG21	1:A:327:ILE:HD12	1.89	0.54
1:A:530:LEU:HD13	1:A:548:MET:HE1	1.88	0.54
1:A:298:ILE:HG21	1:A:334:TRP:CZ2	2.43	0.54
1:A:459:LYS:HA	1:B:470:LYS:NZ	2.23	0.54
1:B:319:GLU:CD	1:B:319:GLU:H	2.11	0.54
1:B:30:VAL:HG12	1:B:32:LYS:HG2	1.90	0.54
1:B:241:PHE:CE1	1:B:258:ILE:HG13	2.41	0.54
1:B:453:THR:HG22	1:B:527:VAL:HG11	1.88	0.54
1:A:317:THR:OG1	1:A:320:LYS:HB2	2.07	0.54
1:B:111:ILE:HG22	1:B:115:LEU:CD1	2.38	0.54
1:B:207:MET:HE3	1:B:291:PHE:CD2	2.42	0.54
1:B:345:ARG:NH2	1:B:398:LYS:HE2	2.23	0.54
1:A:275:CYS:HB2	1:A:283:PHE:HE2	1.73	0.53
2:C:3:A:O5'	2:C:3:A:H8	1.91	0.53
1:A:251:PRO:HB3	1:A:324:MET:HE3	1.89	0.53
1:A:371:TYR:HE1	1:A:374:TYR:HD2	1.56	0.53
1:B:37:LEU:HD22	1:B:83:ILE:HD11	1.89	0.53
1:B:276:SER:HB3	1:B:277:LYS:CE	2.37	0.53
1:A:122:LYS:HD3	1:A:124:ILE:HG13	1.89	0.53
1:B:20:TYR:HB2	1:B:38:ALA:CB	2.39	0.53
1:B:345:ARG:CZ	1:B:398:LYS:HE2	2.38	0.53
1:A:461:ASN:N	1:A:461:ASN:HD22	2.05	0.53
1:A:348:LEU:HD23	1:A:348:LEU:N	2.23	0.53
1:B:21:TYR:HB3	1:B:29:MET:HG3	1.89	0.53
1:B:12:LYS:HG3	3:E:1:A:C8	2.44	0.53
1:B:32:LYS:HD2	1:B:37:LEU:HD21	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:207:MET:HE2	1:B:291:PHE:CB	2.39	0.53
1:B:246:LYS:HG2	1:B:336:MET:HE2	1.90	0.53
1:A:479:ILE:HB	1:A:526:LEU:HD11	1.90	0.53
1:A:314:ASN:N	1:A:475:GLU:OE2	2.39	0.52
1:B:265:LEU:HG	1:B:269:ILE:HD12	1.90	0.52
1:B:341:VAL:CG2	1:B:419:LEU:HD11	2.39	0.52
1:B:200:ARG:O	1:B:335:LYS:HE2	2.09	0.52
1:B:324:MET:HE2	1:B:327:ILE:HG13	1.90	0.52
1:A:450:LEU:HD21	1:A:517:ILE:CD1	2.39	0.52
1:B:255:ALA:O	1:B:259:TYR:HD1	1.92	0.52
1:B:494:GLY:HA3	1:B:514:ARG:HG2	1.91	0.52
1:A:433:ILE:HG23	1:A:437:MET:HE3	1.91	0.52
1:A:442:VAL:HG23	1:A:442:VAL:O	2.10	0.52
1:B:345:ARG:HH21	1:B:398:LYS:CE	2.21	0.52
1:B:95:ILE:HB	1:B:96:PRO:HD2	1.90	0.52
1:B:535:GLU:HG3	1:B:538:LYS:HB2	1.91	0.52
1:A:416:GLN:O	1:A:420:GLU:HG3	2.10	0.52
1:B:12:LYS:HE3	3:E:1:A:N7	2.24	0.52
1:B:95:ILE:HD12	1:B:134:MET:CE	2.37	0.52
1:B:334:TRP:C	1:B:335:LYS:HG2	2.30	0.52
1:B:547:PHE:HA	1:B:550:GLU:HG3	1.91	0.52
1:A:390:ILE:CD1	1:A:437:MET:HE1	2.36	0.52
1:B:129:HIS:HB3	3:E:2:A:OP2	2.10	0.52
1:B:158:LYS:HA	1:B:183:THR:HG22	1.92	0.52
1:A:129:HIS:HE1	3:D:2:A:C8	2.28	0.52
1:B:18:THR:HG22	1:B:19:PHE:N	2.25	0.51
1:B:32:LYS:HD2	1:B:37:LEU:HD23	1.92	0.51
1:B:246:LYS:HG2	1:B:336:MET:HE1	1.91	0.51
1:B:205:GLU:O	1:B:209:ILE:HG13	2.10	0.51
1:B:214:ILE:CD1	1:B:288:ILE:HG12	2.40	0.51
1:A:205:GLU:HG2	1:A:206:ARG:N	2.24	0.51
1:A:501:PHE:CZ	1:A:549:GLU:HG3	2.44	0.51
1:A:9:PHE:HE1	1:A:95:ILE:HD13	1.76	0.51
1:B:455:MET:CE	1:B:466:PHE:HB2	2.41	0.51
1:A:214:ILE:HD13	1:A:288:ILE:HD12	1.91	0.51
1:A:469:LEU:HD12	1:A:470:LYS:N	2.25	0.51
1:A:128:THR:HG1	1:A:162:GLY:H	1.53	0.51
1:B:21:TYR:OH	1:B:178:PRO:HB3	2.11	0.51
2:C:3:A:HO2'	2:C:4:A:P	2.33	0.51
1:A:111:ILE:HG23	1:A:115:LEU:HD11	1.91	0.51
1:B:475:GLU:O	1:B:479:ILE:HG12	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:54:PHE:HB2	1:B:92:TYR:CD1	2.42	0.51
1:B:504:ASP:HB2	1:B:542:LYS:HZ2	1.74	0.51
1:B:529:LYS:HE2	2:C:1:A:OP1	2.11	0.51
1:A:138:THR:O	1:A:142:VAL:HG23	2.10	0.50
1:A:147:ASN:HB2	1:A:148:LEU:HD12	1.92	0.50
1:B:221:ASN:HB3	1:B:223:LEU:HD21	1.93	0.50
1:B:348:LEU:HD12	1:B:397:VAL:HG21	1.93	0.50
1:B:444:SER:O	1:B:488:VAL:HG11	2.10	0.50
1:A:32:LYS:HE2	1:A:41:ILE:HD11	1.93	0.50
1:B:393:LEU:O	1:B:393:LEU:HD12	2.11	0.50
1:A:324:MET:HB3	1:A:347:LEU:CD1	2.39	0.50
1:A:251:PRO:CA	1:A:324:MET:HE3	2.41	0.50
1:A:307:LYS:HG3	1:A:319:GLU:HG2	1.94	0.50
1:B:55:PHE:CZ	1:B:110:GLU:HB3	2.45	0.50
1:B:132:ARG:HB2	3:E:1:A:OP2	2.11	0.50
1:A:430:ILE:CG2	1:A:434:LEU:HD12	2.40	0.50
1:B:152:ALA:HB3	1:B:154:LYS:HE3	1.93	0.50
1:B:312:TYR:HE2	1:B:478:VAL:CG2	2.24	0.50
1:B:276:SER:OG	1:B:277:LYS:N	2.45	0.50
1:A:361:TYR:OH	1:A:562:GLU:OE1	2.30	0.50
1:A:464:GLY:HA2	1:A:563:GLY:O	2.11	0.50
1:A:258:ILE:HG23	1:A:300:LEU:CD2	2.41	0.49
1:A:9:PHE:CB	1:A:130:GLY:HA3	2.41	0.49
1:A:261:ILE:O	1:A:265:LEU:HB2	2.12	0.49
1:B:18:THR:HG22	1:B:19:PHE:H	1.78	0.49
1:B:80:LEU:HA	1:B:83:ILE:HD12	1.94	0.49
1:A:70:ASN:CB	1:A:73:ALA:HB3	2.42	0.49
1:A:104:LEU:HD13	1:A:137:PHE:CD1	2.47	0.49
1:B:55:PHE:HA	1:B:93:ARG:O	2.12	0.49
1:B:83:ILE:HG22	1:B:88:ILE:HB	1.93	0.49
1:B:111:ILE:HG22	1:B:115:LEU:HD12	1.94	0.49
1:A:111:ILE:HG22	1:A:115:LEU:HD11	1.94	0.49
1:A:16:TYR:HD2	1:A:164:TYR:HE2	1.61	0.49
1:A:298:ILE:HG21	1:A:334:TRP:HZ2	1.76	0.49
1:B:65:LEU:HD22	1:B:77:LEU:HD12	1.94	0.49
1:A:58:ASN:OD1	1:A:61:LYS:HD3	2.13	0.49
1:B:406:HIS:O	1:B:409:ARG:HG2	2.12	0.49
1:A:9:PHE:CE1	1:A:95:ILE:HD13	2.48	0.49
1:A:314:ASN:HB2	1:A:475:GLU:OE2	2.13	0.49
1:A:188:LEU:HD12	1:A:188:LEU:C	2.33	0.48
1:B:298:ILE:O	1:B:302:LYS:HD2	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:87:GLY:O	1:A:88:ILE:HG12	2.12	0.48
1:A:111:ILE:O	1:A:115:LEU:HG	2.13	0.48
1:A:197:GLU:O	1:A:201:TYR:HB2	2.12	0.48
1:B:400:TRP:CZ2	1:B:422:ASN:HB3	2.48	0.48
1:A:274:LEU:O	1:A:274:LEU:CD2	2.59	0.48
1:B:241:PHE:CE1	1:B:258:ILE:HD11	2.48	0.48
1:A:479:ILE:CG2	1:A:526:LEU:HD11	2.44	0.48
1:A:542:LYS:NZ	1:A:546:ASP:OD2	2.40	0.48
1:B:252:GLU:OE2	1:B:320:LYS:NZ	2.34	0.48
1:B:348:LEU:HD11	1:B:393:LEU:HG	1.96	0.48
2:C:2:A:H3'	2:C:3:A:C5'	2.34	0.48
1:A:562:GLU:OE2	1:B:465:LYS:HE2	2.13	0.48
1:B:9:PHE:CE1	1:B:95:ILE:HD13	2.49	0.48
1:B:519:PHE:O	1:B:561:ARG:NH1	2.43	0.48
1:B:12:LYS:HA	1:B:64:PHE:CD2	2.49	0.48
1:B:265:LEU:HG	1:B:269:ILE:CD1	2.44	0.48
1:B:540:TYR:H	2:C:4:A:H62	1.61	0.48
1:B:71:GLU:OE1	1:B:71:GLU:HA	2.11	0.48
1:A:77:LEU:HD23	1:A:80:LEU:HD12	1.96	0.48
1:A:532:LYS:HA	1:B:516:GLU:OE2	2.14	0.48
1:B:30:VAL:CG1	1:B:32:LYS:HG2	2.43	0.48
1:B:142:VAL:O	1:B:143:PHE:C	2.49	0.48
1:A:10:LEU:HD23	1:A:10:LEU:HA	1.55	0.47
1:A:158:LYS:HA	1:A:183:THR:HG21	1.95	0.47
1:A:283:PHE:CG	1:A:283:PHE:O	2.66	0.47
1:B:30:VAL:CG2	1:B:42:LEU:HD12	2.44	0.47
1:B:128:THR:HG23	1:B:161:TYR:CD1	2.49	0.47
1:A:323:PHE:CE2	1:A:324:MET:HE1	2.50	0.47
1:B:194:ALA:HB2	1:B:206:ARG:HB3	1.96	0.47
1:A:99:LYS:HG3	1:A:100:ASN:ND2	2.30	0.47
1:A:328:ILE:O	1:A:332:ILE:HG13	2.15	0.47
1:B:322:GLU:OE2	1:B:325:LYS:NZ	2.42	0.47
1:A:512:LEU:C	1:A:512:LEU:HD23	2.35	0.47
1:A:132:ARG:O	1:A:135:ALA:N	2.47	0.47
1:B:32:LYS:NZ	1:B:41:ILE:HD11	2.30	0.47
1:B:507:GLU:O	1:B:508:LEU:HD23	2.15	0.47
1:A:258:ILE:HG23	1:A:300:LEU:HD21	1.95	0.47
1:A:307:LYS:N	1:A:307:LYS:CD	2.74	0.47
1:A:226:LEU:C	1:A:228:GLU:H	2.18	0.47
1:B:344:LEU:HD11	1:B:430:ILE:CD1	2.45	0.47
1:A:162:GLY:CA	1:A:179:ILE:HG12	2.45	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:543:GLU:CD	1:A:543:GLU:H	2.18	0.47
1:A:265:LEU:HD11	1:A:292:LEU:HD22	1.97	0.46
1:B:19:PHE:HB3	1:B:29:MET:HG2	1.97	0.46
1:B:138:THR:O	1:B:139:SER:C	2.51	0.46
1:B:259:TYR:OH	1:B:307:LYS:O	2.29	0.46
1:B:345:ARG:HH21	1:B:398:LYS:NZ	2.13	0.46
1:B:162:GLY:HA2	1:B:179:ILE:HA	1.98	0.46
1:B:449:LEU:HB3	1:B:491:SER:HA	1.97	0.46
1:A:65:LEU:CB	1:A:77:LEU:HD11	2.39	0.46
1:A:346:GLU:HA	1:A:346:GLU:OE1	2.15	0.46
1:A:295:PHE:HA	1:A:299:VAL:HG23	1.97	0.46
1:B:37:LEU:HD23	1:B:79:GLU:OE1	2.15	0.46
1:A:430:ILE:HG22	1:A:434:LEU:HD12	1.98	0.46
1:B:83:ILE:HA	1:B:86:TYR:HD1	1.80	0.46
1:B:248:PRO:HD3	1:B:339:GLU:CG	2.43	0.46
1:B:261:ILE:O	1:B:265:LEU:HB2	2.15	0.46
1:B:30:VAL:HG23	1:B:42:LEU:HD12	1.98	0.46
2:C:3:A:O2'	2:C:4:A:P	2.74	0.46
1:A:9:PHE:CE1	1:A:134:MET:HB3	2.48	0.46
1:B:457:ILE:O	1:B:518:TYR:HD2	1.99	0.46
1:A:250:PRO:HD2	1:A:253:LYS:HG3	1.98	0.46
1:A:5:LEU:HD12	1:A:6:ILE:N	2.31	0.45
1:A:97:LYS:HE2	1:A:99:LYS:HB3	1.98	0.45
1:B:6:ILE:HG12	1:B:124:ILE:HB	1.97	0.45
1:B:9:PHE:HE1	1:B:95:ILE:HD13	1.82	0.45
1:B:241:PHE:HA	1:B:244:LEU:HD12	1.97	0.45
1:B:472:THR:OG1	1:B:475:GLU:HG3	2.16	0.45
2:C:2:A:N3	2:C:2:A:H2'	2.32	0.45
1:A:181:ASP:OD1	1:A:183:THR:HG23	2.15	0.45
1:B:230:LYS:HB3	1:B:230:LYS:HE2	1.73	0.45
1:A:163:ALA:HB3	1:A:166:ILE:CD1	2.45	0.45
1:A:307:LYS:HD3	1:A:307:LYS:H	1.81	0.45
1:A:406:HIS:O	1:A:409:ARG:HG2	2.16	0.45
1:B:77:LEU:HA	1:B:80:LEU:HD12	1.98	0.45
1:B:352:LYS:HE2	1:B:394:LEU:CD2	2.47	0.45
1:A:3:LYS:HD2	1:A:120:GLY:HA2	1.97	0.45
1:A:15:TYR:CB	1:A:76:ILE:HD13	2.46	0.45
1:A:99:LYS:HG3	1:A:100:ASN:HD22	1.81	0.45
1:A:186:LEU:HD12	1:A:186:LEU:O	2.16	0.45
1:A:503:LYS:HA	1:A:508:LEU:O	2.16	0.45
1:B:65:LEU:CB	1:B:77:LEU:HD11	2.46	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:99:LYS:H	1:B:99:LYS:HG2	1.39	0.45
1:B:194:ALA:HB1	1:B:207:MET:SD	2.56	0.45
1:A:503:LYS:O	1:A:507:GLU:HA	2.17	0.45
1:B:12:LYS:HA	1:B:64:PHE:CE2	2.52	0.45
1:B:111:ILE:O	1:B:115:LEU:HD12	2.16	0.45
1:B:450:LEU:HB2	1:B:527:VAL:HG22	1.99	0.45
1:B:533:ARG:NE	2:C:1:A:O2'	2.33	0.45
1:A:21:TYR:CE2	1:A:178:PRO:HB3	2.51	0.45
1:A:127:LEU:HB3	1:A:135:ALA:HB1	1.99	0.45
1:A:459:LYS:HB2	1:A:459:LYS:HE3	1.60	0.45
1:B:211:LEU:HD22	1:B:231:PHE:CE2	2.51	0.45
1:A:10:LEU:HB3	1:A:60:VAL:HG11	1.98	0.45
1:A:214:ILE:HD12	1:A:288:ILE:HD12	1.97	0.45
1:B:519:PHE:CZ	1:B:525:ALA:HB2	2.52	0.45
1:A:229:LEU:HD23	1:A:271:GLU:HB3	1.99	0.45
1:B:196:GLU:O	1:B:197:GLU:C	2.55	0.45
1:A:11:GLY:HA3	3:D:1:A:O2'	2.16	0.45
1:A:16:TYR:HB2	3:D:2:A:N6	2.32	0.45
1:A:244:LEU:HD22	1:A:253:LYS:HB2	1.97	0.45
1:B:207:MET:HE2	1:B:291:PHE:CG	2.51	0.45
1:B:448:TYR:O	1:B:525:ALA:HA	2.16	0.45
1:B:547:PHE:O	1:B:550:GLU:HB2	2.17	0.45
1:A:191:LEU:O	1:A:195:LEU:HD23	2.16	0.44
1:A:341:VAL:HG21	1:A:419:LEU:HD11	1.99	0.44
2:C:1:A:P	2:C:4:A:O2'	2.75	0.44
1:B:84:LYS:CE	1:B:90:VAL:HG12	2.47	0.44
1:B:197:GLU:HB3	1:B:203:ILE:HB	2.00	0.44
1:A:128:THR:OG1	1:A:162:GLY:N	2.30	0.44
1:A:371:TYR:CE1	1:A:374:TYR:HD2	2.34	0.44
2:C:3:A:H4'	2:C:3:A:OP2	2.17	0.44
1:B:307:LYS:CD	1:B:307:LYS:N	2.80	0.44
1:B:483:ALA:HB3	1:B:489:LEU:HD13	2.00	0.44
1:A:255:ALA:O	1:A:259:TYR:HD2	2.00	0.44
1:A:479:ILE:CB	1:A:526:LEU:HD11	2.47	0.44
1:B:167:GLY:O	1:B:168:GLU:HG3	2.18	0.44
1:B:20:TYR:OH	1:B:164:TYR:CE1	2.71	0.44
1:B:44:LYS:HD3	1:B:48:ASN:O	2.17	0.44
1:B:318:LEU:HD23	1:B:318:LEU:HA	1.80	0.44
1:B:439:ASP:OD1	1:B:440:LEU:N	2.50	0.44
1:B:20:TYR:HE1	1:B:177:VAL:HG11	1.84	0.43
1:B:30:VAL:HG23	1:B:42:LEU:CD1	2.48	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:409:ARG:O	1:B:412:THR:OG1	2.35	0.43
1:B:504:ASP:HB2	1:B:542:LYS:NZ	2.33	0.43
1:A:191:LEU:N	1:A:191:LEU:HD12	2.33	0.43
1:A:231:PHE:HZ	1:A:288:ILE:HD11	1.83	0.43
1:A:110:GLU:O	1:A:114:LEU:HG	2.18	0.43
1:A:317:THR:N	1:A:354:ILE:HD11	2.33	0.43
1:A:435:LEU:HD23	1:A:435:LEU:HA	1.78	0.43
1:B:297:LYS:HA	1:B:301:GLU:OE1	2.18	0.43
1:A:285:ILE:O	1:A:288:ILE:HG23	2.19	0.43
1:A:328:ILE:CG2	1:A:427:LEU:HD21	2.47	0.43
1:B:5:LEU:HD12	1:B:6:ILE:H	1.83	0.43
1:B:41:ILE:O	1:B:45:GLU:HG3	2.18	0.43
1:B:67:ASP:HB3	1:B:70:ASN:HB2	2.01	0.43
1:B:128:THR:HG23	1:B:161:TYR:CE1	2.53	0.43
1:B:320:LYS:NZ	1:B:362:TYR:CE2	2.86	0.43
1:A:16:TYR:CD2	1:A:164:TYR:HE2	2.37	0.43
1:A:251:PRO:CB	1:A:324:MET:HE3	2.47	0.43
1:A:345:ARG:HD3	1:A:401:ARG:CD	2.42	0.43
1:B:32:LYS:HZ2	1:B:37:LEU:HD21	1.83	0.43
1:A:466:PHE:HB2	1:B:455:MET:HE1	2.01	0.43
1:B:65:LEU:HD22	1:B:77:LEU:CD1	2.48	0.43
1:B:104:LEU:N	1:B:104:LEU:HD23	2.34	0.43
1:A:440:LEU:CD2	1:A:442:VAL:HG12	2.48	0.43
1:B:341:VAL:HG21	1:B:419:LEU:HD21	2.00	0.43
1:A:10:LEU:HD22	1:A:11:GLY:H	1.83	0.43
1:A:294:ASP:O	1:A:298:ILE:N	2.33	0.43
1:A:529:LYS:HG2	1:A:530:LEU:N	2.33	0.43
1:A:429:MET:O	1:A:433:ILE:HD12	2.19	0.43
1:B:226:LEU:C	1:B:228:GLU:N	2.72	0.43
1:B:372:TRP:C	1:B:398:LYS:HZ3	2.22	0.43
1:A:124:ILE:HA	1:A:158:LYS:O	2.19	0.42
1:A:147:ASN:O	1:A:148:LEU:HD12	2.19	0.42
1:A:504:ASP:CB	1:A:542:LYS:HE3	2.49	0.42
1:B:450:LEU:O	1:B:527:VAL:HA	2.19	0.42
1:A:58:ASN:HA	1:A:61:LYS:HB2	2.00	0.42
1:B:18:THR:HG23	1:B:175:LYS:O	2.20	0.42
1:B:353:LEU:HA	1:B:353:LEU:HD23	1.76	0.42
1:A:80:LEU:O	1:A:83:ILE:HB	2.19	0.42
1:A:345:ARG:NH2	1:A:372:TRP:CB	2.82	0.42
1:B:215:GLN:CG	1:B:231:PHE:HB2	2.47	0.42
1:A:211:LEU:HD23	1:A:211:LEU:HA	1.79	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:100:ASN:O	1:B:104:LEU:HG	2.19	0.42
1:A:20:TYR:O	1:A:29:MET:HA	2.19	0.42
1:A:341:VAL:CG2	1:A:419:LEU:HD11	2.49	0.42
1:B:307:LYS:N	1:B:307:LYS:HD3	2.34	0.42
1:B:553:LEU:HD23	1:B:553:LEU:HA	1.54	0.42
1:A:73:ALA:O	1:A:76:ILE:HG22	2.19	0.42
1:A:193:ILE:HG21	1:A:206:ARG:NH1	2.35	0.42
1:A:293:VAL:CA	1:A:296:GLN:HB3	2.49	0.42
1:A:57:THR:HG22	1:A:95:ILE:HD11	2.02	0.42
1:A:97:LYS:O	1:A:134:MET:HE3	2.20	0.42
1:A:441:LYS:O	1:A:443:ASN:N	2.52	0.42
1:A:514:ARG:O	1:A:514:ARG:HG2	2.20	0.42
1:B:94:ASP:OD1	1:B:94:ASP:N	2.45	0.42
1:B:108:MET:HG2	1:B:141:THR:HG23	2.01	0.42
1:A:494:GLY:CA	1:A:514:ARG:HB2	2.48	0.42
1:B:316:ALA:HB2	1:B:362:TYR:CD1	2.55	0.42
1:A:200:ARG:HA	1:A:200:ARG:NH1	2.35	0.41
1:B:28:LYS:HA	1:B:28:LYS:HD2	1.64	0.41
1:A:72:TYR:HA	1:A:75:ASN:HB2	2.02	0.41
1:A:272:PHE:CG	1:A:273:LYS:N	2.89	0.41
1:A:315:ILE:HD12	1:A:317:THR:HG22	2.00	0.41
1:A:528:ILE:HG23	1:A:528:ILE:O	2.20	0.41
1:B:32:LYS:HG3	1:B:37:LEU:HG	2.01	0.41
1:B:307:LYS:H	1:B:307:LYS:HG2	1.47	0.41
1:B:28:LYS:NZ	1:B:29:MET:O	2.53	0.41
1:A:409:ARG:HD3	1:A:409:ARG:HA	1.78	0.41
1:B:220:LYS:HG3	1:B:221:ASN:H	1.82	0.41
1:A:79:GLU:HA	1:A:82:GLU:CG	2.50	0.41
1:A:129:HIS:CE1	3:D:2:A:C8	3.08	0.41
1:A:143:PHE:CZ	1:A:193:ILE:HD12	2.56	0.41
1:B:485:LYS:HG3	1:B:486:ASP:N	2.34	0.41
1:B:505:LYS:HZ1	1:B:546:ASP:CG	2.19	0.41
1:A:160:VAL:HB	1:A:179:ILE:CG2	2.51	0.41
1:A:112:GLU:CA	1:A:115:LEU:HD12	2.44	0.41
1:A:484:ILE:HD12	1:A:508:LEU:HD22	2.02	0.41
1:B:362:TYR:O	1:B:368:ARG:HD2	2.21	0.41
1:A:95:ILE:O	1:A:95:ILE:HG13	2.20	0.41
1:A:111:ILE:O	1:A:115:LEU:CD1	2.69	0.41
1:B:165:GLU:CB	3:E:2:A:H2	2.33	0.41
1:A:55:PHE:HB3	1:A:95:ILE:HG21	2.03	0.41
1:B:3:LYS:HG3	1:B:49:ASP:CB	2.45	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:5:LEU:HB2	1:B:118:PHE:CE1	2.56	0.41
1:B:140:SER:O	1:B:141:THR:C	2.58	0.41
1:B:64:PHE:HD1	1:B:70:ASN:ND2	2.19	0.41
1:B:107:ILE:O	1:B:111:ILE:HG13	2.21	0.41
1:B:208:ILE:HG23	1:B:235:SER:HB2	2.02	0.41
1:A:114:LEU:N	1:A:114:LEU:HD23	2.36	0.40
1:A:286:LYS:N	1:A:287:PRO:HD2	2.35	0.40
1:B:20:TYR:HB2	1:B:38:ALA:HB1	2.03	0.40
1:A:57:THR:O	1:A:60:VAL:N	2.54	0.40
1:A:455:MET:HE1	1:B:468:ILE:HB	2.02	0.40
1:A:553:LEU:HD23	1:A:553:LEU:N	2.36	0.40
1:B:2:LYS:N	1:B:121:ASN:HD22	2.20	0.40
1:A:394:LEU:O	1:A:395:LYS:C	2.59	0.40
1:B:37:LEU:CD1	1:B:83:ILE:HG12	2.51	0.40
1:B:265:LEU:HD12	1:B:265:LEU:HA	1.91	0.40
1:B:352:LYS:HD3	1:B:391:GLU:OE1	2.22	0.40
1:B:498:VAL:HG22	2:C:4:A:C2	2.56	0.40
1:A:35:SER:HB3	1:A:126:ASP:OD2	2.20	0.40
1:A:229:LEU:HG	1:A:271:GLU:HG3	2.03	0.40
1:A:421:GLU:OE2	1:A:425:ASN:ND2	2.54	0.40
1:B:108:MET:CG	1:B:141:THR:HG23	2.52	0.40
1:B:469:LEU:HG	1:B:471:LEU:HD23	2.02	0.40
1:A:100:ASN:OD1	1:A:102:GLU:N	2.54	0.40
1:A:195:LEU:HD22	1:A:207:MET:HE2	1.96	0.40
1:B:332:ILE:HD11	1:B:423:LEU:HD13	2.03	0.40

All (4) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:128:THR:O	1:A:132:ARG:NH1[2_465]	1.78	0.42
1:B:101:TYR:OH	1:B:187:GLU:OE2[2_465]	2.05	0.15
1:B:161:TYR:OH	3:E:1:A:OP1[2_465]	2.14	0.06
1:A:196:GLU:OE1	1:A:206:ARG:NH2[2_465]	2.18	0.02

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	524/563 (93%)	484 (92%)	40 (8%)	0	100	100
1	B	533/563 (95%)	494 (93%)	38 (7%)	1 (0%)	47	78
All	All	1057/1126 (94%)	978 (92%)	78 (7%)	1 (0%)	51	83

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	144	TYR

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	459/525 (87%)	449 (98%)	10 (2%)	52	77
1	B	483/525 (92%)	470 (97%)	13 (3%)	44	73
All	All	942/1050 (90%)	919 (98%)	23 (2%)	49	76

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	LYS
1	A	10	LEU
1	A	93	ARG
1	A	164	TYR
1	A	200	ARG

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Mol	Chain	Res	Type
1	A	270	ARG
1	A	272	PHE
1	A	275	CYS
1	A	371	TYR
1	A	452	SER
1	B	12	LYS
1	B	146	LYS
1	B	148	LEU
1	B	155	LEU
1	B	157	MET
1	B	224	CYS
1	B	257	SER
1	B	275	CYS
1	B	446	LYS
1	B	461	ASN
1	B	487	ASP
1	B	514	ARG
1	B	549	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	70	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	C	3/4 (75%)	3 (100%)	1 (33%)
3	D	1/2 (50%)	1 (100%)	0
3	E	1/2 (50%)	1 (100%)	0
All	All	5/8 (62%)	5 (100%)	1 (20%)

All (5) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	C	2	A
2	C	3	A
2	C	4	A
3	D	2	A
3	E	2	A

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	C	3	A

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](#)

2 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	ACT	B	601	-	3,3,3	2.73	3 (100%)	3,3,3	2.40	2 (66%)
4	ACT	A	601	-	3,3,3	2.36	2 (66%)	3,3,3	1.63	1 (33%)

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	601	ACT	CH3-C	2.94	1.61	1.49
4	B	601	ACT	OXT-C	2.90	1.44	1.30
4	A	601	ACT	O-C	2.85	1.35	1.22
4	B	601	ACT	O-C	2.74	1.34	1.22
4	B	601	ACT	CH3-C	2.54	1.59	1.49

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
4	B	601	ACT	OXT-C-O	3.06	133.32	122.05
4	B	601	ACT	O-C-CH3	-2.81	111.37	122.33
4	A	601	ACT	OXT-C-O	2.18	130.09	122.05

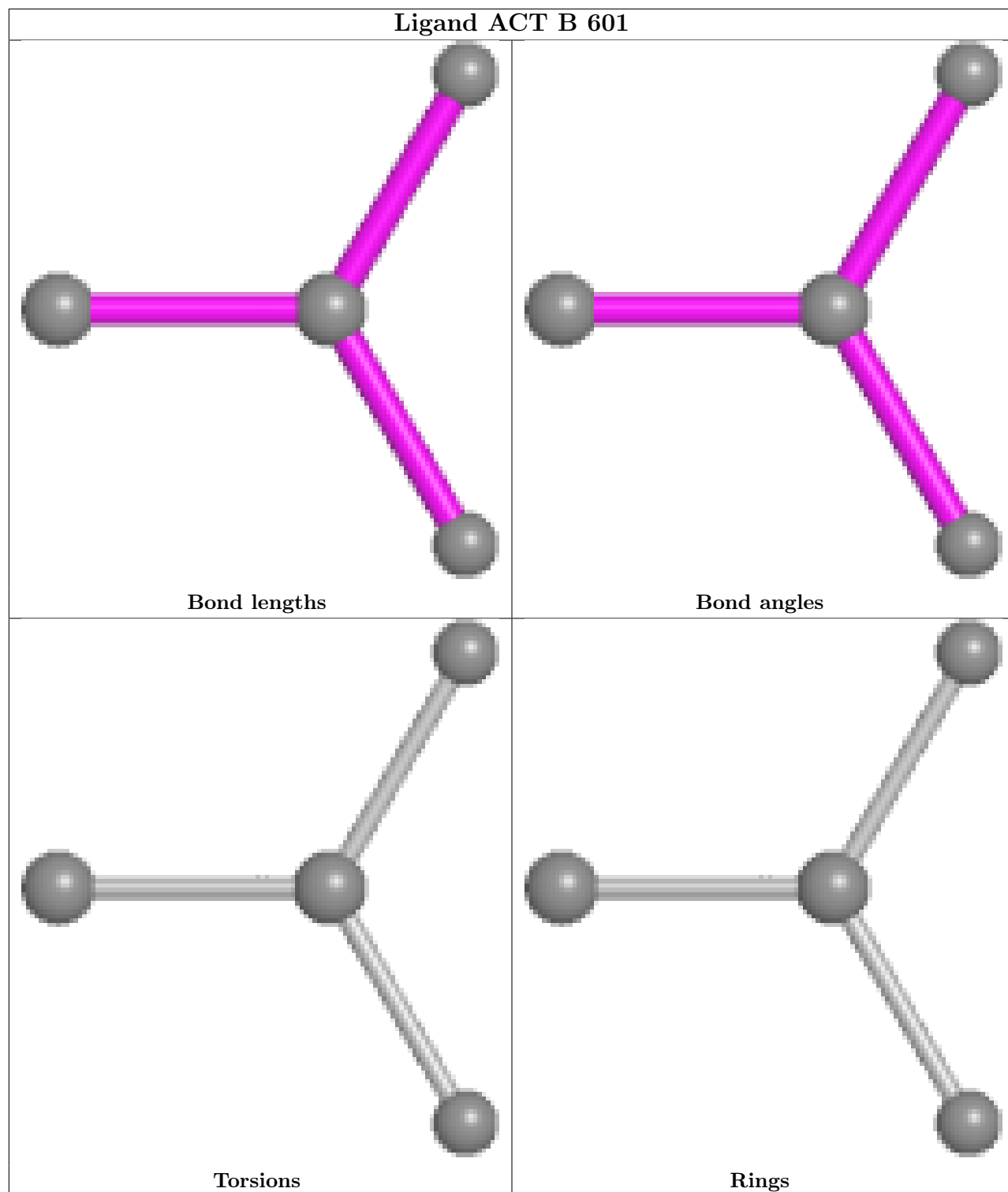
There are no chirality outliers.

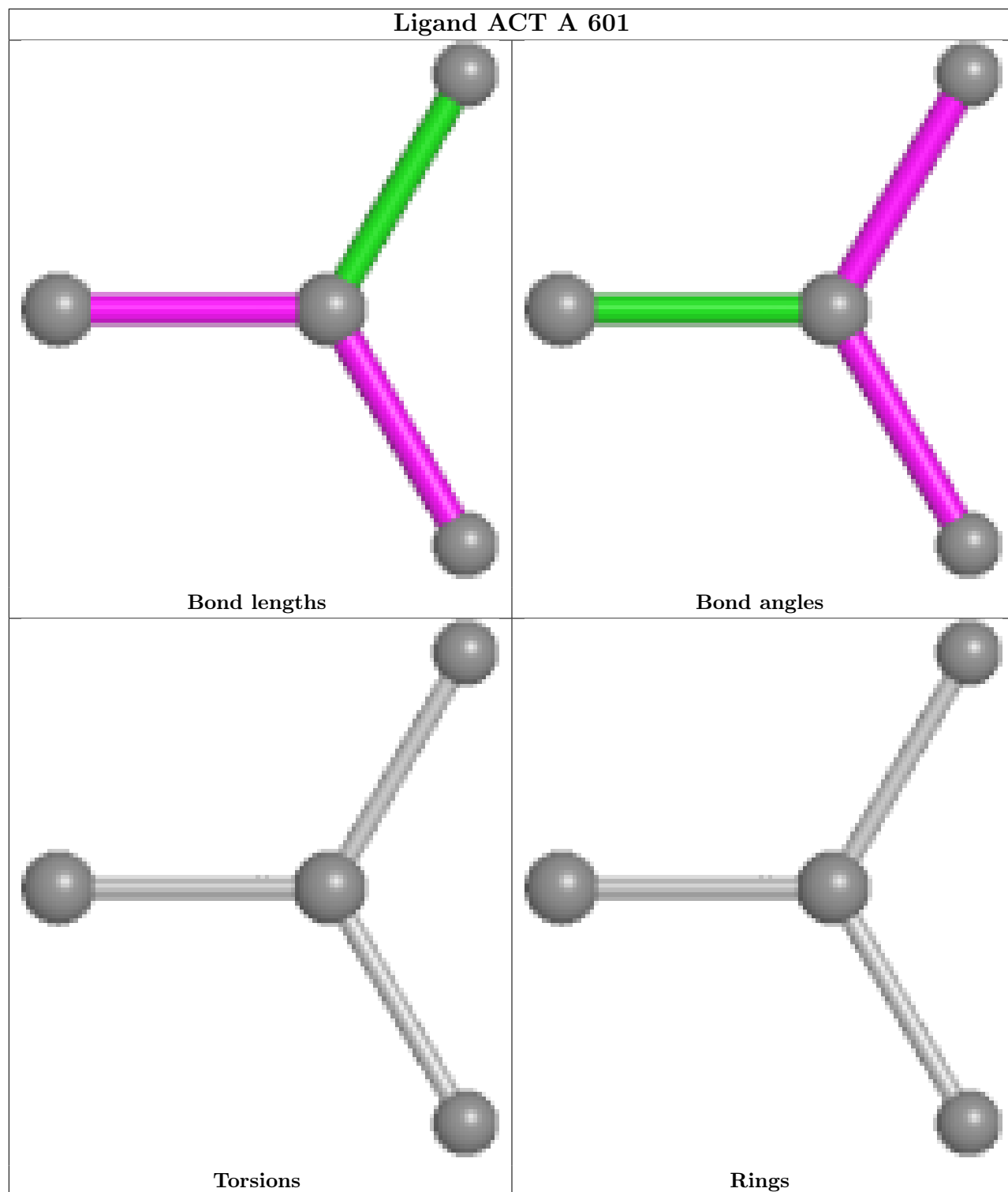
There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	534/563 (94%)	0.23	36 (6%) 17 9	39, 112, 204, 244	0
1	B	543/563 (96%)	0.02	15 (2%) 53 36	33, 85, 167, 220	0
2	C	4/4 (100%)	-0.01	0 100 100	42, 46, 51, 58	0
3	D	2/2 (100%)	1.47	0 100 100	165, 165, 165, 179	0
3	E	2/2 (100%)	0.72	0 100 100	151, 151, 151, 165	0
All	All	1085/1134 (95%)	0.13	51 (4%) 31 17	33, 95, 190, 244	0

All (51) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	41	ILE	5.6
1	A	221	ASN	5.3
1	A	40	ALA	4.1
1	B	39	ASN	4.1
1	A	30	VAL	4.0
1	A	50	VAL	3.9
1	A	440	LEU	3.7
1	A	88	ILE	3.6
1	A	43	GLU	3.4
1	A	39	ASN	3.2
1	A	58	ASN	3.2
1	A	61	LYS	3.2
1	A	22	SER	3.2
1	A	283	PHE	3.1
1	A	55	PHE	3.1
1	B	58	ASN	3.1
1	A	121	ASN	3.0
1	B	20	TYR	3.0
1	A	92	TYR	3.0
1	A	37	LEU	2.9

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Mol	Chain	Res	Type	RSRZ
1	B	10	LEU	2.8
1	A	29	MET	2.7
1	A	54	PHE	2.7
1	A	48	ASN	2.7
1	A	160	VAL	2.6
1	B	87	GLY	2.6
1	A	38	ALA	2.4
1	A	167	GLY	2.4
1	A	46	ASN	2.4
1	A	6	ILE	2.4
1	A	180	LEU	2.4
1	B	41	ILE	2.3
1	B	282	LEU	2.3
1	A	86	TYR	2.3
1	B	443	ASN	2.3
1	A	49	ASP	2.2
1	A	120	GLY	2.2
1	B	374	TYR	2.2
1	B	31	LYS	2.2
1	A	123	VAL	2.2
1	A	233	SER	2.1
1	A	64	PHE	2.1
1	A	13	GLY	2.1
1	A	34	LEU	2.1
1	B	66	TYR	2.1
1	A	304	PRO	2.0
1	B	221	ASN	2.0
1	A	28	LYS	2.0
1	B	56	VAL	2.0
1	B	177	VAL	2.0
1	B	37	LEU	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](#)

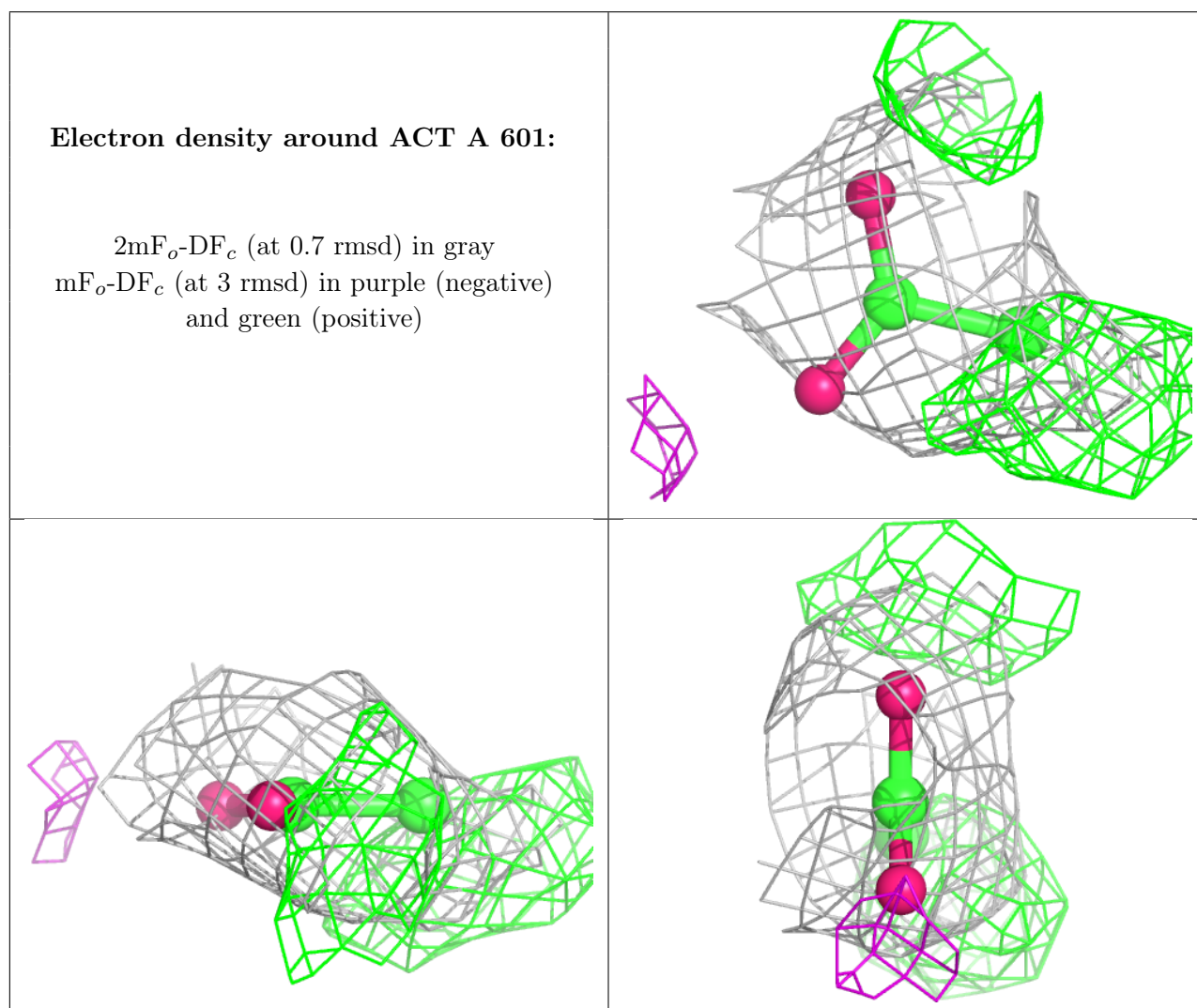
There are no monosaccharides in this entry.

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, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q < 0.9' lists the number of atoms with occupancy less than 0.9.

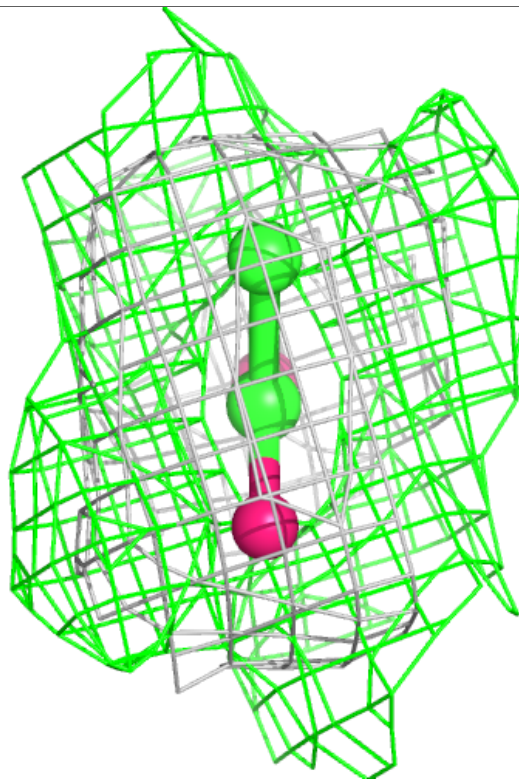
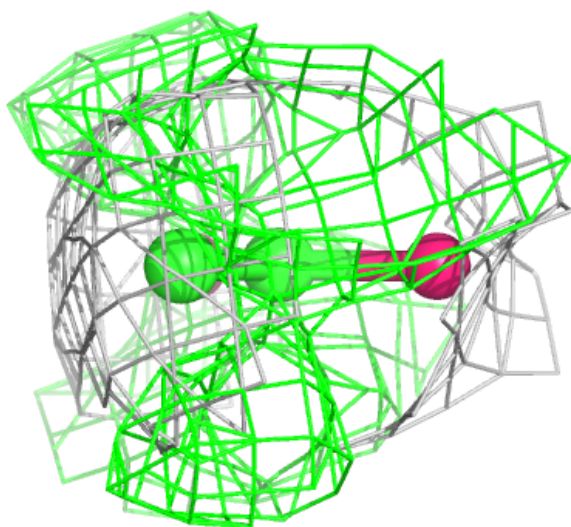
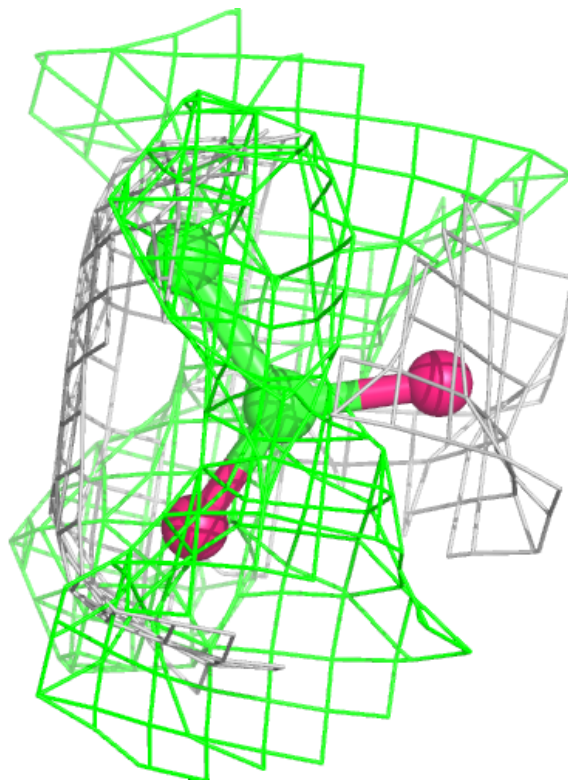
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	ACT	A	601	4/4	0.78	0.32	78,82,83,86	4
4	ACT	B	601	4/4	0.92	0.46	57,58,60,62	4

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 ACT B 601:

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



6.5 Other polymers [i](#)

There are no such residues in this entry.