



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 09:46 AM UTC

PDB ID : 9H6P / pdb\_00009h6p  
Title : Crystal structure of NUDT14 complexed with novel compound AMNUDT14-003 in spacegroup P1  
Authors : Balikci, E.; Koekemoer, L.; Dlamini, L.S.; Gurav, N.; Apostolidou, M.; Adcock, C.; McGown, A.; Marques, A.M.C.; Spencer, J.; Huber, K.V.M.; Structural Genomics Consortium (SGC)  
Deposited on : 2024-10-24  
Resolution : 3.16 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.

The types of validation reports are described at

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

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The following versions of software and data (see [references](#) ①) were used in the production of this report:

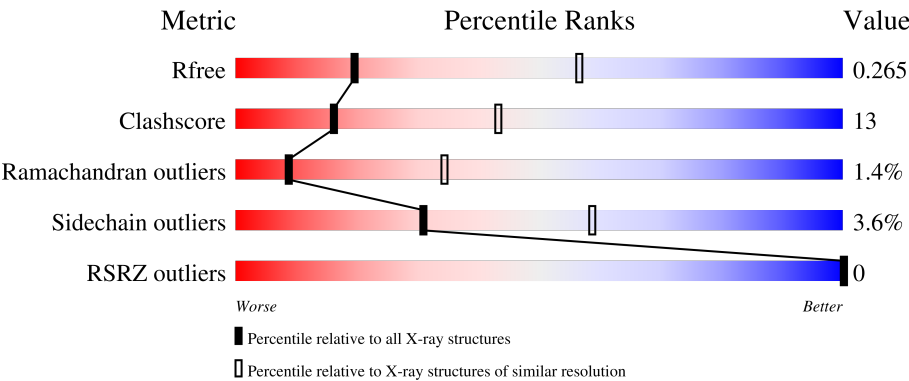
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

# 1 Overall quality at a glance i

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

The reported resolution of this entry is 3.16 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 <sub>free</sub>	180053	2361 (3.20-3.12)
Clashscore	190562	2486 (3.20-3.12)
Ramachandran outliers	187476	2405 (3.20-3.12)
Sidechain outliers	187428	2404 (3.20-3.12)
RSRZ outliers	180081	2361 (3.20-3.12)

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	222	<div><div></div><div></div><div></div><div></div><div></div></div> <div>68%27%. .</div>
1	B	222	<div><div></div><div></div><div></div><div></div><div></div></div> <div>66%27%. 5%</div>
1	C	222	<div><div></div><div></div><div></div><div></div><div></div></div> <div>70%22%. 5%</div>
1	D	222	<div><div></div><div></div><div></div><div></div><div></div></div> <div>67%22%. 9%</div>
1	E	222	<div><div></div><div></div><div></div><div></div><div></div></div> <div>64%25%. 9%</div>

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Mol	Chain	Length	Quality of chain
1	F	222	<div><div></div><div>67%23%6%</div></div>
1	G	222	<div><div></div><div>68%25%5%</div></div>
1	H	222	<div><div></div><div>64%27%5%</div></div>

## 2 Entry composition

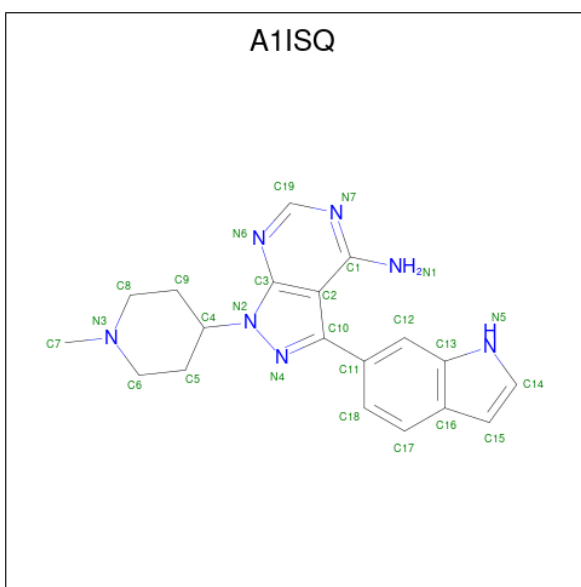
There are 3 unique types of molecules in this entry. The entry contains 12965 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Uridine diphosphate glucose pyrophosphatase NUDT14.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	214	Total	C	N	O	S	0	0	0
			1640	1036	286	311	7			
1	B	212	Total	C	N	O	S	0	0	0
			1632	1032	284	309	7			
1	C	210	Total	C	N	O	S	0	0	0
			1616	1022	282	305	7			
1	D	203	Total	C	N	O	S	0	0	0
			1561	990	271	293	7			
1	E	203	Total	C	N	O	S	0	0	0
			1562	991	271	293	7			
1	F	208	Total	C	N	O	S	0	0	0
			1596	1011	277	301	7			
1	G	210	Total	C	N	O	S	0	0	0
			1616	1022	282	305	7			
1	H	212	Total	C	N	O	S	0	0	0
			1627	1029	284	307	7			

- Molecule 2 is 3-(1H-indol-6-yl)-1-(1-methylpiperidin-4-yl)pyrazolo[3,4-d]pyrimidin-4-amine (CCD ID: A1ISQ) (formula: C<sub>19</sub>H<sub>21</sub>N<sub>7</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	N	0	0
			26	19	7		
2	C	1	Total	C	N	0	0
			26	19	7		
2	D	1	Total	C	N	0	0
			26	19	7		
2	H	1	Total	C	N	0	0
			26	19	7		

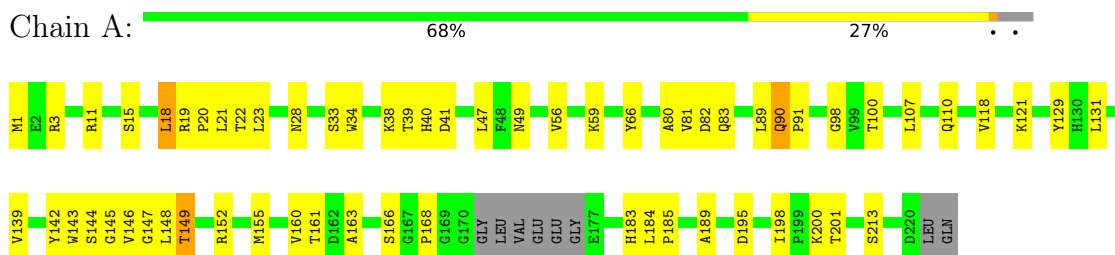
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total	O	0	0
			2	2		
3	B	2	Total	O	0	0
			2	2		
3	D	1	Total	O	0	0
			1	1		
3	E	3	Total	O	0	0
			3	3		
3	F	1	Total	O	0	0
			1	1		
3	G	1	Total	O	0	0
			1	1		
3	H	1	Total	O	0	0
			1	1		

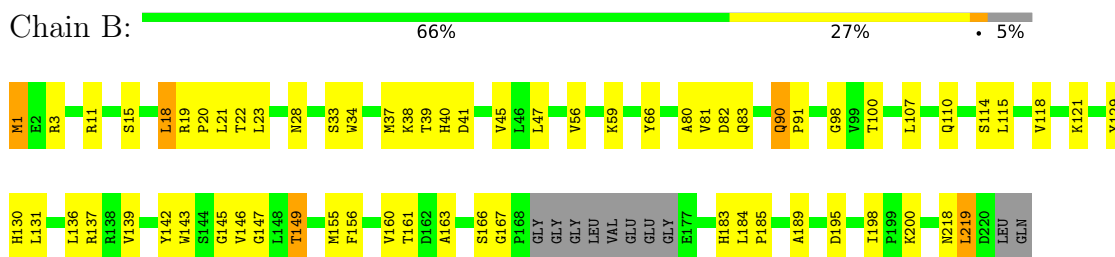
### 3 Residue-property plots

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.

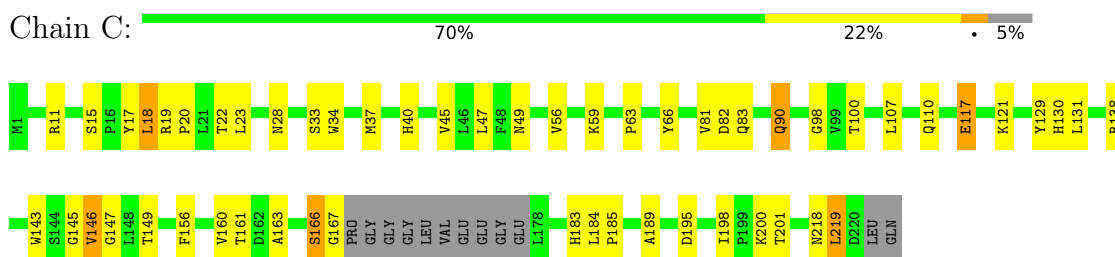
#### • Molecule 1: Uridine diphosphate glucose pyrophosphatase NUDT14



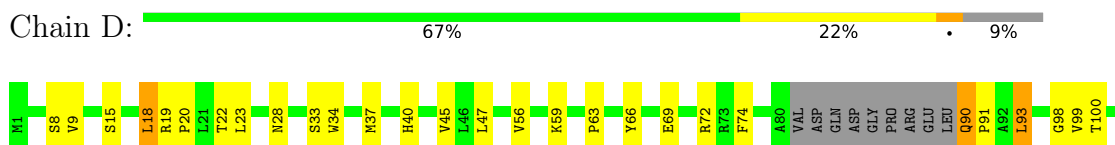
#### • Molecule 1: Uridine diphosphate glucose pyrophosphatase NUDT14

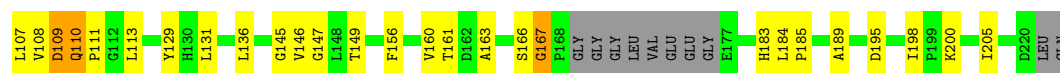


#### • Molecule 1: Uridine diphosphate glucose pyrophosphatase NUDT14



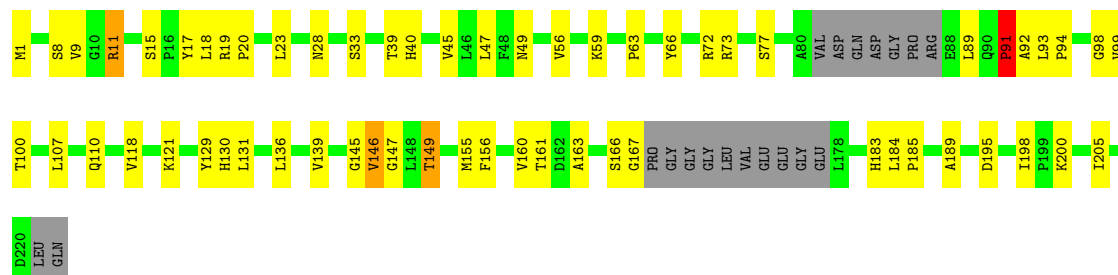
#### • Molecule 1: Uridine diphosphate glucose pyrophosphatase NUDT14





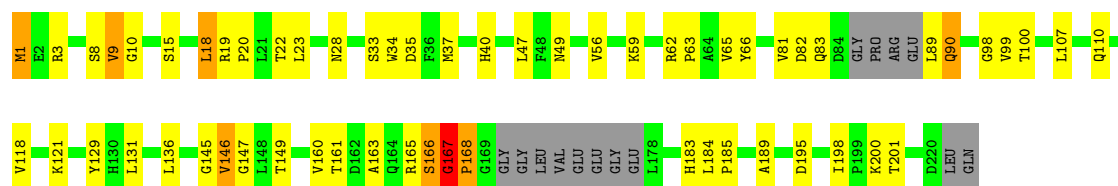
- Molecule 1: Uridine diphosphate glucose pyrophosphatase NUDT14

Chain E: 64% 25% 9%



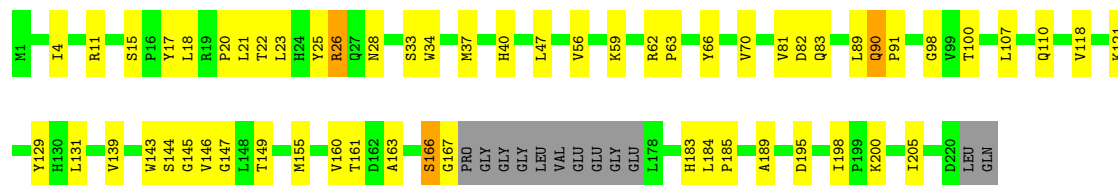
- Molecule 1: Uridine diphosphate glucose pyrophosphatase NUDT14

Chain F: 67% 23% 6%



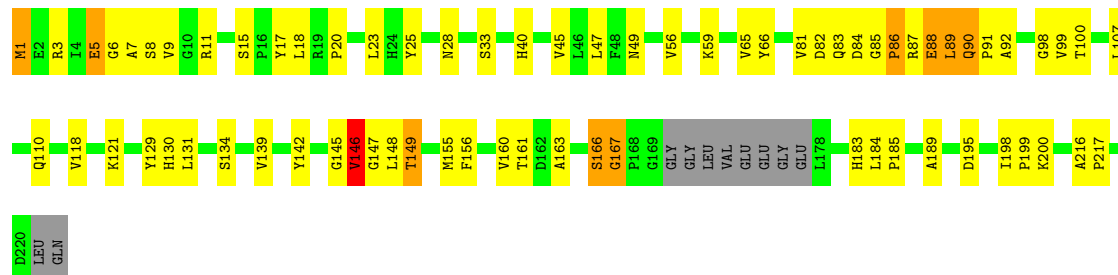
- Molecule 1: Uridine diphosphate glucose pyrophosphatase NUDT14

Chain G: 68% 25% 5%



- Molecule 1: Uridine diphosphate glucose pyrophosphatase NUDT14

Chain H: 64% 27% 5%





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	53.89Å 85.39Å 106.74Å 89.95° 90.00° 78.77°	Depositor
Resolution (Å)	106.74 – 3.16 106.74 – 3.16	Depositor EDS
% Data completeness (in resolution range)	40.1 (106.74-3.16) 40.1 (106.74-3.16)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.49 (at 3.19Å)	Xtriage
Refinement program	REFMAC 5.8.0430 (refmacat 0.4.88)	Depositor
R, $R_{free}$	0.211 , 0.265 0.211 , 0.265	Depositor DCC
$R_{free}$ test set	644 reflections (2.02%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	43.5	Xtriage
Anisotropy	0.158	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 52.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.45$ , $\langle L^2 \rangle = 0.28$	Xtriage
Estimated twinning fraction	0.368 for -h,-k,l	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	12965	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	47.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.59% 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: A1ISQ

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	0.54	0/1678	1.12	3/2282 (0.1%)
1	B	0.52	0/1670	1.08	2/2272 (0.1%)
1	C	0.52	0/1653	1.08	2/2248 (0.1%)
1	D	0.53	0/1597	1.09	3/2171 (0.1%)
1	E	0.53	0/1597	1.08	0/2170
1	F	0.52	0/1632	1.06	0/2219
1	G	0.51	0/1653	1.07	0/2248
1	H	0.53	0/1665	1.09	2/2265 (0.1%)
All	All	0.53	0/13145	1.08	12/17875 (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	D	0	1
1	F	0	1
1	G	0	1
All	All	0	3

There are no bond length outliers.

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	90	GLN	N-CA-CB	-11.14	99.81	110.39
1	D	93	LEU	N-CA-CB	8.97	124.06	109.98
1	C	219	LEU	CB-CG-CD1	6.64	130.63	110.70
1	D	109	ASP	CB-CA-C	6.25	122.19	111.68
1	B	219	LEU	CB-CG-CD1	6.09	128.96	110.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	H	82	ASP	CA-CB-CG	5.93	118.53	112.60
1	H	5	GLU	CB-CG-CD	5.90	122.63	112.60
1	D	90	GLN	CB-CA-C	5.48	120.50	110.10
1	A	89	LEU	CA-C-N	5.32	125.74	119.83
1	A	89	LEU	C-N-CA	5.32	125.74	119.83
1	B	38	LYS	CG-CD-CE	5.14	123.12	111.30
1	C	117	GLU	CB-CG-CD	5.02	121.14	112.60

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	109	ASP	Peptide
1	F	167	GLY	Peptide
1	G	26	ARG	Sidechain

## 5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1640	0	1606	42	1
1	B	1632	0	1600	48	0
1	C	1616	0	1587	51	1
1	D	1561	0	1534	43	1
1	E	1562	0	1538	46	2
1	F	1596	0	1567	44	1
1	G	1616	0	1587	52	0
1	H	1627	0	1597	69	0
2	A	26	0	0	0	0
2	C	26	0	0	1	0
2	D	26	0	0	0	0
2	H	26	0	0	1	0
3	A	2	0	0	0	0
3	B	2	0	0	0	0
3	D	1	0	0	0	0
3	E	3	0	0	0	0
3	F	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	G	1	0	0	0	0
3	H	1	0	0	0	0
All	All	12965	0	12616	335	3

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 13.

All (335) 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:C:145:GLY:HA3	1:C:149:THR:OG1	1.52	1.09
1:F:145:GLY:HA3	1:F:149:THR:OG1	1.54	1.07
1:D:145:GLY:HA3	1:D:149:THR:OG1	1.53	1.05
1:E:93:LEU:HG	1:E:94:PRO:HD2	1.48	0.94
1:D:74:PHE:HE2	1:D:93:LEU:HD11	1.31	0.91
1:H:83:GLN:OE1	1:H:86:PRO:HB3	1.72	0.90
1:D:90:GLN:N	1:D:91:PRO:HD3	1.89	0.87
1:H:18:LEU:HD23	1:H:18:LEU:O	1.75	0.86
1:B:110:GLN:HE22	1:B:121:LYS:HE3	1.41	0.86
1:A:110:GLN:HE22	1:A:121:LYS:HE3	1.38	0.86
1:C:110:GLN:HE22	1:C:121:LYS:HE3	1.40	0.86
1:G:110:GLN:HE22	1:G:121:LYS:HE3	1.41	0.85
1:D:74:PHE:CE2	1:D:93:LEU:HD11	2.11	0.84
1:A:1:MET:N	1:A:3:ARG:HH11	1.76	0.82
1:C:11:ARG:HH21	1:C:82:ASP:HA	1.45	0.81
1:E:93:LEU:CG	1:E:94:PRO:HD2	2.16	0.76
1:G:47:LEU:HB2	1:G:56:VAL:HB	1.67	0.75
1:H:47:LEU:HB2	1:H:56:VAL:HB	1.68	0.75
1:E:47:LEU:HB2	1:E:56:VAL:HB	1.67	0.74
1:A:47:LEU:HB2	1:A:56:VAL:HB	1.69	0.74
1:C:47:LEU:HB2	1:C:56:VAL:HB	1.67	0.74
1:B:47:LEU:HB2	1:B:56:VAL:HB	1.68	0.74
1:F:47:LEU:HB2	1:F:56:VAL:HB	1.67	0.74
1:G:25:TYR:HA	1:H:7:ALA:HB2	1.70	0.74
1:D:47:LEU:HB2	1:D:56:VAL:HB	1.67	0.74
1:G:11:ARG:HH21	1:G:82:ASP:HA	1.53	0.73
1:A:1:MET:H2	1:A:3:ARG:HH11	1.35	0.73
1:A:90:GLN:HB2	1:A:91:PRO:HD3	1.69	0.73
1:C:11:ARG:NH2	1:C:82:ASP:HA	2.05	0.72
1:B:40:HIS:HB2	1:B:107:LEU:HD22	1.72	0.72
1:E:110:GLN:HE22	1:E:121:LYS:HE3	1.53	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:145:GLY:CA	1:C:149:THR:OG1	2.34	0.72
1:H:110:GLN:HE22	1:H:121:LYS:HE3	1.55	0.71
1:G:11:ARG:NH2	1:G:82:ASP:HA	2.06	0.70
1:G:17:TYR:HB3	1:H:148:LEU:HD21	1.74	0.70
1:A:40:HIS:HB2	1:A:107:LEU:HD22	1.73	0.70
1:D:145:GLY:CA	1:D:149:THR:OG1	2.35	0.70
1:H:1:MET:N	1:H:3:ARG:HH11	1.89	0.70
1:H:1:MET:H3	1:H:3:ARG:HH11	1.38	0.70
1:F:145:GLY:CA	1:F:149:THR:OG1	2.36	0.70
1:E:8:SER:HA	1:E:89:LEU:O	1.91	0.69
1:E:91:PRO:O	1:E:92:ALA:HB3	1.92	0.69
1:B:11:ARG:HH22	1:B:80:ALA:HB1	1.56	0.69
1:G:40:HIS:HB2	1:G:107:LEU:HD22	1.75	0.68
1:D:40:HIS:HB2	1:D:107:LEU:HD22	1.76	0.68
1:C:201:THR:HG22	1:F:146:VAL:HG11	1.76	0.68
1:C:15:SER:HB3	1:C:18:LEU:HB2	1.76	0.68
1:C:40:HIS:HB2	1:C:107:LEU:HD22	1.75	0.68
1:F:110:GLN:HE22	1:F:121:LYS:HE3	1.57	0.67
1:G:20:PRO:CB	1:H:18:LEU:HD11	2.23	0.67
1:F:82:ASP:O	1:F:83:GLN:HG3	1.95	0.67
1:H:15:SER:HB3	1:H:18:LEU:HB3	1.77	0.67
1:B:15:SER:HB3	1:B:18:LEU:HB2	1.78	0.66
1:D:111:PRO:HG2	1:D:113:LEU:HG	1.78	0.66
1:H:40:HIS:HB2	1:H:107:LEU:HD22	1.78	0.66
1:C:22:THR:O	1:F:10:GLY:N	2.29	0.66
1:E:40:HIS:HB2	1:E:107:LEU:HD22	1.78	0.65
1:F:15:SER:HB3	1:F:18:LEU:HB2	1.79	0.65
1:D:15:SER:HB3	1:D:18:LEU:HB2	1.78	0.65
1:A:90:GLN:CB	1:A:91:PRO:HD3	2.25	0.64
1:F:40:HIS:HB2	1:F:107:LEU:HD22	1.79	0.64
1:A:15:SER:HB3	1:A:18:LEU:HB2	1.79	0.64
1:D:90:GLN:N	1:D:91:PRO:CD	2.60	0.64
1:F:89:LEU:HB3	1:F:90:GLN:HG2	1.78	0.63
1:G:15:SER:HB3	1:G:18:LEU:HB3	1.81	0.63
1:G:18:LEU:HD11	1:H:20:PRO:CG	2.28	0.62
1:B:145:GLY:O	1:B:147:GLY:N	2.32	0.62
1:C:145:GLY:O	1:C:147:GLY:N	2.32	0.61
1:D:145:GLY:O	1:D:147:GLY:N	2.32	0.61
1:H:145:GLY:O	1:H:147:GLY:N	2.31	0.61
1:B:11:ARG:HB2	1:B:81:VAL:HB	1.82	0.61
1:F:145:GLY:O	1:F:147:GLY:N	2.32	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:11:ARG:HB2	1:A:81:VAL:HB	1.83	0.61
1:A:90:GLN:HB2	1:A:91:PRO:CD	2.30	0.60
1:G:20:PRO:HB2	1:H:18:LEU:HD11	1.82	0.60
1:F:129:TYR:CE2	1:F:160:VAL:HG21	2.37	0.60
1:B:145:GLY:HA3	1:B:149:THR:HB	1.85	0.59
1:G:145:GLY:O	1:G:147:GLY:N	2.33	0.59
1:B:39:THR:OG1	1:B:149:THR:HG23	2.03	0.58
1:E:77:SER:O	1:E:89:LEU:HD22	2.03	0.58
1:G:63:PRO:HB3	1:H:23:LEU:HD23	1.84	0.58
1:H:18:LEU:HD23	1:H:18:LEU:C	2.28	0.58
1:A:39:THR:OG1	1:A:149:THR:HG23	2.04	0.58
1:A:110:GLN:NE2	1:A:121:LYS:HE3	2.14	0.58
1:D:108:VAL:HG12	1:D:110:GLN:HB3	1.85	0.57
1:E:93:LEU:CD1	1:E:94:PRO:HD2	2.34	0.57
1:E:145:GLY:O	1:E:147:GLY:N	2.31	0.57
1:G:20:PRO:HB3	1:H:18:LEU:HD11	1.86	0.57
1:A:145:GLY:HA3	1:A:149:THR:HB	1.86	0.57
1:G:18:LEU:CD1	1:H:20:PRO:HB3	2.34	0.57
1:C:218:ASN:O	1:C:219:LEU:HD12	2.05	0.57
1:C:82:ASP:O	1:C:83:GLN:HG3	2.05	0.57
1:B:110:GLN:NE2	1:B:121:LYS:HE3	2.15	0.56
1:E:91:PRO:O	1:E:92:ALA:CB	2.52	0.55
1:G:110:GLN:NE2	1:G:121:LYS:HE3	2.16	0.55
1:H:8:SER:HB2	1:H:88:GLU:HA	1.88	0.55
1:A:23:LEU:HD23	1:E:63:PRO:HB3	1.87	0.55
1:C:110:GLN:NE2	1:C:121:LYS:HE3	2.15	0.55
1:B:218:ASN:O	1:B:219:LEU:HD12	2.07	0.54
1:B:18:LEU:HD11	1:D:20:PRO:HB3	1.89	0.54
1:B:82:ASP:O	1:B:83:GLN:HG3	2.07	0.54
1:D:47:LEU:HD11	1:D:131:LEU:HD11	1.90	0.54
1:A:82:ASP:O	1:A:83:GLN:HG3	2.08	0.54
1:B:130:HIS:HA	1:E:130:HIS:CD2	2.43	0.54
1:C:117:GLU:OE1	1:H:134:SER:HB3	2.08	0.53
1:D:74:PHE:HE2	1:D:93:LEU:CD1	2.13	0.53
1:E:39:THR:OG1	1:E:149:THR:HG23	2.08	0.53
1:B:11:ARG:NH2	1:B:80:ALA:HB1	2.23	0.53
1:F:47:LEU:HD11	1:F:131:LEU:HD11	1.91	0.53
1:G:11:ARG:HB3	1:G:81:VAL:HB	1.90	0.53
1:G:47:LEU:HD11	1:G:131:LEU:HD11	1.90	0.53
1:C:47:LEU:HD11	1:C:131:LEU:HD11	1.91	0.53
1:G:25:TYR:HA	1:H:7:ALA:CB	2.37	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:82:ASP:O	1:G:83:GLN:HG3	2.09	0.53
1:A:11:ARG:NH2	1:A:80:ALA:HB1	2.24	0.53
1:B:47:LEU:HD11	1:B:131:LEU:HD11	1.91	0.53
1:H:11:ARG:HB3	1:H:81:VAL:HB	1.92	0.52
1:A:145:GLY:O	1:A:147:GLY:N	2.33	0.52
1:C:11:ARG:HB3	1:C:81:VAL:HB	1.90	0.52
1:E:47:LEU:HD11	1:E:131:LEU:HD11	1.90	0.52
1:A:47:LEU:HD11	1:A:131:LEU:HD11	1.90	0.52
1:H:47:LEU:HD11	1:H:131:LEU:HD11	1.91	0.52
1:G:17:TYR:CE1	1:G:107:LEU:HD11	2.44	0.52
1:A:1:MET:N	1:A:3:ARG:NH1	2.54	0.51
1:C:18:LEU:HD21	1:F:35:ASP:HB3	1.91	0.51
1:G:18:LEU:HD11	1:H:20:PRO:CB	2.39	0.51
1:A:90:GLN:CB	1:A:91:PRO:CD	2.88	0.51
1:C:130:HIS:HA	1:H:130:HIS:CD2	2.45	0.51
1:G:4:ILE:CG2	1:H:25:TYR:HB2	2.41	0.51
1:F:110:GLN:NE2	1:F:121:LYS:HE3	2.25	0.51
1:C:130:HIS:CD2	1:H:130:HIS:CD2	2.99	0.50
1:E:110:GLN:NE2	1:E:121:LYS:HE3	2.23	0.50
1:G:205:ILE:HD11	1:H:142:TYR:HB3	1.93	0.50
1:B:23:LEU:HD23	1:D:63:PRO:HB3	1.93	0.50
1:C:201:THR:CG2	1:F:146:VAL:HG11	2.41	0.50
1:D:166:SER:O	1:D:167:GLY:C	2.55	0.49
1:E:66:TYR:HB2	1:E:98:GLY:HA3	1.95	0.49
1:F:166:SER:O	1:F:167:GLY:C	2.54	0.49
1:G:21:LEU:HD13	1:H:9:VAL:HG21	1.93	0.49
1:H:110:GLN:NE2	1:H:121:LYS:HE3	2.24	0.49
1:G:18:LEU:HD11	1:H:20:PRO:HB3	1.93	0.49
1:D:66:TYR:HB2	1:D:98:GLY:HA3	1.94	0.49
1:H:66:TYR:HB2	1:H:98:GLY:HA3	1.95	0.49
1:B:23:LEU:O	1:B:33:SER:HA	2.13	0.49
1:C:198:ILE:HB	1:C:200:LYS:NZ	2.28	0.49
1:F:23:LEU:O	1:F:33:SER:HA	2.13	0.49
1:B:198:ILE:HB	1:B:200:LYS:NZ	2.28	0.49
1:F:198:ILE:HB	1:F:200:LYS:NZ	2.28	0.49
1:H:166:SER:O	1:H:167:GLY:C	2.56	0.49
1:H:1:MET:H3	1:H:3:ARG:HE	1.60	0.48
1:H:198:ILE:HB	1:H:200:LYS:NZ	2.28	0.48
1:D:198:ILE:HB	1:D:200:LYS:NZ	2.29	0.48
1:G:183:HIS:O	1:G:185:PRO:HD3	2.14	0.48
1:E:198:ILE:HB	1:E:200:LYS:NZ	2.28	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:23:LEU:O	1:C:33:SER:HA	2.14	0.48
1:C:66:TYR:HB2	1:C:98:GLY:HA3	1.95	0.48
1:G:23:LEU:O	1:G:33:SER:HA	2.14	0.48
1:A:183:HIS:O	1:A:185:PRO:HD3	2.14	0.48
1:A:198:ILE:HB	1:A:200:LYS:NZ	2.28	0.48
1:B:130:HIS:HA	1:E:130:HIS:HD2	1.78	0.48
1:H:1:MET:N	1:H:3:ARG:NH1	2.61	0.48
1:A:23:LEU:O	1:A:33:SER:HA	2.13	0.48
1:G:198:ILE:HB	1:G:200:LYS:NZ	2.28	0.48
1:H:1:MET:H3	1:H:3:ARG:NH1	2.06	0.48
1:C:183:HIS:O	1:C:185:PRO:HD3	2.14	0.47
1:G:62:ARG:HG3	1:H:146:VAL:HG13	1.95	0.47
1:H:23:LEU:O	1:H:33:SER:HA	2.13	0.47
1:B:66:TYR:HB2	1:B:98:GLY:HA3	1.95	0.47
1:B:183:HIS:O	1:B:185:PRO:HD3	2.14	0.47
1:D:23:LEU:O	1:D:33:SER:HA	2.13	0.47
1:E:23:LEU:O	1:E:33:SER:HA	2.14	0.47
1:F:66:TYR:HB2	1:F:98:GLY:HA3	1.95	0.47
1:G:66:TYR:HB2	1:G:98:GLY:HA3	1.96	0.47
1:G:143:TRP:CE3	1:H:65:VAL:HG22	2.50	0.47
1:F:183:HIS:O	1:F:185:PRO:HD3	2.14	0.47
1:G:17:TYR:CB	1:H:148:LEU:HD21	2.44	0.47
1:G:20:PRO:HB3	1:H:18:LEU:CD1	2.44	0.47
1:H:145:GLY:HA3	1:H:149:THR:O	2.14	0.47
1:H:183:HIS:O	1:H:185:PRO:HD3	2.14	0.47
1:A:66:TYR:HB2	1:A:98:GLY:HA3	1.96	0.47
1:C:37:MET:HE3	1:C:149:THR:HG22	1.97	0.47
1:D:183:HIS:O	1:D:185:PRO:HD3	2.14	0.47
1:D:59:LYS:HA	1:D:100:THR:O	2.15	0.47
1:E:15:SER:HB3	1:E:18:LEU:HB2	1.97	0.47
1:C:146:VAL:O	1:F:62:ARG:HD2	2.15	0.47
1:E:59:LYS:HA	1:E:100:THR:O	2.15	0.47
1:E:183:HIS:O	1:E:185:PRO:HD3	2.14	0.47
1:B:20:PRO:HB3	1:D:18:LEU:HD11	1.97	0.46
1:C:18:LEU:CD2	1:F:35:ASP:HB3	2.44	0.46
1:A:41:ASP:OD2	1:E:72:ARG:NH1	2.48	0.46
1:E:145:GLY:HA3	1:E:149:THR:HB	1.96	0.46
1:C:23:LEU:HD23	1:F:63:PRO:HB3	1.98	0.46
1:B:184:LEU:HD21	1:B:189:ALA:HA	1.98	0.46
1:B:37:MET:HE3	1:B:37:MET:HB2	1.85	0.46
1:A:59:LYS:HA	1:A:100:THR:O	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:63:PRO:HB3	1:F:23:LEU:HD23	1.97	0.46
1:G:59:LYS:HA	1:G:100:THR:O	2.16	0.46
1:H:59:LYS:HA	1:H:100:THR:O	2.16	0.46
1:H:184:LEU:HD21	1:H:189:ALA:HA	1.97	0.46
1:C:59:LYS:HA	1:C:100:THR:O	2.16	0.46
1:D:184:LEU:HD21	1:D:189:ALA:HA	1.97	0.46
1:G:26:ARG:HE	1:G:26:ARG:HB3	1.56	0.46
1:F:59:LYS:HA	1:F:100:THR:O	2.16	0.45
1:A:184:LEU:HD21	1:A:189:ALA:HA	1.98	0.45
1:B:41:ASP:OD2	1:D:72:ARG:NH1	2.49	0.45
1:C:184:LEU:HD21	1:C:189:ALA:HA	1.99	0.45
1:E:93:LEU:HG	1:E:94:PRO:CD	2.35	0.45
1:B:59:LYS:HA	1:B:100:THR:O	2.16	0.45
1:A:201:THR:HG22	1:E:146:VAL:HG11	1.98	0.45
1:E:184:LEU:HD21	1:E:189:ALA:HA	1.98	0.45
1:F:184:LEU:HD21	1:F:189:ALA:HA	1.97	0.45
1:G:18:LEU:HD13	1:H:20:PRO:HB3	1.97	0.45
1:C:20:PRO:HB3	1:F:18:LEU:HD11	1.97	0.45
1:D:161:THR:C	1:D:163:ALA:H	2.25	0.45
1:B:167:GLY:HA2	1:E:166:SER:HB3	1.97	0.45
1:C:145:GLY:HA3	1:C:149:THR:HG1	1.72	0.45
1:G:184:LEU:HD21	1:G:189:ALA:HA	1.98	0.45
1:B:143:TRP:CZ3	1:D:72:ARG:NH2	2.85	0.44
1:C:161:THR:C	1:C:163:ALA:H	2.26	0.44
1:A:152:ARG:NH2	1:E:72:ARG:HD3	2.33	0.44
1:H:17:TYR:CE1	2:H:301:A1ISQ:C1	2.99	0.44
1:C:17:TYR:CE1	2:C:301:A1ISQ:C1	3.01	0.44
1:D:8:SER:HA	1:D:90:GLN:HG2	2.00	0.44
1:H:89:LEU:HD12	1:H:92:ALA:HA	2.00	0.44
1:E:161:THR:C	1:E:163:ALA:H	2.25	0.44
1:H:161:THR:C	1:H:163:ALA:H	2.25	0.44
1:B:142:TYR:HB3	1:D:205:ILE:HD11	2.00	0.44
1:G:161:THR:C	1:G:163:ALA:H	2.25	0.44
1:H:83:GLN:CD	1:H:86:PRO:HB3	2.42	0.44
1:H:87:ARG:HB3	1:H:90:GLN:OE1	2.17	0.43
1:F:8:SER:C	1:F:9:VAL:HG23	2.43	0.43
1:A:161:THR:C	1:A:163:ALA:H	2.26	0.43
1:B:161:THR:C	1:B:163:ALA:H	2.26	0.43
1:C:19:ARG:N	1:C:20:PRO:HD3	2.34	0.43
1:D:161:THR:C	1:D:163:ALA:N	2.76	0.43
1:C:167:GLY:HA2	1:H:166:SER:HB3	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:161:THR:C	1:B:163:ALA:N	2.76	0.43
1:C:161:THR:C	1:C:163:ALA:N	2.76	0.43
1:F:161:THR:C	1:F:163:ALA:H	2.26	0.43
1:D:37:MET:HE3	1:D:37:MET:HB2	1.86	0.43
1:E:161:THR:C	1:E:163:ALA:N	2.76	0.43
1:B:19:ARG:N	1:B:20:PRO:HD3	2.34	0.43
1:F:19:ARG:N	1:F:20:PRO:HD3	2.34	0.43
1:B:129:TYR:CE1	1:B:160:VAL:HG21	2.54	0.43
1:D:19:ARG:N	1:D:20:PRO:HD3	2.33	0.43
1:F:161:THR:C	1:F:163:ALA:N	2.77	0.43
1:G:143:TRP:NE1	1:H:199:PRO:HB3	2.34	0.43
1:D:195:ASP:HB3	1:D:198:ILE:CD1	2.49	0.43
1:B:143:TRP:CH2	1:D:69:GLU:HG2	2.53	0.42
1:C:129:TYR:CE1	1:C:160:VAL:HG21	2.54	0.42
1:F:166:SER:O	1:F:168:PRO:N	2.52	0.42
1:G:37:MET:HE3	1:G:37:MET:HB2	1.87	0.42
1:F:195:ASP:HB3	1:F:198:ILE:CD1	2.49	0.42
1:G:129:TYR:CE1	1:G:160:VAL:HG21	2.54	0.42
1:G:195:ASP:HB3	1:G:198:ILE:CD1	2.50	0.42
1:C:131:LEU:HD23	1:C:131:LEU:HA	1.85	0.42
1:A:161:THR:C	1:A:163:ALA:N	2.77	0.42
1:H:195:ASP:HB3	1:H:198:ILE:CD1	2.49	0.42
1:B:130:HIS:HD2	1:E:130:HIS:HA	1.84	0.42
1:C:166:SER:O	1:C:167:GLY:C	2.63	0.42
1:H:15:SER:HB3	1:H:18:LEU:HD22	2.02	0.42
1:B:1:MET:C	1:B:3:ARG:H	2.28	0.42
1:B:195:ASP:HB3	1:B:198:ILE:CD1	2.50	0.42
1:D:74:PHE:CE2	1:D:93:LEU:CD1	2.94	0.42
1:A:110:GLN:HE22	1:A:121:LYS:CE	2.21	0.42
1:B:37:MET:SD	1:D:37:MET:SD	3.17	0.42
1:C:146:VAL:HG11	1:F:201:THR:HG22	2.02	0.42
1:E:19:ARG:N	1:E:20:PRO:HD3	2.35	0.42
1:H:89:LEU:HD22	1:H:89:LEU:HA	1.93	0.42
1:H:90:GLN:HA	1:H:91:PRO:HA	1.84	0.42
1:G:161:THR:C	1:G:163:ALA:N	2.76	0.42
1:H:129:TYR:CE1	1:H:160:VAL:HG21	2.55	0.42
1:D:37:MET:HE3	1:D:149:THR:HG22	2.02	0.42
1:F:37:MET:HE3	1:F:37:MET:HB2	1.86	0.42
1:G:90:GLN:HA	1:G:91:PRO:HA	1.91	0.42
1:A:21:LEU:HD13	1:E:9:VAL:CG1	2.50	0.41
1:C:37:MET:HE3	1:C:37:MET:HB2	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:130:HIS:HA	1:H:130:HIS:HD2	1.85	0.41
1:E:11:ARG:H	1:E:11:ARG:HG2	1.50	0.41
1:A:19:ARG:N	1:A:20:PRO:HD3	2.35	0.41
1:D:129:TYR:CE1	1:D:160:VAL:HG21	2.56	0.41
1:E:129:TYR:CE1	1:E:160:VAL:HG21	2.55	0.41
1:G:70:VAL:HG11	1:G:89:LEU:HD13	2.02	0.41
1:H:131:LEU:HD23	1:H:131:LEU:HA	1.86	0.41
1:C:45:VAL:HA	1:C:156:PHE:O	2.21	0.41
1:E:195:ASP:HB3	1:E:198:ILE:CD1	2.50	0.41
1:H:49:ASN:HA	1:H:160:VAL:HG23	2.02	0.41
1:A:22:THR:HA	1:A:34:TRP:O	2.21	0.41
1:A:129:TYR:CE1	1:A:160:VAL:HG21	2.54	0.41
1:A:148:LEU:HD21	1:E:17:TYR:HB3	2.01	0.41
1:B:22:THR:HA	1:B:34:TRP:O	2.20	0.41
1:C:138:ARG:HE	1:C:138:ARG:HB2	1.69	0.41
1:E:131:LEU:HD13	1:E:136:LEU:HD21	2.01	0.41
1:B:21:LEU:HD13	1:D:9:VAL:CG2	2.51	0.41
1:E:139:VAL:HB	1:E:155:MET:HG2	2.03	0.41
1:G:17:TYR:HB3	1:H:148:LEU:CD2	2.48	0.41
1:H:5:GLU:O	1:H:7:ALA:N	2.53	0.41
1:A:195:ASP:HB3	1:A:198:ILE:CD1	2.50	0.41
1:B:90:GLN:HA	1:B:91:PRO:HA	1.88	0.41
1:D:131:LEU:HD13	1:D:136:LEU:HD21	2.03	0.41
1:F:22:THR:HA	1:F:34:TRP:O	2.21	0.41
1:A:49:ASN:HA	1:A:160:VAL:HG23	2.02	0.41
1:B:45:VAL:HA	1:B:156:PHE:O	2.21	0.41
1:C:195:ASP:HB3	1:C:198:ILE:CD1	2.50	0.41
1:F:131:LEU:HD13	1:F:136:LEU:HD21	2.03	0.41
1:D:22:THR:HA	1:D:34:TRP:O	2.21	0.41
1:A:142:TYR:HB3	1:E:205:ILE:HD11	2.03	0.41
1:A:143:TRP:CZ3	1:E:72:ARG:NH2	2.89	0.41
1:B:114:SER:O	1:B:115:LEU:C	2.64	0.41
1:B:131:LEU:HD13	1:B:136:LEU:HD21	2.03	0.41
1:C:49:ASN:HA	1:C:160:VAL:HG23	2.03	0.41
1:G:22:THR:HA	1:G:34:TRP:O	2.21	0.41
1:G:166:SER:O	1:G:167:GLY:C	2.64	0.41
1:H:139:VAL:HB	1:H:155:MET:HG2	2.03	0.41
1:B:110:GLN:HE22	1:B:121:LYS:CE	2.22	0.41
1:B:166:SER:HB3	1:E:167:GLY:HA2	2.02	0.41
1:C:22:THR:HA	1:C:34:TRP:O	2.21	0.41
1:F:49:ASN:HA	1:F:160:VAL:HG23	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:129:TYR:CZ	1:F:165:ARG:HB2	2.55	0.41
1:E:49:ASN:HA	1:E:160:VAL:HG23	2.03	0.40
1:F:1:MET:C	1:F:3:ARG:H	2.29	0.40
1:H:45:VAL:HA	1:H:156:PHE:O	2.21	0.40
1:F:37:MET:HE3	1:F:149:THR:HG22	2.02	0.40
1:G:18:LEU:HD11	1:H:20:PRO:HG3	2.00	0.40
1:G:89:LEU:HD23	1:G:89:LEU:HA	1.92	0.40
1:G:139:VAL:HB	1:G:155:MET:HG2	2.03	0.40
1:A:139:VAL:HB	1:A:155:MET:HG2	2.03	0.40
1:E:45:VAL:HA	1:E:156:PHE:O	2.21	0.40
1:H:161:THR:C	1:H:163:ALA:N	2.76	0.40
1:C:143:TRP:CE3	1:F:65:VAL:HG22	2.55	0.40
1:D:45:VAL:HA	1:D:156:PHE:O	2.21	0.40
1:D:145:GLY:HA3	1:D:149:THR:O	2.22	0.40
1:B:139:VAL:HB	1:B:155:MET:HG2	2.04	0.40
1:F:129:TYR:CE1	1:F:165:ARG:HD3	2.57	0.40
1:H:216:ALA:N	1:H:217:PRO:CD	2.85	0.40

All (3) 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:C:90:GLN:O	1:D:111:PRO:O[1_554]	1.80	0.40
1:A:213:SER:O	1:E:11:ARG:NH2[1_655]	2.00	0.20
1:E:73:ARG:CD	1:F:82:ASP:OD1[1_455]	2.10	0.10

## 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	210/222 (95%)	189 (90%)	18 (9%)	3 (1%)	<b>9</b> 34

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	208/222 (94%)	189 (91%)	17 (8%)	2 (1%)	12	41
1	C	206/222 (93%)	187 (91%)	17 (8%)	2 (1%)	12	41
1	D	197/222 (89%)	180 (91%)	14 (7%)	3 (2%)	8	33
1	E	197/222 (89%)	176 (89%)	19 (10%)	2 (1%)	12	41
1	F	202/222 (91%)	178 (88%)	19 (9%)	5 (2%)	4	22
1	G	206/222 (93%)	189 (92%)	16 (8%)	1 (0%)	24	55
1	H	208/222 (94%)	185 (89%)	18 (9%)	5 (2%)	4	23
All	All	1634/1776 (92%)	1473 (90%)	138 (8%)	23 (1%)	9	34

All (23) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	H	86	PRO
1	D	167	GLY
1	F	9	VAL
1	F	167	GLY
1	F	168	PRO
1	H	6	GLY
1	H	167	GLY
1	A	18	LEU
1	A	168	PRO
1	B	18	LEU
1	C	18	LEU
1	D	18	LEU
1	F	18	LEU
1	H	146	VAL
1	E	91	PRO
1	D	146	VAL
1	E	146	VAL
1	F	146	VAL
1	A	146	VAL
1	B	146	VAL
1	C	146	VAL
1	G	146	VAL
1	H	85	GLY

### 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	174/180 (97%)	168 (97%)	6 (3%)	32	60
1	B	174/180 (97%)	168 (97%)	6 (3%)	32	60
1	C	172/180 (96%)	169 (98%)	3 (2%)	53	70
1	D	166/180 (92%)	163 (98%)	3 (2%)	51	70
1	E	166/180 (92%)	159 (96%)	7 (4%)	26	55
1	F	170/180 (94%)	163 (96%)	7 (4%)	27	56
1	G	172/180 (96%)	166 (96%)	6 (4%)	32	59
1	H	173/180 (96%)	162 (94%)	11 (6%)	16	43
All	All	1367/1440 (95%)	1318 (96%)	49 (4%)	31	59

All (49) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	28	ASN
1	A	38	LYS
1	A	118	VAL
1	A	144	SER
1	A	149	THR
1	A	166	SER
1	B	1	MET
1	B	28	ASN
1	B	90	GLN
1	B	118	VAL
1	B	137	ARG
1	B	149	THR
1	C	28	ASN
1	C	90	GLN
1	C	166	SER
1	D	28	ASN
1	D	99	VAL
1	D	110	GLN
1	E	1	MET

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Mol	Chain	Res	Type
1	E	11	ARG
1	E	28	ASN
1	E	91	PRO
1	E	99	VAL
1	E	118	VAL
1	E	149	THR
1	F	1	MET
1	F	28	ASN
1	F	81	VAL
1	F	90	GLN
1	F	99	VAL
1	F	118	VAL
1	F	166	SER
1	G	28	ASN
1	G	90	GLN
1	G	118	VAL
1	G	144	SER
1	G	149	THR
1	G	166	SER
1	H	1	MET
1	H	28	ASN
1	H	84	ASP
1	H	88	GLU
1	H	89	LEU
1	H	90	GLN
1	H	99	VAL
1	H	118	VAL
1	H	146	VAL
1	H	149	THR
1	H	166	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	40	HIS
1	A	110	GLN
1	A	153	GLN
1	B	28	ASN
1	B	110	GLN
1	B	130	HIS
1	C	90	GLN
1	C	110	GLN

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Mol	Chain	Res	Type
1	C	130	HIS
1	D	153	GLN
1	D	164	GLN
1	E	110	GLN
1	E	130	HIS
1	E	153	GLN
1	F	27	GLN
1	F	110	GLN
1	F	153	GLN
1	F	164	GLN
1	G	110	GLN
1	G	153	GLN
1	H	110	GLN
1	H	130	HIS
1	H	153	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

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	A1ISQ	A	301	-	30,30,30	0.60	1 (3%)	44,44,44	0.85	2 (4%)
2	A1ISQ	D	301	-	30,30,30	0.59	0	44,44,44	0.95	3 (6%)
2	A1ISQ	C	301	-	30,30,30	0.58	0	44,44,44	1.17	4 (9%)
2	A1ISQ	H	301	-	30,30,30	0.64	1 (3%)	44,44,44	1.20	4 (9%)

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	A1ISQ	A	301	-	-	2/8/18/18	0/5/5/5
2	A1ISQ	D	301	-	-	0/8/18/18	0/5/5/5
2	A1ISQ	C	301	-	-	2/8/18/18	0/5/5/5
2	A1ISQ	H	301	-	-	0/8/18/18	0/5/5/5

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	301	A1ISQ	C18-C11	2.34	1.43	1.39
2	H	301	A1ISQ	C18-C11	2.26	1.42	1.39

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	301	A1ISQ	C3-N2-N4	-2.97	109.00	110.90
2	H	301	A1ISQ	C10-N4-N2	2.93	108.51	106.97
2	C	301	A1ISQ	C10-N4-N2	2.82	108.45	106.97
2	C	301	A1ISQ	C3-N2-N4	-2.72	109.16	110.90
2	C	301	A1ISQ	C2-C3-N6	-2.71	124.09	126.97
2	H	301	A1ISQ	C3-C2-C10	2.53	106.50	104.74
2	D	301	A1ISQ	C8-N3-C6	2.47	113.48	109.54
2	D	301	A1ISQ	C9-C4-N2	2.32	114.08	111.88
2	H	301	A1ISQ	C2-C10-N4	-2.29	108.62	110.19
2	A	301	A1ISQ	C18-C17-C16	-2.26	118.69	121.74
2	A	301	A1ISQ	C5-C4-N2	-2.17	109.83	111.88
2	D	301	A1ISQ	C18-C17-C16	-2.13	118.86	121.74
2	C	301	A1ISQ	C8-N3-C6	2.11	112.90	109.54

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	301	A1ISQ	C5-C4-N2-C3
2	A	301	A1ISQ	C9-C4-N2-C3
2	A	301	A1ISQ	C5-C4-N2-C3
2	C	301	A1ISQ	C9-C4-N2-C3

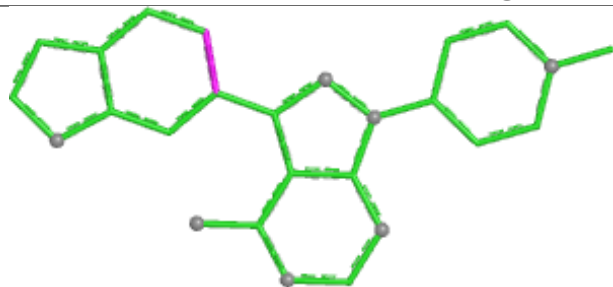
There are no ring outliers.

2 monomers are involved in 2 short contacts:

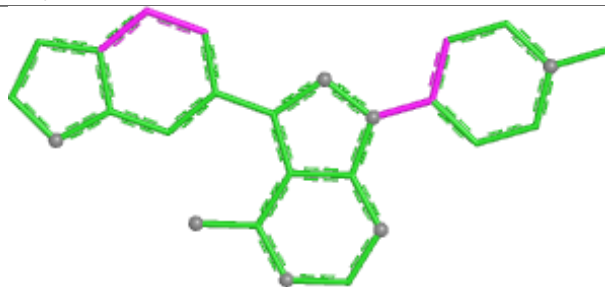
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	301	A1ISQ	1	0
2	H	301	A1ISQ	1	0

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.

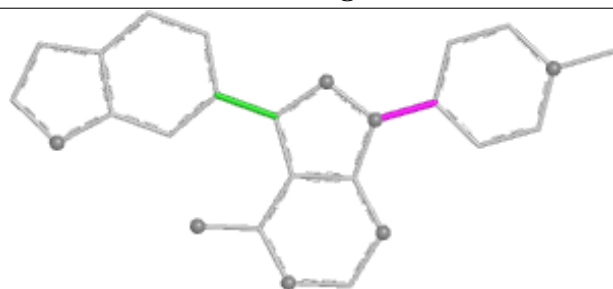
## Ligand A1ISQ A 301



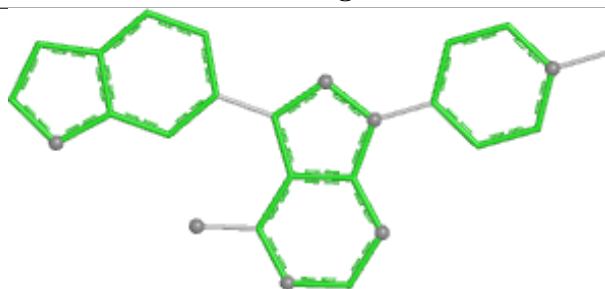
Bond lengths



Bond angles

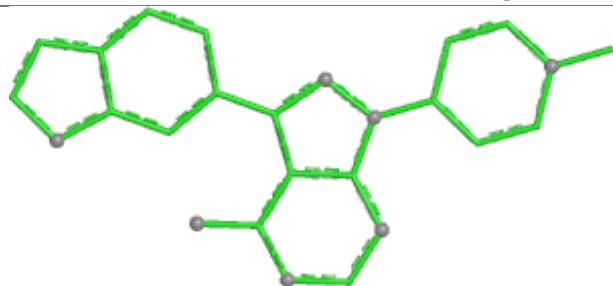


Torsions

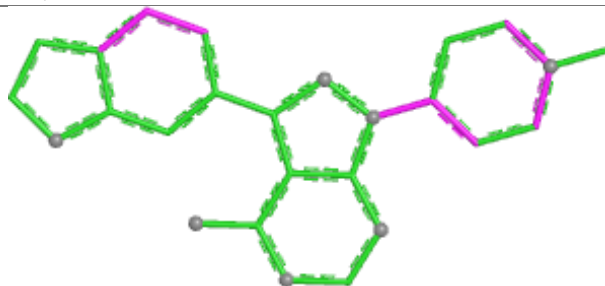


Rings

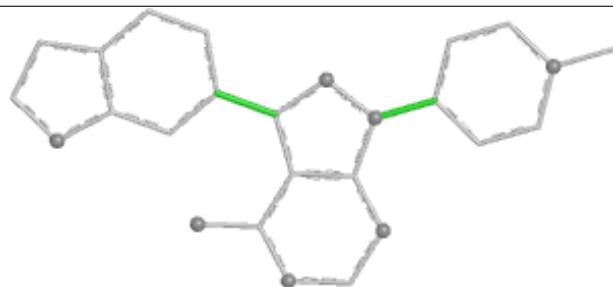
## Ligand A1ISQ D 301



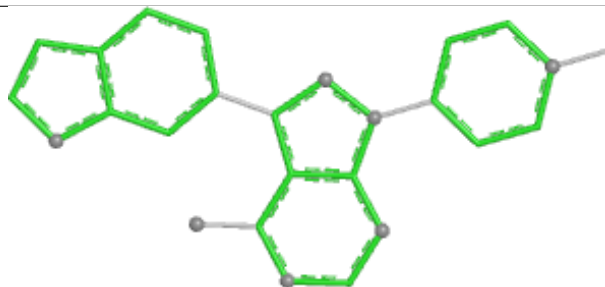
Bond lengths



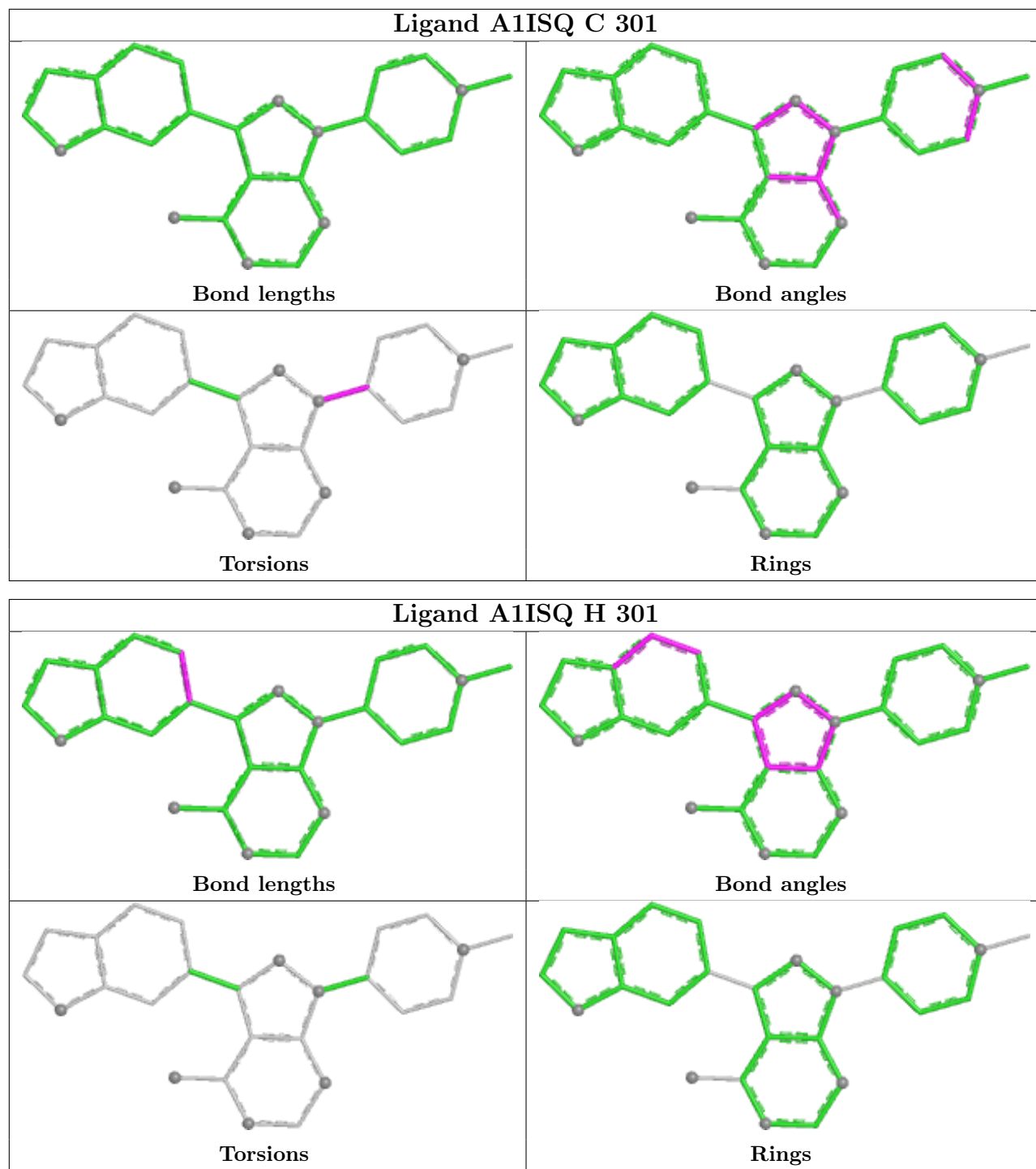
Bond angles



Torsions



Rings



## 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 [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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	214/222 (96%)	-1.82	0 100 100	12, 35, 86, 128	0
1	B	212/222 (95%)	-1.80	0 100 100	10, 37, 86, 122	0
1	C	210/222 (94%)	-1.83	0 100 100	14, 41, 102, 162	0
1	D	203/222 (91%)	-1.80	0 100 100	11, 38, 93, 140	0
1	E	203/222 (91%)	-1.82	0 100 100	12, 35, 92, 133	0
1	F	208/222 (93%)	-1.77	0 100 100	17, 46, 105, 150	0
1	G	210/222 (94%)	-1.81	0 100 100	12, 41, 109, 165	0
1	H	212/222 (95%)	-1.77	0 100 100	15, 48, 114, 155	0
All	All	1672/1776 (94%)	-1.80	0 100 100	10, 40, 102, 165	0

There are no RSRZ outliers to report.

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

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

### 6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

### 6.4 Ligands [i](#)

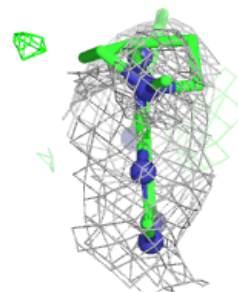
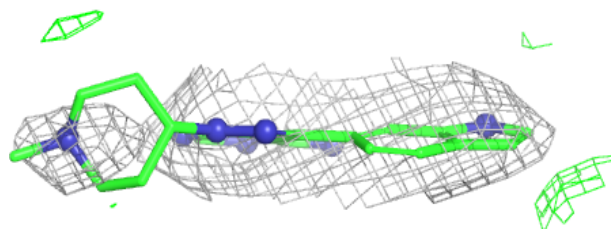
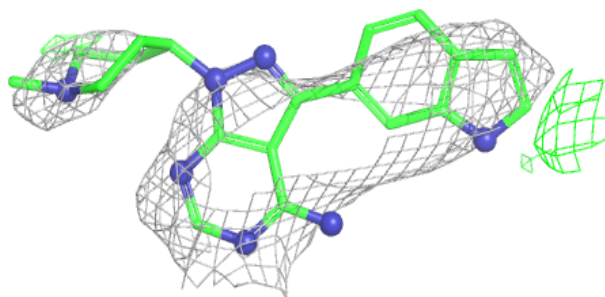
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 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	A1ISQ	H	301	26/26	0.99	0.03	64,71,77,82	26
2	A1ISQ	C	301	26/26	1.00	0.02	49,60,65,66	0
2	A1ISQ	D	301	26/26	1.00	0.02	51,54,56,57	0
2	A1ISQ	A	301	26/26	1.00	0.02	41,53,57,58	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.

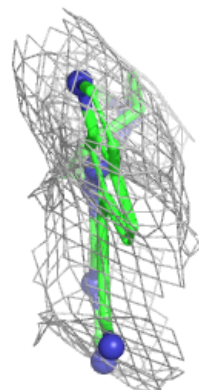
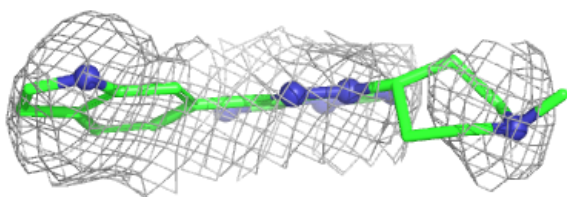
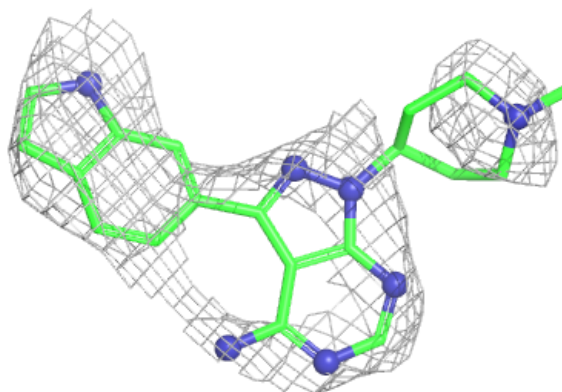
**Electron density around A1ISQ H 301:**

2mF<sub>o</sub>-DF<sub>c</sub> (at 0.7 rmsd) in gray  
mF<sub>o</sub>-DF<sub>c</sub> (at 3 rmsd) in purple (negative)  
and green (positive)

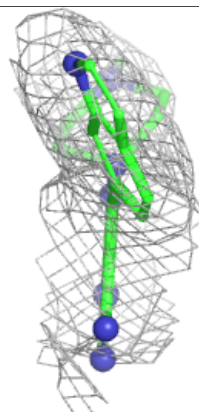
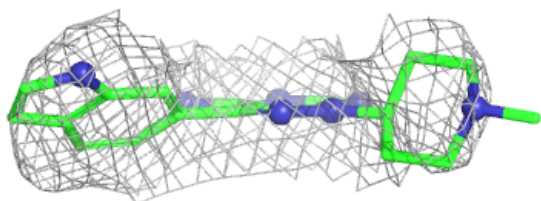
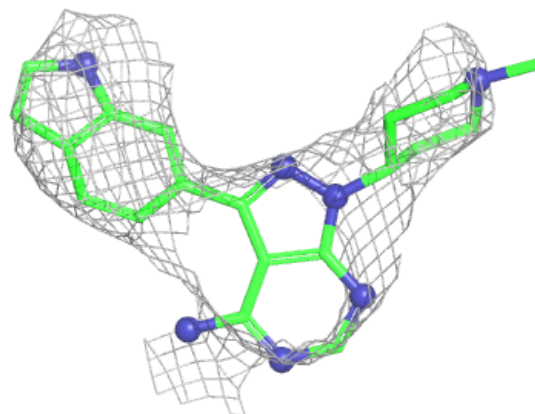


**Electron density around A1ISQ C 301:**

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

**Electron density around A1ISQ D 301:**

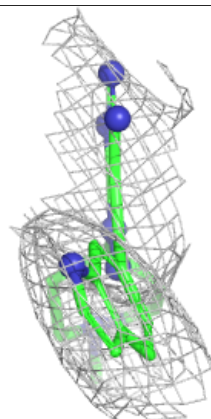
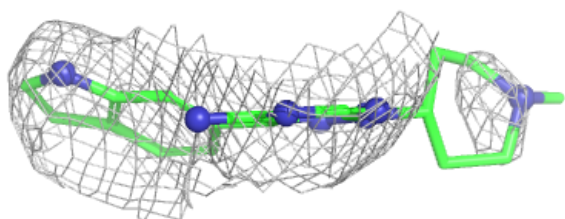
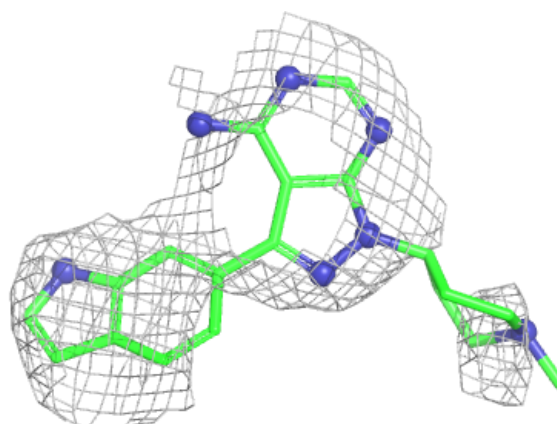
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





**Electron density around A1ISQ 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 [i](#)

There are no such residues in this entry.