Full wwPDB X-ray Structure Validation Report ⓘ

Nov 3, 2024 – 01:28 am GMT

PDB ID	:	1H1S
Title	:	Structure of human Thr160-phospho CDK2/cyclin A complexed with the inhibitor NU6102
Authors	:	Davies, T.G.; Noble, M.E.M.; Endicott, J.A.; Johnson, L.N.
Deposited on	:	2002-07-21
Resolution	:	2.00 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:

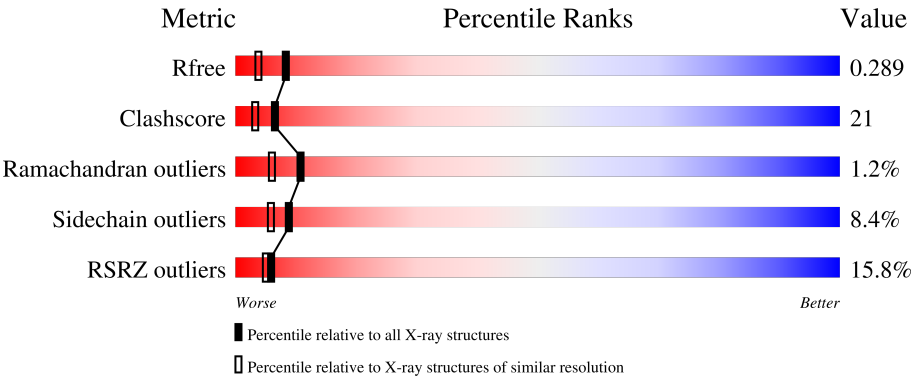
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 2.00 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}	164625	9409 (2.00-2.00)
Clashscore	180529	10737 (2.00-2.00)
Ramachandran outliers	177936	10628 (2.00-2.00)
Sidechain outliers	177891	10627 (2.00-2.00)
RSRZ outliers	164620	9409 (2.00-2.00)

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	303	7% 65% 25% 6%
1	C	303	22% 54% 34% 9%
2	B	258	6% 75% 20%
2	D	258	28% 55% 40% 5%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 9701 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.

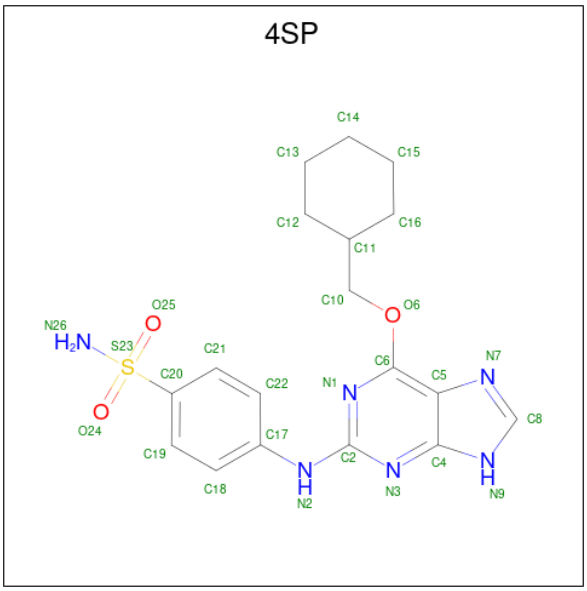
- Molecule 1 is a protein called CELL DIVISION PROTEIN KINASE 2.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	297	Total	C	N	O	P	S	0	0	0
			2388	1550	404	425	1	8			
1	C	297	Total	C	N	O	P	S	0	0	0
			2388	1550	404	425	1	8			

- Molecule 2 is a protein called CYCLIN A2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	258	Total	C	N	O	S	0	0	0
			2083	1350	339	383	11			
2	D	258	Total	C	N	O	S	0	0	0
			2083	1350	339	383	11			

- Molecule 3 is O6-CYCLOHEXYLMETHOXY-2-(4'-SULPHAMOYLANILINO) PURINE (three-letter code: 4SP) (formula: $C_{18}H_{22}N_6O_3S$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			28	18	6	3	1		
3	C	1	Total	C	N	O	S	0	0
			28	18	6	3	1		

- Molecule 4 is water.

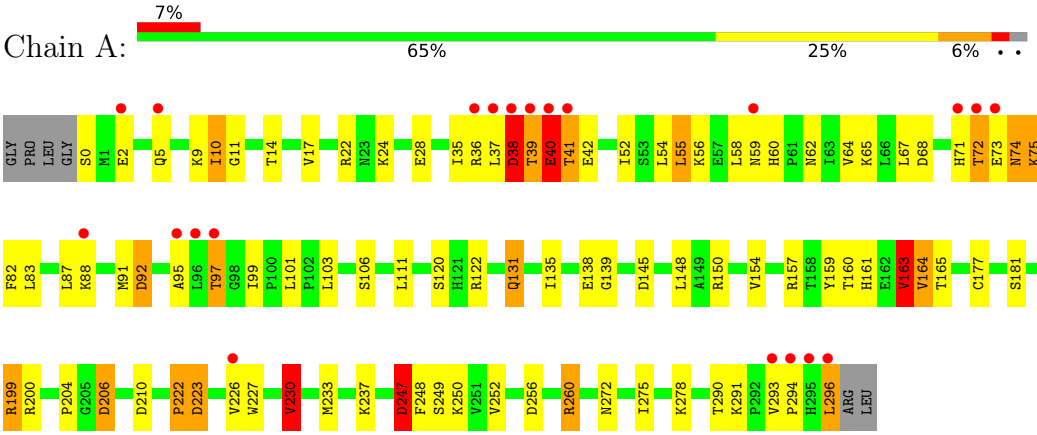
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	271	Total	O	0	0
			271	271		
4	B	182	Total	O	0	0
			182	182		
4	C	138	Total	O	0	0
			138	138		
4	D	112	Total	O	0	0
			112	112		

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.

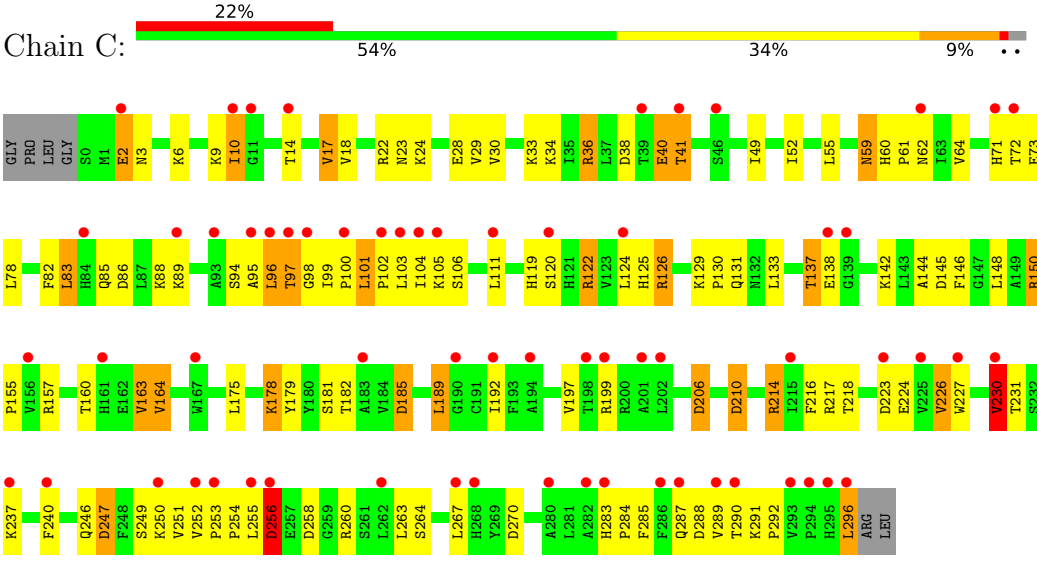
• Molecule 1: CELL DIVISION PROTEIN KINASE 2

Chain A:



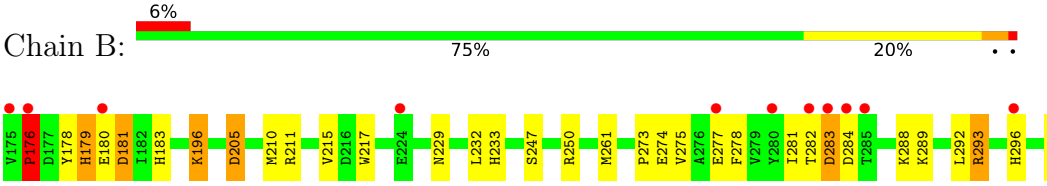
• Molecule 1: CELL DIVISION PROTEIN KINASE 2

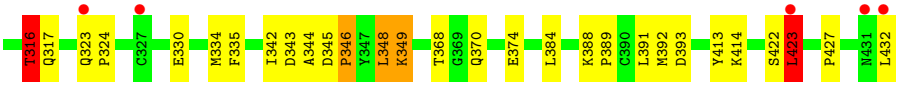
Chain C:



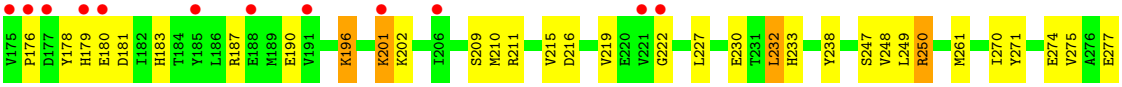
• Molecule 2: CYCLIN A2

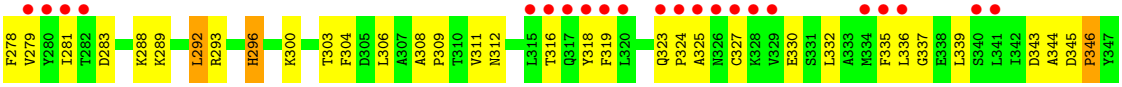
Chain B:

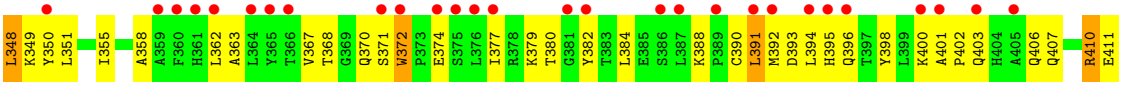


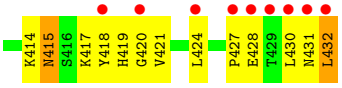


• Molecule 2: CYCLIN A2









4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	74.23Å 135.35Å 148.46Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.00 20.00 – 2.00	Depositor EDS
% Data completeness (in resolution range)	94.5 (20.00-2.00) 94.1 (20.00-2.00)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.09 (at 1.90Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.236 , 0.286 0.238 , 0.289	Depositor DCC
R_{free} test set	4743 reflections (4.96%)	wwPDB-VP
Wilson B-factor (Å^2)	32.6	Xtriage
Anisotropy	0.175	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 51.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	9701	wwPDB-VP
Average B, all atoms (Å^2)	40.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.36% 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: TPO, 4SP

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	0.94	2/2438 (0.1%)	1.29	31/3308 (0.9%)
1	C	0.74	0/2438	1.35	24/3308 (0.7%)
2	B	0.88	0/2133	1.16	14/2897 (0.5%)
2	D	0.68	0/2133	1.20	13/2897 (0.4%)
All	All	0.82	2/9142 (0.0%)	1.26	82/12410 (0.7%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	120	SER	CB-OG	-6.36	1.33	1.42
1	A	159	TYR	CD1-CE1	5.34	1.47	1.39

All (82) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	36	ARG	NE-CZ-NH2	18.79	129.69	120.30
1	C	36	ARG	NE-CZ-NH1	-17.56	111.52	120.30
2	D	250	ARG	NE-CZ-NH1	13.15	126.88	120.30
2	D	293	ARG	NE-CZ-NH2	-11.13	114.74	120.30
1	C	247	ASP	CB-CG-OD2	10.98	128.19	118.30
2	B	293	ARG	NE-CZ-NH1	10.80	125.70	120.30
2	D	250	ARG	NE-CZ-NH2	-10.74	114.93	120.30
1	C	36	ARG	CG-CD-NE	10.36	133.55	111.80
1	C	36	ARG	CD-NE-CZ	10.10	137.74	123.60
1	A	260	ARG	NE-CZ-NH1	9.90	125.25	120.30
1	A	230	VAL	CB-CA-C	-9.76	92.86	111.40
1	C	145	ASP	CB-CG-OD2	9.55	126.90	118.30
2	B	293	ARG	NE-CZ-NH2	-9.12	115.74	120.30
1	C	17	VAL	CB-CA-C	-8.77	94.74	111.40
2	D	293	ARG	NE-CZ-NH1	8.63	124.61	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	284	ASP	CB-CG-OD2	8.48	125.94	118.30
1	A	210	ASP	CB-CG-OD1	8.40	125.86	118.30
2	D	181	ASP	CB-CG-OD2	7.83	125.35	118.30
2	D	393	ASP	CB-CG-OD2	7.78	125.30	118.30
2	D	283	ASP	CB-CG-OD2	7.75	125.28	118.30
1	C	122	ARG	NE-CZ-NH2	-7.67	116.46	120.30
1	A	260	ARG	NE-CZ-NH2	-7.53	116.54	120.30
1	A	36	ARG	NE-CZ-NH2	-7.47	116.56	120.30
1	C	230	VAL	CB-CA-C	-7.35	97.44	111.40
1	A	256	ASP	CB-CG-OD2	7.33	124.90	118.30
1	A	247	ASP	CB-CG-OD2	7.29	124.86	118.30
1	A	38	ASP	N-CA-C	7.26	130.59	111.00
1	C	214	ARG	NE-CZ-NH1	-7.23	116.68	120.30
1	A	157	ARG	NE-CZ-NH2	-7.21	116.70	120.30
2	B	205	ASP	CB-CG-OD2	6.99	124.59	118.30
1	C	122	ARG	NE-CZ-NH1	6.95	123.77	120.30
1	C	270	ASP	CB-CG-OD2	6.90	124.51	118.30
1	A	145	ASP	CB-CG-OD2	6.61	124.25	118.30
2	D	343	ASP	CB-CG-OD2	6.55	124.20	118.30
1	C	157	ARG	NE-CZ-NH2	-6.54	117.03	120.30
1	A	163	VAL	CG1-CB-CG2	6.45	121.23	110.90
1	A	163	VAL	N-CA-CB	-6.37	97.48	111.50
1	C	76	LEU	CA-CB-CG	6.29	129.76	115.30
2	D	432	LEU	CA-CB-CG	6.24	129.66	115.30
1	C	126	ARG	NE-CZ-NH1	6.24	123.42	120.30
1	C	86	ASP	CB-CG-OD2	6.22	123.90	118.30
2	B	176	PRO	N-CA-C	6.20	128.23	112.10
1	C	206	ASP	CB-CG-OD2	6.12	123.81	118.30
2	B	343	ASP	CB-CG-OD2	6.11	123.80	118.30
1	A	36	ARG	NE-CZ-NH1	6.09	123.34	120.30
1	A	92	ASP	CB-CG-OD2	6.07	123.76	118.30
2	B	423	LEU	CB-CA-C	6.06	121.71	110.20
2	B	393	ASP	CB-CG-OD2	5.95	123.66	118.30
1	A	296	LEU	CA-CB-CG	5.88	128.82	115.30
2	B	316	THR	N-CA-CB	-5.86	99.17	110.30
1	C	217	ARG	NE-CZ-NH1	5.84	123.22	120.30
1	A	38	ASP	CB-CG-OD2	5.82	123.54	118.30
1	C	210	ASP	CB-CG-OD2	5.78	123.50	118.30
1	A	248	PHE	CB-CG-CD1	-5.78	116.76	120.80
2	B	432	LEU	CA-CB-CG	5.75	128.53	115.30
2	D	384	LEU	CA-CB-CG	5.75	128.53	115.30
1	C	235	ASP	CB-CG-OD2	5.75	123.47	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	261	MET	CG-SD-CE	5.71	109.34	100.20
2	B	423	LEU	CB-CG-CD1	5.70	120.69	111.00
1	A	199	ARG	NE-CZ-NH1	5.67	123.14	120.30
1	C	256	ASP	CB-CG-OD2	5.66	123.39	118.30
2	D	250	ARG	CD-NE-CZ	5.65	131.51	123.60
1	A	206	ASP	CB-CG-OD2	5.64	123.38	118.30
1	A	41	THR	N-CA-CB	5.60	120.94	110.30
1	C	288	ASP	CB-CG-OD2	5.59	123.33	118.30
1	A	72	THR	N-CA-CB	-5.56	99.74	110.30
1	A	55	LEU	CB-CG-CD1	5.51	120.36	111.00
1	C	185	ASP	CB-CG-OD1	5.45	123.21	118.30
1	A	83	LEU	CA-CB-CG	-5.38	102.92	115.30
1	A	97	THR	CB-CA-C	-5.29	97.33	111.60
2	D	232	LEU	CA-CB-CG	5.28	127.45	115.30
1	A	200	ARG	NE-CZ-NH1	-5.25	117.68	120.30
2	B	181	ASP	CB-CG-OD2	5.24	123.02	118.30
1	C	216	PHE	CB-CG-CD2	-5.24	117.13	120.80
2	B	283	ASP	CB-CG-OD1	5.21	122.99	118.30
1	A	293	VAL	N-CA-C	-5.19	97.00	111.00
1	A	223	ASP	CB-CG-OD2	5.17	122.95	118.30
2	D	410	ARG	NE-CZ-NH2	5.14	122.87	120.30
1	A	68	ASP	CB-CG-OD2	5.13	122.92	118.30
1	A	247	ASP	N-CA-CB	-5.13	101.37	110.60
1	A	157	ARG	CG-CD-NE	-5.07	101.15	111.80
1	A	210	ASP	OD1-CG-OD2	-5.05	113.70	123.30

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	2388	0	2430	92	1
1	C	2388	0	2430	130	0
2	B	2083	0	2107	67	1
2	D	2083	0	2107	115	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	28	0	22	5	0
3	C	28	0	22	1	0
4	A	271	0	0	22	0
4	B	182	0	0	13	0
4	C	138	0	0	40	0
4	D	112	0	0	36	0
All	All	9701	0	9118	388	1

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 21.

All (388) 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:B:423:LEU:HB2	4:B:2176:HOH:O	1.21	1.33
2:B:414:LYS:HG2	2:B:423:LEU:HD11	1.34	1.07
1:A:272:ASN:HB3	4:A:2246:HOH:O	1.56	1.05
2:B:334:MET:HG2	4:B:2107:HOH:O	1.57	1.03
1:A:72:THR:HB	1:A:75:LYS:O	1.60	1.01
1:C:85:GLN:HE21	1:C:296:LEU:HD21	1.20	1.00
1:C:40:GLU:OE1	4:C:2031:HOH:O	1.81	0.97
1:C:88:LYS:HD2	1:C:131:GLN:HG3	1.48	0.95
2:B:423:LEU:CB	4:B:2176:HOH:O	1.88	0.94
2:D:312:ASN:HB2	4:D:2038:HOH:O	1.66	0.93
1:C:88:LYS:HB2	1:C:131:GLN:HE21	1.33	0.93
1:A:88:LYS:HD2	1:A:131:GLN:HE21	1.35	0.92
2:B:423:LEU:CG	4:B:2176:HOH:O	2.14	0.89
2:D:270:ILE:O	4:D:2048:HOH:O	1.93	0.86
2:B:423:LEU:CD1	4:B:2176:HOH:O	2.22	0.85
1:C:60:HIS:HD2	1:C:62:ASN:H	1.21	0.84
2:D:401:ALA:HB3	2:D:402:PRO:HD3	1.58	0.84
2:B:423:LEU:HD13	4:B:2176:HOH:O	1.78	0.83
1:C:252:VAL:HG11	1:C:255:LEU:HD22	1.60	0.83
2:D:355:ILE:HG21	4:D:2080:HOH:O	1.78	0.81
1:A:88:LYS:CD	1:A:131:GLN:HE21	1.94	0.81
1:A:177:CYS:SG	4:A:2024:HOH:O	2.39	0.80
2:B:334:MET:SD	4:B:2120:HOH:O	2.39	0.80
1:C:175:LEU:HD13	1:C:233:MET:CE	2.11	0.80
1:A:260:ARG:HD3	4:A:2228:HOH:O	1.81	0.79
1:A:60:HIS:CD2	1:A:62:ASN:H	2.01	0.79
2:D:318:TYR:HE1	4:D:2069:HOH:O	1.66	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:287:GLN:HG2	4:C:2132:HOH:O	1.83	0.78
1:A:95:ALA:O	1:A:199:ARG:NH1	2.16	0.77
1:C:38:ASP:HB3	1:C:41:THR:HB	1.66	0.77
2:D:210:MET:HE1	2:D:250:ARG:HD3	1.67	0.77
1:C:49:ILE:HG23	2:D:306:LEU:HD12	1.67	0.77
1:A:60:HIS:HD2	1:A:62:ASN:H	1.30	0.77
2:D:344:ALA:HB1	2:D:348:LEU:HD22	1.67	0.77
2:D:374:GLU:HA	2:D:377:ILE:HG13	1.67	0.77
2:D:216:ASP:HB2	2:D:406:GLN:HG3	1.66	0.76
1:C:10:ILE:HG23	4:C:2009:HOH:O	1.85	0.76
2:D:402:PRO:HB2	2:D:403:GLN:OE1	1.85	0.76
2:B:283:ASP:HB2	4:B:2086:HOH:O	1.86	0.76
2:D:335:PHE:CZ	2:D:339:LEU:HD11	2.20	0.75
1:C:144:ALA:HA	4:C:2071:HOH:O	1.87	0.75
2:D:336:LEU:HD22	4:D:2098:HOH:O	1.87	0.75
2:D:327:CYS:HB2	2:D:419:HIS:NE2	2.01	0.74
4:A:2051:HOH:O	2:B:316:THR:HG21	1.87	0.74
1:C:88:LYS:HB2	1:C:131:GLN:NE2	2.00	0.74
1:C:240:PHE:HB2	4:C:2111:HOH:O	1.87	0.73
1:C:30:VAL:HG13	4:C:2023:HOH:O	1.87	0.73
1:C:146:PHE:CE1	4:C:2071:HOH:O	2.41	0.73
1:A:38:ASP:O	1:A:39:THR:CB	2.37	0.72
1:A:88:LYS:HD2	1:A:131:GLN:HG3	1.71	0.72
1:C:88:LYS:CB	1:C:131:GLN:HE21	2.01	0.72
1:C:256:ASP:O	1:C:260:ARG:HG3	1.89	0.72
1:A:72:THR:OG1	4:A:2083:HOH:O	2.08	0.71
1:A:72:THR:HG22	1:A:74:ASN:H	1.57	0.69
2:B:289:LYS:HE3	2:B:293:ARG:NE	2.07	0.69
2:B:217:TRP:CH2	2:B:281:ILE:HD12	2.28	0.69
2:B:414:LYS:CG	2:B:423:LEU:HD11	2.18	0.69
1:C:60:HIS:CD2	1:C:62:ASN:H	2.07	0.69
1:C:85:GLN:NE2	1:C:296:LEU:HD21	2.02	0.69
1:C:130:PRO:HB2	1:C:131:GLN:HE22	1.58	0.69
2:D:358:ALA:HB1	4:D:2096:HOH:O	1.91	0.69
1:A:181:SER:HB3	4:A:2165:HOH:O	1.92	0.68
1:C:85:GLN:OE1	1:C:89:LYS:HB3	1.93	0.68
1:C:52:ILE:HD11	1:C:78:LEU:HD21	1.76	0.68
1:C:249:SER:OG	1:C:250:LYS:HE3	1.93	0.68
1:C:94:SER:OG	4:C:2059:HOH:O	2.12	0.67
1:C:40:GLU:CD	4:C:2031:HOH:O	2.25	0.67
2:D:394:LEU:HB2	4:D:2096:HOH:O	1.93	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:38:ASP:O	1:A:39:THR:HB	1.95	0.66
2:B:414:LYS:HG2	2:B:423:LEU:CD1	2.20	0.66
1:A:28:GLU:OE2	4:A:2029:HOH:O	2.13	0.66
1:C:251:VAL:HG12	1:C:252:VAL:HG23	1.78	0.65
2:D:318:TYR:CE1	4:D:2069:HOH:O	2.44	0.65
2:B:289:LYS:HE3	2:B:293:ARG:HE	1.62	0.65
2:D:362:LEU:HD23	4:D:2098:HOH:O	1.96	0.65
1:C:154:VAL:O	2:D:316:THR:HG22	1.97	0.65
1:C:10:ILE:HD11	1:C:82:PHE:HE1	1.62	0.65
2:D:401:ALA:HB1	2:D:410:ARG:HD2	1.77	0.65
1:C:283:HIS:ND1	4:C:2130:HOH:O	2.29	0.64
2:D:346:PRO:O	2:D:349:LYS:HG2	1.97	0.64
2:D:394:LEU:CB	4:D:2096:HOH:O	2.46	0.64
2:D:417:LYS:HA	4:D:2105:HOH:O	1.97	0.64
1:C:130:PRO:HB2	1:C:131:GLN:NE2	2.11	0.64
1:C:292:PRO:HA	4:C:2134:HOH:O	1.98	0.64
1:C:197:VAL:HA	4:C:2098:HOH:O	1.98	0.64
2:B:330:GLU:O	2:B:334:MET:HG3	1.97	0.64
2:D:183:HIS:HE1	4:D:2069:HOH:O	1.80	0.64
1:C:155:PRO:HD2	2:D:316:THR:HG23	1.81	0.63
1:C:146:PHE:HE1	4:C:2071:HOH:O	1.77	0.62
1:A:247:ASP:OD2	1:A:249:SER:OG	2.09	0.62
1:C:285:PHE:HB2	4:C:2130:HOH:O	1.98	0.62
2:D:277:GLU:O	2:D:281:ILE:HG23	1.99	0.62
1:A:71:HIS:ND1	2:B:304:PHE:HZ	1.98	0.62
1:C:253:PRO:HB2	1:C:254:PRO:HD3	1.82	0.62
2:D:261:MET:HE1	4:D:2026:HOH:O	1.99	0.62
2:D:325:ALA:HB3	4:D:2075:HOH:O	1.99	0.62
1:C:40:GLU:OE2	4:C:2031:HOH:O	2.16	0.62
2:B:293:ARG:HD3	1:C:2:GLU:OE1	2.00	0.61
1:C:111:LEU:HD13	1:C:189:LEU:HD21	1.81	0.61
2:D:275:VAL:HG21	2:D:292:LEU:HD11	1.82	0.61
2:D:418:TYR:O	2:D:421:VAL:HG13	2.01	0.61
1:A:88:LYS:CG	1:A:131:GLN:HE21	2.14	0.61
1:A:39:THR:HA	2:B:292:LEU:HD23	1.83	0.60
1:A:95:ALA:HA	4:A:2101:HOH:O	2.01	0.60
1:A:161:HIS:HD2	4:A:2055:HOH:O	1.83	0.60
1:C:218:THR:HG23	4:C:2116:HOH:O	2.02	0.60
1:C:223:ASP:H	1:C:226:VAL:CG1	2.14	0.60
1:A:71:HIS:NE2	4:A:2082:HOH:O	2.30	0.60
1:C:283:HIS:CE1	4:C:2130:HOH:O	2.55	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:223:ASP:OD1	1:A:226:VAL:HG12	2.03	0.59
1:C:100:PRO:O	1:C:104:ILE:HG13	2.03	0.59
1:C:210:ASP:O	1:C:214:ARG:HG3	2.03	0.59
2:D:401:ALA:HB3	2:D:402:PRO:CD	2.30	0.59
1:A:88:LYS:HD2	1:A:131:GLN:NE2	2.14	0.58
2:D:362:LEU:HD13	2:D:430:LEU:HD21	1.84	0.58
2:B:388:LYS:HB3	2:B:389:PRO:HD3	1.85	0.58
1:C:155:PRO:HD2	2:D:316:THR:CG2	2.33	0.58
2:D:183:HIS:CE1	4:D:2069:HOH:O	2.54	0.58
1:A:154:VAL:O	2:B:316:THR:HG23	2.03	0.57
2:B:217:TRP:CZ2	2:B:281:ILE:HD12	2.39	0.57
2:D:211:ARG:O	2:D:215:VAL:HG23	2.03	0.57
1:A:237:LYS:HE2	4:A:2200:HOH:O	2.04	0.57
2:B:289:LYS:CE	2:B:293:ARG:HE	2.17	0.57
2:B:344:ALA:HB1	2:B:348:LEU:HD22	1.87	0.56
1:C:10:ILE:HD11	1:C:82:PHE:CE1	2.39	0.56
2:D:196:LYS:HE3	2:D:202:LYS:NZ	2.20	0.56
1:C:146:PHE:CD1	4:C:2071:HOH:O	2.59	0.56
2:D:367:VAL:HG12	2:D:368:THR:HG23	1.86	0.56
2:D:396:GLN:HB3	2:D:400:LYS:HE3	1.88	0.56
1:C:2:GLU:HG2	1:C:3:ASN:N	2.21	0.56
2:D:372:TRP:HD1	4:D:2094:HOH:O	1.87	0.56
1:C:49:ILE:HG23	2:D:306:LEU:CD1	2.35	0.56
1:A:10:ILE:HG22	1:A:11:GLY:N	2.21	0.56
1:C:10:ILE:HG22	1:C:18:VAL:O	2.06	0.56
2:D:275:VAL:HG11	2:D:292:LEU:HD13	1.88	0.56
2:B:345:ASP:OD1	4:B:2130:HOH:O	2.18	0.56
2:D:388:LYS:O	2:D:392:MET:HG2	2.05	0.56
1:A:42:GLU:OE1	2:B:275:VAL:HG23	2.04	0.55
1:C:101:LEU:HD13	1:C:101:LEU:O	2.06	0.55
1:C:129:LYS:HD2	1:C:131:GLN:OE1	2.07	0.55
1:C:155:PRO:HA	4:C:2077:HOH:O	2.07	0.55
1:A:223:ASP:H	1:A:226:VAL:CG1	2.19	0.55
1:A:9:LYS:HE3	1:A:17:VAL:HG13	1.89	0.55
1:C:125:HIS:NE2	4:C:2064:HOH:O	2.33	0.55
1:C:227:TRP:HB3	1:C:230:VAL:HG22	1.89	0.55
2:D:363:ALA:HB3	4:D:2088:HOH:O	2.06	0.55
1:C:88:LYS:HD2	1:C:131:GLN:CG	2.29	0.55
2:D:394:LEU:HG	4:D:2098:HOH:O	2.07	0.55
1:A:72:THR:HG22	1:A:75:LYS:H	1.71	0.54
1:C:126:ARG:CZ	1:C:150:ARG:HG2	2.37	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:10:ILE:HG21	1:C:18:VAL:HG12	1.89	0.54
2:D:303:THR:O	2:D:304:PHE:HB2	2.07	0.54
1:C:163:VAL:HG13	1:C:164:VAL:HG23	1.88	0.54
1:A:278:LYS:NZ	2:B:181:ASP:OD2	2.41	0.54
1:A:40:GLU:HA	2:B:288:LYS:HE2	1.90	0.53
1:C:88:LYS:CG	1:C:131:GLN:HE21	2.20	0.53
1:A:71:HIS:CD2	1:A:76:LEU:HD13	2.44	0.53
1:C:178:LYS:HE2	1:C:179:TYR:CZ	2.44	0.53
2:B:233:HIS:HD2	4:B:2106:HOH:O	1.90	0.53
2:D:358:ALA:HA	2:D:391:LEU:HD22	1.90	0.53
1:A:177:CYS:HB2	1:A:233:MET:HE3	1.90	0.52
2:B:183:HIS:HB2	2:B:317:GLN:HE22	1.74	0.52
2:B:281:ILE:HG13	2:B:282:THR:N	2.22	0.52
1:C:237:LYS:HD3	4:C:2109:HOH:O	2.10	0.52
1:C:285:PHE:N	4:C:2130:HOH:O	2.41	0.52
1:A:10:ILE:HG22	1:A:11:GLY:H	1.75	0.52
2:D:215:VAL:O	2:D:219:VAL:HG23	2.10	0.52
1:C:181:SER:OG	1:C:182:THR:N	2.39	0.52
3:C:1298:4SP:H101	4:C:2009:HOH:O	2.10	0.52
2:B:422:SER:C	2:B:423:LEU:HG	2.30	0.52
2:D:190:GLU:HG3	2:D:351:LEU:HD22	1.91	0.52
4:A:2082:HOH:O	2:B:296:HIS:CG	2.62	0.52
1:C:142:LYS:NZ	4:C:2070:HOH:O	2.43	0.51
1:C:249:SER:HB3	4:C:2117:HOH:O	2.10	0.51
2:B:210:MET:CE	2:B:250:ARG:HB2	2.40	0.51
1:C:96:LEU:O	1:C:199:ARG:NH1	2.43	0.51
1:A:39:THR:HG23	2:B:289:LYS:HD3	1.93	0.51
1:C:88:LYS:HD2	1:C:131:GLN:HE21	1.75	0.51
1:C:99:ILE:O	1:C:104:ILE:HD11	2.11	0.51
2:D:358:ALA:CB	2:D:391:LEU:HD22	2.41	0.51
1:A:39:THR:CG2	2:B:289:LYS:HD3	2.40	0.51
2:D:396:GLN:O	2:D:400:LYS:HG3	2.10	0.51
2:D:428:GLU:HG2	4:D:2111:HOH:O	2.10	0.51
2:D:419:HIS:CE1	4:D:2108:HOH:O	2.63	0.51
2:B:289:LYS:HE3	2:B:293:ARG:NH2	2.26	0.51
1:A:64:VAL:HG21	3:A:1298:4SP:C8	2.41	0.51
2:D:279:VAL:HB	4:D:2052:HOH:O	2.10	0.51
2:D:335:PHE:CE2	2:D:339:LEU:HD11	2.46	0.51
1:A:10:ILE:HD11	1:A:82:PHE:HE1	1.76	0.50
2:B:323:GLN:OE1	2:B:324:PRO:HA	2.11	0.50
1:C:231:THR:HA	1:C:236:TYR:CD1	2.46	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:289:LYS:NZ	2:B:293:ARG:HE	2.08	0.50
2:D:201:LYS:O	2:D:201:LYS:HD3	2.11	0.50
1:C:131:GLN:CD	1:C:131:GLN:H	2.15	0.50
2:D:279:VAL:HG21	2:D:288:LYS:HA	1.94	0.50
1:C:10:ILE:HG23	1:C:10:ILE:O	2.11	0.50
1:A:222:PRO:HA	1:A:226:VAL:HG11	1.94	0.50
2:D:417:LYS:NZ	2:D:417:LYS:HB3	2.27	0.50
1:A:5:GLN:OE1	1:A:24:LYS:HE2	2.11	0.49
2:B:289:LYS:HE3	2:B:293:ARG:CZ	2.42	0.49
2:B:427:PRO:HA	4:B:2180:HOH:O	2.11	0.49
1:C:28:GLU:HB3	4:C:2023:HOH:O	2.12	0.49
1:C:251:VAL:HG22	4:C:2116:HOH:O	2.13	0.49
2:D:248:VAL:HG12	2:D:249:LEU:O	2.12	0.49
1:C:131:GLN:CD	1:C:131:GLN:N	2.66	0.49
2:D:275:VAL:HG12	4:D:2052:HOH:O	2.11	0.49
1:C:263:LEU:HD11	1:C:267:LEU:HD11	1.95	0.49
2:D:222:GLY:HA2	2:D:227:LEU:HB2	1.94	0.48
1:C:85:GLN:HE21	1:C:296:LEU:CD2	2.10	0.48
2:D:279:VAL:CG2	4:D:2052:HOH:O	2.60	0.48
2:B:346:PRO:HB2	2:B:349:LYS:HE2	1.95	0.48
1:C:74:ASN:HB2	4:C:2049:HOH:O	2.12	0.48
1:C:230:VAL:HG13	1:C:233:MET:HE1	1.95	0.48
1:C:23:ASN:HB2	4:C:2023:HOH:O	2.13	0.48
1:C:285:PHE:HA	4:C:2131:HOH:O	2.13	0.48
2:D:380:THR:HB	2:D:382:TYR:CD2	2.49	0.48
1:A:71:HIS:CE1	4:A:2082:HOH:O	2.67	0.48
1:C:206:ASP:HA	4:C:2100:HOH:O	2.14	0.48
1:A:199:ARG:HD2	4:A:2101:HOH:O	2.14	0.47
2:B:323:GLN:OE1	2:B:323:GLN:HA	2.14	0.47
1:C:6:LYS:HE2	4:C:2003:HOH:O	2.14	0.47
1:A:154:VAL:O	2:B:316:THR:CG2	2.62	0.47
2:B:183:HIS:HB2	2:B:317:GLN:NE2	2.29	0.47
1:C:59:ASN:C	1:C:59:ASN:ND2	2.68	0.47
1:C:85:GLN:HG2	1:C:296:LEU:HD11	1.96	0.47
2:D:358:ALA:CA	2:D:391:LEU:HD22	2.44	0.47
1:A:39:THR:HG22	1:A:40:GLU:HG3	1.96	0.47
1:C:106:SER:HB2	1:C:290:THR:O	2.14	0.47
2:D:196:LYS:O	2:D:196:LYS:HG3	2.14	0.47
2:D:279:VAL:HG23	4:D:2052:HOH:O	2.14	0.47
1:A:9:LYS:HE3	1:A:17:VAL:CG1	2.44	0.47
1:A:71:HIS:CG	1:A:76:LEU:HD13	2.50	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:391:LEU:HA	4:D:2096:HOH:O	2.14	0.47
1:A:92:ASP:O	1:A:95:ALA:HB2	2.14	0.47
1:A:99:ILE:HG23	1:A:103:LEU:HD23	1.96	0.47
2:B:278:PHE:O	2:B:281:ILE:HG12	2.14	0.47
2:D:401:ALA:CB	2:D:402:PRO:HD3	2.38	0.47
1:C:38:ASP:HB3	1:C:41:THR:CB	2.41	0.47
1:C:111:LEU:CD1	1:C:189:LEU:HD21	2.44	0.47
2:D:323:GLN:OE1	2:D:324:PRO:HA	2.15	0.47
2:B:229:ASN:HD22	2:B:334:MET:CE	2.28	0.47
1:C:14:THR:HG21	1:C:148:LEU:HD13	1.97	0.47
1:C:95:ALA:O	1:C:199:ARG:NH1	2.45	0.47
1:C:144:ALA:CA	4:C:2071:HOH:O	2.55	0.47
1:C:255:LEU:HB3	1:C:260:ARG:HG2	1.96	0.47
2:D:178:TYR:HE2	4:D:2011:HOH:O	1.97	0.47
2:D:332:LEU:HB3	2:D:363:ALA:HB1	1.97	0.47
1:A:2:GLU:OE2	1:C:73:GLU:HG3	2.15	0.46
2:B:176:PRO:HA	2:B:179:HIS:CG	2.50	0.46
1:C:258:ASP:HB3	4:C:2130:HOH:O	2.14	0.46
2:D:180:GLU:OE1	2:D:379:LYS:NZ	2.47	0.46
2:D:216:ASP:CB	2:D:406:GLN:HG3	2.42	0.46
2:B:277:GLU:O	2:B:281:ILE:HG23	2.15	0.46
1:A:111:LEU:HD13	1:A:189:LEU:HD21	1.98	0.46
1:A:197:VAL:HG11	1:A:252:VAL:CG1	2.45	0.46
2:D:407:GLN:O	2:D:411:GLU:HG2	2.16	0.46
1:A:71:HIS:ND1	2:B:304:PHE:CZ	2.80	0.46
1:C:254:PRO:HB2	4:C:2121:HOH:O	2.15	0.46
1:A:237:LYS:CE	4:A:2200:HOH:O	2.63	0.46
2:B:196:LYS:CB	2:B:196:LYS:NZ	2.78	0.46
1:A:139:GLY:HA2	1:A:294:PRO:HD3	1.97	0.46
1:C:71:HIS:NE2	2:D:296:HIS:CE1	2.84	0.46
1:A:249:SER:HA	4:A:2228:HOH:O	2.15	0.45
1:C:33:LYS:HB3	1:C:78:LEU:HB2	1.97	0.45
1:A:72:THR:CG2	1:A:74:ASN:OD1	2.64	0.45
2:D:350:TYR:CD1	2:D:390:CYS:HB2	2.52	0.45
1:C:72:THR:HG22	1:C:74:ASN:OD1	2.16	0.45
2:D:275:VAL:HG11	2:D:292:LEU:CD1	2.46	0.45
2:D:401:ALA:CB	2:D:402:PRO:CD	2.94	0.45
1:C:283:HIS:CG	1:C:284:PRO:HD2	2.51	0.45
1:A:35:ILE:HB	1:A:76:LEU:HB3	1.97	0.45
1:C:60:HIS:CD2	1:C:61:PRO:HD2	2.51	0.45
1:C:72:THR:HG22	1:C:73:GLU:H	1.81	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:52:ILE:HD11	1:A:78:LEU:HD21	1.97	0.45
1:A:275:ILE:HG21	1:A:275:ILE:HD13	1.68	0.45
1:A:135:ILE:HD12	1:A:296:LEU:HD21	1.99	0.45
1:A:91:MET:HG2	1:A:99:ILE:HD11	1.99	0.45
2:B:215:VAL:HG12	2:B:342:ILE:HD13	1.97	0.45
2:D:421:VAL:O	2:D:424:LEU:HG	2.17	0.45
1:C:52:ILE:CD1	1:C:78:LEU:HD21	2.47	0.45
2:D:311:VAL:HG21	4:D:2080:HOH:O	2.17	0.45
1:A:65:LYS:NZ	4:A:2073:HOH:O	2.49	0.44
1:A:65:LYS:HG2	1:A:67:LEU:HD23	1.99	0.44
1:A:163:VAL:HG13	1:A:164:VAL:HG23	1.99	0.44
2:B:211:ARG:HD3	2:B:344:ALA:HB2	1.97	0.44
2:D:211:ARG:HG2	2:D:211:ARG:HH11	1.81	0.44
2:D:358:ALA:HA	2:D:391:LEU:CD2	2.47	0.44
2:D:368:THR:CB	2:D:370:GLN:HE21	2.29	0.44
2:D:395:HIS:HE1	2:D:427:PRO:O	1.99	0.44
1:A:131:GLN:CD	1:A:131:GLN:H	2.20	0.44
1:C:85:GLN:HB3	4:C:2051:HOH:O	2.17	0.44
1:A:291:LYS:NZ	4:A:2265:HOH:O	2.50	0.44
2:D:278:PHE:O	2:D:281:ILE:HG12	2.16	0.44
2:D:274:GLU:HG2	2:D:277:GLU:HG3	2.00	0.44
1:A:10:ILE:CG2	1:A:11:GLY:N	2.81	0.44
1:A:204:PRO:HG3	4:A:2176:HOH:O	2.18	0.44
1:C:83:LEU:HD21	1:C:142:LYS:HG3	2.00	0.44
1:C:119:HIS:HE1	1:C:185:ASP:OD2	2.01	0.44
2:D:230:GLU:HA	2:D:230:GLU:OE1	2.17	0.44
1:C:105:LYS:HG2	1:C:289:VAL:HG23	1.99	0.43
1:C:253:PRO:CB	1:C:254:PRO:HD3	2.48	0.43
2:D:414:LYS:O	2:D:415:ASN:C	2.54	0.43
1:A:39:THR:HG22	1:A:40:GLU:N	2.33	0.43
1:A:296:LEU:CB	4:A:2269:HOH:O	2.65	0.43
1:C:103:LEU:HD12	1:C:103:LEU:HA	1.71	0.43
2:D:350:TYR:CE1	2:D:390:CYS:HB2	2.53	0.43
2:B:334:MET:HB3	2:B:334:MET:HE2	1.82	0.43
2:D:279:VAL:CB	4:D:2052:HOH:O	2.65	0.43
2:D:368:THR:HB	2:D:370:GLN:HE21	1.83	0.43
2:B:308:ALA:HA	2:B:309:PRO:HD3	1.87	0.43
1:A:88:LYS:CG	1:A:131:GLN:NE2	2.81	0.43
1:C:291:LYS:O	4:C:2134:HOH:O	2.21	0.43
2:B:210:MET:HE1	2:B:250:ARG:HB2	2.01	0.43
2:D:196:LYS:HE3	2:D:202:LYS:HZ2	1.84	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:388:LYS:HB3	4:D:2095:HOH:O	2.18	0.43
1:C:22:ARG:NH2	1:C:24:LYS:HA	2.34	0.43
1:C:223:ASP:H	1:C:226:VAL:HG13	1.81	0.43
1:C:231:THR:HA	1:C:236:TYR:CG	2.53	0.43
2:D:233:HIS:HE1	4:D:2079:HOH:O	2.01	0.43
1:A:237:LYS:HA	1:A:237:LYS:HD3	1.75	0.43
1:C:29:VAL:HG23	4:C:2022:HOH:O	2.18	0.43
1:C:59:ASN:C	1:C:59:ASN:HD22	2.21	0.42
1:C:71:HIS:CD2	2:D:296:HIS:CE1	3.07	0.42
1:A:227:TRP:CE3	1:A:230:VAL:HG13	2.54	0.42
1:A:250:LYS:HA	1:A:250:LYS:HD3	1.85	0.42
1:C:124:LEU:HG	1:C:152:PHE:CD1	2.54	0.42
2:D:238:TYR:OH	2:D:306:LEU:HB3	2.19	0.42
1:A:10:ILE:CG2	3:A:1298:4SP:H101	2.50	0.42
1:C:125:HIS:CE1	4:C:2064:HOH:O	2.73	0.42
2:D:417:LYS:HE2	2:D:418:TYR:CZ	2.54	0.42
1:A:54:LEU:O	1:A:58:LEU:HG	2.18	0.42
2:B:176:PRO:HA	2:B:179:HIS:ND1	2.34	0.42
2:B:205:ASP:OD1	2:B:250:ARG:NH2	2.48	0.42
2:B:346:PRO:O	2:B:349:LYS:HG2	2.19	0.42
1:C:133:LEU:HD11	1:C:192:ILE:HD13	2.00	0.42
2:D:210:MET:HE2	2:D:250:ARG:HB2	2.02	0.42
2:D:419:HIS:CG	4:D:2108:HOH:O	2.72	0.42
2:D:421:VAL:HA	2:D:424:LEU:HG	2.02	0.42
1:C:64:VAL:HG12	4:C:2071:HOH:O	2.19	0.42
1:C:99:ILE:CG2	1:C:104:ILE:HG12	2.49	0.42
1:A:14:THR:HG21	1:A:148:LEU:HD12	2.02	0.42
3:A:1298:4SP:N1	3:A:1298:4SP:H22	2.35	0.42
2:B:183:HIS:HD2	4:B:2031:HOH:O	2.02	0.42
2:B:414:LYS:HG2	2:B:423:LEU:HD21	2.02	0.42
1:A:165:THR:HG22	4:A:2154:HOH:O	2.20	0.42
1:A:223:ASP:H	1:A:226:VAL:HG12	1.85	0.42
2:D:271:TYR:OH	4:D:2051:HOH:O	2.21	0.42
1:A:72:THR:CG2	1:A:75:LYS:H	2.33	0.42
2:D:337:GLY:HA3	4:D:2078:HOH:O	2.20	0.42
2:D:370:GLN:HB3	4:D:2091:HOH:O	2.20	0.42
2:B:210:MET:HE3	2:B:250:ARG:HD3	2.02	0.42
1:C:88:LYS:CD	1:C:131:GLN:HE21	2.33	0.42
1:C:96:LEU:O	1:C:98:GLY:N	2.53	0.42
1:C:101:LEU:N	1:C:102:PRO:CD	2.83	0.41
2:D:380:THR:HG22	4:D:2069:HOH:O	2.19	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:64:VAL:HG21	3:A:1298:4SP:H8	2.02	0.41
1:C:10:ILE:CG2	1:C:18:VAL:HG12	2.49	0.41
1:C:83:LEU:HD11	1:C:142:LYS:HD2	2.01	0.41
2:D:371:SER:O	2:D:372:TRP:C	2.58	0.41
2:D:415:ASN:OD1	2:D:417:LYS:N	2.44	0.41
1:A:87:LEU:O	1:A:91:MET:HG3	2.20	0.41
2:D:327:CYS:HB2	2:D:419:HIS:CE1	2.55	0.41
2:D:201:LYS:HD3	2:D:201:LYS:C	2.41	0.41
2:D:430:LEU:O	2:D:431:ASN:HB2	2.20	0.41
1:A:72:THR:HG23	1:A:74:ASN:OD1	2.21	0.41
2:B:335:PHE:HB2	2:B:413:TYR:CD2	2.56	0.41
2:D:187:ARG:HD2	2:D:187:ARG:HA	1.85	0.41
1:A:56:LYS:HB3	1:A:56:LYS:HE2	1.93	0.41
1:A:131:GLN:CD	1:A:131:GLN:N	2.74	0.41
1:A:296:LEU:HB3	4:A:2269:HOH:O	2.20	0.41
3:A:1298:4SP:N1	3:A:1298:4SP:C22	2.84	0.41
2:B:414:LYS:HE2	2:B:423:LEU:HD21	2.03	0.41
2:D:308:ALA:HA	2:D:309:PRO:HD3	1.92	0.41
2:B:178:TYR:N	4:B:2028:HOH:O	2.13	0.41
2:B:368:THR:CB	2:B:370:GLN:HE21	2.34	0.41
1:C:252:VAL:HG12	1:C:255:LEU:HB2	2.03	0.41
2:D:196:LYS:HE3	2:D:202:LYS:HZ3	1.84	0.41
2:D:319:PHE:CZ	2:D:330:GLU:HA	2.56	0.41
1:C:291:LYS:O	1:C:291:LYS:HG2	2.21	0.40
1:A:37:LEU:HB2	1:A:74:ASN:O	2.20	0.40
2:D:358:ALA:HB1	2:D:391:LEU:HD22	2.02	0.40
1:A:75:LYS:HZ3	1:A:75:LYS:HG2	1.67	0.40
1:A:106:SER:HB2	1:A:290:THR:O	2.21	0.40
1:C:137:THR:O	1:C:137:THR:OG1	2.35	0.40
1:C:224:GLU:OE2	1:C:231:THR:OG1	2.31	0.40
2:D:407:GLN:HA	4:D:2103:HOH:O	2.21	0.40
2:B:273:PRO:HB2	2:B:278:PHE:CE2	2.56	0.40
2:D:345:ASP:HA	2:D:346:PRO:HA	1.93	0.40

All (1) 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:199:ARG:NH2	2:B:374:GLU:OE2[4_456]	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	294/303 (97%)	281 (96%)	10 (3%)	3 (1%)	13 8
1	C	294/303 (97%)	283 (96%)	6 (2%)	5 (2%)	7 3
2	B	256/258 (99%)	250 (98%)	5 (2%)	1 (0%)	30 27
2	D	256/258 (99%)	244 (95%)	8 (3%)	4 (2%)	8 3
All	All	1100/1122 (98%)	1058 (96%)	29 (3%)	13 (1%)	11 6

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	176	PRO
1	C	96	LEU
1	C	97	THR
1	C	256	ASP
2	D	176	PRO
1	A	164	VAL
1	C	164	VAL
1	A	40	GLU
1	C	40	GLU
1	A	39	THR
2	D	415	ASN
2	D	372	TRP
2	D	420	GLY

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	261/265 (98%)	238 (91%)	23 (9%)	8 5
1	C	261/265 (98%)	231 (88%)	30 (12%)	4 2
2	B	232/232 (100%)	217 (94%)	15 (6%)	14 11
2	D	232/232 (100%)	217 (94%)	15 (6%)	14 11
All	All	986/994 (99%)	903 (92%)	83 (8%)	9 6

All (83) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	0	SER
1	A	10	ILE
1	A	22	ARG
1	A	38	ASP
1	A	40	GLU
1	A	41	THR
1	A	55	LEU
1	A	59	ASN
1	A	73	GLU
1	A	74	ASN
1	A	75	LYS
1	A	97	THR
1	A	101	LEU
1	A	122	ARG
1	A	131	GLN
1	A	138	GLU
1	A	150	ARG
1	A	163	VAL
1	A	189	LEU
1	A	206	ASP
1	A	222	PRO
1	A	230	VAL
1	A	247	ASP
2	B	176	PRO
2	B	179	HIS
2	B	180	GLU
2	B	196	LYS
2	B	232	LEU
2	B	247	SER
2	B	274	GLU
2	B	316	THR
2	B	346	PRO
2	B	348	LEU

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Mol	Chain	Res	Type
2	B	349	LYS
2	B	384	LEU
2	B	391	LEU
2	B	392	MET
2	B	423	LEU
1	C	2	GLU
1	C	9	LYS
1	C	10	ILE
1	C	17	VAL
1	C	34	LYS
1	C	36	ARG
1	C	41	THR
1	C	55	LEU
1	C	59	ASN
1	C	74	ASN
1	C	75	LYS
1	C	83	LEU
1	C	97	THR
1	C	101	LEU
1	C	120	SER
1	C	122	ARG
1	C	137	THR
1	C	138	GLU
1	C	150	ARG
1	C	163	VAL
1	C	178	LYS
1	C	189	LEU
1	C	226	VAL
1	C	230	VAL
1	C	233	MET
1	C	246	GLN
1	C	247	ASP
1	C	256	ASP
1	C	264	SER
1	C	296	LEU
2	D	179	HIS
2	D	196	LYS
2	D	201	LYS
2	D	209	SER
2	D	232	LEU
2	D	247	SER
2	D	289	LYS

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Mol	Chain	Res	Type
2	D	292	LEU
2	D	296	HIS
2	D	300	LYS
2	D	346	PRO
2	D	348	LEU
2	D	391	LEU
2	D	398	TYR
2	D	432	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (26) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	60	HIS
1	A	119	HIS
1	A	131	GLN
1	A	161	HIS
1	A	268	HIS
2	B	183	HIS
2	B	233	HIS
2	B	254	GLN
2	B	296	HIS
2	B	317	GLN
2	B	370	GLN
2	B	395	HIS
2	B	396	GLN
2	B	425	ASN
2	B	431	ASN
1	C	59	ASN
1	C	60	HIS
1	C	113	GLN
1	C	131	GLN
2	D	183	HIS
2	D	254	GLN
2	D	296	HIS
2	D	313	GLN
2	D	317	GLN
2	D	370	GLN
2	D	395	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

2 non-standard protein/DNA/RNA residues 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	$\#\|Z\| > 2$
1	TPO	A	160	1	8,10,11	1.25	0	10,14,16	1.33	1 (10%)
1	TPO	C	160	1	8,10,11	1.02	1 (12%)	10,14,16	1.07	1 (10%)

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
1	TPO	A	160	1	-	0/9/11/13	-
1	TPO	C	160	1	-	1/9/11/13	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	160	TPO	P-OG1	2.07	1.63	1.59

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	160	TPO	CG2-CB-CA	-2.35	108.54	113.16
1	C	160	TPO	O3P-P-O1P	2.23	119.41	110.68

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	C	160	TPO	O-C-CA-CB

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no oligosaccharides 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	$\#\|Z\| > 2$
3	4SP	A	1298	-	28,31,31	1.77	8 (28%)	35,44,44	3.47	13 (37%)
3	4SP	C	1298	-	28,31,31	1.84	6 (21%)	35,44,44	3.07	22 (62%)

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
3	4SP	A	1298	-	-	4/15/23/23	0/4/4/4
3	4SP	C	1298	-	-	0/15/23/23	0/4/4/4

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	1298	4SP	C4-N3	4.47	1.45	1.36
3	A	1298	4SP	C21-C20	3.84	1.44	1.38
3	C	1298	4SP	C20-S23	3.39	1.82	1.77

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1298	4SP	C2-N1	3.39	1.45	1.34
3	C	1298	4SP	O6-C6	-3.30	1.32	1.35
3	C	1298	4SP	C2-N1	3.30	1.44	1.34
3	A	1298	4SP	C5-C4	-2.92	1.33	1.40
3	A	1298	4SP	C2-N2	-2.65	1.31	1.36
3	A	1298	4SP	C14-C13	2.47	1.61	1.51
3	A	1298	4SP	C2-N3	-2.33	1.27	1.34
3	C	1298	4SP	C5-C4	-2.22	1.35	1.40
3	A	1298	4SP	O6-C6	-2.20	1.33	1.35
3	C	1298	4SP	C2-N2	-2.20	1.32	1.36
3	A	1298	4SP	C4-N3	2.10	1.40	1.36

All (35) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	1298	4SP	C10-O6-C6	-13.26	104.83	117.50
3	A	1298	4SP	C2-N3-C4	8.91	125.39	115.28
3	C	1298	4SP	C4-C5-N7	-6.09	103.06	109.40
3	C	1298	4SP	C2-N1-C6	5.75	125.33	115.18
3	A	1298	4SP	N3-C2-N1	-5.01	118.30	126.23
3	A	1298	4SP	C4-C5-N7	-5.01	104.18	109.40
3	C	1298	4SP	N3-C2-N1	-4.99	118.33	126.23
3	C	1298	4SP	C18-C17-C22	-4.96	112.24	119.03
3	A	1298	4SP	O25-S23-C20	4.79	112.69	107.35
3	C	1298	4SP	C21-C20-C19	-4.27	114.48	120.44
3	C	1298	4SP	O25-S23-N26	4.26	113.68	107.36
3	A	1298	4SP	C21-C22-C17	3.98	124.90	120.30
3	C	1298	4SP	O6-C6-N1	3.86	123.46	120.12
3	C	1298	4SP	C5-C6-N1	-3.73	116.16	123.26
3	C	1298	4SP	C2-N3-C4	3.71	119.49	115.28
3	A	1298	4SP	C18-C17-C22	-3.70	113.97	119.03
3	C	1298	4SP	O24-S23-N26	-3.61	102.01	107.36
3	C	1298	4SP	C19-C18-C17	3.54	124.39	120.30
3	C	1298	4SP	O25-S23-O24	3.50	124.51	118.76
3	C	1298	4SP	C22-C21-C20	3.48	123.05	119.45
3	C	1298	4SP	C10-O6-C6	-3.24	114.41	117.50
3	C	1298	4SP	N2-C2-N3	3.08	127.39	116.92
3	A	1298	4SP	O6-C6-N1	2.99	122.71	120.12
3	C	1298	4SP	C21-C22-C17	2.96	123.72	120.30
3	C	1298	4SP	C20-S23-N26	-2.93	104.24	108.38
3	A	1298	4SP	C19-C18-C17	2.63	123.34	120.30
3	C	1298	4SP	O25-S23-C20	-2.60	104.45	107.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	C	1298	4SP	C12-C11-C10	-2.58	104.80	111.28
3	C	1298	4SP	C18-C19-C20	2.50	122.04	119.45
3	A	1298	4SP	C14-C15-C16	2.48	116.48	111.42
3	A	1298	4SP	C22-C17-N2	2.42	128.74	120.64
3	C	1298	4SP	C21-C20-S23	2.34	123.13	119.73
3	A	1298	4SP	C13-C12-C11	2.28	116.46	112.15
3	C	1298	4SP	C16-C11-C12	2.18	114.67	109.33
3	A	1298	4SP	C21-C20-C19	-2.03	117.61	120.44

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1298	4SP	C19-C20-S23-O24
3	A	1298	4SP	C21-C20-S23-O24
3	A	1298	4SP	C19-C20-S23-N26
3	A	1298	4SP	C21-C20-S23-N26

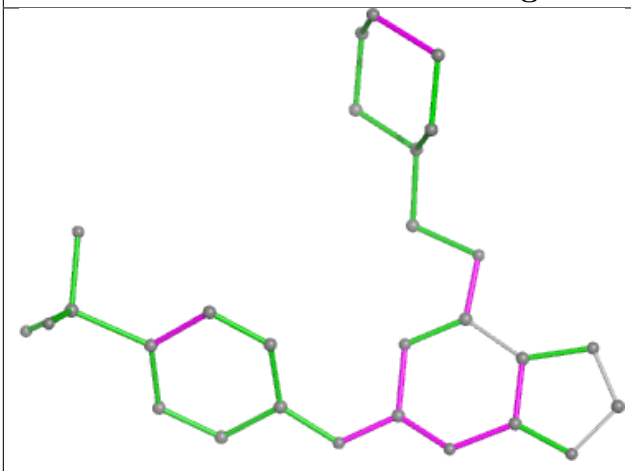
There are no ring outliers.

2 monomers are involved in 6 short contacts:

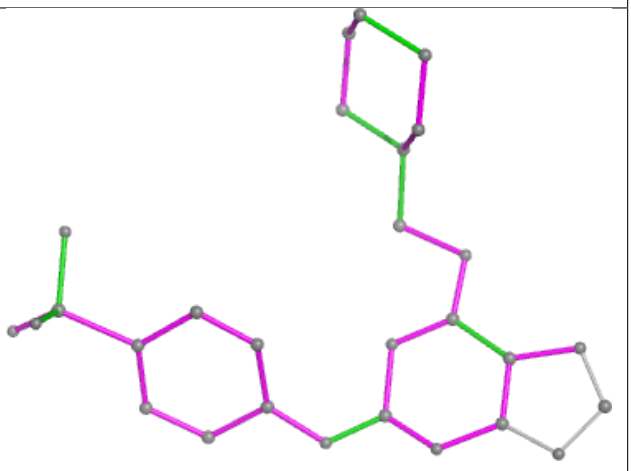
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1298	4SP	5	0
3	C	1298	4SP	1	0

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 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.

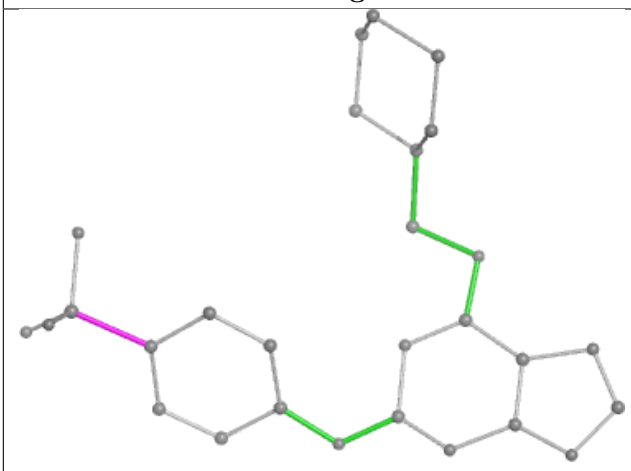
Ligand 4SP A 1298



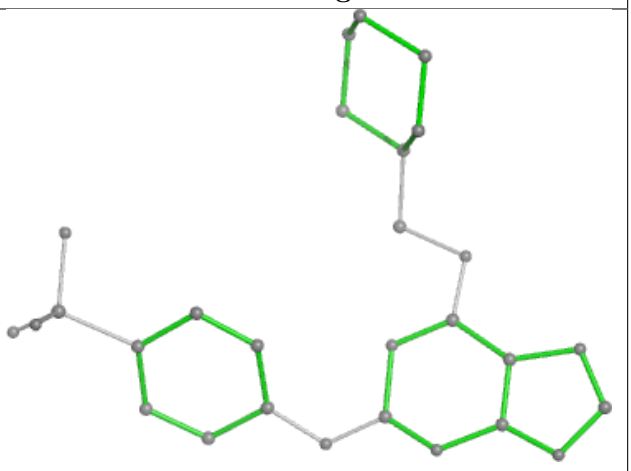
Bond lengths



Bond angles

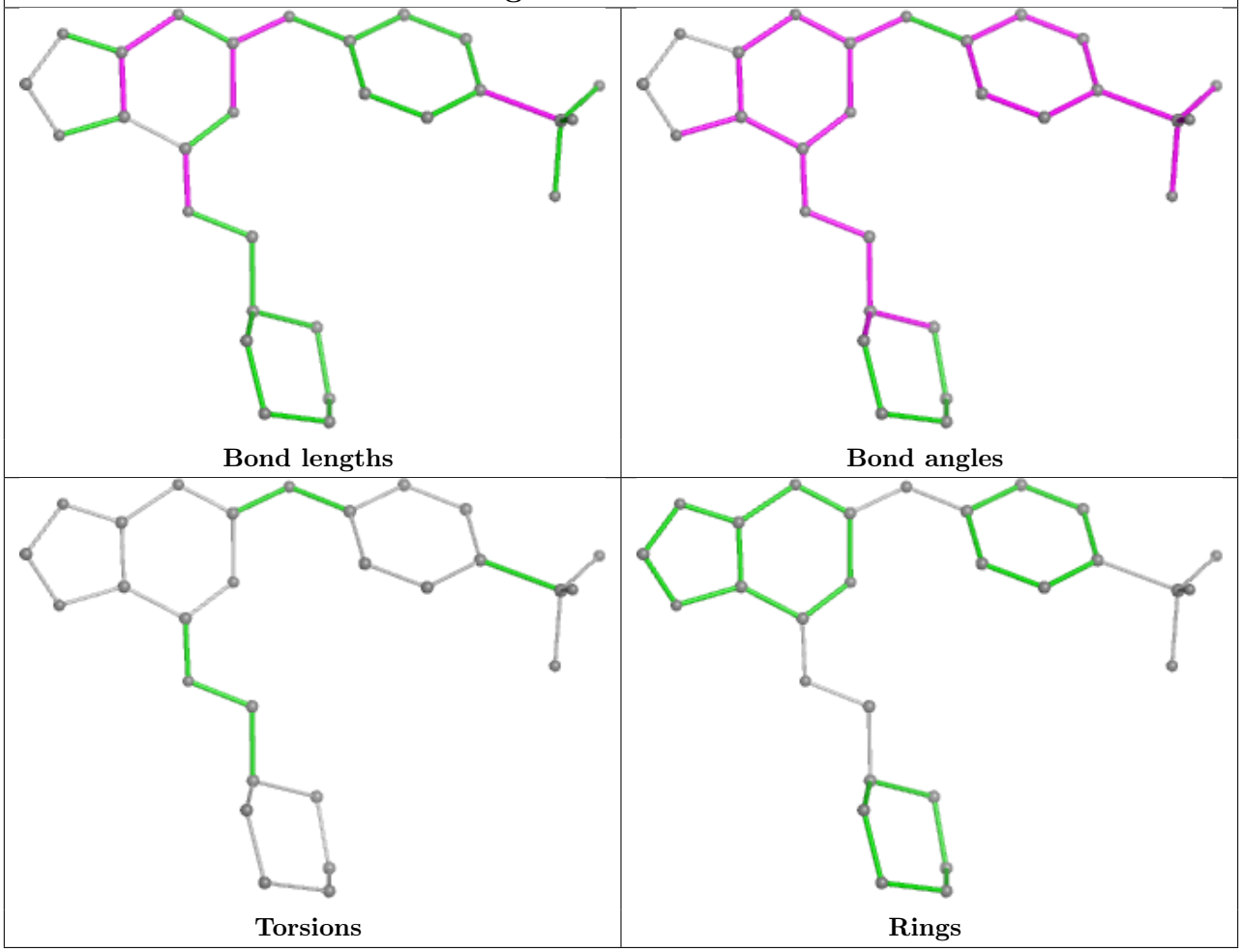


Torsions



Rings

Ligand 4SP C 1298



5.7 Other polymers

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, 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	296/303 (97%)	0.15	21 (7%) 23 21	17, 29, 52, 70	0
1	C	296/303 (97%)	1.46	67 (22%) 3 2	32, 45, 62, 80	0
2	B	258/258 (100%)	0.26	16 (6%) 28 26	20, 31, 50, 63	0
2	D	258/258 (100%)	1.56	71 (27%) 2 1	29, 48, 65, 75	0
All	All	1108/1122 (98%)	0.85	175 (15%) 6 5	17, 39, 62, 80	0

All (175) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	175	VAL	8.5
1	C	97	THR	7.2
1	C	98	GLY	6.8
2	B	175	VAL	6.3
1	A	295	HIS	5.9
1	C	296	LEU	5.9
1	A	38	ASP	5.6
1	A	71	HIS	5.4
1	A	39	THR	5.1
2	D	429	THR	4.9
1	C	10	ILE	4.7
1	C	120	SER	4.7
2	D	364	LEU	4.6
2	D	281	ILE	4.6
1	C	295	HIS	4.6
1	C	104	ILE	4.4
2	D	432	LEU	4.3
1	C	256	ASP	4.2
2	D	372	TRP	4.2
1	A	72	THR	4.2
2	B	176	PRO	4.0

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Mol	Chain	Res	Type	RSRZ
1	C	280	ALA	3.9
2	D	365	TYR	3.9
1	C	294	PRO	3.9
2	D	394	LEU	3.9
2	B	432	LEU	3.8
2	D	359	ALA	3.8
1	A	40	GLU	3.8
1	C	223	ASP	3.7
2	B	327	CYS	3.7
2	D	336	LEU	3.7
1	C	39	THR	3.7
1	C	225	VAL	3.7
2	D	325	ALA	3.7
1	A	73	GLU	3.7
2	D	403	GLN	3.7
1	C	215	ILE	3.7
1	C	282	ALA	3.7
1	C	100	PRO	3.6
1	C	190	GLY	3.6
2	D	319	PHE	3.6
2	D	374	GLU	3.5
2	D	279	VAL	3.5
2	D	327	CYS	3.5
1	A	97	THR	3.5
2	D	405	ALA	3.4
1	C	74	ASN	3.4
2	D	381	GLY	3.4
1	A	296	LEU	3.3
2	D	320	LEU	3.3
1	C	250	LYS	3.3
2	D	395	HIS	3.3
2	D	180	GLU	3.3
2	D	176	PRO	3.3
2	D	382	TYR	3.3
1	C	84	HIS	3.3
1	C	268	HIS	3.2
2	D	350	TYR	3.2
2	D	389	PRO	3.2
2	D	418	TYR	3.2
2	B	284	ASP	3.2
2	B	423	LEU	3.1
2	D	341	LEU	3.1

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Mol	Chain	Res	Type	RSRZ
2	D	424	LEU	3.1
1	C	72	THR	3.1
2	B	285	THR	3.1
2	D	366	THR	3.1
1	A	36	ARG	3.1
1	C	139	GLY	3.1
2	D	431	ASN	3.1
2	D	316	THR	3.0
1	A	96	LEU	3.0
1	C	103	LEU	3.0
1	C	96	LEU	3.0
1	C	95	ALA	3.0
1	C	287	GLN	3.0
2	D	317	GLN	3.0
2	D	280	TYR	2.9
1	C	290	THR	2.9
2	D	430	LEU	2.9
2	D	401	ALA	2.9
1	C	252	VAL	2.8
1	C	93	ALA	2.8
2	B	283	ASP	2.8
2	D	326	ASN	2.8
2	B	431	ASN	2.8
2	B	323	GLN	2.8
1	C	105	LYS	2.7
1	C	234	PRO	2.7
2	D	334	MET	2.7
2	B	280	TYR	2.7
1	C	227	TRP	2.7
1	C	71	HIS	2.7
2	D	188	GLU	2.7
1	C	11	GLY	2.6
2	D	177	ASP	2.6
1	C	89	LYS	2.6
2	D	371	SER	2.6
1	C	267	LEU	2.6
1	A	95	ALA	2.6
2	D	328	LYS	2.6
1	C	138	GLU	2.6
2	D	387	LEU	2.6
1	C	255	LEU	2.5
2	D	315	LEU	2.5

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Mol	Chain	Res	Type	RSRZ
2	D	362	LEU	2.5
2	D	329	VAL	2.5
1	C	14	THR	2.5
2	D	391	LEU	2.5
1	C	183	ALA	2.5
1	C	293	VAL	2.5
2	D	396	GLN	2.5
1	C	253	PRO	2.5
1	A	293	VAL	2.5
2	D	376	LEU	2.4
1	C	46	SER	2.4
2	D	206	ILE	2.4
1	A	59	ASN	2.4
1	C	2	GLU	2.4
1	C	102	PRO	2.4
1	A	41	THR	2.4
2	D	427	PRO	2.4
2	D	386	SER	2.4
2	B	296	HIS	2.3
2	D	392	MET	2.3
1	A	5	GLN	2.3
2	B	224	GLU	2.3
1	C	192	ILE	2.3
1	C	198	THR	2.3
1	C	199	ARG	2.3
2	D	323	GLN	2.3
2	B	277	GLU	2.2
2	D	179	HIS	2.2
1	C	124	LEU	2.2
2	D	428	GLU	2.2
2	D	324	PRO	2.2
2	D	420	GLY	2.2
1	C	161	HIS	2.2
1	C	240	PHE	2.2
2	B	282	THR	2.2
2	D	191	VAL	2.2
1	A	294	PRO	2.2
1	C	62	ASN	2.2
1	A	226	VAL	2.2
1	C	286	PHE	2.1
2	D	222	GLY	2.1
1	C	156	VAL	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	37	LEU	2.1
2	D	335	PHE	2.1
2	D	377	ILE	2.1
2	D	400	LYS	2.1
1	C	41	THR	2.1
2	D	282	THR	2.1
2	D	340	SER	2.1
1	C	194	ALA	2.1
1	C	233	MET	2.1
2	B	180	GLU	2.1
1	C	111	LEU	2.1
1	C	202	LEU	2.1
1	C	262	LEU	2.1
2	D	185	TYR	2.1
1	A	2	GLU	2.1
2	D	221	VAL	2.1
1	C	237	LYS	2.1
2	D	360	PHE	2.1
2	D	361	HIS	2.1
2	D	318	TYR	2.0
2	D	201	LYS	2.0
1	C	289	VAL	2.0
1	C	283	HIS	2.0
2	D	375	SER	2.0
1	C	201	ALA	2.0
1	A	88	LYS	2.0
1	C	167	TRP	2.0
1	C	230	VAL	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (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
1	TPO	C	160	11/12	0.89	0.14	34,38,40,41	0
1	TPO	A	160	11/12	0.98	0.05	22,24,24,25	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

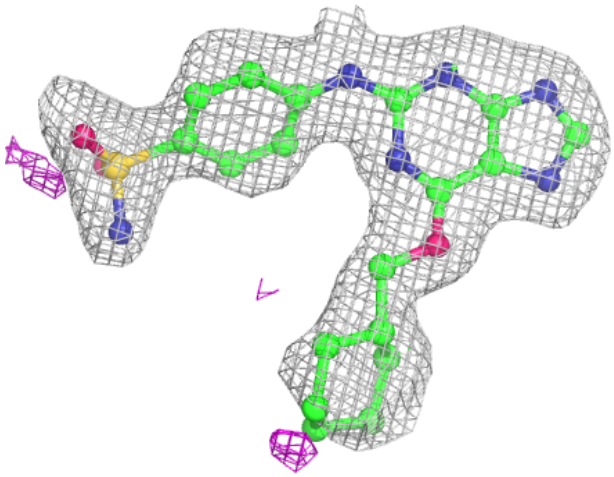
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

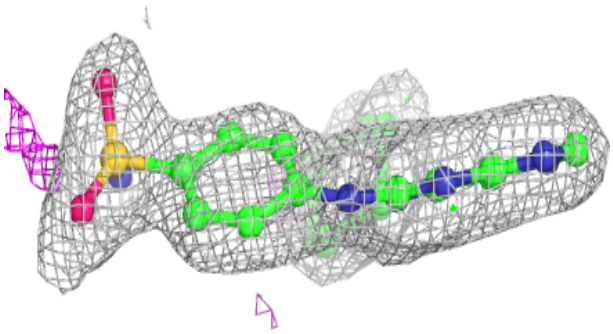
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	4SP	C	1298	28/28	0.88	0.13	38,47,59,62	0
3	4SP	A	1298	28/28	0.97	0.07	25,33,38,44	0

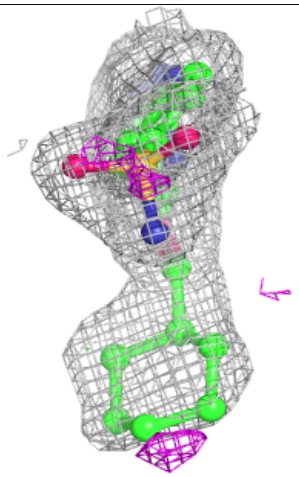
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around 4SP C 1298:

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

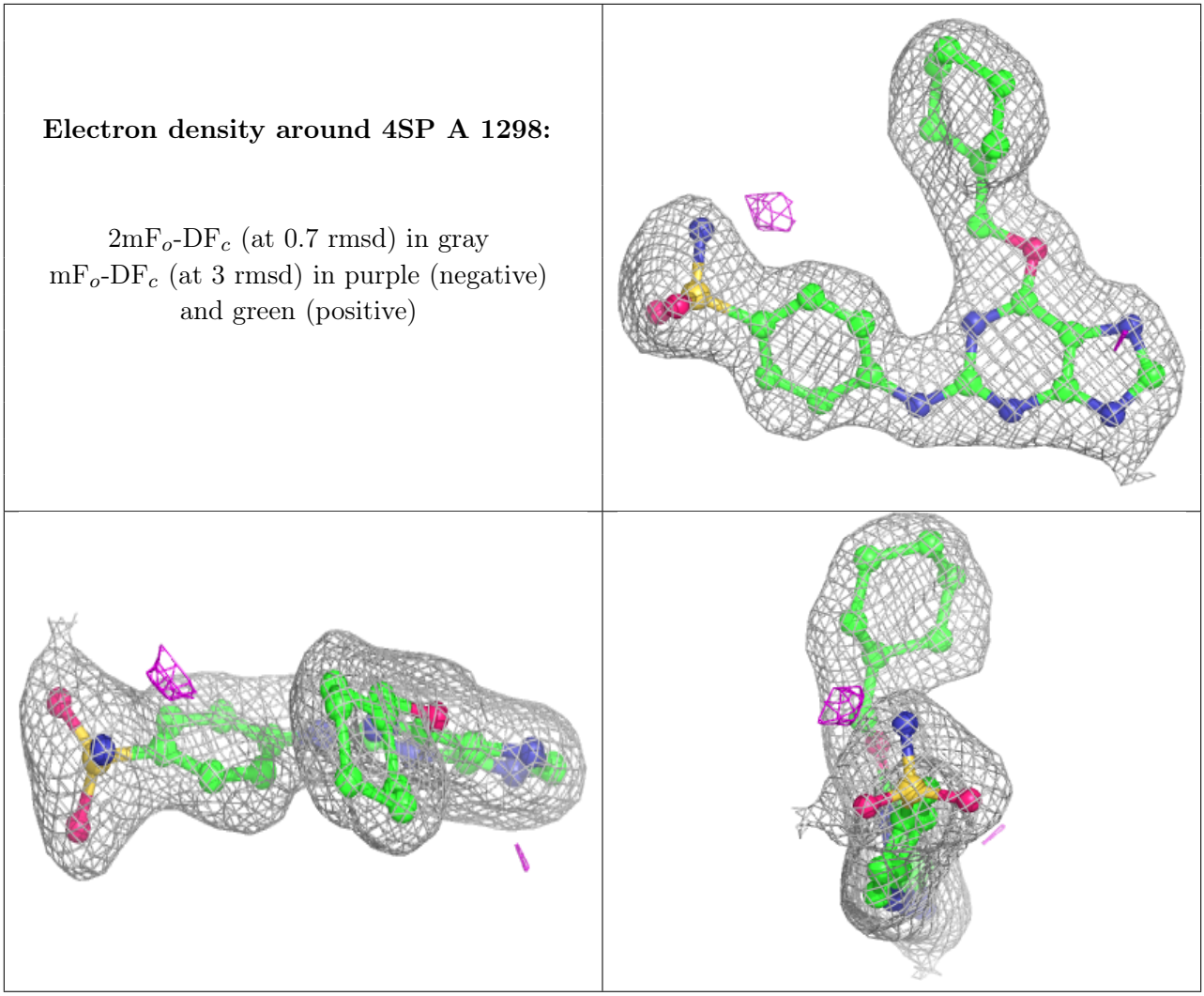






Electron density around 4SP A 1298:

$2mF_o$-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.