Full wwPDB X-ray Structure Validation Report ⓘ

Aug 14, 2023 – 07:54 PM EDT

PDB ID	:	1RV0
Title	:	1930 Swine H1 Hemagglutinin complexed with LSTA
Authors	:	Skehel, J.J.; Gamblin, S.J.; Haire, L.F.; Russell, R.J.; Stevens, D.J.; Xiao, B.; Ha, Y.; Vasisht, N.; Steinhauer, D.A.; Daniels, R.S.
Deposited on	:	2003-12-12
Resolution	:	2.50 Å(reported)

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

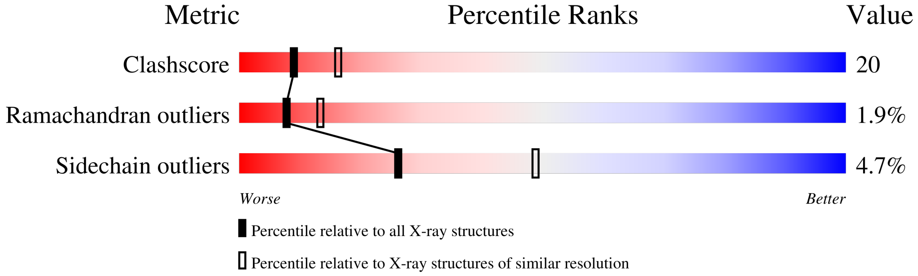
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.50 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))
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)

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%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	H	328	
1	J	328	
1	L	328	
2	I	160	
2	K	160	
2	M	160	

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	NDG	H	642	-	-	X	-
3	NDG	L	644	-	-	X	-

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 11997 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.

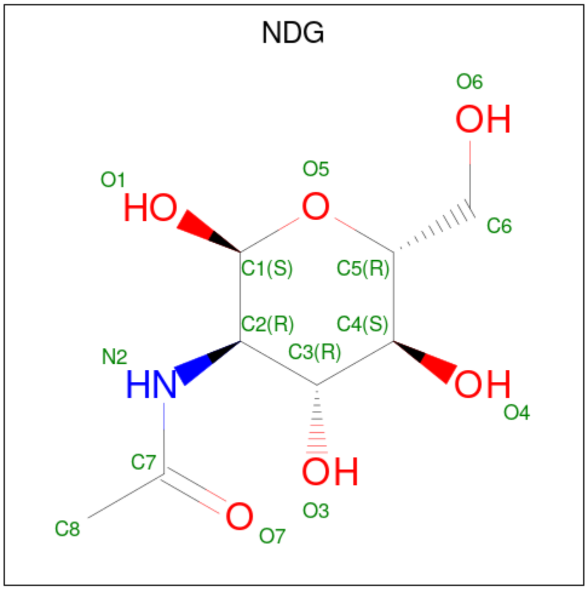
- Molecule 1 is a protein called hemagglutinin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	H	324	Total 2511	C 1580	N 436	O 484	S 11	0	0	0
1	J	324	Total 2511	C 1580	N 436	O 484	S 11	0	0	0
1	L	324	Total 2511	C 1580	N 436	O 484	S 11	0	0	0

- Molecule 2 is a protein called hemagglutinin.

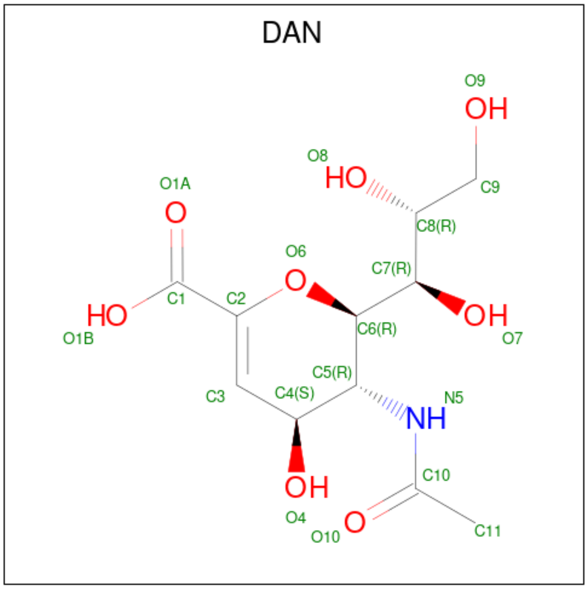
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	I	160	Total 1281	C 801	N 223	O 252	S 5	0	0	0
2	K	160	Total 1281	C 801	N 223	O 252	S 5	0	0	0
2	M	160	Total 1281	C 801	N 223	O 252	S 5	0	0	0

- Molecule 3 is 2-acetamido-2-deoxy-alpha-D-glucopyranose (three-letter code: NDG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	H	1	Total C N O 15 8 1 6	0	0
3	J	1	Total C N O 15 8 1 6	0	0
3	L	1	Total C N O 15 8 1 6	0	0

- Molecule 4 is 2-DEOXY-2,3-DEHYDRO-N-ACETYL-NEURAMINIC ACID (three-letter code: DAN) (formula: $C_{11}H_{17}NO_8$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	L	1	Total C N O 20 11 1 8	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	H	115	Total O 115 115	0	0
5	I	32	Total O 32 32	0	0
5	J	136	Total O 136 136	0	0
5	K	45	Total O 45 45	0	0
5	L	179	Total O 179 179	0	0
5	M	49	Total O 49 49	0	0

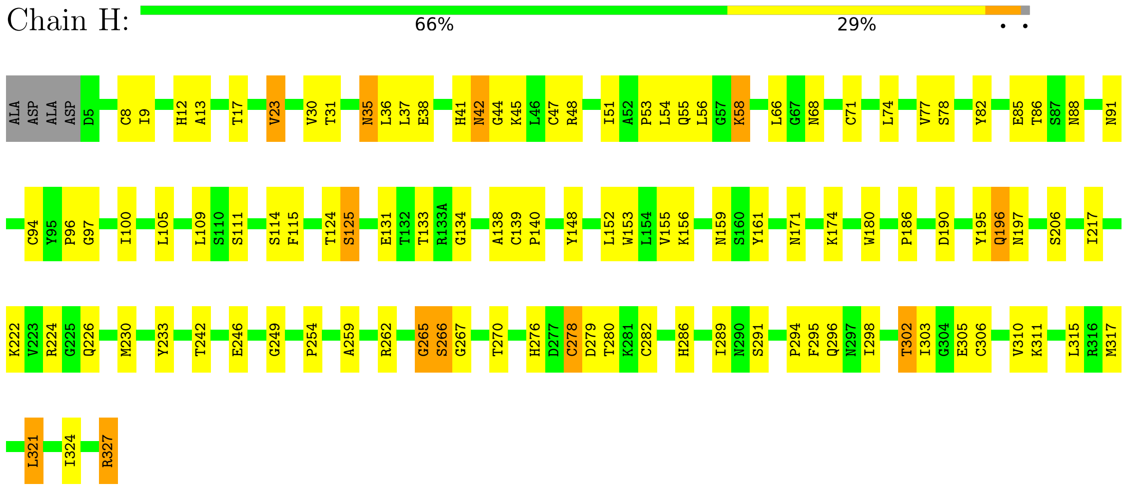
3 Residue-property plots ⓘ

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. 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. 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.

Note EDS was not executed.

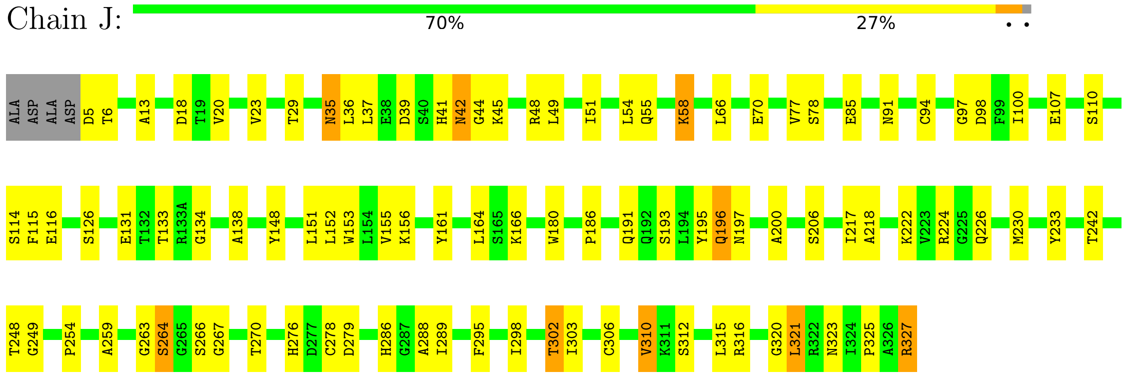
- Molecule 1: hemagglutinin

Chain H:



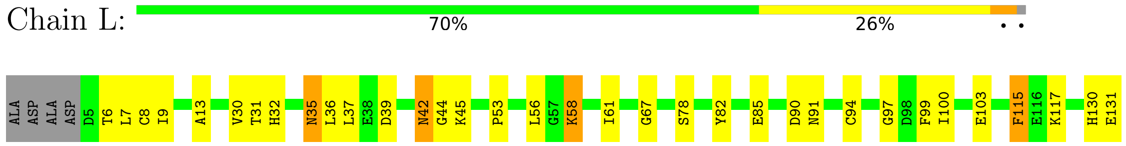
- Molecule 1: hemagglutinin

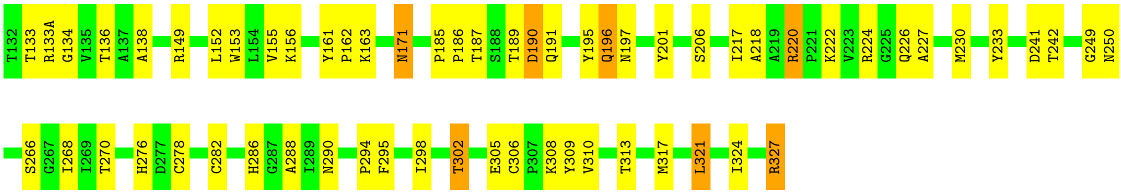
Chain J:



- Molecule 1: hemagglutinin

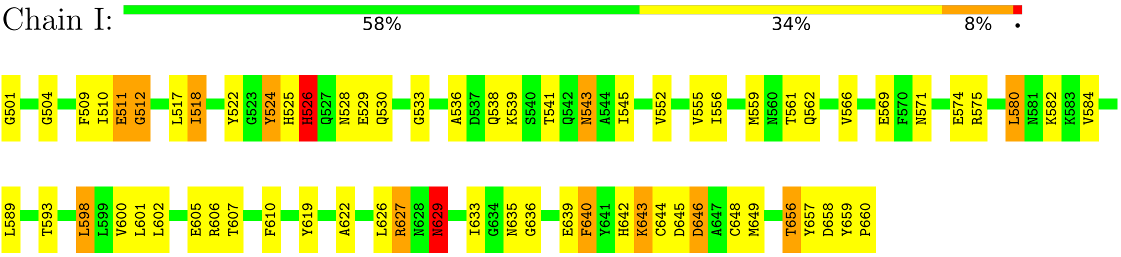
Chain L:





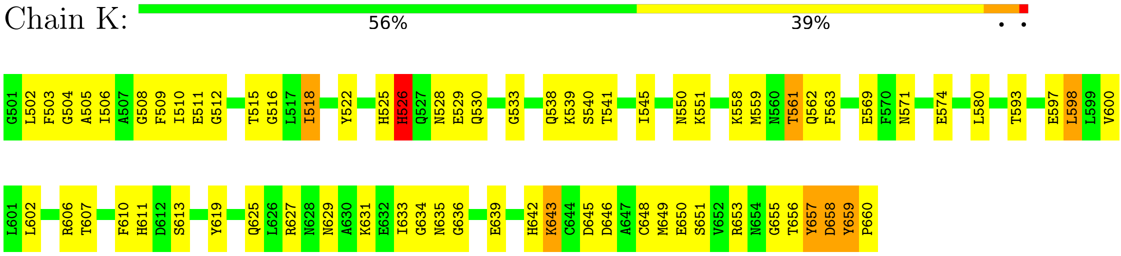
- Molecule 2: hemagglutinin

Chain I:



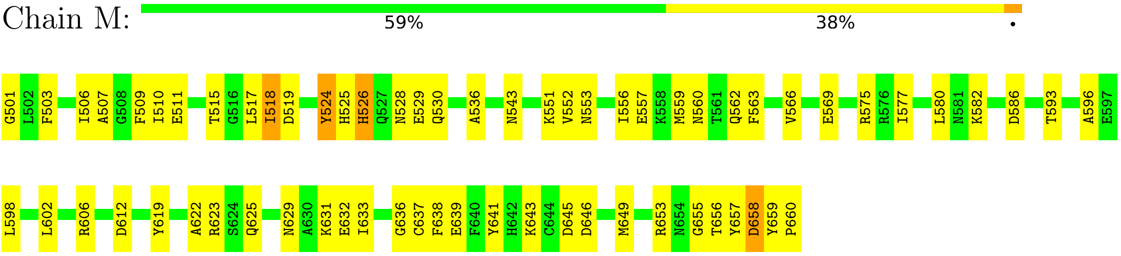
- Molecule 2: hemagglutinin

Chain K:



- Molecule 2: hemagglutinin

Chain M:



4 Data and refinement statistics ⓘ

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	**Value**	**Source**
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	202.04Å 82.94Å 176.88Å 90.00° 105.86° 90.00°	Depositor
Resolution (Å)	20.00 – 2.50	Depositor
% Data completeness (in resolution range)	(Not available) (20.00-2.50)	Depositor
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.214 , 0.254	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	11997	wwPDB-VP
Average B, all atoms (Å^2)	51.0	wwPDB-VP

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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	H	0.35	0/2574	0.61	0/3507
1	J	0.35	0/2574	0.63	0/3507
1	L	0.38	0/2574	0.65	0/3507
2	I	0.32	0/1307	0.50	0/1761
2	K	0.33	0/1307	0.54	0/1761
2	M	0.35	0/1307	0.56	0/1761
All	All	0.35	0/11643	0.60	0/15804

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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	H	2511	0	2437	102	0
1	J	2511	0	2437	90	0
1	L	2511	0	2437	106	0
2	I	1281	0	1201	67	0
2	K	1281	0	1201	66	0
2	M	1281	0	1201	76	0
3	H	15	0	12	11	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	J	15	0	12	6	0
3	L	15	0	12	8	0
4	L	20	0	16	1	0
5	H	115	0	0	4	0
5	I	32	0	0	2	0
5	J	136	0	0	0	0
5	K	45	0	0	6	0
5	L	179	0	0	9	0
5	M	49	0	0	10	0
All	All	11997	0	10966	453	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 20.

All (453) 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:L:58:LYS:H	1:L:58:LYS:HE2	0.95	1.10
1:J:58:LYS:H	1:J:58:LYS:HD3	1.13	1.05
1:J:91:ASN:HD21	3:J:640:NDG:H3	1.24	1.03
1:H:224:ARG:HH22	3:H:642:NDG:H2	1.21	1.02
1:L:224:ARG:NH2	3:L:644:NDG:H2	1.76	1.01
1:L:58:LYS:H	1:L:58:LYS:CE	1.78	0.96
1:L:58:LYS:HE2	1:L:58:LYS:N	1.80	0.95
1:L:224:ARG:HH22	3:L:644:NDG:H2	1.34	0.92
2:M:530:GLN:NE2	2:M:645:ASP:HB2	1.87	0.89
1:L:91:ASN:ND2	3:L:644:NDG:C1	2.35	0.88
1:H:224:ARG:NH2	3:H:642:NDG:H2	1.90	0.86
1:H:327:ARG:H	1:H:327:ARG:HE	1.22	0.84
2:I:629:ASN:N	2:I:629:ASN:HD22	1.74	0.83
2:K:619:TYR:CE1	2:K:636:GLY:HA2	2.15	0.81
1:L:156:LYS:HD2	1:L:196:GLN:HG2	1.62	0.80
1:L:187:THR:HG22	1:L:189:THR:H	1.47	0.80
1:J:310:VAL:HG13	1:J:312:SER:H	1.47	0.79
1:H:156:LYS:HD2	1:H:196:GLN:HG2	1.63	0.79
1:J:91:ASN:ND2	3:J:640:NDG:H3	1.98	0.78
1:L:317:MET:HE2	2:M:552:VAL:HG22	1.65	0.77
1:L:302:THR:HG22	2:M:563:PHE:O	1.84	0.76
1:J:58:LYS:HD3	1:J:58:LYS:N	1.96	0.76
1:J:302:THR:HG23	1:J:306:CYS:SG	2.26	0.76
1:H:156:LYS:NZ	1:H:196:GLN:HE21	1.85	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:530:GLN:HE21	2:M:645:ASP:HB2	1.52	0.75
2:M:659:TYR:HD2	2:M:660:PRO:HD2	1.51	0.75
1:J:156:LYS:NZ	1:J:196:GLN:HE21	1.86	0.74
1:H:317:MET:HE3	2:I:600:VAL:HG22	1.70	0.73
1:H:327:ARG:HE	1:H:327:ARG:N	1.86	0.73
2:K:526:HIS:HB2	2:K:649:MET:HE3	1.69	0.73
1:J:321:LEU:HD12	1:J:321:LEU:H	1.53	0.73
2:K:619:TYR:HE1	2:K:636:GLY:HA2	1.52	0.72
1:L:187:THR:HG22	1:L:189:THR:N	2.04	0.72
2:I:530:GLN:NE2	2:I:645:ASP:HB2	2.05	0.71
1:H:58:LYS:H	1:H:58:LYS:HD3	1.56	0.70
1:L:224:ARG:HH22	3:L:644:NDG:C2	2.03	0.70
1:H:156:LYS:HZ3	1:H:196:GLN:HE21	1.36	0.70
1:L:187:THR:CG2	1:L:189:THR:H	2.04	0.70
1:L:310:VAL:HG23	2:M:593:THR:HA	1.73	0.70
1:L:100:ILE:HG13	1:L:233:TYR:CE2	2.27	0.69
1:H:54:LEU:HD13	1:H:77:VAL:HG11	1.74	0.69
1:L:302:THR:HG23	1:L:306:CYS:SG	2.32	0.69
1:J:156:LYS:HD2	1:J:196:GLN:HG2	1.74	0.69
1:H:100:ILE:HG13	1:H:233:TYR:CE2	2.27	0.69
2:I:526:HIS:HD2	2:I:649:MET:HG3	1.58	0.68
2:M:501:GLY:HA3	5:M:663:HOH:O	1.92	0.68
1:H:171:ASN:HB2	5:H:643:HOH:O	1.94	0.68
1:H:42:ASN:C	1:H:42:ASN:HD22	1.96	0.67
2:M:643:LYS:HG3	5:M:704:HOH:O	1.94	0.67
1:L:35:ASN:ND2	1:L:37:LEU:H	1.91	0.67
2:I:659:TYR:HD2	2:I:660:PRO:HD2	1.60	0.67
1:J:295:PHE:CZ	2:K:559:MET:HG3	2.30	0.67
1:H:124:THR:O	1:H:125:SER:HB3	1.93	0.67
2:I:530:GLN:NE2	2:I:646:ASP:H	1.93	0.67
1:H:91:ASN:ND2	3:H:642:NDG:O1	2.28	0.66
1:L:91:ASN:HD21	3:L:644:NDG:C1	2.07	0.66
1:J:42:ASN:C	1:J:42:ASN:HD22	1.99	0.66
1:L:90:ASP:HB2	5:L:734:HOH:O	1.96	0.65
1:L:282:CYS:HB2	1:L:305:GLU:O	1.96	0.65
1:J:35:ASN:ND2	1:J:37:LEU:H	1.94	0.65
2:K:631:LYS:HE3	2:K:633:ILE:CD1	2.27	0.64
1:L:266:SER:HB2	5:L:735:HOH:O	1.97	0.64
1:H:156:LYS:CD	1:H:196:GLN:HG2	2.27	0.64
1:H:282:CYS:HB2	1:H:305:GLU:O	1.97	0.64
2:K:631:LYS:HE3	2:K:633:ILE:HD13	1.78	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:K:648:CYS:O	2:K:651:SER:HB3	1.99	0.63
1:J:91:ASN:ND2	3:J:640:NDG:O1	2.33	0.62
1:J:100:ILE:HG13	1:J:233:TYR:CE2	2.35	0.62
2:I:629:ASN:N	2:I:629:ASN:ND2	2.46	0.62
1:J:58:LYS:H	1:J:58:LYS:CD	1.92	0.62
2:I:541:THR:O	2:I:545:ILE:HG13	1.99	0.62
2:K:650:GLU:HA	2:K:653:ARG:HD2	1.80	0.62
1:L:61:ILE:HD11	1:L:268:ILE:HD13	1.80	0.62
1:J:42:ASN:ND2	1:J:45:LYS:H	1.97	0.62
2:K:518:ILE:HD13	2:K:518:ILE:H	1.65	0.61
1:H:56:LEU:HD12	1:H:85:GLU:HG2	1.82	0.61
2:M:569:GLU:HG3	5:M:669:HOH:O	2.00	0.61
1:H:42:ASN:ND2	1:H:45:LYS:H	1.99	0.61
2:M:633:ILE:HD11	2:M:639:GLU:HB3	1.82	0.61
1:H:139:CYS:HA	3:H:642:NDG:H8C2	1.83	0.61
1:L:134:GLY:HA3	1:L:153:TRP:HB3	1.81	0.61
2:M:656:THR:C	2:M:658:ASP:H	2.04	0.61
1:H:295:PHE:CZ	2:I:559:MET:HG3	2.36	0.61
1:H:310:VAL:CG2	2:I:593:THR:HA	2.30	0.60
1:H:133:THR:HG22	1:H:133:THR:O	2.00	0.60
1:L:91:ASN:ND2	3:L:644:NDG:O1	2.35	0.60
2:M:552:VAL:O	2:M:556:ILE:HD13	2.02	0.60
1:H:37:LEU:HB2	1:H:315:LEU:HB2	1.84	0.60
1:H:48:ARG:HB2	1:H:51:ILE:O	2.02	0.60
1:J:97:GLY:HA3	1:J:230:MET:O	2.01	0.59
2:I:518:ILE:HD13	2:I:518:ILE:H	1.67	0.59
1:L:187:THR:HB	1:L:190:ASP:OD1	2.03	0.59
1:H:310:VAL:HG23	2:I:593:THR:HA	1.83	0.59
1:J:78:SER:O	1:J:114:SER:HB2	2.03	0.59
1:L:133:THR:HG22	1:L:133:THR:O	2.02	0.59
2:I:509:PHE:CD1	2:I:510:ILE:HG13	2.38	0.59
1:L:195:TYR:O	1:L:197:ASN:N	2.36	0.58
1:H:195:TYR:O	1:H:197:ASN:N	2.34	0.58
1:H:124:THR:O	1:H:125:SER:CB	2.52	0.58
2:K:530:GLN:NE2	2:K:645:ASP:HB2	2.18	0.58
1:L:42:ASN:ND2	1:L:288:ALA:H	2.02	0.58
1:L:295:PHE:CZ	2:M:559:MET:HG3	2.39	0.58
1:J:134:GLY:HA3	1:J:153:TRP:HB3	1.86	0.58
1:H:134:GLY:HA3	1:H:153:TRP:HB3	1.86	0.57
2:M:631:LYS:HE3	2:M:633:ILE:CD1	2.33	0.57
2:I:656:THR:O	2:I:658:ASP:N	2.38	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:35:ASN:HD22	1:L:36:LEU:N	2.02	0.57
1:J:54:LEU:HD13	1:J:77:VAL:HG11	1.86	0.57
1:H:96:PRO:HG3	1:H:226:GLN:HB2	1.85	0.57
2:K:518:ILE:HD13	2:K:518:ILE:N	2.20	0.57
1:J:310:VAL:HG22	2:K:593:THR:HA	1.86	0.57
1:L:7:LEU:HD11	2:M:524:TYR:HB3	1.87	0.57
1:H:23:VAL:HG22	2:I:601:LEU:CD1	2.35	0.56
1:H:9:ILE:HD12	2:I:619:TYR:HA	1.87	0.56
1:H:58:LYS:H	1:H:58:LYS:CD	2.18	0.56
1:J:39:ASP:HA	1:J:298:ILE:HD11	1.87	0.56
1:J:164:LEU:HD12	1:J:164:LEU:O	2.06	0.56
2:K:550:ASN:HB2	5:K:679:HOH:O	2.05	0.56
5:H:681:HOH:O	2:M:577:ILE:HG13	2.05	0.56
2:I:633:ILE:HD11	2:I:639:GLU:HB2	1.87	0.56
1:L:61:ILE:CD1	1:L:268:ILE:HD13	2.35	0.56
1:L:187:THR:HG23	5:L:746:HOH:O	2.05	0.56
1:J:48:ARG:HB2	1:J:51:ILE:O	2.05	0.56
2:M:623:ARG:HD2	2:M:632:GLU:OE2	2.06	0.56
1:J:70:GLU:HG3	3:J:640:NDG:H3	1.88	0.56
1:J:41:HIS:HB3	1:J:289:ILE:CD1	2.36	0.56
1:L:156:LYS:NZ	1:L:196:GLN:HE21	2.02	0.56
1:J:302:THR:HB	2:K:562:GLN:HE21	1.71	0.55
1:L:156:LYS:CD	1:L:196:GLN:HG2	2.36	0.55
1:H:44:GLY:HA2	1:H:286:HIS:O	2.07	0.55
1:H:311:LYS:HE3	2:I:589:LEU:CD2	2.37	0.55
2:K:510:ILE:HB	5:K:667:HOH:O	2.05	0.55
1:L:295:PHE:HZ	2:M:559:MET:HG3	1.72	0.55
2:M:632:GLU:HG2	2:M:638:PHE:HE2	1.72	0.55
1:L:131:GLU:OE2	1:L:133:THR:HB	2.07	0.55
1:L:222:LYS:HA	1:L:226:GLN:O	2.07	0.55
2:M:518:ILE:HD13	2:M:518:ILE:H	1.70	0.55
2:M:629:ASN:N	2:M:629:ASN:HD22	2.03	0.54
1:J:180:TRP:HB3	1:J:254:PRO:HG3	1.89	0.54
1:H:317:MET:HE1	2:I:555:VAL:HG11	1.90	0.54
2:I:509:PHE:CE1	2:I:510:ILE:HG13	2.43	0.54
1:J:321:LEU:HD12	1:J:321:LEU:N	2.19	0.54
2:K:504:GLY:O	2:K:508:GLY:HA3	2.08	0.54
1:H:47:CYS:HB2	1:H:280:THR:HG22	1.89	0.54
2:K:516:GLY:O	2:K:518:ILE:HG23	2.07	0.54
2:M:582:LYS:HE2	2:M:586:ASP:OD2	2.08	0.54
1:J:66:LEU:HD22	1:J:151:LEU:HD11	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:324:ILE:CG2	2:I:512:GLY:HA2	2.38	0.54
2:M:632:GLU:HG2	2:M:638:PHE:CE2	2.43	0.54
2:I:517:LEU:HD11	2:I:536:ALA:HB2	1.90	0.53
1:J:156:LYS:NZ	1:J:196:GLN:NE2	2.54	0.53
2:K:561:THR:HA	5:K:672:HOH:O	2.06	0.53
1:J:49:LEU:CD1	1:J:303:ILE:HG22	2.39	0.53
1:L:30:VAL:HG12	1:L:32:HIS:H	1.73	0.53
1:J:138:ALA:O	1:J:224:ARG:NH1	2.39	0.53
1:L:186:PRO:HA	1:L:218:ALA:O	2.08	0.53
1:H:71:CYS:HB3	1:H:74:LEU:HD12	1.91	0.53
2:K:530:GLN:NE2	2:K:646:ASP:H	2.07	0.53
1:L:130:HIS:CE1	1:L:162:PRO:HD2	2.44	0.53
1:H:30:VAL:HG12	1:H:31:THR:N	2.23	0.53
1:H:94:CYS:CB	3:H:642:NDG:H8C2	2.39	0.53
1:L:224:ARG:HH22	3:L:644:NDG:C3	2.21	0.53
1:L:58:LYS:HG3	5:L:755:HOH:O	2.08	0.53
1:J:5:ASP:OD2	2:K:529:GLU:HG3	2.09	0.53
1:J:156:LYS:HZ2	1:J:196:GLN:NE2	2.07	0.53
1:L:53:PRO:HB3	1:L:82:TYR:CZ	2.44	0.53
2:I:629:ASN:HD22	2:I:629:ASN:H	1.54	0.52
1:J:94:CYS:HB2	1:J:138:ALA:O	2.09	0.52
2:M:659:TYR:CD2	2:M:660:PRO:HD2	2.38	0.52
1:L:206:SER:HA	1:L:242:THR:O	2.09	0.52
2:M:598:LEU:HD13	2:M:602:LEU:HD22	1.90	0.52
2:I:645:ASP:O	2:I:648:CYS:HB3	2.09	0.52
1:H:289:ILE:CD1	1:H:298:ILE:HD12	2.40	0.52
1:J:13:ALA:O	2:K:515:THR:HA	2.09	0.52
2:M:530:GLN:NE2	2:M:646:ASP:H	2.08	0.52
1:H:302:THR:HB	2:I:562:GLN:HE21	1.74	0.52
2:K:658:ASP:O	2:K:659:TYR:HB2	2.08	0.52
1:L:324:ILE:CD1	2:M:507:ALA:HB2	2.39	0.52
2:M:657:TYR:O	2:M:659:TYR:N	2.43	0.52
1:H:156:LYS:NZ	1:H:196:GLN:NE2	2.57	0.52
2:I:539:LYS:O	2:I:543:ASN:HB2	2.10	0.52
2:K:571:ASN:OD1	2:K:574:GLU:HG3	2.10	0.52
1:L:42:ASN:HD21	1:L:288:ALA:H	1.57	0.52
2:I:528:ASN:OD1	2:I:645:ASP:HA	2.09	0.52
2:I:633:ILE:HD11	2:I:639:GLU:CB	2.39	0.52
2:K:510:ILE:O	2:K:512:GLY:N	2.42	0.52
1:L:308:LYS:HD2	2:M:562:GLN:HE21	1.75	0.52
2:I:530:GLN:HE21	2:I:645:ASP:HB2	1.71	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:156:LYS:HZ2	1:J:196:GLN:HE21	1.54	0.51
2:K:525:HIS:O	2:K:533:GLY:O	2.29	0.51
1:H:42:ASN:C	1:H:42:ASN:ND2	2.63	0.51
1:H:206:SER:HA	1:H:242:THR:O	2.11	0.51
1:J:37:LEU:HB2	1:J:315:LEU:HB2	1.91	0.51
2:I:501:GLY:HA3	5:I:670:HOH:O	2.09	0.51
1:L:171:ASN:HD22	1:L:171:ASN:H	1.58	0.51
1:L:187:THR:CG2	1:L:189:THR:HB	2.40	0.51
1:L:97:GLY:HA3	1:L:230:MET:O	2.11	0.51
1:J:91:ASN:HD21	3:J:640:NDG:C3	2.10	0.51
2:K:522:TYR:HD1	2:K:540:SER:HB3	1.76	0.51
2:I:605:GLU:HG2	2:K:606:ARG:NH2	2.26	0.51
1:L:94:CYS:HB2	1:L:138:ALA:O	2.11	0.51
1:L:220:ARG:HG2	1:L:227:ALA:O	2.11	0.51
1:H:302:THR:HG23	1:H:306:CYS:SG	2.51	0.50
1:J:206:SER:HA	1:J:242:THR:O	2.10	0.50
1:J:222:LYS:HA	1:J:226:GLN:O	2.10	0.50
2:M:528:ASN:HD21	2:M:530:GLN:HG3	1.75	0.50
1:H:42:ASN:HD22	1:H:44:GLY:N	2.10	0.50
1:L:131:GLU:HB3	1:L:155:VAL:HG23	1.93	0.50
1:L:161:TYR:CZ	1:L:249:GLY:HA2	2.46	0.50
1:L:185:PRO:HG2	1:L:191:GLN:HE21	1.77	0.50
1:L:310:VAL:CG2	2:M:593:THR:HA	2.40	0.50
1:H:85:GLU:O	1:H:270:THR:HA	2.12	0.50
3:H:642:NDG:C1	3:H:642:NDG:O7	2.60	0.50
1:H:217:ILE:N	1:H:217:ILE:HD12	2.26	0.50
1:J:116:GLU:HB2	1:J:259:ALA:HB3	1.94	0.50
2:K:629:ASN:N	2:K:629:ASN:HD22	2.09	0.50
1:L:163:LYS:HE2	1:L:201:TYR:OH	2.12	0.50
1:H:9:ILE:HD11	2:I:622:ALA:CB	2.41	0.49
1:H:222:LYS:HA	1:H:226:GLN:O	2.11	0.49
2:I:511:GLU:O	2:I:512:GLY:O	2.31	0.49
1:L:217:ILE:N	1:L:217:ILE:HD12	2.28	0.49
1:H:267:GLY:HA3	2:I:566:VAL:HG11	1.93	0.49
1:J:23:VAL:HG21	5:M:688:HOH:O	2.12	0.49
1:J:66:LEU:O	1:J:148:TYR:HB3	2.12	0.49
2:K:625:GLN:HE22	2:K:655:GLY:HA2	1.78	0.49
1:J:315:LEU:HD22	2:K:600:VAL:HG21	1.94	0.49
2:M:528:ASN:ND2	2:M:530:GLN:H	2.11	0.49
1:H:97:GLY:HA3	1:H:230:MET:O	2.12	0.49
2:I:580:LEU:O	2:I:584:VAL:HG23	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:623:ARG:HB2	2:M:638:PHE:HZ	1.76	0.49
2:K:538:GLN:O	2:K:539:LYS:C	2.51	0.49
1:H:35:ASN:ND2	1:H:37:LEU:H	2.10	0.49
1:H:139:CYS:HA	3:H:642:NDG:C8	2.43	0.49
1:H:289:ILE:HD12	1:H:298:ILE:HD12	1.95	0.49
2:M:553:ASN:O	2:M:557:GLU:HG3	2.12	0.49
1:J:295:PHE:HZ	2:K:559:MET:HG3	1.74	0.48
2:M:528:ASN:OD1	2:M:645:ASP:HA	2.14	0.48
1:H:35:ASN:HD22	1:H:36:LEU:N	2.11	0.48
1:J:42:ASN:C	1:J:42:ASN:ND2	2.66	0.48
1:J:327:ARG:NE	1:J:327:ARG:C	2.67	0.48
2:K:506:ILE:HA	5:K:667:HOH:O	2.14	0.48
1:L:302:THR:CG2	2:M:563:PHE:O	2.60	0.48
2:I:598:LEU:HD23	2:K:558:LYS:HG3	1.95	0.48
2:K:526:HIS:HD2	2:K:649:MET:HG3	1.78	0.48
2:I:598:LEU:HD13	2:I:602:LEU:HD13	1.95	0.48
1:J:156:LYS:HE2	1:J:193:SER:O	2.13	0.48
1:L:324:ILE:HD11	2:M:507:ALA:HB2	1.95	0.48
1:H:41:HIS:HB3	1:H:298:ILE:HD13	1.96	0.48
2:I:510:ILE:HG22	2:I:510:ILE:O	2.14	0.48
1:L:6:THR:O	2:M:526:HIS:HA	2.14	0.48
1:L:133:THR:O	1:L:133:THR:CG2	2.62	0.48
2:K:528:ASN:ND2	2:K:530:GLN:HG3	2.29	0.48
1:L:39:ASP:C	1:L:298:ILE:HD11	2.34	0.48
2:M:518:ILE:HD13	2:M:518:ILE:N	2.29	0.48
1:H:12:HIS:CG	1:H:13:ALA:N	2.81	0.48
1:H:91:ASN:CG	3:H:642:NDG:O1	2.51	0.48
1:J:320:GLY:O	2:K:611:HIS:NE2	2.47	0.48
1:H:321:LEU:HD12	1:H:321:LEU:H	1.79	0.48
2:K:526:HIS:HB2	2:K:649:MET:CE	2.43	0.47
2:M:524:TYR:CE1	2:M:653:ARG:HG2	2.49	0.47
1:H:8:CYS:O	2:I:524:TYR:HA	2.14	0.47
1:H:9:ILE:CD1	2:I:619:TYR:HA	2.44	0.47
1:L:42:ASN:C	1:L:42:ASN:HD22	2.17	0.47
1:L:115:PHE:C	1:L:115:PHE:CD1	2.88	0.47
2:I:509:PHE:O	2:I:635:ASN:HA	2.13	0.47
2:K:651:SER:OG	2:K:657:TYR:HA	2.14	0.47
1:H:68:ASN:HB3	1:H:71:CYS:SG	2.55	0.47
2:K:503:PHE:CE1	2:K:613:SER:HB2	2.50	0.47
1:L:327:ARG:C	1:L:327:ARG:NE	2.68	0.47
2:I:552:VAL:O	2:I:556:ILE:HD13	2.13	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:I:538:GLN:O	2:I:539:LYS:C	2.53	0.47
1:J:200:ALA:HA	1:J:248:THR:OG1	2.14	0.47
1:J:302:THR:HG22	2:K:563:PHE:O	2.13	0.47
1:L:30:VAL:HG12	1:L:31:THR:N	2.30	0.47
1:L:115:PHE:C	1:L:115:PHE:HD1	2.18	0.47
2:M:543:ASN:HB3	5:M:684:HOH:O	2.14	0.47
1:H:161:TYR:CZ	1:H:249:GLY:HA2	2.49	0.47
1:L:241:ASP:OD2	1:L:242:THR:N	2.45	0.47
2:I:607:THR:O	2:I:610:PHE:HB3	2.15	0.47
1:L:117:LYS:HE2	5:L:760:HOH:O	2.15	0.47
1:H:265:GLY:O	1:H:266:SER:HB2	2.16	0.46
1:J:39:ASP:C	1:J:298:ILE:HD11	2.34	0.46
1:L:134:GLY:HA2	4:L:701:DAN:H113	1.96	0.46
2:M:657:TYR:O	2:M:657:TYR:CG	2.68	0.46
1:J:323:ASN:C	1:J:325:PRO:HD3	2.36	0.46
2:K:569:GLU:HG2	5:K:680:HOH:O	2.16	0.46
1:L:42:ASN:ND2	1:L:45:LYS:H	2.14	0.46
2:M:525:HIS:O	2:M:526:HIS:ND1	2.48	0.46
1:J:6:THR:HG22	2:K:639:GLU:HG3	1.97	0.46
2:K:634:GLY:O	2:K:635:ASN:HB2	2.14	0.46
1:L:290:ASN:HA	5:L:792:HOH:O	2.14	0.46
1:H:246:GLU:HB2	5:H:730:HOH:O	2.15	0.46
2:I:582:LYS:HD3	5:I:691:HOH:O	2.16	0.46
1:J:44:GLY:HA2	1:J:286:HIS:O	2.16	0.46
1:J:85:GLU:O	1:J:270:THR:HA	2.15	0.46
1:J:195:TYR:O	1:J:197:ASN:N	2.46	0.46
2:M:656:THR:C	2:M:658:ASP:N	2.69	0.46
1:J:164:LEU:HD12	1:J:164:LEU:C	2.35	0.46
1:L:156:LYS:HZ2	1:L:196:GLN:HE21	1.64	0.46
1:J:217:ILE:N	1:J:217:ILE:HD12	2.30	0.46
1:J:302:THR:CG2	1:J:306:CYS:SG	3.00	0.46
1:L:133(A):ARG:HD3	5:L:767:HOH:O	2.15	0.46
1:J:70:GLU:HG3	3:J:640:NDG:C3	2.45	0.46
1:L:103:GLU:HG3	2:M:569:GLU:HB3	1.97	0.46
1:H:105:LEU:O	1:H:109:LEU:HD23	2.16	0.46
1:J:133:THR:HG22	1:J:133:THR:O	2.16	0.46
2:K:541:THR:O	2:K:545:ILE:HG13	2.16	0.46
1:L:91:ASN:ND2	3:L:644:NDG:O5	2.49	0.46
1:L:276:HIS:CD2	5:L:703:HOH:O	2.69	0.46
1:J:23:VAL:CG1	2:M:551:LYS:HG3	2.46	0.45
1:J:156:LYS:CD	1:J:196:GLN:HG2	2.45	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:35:ASN:HD22	1:L:37:LEU:H	1.64	0.45
1:L:44:GLY:HA2	1:L:286:HIS:O	2.15	0.45
1:L:185:PRO:HG2	1:L:191:GLN:NE2	2.31	0.45
2:K:598:LEU:HD22	2:K:602:LEU:HD13	1.97	0.45
1:H:294:PRO:HG2	1:H:295:PHE:CD1	2.52	0.45
1:L:30:VAL:CG1	1:L:31:THR:N	2.79	0.45
1:L:35:ASN:HD22	1:L:35:ASN:C	2.18	0.45
2:M:559:MET:CE	2:M:596:ALA:HA	2.46	0.45
1:J:320:GLY:O	2:K:611:HIS:CD2	2.70	0.45
2:K:625:GLN:NE2	2:K:655:GLY:HA2	2.32	0.45
2:M:528:ASN:CG	2:M:529:GLU:N	2.71	0.45
1:H:94:CYS:HB2	1:H:138:ALA:O	2.17	0.45
1:H:131:GLU:OE2	1:H:133:THR:HB	2.16	0.45
1:L:187:THR:HG21	1:L:189:THR:HB	1.99	0.45
2:I:659:TYR:HD2	2:I:660:PRO:CD	2.27	0.45
1:J:70:GLU:HB2	1:J:91:ASN:ND2	2.32	0.45
1:H:78:SER:O	1:H:114:SER:HB2	2.17	0.45
2:K:627:ARG:NH1	2:K:660:PRO:HB3	2.32	0.45
2:K:642:HIS:NE2	2:K:657:TYR:OH	2.47	0.45
2:M:519:ASP:HB2	2:M:536:ALA:CB	2.47	0.45
1:H:302:THR:HG23	1:H:303:ILE:N	2.31	0.44
1:H:327:ARG:H	1:H:327:ARG:NE	2.02	0.44
1:J:126:SER:HB3	1:J:166:LYS:HE2	1.99	0.44
1:L:220:ARG:HG2	1:L:220:ARG:H	1.69	0.44
1:H:66:LEU:O	1:H:148:TYR:HB3	2.17	0.44
1:H:140:PRO:HD2	3:H:642:NDG:H8C1	1.98	0.44
1:J:42:ASN:HD21	1:J:288:ALA:H	1.65	0.44
2:M:559:MET:HE3	2:M:596:ALA:HA	1.97	0.44
2:M:629:ASN:N	2:M:629:ASN:ND2	2.65	0.44
2:M:631:LYS:HB3	2:M:641:TYR:OH	2.17	0.44
1:H:38:GLU:OE1	1:H:291:SER:HB2	2.17	0.44
1:J:263:GLY:O	1:J:264:SER:O	2.35	0.44
2:M:625:GLN:HE22	2:M:655:GLY:HA2	1.82	0.44
2:I:659:TYR:CD2	2:I:660:PRO:HD2	2.46	0.44
1:L:58:LYS:CE	1:L:58:LYS:N	2.58	0.44
2:M:575:ARG:NE	5:M:667:HOH:O	2.49	0.44
1:H:133:THR:O	1:H:133:THR:CG2	2.66	0.44
1:H:91:ASN:ND2	3:H:642:NDG:C1	2.80	0.44
1:H:124:THR:HG22	5:H:748:HOH:O	2.18	0.44
1:L:294:PRO:HG2	1:L:295:PHE:CD1	2.52	0.44
1:H:94:CYS:HB3	3:H:642:NDG:H8C2	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:I:629:ASN:ND2	2:I:629:ASN:H	2.13	0.44
1:J:42:ASN:HD22	1:J:44:GLY:N	2.16	0.44
1:L:6:THR:O	2:M:649:MET:HE3	2.18	0.44
1:L:302:THR:CG2	1:L:306:CYS:SG	3.03	0.44
1:H:30:VAL:HG12	1:H:31:THR:H	1.83	0.44
1:H:311:LYS:HE3	2:I:589:LEU:HD23	1.99	0.44
1:H:295:PHE:HZ	2:I:559:MET:HG3	1.82	0.44
2:K:502:LEU:HG	2:M:503:PHE:CZ	2.52	0.44
2:K:593:THR:O	2:K:597:GLU:HG3	2.18	0.44
1:H:111:SER:OG	1:H:262:ARG:NH1	2.49	0.43
2:I:629:ASN:HB3	2:I:642:HIS:NE2	2.33	0.43
2:M:509:PHE:CD1	2:M:510:ILE:HG13	2.53	0.43
1:J:20:VAL:HG12	1:J:316:ARG:HG2	2.00	0.43
1:H:180:TRP:HB3	1:H:254:PRO:HG3	2.00	0.43
2:I:571:ASN:OD1	2:I:574:GLU:HG3	2.18	0.43
2:I:642:HIS:O	2:I:643:LYS:C	2.56	0.43
1:J:18:ASP:O	1:J:29:THR:HA	2.19	0.43
2:K:510:ILE:O	2:K:510:ILE:HG22	2.18	0.43
1:J:191:GLN:HA	1:J:191:GLN:NE2	2.34	0.43
1:J:98:ASP:OD2	1:J:100:ILE:HD13	2.19	0.43
1:L:45:LYS:HD2	1:L:276:HIS:CG	2.53	0.43
2:M:619:TYR:CE1	2:M:636:GLY:HA2	2.54	0.43
2:K:629:ASN:N	2:K:629:ASN:ND2	2.66	0.43
1:L:9:ILE:HD11	2:M:622:ALA:HB2	2.01	0.43
1:H:45:LYS:HD2	1:H:276:HIS:CG	2.54	0.43
1:L:8:CYS:HA	2:M:637:CYS:HA	2.01	0.43
2:I:601:LEU:HD13	2:I:601:LEU:O	2.19	0.42
2:K:619:TYR:CD1	2:K:636:GLY:HA2	2.54	0.42
1:J:35:ASN:HD22	1:J:36:LEU:N	2.17	0.42
1:J:98:ASP:OD2	1:J:100:ILE:CD1	2.67	0.42
2:K:525:HIS:O	2:K:526:HIS:ND1	2.47	0.42
1:H:47:CYS:HB2	1:H:280:THR:CG2	2.49	0.42
2:I:619:TYR:CE1	2:I:636:GLY:HA2	2.54	0.42
1:H:53:PRO:HB3	1:H:82:TYR:CZ	2.54	0.42
2:I:518:ILE:HD13	2:I:518:ILE:N	2.31	0.42
2:I:561:THR:HG22	2:I:562:GLN:N	2.34	0.42
2:M:526:HIS:HB2	2:M:649:MET:HE3	2.01	0.42
2:M:625:GLN:HE22	2:M:655:GLY:C	2.23	0.42
2:I:626:LEU:O	2:I:627:ARG:HB2	2.18	0.42
1:J:39:ASP:CA	1:J:298:ILE:HD11	2.49	0.42
1:L:56:LEU:HD12	1:L:85:GLU:HG3	2.00	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:526:HIS:HB2	2:M:649:MET:CE	2.50	0.42
2:K:509:PHE:CD1	2:K:510:ILE:HG13	2.54	0.42
2:K:518:ILE:N	2:K:518:ILE:CD1	2.83	0.42
2:M:623:ARG:HB2	2:M:638:PHE:CZ	2.53	0.42
1:H:278:CYS:SG	1:H:279:ASP:N	2.92	0.42
1:L:13:ALA:O	2:M:515:THR:HA	2.20	0.42
2:M:566:VAL:HG23	5:M:694:HOH:O	2.20	0.42
1:H:38:GLU:O	1:H:296:GLN:HA	2.19	0.42
1:H:159:ASN:C	1:H:196:GLN:HG3	2.40	0.42
2:I:525:HIS:O	2:I:533:GLY:O	2.38	0.42
2:K:645:ASP:O	2:K:648:CYS:N	2.50	0.42
1:L:171:ASN:H	1:L:171:ASN:ND2	2.18	0.42
1:H:9:ILE:HD11	2:I:622:ALA:HB2	2.01	0.42
1:H:131:GLU:HB3	1:H:155:VAL:CG2	2.50	0.42
1:J:107:GLU:O	1:J:110:SER:HB2	2.20	0.42
2:I:528:ASN:CG	2:I:529:GLU:N	2.74	0.41
2:I:575:ARG:HD3	1:J:107:GLU:HG3	2.02	0.41
2:I:598:LEU:HD13	2:I:598:LEU:O	2.20	0.41
1:J:266:SER:OG	1:J:267:GLY:N	2.53	0.41
2:M:517:LEU:HA	5:M:691:HOH:O	2.19	0.41
2:M:625:GLN:NE2	2:M:655:GLY:HA2	2.35	0.41
2:M:659:TYR:O	2:M:660:PRO:C	2.59	0.41
1:J:6:THR:HG22	2:K:639:GLU:HA	2.02	0.41
1:H:174:LYS:HD2	1:H:259:ALA:HB1	2.03	0.41
1:J:48:ARG:HG3	1:J:279:ASP:OD1	2.21	0.41
2:K:607:THR:O	2:K:610:PHE:HB3	2.20	0.41
2:K:643:LYS:HG3	5:K:699:HOH:O	2.20	0.41
1:L:171:ASN:HD22	1:L:171:ASN:N	2.15	0.41
1:J:191:GLN:HA	1:J:191:GLN:HE21	1.85	0.41
2:K:656:THR:O	2:K:657:TYR:C	2.59	0.41
1:L:31:THR:HG23	1:L:321:LEU:O	2.21	0.41
2:M:515:THR:HG23	5:M:681:HOH:O	2.20	0.41
2:M:569:GLU:HG2	5:M:699:HOH:O	2.19	0.41
2:I:526:HIS:O	2:I:526:HIS:ND1	2.53	0.41
1:L:276:HIS:HD2	5:L:703:HOH:O	2.02	0.41
1:H:186:PRO:HG2	1:H:190:ASP:OD2	2.21	0.41
1:H:327:ARG:N	1:H:327:ARG:NE	2.61	0.41
1:J:42:ASN:HD22	1:J:45:LYS:H	1.66	0.41
1:J:131:GLU:HB3	1:J:155:VAL:HG23	2.03	0.41
1:J:186:PRO:HA	1:J:218:ALA:O	2.20	0.41
2:K:528:ASN:HD21	2:K:530:GLN:HG3	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:42:ASN:HD22	1:L:44:GLY:N	2.19	0.41
1:L:67:GLY:O	1:L:149:ARG:HG2	2.21	0.41
2:M:524:TYR:CD1	2:M:653:ARG:HG2	2.56	0.41
1:H:23:VAL:HG12	2:K:551:LYS:HG3	2.02	0.40
1:H:86:THR:C	1:H:88:ASN:H	2.23	0.40
2:I:528:ASN:ND2	2:I:530:GLN:H	2.19	0.40
1:J:45:LYS:HD2	1:J:276:HIS:ND1	2.37	0.40
1:J:161:TYR:CZ	1:J:249:GLY:HA2	2.57	0.40
1:H:35:ASN:HD22	1:H:36:LEU:H	1.69	0.40
1:L:309:TYR:H	2:M:562:GLN:NE2	2.20	0.40
2:M:506:ILE:HD12	2:M:612:ASP:HA	2.03	0.40
2:I:640:PHE:CD2	2:I:644:CYS:HB2	2.56	0.40
1:L:9:ILE:HD11	2:M:622:ALA:CB	2.52	0.40
1:L:85:GLU:O	1:L:270:THR:HA	2.21	0.40
2:I:606:ARG:HH12	2:M:606:ARG:HD2	1.86	0.40
2:K:598:LEU:O	2:K:602:LEU:HD13	2.22	0.40
1:L:249:GLY:C	1:L:250:ASN:HD22	2.25	0.40
1:L:321:LEU:HD23	1:L:321:LEU:N	2.36	0.40
1:H:42:ASN:O	1:H:45:LYS:HG3	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	H	322/328 (98%)	298 (92%)	20 (6%)	4 (1%)	13	24
1	J	322/328 (98%)	300 (93%)	20 (6%)	2 (1%)	25	43
1	L	322/328 (98%)	307 (95%)	14 (4%)	1 (0%)	41	61
2	I	158/160 (99%)	129 (82%)	19 (12%)	10 (6%)	1	1
2	K	158/160 (99%)	135 (85%)	16 (10%)	7 (4%)	2	3

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
2	M	158/160 (99%)	140 (89%)	15 (10%)	3 (2%)	8 13
All	All	1440/1464 (98%)	1309 (91%)	104 (7%)	27 (2%)	8 13

All (27) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	J	264	SER
2	K	511	GLU
2	K	657	TYR
2	K	658	ASP
2	K	659	TYR
2	M	658	ASP
1	H	125	SER
2	I	512	GLY
2	I	640	PHE
2	I	643	LYS
2	I	657	TYR
2	K	526	HIS
1	H	196	GLN
1	H	265	GLY
2	I	656	THR
2	M	511	GLU
2	M	560	ASN
1	H	266	SER
2	I	504	GLY
2	I	511	GLU
2	I	627	ARG
2	I	629	ASN
2	K	505	ALA
2	K	643	LYS
1	L	196	GLN
2	I	526	HIS
1	J	196	GLN

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	H	279/281 (99%)	267 (96%)	12 (4%)	29	53
1	J	279/281 (99%)	268 (96%)	11 (4%)	32	57
1	L	279/281 (99%)	263 (94%)	16 (6%)	20	39
2	I	134/134 (100%)	124 (92%)	10 (8%)	13	26
2	K	134/134 (100%)	129 (96%)	5 (4%)	34	60
2	M	134/134 (100%)	130 (97%)	4 (3%)	41	68
All	All	1239/1245 (100%)	1181 (95%)	58 (5%)	26	49

All (58) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	H	17	THR
1	H	23	VAL
1	H	35	ASN
1	H	42	ASN
1	H	55	GLN
1	H	58	LYS
1	H	115	PHE
1	H	152	LEU
1	H	278	CYS
1	H	302	THR
1	H	321	LEU
1	H	327	ARG
2	I	518	ILE
2	I	522	TYR
2	I	524	TYR
2	I	526	HIS
2	I	543	ASN
2	I	569	GLU
2	I	580	LEU
2	I	598	LEU
2	I	629	ASN
2	I	646	ASP
1	J	35	ASN
1	J	42	ASN
1	J	55	GLN
1	J	58	LYS
1	J	115	PHE
1	J	152	LEU
1	J	278	CYS
1	J	302	THR

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Mol	Chain	Res	Type
1	J	310	VAL
1	J	321	LEU
1	J	327	ARG
2	K	518	ILE
2	K	526	HIS
2	K	561	THR
2	K	580	LEU
2	K	598	LEU
1	L	35	ASN
1	L	42	ASN
1	L	58	LYS
1	L	78	SER
1	L	99	PHE
1	L	115	PHE
1	L	136	THR
1	L	152	LEU
1	L	171	ASN
1	L	190	ASP
1	L	220	ARG
1	L	278	CYS
1	L	302	THR
1	L	313	THR
1	L	321	LEU
1	L	327	ARG
2	M	518	ILE
2	M	524	TYR
2	M	526	HIS
2	M	580	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (38) such sidechains are listed below:

Mol	Chain	Res	Type
1	H	35	ASN
1	H	42	ASN
1	H	91	ASN
1	H	130	HIS
1	H	159	ASN
1	H	191	GLN
1	H	196	GLN
1	H	250	ASN
2	I	526	HIS
2	I	528	ASN

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Mol	Chain	Res	Type
2	I	530	GLN
2	I	614	ASN
2	I	629	ASN
1	J	35	ASN
1	J	42	ASN
1	J	55	GLN
1	J	91	ASN
1	J	191	GLN
1	J	196	GLN
1	J	250	ASN
2	K	528	ASN
2	K	530	GLN
2	K	625	GLN
2	K	629	ASN
1	L	35	ASN
1	L	42	ASN
1	L	91	ASN
1	L	130	HIS
1	L	171	ASN
1	L	191	GLN
1	L	196	GLN
1	L	250	ASN
2	M	528	ASN
2	M	530	GLN
2	M	550	ASN
2	M	562	GLN
2	M	625	GLN
2	M	629	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

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	$\#\|Z\| > 2$
3	NDG	J	640	-	15,15,15	0.35	0	21,21,21	0.49	0
3	NDG	L	644	-	15,15,15	0.42	0	21,21,21	0.72	0
4	DAN	L	701	-	20,20,20	4.86	11 (55%)	23,28,28	3.53	3 (13%)
3	NDG	H	642	-	15,15,15	0.36	0	21,21,21	0.76	0

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	NDG	J	640	-	-	6/6/26/26	0/1/1/1
3	NDG	L	644	-	-	3/6/26/26	0/1/1/1
4	DAN	L	701	-	-	4/18/34/34	0/1/1/1
3	NDG	H	642	-	-	4/6/26/26	0/1/1/1

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	L	701	DAN	C3-C2	18.24	1.61	1.33
4	L	701	DAN	C4-C3	5.98	1.58	1.50
4	L	701	DAN	C2-C1	4.86	1.60	1.48
4	L	701	DAN	C6-C5	4.13	1.59	1.53
4	L	701	DAN	O6-C2	3.64	1.52	1.37
4	L	701	DAN	O6-C6	3.56	1.52	1.46
4	L	701	DAN	C7-C6	3.43	1.57	1.53
4	L	701	DAN	C4-C5	2.82	1.56	1.53
4	L	701	DAN	C5-N5	2.69	1.50	1.45
4	L	701	DAN	O1A-C1	2.21	1.28	1.22
4	L	701	DAN	C8-C7	2.01	1.57	1.53

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	L	701	DAN	O6-C2-C3	-13.60	108.75	124.61
4	L	701	DAN	C4-C3-C2	-6.88	109.96	121.60
4	L	701	DAN	C3-C2-C1	-5.34	112.14	123.65

There are no chirality outliers.

All (17) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	J	640	NDG	C8-C7-N2-C2
3	J	640	NDG	O7-C7-N2-C2
4	L	701	DAN	O1A-C1-C2-C3
4	L	701	DAN	O1B-C1-C2-C3
4	L	701	DAN	O8-C8-C9-O9
3	J	640	NDG	O5-C5-C6-O6
3	J	640	NDG	C4-C5-C6-O6
3	H	642	NDG	C8-C7-N2-C2
4	L	701	DAN	C7-C8-C9-O9
3	H	642	NDG	O7-C7-N2-C2
3	L	644	NDG	C3-C2-N2-C7
3	H	642	NDG	C1-C2-N2-C7
3	H	642	NDG	C3-C2-N2-C7
3	L	644	NDG	O5-C5-C6-O6
3	J	640	NDG	C3-C2-N2-C7
3	J	640	NDG	C1-C2-N2-C7
3	L	644	NDG	C1-C2-N2-C7

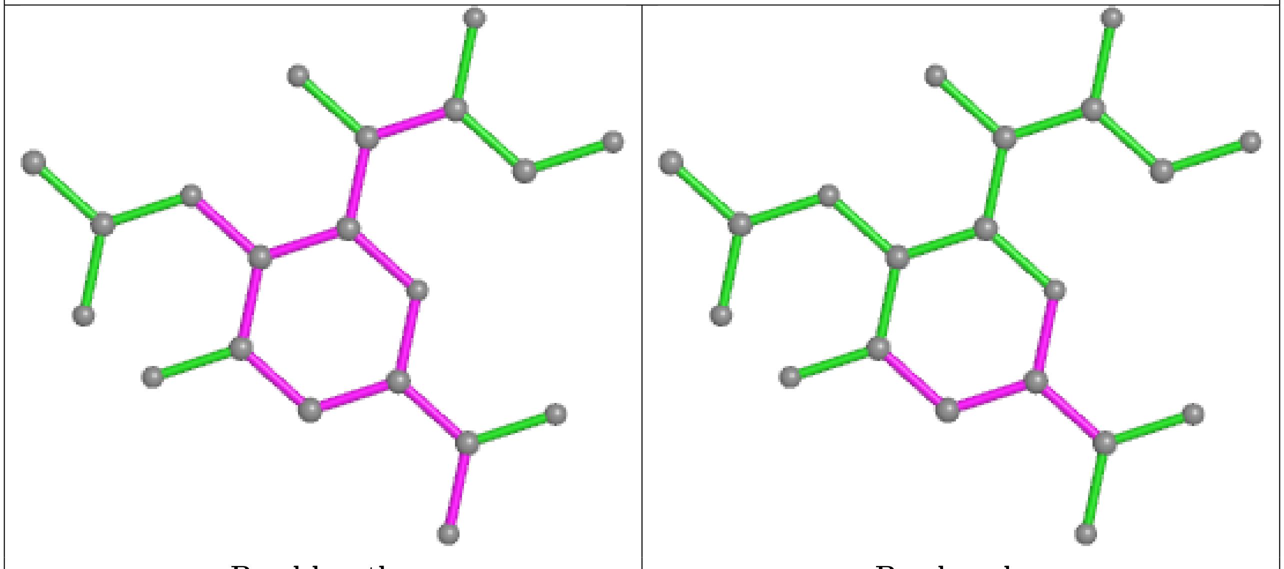
There are no ring outliers.

4 monomers are involved in 26 short contacts:

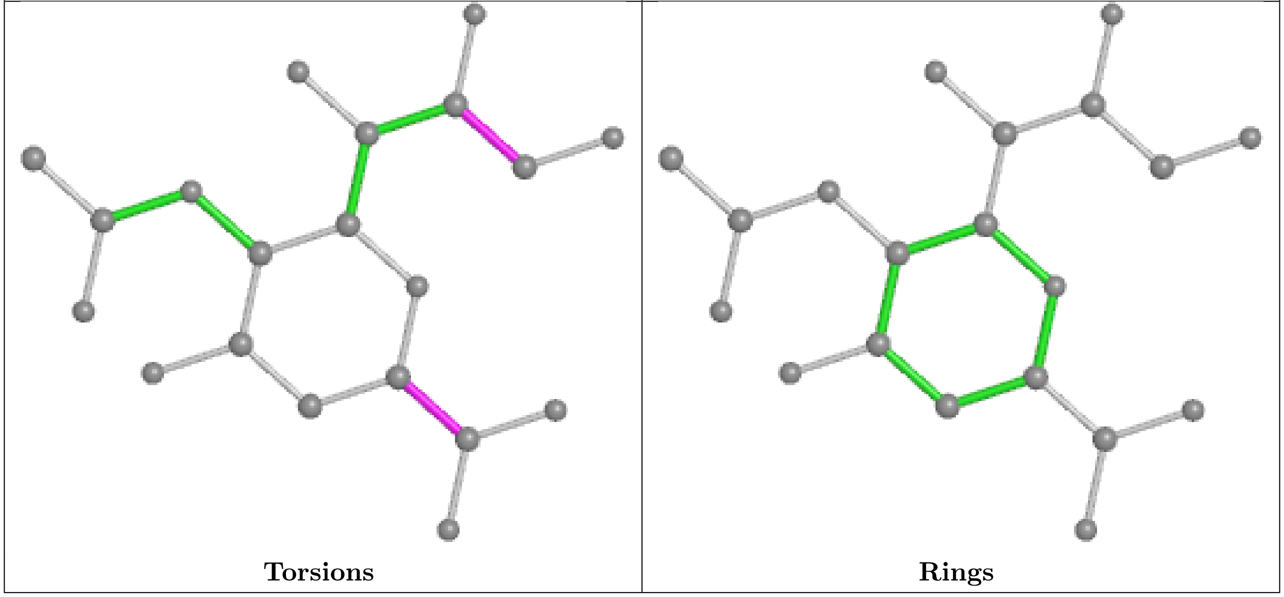
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	J	640	NDG	6	0
3	L	644	NDG	8	0
4	L	701	DAN	1	0
3	H	642	NDG	11	0

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 DAN L 701



Bond lengths **Bond angles**



Torsions **Rings**

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 ⓘ

EDS was not executed - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates ⓘ

EDS was not executed - this section is therefore empty.

6.4 Ligands ⓘ

EDS was not executed - this section is therefore empty.

6.5 Other polymers ⓘ

EDS was not executed - this section is therefore empty.