Integrative Structure Validation Report

July 22, 2024 - 04:43 PM PDT

The following software was used in the production of this report:

Python-IHM Version 1.3
MolProbity Version 4.5.2
Integrative Modeling Validation Version 1.2

PDB ID	9A1S
PDB-Dev ID	PDBDEV_00000112
Structure Title	Molten Globule Ensemble from Helicobacter pylori Flavodoxin
Structure Authors	Galano-Frutos JJ; Torreblanca R; Garcia-Cebollada H; Sancho J

This is a PDB-Dev IM Structure Validation Report for a publicly released PDB-Dev entry.

We welcome your comments at pdb-dev@mail.wwpdb.org

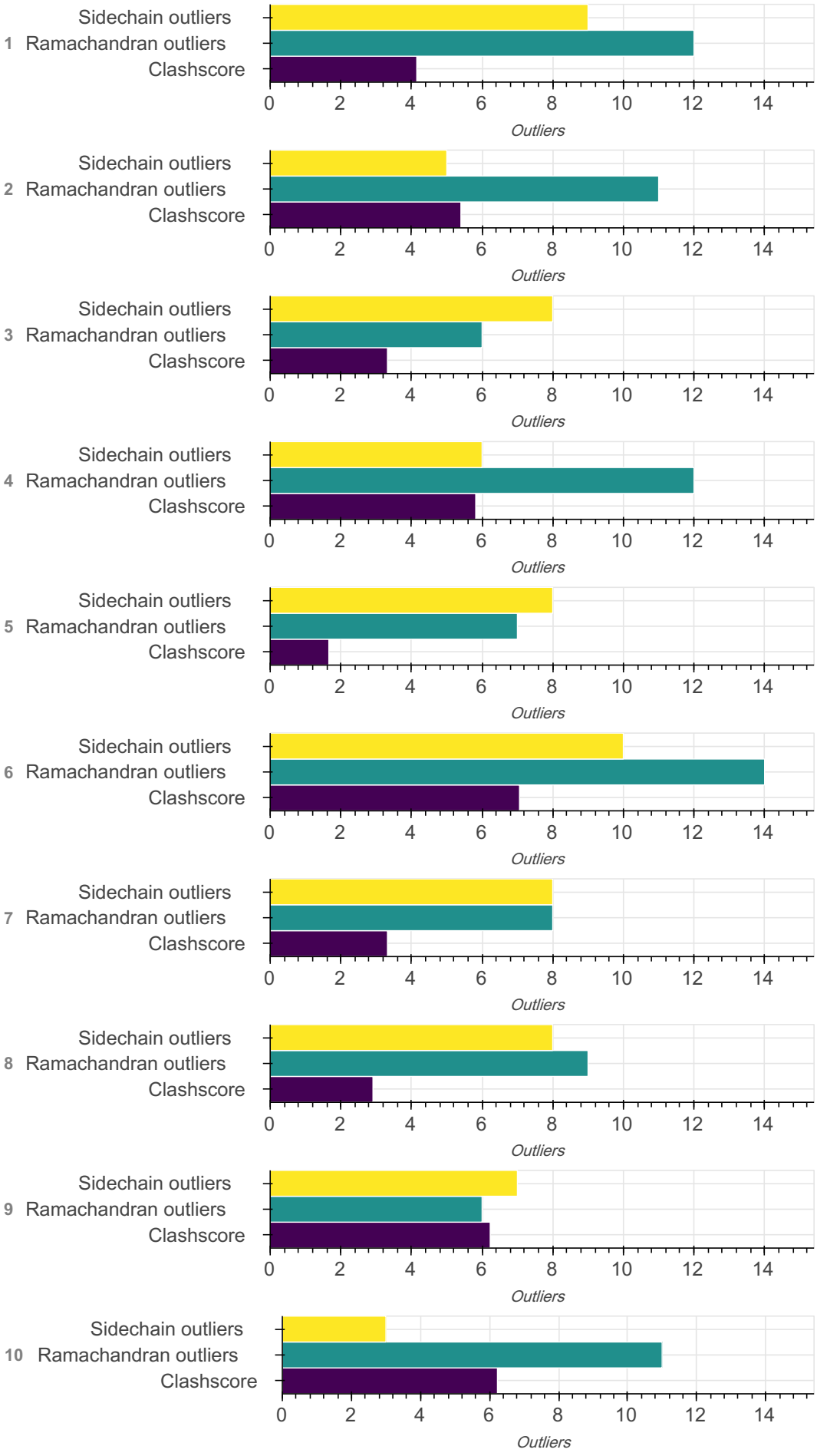
A user guide is available at https://pdb-dev.wwpdb.org/validation_help.html with specific help available everywhere you see the ? symbol.

List of references used to build this report is available here.

Overall quality

This validation report contains model quality assessments for all structures, data quality assessment for SAS datasets and fit to model assessments for SAS datasets. Data quality and fit to model assessments for other datasets and model uncertainty are under development. Number of plots is limited to 256.

Model Quality: MolProbity Analysis


1
Sidechain outliers
Ramachandran outliers
Clashscore
0 2 4 6 8 10 12 14
Outliers
2
Sidechain outliers
Ramachandran outliers
Clashscore
0 2 4 6 8 10 12 14
Outliers
3
Sidechain outliers
Ramachandran outliers
Clashscore
0 2 4 6 8 10 12 14
Outliers
4
Sidechain outliers
Ramachandran outliers
Clashscore
0 2 4 6 8 10 12 14
Outliers
5
Sidechain outliers
Ramachandran outliers
Clashscore
0 2 4 6 8 10 12 14
Outliers
6
Sidechain outliers
Ramachandran outliers
Clashscore
0 2 4 6 8 10 12 14
Outliers
7
Sidechain outliers
Ramachandran outliers
Clashscore
0 2 4 6 8 10 12 14
Outliers
8
Sidechain outliers
Ramachandran outliers
Clashscore
0 2 4 6 8 10 12 14
Outliers
9
Sidechain outliers
Ramachandran outliers
Clashscore
0 2 4 6 8 10 12 14
Outliers
10
Sidechain outliers
Ramachandran outliers
Clashscore
0 2 4 6 8 10 12 14
Outliers

Ensemble information

This entry consists of 1 distinct ensemble(s).

Summary

This entry consists of 10 unique models, with 1 subunits in each model. A total of 4 datasets or restraints were used to build this entry. Each model is represented by 0 rigid bodies and 1 flexible or non-rigid units.

Entry composition

There are 10 unique types of models in this entry.These models are titled None, None, None, None, None, None, None, None, None, None respectively.

Model ID	Subunit number	Subunit ID	Subunit name	Chain ID	Chain ID [auth]	Total residues
1	1	1	MOLTEN GLOBULE OF APOFLAVODOXIN FROM HELICOBACTER PYLORI, ELECTRON TRANSPORT	A	A	163
2	1	1	MOLTEN GLOBULE OF APOFLAVODOXIN FROM HELICOBACTER PYLORI, ELECTRON TRANSPORT	A	A	163
3	1	1	MOLTEN GLOBULE OF APOFLAVODOXIN FROM HELICOBACTER PYLORI, ELECTRON TRANSPORT	A	A	163
4	1	1	MOLTEN GLOBULE OF APOFLAVODOXIN FROM HELICOBACTER PYLORI, ELECTRON TRANSPORT	A	A	163
5	1	1	MOLTEN GLOBULE OF APOFLAVODOXIN FROM HELICOBACTER PYLORI, ELECTRON TRANSPORT	A	A	163
6	1	1	MOLTEN GLOBULE OF APOFLAVODOXIN FROM HELICOBACTER PYLORI, ELECTRON TRANSPORT	A	A	163

Model ID	Subunit number	Subunit ID	Subunit name	Chain ID	Chain ID [auth]	Total residues
7	1	1	MOLTEN GLOBULE OF APOFLAVODOXIN FROM HELICOBACTER PYLORI, ELECTRON TRANSPORT	A	A	163
8	1	1	MOLTEN GLOBULE OF APOFLAVODOXIN FROM HELICOBACTER PYLORI, ELECTRON TRANSPORT	A	A	163
9	1	1	MOLTEN GLOBULE OF APOFLAVODOXIN FROM HELICOBACTER PYLORI, ELECTRON TRANSPORT	A	A	163
10	1	1	MOLTEN GLOBULE OF APOFLAVODOXIN FROM HELICOBACTER PYLORI, ELECTRON TRANSPORT	A	A	163

Datasets used for modeling

There are 4 unique datasets used to build the models in this entry.

ID	Dataset type	Database name	Data access code
1	Experimental model	PDB	2BMV
2	Mutagenesis data	Not available	Not available
3	Other	Not available	Not available
4	Other	Not available	Not available

Representation

This entry has only one representation and includes 0 rigid bodies and 1 flexible units

Chain ID	Rigid bodies	Non-rigid segments
A	-	1-163

Methodology and software

This entry is a result of 1 distinct protocol(s).

Step number	Protocol ID	Method name	Method type	Method description	Number of computed models	Multi state modeling	Multi scale modeling
1	1	Biased (experimental phi-values) molecular dynamics simulations	Generation of the initial ensemble	Experimental phi-values from mutagenesis experiments are used as a reaction coordinate to bias a starting model using molecular dynamics simulations (HQBM module from Charmm program)	21	False	False
2	1	Ensemble refinement based on experimental spectroscopic data	Ensemble refinement	A variety of spectroscopic data (fluorescence, far- and near-UV, and NMR) used for refining the initial biased MD ensemble	10	False	False

There is 1 software package reported in this entry.

ID	Software name	Software version	Software classification	Software location
1	CHARMM	v.44b2	Molecular dynamics simulations	https://www.charmm.org/

Data quality

Mutagenesis

Validation for this section is under development.

Model quality

For models with atomic structures, molprobity analysis is performed. For models with coarse-grained or multi-scale structures, excluded volume analysis is performed.

Standard geometry: bond outliers

There are 2739 bond outliers in this entry. A summary is provided below, and a detailed list of outliers can be found here.

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
N--H	0.98	0.86	1610
OH--HH	0.96	0.84	30
OG--HG	0.96	0.84	100
NE2--HE21	0.98	0.86	60
OG1--HG1	0.96	0.84	110
NE--HE	0.98	0.86	10
ND2--HD22	0.98	0.86	50
ND2--HD21	0.98	0.86	50
NE2--HE22	0.98	0.86	60
ND1--HD1	0.98	0.86	20
NE2--HE2	0.98	0.86	20
NE1--HE1	0.98	0.86	20
NH1--HH11	1.00	0.86	10
NH1--HH12	1.00	0.86	10
NH2--HH21	1.00	0.86	10
NH2--HH22	1.00	0.86	10
NZ--HZ1	1.04	0.89	140
NZ--HZ2	1.04	0.89	140
NZ--HZ3	1.04	0.89	140

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
N--H1	1.04	0.89	10
N--H2	1.04	0.89	10
N--H3	1.04	0.89	10
OD2--HD2	2.06	0.95	1
OE2--HE2	2.06	0.95	1
OE2--HE2	2.07	0.95	2
OD2--HD2	2.07	0.95	1
OD2--HD2	2.10	0.95	1
OD2--HD2	2.12	0.95	1
OE2--HE2	2.12	0.95	1
OE2--HE2	2.13	0.95	3
OE2--HE2	2.15	0.95	1
OE2--HE2	2.17	0.95	2
OD2--HD2	2.18	0.95	2
OE2--HE2	2.19	0.95	1
OD2--HD2	2.21	0.95	1
OD2--HD2	2.22	0.95	1
OD2--HD2	2.23	0.95	1
OE2--HE2	2.24	0.95	2
OD2--HD2	2.24	0.95	3
OD2--HD2	2.25	0.95	2
OE2--HE2	2.25	0.95	2
OD2--HD2	2.26	0.95	1

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
OE2--HE2	2.26	0.95	2
OD2--HD2	2.27	0.95	3
OE2--HE2	2.27	0.95	1
OE2--HE2	2.28	0.95	2
OE2--HE2	2.29	0.95	2
OD2--HD2	2.30	0.95	2
OE2--HE2	2.31	0.95	3
OE2--HE2	2.32	0.95	4
OD2--HD2	2.32	0.95	1
OE2--HE2	2.33	0.95	2
OD2--HD2	2.34	0.95	3
OE2--HE2	2.34	0.95	3
OE2--HE2	2.35	0.95	2
OD2--HD2	2.35	0.95	1
OE2--HE2	2.36	0.95	1
OD2--HD2	2.37	0.95	1
OD2--HD2	2.38	0.95	2
OE2--HE2	2.38	0.95	4
OD2--HD2	2.39	0.95	1
OE2--HE2	2.39	0.95	2
OE2--HE2	2.40	0.95	2
OD2--HD2	2.40	0.95	2
OE2--HE2	2.41	0.95	1

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
OE2--HE2	2.42	0.95	3
OE2--HE2	2.43	0.95	3
OD2--HD2	2.43	0.95	1
OE2--HE2	2.44	0.95	3
OD2--HD2	2.44	0.95	2
OD2--HD2	2.47	0.95	1
OE2--HE2	2.49	0.95	1
OE2--HE2	2.89	0.95	1
OD2--HD2	2.91	0.95	1
OD2--HD2	2.94	0.95	1
OD2--HD2	2.97	0.95	1
OE2--HE2	2.98	0.95	1
OE2--HE2	3.00	0.95	1
OE2--HE2	3.01	0.95	1
OD2--HD2	3.02	0.95	1
OD2--HD2	3.03	0.95	1
OE2--HE2	3.03	0.95	1
OD2--HD2	3.04	0.95	1
OD2--HD2	3.05	0.95	1
OD2--HD2	3.06	0.95	1
OE2--HE2	3.08	0.95	3
OD2--HD2	3.11	0.95	1
OD2--HD2	3.12	0.95	1

Standard geometry: angle outliers

There are 1303 angle outliers in this entry. A summary is provided below, and a detailed list of outliers can be found here.

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG	113.80	124.62	1
OD1-CG-ND2	122.60	111.81	1
OE1-CD-NE2	122.60	111.93	1
OD1-CG-ND2	122.60	112.41	1
CB-CG-CD2	131.20	118.18	1
CA-CB-CG	112.60	122.52	1
CB-CG-CD2	131.20	118.42	1
CA-CB-CG	113.80	123.61	1
CA-CB-CG	112.60	122.37	1
NE1-CE2-CZ2	130.10	115.60	1
CA-CB-CG	112.60	122.16	1
CB-CG-ND1	122.70	136.85	1
OE1-CD-NE2	122.60	113.21	1
OE1-CD-NE2	122.60	113.25	1
CB-CG-CD2	131.20	119.07	1
CB-CG-CD2	131.20	119.23	1
CA-CB-CG	112.60	121.72	1
CB-CG-ND2	116.40	129.94	1
CB-CG-ND1	122.70	136.15	1
OE1-CD-NE2	122.60	113.71	1
CA-CB-CG	112.60	121.48	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
ND1-CG-CD2	106.10	114.97	1
CG-CD-NE2	116.40	129.67	1
CA-CB-CG	112.60	121.30	1
CB-CG-CD2	131.20	119.91	1
OD1-CG-ND2	122.60	113.95	1
N-CA-CB	110.40	97.43	1
OD1-CG-ND2	122.60	113.98	1
OD1-CG-ND2	122.60	114.01	3
CA-CB-CG2	110.50	125.07	1
CA-CB-CG	112.60	121.16	1
OE1-CD-NE2	122.60	114.06	1
OD1-CG-ND2	122.60	114.23	1
CA-CB-CG	112.60	120.92	1
CA-CB-CG	112.60	120.90	1
NE1-CE2-CZ2	130.10	117.65	1
CD2-CE2-NE1	107.40	118.12	1
CA-CB-CG	113.80	121.97	1
OE1-CD-NE2	122.60	114.43	1
CA-CB-CG	112.60	120.77	1
OD1-CG-ND2	122.60	114.44	1
CE2-CD2-CE3	118.80	126.87	1
CB-CG-CD2	131.20	120.75	1
CG-CD2-CE2	107.20	97.58	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG	112.60	120.59	1
CA-CB-CG	112.60	120.56	1
C-CA-CB	110.50	98.58	1
CA-CB-CG	113.80	121.74	1
OD1-CG-ND2	122.60	114.68	1
CA-CB-CG	113.80	121.60	1
OE1-CD-NE2	122.60	114.81	1
CA-CB-CG	112.60	120.38	1
OE1-CD-NE2	122.60	114.85	1
OD1-CG-ND2	122.60	114.85	1
CA-CB-CG	112.60	120.33	1
CA-CB-CG	113.80	121.53	1
CA-CB-CG	112.60	120.32	1
NE1-CE2-CZ2	130.10	118.53	1
CA-CB-CG	114.10	129.43	1
CA-CB-CG	113.80	121.41	1
OD1-CG-ND2	122.60	115.01	1
CG-CD1-NE1	110.20	100.35	1
CA-CB-CG	112.60	120.16	1
NE1-CE2-CZ2	130.10	118.76	1
CA-CB-CG	112.60	120.13	1
OE1-CD-NE2	122.60	115.09	1
CA-CB-CG	112.60	105.10	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CB-CG-ND1	122.70	133.94	1
CA-CB-CG	113.80	121.27	1
CD2-CE2-NE1	107.40	117.10	1
CB-CG-ND2	116.40	127.47	1
C-CA-CB	110.10	123.95	1
CA-CB-CG	112.60	119.89	1
CG-CD2-CE2	107.20	98.52	1
CB-CG-CD2	126.80	116.68	1
CA-CB-CG	113.80	121.00	1
CA-CB-CG2	110.50	122.69	1
NE1-CE2-CZ2	130.10	119.35	1
CB-CG-CD	112.60	124.78	1
OE1-CD-NE2	122.60	115.47	1
NE1-CE2-CZ2	130.10	119.41	1
OD1-CG-ND2	122.60	115.47	1
CB-CG-CD2	131.20	121.94	1
CA-CB-CG2	110.50	122.54	1
CA-CB-CG	112.60	119.67	1
CA-CB-OG1	109.60	99.02	1
CB-CG-CD	112.60	124.57	1
CE2-CD2-CE3	118.80	125.84	1
CG-CD-NE2	116.40	126.94	1
CA-CB-CG	112.60	119.62	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
C-CA-CB	110.50	99.97	1
N-CA-CB	110.40	99.91	1
O-C-N	123.00	134.18	1
OE1-CD-NE2	122.60	115.65	1
CA-CB-OG1	109.60	99.21	1
CA-CB-CG	112.60	105.70	1
O-C-N	123.00	111.96	1
CA-CB-CG	112.60	119.48	1
C-N-CA	121.70	134.09	1
CB-CG-CD1	126.90	116.62	1
O-C-N	123.00	133.96	1
C-CA-CB	110.10	123.04	1
CB-CG-ND1	122.70	132.89	1
CA-CB-CG	113.80	107.01	1
CA-CB-CG	112.60	119.38	1
CB-CG-ND2	116.40	126.55	1
NE1-CE2-CZ2	130.10	119.95	1
C-CA-CB	110.50	100.39	1
CB-CG-CD2	131.20	122.44	1
CA-CB-CG	113.80	120.53	1
O-C-N	123.00	112.25	1
CG-CD2-CE2	107.20	99.17	1
OD1-CG-ND2	122.60	115.94	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
ND1-CE1-NE2	108.40	115.05	1
CA-C-N	116.20	102.94	1
CA-CB-OG1	109.60	99.69	2
OE1-CD-NE2	122.60	129.21	1
O-C-N	123.00	112.43	1
CA-C-N	116.20	103.00	1
OE1-CD-NE2	122.60	116.03	1
CA-CB-CG	113.80	120.37	1
NE1-CE2-CZ2	130.10	120.25	1
OD1-CG-ND2	122.60	116.05	1
CD2-CE2-NE1	107.40	115.90	1
CG-CD2-CE2	107.20	99.38	1
CA-CB-CG	113.80	120.31	1
CA-CB-CG	113.80	107.30	1
CA-CB-CG1	110.40	99.36	1
CB-CG-ND2	116.40	126.14	1
CA-CB-CG	113.80	107.31	1
CD2-CE2-NE1	107.40	115.83	1
CA-CB-CG	112.60	119.05	1
CG-CD2-CE2	107.20	99.46	1
C-CA-CB	110.50	100.82	1
CG-CD-NE2	116.40	126.07	1
CG-CD-CE	111.30	126.06	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
NE-CZ-NH2	119.20	124.97	1
N-CA-CB	110.50	121.41	1
CA-CB-CG	112.60	119.00	1
OD1-CG-ND2	122.60	116.21	1
CB-CG-CD	112.60	123.44	1
CA-CB-CG	113.80	120.13	1
CA-CB-CG	114.10	101.45	1
CB-CG-ND1	122.70	132.19	1
CB-CG-CD2	120.70	110.01	1
CA-CB-OG1	109.60	119.02	1
CA-CB-CG	113.80	120.07	1
CA-CB-CG	112.60	118.87	1
CA-CB-OG1	109.60	100.21	1
CA-CB-CG	113.80	120.05	1
CB-CG-CD	112.60	123.21	1
CB-CG-ND1	122.70	132.06	1
OD1-CG-ND2	122.60	116.38	1
CG-CD2-CE2	107.20	99.74	1
CA-CB-CG	112.60	118.81	1
CA-CB-CG	114.10	126.51	1
CA-CB-CG1	110.40	120.95	1
CA-CB-CG	112.60	118.80	1
CA-C-N	116.20	103.81	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
N-CA-CB	111.50	122.01	1
CA-C-N	116.90	126.17	1
CB-CG-CD	111.30	125.49	1
CB-CG-ND1	122.70	131.95	1
N-CA-CB	111.50	101.03	1
CB-CG-ND1	122.70	131.93	1
O-C-N	123.00	113.16	1
CA-CB-OG1	109.60	100.41	1
C-CA-CB	110.50	101.32	1
CG1-CB-CG2	110.80	97.33	1
N-CA-CB	110.50	100.09	1
CA-CB-CG	113.80	107.68	1
CA-CB-CG2	110.40	120.78	1
CA-C-N	116.20	103.99	1
OE1-CD-NE2	122.60	116.50	1
N-CA-CB	110.50	120.87	1
CA-CB-CG	112.60	118.69	1
CA-CB-OG1	109.60	100.48	1
OD1-CG-ND2	122.60	116.52	1
N-CA-CB	111.50	101.17	1
CA-CB-CG	113.80	119.87	1
O-C-N	123.00	113.28	1
NH1-CZ-NH2	119.30	127.19	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-C-O	120.80	131.11	1
CA-CB-CG2	110.50	120.80	1
N-CA-CB	110.50	120.76	1
CA-CB-CG2	110.50	120.76	1
CA-CB-CG	112.60	118.63	1
N-CA-CB	111.50	101.26	1
CA-CB-CG	112.60	118.59	1
N-CA-C	111.00	127.76	1
O-C-N	123.00	113.43	1
CA-CB-CG	114.10	126.05	1
CA-CB-CG1	110.40	120.53	1
O-C-N	123.00	132.51	1
N-CA-CB	110.40	101.49	1
OD1-CG-ND2	122.60	116.67	1
N-CA-CB	110.40	119.29	1
CA-CB-CG2	110.40	120.46	1
CA-CB-CG	112.60	118.51	1
CA-CB-OG1	109.60	100.75	1
CA-CB-CG2	110.50	120.50	1
CA-CB-CG	114.10	125.85	1
OE1-CD-NE2	122.60	116.72	1
CB-CG-CD	112.60	122.58	1
CA-C-N	116.20	127.94	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CB-CG-CD1	120.70	110.73	1
CA-CB-CG	114.10	102.38	1
O-C-N	123.00	113.64	1
C-N-CA	121.70	132.22	1
CG-CD-NE2	116.40	125.15	1
C-CA-CB	110.50	101.75	1
CG-CD2-CE3	133.90	128.07	1
CA-CB-CG	113.80	119.62	1
CA-CB-CG2	110.50	120.37	1
CB-CG1-CD1	113.80	125.99	1
CA-CB-CG	112.60	106.81	1
CB-CG-CD	111.30	97.98	1
CA-CB-CG	113.80	119.59	1
N-CA-CB	110.50	120.32	1
CA-CB-CG	112.60	118.37	1
N-CA-CB	110.50	120.30	1
CG-CD1-NE1	110.20	102.71	1
CD2-CE2-NE1	107.40	114.89	1
CA-CB-CG	114.10	125.61	1
CA-CB-OG1	109.60	100.97	1
CA-CB-CG	114.10	125.60	1
N-CA-CB	110.40	101.78	2
CA-CB-CG	114.10	125.56	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG	112.60	118.33	1
CB-CG-CD1	126.90	118.33	1
CA-CB-CG	112.60	118.31	1
CA-CB-OG1	109.60	101.07	1
CA-CB-CG2	110.50	100.84	1
OD1-CG-ND2	122.60	116.92	1
CA-CB-CG	113.80	108.13	1
CA-CB-CG	112.60	118.26	1
O-C-N	123.00	113.96	1
N-CA-CB	111.50	101.91	1
CA-CB-CG2	110.40	119.99	1
CA-C-N	116.20	104.92	1
CD2-CE2-NE1	107.40	114.72	2
CA-CB-CG1	110.40	119.95	1
CB-CG-CD	112.60	122.14	1
CB-CG-CD2	131.20	123.90	1
CA-CB-CG	112.60	106.99	1
CA-CB-CG	112.60	118.21	1
C-N-CA	121.70	131.80	1
CA-CB-CG1	110.40	119.93	1
CA-CB-OG1	109.60	101.19	1
N-CA-CB	110.50	100.97	1
CA-CB-CG	112.60	118.20	2

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
OD1-CG-ND2	122.60	128.20	1
O-C-N	123.00	114.07	1
CA-CB-OG1	109.60	101.23	1
OE1-CD-NE2	122.60	117.03	1
O-C-N	123.00	114.09	1
O-C-N	123.00	114.10	1
CA-CB-CG2	110.50	119.94	1
C-CA-CB	110.50	102.17	1
CB-CG-CD1	126.90	118.59	1
OD1-CG-ND2	122.60	117.07	1
CA-C-O	120.80	111.41	1
O-C-N	123.00	114.16	1
CD1-CG-CD2	118.60	126.87	1
CG-CD-CE	111.30	123.99	1
O-C-N	123.00	114.20	1
C-N-CA	121.70	131.60	1
N-CA-C	111.00	126.39	1
CD1-CG-CD2	106.30	115.08	1
CA-C-O	120.80	130.13	1
NE1-CE2-CZ2	130.10	121.90	1
O-C-N	123.00	114.26	1
CB-CG1-CD1	113.80	125.26	1
CA-CB-OG	111.10	122.01	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-C-O	120.80	130.07	1
C-N-CA	121.70	111.89	1
CA-CB-CG	113.80	119.23	1
O-C-N	123.00	114.32	1
CA-CB-OG1	109.60	101.47	1
C-N-CA	121.70	131.44	1
O-C-N	123.00	114.35	1
N-CA-C	111.00	126.14	1
OD1-CG-ND2	122.60	117.20	1
C-N-CA	121.70	131.40	1
CG-CD1-NE1	110.20	103.19	1
O-C-N	123.00	131.62	2
CA-CB-CG	114.10	103.34	1
CA-CB-CG2	110.50	119.64	1
CA-CB-CG	112.60	117.98	1
N-CA-C	111.00	126.05	1
CA-C-N	116.20	126.95	1
O-C-N	123.00	114.41	1
CA-C-O	120.80	129.93	1
CG-CD2-NE2	107.20	101.83	1
CE2-CD2-CE3	118.80	124.17	1
CA-CB-OG1	109.60	101.55	1
CA-CB-OG	111.10	100.39	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
N-CA-CB	111.50	120.60	1
CB-CG-CD	111.30	98.99	1
OD1-CG-OD2	122.90	110.06	1
CA-CB-CG2	110.50	101.41	1
N-CA-CB	110.40	118.42	1
CA-C-O	120.80	111.71	1
CA-C-N	116.20	126.89	1
NE-CZ-NH2	119.20	124.01	1
CB-CG-CD1	120.70	129.77	1
CB-CG-CD1	126.90	118.90	1
CB-CG-OD1	118.40	130.65	1
CB-CG-CD	112.60	121.66	1
CA-C-N	116.20	105.55	1
O-C-N	123.00	114.48	1
CA-CB-CG1	110.40	119.44	2
CA-CB-CG	114.10	124.74	1
CA-C-N	116.20	126.81	1
CB-CG-CD	111.30	99.11	1
O-C-N	123.00	114.53	1
CA-CB-CG1	110.40	119.38	1
CA-CB-OG	111.10	100.54	1
CA-CB-CG2	110.50	119.46	1
CA-C-O	120.80	111.84	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
OE1-CD-NE2	122.60	117.33	1
CA-CB-CG	112.60	107.33	1
C-N-CA	121.70	131.18	1
CA-C-N	116.20	105.67	1
CA-CB-CG	114.10	124.61	1
N-CA-CB	110.50	101.58	1
CA-CB-CG	112.60	117.84	1
N-CA-CB	111.50	120.40	1
CG-CD2-CE2	107.20	100.91	1
CB-CG1-CD1	113.80	102.80	1
C-CA-CB	110.10	120.04	1
CA-CB-CG1	110.40	119.29	1
CA-C-N	116.20	105.76	1
N-CA-CB	111.50	102.63	1
CA-CB-CG	112.60	117.82	1
O-C-N	123.00	114.65	1
N-CA-CB	110.40	102.59	1
CA-CB-CG2	110.50	101.65	1
CG-CD2-CE2	107.20	100.96	1
CA-C-O	120.80	111.97	1
CA-C-O	120.80	111.98	1
CA-CB-OG1	109.60	101.82	1
C-CA-CB	110.10	100.25	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
OE1-CD-NE2	122.60	117.42	1
O-C-N	123.00	114.72	1
N-CA-CB	110.40	102.64	1
CA-C-N	116.20	126.54	1
O-C-N	123.00	114.73	2
CA-C-O	120.80	112.02	1
CD1-CG-CD2	106.30	114.54	1
OE1-CD-NE2	122.60	117.45	1
C-N-CA	121.70	130.97	1
C-N-CA	121.70	130.95	2
CA-C-O	120.80	129.53	1
CD1-CG-CD2	110.80	99.52	1
CB-CG-CD	112.60	121.31	1
N-CA-CB	110.50	101.80	1
CA-CB-CG2	110.50	119.20	1
CA-C-N	116.20	105.98	1
CB-CG-CD	111.30	99.56	1
CB-CG-CD	112.60	121.27	1
CA-CB-OG	111.10	121.30	1
C-CA-CB	110.50	102.85	1
O-C-N	123.00	114.84	1
CA-CB-CG	113.80	118.90	1
O-C-N	123.00	114.85	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
N-CA-CB	110.40	102.77	1
CA-CB-CG	113.80	118.89	1
O-C-N	123.00	114.86	1
CA-C-N	116.20	106.03	1
OE1-CD-NE2	122.60	117.52	1
C-CA-CB	110.10	119.75	1
CE2-CD2-CE3	118.80	123.88	1
C-N-CA	121.70	130.83	1
CA-C-N	116.20	126.34	1
CA-CB-CG1	110.40	119.02	1
C-CA-CB	110.50	102.91	1
OG1-CB-CG2	109.30	119.43	1
C-CA-CB	109.10	120.24	1
CA-C-N	116.20	126.32	1
CG-CD-CE	111.30	99.67	1
CA-CB-CG	112.60	117.66	1
CA-CB-CG2	110.50	119.09	1
CB-CG-CD	111.30	122.92	1
OE1-CD-OE2	122.90	110.78	1
CA-CB-OG1	109.60	102.03	1
N-CA-CB	110.50	119.07	1
CB-CG-ND2	116.40	123.94	1
C-CA-CB	111.40	120.94	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
N-CA-CB	110.50	119.03	1
CE2-CD2-CE3	118.80	123.81	1
O-C-N	123.00	114.98	1
N-CA-CB	110.50	101.98	1
C-CA-CB	111.40	120.91	1
N-CA-C	111.00	125.00	1
O-C-N	123.00	115.00	1
CA-CB-CG	114.10	124.09	1
CE2-CD2-CE3	118.80	123.79	1
O-C-N	123.00	115.01	1
OG1-CB-CG2	109.30	119.28	1
OD1-CG-OD2	122.90	110.94	1
CA-C-N	116.20	126.16	1
O-C-N	123.00	130.96	1
CA-CB-OG1	109.60	102.14	1
CA-CB-CG	113.80	118.76	1
CA-CB-CG1	110.40	118.83	1
O-C-N	123.00	130.94	1
OE1-CD-NE2	122.60	127.56	1
OE1-CD-NE2	122.60	117.64	1
CD2-CE2-NE1	107.40	113.84	1
CG1-CB-CG2	110.80	99.90	1
CA-C-N	116.20	106.30	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG	112.60	117.55	1
CB-CG-CD	112.60	121.01	1
C-CA-CB	110.10	119.49	1
O-C-N	123.00	115.10	1
NE-CZ-NH2	119.20	114.76	1
N-CA-C	111.00	124.83	1
CA-C-N	116.20	106.34	1
CA-CB-OG1	109.60	116.99	1
N-CA-C	111.00	97.22	1
C-CA-CB	111.60	101.77	1
N-CA-CB	111.50	103.15	1
CD1-CG-CD2	118.10	125.47	1
O-C-N	123.00	115.15	1
CA-CB-CG1	110.40	118.73	1
CA-C-N	116.20	126.00	1
CA-C-N	116.20	125.99	1
CA-CB-CG	113.80	108.91	1
OD1-CG-ND2	122.60	117.71	1
CA-CB-CG	112.60	117.49	1
O-C-N	123.00	130.81	1
CB-CG-CD1	126.90	119.58	1
N-CA-CB	110.40	103.10	1
CB-CG-ND2	116.40	123.70	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
O-C-N	123.00	115.22	1
CA-C-O	120.80	112.53	1
C-CA-CB	110.10	119.33	1
O-C-N	123.00	115.23	2
CD1-CG-CD2	106.30	114.07	1
CB-CG-CD	111.30	100.13	1
CB-CG-CD2	120.70	112.45	1
CB-CG1-CD1	113.80	123.98	1
CA-CB-CG	114.10	123.80	1
C-CA-CB	110.50	103.23	1
N-CA-CB	111.50	103.26	2
OD1-CG-OD2	122.90	111.27	1
N-CA-CB	111.50	119.74	1
CA-CB-CG2	110.50	118.73	1
CA-CB-CG	113.90	122.61	1
CA-CB-CG	113.80	118.64	1
CB-CG-CD2	131.20	124.92	1
N-CA-CB	111.50	119.70	1
NE-CZ-NH2	119.20	114.86	1
CA-CB-CG	112.60	117.42	2
CA-CB-CG2	110.40	118.59	1
CA-CB-CG	112.60	117.41	1
CA-CB-CG	113.80	118.61	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG1	110.40	118.57	2
N-CA-C	111.00	124.46	1
N-CA-CB	110.40	103.19	1
CA-CB-CG	113.80	118.60	1
CA-C-O	120.80	128.97	1
CA-C-N	116.20	125.80	1
CA-C-O	120.80	112.64	1
CA-CB-CG	114.10	104.50	1
CG1-CB-CG2	110.80	121.35	1
NE1-CE2-CZ2	130.10	122.91	1
CA-C-O	120.80	128.94	1
N-CA-CB	110.50	102.36	1
CB-CG-ND2	116.40	123.58	1
CA-C-O	120.80	112.67	1
O-C-N	123.00	115.36	1
CG-CD2-CE2	107.20	101.47	1
CA-CB-OG1	109.60	102.44	1
CA-CB-CG	113.80	118.56	1
C-CA-CB	110.50	103.36	1
CA-CB-CG	114.10	104.58	1
OG1-CB-CG2	109.30	118.81	1
CA-CB-CG	112.60	117.35	1
N-CA-C	111.00	97.69	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CD2-CE2-NE1	107.40	113.58	1
CG-CD1-NE1	110.20	104.03	1
CB-CG1-CD1	113.80	123.77	1
N-CA-CB	111.50	103.43	1
N-CA-C	111.00	124.28	1
CA-CB-CG	114.10	123.59	1
OE1-CD-NE2	122.60	117.86	1
CA-C-N	116.20	106.72	1
CA-C-O	120.80	112.74	1
CA-CB-CG	114.10	104.62	1
CB-CG-ND2	116.40	109.29	1
CA-CB-CG1	110.40	118.45	1
O-C-N	123.00	130.58	1
NE1-CE2-CZ2	130.10	123.00	1
CD2-CE2-NE1	107.40	113.55	1
N-CA-CB	111.50	103.46	1
N-CA-CB	110.40	103.31	1
CA-CB-OG	111.10	120.55	1
C-N-CA	121.70	130.20	1
CA-C-N	116.20	125.64	1
N-CA-CB	110.40	103.33	1
OG1-CB-CG2	109.30	118.73	1
CA-C-N	116.20	125.62	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
O-C-N	123.00	115.47	1
CA-CB-CG	113.80	109.09	1
O-C-N	123.00	115.48	1
C-N-CA	121.70	130.16	1
CA-C-O	120.80	128.79	1
CA-CB-CG	113.80	118.50	1
CD2-CE2-NE1	107.40	113.50	1
C-N-CA	121.70	130.15	1
CA-CB-CG1	110.40	118.38	1
N-CA-CB	110.40	117.44	1
CA-C-N	116.20	125.58	1
CB-CG-CD	112.60	120.57	1
CA-CB-CG	113.80	109.11	1
CB-CG-CD	111.30	122.07	1
N-CA-CB	111.50	103.54	1
CA-CB-CG	113.80	118.48	1
CB-CG1-CD1	113.80	123.63	1
N-CA-C	111.00	124.09	1
O-C-N	123.00	130.48	1
CA-CB-CG	113.80	118.47	1
CA-CB-CG2	110.40	118.34	1
N-CA-CB	110.50	118.43	1
CA-CB-CG2	110.50	118.42	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-C-O	120.80	112.88	1
O-C-N	123.00	115.55	1
CA-CB-CG1	110.40	102.49	1
CA-C-N	116.20	125.50	1
CA-C-O	120.80	128.71	1
CA-CB-CG2	110.50	118.41	1
CB-CG1-CD1	113.80	123.57	1
CA-CB-CG1	110.40	118.31	1
CD2-CE2-CZ2	122.40	127.05	1
O-C-N	123.00	130.44	1
N-CA-CB	110.50	102.60	1
CB-CG-OD1	118.40	129.08	1
N-CA-CB	110.50	102.61	1
CA-CB-CG	112.60	117.24	1
CG-CD-NE2	116.40	123.36	1
CG-CD2-NE2	107.20	111.84	1
C-N-CA	121.70	130.05	1
CB-CG-CD2	131.20	125.17	1
CB-CG-ND1	122.70	129.66	1
N-CA-CB	111.50	103.62	1
N-CA-C	111.00	123.98	1
N-CA-CB	110.50	102.62	1
O-C-N	123.00	115.60	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
N-CA-C	111.00	123.95	1
N-CA-CB	110.50	102.65	1
O-C-N	123.00	115.61	1
C-N-CA	121.70	130.01	1
CA-C-N	116.20	125.42	1
CA-CB-CG	113.80	118.41	1
CB-CG1-CD1	113.80	123.48	1
C-CA-CB	110.50	103.59	1
O-C-N	123.00	115.63	1
C-CA-CB	111.40	120.15	1
N-CA-CB	111.50	119.33	1
CA-C-N	116.20	106.99	1
CA-C-O	120.80	128.63	1
N-CA-CB	110.50	102.68	1
CA-C-O	120.80	112.98	1
CA-CB-CG	112.60	117.20	1
CA-CB-CG2	110.40	118.22	1
C-CA-CB	110.50	103.61	1
CA-C-O	120.80	113.00	1
CB-CG-OD1	118.40	128.95	1
O-C-N	123.00	115.66	1
O-C-N	123.00	130.33	2
O-C-N	123.00	115.67	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CB-CG-CD	111.30	100.77	1
O-C-N	123.00	115.68	1
O-C-N	123.00	130.32	1
CA-C-N	116.20	107.05	1
CB-CG-CD	111.30	100.78	1
CG1-CB-CG2	110.70	124.42	1
CA-C-N	116.20	125.34	1
C-N-CA	121.70	113.47	1
NE1-CE2-CZ2	130.10	123.25	1
CA-C-O	120.80	128.57	1
CA-CB-OG1	109.60	102.75	1
OE1-CD-OE2	122.90	111.94	1
N-CA-CB	110.50	118.26	1
CG-CD-NE2	116.40	123.24	1
CA-CB-CG1	110.40	118.15	1
C-CA-CB	110.10	118.76	1
N-CA-CB	110.50	102.75	1
CA-CB-OG	111.10	120.21	1
N-CA-CB	110.50	102.76	1
CA-CB-CG2	110.40	118.13	1
CG1-CB-CG2	110.70	124.34	1
CA-CB-OG1	109.60	102.78	1
CA-CB-CG	114.10	123.19	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
O-C-N	123.00	115.73	1
C-N-CA	121.70	129.88	2
CA-C-O	120.80	128.52	1
CG1-CB-CG2	110.80	100.81	1
CB-CG-CD	112.60	104.89	1
CB-CG1-CD1	113.80	104.28	1
CA-C-N	116.20	125.27	1
ND1-CE1-NE2	108.40	112.93	1
CA-C-N	116.20	107.14	1
CA-CB-CG	114.10	105.04	1
CB-CG-CD	112.60	120.30	1
CA-C-O	120.80	128.49	1
N-CA-C	111.00	123.67	1
C-CA-CB	110.50	103.72	1
C-CA-CB	110.10	101.51	1
CA-CB-CG	114.10	123.14	1
CB-CG-CD	111.30	100.90	1
N-CA-C	111.00	123.65	1
O-C-N	123.00	115.77	1
C-CA-CB	110.10	118.67	1
CA-C-N	116.20	125.22	1
N-CA-CB	110.50	102.83	1
CA-C-N	116.20	107.18	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG	114.10	123.12	1
CG1-CB-CG2	110.80	100.88	1
O-C-N	123.00	115.79	1
CA-C-O	120.80	113.14	1
CA-C-N	116.20	107.19	1
N-CA-C	111.00	98.39	1
CA-CB-CG	113.80	118.30	1
OD1-CG-OD2	122.90	112.10	1
CA-CB-CG	112.60	117.10	1
CB-CG-OD1	118.40	128.75	1
CA-C-N	116.20	125.19	2
N-CA-CB	111.50	103.86	1
CA-CB-CG	114.10	105.11	1
C-N-CA	121.70	113.61	1
O-C-N	123.00	130.19	1
CA-C-N	116.20	125.18	1
O-C-N	123.00	130.18	1
N-CA-CB	110.50	102.88	1
CA-C-N	116.20	125.17	1
N-CA-CB	110.40	103.68	1
CB-CG-ND2	116.40	123.12	1
CA-CB-CG1	110.40	118.02	1
CA-C-O	120.80	113.18	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
N-CA-CB	111.50	103.89	2
CD1-CG-CD2	118.60	125.31	1
CA-C-N	116.20	125.15	1
CA-C-N	116.20	125.14	1
CG1-CB-CG2	110.80	100.96	1
CA-C-O	120.80	128.40	1
CA-CB-CG	112.60	117.07	1
CA-C-N	116.20	107.26	2
O-C-N	123.00	115.85	1
CB-CG-CD	112.60	120.19	1
CG-CD-NE2	116.40	123.09	1
C-CA-CB	110.10	118.57	1
N-CA-CB	110.40	103.72	1
O-C-N	123.00	115.87	2
CG-CD-NE2	116.40	123.08	1
CA-CB-CG2	110.50	102.93	1
N-CA-CB	110.50	118.06	1
C-N-CA	121.70	129.71	1
CG-CD2-CE2	107.20	101.86	1
CG-CD1-NE1	110.20	104.42	1
C-N-CA	121.70	129.70	1
CD1-CG-CD2	118.60	125.26	1
CA-CB-OG	111.10	119.97	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG1	110.40	102.86	1
N-CA-CB	110.40	117.05	2
C-N-CA	121.70	129.68	1
O-C-N	123.00	115.91	1
CA-CB-CG	104.50	112.91	1
CA-CB-CG	114.10	105.25	1
CA-CB-CG	113.80	118.22	1
CB-CG-CD	112.60	120.12	1
O-C-N	123.00	115.93	2
C-N-CA	121.70	129.66	1
CA-CB-CG	113.80	109.38	1
CA-CB-CG	114.10	122.93	1
N-CA-CB	110.40	117.03	1
C-CA-CB	110.10	118.48	1
CA-C-N	116.20	125.02	1
OE1-CD-OE2	122.90	112.32	1
CA-C-N	116.20	107.39	2
CG1-CB-CG2	110.80	101.11	1
N-CA-CB	110.50	103.01	1
CD1-CG-CD2	110.80	101.12	1
C-N-CA	121.70	129.62	1
CA-C-N	116.20	125.00	1
CD1-CG-CD2	118.60	125.20	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CB-CG1-CD1	113.80	104.57	1
N-CA-CB	110.50	117.97	1
CA-CB-CG	112.60	116.99	1
N-CA-CB	110.50	117.96	1
CA-C-N	116.20	124.98	1
CA-CB-CG	114.10	105.32	1
CG-CD2-CE2	121.20	114.62	1
OD1-CG-ND2	122.60	118.21	1
OG1-CB-CG2	109.30	100.53	1
N-CA-CB	110.50	103.05	1
CA-C-O	120.80	128.24	1
CG-CD1-CE1	121.20	114.63	1
OG1-CB-CG2	109.30	118.06	1
N-CA-CB	111.50	118.94	1
CA-CB-CG	112.60	116.98	1
CA-CB-CG	114.10	105.35	1
CA-CB-CG	112.60	116.97	2
CG-CD2-CE2	120.70	113.27	1
N-CA-CB	110.40	103.84	1
O-C-N	123.00	116.01	1
CA-CB-CG	114.10	122.84	1
N-CA-CB	110.50	117.92	1
N-CA-CB	110.40	116.94	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CD1-CG-CD2	118.10	124.64	1
CA-C-O	120.80	113.39	1
N-CA-CB	110.50	103.09	1
N-CA-C	111.00	123.21	1
CA-C-O	120.80	128.20	1
OG1-CB-CG2	109.30	100.59	1
CA-CB-CG	112.60	116.95	1
CA-C-N	116.20	124.89	1
O-C-N	123.00	116.05	1
N-CA-CB	110.40	103.88	1
CA-CB-CG	112.60	116.94	1
O-C-N	123.00	116.06	1
CB-CG-ND2	116.40	109.90	1
CB-CG-CD	111.30	101.35	1
CA-C-O	120.80	128.15	1
NE1-CE2-CZ2	130.10	123.61	1
N-CA-CB	111.50	104.15	1
CA-CB-CG2	110.50	117.84	2
CA-CB-CG2	110.50	103.16	1
CA-CB-CG1	110.40	117.73	1
N-CA-CB	111.50	104.17	1
N-CA-CB	110.50	117.83	1
CA-C-O	120.80	128.12	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG2	110.50	103.19	1
C-N-CA	121.70	129.44	1
CG-CD-OE2	118.40	128.29	1
C-CA-CB	111.40	103.23	1
N-CA-CB	110.50	117.80	1
CB-CG-CD	112.60	119.90	2
N-CA-C	111.00	123.03	1
CA-CB-CG2	110.50	103.20	1
CA-C-N	116.20	107.61	1
CG-CD-NE2	116.40	122.84	1
OE1-CD-NE2	122.60	118.31	1
N-CA-CB	110.40	103.97	1
N-CD-CG	103.20	96.77	1
CA-C-O	120.80	128.09	1
CG1-CB-CG2	110.80	101.37	1
C-N-CA	121.70	129.41	1
CB-CG-ND2	116.40	122.82	1
CA-CB-CG	112.60	108.32	1
CA-CB-CG2	110.40	117.68	1
CA-C-N	116.20	124.76	1
N-CA-C	111.00	122.99	1
N-CA-CB	110.40	103.98	1
C-CA-CB	110.10	118.23	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CG-CD-OE2	118.40	128.24	1
CA-C-N	116.20	107.64	1
CA-CB-CG	114.10	105.54	1
N-CA-CB	111.50	104.23	1
N-CA-CB	110.50	117.77	1
CA-CB-CG2	110.50	117.76	1
CA-CB-OG	111.10	119.64	1
CB-CG-OD2	118.40	128.22	1
NE1-CE2-CZ2	130.10	123.69	1
OG1-CB-CG2	109.30	117.83	1
CA-C-O	120.80	128.04	2
N-CA-CB	110.50	103.26	1
CA-CB-CG	112.60	116.86	1
CA-C-N	116.20	107.68	1
O-C-N	123.00	116.19	1
CB-CG-CD	112.60	105.38	1
OE1-CD-NE2	122.60	118.35	1
C-CA-CB	110.10	102.03	1
CG1-CB-CG2	110.80	101.46	2
C-CA-CB	110.50	104.13	1
N-CA-C	111.00	122.88	1
CA-CB-CG2	110.50	117.71	1
C-N-CA	121.70	129.34	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CG1-CB-CG2	110.80	120.13	1
N-CA-C	111.00	122.87	1
OD1-CG-OD2	122.90	112.72	1
CB-CG-CD	111.30	121.05	1
N-CA-CB	111.50	104.29	1
N-CA-CB	111.50	118.71	1
N-CA-C	111.00	122.85	1
N-CA-CB	110.50	103.31	1
CA-C-O	120.80	113.61	1
CA-CB-CG	113.80	109.57	1
C-N-CA	121.70	129.31	1
CE2-CZ2-CH2	117.50	112.01	1
O-C-N	123.00	116.25	1
CA-CB-CG	112.60	116.82	1
C-N-CA	121.70	114.11	1
N-CA-CB	111.50	104.33	1
CA-CB-CG	113.80	109.58	1
CA-C-O	120.80	127.97	1
N-CA-CB	110.50	103.34	1
N-CA-CB	111.50	118.66	1
C-CA-CB	110.50	104.18	1
O-C-N	123.00	116.26	1
CA-CB-CG1	110.40	117.56	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-C-N	116.20	107.78	1
CG-CD2-CE3	133.90	129.69	1
OE1-CD-OE2	122.90	112.81	1
N-CA-C	111.00	122.77	1
CE2-CD2-CE3	118.80	123.01	1
CA-CB-CG2	110.50	117.65	1
N-CA-CB	111.50	104.36	2
O-C-N	123.00	129.72	2
CA-CB-CG	113.90	121.46	1
CB-CG-CD	111.30	101.64	1
CG-CD-NE2	116.40	110.10	1
OE1-CD-OE2	122.90	112.82	1
C-N-CA	121.70	129.26	1
OD1-CG-OD2	122.90	112.82	1
CA-CB-CG2	110.50	117.63	1
CG-CD-CE	111.30	101.66	1
N-CA-CB	110.50	103.38	1
CB-CG1-CD1	113.80	122.60	1
C-N-CA	121.70	129.24	1
CA-CB-CG1	110.40	117.51	1
C-CA-CB	110.50	104.22	1
CA-C-O	120.80	127.91	1
O-C-N	123.00	116.31	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CG-CD2-CE2	107.20	102.19	1
CA-C-O	120.80	127.90	1
O-C-N	123.00	116.32	1
CA-CB-CG2	110.50	117.59	1
CA-C-N	116.20	107.86	2
CA-CB-CG	114.10	122.44	1
CG1-CB-CG2	110.80	101.63	1
N-CA-C	111.00	122.67	1
NH1-CZ-NH2	119.30	113.88	1
N-CA-CB	110.50	103.42	1
C-N-CA	121.70	129.20	1
N-CA-C	111.00	99.34	1
CA-CB-CG	113.80	117.96	1
CG-CD-CE	111.30	120.88	1
CA-CB-CG	114.10	122.43	1
OE1-CD-OE2	122.90	112.91	1
CA-C-O	120.80	113.73	1
CG-CD-NE2	116.40	122.64	1
N-CA-C	111.00	122.65	1
N-CA-CB	110.50	103.44	1
O-C-N	123.00	116.36	2
CA-CB-CG	112.60	116.75	1
OE1-CD-NE2	122.60	118.45	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-OG	111.10	119.40	1
N-CA-C	111.00	122.62	1
CA-CB-CG	113.80	117.95	1
CA-CB-CG1	110.40	117.45	1
CD2-NE2-CE1	109.00	104.85	1
N-CA-CB	110.50	117.55	1
CA-CB-CG	112.60	116.74	1
N-CA-CB	110.40	104.19	1
C-N-CA	121.70	114.24	1
C-N-CA	121.70	129.15	1
CA-C-N	116.20	107.92	1
CB-CG-CD1	126.90	120.69	1
CA-C-N	116.20	124.48	1
CA-CB-CG1	110.40	117.44	1
CA-CB-CG2	110.50	117.53	2
NE1-CE2-CZ2	130.10	123.89	1
C-N-CA	121.70	129.14	2
N-CA-C	111.00	122.58	1
N-CA-CB	110.50	103.47	1
CA-C-N	116.20	124.47	1
N-CA-CB	110.50	117.52	1
CA-C-N	116.20	107.95	1
N-CA-CB	110.50	103.49	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
N-CA-CB	110.50	117.51	2
CA-C-N	116.20	107.96	1
CA-CB-CG	114.10	122.34	1
N-CA-C	111.00	122.53	1
N-CA-CB	110.40	104.22	1
N-CA-CB	110.50	117.50	1
O-C-N	123.00	116.42	1
CA-C-N	116.20	124.42	2
CG-CD2-CE2	107.20	102.27	1
CA-CB-CG1	110.40	117.39	1
OD1-CG-OD2	122.90	113.04	1
CA-C-N	116.20	124.41	1
CG-CD2-NE2	107.20	103.09	1
N-CA-CB	110.50	103.52	1
CB-CG-ND1	122.70	128.86	1
C-CA-CB	111.40	119.19	1
CA-N-CD	112.00	106.26	1
CB-CG-CD	112.60	119.57	1
N-CA-CB	111.50	104.53	1
CB-CG1-CD1	113.80	122.40	1
CB-CG-ND2	116.40	122.54	1
N-CA-CB	110.40	104.26	1
C-CA-CB	111.60	103.41	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
C-CA-CB	110.50	104.36	1
N-CA-CB	110.50	117.45	1
OE1-CD-NE2	122.60	118.51	1
CG-CD2-CE2	107.20	102.29	1
CA-C-N	116.20	108.03	1
CA-CB-CG	112.60	116.69	1
CA-C-N	116.20	124.37	1
O-C-N	123.00	116.47	2
C-CA-CB	110.50	104.38	1
CB-CG-CD2	126.80	121.09	1
CA-CB-CG	112.60	116.68	1
OE1-CD-OE2	122.90	113.11	1
CA-C-N	116.90	123.01	1
CA-CB-OG	111.10	102.95	1
CG1-CB-CG2	110.80	101.84	1
OE1-CD-OE2	122.90	113.12	1
C-CA-CB	110.50	104.39	1
O-C-N	123.00	116.49	1
C-CA-CB	110.50	116.60	1
CB-CG-CD	112.60	105.68	1
N-CA-C	111.00	99.61	1
CB-CG-CD	112.60	119.51	1
CA-C-O	120.80	127.71	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
C-CA-CB	110.50	104.41	1
CA-C-N	116.20	124.32	1
C-N-CA	121.70	129.01	1
C-CA-CB	110.10	117.81	1
N-CA-CB	111.50	104.60	1
CG-CD-CE	111.30	101.97	1
CB-CG-CD2	120.70	113.81	1
N-CA-C	111.00	99.67	1
CD1-CG-CD2	110.80	101.89	1
N-CA-C	111.00	122.33	1
CA-C-N	116.20	124.29	1
CA-CB-CG	113.80	117.84	1
N-CA-CB	110.50	103.63	2
CA-CB-CG2	110.40	117.27	1
CA-C-N	116.20	124.28	1
CA-C-O	120.80	127.67	1
CA-CB-OG	111.10	119.18	1
N-CA-CB	110.50	103.64	1
CA-C-N	116.20	108.13	1
CG-CD-CE	111.30	120.58	1
CG-CD-OE2	118.40	127.68	1
CB-CG-OD1	118.40	127.68	1
C-CA-CB	110.10	117.76	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
N-CA-CB	110.40	104.35	1
NE1-CE2-CZ2	130.10	124.05	1
CB-CG-CD1	126.90	120.85	1
CG-CD1-NE1	110.20	104.96	1
CA-CB-OG	111.10	119.16	1
O-C-N	123.00	116.56	1
N-CA-CB	110.50	103.65	1
N-CA-CB	110.40	116.44	1
CA-CB-CG1	110.40	117.24	1
N-CA-CB	110.40	116.43	1
CA-C-N	116.20	108.16	1
CB-CG-OD2	118.40	127.64	1
CG-CD-NE2	116.40	122.43	1
CD1-CG-CD2	118.60	124.63	1
CA-CB-CG	114.10	106.07	1
O-C-N	123.00	116.57	1
N-CA-CB	110.50	117.32	1
CA-C-N	116.20	108.18	1
C-CA-CB	110.10	117.72	1
C-CA-CB	110.50	104.48	1
O-C-N	123.00	116.59	1
OE1-CD-OE2	122.90	113.29	1
CB-CG-OD1	120.80	128.81	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG2	110.50	117.30	1
CA-CB-OG	111.10	119.10	1
CA-N-H	126.00	114.00	2
C-N-H	112.29	124.30	1
CG-ND1-HD1	137.37	125.35	1
CG-ND2-HD21	107.98	120.00	1
CE-NZ-HZ1	97.98	110.00	1
C-N-H	112.25	124.30	1
CA-N-H	126.08	114.00	2
C-N-H	112.22	124.30	1
C-N-H	112.21	124.30	1
CA-N-H	126.12	114.00	1
C-N-H	112.17	124.30	1
CB-OG1-HG1	97.86	110.00	1
CA-N-H	126.18	114.00	1
C-N-H	112.10	124.30	1
CA-N-H	126.20	114.00	1
CB-OG-HG	97.78	110.00	1
CA-N-H	126.24	114.00	1
CA-N-H	126.25	114.00	1
C-N-H	112.03	124.30	1
C-N-H	111.98	124.30	1
C-N-H	111.94	124.30	3

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-N-H	126.36	114.00	1
CA-N-H	126.39	114.00	1
CG-ND2-HD21	107.60	120.00	1
CA-N-H	126.41	114.00	1
C-N-H	111.87	124.30	2
C-N-H	111.86	124.30	1
C-N-H	111.85	124.30	1
CA-N-H	126.46	114.00	1
C-N-H	111.84	124.30	1
C-N-H	111.83	124.30	1
C-N-H	111.82	124.30	1
C-N-H	111.81	124.30	2
C-N-H	111.80	124.30	1
C-N-H	111.77	124.30	1
C-N-H	111.74	124.30	1
C-N-H	111.71	124.30	1
CG-ND2-HD21	107.40	120.00	1
C-N-H	111.70	124.30	1
C-N-H	111.68	124.30	1
C-N-H	111.63	124.30	1
CA-N-H	126.68	114.00	1
C-N-H	111.61	124.30	1
CB-OG1-HG1	122.70	110.00	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
HZ1-NZ-HZ2	121.70	109.00	1
HD21-ND2-HD22	132.71	120.00	1
C-N-H	111.59	124.30	2
CB-OG1-HG1	97.26	110.00	1
C-N-H	111.56	124.30	1
C-N-H	111.53	124.30	1
CD-NE2-HE22	132.78	120.00	1
CA-N-H	126.78	114.00	1
C-N-H	111.51	124.30	1
C-N-H	111.50	124.30	1
C-N-H	111.47	124.30	1
C-N-H	111.46	124.30	1
C-N-H	111.45	124.30	1
CA-N-H	126.87	114.00	1
CA-N-H	126.92	114.00	1
C-N-H	111.36	124.30	1
CA-N-H	126.98	114.00	1
C-N-H	111.31	124.30	1
C-N-H	111.30	124.30	1
CA-N-H	127.02	114.00	1
CG-ND2-HD22	106.97	120.00	1
C-N-H	111.26	124.30	1
CA-N-H	127.06	114.00	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-N-H	127.09	114.00	1
C-N-H	111.20	124.30	1
CA-N-H	127.12	114.00	1
C-N-H	111.17	124.30	2
HZ2-NZ-HZ3	122.13	109.00	1
C-N-H	111.15	124.30	1
CA-N-H	127.16	114.00	2
C-N-H	111.14	124.30	2
C-N-H	111.13	124.30	3
C-N-H	111.12	124.30	1
CA-N-H	127.22	114.00	1
C-N-H	111.08	124.30	1
C-N-H	111.03	124.30	1
C-N-H	111.01	124.30	1
CA-N-H	127.30	114.00	1
C-N-H	111.00	124.30	1
C-N-H	110.99	124.30	1
CB-OG-HG	123.33	110.00	2
C-N-H	110.97	124.30	1
CA-N-H	127.34	114.00	1
C-N-H	110.94	124.30	1
CA-N-H	127.41	114.00	1
C-N-H	110.79	124.30	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-N-H	127.52	114.00	1
C-N-H	110.77	124.30	1
CA-N-H	127.56	114.00	1
C-N-H	110.73	124.30	2
C-N-H	110.72	124.30	1
C-N-H	110.69	124.30	1
C-N-H	110.66	124.30	1
C-N-H	110.65	124.30	1
CA-N-H	127.68	114.00	1
C-N-H	110.58	124.30	1
CA-N-H	127.73	114.00	1
CA-N-H	127.77	114.00	1
C-N-H	110.49	124.30	2
CA-N-H	127.81	114.00	1
C-N-H	110.42	124.30	1
C-N-H	110.38	124.30	1
C-N-H	110.37	124.30	2
C-N-H	110.36	124.30	1
C-N-H	110.35	124.30	1
CA-N-H	127.96	114.00	1
CA-N-H	127.99	114.00	1
CG-ND2-HD21	105.97	120.00	1
CA-N-H	128.03	114.00	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
C-N-H	110.24	124.30	1
CA-N-H	128.07	114.00	1
C-N-H	110.22	124.30	1
CA-N-H	128.09	114.00	1
C-N-H	110.20	124.30	1
C-N-H	110.17	124.30	1
C-N-H	110.16	124.30	1
C-N-H	110.15	124.30	1
CA-N-H	128.27	114.00	1
C-N-H	110.02	124.30	1
C-N-H	109.98	124.30	1
CD-NE2-HE22	105.58	120.00	1
CA-N-H	128.57	114.00	1
C-N-H	109.72	124.30	1
C-N-H	109.49	124.30	1
CA-N-H	128.82	114.00	1
C-N-H	109.46	124.30	1
C-N-H	109.30	124.30	1
C-N-H	109.17	124.30	2
CB-OG1-HG1	125.20	110.00	1
C-N-H	109.08	124.30	1
C-N-H	109.03	124.30	1
CA-N-H	129.30	114.00	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-N-H	129.31	114.00	1
C-N-H	108.71	124.30	1
C-N-H	108.68	124.30	1
C-N-H	108.65	124.30	1
C-N-H	108.63	124.30	2
CA-N-H	129.70	114.00	1
C-N-H	108.55	124.30	1
CA-N-H	129.87	114.00	1
C-N-H	108.39	124.30	1
CA-N-H	129.95	114.00	1
CE-NZ-HZ3	94.03	110.00	1
C-N-H	108.30	124.30	1
C-N-H	108.25	124.30	1
C-N-H	108.19	124.30	1
CA-N-H	130.11	114.00	1
C-N-H	108.07	124.30	1
C-N-H	108.03	124.30	1
C-N-H	107.96	124.30	1
C-N-H	107.78	124.30	1
C-N-H	107.74	124.30	1
HZ1-NZ-HZ3	92.44	109.00	1
C-N-H	107.70	124.30	1
C-N-H	107.43	124.30	2

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
C-N-H	107.37	124.30	1
CA-N-H	131.27	114.00	1
CA-N-H	131.30	114.00	1
C-N-H	106.85	124.30	1
C-N-H	106.75	124.30	1
CE-NZ-HZ2	91.94	110.00	1
CA-N-H	132.75	114.00	1
C-N-H	105.46	124.30	1
C-N-H	105.27	124.30	1
C-N-H	105.24	124.30	1
C-N-H	104.01	124.30	1
CA-N-H	134.73	114.00	1
CD-OE2-HE2	62.58	108.32	1
CD-OE2-HE2	62.41	108.32	1
CD-OE2-HE2	62.04	108.32	1
CD-OE2-HE2	61.83	108.32	1
CD-OE2-HE2	61.26	108.32	1
CG-OD2-HD2	61.21	108.32	1
CG-OD2-HD2	60.96	108.32	1
CD-OE2-HE2	60.88	108.32	1
CD-OE2-HE2	60.49	108.32	1
CG-OD2-HD2	60.43	108.32	1
CG-OD2-HD2	60.22	108.32	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CD-OE2-HE2	59.47	108.32	1
CG-OD2-HD2	59.15	108.32	1
CG-OD2-HD2	58.96	108.32	1
CD-OE2-HE2	58.87	108.32	1
CG-OD2-HD2	58.77	108.32	1
CD-OE2-HE2	58.61	108.32	1
CG-OD2-HD2	58.42	108.32	1
CD-OE2-HE2	58.30	108.32	1
CG-OD2-HD2	58.23	108.32	1
CG-OD2-HD2	58.10	108.32	1
CG-OD2-HD2	57.97	108.32	1
CG-OD2-HD2	57.78	108.32	1
CD-OE2-HE2	57.65	108.32	1
CD-OE2-HE2	57.61	108.32	1
CD-OE2-HE2	57.49	108.32	1
CD-OE2-HE2	57.47	108.32	1
CD-OE2-HE2	57.46	108.32	1
CG-OD2-HD2	57.21	108.32	1
CG-OD2-HD2	57.16	108.32	1
CD-OE2-HE2	56.81	108.32	1
CG-OD2-HD2	56.80	108.32	1
CG-OD2-HD2	56.76	108.32	1
CD-OE2-HE2	56.65	108.32	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CD-OE2-HE2	56.46	108.32	1
CD-OE2-HE2	56.44	108.32	1
CD-OE2-HE2	56.43	108.32	1
CG-OD2-HD2	56.42	108.32	1
CD-OE2-HE2	56.35	108.32	1
CG-OD2-HD2	56.31	108.32	1
CG-OD2-HD2	56.30	108.32	1
CD-OE2-HE2	56.26	108.32	1
CG-OD2-HD2	56.14	108.32	1
CD-OE2-HE2	56.12	108.32	1
CD-OE2-HE2	56.10	108.32	1
CG-OD2-HD2	56.09	108.32	1
CG-OD2-HD2	56.05	108.32	1
CG-OD2-HD2	55.92	108.32	1
CD-OE2-HE2	55.91	108.32	1
CD-OE2-HE2	55.84	108.32	1
CD-OE2-HE2	55.81	108.32	1
CD-OE2-HE2	55.78	108.32	1
CD-OE2-HE2	55.76	108.32	2
CD-OE2-HE2	55.71	108.32	1
CD-OE2-HE2	55.65	108.32	1
CD-OE2-HE2	55.63	108.32	1
CD-OE2-HE2	55.58	108.32	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CG-OD2-HD2	55.50	108.32	1
CD-OE2-HE2	55.43	108.32	1
CD-OE2-HE2	55.38	108.32	2
CD-OE2-HE2	55.25	108.32	1
CD-OE2-HE2	55.24	108.32	1
CD-OE2-HE2	55.22	108.32	1
CG-OD2-HD2	55.18	108.32	1
CG-OD2-HD2	54.93	108.32	1
CG-OD2-HD2	54.92	108.32	1
CD-OE2-HE2	54.91	108.32	1
CG-OD2-HD2	54.88	108.32	1
CD-OE2-HE2	54.87	108.32	1
CD-OE2-HE2	54.76	108.32	1
CD-OE2-HE2	54.70	108.32	1
CG-OD2-HD2	54.55	108.32	1
CD-OE2-HE2	54.54	108.32	1
CD-OE2-HE2	54.52	108.32	1
CG-OD2-HD2	54.44	108.32	1
CD-OE2-HE2	54.37	108.32	1
CG-OD2-HD2	54.29	108.32	1
CG-OD2-HD2	54.22	108.32	1
CD-OE2-HE2	53.74	108.32	1
CD-OE2-HE2	53.65	108.32	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CG-OD2-HD2	53.54	108.32	1
CD-OE2-HE2	53.35	108.32	1
CD-OE2-HE2	53.11	108.32	1
CG-OD2-HD2	52.51	108.32	1
CG-OD2-HD2	52.00	108.32	1
CD-OE2-HE2	51.47	108.32	1
CD-OE2-HE2	51.37	108.32	1
CD-OE2-HE2	51.14	108.32	1
CD-OE2-HE2	50.01	108.32	1
CD-OE2-HE2	28.89	108.32	1
CG-OD2-HD2	27.00	108.32	1
CD-OE2-HE2	25.60	108.32	1
CD-OE2-HE2	23.57	108.32	1
CG-OD2-HD2	23.19	108.32	1
CG-OD2-HD2	23.14	108.32	1
CD-OE2-HE2	22.61	108.32	1
CD-OE2-HE2	22.45	108.32	1
CG-OD2-HD2	22.12	108.32	1
CG-OD2-HD2	22.06	108.32	1
CG-OD2-HD2	22.00	108.32	1
CG-OD2-HD2	21.90	108.32	1
CD-OE2-HE2	21.20	108.32	1
CD-OE2-HE2	20.31	108.32	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CG-OD2-HD2	19.64	108.32	1
CD-OE2-HE2	18.39	108.32	1
CG-OD2-HD2	17.23	108.32	1
CG-OD2-HD2	17.17	108.32	1

Too-close contacts

The following all-atom clashscore is based on a MolProbity analysis. All-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The table below contains clashscores for all the models in this entry.

Model ID	Clash score	Number of clashes
1	4.15	10
2	5.40	13
3	3.32	8
4	5.82	14
5	1.66	4
6	7.06	17
7	3.32	8
8	2.91	7
9	6.23	15
10	6.23	15

All 111 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	A:59:LEU:HB2	A:94:THR:HG21	0.663
1	A:5:ILE:HD11	A:26:GLY:HA3	0.574
1	A:67:LEU:HB3	A:101:HIS:CD2	0.539
1	A:67:LEU:HB3	A:101:HIS:HD2	0.534

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	A:147:THR:HA	A:154:TRP:HZ2	0.531
1	A:63:TRP:HB2	A:67:LEU:HD12	0.482
1	A:5:ILE:HG13	A:22:SER:HB3	0.476
1	A:80:ILE:HB	A:111:VAL:HG23	0.453
1	A:78:LYS:HA	A:78:LYS:HD2	0.431
1	A:120:TYR:HB3	A:122:PHE:CZ	0.417
2	A:118:ASP:HA	A:136:LEU:HD13	0.700
2	A:6:PHE:HA	A:31:VAL:HG22	0.603
2	A:95:PHE:HB2	A:122:PHE:HB3	0.572
2	A:1:GLY:N	A:45:THR:HG1	0.565
2	A:110:LYS:HE3	A:132:LYS:O	0.502
2	A:154:TRP:CD1	A:154:TRP:H	0.495
2	A:81:GLY:O	A:83:VAL:HG23	0.493
2	A:6:PHE:HD2	A:31:VAL:HG13	0.455
2	A:45:THR:O	A:76:ALA:HB1	0.423
2	A:118:ASP:HA	A:136:LEU:CD1	0.411
2	A:83:VAL:HG22	A:154:TRP:CD1	0.410
2	A:154:TRP:CD1	A:154:TRP:N	0.410
2	A:83:VAL:HG22	A:154:TRP:NE1	0.401
3	A:3:ILE:HD13	A:81:GLY:HA3	0.606
3	A:21:ILE:O	A:25:ILE:HG12	0.580
3	A:18:ALA:HB1	A:155:VAL:HG11	0.551
3	A:101:HIS:O	A:104:GLU:HB3	0.519

Model ID	Atom-1	Atom-2	Clash overlap (Å)
3	A:128:VAL:O	A:130:GLY:N	0.462
3	A:82:LEU:HD13	A:134:VAL:HB	0.461
3	A:5:ILE:CG2	A:85:LEU:HD11	0.420
3	A:91:TYR:O	A:93:GLU:N	0.418
4	A:33:VAL:HG21	A:67:LEU:HD21	0.793
4	A:82:LEU:HD12	A:114:GLN:HB2	0.561
4	A:82:LEU:HD12	A:114:GLN:H	0.525
4	A:79:THR:HA	A:110:LYS:O	0.524
4	A:139:ASP:HA	A:154:TRP:HZ2	0.505
4	A:71:GLU:HA	A:101:HIS:HE1	0.480
4	A:5:ILE:HG23	A:30:VAL:HA	0.478
4	A:121:HIS:CE1	A:131:GLY:HA2	0.473
4	A:91:TYR:HB3	A:94:THR:O	0.431
4	A:117:THR:HB	A:133:PHE:HB2	0.426
4	A:142:ASN:ND2	A:143:GLN:OE1	0.418
4	A:85:LEU:HA	A:85:LEU:HD23	0.414
4	A:150:ARG:HA	A:153:LYS:HB2	0.409
4	A:17:ILE:O	A:21:ILE:HG12	0.400
5	A:122:PHE:HE1	A:128:VAL:HG22	0.553
5	A:155:VAL:HG23	A:163:ALA:HB3	0.536
5	A:32:ASP:HB3	A:35:LYS:HB2	0.500
5	A:3:ILE:HD11	A:139:ASP:HB3	0.479
6	A:80:ILE:HD12	A:111:VAL:HG12	0.703

Model ID	Atom-1	Atom-2	Clash overlap (Å)
6	A:1:GLY:N	A:45:THR:HG1	0.599
6	A:47:VAL:HB	A:82:LEU:HD23	0.534
6	A:31:VAL:HG23	A:63:TRP:HZ3	0.483
6	A:94:THR:HA	A:123:GLU:HB3	0.477
6	A:117:THR:HG23	A:143:GLN:HG2	0.475
6	A:3:ILE:HG23	A:46:LYS:HB2	0.460
6	A:21:ILE:O	A:25:ILE:HG12	0.451
6	A:80:ILE:HD12	A:111:VAL:CG1	0.451
6	A:52:PRO:HB2	A:60:GLN:HB3	0.450
6	A:83:VAL:HG12	A:85:LEU:HG	0.437
6	A:129:GLU:HB2	A:132:LYS:HB2	0.435
6	A:8:GLY:HA2	A:60:GLN:HE22	0.425
6	A:36:ALA:HA	A:40:GLN:HB2	0.410
6	A:31:VAL:HG23	A:63:TRP:CZ3	0.406
6	A:88:GLN:OE1	A:96:ALA:HB2	0.405
6	A:19:GLU:O	A:23:LYS:HG3	0.404
7	A:52:PRO:HG3	A:60:GLN:HB2	0.559
7	A:7:PHE:HB2	A:30:VAL:HG12	0.520
7	A:52:PRO:HB2	A:58:ASP:HB3	0.493
7	A:61:THR:HA	A:64:GLU:HB3	0.490
7	A:79:THR:HA	A:110:LYS:O	0.472
7	A:7:PHE:CZ	A:15:GLU:HG3	0.439
7	A:5:ILE:HD12	A:30:VAL:HG22	0.418

Model ID	Atom-1	Atom-2	Clash overlap (Å)
7	A:59:LEU:HD23	A:63:TRP:CD1	0.401
8	A:83:VAL:HG12	A:136:LEU:HD12	0.609
8	A:80:ILE:HG12	A:108:ALA:HB2	0.476
8	A:35:LYS:O	A:39:GLU:HB3	0.461
8	A:75:PHE:HB2	A:106:ALA:HA	0.442
8	A:51:ALA:HA	A:52:PRO:HD2	0.419
8	A:10:ASP:HA	A:58:ASP:HA	0.415
8	A:96:ALA:HB1	A:101:HIS:ND1	0.412
9	A:143:GLN:HB2	A:150:ARG:HG2	0.640
9	A:7:PHE:HA	A:50:VAL:O	0.630
9	A:36:ALA:HA	A:41:PHE:HB2	0.583
9	A:117:THR:HB	A:135:GLY:HA3	0.508
9	A:5:ILE:HG23	A:50:VAL:HG21	0.468
9	A:10:ASP:HA	A:52:PRO:HG2	0.453
9	A:157:GLN:HB3	A:160:GLY:HA3	0.448
9	A:122:PHE:HB2	A:133:PHE:HB3	0.438
9	A:100:PHE:HA	A:103:TYR:HD2	0.435
9	A:77:ASN:H	A:108:ALA:HB3	0.435
9	A:80:ILE:O	A:111:VAL:HA	0.435
9	A:80:ILE:HG13	A:111:VAL:HG22	0.418
9	A:82:LEU:HB2	A:137:VAL:HG11	0.418
9	A:77:ASN:N	A:108:ALA:HB3	0.415
9	A:111:VAL:HB	A:114:GLN:HG3	0.406

Model ID	Atom-1	Atom-2	Clash overlap (Å)
10	A:150:ARG:HG3	A:151:ILE:HG13	0.944
10	A:75:PHE:HB2	A:106:ALA:HA	0.709
10	A:46:LYS:HD3	A:155:VAL:HG21	0.645
10	A:137:VAL:HG23	A:143:GLN:HB3	0.601
10	A:81:GLY:HA2	A:112:VAL:HB	0.571
10	A:25:ILE:HG23	A:153:LYS:HA	0.529
10	A:5:ILE:HD12	A:50:VAL:HG21	0.522
10	A:137:VAL:HB	A:146:LEU:HD12	0.518
10	A:82:LEU:HB2	A:135:GLY:HA2	0.517
10	A:95:PHE:HZ	A:127:ALA:HB2	0.514
10	A:3:ILE:HG22	A:5:ILE:HG23	0.500
10	A:44:PHE:CE2	A:49:LEU:HD13	0.447
10	A:146:LEU:HD13	A:151:ILE:HD12	0.445
10	A:107:LYS:HA	A:107:LYS:HD2	0.421
10	A:44:PHE:HD2	A:47:VAL:HG13	0.409

Torsion angles: Protein backbone

In the following table, Ramachandran outliers are listed. The Analysed column shows the number of residues for which the backbone conformation was analysed.

Model ID	Analyzed	Favored	Allowed	Outliers
1	161	113	36	12
2	161	130	20	11
3	161	130	25	6
4	161	120	29	12
5	161	122	32	7

Model ID	Analyzed	Favored	Allowed	Outliers
6	161	121	26	14
7	161	113	40	8
8	161	132	20	9
9	161	119	36	6
10	161	125	25	11

Detailed list of outliers are tabulated below.

Torsion angles: Protein sidechains

In the following table, sidechain outliers are listed. The Analysed column shows the number of residues for which the sidechain conformation was analysed.

Model ID	Analyzed	Favored	Allowed	Outliers
1	126	107	10	9
2	126	107	14	5
3	126	101	17	8
4	126	108	12	6
5	126	104	14	8
6	126	101	15	10
7	126	99	19	8
8	126	111	7	8
9	126	102	17	7
10	126	110	13	3

Detailed list of outliers are tabulated below.

Model ID	Chain	Residue ID	Residue type
1	A	7	PHE
1	A	41	PHE
1	A	48	ILE

Model ID	Chain	Residue ID	Residue type
1	A	49	LEU
1	A	61	THR
1	A	73	SER
1	A	79	THR
1	A	85	LEU
1	A	93	GLU
2	A	52	PRO
2	A	63	TRP
2	A	67	LEU
2	A	138	ILE
2	A	147	THR
3	A	42	ASN
3	A	53	THR
3	A	59	LEU
3	A	60	GLN
3	A	90	THR
3	A	92	SER
3	A	136	LEU
3	A	147	THR
4	A	17	ILE
4	A	32	ASP
4	A	78	LYS
4	A	79	THR

Model ID	Chain	Residue ID	Residue type
4	A	110	LYS
4	A	147	THR
5	A	25	ILE
5	A	50	VAL
5	A	61	THR
5	A	82	LEU
5	A	83	VAL
5	A	88	GLN
5	A	112	VAL
5	A	147	THR
6	A	5	ILE
6	A	9	THR
6	A	39	GLU
6	A	47	VAL
6	A	69	THR
6	A	80	ILE
6	A	116	SER
6	A	117	THR
6	A	134	VAL
6	A	147	THR
7	A	27	ASN
7	A	44	PHE
7	A	45	THR

Model ID	Chain	Residue ID	Residue type
7	A	69	THR
7	A	90	THR
7	A	102	ILE
7	A	137	VAL
7	A	156	GLU
8	A	25	ILE
8	A	33	VAL
8	A	44	PHE
8	A	45	THR
8	A	60	GLN
8	A	79	THR
8	A	115	THR
8	A	117	THR
9	A	60	GLN
9	A	61	THR
9	A	69	THR
9	A	114	GLN
9	A	116	SER
9	A	137	VAL
9	A	151	ILE
10	A	42	ASN
10	A	77	ASN
10	A	90	THR

Fit of model to data used for modeling

Mutagenesis

Validation for this section is under development.

Fit of model to data used for validation

Validation for this section is under development.

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