



Full wwPDB EM Validation Report ⓘ

Jul 15, 2025 – 09:08 PM JST

PDB ID : 9IS8 / pdb_00009is8
EMDB ID : EMD-60834
Title : Cryo-EM structure of AKT1-AtKC1(G315D)
Authors : Dongliang, L.; Zijie, Z.; Yannan, Q.; Yuyue, T.; Huaizong, S.
Deposited on : 2024-07-17
Resolution : 2.77 Å(reported)

This is a Full wwPDB EM 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/EMValidationReportHelp>

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:

EMDB validation analysis : **FAILED**
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0rc1
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

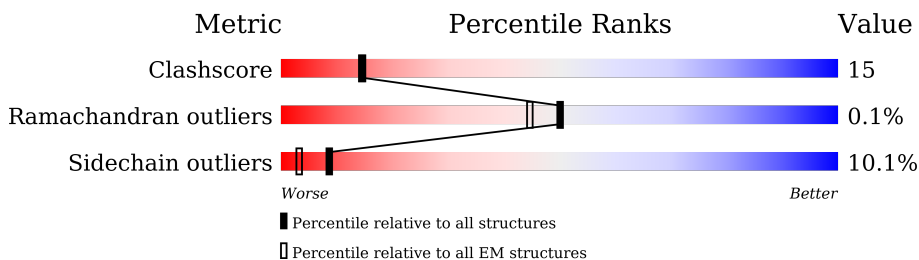
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.77 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)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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

Mol	Chain	Length	Quality of chain
1	A	885	
1	C	885	
1	D	885	
2	B	710	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 14809 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Potassium channel AKT1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	441	Total	C	N	O	S	0	0
			3599	2341	608	630	20		
1	C	441	Total	C	N	O	S	0	0
			3599	2341	608	630	20		
1	D	440	Total	C	N	O	S	0	0
			3591	2335	607	629	20		

There are 84 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	858	LEU	-	expression tag	UNP Q38998
A	859	GLU	-	expression tag	UNP Q38998
A	860	GLY	-	expression tag	UNP Q38998
A	861	SER	-	expression tag	UNP Q38998
A	862	ASP	-	expression tag	UNP Q38998
A	863	GLU	-	expression tag	UNP Q38998
A	864	VAL	-	expression tag	UNP Q38998
A	865	ASP	-	expression tag	UNP Q38998
A	866	ALA	-	expression tag	UNP Q38998
A	867	GLY	-	expression tag	UNP Q38998
A	868	SER	-	expression tag	UNP Q38998
A	869	ALA	-	expression tag	UNP Q38998
A	870	ALA	-	expression tag	UNP Q38998
A	871	ALA	-	expression tag	UNP Q38998
A	872	SER	-	expression tag	UNP Q38998
A	873	GLY	-	expression tag	UNP Q38998
A	874	GLY	-	expression tag	UNP Q38998
A	875	SER	-	expression tag	UNP Q38998
A	876	GLY	-	expression tag	UNP Q38998
A	877	SER	-	expression tag	UNP Q38998
A	878	ASP	-	expression tag	UNP Q38998
A	879	TYR	-	expression tag	UNP Q38998
A	880	LYS	-	expression tag	UNP Q38998
A	881	ASP	-	expression tag	UNP Q38998

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	882	ASP	-	expression tag	UNP Q38998
A	883	ASP	-	expression tag	UNP Q38998
A	884	ASP	-	expression tag	UNP Q38998
A	885	LYS	-	expression tag	UNP Q38998
C	858	LEU	-	expression tag	UNP Q38998
C	859	GLU	-	expression tag	UNP Q38998
C	860	GLY	-	expression tag	UNP Q38998
C	861	SER	-	expression tag	UNP Q38998
C	862	ASP	-	expression tag	UNP Q38998
C	863	GLU	-	expression tag	UNP Q38998
C	864	VAL	-	expression tag	UNP Q38998
C	865	ASP	-	expression tag	UNP Q38998
C	866	ALA	-	expression tag	UNP Q38998
C	867	GLY	-	expression tag	UNP Q38998
C	868	SER	-	expression tag	UNP Q38998
C	869	ALA	-	expression tag	UNP Q38998
C	870	ALA	-	expression tag	UNP Q38998
C	871	ALA	-	expression tag	UNP Q38998
C	872	SER	-	expression tag	UNP Q38998
C	873	GLY	-	expression tag	UNP Q38998
C	874	GLY	-	expression tag	UNP Q38998
C	875	SER	-	expression tag	UNP Q38998
C	876	GLY	-	expression tag	UNP Q38998
C	877	SER	-	expression tag	UNP Q38998
C	878	ASP	-	expression tag	UNP Q38998
C	879	TYR	-	expression tag	UNP Q38998
C	880	LYS	-	expression tag	UNP Q38998
C	881	ASP	-	expression tag	UNP Q38998
C	882	ASP	-	expression tag	UNP Q38998
C	883	ASP	-	expression tag	UNP Q38998
C	884	ASP	-	expression tag	UNP Q38998
C	885	LYS	-	expression tag	UNP Q38998
D	858	LEU	-	expression tag	UNP Q38998
D	859	GLU	-	expression tag	UNP Q38998
D	860	GLY	-	expression tag	UNP Q38998
D	861	SER	-	expression tag	UNP Q38998
D	862	ASP	-	expression tag	UNP Q38998
D	863	GLU	-	expression tag	UNP Q38998
D	864	VAL	-	expression tag	UNP Q38998
D	865	ASP	-	expression tag	UNP Q38998
D	866	ALA	-	expression tag	UNP Q38998
D	867	GLY	-	expression tag	UNP Q38998

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
D	868	SER	-	expression tag	UNP Q38998
D	869	ALA	-	expression tag	UNP Q38998
D	870	ALA	-	expression tag	UNP Q38998
D	871	ALA	-	expression tag	UNP Q38998
D	872	SER	-	expression tag	UNP Q38998
D	873	GLY	-	expression tag	UNP Q38998
D	874	GLY	-	expression tag	UNP Q38998
D	875	SER	-	expression tag	UNP Q38998
D	876	GLY	-	expression tag	UNP Q38998
D	877	SER	-	expression tag	UNP Q38998
D	878	ASP	-	expression tag	UNP Q38998
D	879	TYR	-	expression tag	UNP Q38998
D	880	LYS	-	expression tag	UNP Q38998
D	881	ASP	-	expression tag	UNP Q38998
D	882	ASP	-	expression tag	UNP Q38998
D	883	ASP	-	expression tag	UNP Q38998
D	884	ASP	-	expression tag	UNP Q38998
D	885	LYS	-	expression tag	UNP Q38998

- Molecule 2 is a protein called Potassium channel KAT3.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	474	Total	C	N	O	S	0	0
			3861	2533	636	676	16		

There are 49 discrepancies between the modelled and reference sequences:

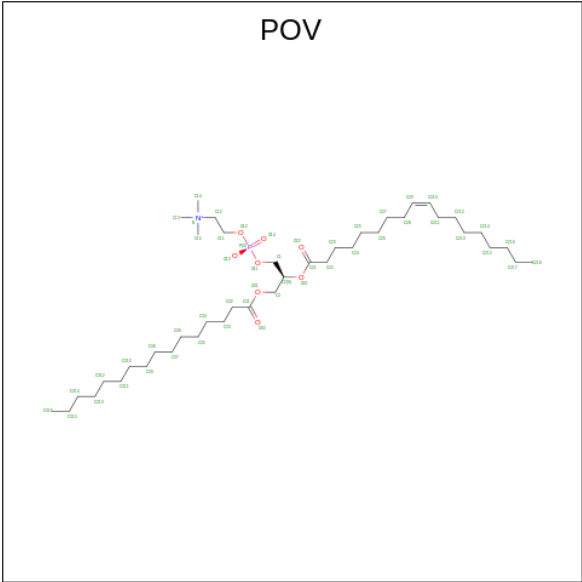
Chain	Residue	Modelled	Actual	Comment	Reference
B	315	ASP	GLY	engineered mutation	UNP P92960
B	663	LEU	-	expression tag	UNP P92960
B	664	GLU	-	expression tag	UNP P92960
B	665	GLY	-	expression tag	UNP P92960
B	666	SER	-	expression tag	UNP P92960
B	667	ASP	-	expression tag	UNP P92960
B	668	GLU	-	expression tag	UNP P92960
B	669	VAL	-	expression tag	UNP P92960
B	670	ASP	-	expression tag	UNP P92960
B	671	ALA	-	expression tag	UNP P92960
B	672	GLY	-	expression tag	UNP P92960
B	673	SER	-	expression tag	UNP P92960
B	674	ALA	-	expression tag	UNP P92960
B	675	ALA	-	expression tag	UNP P92960

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	676	ALA	-	expression tag	UNP P92960
B	677	SER	-	expression tag	UNP P92960
B	678	GLY	-	expression tag	UNP P92960
B	679	GLY	-	expression tag	UNP P92960
B	680	SER	-	expression tag	UNP P92960
B	681	GLY	-	expression tag	UNP P92960
B	682	SER	-	expression tag	UNP P92960
B	683	TRP	-	expression tag	UNP P92960
B	684	SER	-	expression tag	UNP P92960
B	685	HIS	-	expression tag	UNP P92960
B	686	PRO	-	expression tag	UNP P92960
B	687	GLN	-	expression tag	UNP P92960
B	688	PHE	-	expression tag	UNP P92960
B	689	GLU	-	expression tag	UNP P92960
B	690	LYS	-	expression tag	UNP P92960
B	691	GLY	-	expression tag	UNP P92960
B	692	GLY	-	expression tag	UNP P92960
B	693	GLY	-	expression tag	UNP P92960
B	694	ALA	-	expression tag	UNP P92960
B	695	ARG	-	expression tag	UNP P92960
B	696	GLY	-	expression tag	UNP P92960
B	697	GLY	-	expression tag	UNP P92960
B	698	SER	-	expression tag	UNP P92960
B	699	GLY	-	expression tag	UNP P92960
B	700	GLY	-	expression tag	UNP P92960
B	701	GLY	-	expression tag	UNP P92960
B	702	SER	-	expression tag	UNP P92960
B	703	TRP	-	expression tag	UNP P92960
B	704	SER	-	expression tag	UNP P92960
B	705	HIS	-	expression tag	UNP P92960
B	706	PRO	-	expression tag	UNP P92960
B	707	GLN	-	expression tag	UNP P92960
B	708	PHE	-	expression tag	UNP P92960
B	709	GLU	-	expression tag	UNP P92960
B	710	LYS	-	expression tag	UNP P92960

- Molecule 3 is (2S)-3-(hexadecanoyloxy)-2-[(9Z)-octadec-9-enoyloxy]propyl 2-(trimethylammonio)ethyl phosphate (CCD ID: POV) (formula: C₄₂H₈₂NO₈P).



Mol	Chain	Residues	Atoms				AltConf
3	A	1	Total	C	O	P	0
			39	30	8	1	
3	B	1	Total	C	O	P	0
			39	30	8	1	
3	C	1	Total	C	O	P	0
			39	30	8	1	
3	D	1	Total	C	O	P	0
			39	30	8	1	

- Molecule 4 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms		AltConf
4	C	2	Total	K	0
			2	2	
4	D	1	Total	K	0
			1	1	

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	649659	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	0.43	1/3689 (0.0%)	0.53	1/5010 (0.0%)
1	C	0.38	0/3689	0.54	1/5010 (0.0%)
1	D	0.43	3/3681 (0.1%)	0.55	4/4999 (0.1%)
2	B	0.59	6/3958 (0.2%)	0.77	12/5368 (0.2%)
All	All	0.47	10/15017 (0.1%)	0.61	18/20387 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	C	0	1

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	458	ARG	C-O	-10.47	1.12	1.23
2	B	215	GLU	C-O	-7.36	1.13	1.23
2	B	217	ASP	C-O	-7.34	1.15	1.23
1	D	250	THR	C-O	-6.93	1.14	1.23
1	D	251	LEU	C-O	-6.07	1.17	1.24
1	D	253	THR	C-O	-5.95	1.16	1.24
2	B	320	ILE	C-O	-5.93	1.17	1.24
2	B	218	ALA	C-O	-5.59	1.16	1.24
2	B	216	LYS	C-O	-5.39	1.16	1.23
2	B	228	ILE	C-O	-5.01	1.18	1.24

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	222	TYR	CB-CA-C	-9.63	95.68	110.90
1	A	78	GLU	CB-CA-C	-9.26	96.27	110.90
1	D	250	THR	CA-CB-OG1	-8.60	96.70	109.60
2	B	216	LYS	N-CA-C	-7.21	105.02	113.88
2	B	217	ASP	CA-C-O	-6.59	113.23	120.81
2	B	234	THR	CA-CB-OG1	-6.41	99.98	109.60
2	B	319	TYR	CB-CA-C	-6.30	100.95	110.90
2	B	227	VAL	CA-C-O	-5.77	114.95	120.95
2	B	125	VAL	N-CA-C	-5.67	107.29	112.96
2	B	223	PHE	N-CA-C	-5.55	105.23	112.23
2	B	66	PHE	CA-CB-CG	5.48	119.28	113.80
1	C	189	VAL	N-CA-C	-5.22	108.42	113.53
1	D	252	THR	CA-CB-OG1	-5.21	101.79	109.60
2	B	84	ARG	CA-C-O	-5.16	115.58	120.90
2	B	215	GLU	CB-CA-C	-5.11	101.56	110.09
1	D	252	THR	CA-C-N	5.09	131.27	121.54
1	D	252	THR	C-N-CA	5.09	131.27	121.54
2	B	66	PHE	N-CA-CB	-5.01	102.39	109.85

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	303	ARG	Sidechain

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	3599	0	3614	93	0
1	C	3599	0	3614	130	0
1	D	3591	0	3602	125	0
2	B	3861	0	3907	130	0
3	A	39	0	52	0	0
3	B	39	0	52	0	0
3	C	39	0	52	9	0
3	D	39	0	52	3	0
4	C	2	0	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	D	1	0	0	0	0
All	All	14809	0	14945	448	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 15.

All (448) 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:479:VAL:HG11	2:B:523:PHE:CE2	1.49	1.47
2:B:479:VAL:CG1	2:B:523:PHE:HE2	1.61	1.13
1:C:458:ARG:HG2	1:D:117:THR:HG21	1.26	1.12
1:A:458:ARG:HH21	1:A:458:ARG:HB3	1.24	1.01
1:C:395:PRO:HB3	1:C:458:ARG:O	1.64	0.96
1:C:458:ARG:HG2	1:D:117:THR:CG2	1.97	0.94
2:B:479:VAL:CG1	2:B:523:PHE:CE2	2.42	0.94
1:C:415:GLY:HA3	1:C:460:CYS:HB3	1.53	0.91
1:C:303:ARG:HH21	1:D:186:TYR:HB2	1.34	0.90
1:C:458:ARG:HB3	1:C:458:ARG:HH21	1.35	0.90
2:B:479:VAL:HG11	2:B:523:PHE:HE2	0.77	0.90
1:C:193:LYS:HE2	3:C:901:POV:H3	1.55	0.87
1:C:458:ARG:HH21	1:C:458:ARG:CB	1.89	0.85
1:A:458:ARG:HB3	1:A:458:ARG:NH2	1.91	0.85
1:C:395:PRO:CB	1:C:458:ARG:O	2.25	0.84
2:B:479:VAL:HG21	2:B:523:PHE:CZ	2.14	0.82
1:A:274:MET:HE1	1:D:249:THR:HG22	1.61	0.81
2:B:228:ILE:O	2:B:228:ILE:HD12	1.80	0.81
1:D:202:VAL:HG23	1:D:251:LEU:HD12	1.62	0.81
1:C:190:ARG:HG2	1:C:190:ARG:HH11	1.45	0.80
1:A:458:ARG:HH21	1:A:458:ARG:CB	1.95	0.79
1:C:416:THR:HG22	1:C:458:ARG:HD3	1.61	0.79
2:B:446:ILE:HG22	2:B:496:VAL:HG12	1.64	0.79
1:D:448:ARG:HH22	1:D:451:LEU:HB2	1.47	0.78
1:C:413:VAL:CG2	1:C:461:GLN:HG2	2.15	0.76
2:B:349:THR:HG22	2:B:354:LEU:HD12	1.68	0.75
1:C:395:PRO:CA	1:C:458:ARG:O	2.35	0.74
1:C:193:LYS:HE3	3:C:901:POV:H32	1.67	0.74
1:C:303:ARG:NH1	1:D:182:ARG:HA	2.03	0.74
1:D:399:VAL:HG23	1:D:400:ILE:HG13	1.70	0.73
1:A:366:LEU:HD11	1:A:436:GLY:HA2	1.68	0.73
2:B:457:LYS:HZ3	2:B:462:GLN:HB2	1.51	0.73

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:344:ASP:HB2	1:C:343:GLN:HE22	1.53	0.72
1:A:293:VAL:O	1:D:300:ARG:NH2	2.21	0.72
1:A:74:VAL:O	1:A:78:GLU:HG2	1.89	0.71
2:B:339:ARG:NH2	1:C:181:ASP:O	2.24	0.70
1:D:426:THR:HG22	1:D:427:GLU:H	1.55	0.70
1:C:459:LEU:HD23	1:C:459:LEU:O	1.92	0.70
1:A:248:ILE:HD12	2:B:307:MET:HB2	1.72	0.70
2:B:239:HIS:HA	2:B:280:MET:HE1	1.72	0.70
2:B:231:LEU:C	2:B:231:LEU:HD23	2.16	0.70
2:B:504:PHE:O	2:B:508:VAL:HG12	1.91	0.69
2:B:126:ASP:OD2	2:B:200:ARG:NH2	2.26	0.69
1:C:413:VAL:CG2	1:C:461:GLN:CG	2.70	0.68
1:D:332:LEU:HD21	1:D:459:LEU:HD21	1.76	0.68
1:A:367:MET:HG3	1:A:385:VAL:HG12	1.77	0.67
1:C:193:LYS:CE	3:C:901:POV:H32	2.24	0.67
1:D:251:LEU:HD23	1:D:251:LEU:O	1.94	0.67
2:B:285:VAL:HG12	1:C:274:MET:HE1	1.77	0.67
1:C:147:GLU:N	1:C:147:GLU:OE2	2.27	0.67
1:C:416:THR:HG22	1:C:458:ARG:CD	2.26	0.66
1:D:372:LEU:HD11	1:D:484:ILE:HG23	1.77	0.66
1:D:408:ASP:N	1:D:408:ASP:OD1	2.29	0.66
2:B:146:THR:HG22	2:B:148:LEU:HG	1.78	0.66
1:C:410:TYR:HB2	1:C:439:ILE:HD11	1.77	0.66
1:D:440:GLY:O	1:D:450:GLN:NE2	2.29	0.66
2:B:458:GLY:HA2	1:C:476:ALA:HB1	1.78	0.65
1:A:121:VAL:HG12	1:A:123:ASP:H	1.60	0.65
2:B:90:GLU:OE2	2:B:213:ARG:NH2	2.22	0.65
1:A:216:ASN:ND2	1:A:217:SER:O	2.29	0.65
1:A:300:ARG:HD3	2:B:222:TYR:CE2	2.32	0.65
2:B:524:MET:HE3	2:B:524:MET:HA	1.77	0.65
1:D:418:ASP:HA	1:D:432:GLU:HA	1.79	0.65
2:B:519:ILE:O	2:B:523:PHE:HB2	1.96	0.65
1:D:202:VAL:CG2	1:D:251:LEU:HD12	2.27	0.64
1:A:61:GLU:OE1	1:A:177:ARG:NH2	2.31	0.63
2:B:440:PRO:HD3	2:B:483:PRO:HA	1.81	0.63
1:C:418:ASP:OD2	1:C:457:LYS:NZ	2.31	0.63
2:B:237:TRP:HH2	2:B:312:PHE:HB2	1.64	0.63
1:C:190:ARG:HG2	1:C:190:ARG:NH1	2.09	0.63
2:B:282:TRP:O	2:B:286:THR:HG23	1.99	0.63
1:D:447:TYR:HD1	1:D:467:ARG:HH12	1.46	0.63
1:A:324:ASP:N	1:A:324:ASP:OD1	2.29	0.62

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:419:LEU:HD12	1:C:452:PHE:HB2	1.81	0.62
1:A:416:THR:HG22	1:A:434:LYS:HA	1.82	0.62
1:D:181:ASP:OD1	1:D:182:ARG:N	2.34	0.61
1:C:371:TYR:HE2	1:C:438:ILE:HD11	1.65	0.61
2:B:84:ARG:O	2:B:86:TYR:N	2.33	0.61
1:D:416:THR:HB	1:D:457:LYS:HE3	1.82	0.61
1:C:181:ASP:OD1	1:C:183:ASN:N	2.30	0.60
1:D:304:ASP:OD1	1:D:305:THR:N	2.35	0.60
2:B:476:ILE:HD12	2:B:476:ILE:H	1.66	0.60
1:C:440:GLY:HA2	1:C:450:GLN:HE22	1.66	0.60
2:B:416:VAL:HA	2:B:419:VAL:HG12	1.84	0.60
2:B:368:LEU:HD12	2:B:493:LEU:HD12	1.84	0.59
1:C:425:GLY:O	1:C:426:THR:OG1	2.19	0.59
1:D:445:LEU:HD21	1:D:470:PHE:HE2	1.67	0.59
2:B:281:TYR:O	2:B:285:VAL:HG13	2.03	0.59
2:B:432:GLU:HA	2:B:489:ARG:HA	1.84	0.59
1:D:481:GLY:O	1:D:482:THR:OG1	2.19	0.59
1:A:142:SER:O	1:A:164:ARG:NH1	2.36	0.59
1:C:60:TRP:NE1	1:C:103:ASP:OD2	2.31	0.59
1:D:216:ASN:ND2	1:D:218:ASN:O	2.36	0.58
1:D:433:VAL:HG23	1:D:437:ASP:HB2	1.85	0.58
1:C:73:TRP:HD1	3:C:901:POV:H315	1.68	0.58
1:A:383:GLN:O	1:A:386:SER:OG	2.20	0.58
1:C:348:ASP:O	1:C:355:ARG:NH1	2.37	0.58
1:C:376:VAL:HG11	1:C:380:LEU:HD22	1.86	0.57
1:D:416:THR:HG22	1:D:434:LYS:HE2	1.85	0.57
1:C:303:ARG:HH11	1:D:182:ARG:HA	1.69	0.57
2:B:423:GLN:HE22	2:B:498:ARG:HG2	1.69	0.57
1:C:458:ARG:CG	1:D:117:THR:CG2	2.80	0.57
2:B:228:ILE:HD12	2:B:228:ILE:C	2.29	0.57
2:B:288:THR:O	2:B:289:THR:OG1	2.22	0.57
1:C:458:ARG:HH21	1:C:458:ARG:CG	2.15	0.57
2:B:347:ARG:NH2	1:C:343:GLN:OE1	2.38	0.57
1:A:123:ASP:HB3	1:A:126:GLN:HB2	1.88	0.56
1:D:406:PRO:HG2	1:D:467:ARG:HH11	1.68	0.56
1:D:147:GLU:OE1	1:D:147:GLU:N	2.38	0.56
2:B:186:ASP:OD1	2:B:187:VAL:N	2.39	0.56
1:C:402:GLN:H	1:C:453:THR:HG23	1.71	0.56
1:A:91:ILE:HD12	1:A:92:THR:H	1.70	0.56
1:D:379:ASP:OD1	1:D:379:ASP:N	2.31	0.55
1:C:181:ASP:OD1	1:C:182:ARG:N	2.40	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:524:MET:HA	2:B:524:MET:CE	2.35	0.55
1:C:246:TRP:O	1:C:250:THR:HG22	2.07	0.55
1:D:388:MET:HE3	1:D:463:LEU:HD23	1.87	0.55
1:D:471:LEU:HA	1:D:474:ILE:HD12	1.87	0.55
1:A:139:ASP:OD1	1:A:169:ARG:NH2	2.40	0.55
2:B:344:ASP:N	2:B:344:ASP:OD1	2.37	0.55
2:B:113:ALA:HB1	2:B:118:LEU:HD13	1.89	0.54
1:D:485:MET:HA	1:D:488:LEU:HB3	1.89	0.54
1:C:413:VAL:HG22	1:C:461:GLN:O	2.08	0.54
1:C:52:PRO:HB3	1:C:111:GLY:HA3	1.88	0.54
1:A:313:ALA:HA	1:A:318:LEU:HD12	1.90	0.54
2:B:149:ASN:O	2:B:151:THR:OG1	2.24	0.54
1:C:420:VAL:HG13	1:C:453:THR:HB	1.89	0.54
1:A:458:ARG:HG2	2:B:146:THR:HG23	1.89	0.54
1:D:157:TYR:O	1:D:161:ASN:ND2	2.41	0.54
1:D:483:ILE:HA	1:D:486:ASN:HB2	1.87	0.54
1:C:228:VAL:HG21	1:C:238:MET:HE1	1.89	0.53
1:C:413:VAL:HG22	1:C:461:GLN:CG	2.36	0.53
1:C:139:ASP:OD1	1:C:166:TRP:NE1	2.21	0.53
1:C:458:ARG:HB3	1:C:458:ARG:NH2	2.14	0.53
1:D:411:ILE:O	1:D:463:LEU:N	2.42	0.53
1:D:117:THR:O	1:D:119:LEU:N	2.42	0.53
1:C:159:LEU:HD12	1:C:159:LEU:H	1.73	0.53
1:C:311:ASN:HB3	1:C:315:ARG:HH12	1.74	0.53
1:A:371:TYR:OH	1:A:441:GLU:OE1	2.27	0.53
1:D:371:TYR:OH	1:D:488:LEU:O	2.27	0.53
1:C:190:ARG:NH1	1:C:190:ARG:CG	2.72	0.52
1:C:331:CYS:SG	1:C:332:LEU:N	2.82	0.52
1:D:75:SER:HB2	1:D:76:PRO:HD3	1.90	0.52
1:D:407:THR:O	1:D:467:ARG:N	2.40	0.52
1:D:472:ASN:O	1:D:475:GLN:NE2	2.41	0.52
2:B:237:TRP:CD1	2:B:240:LEU:HD23	2.45	0.52
1:D:350:LEU:HG	1:D:351:PRO:HD3	1.92	0.52
2:B:219:HIS:C	2:B:219:HIS:CD2	2.88	0.52
1:C:112:TYR:HB2	1:C:127:ILE:HD13	1.92	0.52
1:C:115:LYS:O	1:C:115:LYS:NZ	2.29	0.52
1:C:319:PRO:HD2	1:C:322:LEU:HD21	1.90	0.52
1:C:419:LEU:HD23	1:C:431:ARG:HD2	1.90	0.52
2:B:146:THR:O	2:B:148:LEU:N	2.41	0.52
1:D:396:LYS:HG3	1:D:455:ARG:HD2	1.92	0.52
1:A:426:THR:OG1	1:A:427:GLU:N	2.41	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:484:ILE:O	1:A:488:LEU:HD12	2.09	0.51
2:B:519:ILE:HD12	2:B:520:ILE:H	1.74	0.51
1:D:395:PRO:HG3	1:D:458:ARG:HA	1.92	0.51
1:A:358:ILE:HD12	1:A:358:ILE:H	1.74	0.51
2:B:474:GLY:O	2:B:484:GLN:NE2	2.40	0.51
1:C:413:VAL:HG22	1:C:461:GLN:HG2	1.92	0.51
1:C:471:LEU:HA	1:C:474:ILE:HG22	1.92	0.51
2:B:443:PHE:CD1	2:B:478:VAL:HG11	2.46	0.51
1:A:72:ALA:HB2	1:A:168:LEU:HD11	1.93	0.51
1:A:402:GLN:N	1:A:453:THR:OG1	2.44	0.51
2:B:137:PHE:HE1	2:B:160:TYR:HD2	1.59	0.51
2:B:435:LEU:HD23	2:B:438:GLU:OE1	2.11	0.51
1:D:344:GLN:HA	1:D:347:LEU:HD13	1.91	0.51
1:C:392:TYR:CE1	1:C:461:GLN:HB3	2.46	0.51
1:D:93:ASP:OD1	1:D:94:ASN:N	2.44	0.51
1:D:421:ASP:OD2	1:D:430:VAL:HG13	2.11	0.51
1:A:114:ASP:OD1	1:A:115:LYS:N	2.44	0.51
1:A:345:GLU:OE1	1:A:345:GLU:N	2.33	0.51
2:B:169:ASP:OD1	2:B:202:TRP:NE1	2.35	0.51
1:C:54:ASP:OD1	1:C:54:ASP:N	2.42	0.51
1:C:193:LYS:HE2	3:C:901:POV:C3	2.34	0.51
2:B:84:ARG:C	2:B:86:TYR:H	2.17	0.50
2:B:230:LEU:HD21	2:B:319:TYR:CD2	2.46	0.50
2:B:435:LEU:HA	2:B:487:THR:HG23	1.93	0.50
2:B:69:ASP:OD1	2:B:69:ASP:N	2.43	0.50
1:C:311:ASN:HB3	1:C:315:ARG:NH1	2.25	0.50
1:D:251:LEU:HD23	1:D:251:LEU:C	2.36	0.50
1:A:152:ILE:HG13	1:A:153:SER:N	2.25	0.50
1:C:485:MET:HE3	1:C:485:MET:O	2.12	0.50
1:D:74:VAL:O	1:D:78:GLU:HG2	2.11	0.50
1:C:60:TRP:HD1	1:C:61:GLU:OE1	1.94	0.50
3:D:901:POV:H1	3:D:901:POV:O22	2.12	0.50
2:B:231:LEU:C	2:B:231:LEU:CD2	2.84	0.50
1:C:248:ILE:O	1:C:252:THR:OG1	2.27	0.50
1:D:175:PHE:O	1:D:179:GLU:HG2	2.11	0.50
1:D:415:GLY:HA2	1:D:458:ARG:NE	2.26	0.50
1:D:420:VAL:HG13	1:D:453:THR:HG23	1.94	0.50
1:C:303:ARG:HH21	1:D:186:TYR:CB	2.15	0.50
1:C:309:ALA:HB2	1:D:345:GLU:HG3	1.94	0.50
1:D:348:ASP:C	1:D:350:LEU:H	2.18	0.50
1:D:413:VAL:HG12	1:D:461:GLN:O	2.11	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:252:THR:O	1:C:253:THR:OG1	2.27	0.50
1:C:395:PRO:HB3	1:C:458:ARG:C	2.35	0.50
1:A:230:ASN:OD1	1:A:230:ASN:N	2.42	0.49
1:A:300:ARG:HD3	2:B:222:TYR:CD2	2.46	0.49
1:A:394:PRO:HG2	1:A:397:GLU:HG3	1.94	0.49
2:B:57:SER:O	2:B:61:PRO:HD2	2.12	0.49
2:B:77:PHE:O	2:B:78:ILE:HG12	2.10	0.49
1:D:78:GLU:OE1	1:D:157:TYR:OH	2.27	0.49
1:D:190:ARG:NH2	3:D:901:POV:O12	2.45	0.49
1:C:244:MET:HE1	3:C:901:POV:H31H	1.93	0.49
1:A:444:VAL:HG12	1:A:445:LEU:HD23	1.95	0.49
1:C:104:ILE:HD11	1:C:139:ASP:O	2.12	0.49
1:A:202:VAL:HG12	1:A:244:MET:HE3	1.94	0.49
1:A:343:GLN:O	1:A:346:THR:HG22	2.13	0.49
1:C:348:ASP:HA	1:C:355:ARG:HD3	1.93	0.49
1:C:458:ARG:HB3	1:D:117:THR:HG23	1.95	0.49
1:D:251:LEU:C	1:D:251:LEU:CD2	2.85	0.49
1:D:352:LYS:HA	1:D:355:ARG:HG2	1.95	0.49
2:B:221:ASN:HB3	2:B:224:VAL:HB	1.95	0.49
1:D:245:TYR:O	1:D:249:THR:HG23	2.12	0.49
1:A:244:MET:O	1:A:248:ILE:HG13	2.11	0.49
1:A:381:LEU:O	1:A:385:VAL:HG13	2.13	0.49
1:C:395:PRO:HA	1:C:458:ARG:O	2.10	0.49
1:A:67:LEU:HD13	1:A:96:VAL:HG13	1.94	0.48
2:B:87:ARG:HA	2:B:90:GLU:HG2	1.94	0.48
1:D:56:LYS:O	1:D:59:ILE:HG13	2.13	0.48
1:A:85:PRO:HG3	1:A:157:TYR:CE1	2.48	0.48
2:B:137:PHE:CE1	2:B:160:TYR:HD2	2.32	0.48
2:B:524:MET:SD	2:B:524:MET:N	2.87	0.48
1:C:74:VAL:O	1:C:78:GLU:HG3	2.14	0.48
1:C:421:ASP:N	1:C:428:SER:O	2.30	0.48
1:D:376:VAL:HG12	1:D:380:LEU:HD21	1.94	0.48
2:B:362:MET:SD	1:C:358:ILE:HD11	2.53	0.48
2:B:516:ALA:N	2:B:518:MET:SD	2.79	0.48
1:C:73:TRP:CD1	3:C:901:POV:H315	2.48	0.48
1:C:280:LEU:HA	3:C:901:POV:H25	1.95	0.48
1:C:303:ARG:NH1	1:D:181:ASP:O	2.46	0.48
1:D:218:ASN:HD22	1:D:219:PRO:HD2	1.78	0.48
2:B:230:LEU:CD2	2:B:323:ILE:HG13	2.43	0.48
1:A:458:ARG:HG2	2:B:146:THR:CG2	2.44	0.48
1:C:152:ILE:HD12	1:C:153:SER:HB3	1.95	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:230:LEU:HD23	2:B:323:ILE:HG13	1.95	0.48
1:A:78:GLU:HA	1:A:78:GLU:OE1	2.13	0.48
1:C:154:SER:OG	1:C:155:GLN:N	2.47	0.48
1:D:393:PHE:CD1	1:D:462:LEU:HD12	2.49	0.48
1:A:303:ARG:NH2	2:B:220:PHE:O	2.40	0.47
1:A:352:LYS:HA	1:A:355:ARG:HB3	1.96	0.47
1:A:408:ASP:OD2	1:A:464:ARG:HD3	2.14	0.47
2:B:479:VAL:CG2	2:B:523:PHE:CZ	2.92	0.47
1:D:348:ASP:OD1	1:D:348:ASP:N	2.47	0.47
1:A:392:TYR:CE1	1:A:461:GLN:HB2	2.50	0.47
1:D:380:LEU:HD12	1:D:384:LEU:HD23	1.96	0.47
1:A:90:SER:O	1:A:94:ASN:ND2	2.46	0.47
1:A:379:ASP:N	1:A:379:ASP:OD1	2.46	0.47
2:B:440:PRO:HB3	2:B:484:GLN:HG2	1.96	0.47
2:B:519:ILE:HD12	2:B:520:ILE:N	2.30	0.47
1:C:303:ARG:NH2	1:D:186:TYR:HB2	2.15	0.47
1:A:252:THR:O	1:A:253:THR:OG1	2.26	0.47
2:B:411:PRO:HG2	2:B:512:ASN:ND2	2.29	0.47
2:B:418:LEU:O	2:B:422:ILE:HG23	2.15	0.47
1:C:216:ASN:ND2	1:C:218:ASN:H	2.12	0.47
1:D:154:SER:OG	1:D:155:GLN:N	2.47	0.47
2:B:223:PHE:HA	2:B:226:ARG:HG3	1.96	0.47
2:B:506:GLU:HA	2:B:509:GLN:NE2	2.29	0.47
1:D:402:GLN:HG3	1:D:451:LEU:HA	1.97	0.47
1:C:102:ILE:O	1:C:105:ILE:HG13	2.14	0.47
2:B:84:ARG:C	2:B:86:TYR:N	2.73	0.47
1:A:415:GLY:HA2	1:A:458:ARG:HD3	1.96	0.46
2:B:461:GLU:O	2:B:462:GLN:NE2	2.48	0.46
1:C:458:ARG:CG	1:C:458:ARG:NH2	2.72	0.46
1:C:411:ILE:HG12	1:C:438:ILE:HG22	1.98	0.46
1:C:413:VAL:HG21	1:C:461:GLN:OE1	2.15	0.46
2:B:144:ASN:C	2:B:146:THR:H	2.24	0.46
1:A:290:ASN:OD1	1:D:293:VAL:HG22	2.16	0.46
1:D:154:SER:O	1:D:155:GLN:HG2	2.15	0.46
1:D:448:ARG:HG2	1:D:449:PRO:HD2	1.95	0.46
1:C:183:ASN:N	1:C:183:ASN:OD1	2.48	0.46
1:D:439:ILE:HD12	1:D:454:VAL:HG11	1.97	0.46
1:A:393:PHE:CE2	1:A:399:VAL:HG12	2.51	0.46
2:B:219:HIS:CD2	2:B:219:HIS:O	2.68	0.46
1:D:347:LEU:O	1:D:350:LEU:HB3	2.16	0.46
1:D:434:LYS:HA	1:D:434:LYS:HD3	1.73	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:93:ASP:O	1:C:97:ASN:ND2	2.48	0.46
1:D:249:THR:O	1:D:255:GLY:N	2.47	0.46
1:C:451:LEU:H	1:C:451:LEU:HD12	1.81	0.46
2:B:475:GLU:HA	2:B:478:VAL:HG12	1.98	0.46
2:B:492:ARG:O	2:B:494:SER:OG	2.29	0.46
1:D:298:ARG:HD2	1:D:299:THR:N	2.30	0.46
1:D:367:MET:HB3	1:D:381:LEU:HD11	1.97	0.46
1:A:388:MET:HG3	1:A:465:MET:HE3	1.97	0.46
2:B:482:ILE:HD12	2:B:483:PRO:O	2.16	0.46
1:C:370:VAL:HG12	1:C:372:LEU:H	1.80	0.46
2:B:215:GLU:HG2	2:B:222:TYR:HE1	1.81	0.45
2:B:411:PRO:HG2	2:B:512:ASN:HD21	1.81	0.45
1:C:257:GLY:O	1:C:260:HIS:ND1	2.43	0.45
1:C:442:ILE:HG21	1:C:451:LEU:HD21	1.98	0.45
1:D:349:ALA:C	1:D:351:PRO:HD2	2.42	0.45
1:A:137:LEU:HD13	1:A:137:LEU:HA	1.83	0.45
2:B:344:ASP:HB2	1:C:343:GLN:NE2	2.28	0.45
1:D:485:MET:HE2	1:D:485:MET:H	1.82	0.45
2:B:517:LYS:N	2:B:517:LYS:HE2	2.31	0.45
1:C:424:THR:OG1	1:C:425:GLY:N	2.49	0.45
1:A:166:TRP:CZ2	1:A:169:ARG:HD3	2.51	0.45
1:A:471:LEU:O	1:A:474:ILE:HG22	2.15	0.45
2:B:60:LEU:HD23	2:B:60:LEU:HA	1.62	0.45
1:C:442:ILE:HB	1:C:451:LEU:HD11	1.98	0.45
1:A:348:ASP:OD1	1:A:349:ALA:N	2.49	0.45
2:B:222:TYR:O	2:B:222:TYR:CD1	2.70	0.45
2:B:342:ILE:HG23	2:B:363:LEU:HD22	1.97	0.45
2:B:452:ASP:OD1	2:B:452:ASP:N	2.50	0.45
1:C:413:VAL:HG22	1:C:461:GLN:HG3	1.98	0.45
1:A:343:GLN:HB2	1:A:346:THR:HG22	1.99	0.45
2:B:83:ASP:OD1	2:B:84:ARG:N	2.50	0.45
1:D:104:ILE:HD11	1:D:139:ASP:O	2.17	0.45
1:A:482:THR:O	1:A:486:ASN:ND2	2.32	0.45
1:C:348:ASP:HA	1:C:355:ARG:HH11	1.81	0.45
1:D:150:MET:SD	1:D:157:TYR:HB2	2.57	0.45
1:D:117:THR:HG22	1:D:119:LEU:HG	1.98	0.44
1:C:417:ALA:HB2	1:C:456:THR:HA	1.98	0.44
1:D:370:VAL:HG21	1:D:373:PHE:HD2	1.82	0.44
1:D:396:LYS:HB2	1:D:396:LYS:HE2	1.70	0.44
2:B:506:GLU:HA	2:B:509:GLN:HE21	1.83	0.44
1:C:420:VAL:HA	1:C:429:ILE:HG22	2.00	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:115:LYS:HD2	1:D:115:LYS:C	2.43	0.44
1:A:83:ARG:HH12	1:A:215:ARG:HG3	1.82	0.44
1:A:368:ASP:O	1:A:374:ARG:NH2	2.50	0.44
1:A:379:ASP:OD1	1:A:380:LEU:HD12	2.17	0.44
2:B:398:ARG:HH22	2:B:415:LEU:HB3	1.83	0.44
1:D:374:ARG:O	1:D:374:ARG:NE	2.51	0.44
1:D:103:ASP:HA	1:D:106:MET:HG2	1.99	0.44
2:B:446:ILE:HD11	2:B:468:GLY:O	2.17	0.44
1:C:333:LYS:NZ	1:C:342:GLN:HE22	2.16	0.44
1:C:138:LEU:HD23	1:C:138:LEU:HA	1.84	0.43
1:C:190:ARG:HA	1:C:190:ARG:HD3	1.62	0.43
1:A:249:THR:HG22	1:A:255:GLY:H	1.83	0.43
1:A:294:HIS:C	1:A:296:THR:H	2.26	0.43
1:D:139:ASP:OD1	1:D:166:TRP:NE1	2.39	0.43
1:D:258:ASP:OD1	1:D:258:ASP:N	2.50	0.43
1:D:330:LEU:HD23	1:D:330:LEU:HA	1.86	0.43
1:A:113:LEU:HD12	1:A:113:LEU:O	2.18	0.43
1:A:160:PHE:C	1:A:162:MET:H	2.27	0.43
2:B:373:ALA:HA	2:B:376:ARG:HH21	1.83	0.43
2:B:434:ILE:HD13	2:B:434:ILE:HA	1.87	0.43
2:B:110:PHE:O	2:B:112:LYS:N	2.52	0.43
1:C:196:CYS:HB3	3:C:901:POV:H38A	2.00	0.43
1:A:54:ASP:OD1	1:A:54:ASP:N	2.42	0.43
1:A:281:THR:O	1:A:285:ILE:HG13	2.18	0.43
1:A:401:LEU:H	1:A:401:LEU:HD23	1.84	0.43
1:C:381:LEU:O	1:C:385:VAL:HG12	2.19	0.43
2:B:349:THR:HG21	2:B:359:ARG:HG3	2.01	0.43
2:B:366:MET:HE3	2:B:367:GLN:HG2	2.01	0.43
2:B:398:ARG:HH12	2:B:412:GLU:HG3	1.83	0.43
1:C:314:HIS:C	1:C:316:ASN:H	2.26	0.43
1:C:393:PHE:CE2	1:C:399:VAL:HG22	2.54	0.43
1:C:430:VAL:O	1:C:431:ARG:HB2	2.17	0.43
1:D:371:TYR:HD2	1:D:438:ILE:HD11	1.84	0.43
1:D:400:ILE:O	1:D:453:THR:HA	2.19	0.43
1:A:478:VAL:O	1:A:481:GLY:N	2.42	0.43
1:C:230:ASN:OD1	1:C:230:ASN:N	2.51	0.43
1:D:56:LYS:HG3	1:D:57:TYR:N	2.34	0.43
1:D:419:LEU:HD12	1:D:419:LEU:HA	1.86	0.43
3:D:901:POV:C1	3:D:901:POV:C31	2.97	0.43
2:B:215:GLU:HG2	2:B:222:TYR:CE1	2.54	0.43
1:C:372:LEU:HA	1:C:372:LEU:HD23	1.73	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:227:ASN:OD1	1:D:227:ASN:N	2.52	0.43
1:D:448:ARG:NH2	1:D:449:PRO:O	2.52	0.43
1:C:141:VAL:HA	1:C:144:ILE:HG13	2.01	0.42
1:C:382:PHE:O	1:C:386:SER:OG	2.37	0.42
1:A:271:ILE:HG23	1:D:248:ILE:HD12	2.01	0.42
2:B:79:VAL:HG12	2:B:138:PHE:O	2.19	0.42
1:A:87:PRO:HG2	1:A:88:PRO:HD3	2.01	0.42
2:B:66:PHE:CD1	2:B:66:PHE:C	2.97	0.42
1:C:405:ALA:O	1:C:407:THR:HG23	2.20	0.42
2:B:517:LYS:HA	2:B:520:ILE:HB	2.01	0.42
1:D:410:TYR:CE1	1:D:464:ARG:HB2	2.55	0.42
1:C:458:ARG:CB	1:D:117:THR:HG23	2.49	0.42
1:D:137:LEU:HD23	1:D:138:LEU:H	1.85	0.42
1:A:138:LEU:HD23	1:A:138:LEU:HA	1.85	0.42
1:A:442:ILE:HG13	1:A:443:GLY:N	2.34	0.42
2:B:444:TYR:HD2	2:B:496:VAL:HB	1.83	0.42
2:B:511:ASP:OD1	2:B:511:ASP:N	2.51	0.42
1:C:401:LEU:HA	1:C:453:THR:CG2	2.50	0.42
1:D:409:PHE:HE1	1:D:438:ILE:HB	1.84	0.42
2:B:244:ILE:O	2:B:248:ILE:HG13	2.20	0.42
2:B:290:VAL:HG22	1:C:253:THR:HA	2.01	0.42
1:D:338:SER:HA	1:D:341:LEU:HD22	2.01	0.42
2:B:97:VAL:HG23	2:B:129:PHE:HZ	1.84	0.42
1:A:199:LEU:HD23	1:A:199:LEU:HA	1.91	0.41
1:A:384:LEU:HD23	1:A:465:MET:HE1	2.02	0.41
1:A:473:ILE:HD12	1:A:473:ILE:HA	1.92	0.41
1:D:162:MET:HE3	1:D:162:MET:HB3	1.96	0.41
1:D:352:LYS:O	1:D:356:SER:HB3	2.19	0.41
1:A:347:LEU:HD12	1:A:347:LEU:HA	1.77	0.41
2:B:141:TYR:CE2	2:B:159:ARG:HD3	2.56	0.41
2:B:152:ASP:OD1	2:B:155:LEU:HB2	2.20	0.41
2:B:273:TRP:O	2:B:277:THR:OG1	2.26	0.41
2:B:523:PHE:HD1	2:B:523:PHE:HA	1.70	0.41
1:A:419:LEU:HD23	1:A:452:PHE:HB2	2.02	0.41
1:D:213:ALA:HB2	1:D:223:TRP:NE1	2.34	0.41
1:A:114:ASP:O	1:A:118:TYR:N	2.49	0.41
2:B:231:LEU:HD23	2:B:231:LEU:O	2.18	0.41
1:C:202:VAL:HG13	1:C:247:SER:OG	2.21	0.41
1:C:401:LEU:HA	1:C:453:THR:HG22	2.03	0.41
1:D:326:MET:HG3	1:D:327:LEU:N	2.35	0.41
1:D:401:LEU:HD23	1:D:402:GLN:N	2.35	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:432:GLU:OE2	1:A:432:GLU:N	2.54	0.41
1:C:421:ASP:OD1	1:C:430:VAL:HG12	2.21	0.41
1:A:410:TYR:HB2	1:A:439:ILE:HD11	2.03	0.41
2:B:109:ALA:HB2	2:B:243:CYS:HB3	2.02	0.41
2:B:354:LEU:HA	1:C:361:PHE:CE2	2.56	0.41
2:B:369:LYS:HE2	2:B:369:LYS:HB3	1.95	0.41
1:C:318:LEU:HD22	1:C:322:LEU:HD11	2.03	0.41
1:C:468:THR:OG1	1:C:469:THR:N	2.53	0.41
1:D:199:LEU:HD23	1:D:199:LEU:HA	1.87	0.41
1:A:52:PRO:HG3	1:A:111:GLY:H	1.86	0.41
1:A:137:LEU:O	1:A:141:VAL:HG12	2.19	0.41
1:A:374:ARG:HA	1:A:374:ARG:HD3	1.57	0.41
2:B:396:LEU:HD23	2:B:396:LEU:HA	1.86	0.41
1:C:92:THR:O	1:C:96:VAL:HG23	2.21	0.41
1:A:139:ASP:CG	1:A:169:ARG:HH22	2.29	0.41
1:A:379:ASP:O	1:A:383:GLN:HG2	2.20	0.41
2:B:154:LYS:H	2:B:154:LYS:HG2	1.65	0.41
2:B:174:LEU:HA	2:B:175:PRO:HD3	1.95	0.41
2:B:174:LEU:HA	2:B:174:LEU:HD12	1.86	0.41
2:B:237:TRP:CH2	2:B:312:PHE:HB2	2.51	0.41
2:B:390:SER:O	2:B:390:SER:OG	2.30	0.41
2:B:446:ILE:HD12	2:B:469:PRO:HA	2.02	0.41
2:B:512:ASN:OD1	2:B:513:ASP:N	2.54	0.41
1:C:442:ILE:HD13	1:C:442:ILE:HA	1.87	0.41
1:D:218:ASN:HD22	1:D:219:PRO:CD	2.34	0.41
1:D:380:LEU:HA	1:D:383:GLN:HE21	1.85	0.41
1:A:406:PRO:HD3	1:A:449:PRO:HA	2.02	0.41
2:B:369:LYS:HA	2:B:372:THR:HG22	2.03	0.41
1:D:54:ASP:OD1	1:D:54:ASP:N	2.52	0.41
1:D:428:SER:OG	1:D:429:ILE:N	2.54	0.41
1:A:55:HIS:O	1:A:59:ILE:HG13	2.21	0.40
1:A:351:PRO:HD3	1:D:329:HIS:NE2	2.36	0.40
1:D:152:ILE:HD13	1:D:152:ILE:HA	1.82	0.40
1:D:230:ASN:OD1	1:D:230:ASN:N	2.46	0.40
1:A:154:SER:OG	1:A:155:GLN:N	2.54	0.40
1:A:484:ILE:HA	1:A:487:ASN:OD1	2.21	0.40
1:D:219:PRO:O	1:D:222:THR:OG1	2.37	0.40
1:D:360:HIS:ND1	1:D:360:HIS:C	2.78	0.40
2:B:478:VAL:HG23	2:B:501:HIS:HB2	2.03	0.40
1:C:175:PHE:O	1:C:179:GLU:HG2	2.21	0.40
1:C:392:TYR:CE2	1:C:461:GLN:NE2	2.89	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:415:GLY:HA2	1:D:458:ARG:HE	1.86	0.40
1:D:420:VAL:HG21	1:D:455:ARG:NH2	2.36	0.40
1:D:431:ARG:HG3	1:D:432:GLU:N	2.35	0.40
2:B:67:ILE:HD13	2:B:67:ILE:HA	1.93	0.40
2:B:441:THR:O	2:B:501:HIS:N	2.48	0.40
1:C:407:THR:O	1:C:467:ARG:HB2	2.21	0.40

There are no symmetry-related clashes.

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 PDB entries followed by that with respect to all EM entries.

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	439/885 (50%)	396 (90%)	43 (10%)	0	100	100
1	C	439/885 (50%)	393 (90%)	46 (10%)	0	100	100
1	D	438/885 (50%)	403 (92%)	35 (8%)	0	100	100
2	B	472/710 (66%)	429 (91%)	41 (9%)	2 (0%)	30	58
All	All	1788/3365 (53%)	1621 (91%)	165 (9%)	2 (0%)	50	76

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	85	ARG
2	B	60	LEU

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 PDB entries followed by that with respect to all EM entries.

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	392/766 (51%)	353 (90%)	39 (10%)	6	18
1	C	392/766 (51%)	354 (90%)	38 (10%)	6	19
1	D	391/766 (51%)	356 (91%)	35 (9%)	8	22
2	B	420/615 (68%)	371 (88%)	49 (12%)	4	13
All	All	1595/2913 (55%)	1434 (90%)	161 (10%)	9	17

All (161) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	71	THR
1	A	91	ILE
1	A	102	ILE
1	A	104	ILE
1	A	106	MET
1	A	113	LEU
1	A	117	THR
1	A	126	GLN
1	A	137	LEU
1	A	143	THR
1	A	152	ILE
1	A	159	LEU
1	A	161	ASN
1	A	164	ARG
1	A	174	LEU
1	A	178	LEU
1	A	189	VAL
1	A	217	SER
1	A	235	SER
1	A	251	LEU
1	A	284	LEU
1	A	296	THR
1	A	324	ASP
1	A	352	LYS
1	A	372	LEU
1	A	377	SER
1	A	407	THR
1	A	423	ASP
1	A	427	GLU
1	A	430	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	434	LYS
1	A	439	ILE
1	A	441	GLU
1	A	447	TYR
1	A	458	ARG
1	A	484	ILE
1	A	487	ASN
1	A	488	LEU
1	A	489	LEU
2	B	55	VAL
2	B	66	PHE
2	B	69	ASP
2	B	74	SER
2	B	78	ILE
2	B	84	ARG
2	B	91	LEU
2	B	100	SER
2	B	107	GLU
2	B	111	GLU
2	B	120	THR
2	B	123	LEU
2	B	131	VAL
2	B	144	ASN
2	B	177	GLN
2	B	180	TYR
2	B	182	THR
2	B	204	LEU
2	B	219	HIS
2	B	225	ILE
2	B	228	ILE
2	B	230	LEU
2	B	231	LEU
2	B	233	VAL
2	B	245	LEU
2	B	264	VAL
2	B	285	VAL
2	B	286	THR
2	B	314	ILE
2	B	357	THR
2	B	362	MET
2	B	374	GLU
2	B	384	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	B	388	ILE
2	B	390	SER
2	B	399	SER
2	B	432	GLU
2	B	433	ILE
2	B	447	VAL
2	B	451	VAL
2	B	454	ILE
2	B	461	GLU
2	B	488	VAL
2	B	506	GLU
2	B	508	VAL
2	B	519	ILE
2	B	523	PHE
2	B	524	MET
2	B	525	THR
1	C	54	ASP
1	C	59	ILE
1	C	61	GLU
1	C	71	THR
1	C	75	SER
1	C	89	LEU
1	C	90	SER
1	C	106	MET
1	C	115	LYS
1	C	116	SER
1	C	127	ILE
1	C	129	PHE
1	C	132	LEU
1	C	142	SER
1	C	153	SER
1	C	169	ARG
1	C	174	LEU
1	C	178	LEU
1	C	183	ASN
1	C	190	ARG
1	C	291	LEU
1	C	346	THR
1	C	359	SER
1	C	365	SER
1	C	367	MET
1	C	377	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	379	ASP
1	C	386	SER
1	C	420	VAL
1	C	421	ASP
1	C	452	PHE
1	C	453	THR
1	C	458	ARG
1	C	459	LEU
1	C	461	GLN
1	C	462	LEU
1	C	468	THR
1	C	492	LEU
1	D	71	THR
1	D	89	LEU
1	D	90	SER
1	D	102	ILE
1	D	105	ILE
1	D	106	MET
1	D	135	TRP
1	D	142	SER
1	D	146	SER
1	D	152	ILE
1	D	159	LEU
1	D	217	SER
1	D	222	THR
1	D	249	THR
1	D	251	LEU
1	D	306	ILE
1	D	322	LEU
1	D	341	LEU
1	D	346	THR
1	D	359	SER
1	D	363	PHE
1	D	372	LEU
1	D	379	ASP
1	D	383	GLN
1	D	391	GLU
1	D	408	ASP
1	D	424	THR
1	D	437	ASP
1	D	442	ILE
1	D	445	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	D	474	ILE
1	D	478	VAL
1	D	487	ASN
1	D	489	LEU
1	D	490	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (33) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	216	ASN
1	A	323	GLN
1	A	402	GLN
2	B	81	HIS
2	B	149	ASN
2	B	153	HIS
2	B	219	HIS
2	B	251	HIS
2	B	330	HIS
2	B	361	GLN
2	B	421	GLN
2	B	423	GLN
2	B	495	GLN
2	B	522	ASN
1	C	94	ASN
1	C	185	ASN
1	C	216	ASN
1	C	227	ASN
1	C	290	ASN
1	C	301	ASN
1	C	307	GLN
1	C	342	GLN
1	C	378	ASN
1	C	383	GLN
1	C	414	ASN
1	C	450	GLN
1	D	185	ASN
1	D	218	ASN
1	D	277	ASN
1	D	294	HIS
1	D	314	HIS
1	D	383	GLN
1	D	487	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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 7 ligands modelled in this entry, 3 are monoatomic - leaving 4 for Mogul analysis.

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	POV	A	901	-	38,38,51	1.27	6 (15%)	42,43,59	1.24	6 (14%)
3	POV	D	901	-	38,38,51	0.54	0	42,43,59	0.87	3 (7%)
3	POV	C	901	-	38,38,51	1.04	1 (2%)	42,43,59	1.38	5 (11%)
3	POV	B	801	-	38,38,51	0.53	0	42,43,59	0.70	2 (4%)

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	POV	A	901	-	-	21/40/40/55	-
3	POV	D	901	-	-	25/40/40/55	-
3	POV	C	901	-	-	19/40/40/55	-
3	POV	B	801	-	-	21/40/40/55	-

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	901	POV	O22-C21	-3.13	1.13	1.22
3	A	901	POV	C313-C312	-3.01	1.34	1.51
3	A	901	POV	C27-C28	-2.92	1.40	1.52
3	A	901	POV	O22-C21	-2.77	1.14	1.22
3	A	901	POV	C23-C22	-2.44	1.43	1.52
3	A	901	POV	C22-C21	-2.08	1.44	1.50
3	A	901	POV	C36-C35	-2.05	1.40	1.51

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	901	POV	O21-C21-C22	5.29	122.89	111.50
3	D	901	POV	O21-C21-C22	3.35	118.72	111.50
3	A	901	POV	O11-P-O14	3.35	115.87	106.47
3	A	901	POV	O21-C21-C22	3.28	118.58	111.50
3	A	901	POV	O12-P-O11	-2.76	99.38	106.73
3	D	901	POV	O13-P-O14	2.46	120.31	110.68
3	C	901	POV	O11-P-O14	2.46	113.37	106.47
3	C	901	POV	O22-C21-C22	-2.31	114.72	123.73
3	A	901	POV	O13-P-O14	2.28	119.59	110.68
3	A	901	POV	C3-C2-C1	2.27	117.16	111.79
3	C	901	POV	O12-P-O14	-2.25	101.86	110.68
3	D	901	POV	O13-P-O11	2.25	112.72	106.73
3	C	901	POV	O13-P-O14	2.25	119.48	110.68
3	B	801	POV	O13-P-O14	2.18	119.22	110.68
3	A	901	POV	C2-O21-C21	2.10	122.97	117.79
3	B	801	POV	O12-P-O11	-2.04	101.30	106.73

There are no chirality outliers.

All (86) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	901	POV	C1-O11-P-O12
3	A	901	POV	C1-O11-P-O13
3	A	901	POV	C1-O11-P-O14
3	B	801	POV	C1-O11-P-O12
3	B	801	POV	C1-O11-P-O13
3	B	801	POV	C1-O11-P-O14
3	B	801	POV	C211-C210-C29-C28
3	B	801	POV	C22-C21-O21-C2
3	C	901	POV	C1-O11-P-O12

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
3	C	901	POV	C1-O11-P-O13
3	C	901	POV	C1-O11-P-O14
3	C	901	POV	C2-C1-O11-P
3	C	901	POV	C32-C31-O31-C3
3	D	901	POV	C1-O11-P-O12
3	D	901	POV	C1-O11-P-O13
3	D	901	POV	C1-O11-P-O14
3	C	901	POV	O32-C31-O31-C3
3	D	901	POV	O32-C31-O31-C3
3	B	801	POV	O22-C21-O21-C2
3	D	901	POV	C2-C3-O31-C31
3	D	901	POV	C32-C31-O31-C3
3	B	801	POV	C32-C33-C34-C35
3	B	801	POV	C34-C35-C36-C37
3	D	901	POV	C22-C21-O21-C2
3	A	901	POV	C21-C22-C23-C24
3	C	901	POV	C31-C32-C33-C34
3	D	901	POV	C31-C32-C33-C34
3	D	901	POV	O22-C21-O21-C2
3	A	901	POV	C39-C310-C311-C312
3	A	901	POV	C23-C24-C25-C26
3	D	901	POV	C311-C310-C39-C38
3	D	901	POV	C23-C24-C25-C26
3	D	901	POV	C32-C33-C34-C35
3	A	901	POV	C32-C33-C34-C35
3	B	801	POV	C36-C37-C38-C39
3	C	901	POV	C33-C34-C35-C36
3	D	901	POV	C24-C25-C26-C27
3	A	901	POV	C36-C37-C38-C39
3	C	901	POV	C311-C312-C313-C314
3	D	901	POV	C34-C35-C36-C37
3	D	901	POV	C35-C36-C37-C38
3	A	901	POV	O22-C21-O21-C2
3	B	801	POV	C22-C23-C24-C25
3	A	901	POV	C33-C34-C35-C36
3	D	901	POV	C26-C27-C28-C29
3	C	901	POV	C37-C38-C39-C310
3	C	901	POV	C24-C25-C26-C27
3	A	901	POV	C22-C21-O21-C2
3	C	901	POV	C22-C21-O21-C2
3	B	801	POV	C37-C38-C39-C310
3	C	901	POV	O22-C21-O21-C2

Continued on next page...

Continued from previous page...

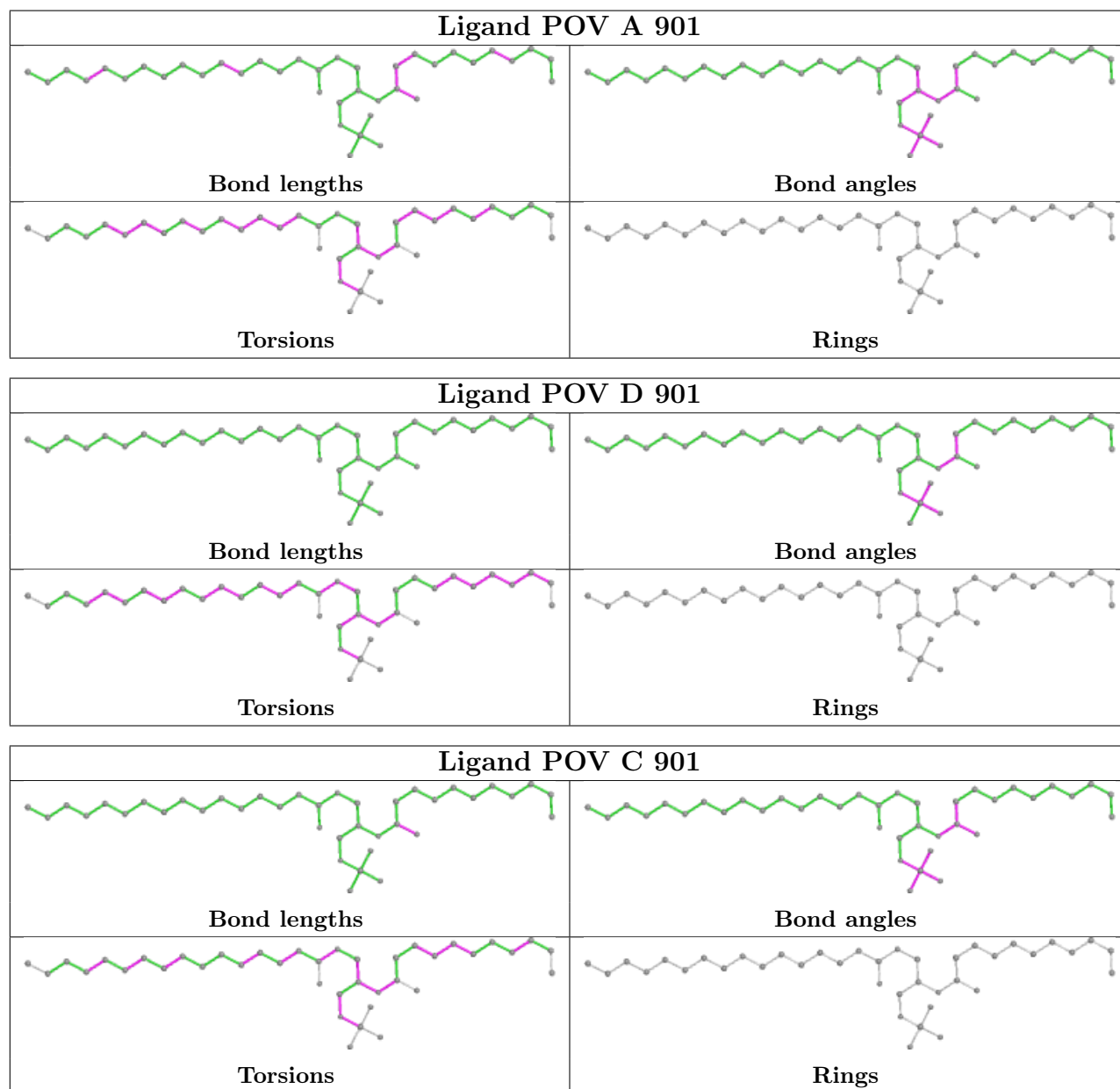
Mol	Chain	Res	Type	Atoms
3	B	801	POV	C311-C310-C39-C38
3	D	901	POV	C310-C311-C312-C313
3	D	901	POV	C311-C312-C313-C314
3	D	901	POV	O11-C1-C2-C3
3	B	801	POV	C24-C25-C26-C27
3	A	901	POV	C1-C2-O21-C21
3	A	901	POV	C310-C311-C312-C313
3	A	901	POV	C34-C35-C36-C37
3	B	801	POV	O21-C2-C3-O31
3	D	901	POV	C37-C38-C39-C310
3	B	801	POV	O11-C1-C2-C3
3	A	901	POV	C31-C32-C33-C34
3	A	901	POV	C2-C1-O11-P
3	B	801	POV	C1-C2-C3-O31
3	D	901	POV	O11-C1-C2-O21
3	D	901	POV	C25-C26-C27-C28
3	C	901	POV	C22-C23-C24-C25
3	D	901	POV	C211-C210-C29-C28
3	A	901	POV	C25-C26-C27-C28
3	C	901	POV	C23-C24-C25-C26
3	B	801	POV	C1-C2-O21-C21
3	B	801	POV	C3-C2-O21-C21
3	C	901	POV	C1-C2-O21-C21
3	B	801	POV	C25-C26-C27-C28
3	A	901	POV	C22-C23-C24-C25
3	D	901	POV	C27-C28-C29-C210
3	A	901	POV	O21-C2-C3-O31
3	C	901	POV	C1-C2-C3-O31
3	D	901	POV	C1-C2-O21-C21
3	B	801	POV	C311-C312-C313-C314
3	C	901	POV	C39-C310-C311-C312
3	B	801	POV	C27-C28-C29-C210
3	C	901	POV	C27-C28-C29-C210
3	A	901	POV	C1-C2-C3-O31
3	A	901	POV	C311-C310-C39-C38

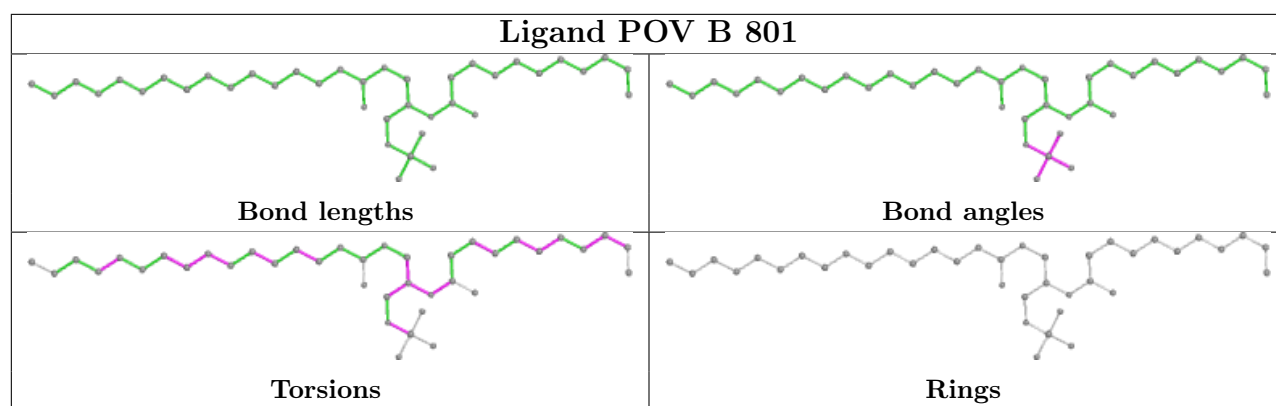
There are no ring outliers.

2 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	901	POV	3	0
3	C	901	POV	9	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.