



# Full wwPDB X-ray Structure Validation Report ⓘ

May 29, 2020 – 12:30 pm BST

PDB ID : 1VAO  
Title : STRUCTURE OF THE OCTAMERIC FLAVOENZYME VANILLYL-ALCOHOL OXIDASE  
Authors : Mattevi, A.  
Deposited on : 1997-04-10  
Resolution : 2.50 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.11

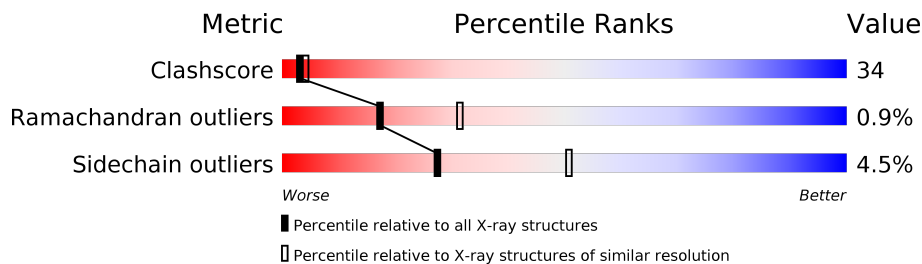
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.50 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)

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

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	560	
1	B	560	

## 2 Entry composition [i](#)

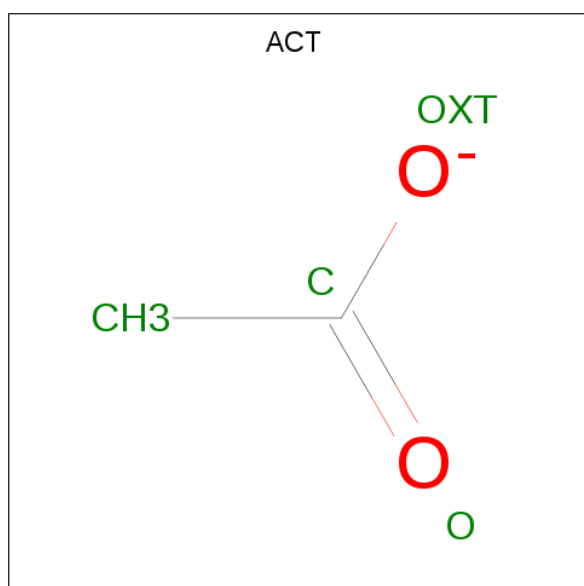
There are 5 unique types of molecules in this entry. The entry contains 9134 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called VANILLYL-ALCOHOL OXIDASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	550	4351	2793	744	790	24	36	0	0
1	B	550	4351	2793	744	790	24	36	0	0

- Molecule 2 is ACETATE ION (three-letter code: ACT) (formula: C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>).

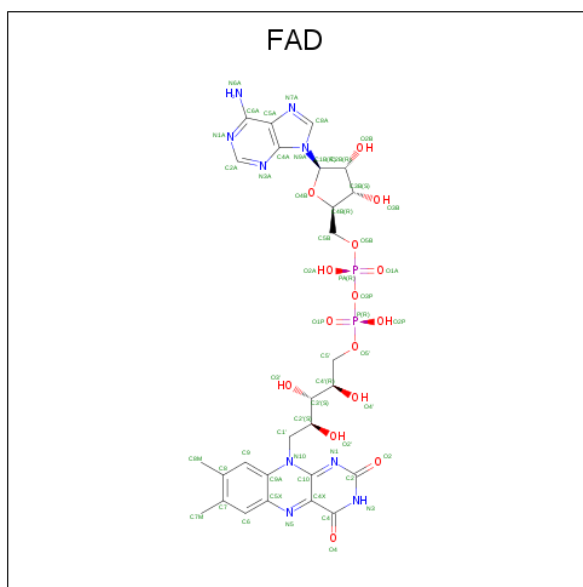


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
2	A	1	4	2	2	0	0
2	B	1	4	2	2	0	0

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	1	Total Cl 1 1	0	0
3	A	1	Total Cl 1 1	0	0

- Molecule 4 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula:  $C_{27}H_{33}N_9O_{15}P_2$ ).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C N O P 53 27 9 15 2	0	0
4	B	1	Total C N O P 53 27 9 15 2	0	0

- Molecule 5 is water.

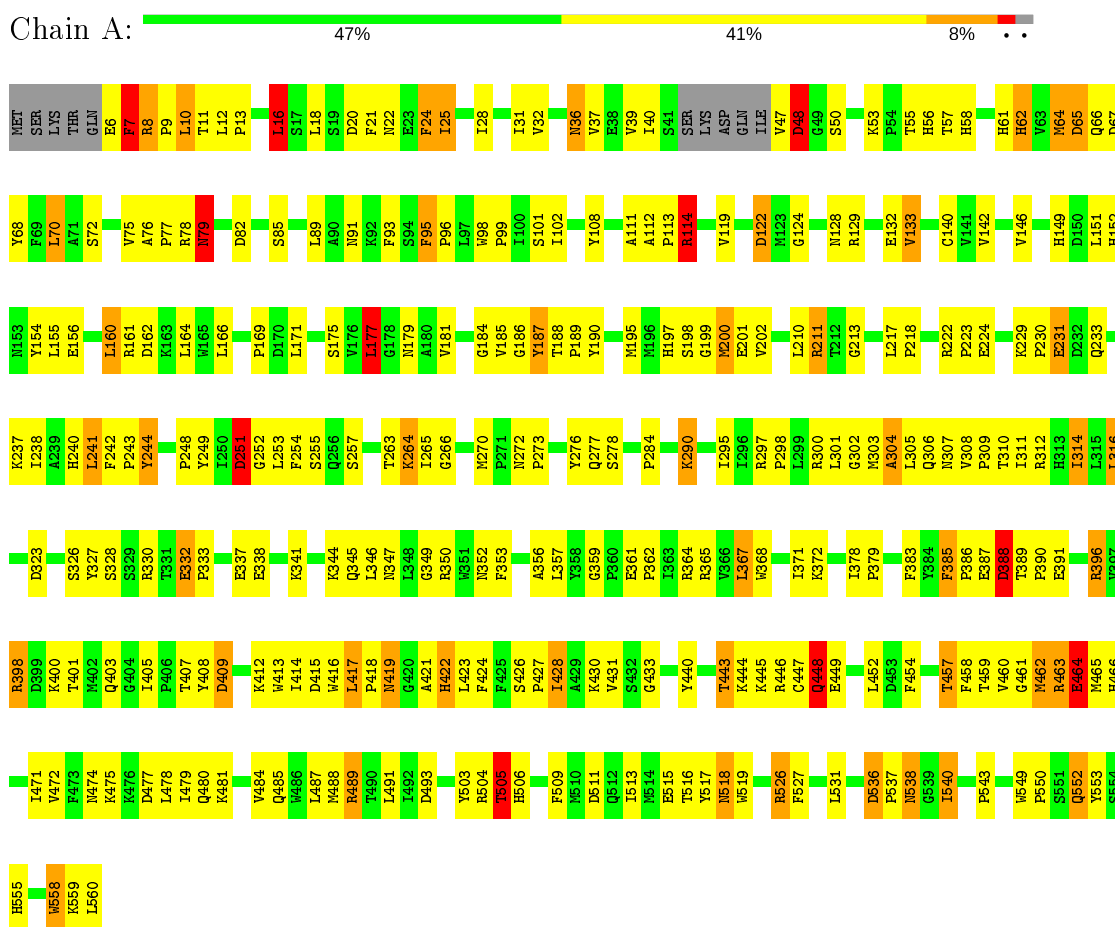
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	166	Total O 166 166	0	0
5	B	150	Total O 150 150	0	0

### 3 Residue-property plots

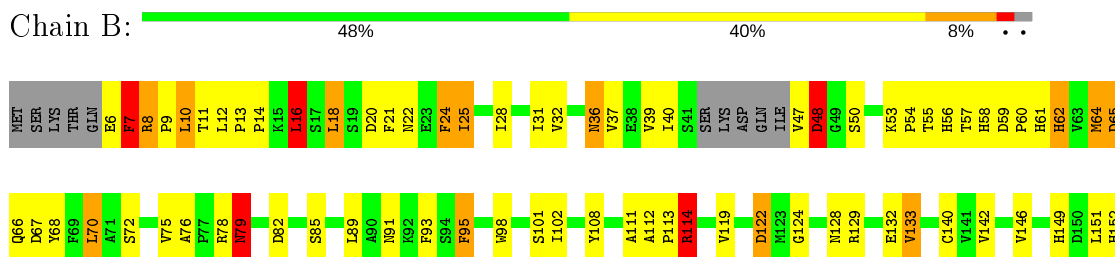
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

Note EDS was not executed.

- Molecule 1: VANILLYL-ALCOHOL OXIDASE



- Molecule 1: VANILLYL-ALCOHOL OXIDASE



W153	P243	S328	G464	Q480
Y154	Y244	S329	I405	K481
L155	G245	R330	P406	R482
E156	F246	T331	T407	F483
L160	G247	E332	Y408	V484
R161	P248	R333	D409	Q485
D162	Y249	E337	K412	W486
K163	I250	E338	W413	L487
L164	D251	K341	I414	M488
W165	G252	K344	D415	R489
L166	L253	Q344	W416	T490
P169	P254	Q345	I417	L491
D170	S255	Q346	P418	T492
L171	I261	L346	M419	D493
S175	V262	N347	G420	W500
W176	K263	L348	A421	Y503
L177	Q264	G349	H422	R504
G178	L265	R350	I423	B505
N179	G266	K351	F424	B506
A180	M270	N352	I428	F509
V181	P271	F353	A429	M510
G184	N272	A356	K430	D511
V185	P273	L357	V431	D512
G186	Y276	S358	S432	I513
Y187	Q277	G359	G433	M514
T188	S278	P360	Y440	E515
P189	P284	E361	T443	T516
Y190	K290	P362	K444	M518
M195	I295	I363	K445	W519
R197	I296	R364	R446	R526
S198	R297	R365	C447	F527
G199	P298	V366	Q448	L531
M200	L299	W368	E449	D536
E201	R300	I371	F454	P537
V202	L301	K372	T457	M538
L210	G302	I378	F458	G539
R211	M303	P379	T459	I540
R222	A304	F383	V460	P543
P223	L305	V384	G461	W549
E224	Q306	F385	M462	S551
K229	N307	P386	R463	Q552
P230	V308	E387	E464	Y553
E231	P309	D388	M465	H555
D232	T310	T389	H466	W558
Q233	I311	P390	I471	K559
L238	R312	R396	V472	L560
A239	H313	V397	F473	
H240	D314	R398	N474	
L241	L315	D399	K475	
F242	L316	K400	K476	
	K324	T401	D477	
	Y327	M402	L478	
		Q403	I479	

## 4 Data and refinement statistics

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

Property	Value	Source
Space group	I 4	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	130.24Å 130.24Å 133.51Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	30.00 – 2.50	Depositor
% Data completeness (in resolution range)	98.9 (30.00-2.50)	Depositor
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.88	Depositor
Refinement program	TNT 5E	Depositor
R, $R_{free}$	0.220 , 0.290	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	9134	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	24.0	wwPDB-VP

## 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: CL, FAD, ACT

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	0.76	3/4470 (0.1%)	1.68	89/6075 (1.5%)
1	B	0.76	3/4470 (0.1%)	1.68	89/6075 (1.5%)
All	All	0.76	6/8940 (0.1%)	1.68	178/12150 (1.5%)

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	A	2	0
1	B	2	0
All	All	4	0

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	7	PHE	CE1-CZ	7.54	1.51	1.37
1	B	7	PHE	CE1-CZ	7.50	1.51	1.37
1	A	7	PHE	CD1-CE1	7.35	1.53	1.39
1	B	7	PHE	CD1-CE1	7.35	1.53	1.39
1	A	7	PHE	CD2-CE2	6.36	1.51	1.39
1	B	7	PHE	CD2-CE2	6.34	1.51	1.39

All (178) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	526	ARG	NE-CZ-NH2	-19.95	110.33	120.30
1	A	526	ARG	NE-CZ-NH2	-19.88	110.36	120.30
1	B	526	ARG	NE-CZ-NH1	13.88	127.24	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	526	ARG	NE-CZ-NH1	13.87	127.23	120.30
1	A	489	ARG	NE-CZ-NH1	12.01	126.31	120.30
1	B	489	ARG	NE-CZ-NH1	11.88	126.24	120.30
1	A	7	PHE	CB-CG-CD1	11.24	128.67	120.80
1	B	7	PHE	CB-CG-CD1	11.23	128.66	120.80
1	B	128	ASN	CB-CA-C	-10.13	90.14	110.40
1	A	128	ASN	CB-CA-C	-10.12	90.15	110.40
1	B	526	ARG	CG-CD-NE	-9.51	91.83	111.80
1	A	526	ARG	CG-CD-NE	-9.50	91.86	111.80
1	B	200	MET	CG-SD-CE	-9.06	85.70	100.20
1	A	200	MET	CG-SD-CE	-9.05	85.71	100.20
1	B	464	GLU	N-CA-CB	-8.84	94.69	110.60
1	A	464	GLU	N-CA-CB	-8.81	94.73	110.60
1	B	7	PHE	CB-CG-CD2	-8.78	114.65	120.80
1	A	7	PHE	CB-CG-CD2	-8.77	114.66	120.80
1	A	536	ASP	C-N-CD	-8.63	101.62	120.60
1	B	536	ASP	C-N-CD	-8.62	101.63	120.60
1	B	7	PHE	N-CA-C	8.55	134.09	111.00
1	A	7	PHE	N-CA-C	8.54	134.06	111.00
1	A	489	ARG	NE-CZ-NH2	-8.43	116.09	120.30
1	B	489	ARG	NE-CZ-NH2	-8.38	116.11	120.30
1	A	202	VAL	CB-CA-C	-8.35	95.53	111.40
1	B	202	VAL	CB-CA-C	-8.35	95.54	111.40
1	B	129	ARG	N-CA-C	8.30	133.40	111.00
1	A	129	ARG	N-CA-C	8.29	133.38	111.00
1	B	505	THR	CB-CA-C	-8.18	89.52	111.60
1	A	505	THR	CB-CA-C	-8.17	89.55	111.60
1	A	388	ASP	CB-CG-OD1	-8.10	111.01	118.30
1	B	388	ASP	CB-CG-OD1	-8.07	111.04	118.30
1	A	419	ASN	N-CA-C	-8.02	89.35	111.00
1	B	419	ASN	N-CA-C	-8.00	89.40	111.00
1	B	187	TYR	N-CA-C	7.80	132.06	111.00
1	A	187	TYR	N-CA-C	7.79	132.03	111.00
1	A	396	ARG	NE-CZ-NH2	-7.59	116.50	120.30
1	B	396	ARG	NE-CZ-NH2	-7.46	116.57	120.30
1	B	122	ASP	N-CA-CB	7.11	123.39	110.60
1	A	122	ASP	N-CA-CB	7.10	123.38	110.60
1	A	160	LEU	CB-CG-CD2	-7.09	98.94	111.00
1	B	160	LEU	CB-CG-CD2	-7.09	98.94	111.00
1	B	114	ARG	CB-CG-CD	7.07	129.99	111.60
1	A	114	ARG	CB-CG-CD	7.06	129.96	111.60
1	B	446	ARG	NE-CZ-NH1	-7.02	116.79	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	25	ILE	CB-CA-C	7.02	125.64	111.60
1	A	446	ARG	NE-CZ-NH1	-7.00	116.80	120.30
1	B	25	ILE	CB-CA-C	7.00	125.59	111.60
1	B	448	GLN	CB-CA-C	6.94	124.28	110.40
1	A	448	GLN	CB-CA-C	6.92	124.24	110.40
1	A	18	LEU	CA-CB-CG	-6.91	99.40	115.30
1	B	18	LEU	CA-CB-CG	-6.90	99.44	115.30
1	A	463	ARG	N-CA-CB	-6.85	98.27	110.60
1	B	463	ARG	N-CA-CB	-6.85	98.27	110.60
1	A	518	ASN	N-CA-C	6.80	129.35	111.00
1	B	518	ASN	N-CA-C	6.79	129.34	111.00
1	A	428	ILE	CG1-CB-CG2	-6.77	96.51	111.40
1	B	428	ILE	CG1-CB-CG2	-6.76	96.52	111.40
1	A	457	THR	CB-CA-C	-6.73	93.44	111.60
1	B	457	THR	CB-CA-C	-6.73	93.44	111.60
1	A	430	LYS	CB-CG-CD	-6.57	94.51	111.60
1	B	430	LYS	CB-CG-CD	-6.57	94.53	111.60
1	B	540	ILE	CB-CA-C	-6.56	98.49	111.60
1	A	540	ILE	CB-CA-C	-6.51	98.57	111.60
1	A	177	LEU	CA-CB-CG	6.42	130.08	115.30
1	B	177	LEU	CA-CB-CG	6.42	130.05	115.30
1	A	558	TRP	N-CA-C	6.40	128.28	111.00
1	B	558	TRP	N-CA-C	6.39	128.25	111.00
1	B	241	LEU	CB-CG-CD2	6.24	121.60	111.00
1	A	241	LEU	CB-CG-CD2	6.22	121.57	111.00
1	A	304	ALA	N-CA-C	-6.14	94.42	111.00
1	B	251	ASP	CB-CG-OD1	6.13	123.82	118.30
1	A	526	ARG	CD-NE-CZ	6.13	132.18	123.60
1	B	487	LEU	CB-CG-CD2	-6.13	100.58	111.00
1	B	177	LEU	CB-CA-C	6.13	121.84	110.20
1	A	430	LYS	CD-CE-NZ	-6.12	97.61	111.70
1	B	304	ALA	N-CA-C	-6.12	94.47	111.00
1	B	430	LYS	CD-CE-NZ	-6.12	97.62	111.70
1	A	177	LEU	CB-CA-C	6.12	121.83	110.20
1	A	487	LEU	CB-CG-CD2	-6.11	100.61	111.00
1	B	526	ARG	CD-NE-CZ	6.11	132.15	123.60
1	B	36	ASN	CB-CA-C	6.08	122.57	110.40
1	A	251	ASP	CB-CG-OD1	6.08	123.77	118.30
1	A	211	ARG	CB-CG-CD	6.08	127.40	111.60
1	B	211	ARG	CB-CG-CD	6.08	127.40	111.60
1	A	36	ASN	CB-CA-C	6.07	122.53	110.40
1	B	388	ASP	CB-CG-OD2	6.02	123.72	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	62	HIS	N-CA-C	6.02	127.25	111.00
1	A	367	LEU	CA-CB-CG	-6.01	101.46	115.30
1	B	367	LEU	CA-CB-CG	-6.01	101.48	115.30
1	A	62	HIS	N-CA-C	6.00	127.20	111.00
1	A	388	ASP	CB-CG-OD2	5.98	123.68	118.30
1	B	297	ARG	N-CA-C	5.97	127.13	111.00
1	A	297	ARG	N-CA-C	5.97	127.11	111.00
1	A	8	ARG	CB-CA-C	-5.96	98.47	110.40
1	B	8	ARG	CB-CA-C	-5.93	98.53	110.40
1	A	24	PHE	N-CA-CB	-5.92	99.94	110.60
1	B	24	PHE	N-CA-CB	-5.92	99.95	110.60
1	A	171	LEU	CB-CG-CD2	-5.91	100.96	111.00
1	B	171	LEU	CB-CG-CD2	-5.90	100.98	111.00
1	B	398	ARG	NE-CZ-NH1	5.87	123.24	120.30
1	A	398	ARG	NE-CZ-NH1	5.85	123.23	120.30
1	A	462	MET	CA-CB-CG	5.83	123.21	113.30
1	A	493	ASP	CB-CG-OD1	5.80	123.52	118.30
1	B	462	MET	CA-CB-CG	5.79	123.14	113.30
1	B	290	LYS	CD-CE-NZ	5.77	124.97	111.70
1	A	290	LYS	CD-CE-NZ	5.75	124.94	111.70
1	B	493	ASP	CB-CG-OD1	5.75	123.47	118.30
1	B	48	ASP	C-N-CA	-5.74	110.25	122.30
1	A	48	ASP	C-N-CA	-5.72	110.28	122.30
1	B	164	LEU	CB-CA-C	-5.69	99.39	110.20
1	A	164	LEU	CB-CA-C	-5.65	99.46	110.20
1	A	79	ASN	N-CA-CB	-5.65	100.43	110.60
1	B	211	ARG	NE-CZ-NH2	-5.65	117.48	120.30
1	B	79	ASN	N-CA-CB	-5.64	100.44	110.60
1	B	244	TYR	N-CA-C	5.64	126.22	111.00
1	A	244	TYR	N-CA-C	5.63	126.21	111.00
1	A	211	ARG	NE-CZ-NH2	-5.57	117.51	120.30
1	B	264	LYS	CB-CA-C	-5.57	99.26	110.40
1	A	264	LYS	CB-CA-C	-5.56	99.28	110.40
1	B	312	ARG	NE-CZ-NH2	-5.56	117.52	120.30
1	B	16	LEU	CB-CG-CD1	5.54	120.42	111.00
1	A	89	LEU	CB-CG-CD2	-5.54	101.59	111.00
1	A	16	LEU	CB-CG-CD1	5.53	120.40	111.00
1	B	89	LEU	CB-CG-CD2	-5.51	101.63	111.00
1	B	133	VAL	N-CA-C	-5.50	96.14	111.00
1	A	133	VAL	N-CA-C	-5.50	96.15	111.00
1	A	415	ASP	N-CA-C	5.50	125.84	111.00
1	B	415	ASP	N-CA-C	5.49	125.82	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	312	ARG	NE-CZ-NH2	-5.48	117.56	120.30
1	A	417	LEU	CB-CG-CD2	5.45	120.27	111.00
1	B	417	LEU	CB-CG-CD2	5.45	120.26	111.00
1	A	421	ALA	N-CA-C	-5.42	96.36	111.00
1	B	10	LEU	CB-CG-CD1	-5.41	101.81	111.00
1	B	421	ALA	N-CA-C	-5.41	96.41	111.00
1	A	16	LEU	CA-CB-CG	5.40	127.71	115.30
1	B	16	LEU	CA-CB-CG	5.40	127.72	115.30
1	B	443	THR	CB-CA-C	-5.40	97.03	111.60
1	A	443	THR	CB-CA-C	-5.39	97.04	111.60
1	A	10	LEU	CB-CG-CD1	-5.39	101.84	111.00
1	A	32	VAL	N-CA-C	5.37	125.50	111.00
1	B	32	VAL	N-CA-C	5.36	125.48	111.00
1	B	560	LEU	N-CA-C	-5.32	96.65	111.00
1	A	560	LEU	N-CA-C	-5.30	96.70	111.00
1	A	396	ARG	NE-CZ-NH1	5.28	122.94	120.30
1	B	493	ASP	CB-CG-OD2	-5.25	113.58	118.30
1	B	251	ASP	CB-CG-OD2	-5.23	113.59	118.30
1	B	396	ARG	NE-CZ-NH1	5.23	122.91	120.30
1	B	316	LEU	CB-CG-CD2	-5.22	102.13	111.00
1	A	316	LEU	CB-CG-CD2	-5.21	102.13	111.00
1	A	461	GLY	N-CA-C	-5.19	100.12	113.10
1	A	493	ASP	CB-CG-OD2	-5.19	113.63	118.30
1	B	461	GLY	N-CA-C	-5.19	100.13	113.10
1	A	251	ASP	CB-CG-OD2	-5.16	113.66	118.30
1	B	114	ARG	CG-CD-NE	5.14	122.59	111.80
1	A	114	ARG	CG-CD-NE	5.13	122.57	111.80
1	A	332	GLU	N-CA-CB	5.12	119.82	110.60
1	A	290	LYS	CB-CG-CD	5.12	124.92	111.60
1	B	70	LEU	CA-CB-CG	5.12	127.08	115.30
1	B	306	GLN	N-CA-C	5.12	124.83	111.00
1	A	249	TYR	CB-CA-C	5.11	120.63	110.40
1	A	70	LEU	CA-CB-CG	5.11	127.06	115.30
1	B	290	LYS	CB-CG-CD	5.11	124.89	111.60
1	A	290	LYS	CA-CB-CG	-5.11	102.16	113.40
1	B	332	GLU	N-CA-CB	5.11	119.80	110.60
1	B	290	LYS	CA-CB-CG	-5.11	102.17	113.40
1	A	306	GLN	N-CA-C	5.10	124.77	111.00
1	B	249	TYR	CB-CA-C	5.10	120.59	110.40
1	A	385	PHE	N-CA-C	-5.09	97.26	111.00
1	B	385	PHE	N-CA-C	-5.08	97.28	111.00
1	B	211	ARG	CB-CA-C	5.07	120.54	110.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	171	LEU	CA-CB-CG	-5.06	103.66	115.30
1	A	231	GLU	CA-CB-CG	-5.06	102.27	113.40
1	B	231	GLU	CA-CB-CG	-5.06	102.27	113.40
1	A	211	ARG	CB-CA-C	5.05	120.50	110.40
1	B	171	LEU	CA-CB-CG	-5.05	103.68	115.30
1	B	538	ASN	CB-CA-C	-5.02	100.36	110.40
1	A	538	ASN	CB-CA-C	-5.02	100.36	110.40

All (4) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	A	7	PHE	CA
1	A	332	GLU	CA
1	B	7	PHE	CA
1	B	332	GLU	CA

There are no planarity outliers.

## 5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4351	0	4288	307	1
1	B	4351	0	4288	286	0
2	A	4	0	3	0	0
2	B	4	0	3	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	53	0	29	6	0
4	B	53	0	29	5	0
5	A	166	0	0	19	0
5	B	150	0	0	11	0
All	All	9134	0	8640	580	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 34.

All (580) 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)
4:B:600:FAD:H51A	4:B:600:FAD:H8A	1.22	1.16
4:A:600:FAD:H8A	4:A:600:FAD:H51A	1.23	1.11
1:A:253:LEU:HD21	1:B:253:LEU:HD21	1.11	1.07
1:A:211:ARG:HG3	1:B:519:TRP:CZ3	1.99	0.98
1:B:555:HIS:HB3	1:B:559:LYS:HE3	1.46	0.97
1:A:555:HIS:HB3	1:A:559:LYS:HE3	1.46	0.97
1:A:91:ASN:HD22	1:A:538:ASN:ND2	1.62	0.97
1:B:91:ASN:HD22	1:B:538:ASN:ND2	1.62	0.96
1:B:91:ASN:ND2	1:B:538:ASN:HD22	1.66	0.94
1:A:519:TRP:CZ3	1:B:211:ARG:HG3	2.03	0.93
1:A:91:ASN:ND2	1:A:538:ASN:HD22	1.66	0.91
1:A:448:GLN:N	1:A:448:GLN:HE21	1.70	0.89
1:B:448:GLN:HE21	1:B:448:GLN:N	1.70	0.89
1:A:550:PRO:HB2	1:A:552:GLN:HE21	1.39	0.87
1:A:505:THR:HG22	1:A:506:HIS:H	1.37	0.87
1:B:550:PRO:HB2	1:B:552:GLN:HE21	1.39	0.87
1:B:505:THR:HG22	1:B:506:HIS:H	1.37	0.86
1:A:91:ASN:HD22	1:A:538:ASN:HD22	0.88	0.85
1:A:445:LYS:HE2	1:A:449:GLU:OE2	1.76	0.85
1:A:341:LYS:O	1:A:344:LYS:HG2	1.77	0.85
4:A:600:FAD:C8A	4:A:600:FAD:H51A	2.06	0.85
1:B:445:LYS:HE2	1:B:449:GLU:OE2	1.76	0.84
1:A:538:ASN:CB	1:A:540:ILE:HD11	2.08	0.84
1:A:550:PRO:HG2	1:A:553:TYR:CD1	2.13	0.84
1:A:414:ILE:HD11	4:A:600:FAD:HM71	1.56	0.84
1:A:78:ARG:HD3	1:A:82:ASP:OD2	1.78	0.84
1:B:538:ASN:CB	1:B:540:ILE:HD11	2.08	0.84
1:B:91:ASN:HD22	1:B:538:ASN:HD22	0.88	0.84
1:B:550:PRO:HG2	1:B:553:TYR:CD1	2.13	0.84
1:B:414:ILE:HD11	4:B:600:FAD:HM71	1.56	0.83
4:B:600:FAD:H51A	4:B:600:FAD:C8A	2.06	0.83
1:B:78:ARG:HD3	1:B:82:ASP:OD2	1.78	0.83
1:B:341:LYS:O	1:B:344:LYS:HG2	1.77	0.83
1:A:349:GLY:H	1:A:352:ASN:HD21	1.27	0.81
1:A:550:PRO:CB	1:A:552:GLN:HE21	1.93	0.80
1:B:349:GLY:H	1:B:352:ASN:HD21	1.27	0.80
1:B:550:PRO:CB	1:B:552:GLN:HE21	1.93	0.80
1:A:538:ASN:HB2	1:A:540:ILE:HD11	1.63	0.79
1:B:538:ASN:HB2	1:B:540:ILE:HD11	1.63	0.79
1:A:253:LEU:CD2	1:B:253:LEU:HD21	2.05	0.78
1:A:187:TYR:O	1:A:307:ASN:HB2	1.83	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:187:TYR:O	1:B:307:ASN:HB2	1.83	0.77
1:B:350:ARG:HD2	5:B:694:HOH:O	1.85	0.77
1:A:361:GLU:HB3	1:A:362:PRO:HD3	1.67	0.77
1:A:385:PHE:HB3	1:A:386:PRO:HD2	1.66	0.77
1:B:21:PHE:O	1:B:25:ILE:HG22	1.86	0.76
1:B:385:PHE:HB3	1:B:386:PRO:HD2	1.66	0.76
1:B:516:THR:HG21	5:B:731:HOH:O	1.84	0.76
1:B:304:ALA:HB2	5:B:631:HOH:O	1.86	0.76
1:B:341:LYS:O	1:B:345:GLN:HG3	1.86	0.76
1:B:361:GLU:HB3	1:B:362:PRO:HD3	1.67	0.76
1:A:341:LYS:O	1:A:345:GLN:HG3	1.86	0.76
1:B:482:ARG:HD2	5:B:655:HOH:O	1.86	0.76
1:A:21:PHE:O	1:A:25:ILE:HG22	1.86	0.75
1:B:419:ASN:O	1:B:474:ASN:HA	1.86	0.75
1:A:79:ASN:ND2	1:A:82:ASP:H	1.85	0.74
1:A:478:LEU:H	1:A:478:LEU:HD12	1.53	0.74
1:B:416:TRP:C	1:B:417:LEU:HD23	2.08	0.74
1:A:416:TRP:C	1:A:417:LEU:HD23	2.08	0.74
4:B:600:FAD:H8A	4:B:600:FAD:C5B	2.11	0.74
1:A:515:GLU:HB2	5:A:765:HOH:O	1.87	0.74
1:A:409:ASP:HA	1:A:412:LYS:HE3	1.69	0.74
1:A:419:ASN:O	1:A:474:ASN:HA	1.87	0.74
1:B:230:PRO:HA	1:B:233:GLN:HG3	1.70	0.73
1:B:79:ASN:ND2	1:B:82:ASP:H	1.85	0.73
1:B:409:ASP:HA	1:B:412:LYS:HE3	1.69	0.73
1:B:478:LEU:H	1:B:478:LEU:HD12	1.53	0.72
1:A:91:ASN:ND2	1:A:538:ASN:ND2	2.31	0.72
4:A:600:FAD:H8A	4:A:600:FAD:C5B	2.11	0.72
1:A:516:THR:HG21	5:A:709:HOH:O	1.88	0.72
1:B:114:ARG:NH2	5:B:638:HOH:O	2.23	0.72
1:A:230:PRO:HA	1:A:233:GLN:HG3	1.70	0.72
1:A:253:LEU:HD21	1:B:253:LEU:CD2	2.05	0.72
1:A:314:ILE:O	1:A:314:ILE:HD13	1.91	0.71
1:A:244:TYR:OH	1:B:195:MET:HG2	1.90	0.71
1:B:389:THR:HB	1:B:390:PRO:HD2	1.72	0.71
1:A:37:VAL:HG13	1:A:75:VAL:HG22	1.72	0.70
1:B:314:ILE:HD13	1:B:314:ILE:O	1.91	0.70
1:A:389:THR:HB	1:A:390:PRO:HD2	1.72	0.70
1:B:37:VAL:HG13	1:B:75:VAL:HG22	1.72	0.70
1:B:31:ILE:HD13	1:B:85:SER:HB3	1.74	0.70
1:A:31:ILE:HD13	1:A:85:SER:HB3	1.74	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:463:ARG:HD2	5:B:725:HOH:O	1.92	0.70
1:B:156:GLU:HB2	1:B:161:ARG:NH2	2.07	0.69
1:B:132:GLU:HG2	1:B:133:VAL:N	2.08	0.69
1:A:156:GLU:HB2	1:A:161:ARG:NH2	2.07	0.69
1:B:210:LEU:HD23	1:B:211:ARG:N	2.08	0.69
1:A:210:LEU:HD23	1:A:211:ARG:N	2.08	0.68
1:A:550:PRO:HG2	1:A:553:TYR:HD1	1.58	0.68
1:A:96:PRO:HG3	5:A:746:HOH:O	1.94	0.68
1:A:132:GLU:HG2	1:A:133:VAL:N	2.08	0.67
1:A:538:ASN:HB3	1:A:540:ILE:HD11	1.75	0.67
1:A:162:ASP:HB2	5:A:727:HOH:O	1.95	0.67
1:A:195:MET:HG2	1:B:244:TYR:OH	1.94	0.67
1:B:163:LYS:HG2	5:B:726:HOH:O	1.93	0.67
1:B:513:ILE:O	1:B:516:THR:HB	1.95	0.67
1:B:538:ASN:HB3	1:B:540:ILE:HD11	1.75	0.67
1:A:513:ILE:O	1:A:516:THR:HB	1.95	0.67
1:B:91:ASN:ND2	1:B:538:ASN:ND2	2.31	0.67
1:B:133:VAL:HG21	1:B:154:TYR:CE2	2.30	0.66
1:A:423:LEU:HD21	1:A:488:MET:HG3	1.78	0.66
1:B:142:VAL:CG2	1:B:146:VAL:HB	2.26	0.66
1:A:133:VAL:HG21	1:A:154:TYR:CE2	2.30	0.66
1:A:142:VAL:CG2	1:A:146:VAL:HB	2.25	0.66
1:B:550:PRO:HG2	1:B:553:TYR:HD1	1.58	0.66
1:B:156:GLU:HB2	1:B:161:ARG:NE	2.10	0.66
1:B:423:LEU:HD21	1:B:488:MET:HG3	1.78	0.66
1:A:505:THR:HG21	1:A:513:ILE:HD12	1.78	0.66
1:A:222:ARG:HG3	1:A:224:GLU:OE1	1.96	0.65
1:A:156:GLU:HB2	1:A:161:ARG:NE	2.11	0.65
1:B:349:GLY:N	1:B:352:ASN:HD21	1.94	0.65
1:A:330:ARG:NH1	1:A:338:GLU:OE1	2.30	0.65
1:B:330:ARG:NH1	1:B:338:GLU:OE1	2.30	0.65
1:A:50:SER:OG	1:A:53:LYS:N	2.29	0.65
1:A:379:PRO:HG3	5:A:668:HOH:O	1.97	0.64
1:B:505:THR:HG21	1:B:513:ILE:HD12	1.78	0.64
1:B:222:ARG:HG3	1:B:224:GLU:OE1	1.97	0.64
1:B:505:THR:HG22	1:B:506:HIS:N	2.11	0.64
1:A:505:THR:HG22	1:A:506:HIS:N	2.11	0.64
1:A:99:PRO:HD2	5:A:642:HOH:O	1.97	0.64
1:A:478:LEU:N	1:A:478:LEU:HD12	2.12	0.64
1:B:464:GLU:OE2	1:B:466:HIS:ND1	2.30	0.64
1:A:464:GLU:OE2	1:A:466:HIS:ND1	2.30	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:349:GLY:N	1:A:352:ASN:HD21	1.94	0.64
1:A:543:PRO:HB3	1:A:550:PRO:HG3	1.80	0.64
1:B:550:PRO:HB2	1:B:552:GLN:HG2	1.80	0.63
1:B:65:ASP:N	1:B:65:ASP:OD1	2.31	0.63
1:B:478:LEU:N	1:B:478:LEU:HD12	2.12	0.63
1:B:50:SER:OG	1:B:53:LYS:N	2.30	0.63
1:A:156:GLU:HB2	1:A:161:ARG:CZ	2.29	0.63
1:A:300:ARG:NH2	1:A:460:VAL:O	2.32	0.63
1:B:156:GLU:HB2	1:B:161:ARG:CZ	2.29	0.62
1:A:550:PRO:HB2	1:A:552:GLN:HG2	1.80	0.62
1:B:300:ARG:NH2	1:B:460:VAL:O	2.32	0.62
1:B:337:GLU:O	1:B:341:LYS:HG3	1.99	0.62
1:A:95:PHE:CE1	1:A:119:VAL:HG23	2.34	0.62
1:B:95:PHE:CE1	1:B:119:VAL:HG23	2.34	0.62
1:B:543:PRO:HB3	1:B:550:PRO:HG3	1.80	0.62
1:B:310:THR:HG22	1:B:459:THR:HG22	1.82	0.62
1:A:337:GLU:O	1:A:341:LYS:HG3	2.00	0.62
1:A:211:ARG:HG3	1:B:519:TRP:CE3	2.34	0.61
1:A:310:THR:HG22	1:A:459:THR:HG22	1.82	0.61
1:B:478:LEU:CD1	1:B:478:LEU:H	2.14	0.61
1:B:79:ASN:HD22	1:B:79:ASN:C	2.04	0.61
1:A:156:GLU:OE1	1:A:161:ARG:NH2	2.34	0.61
1:A:243:PRO:HD2	1:A:244:TYR:H	1.65	0.61
1:B:156:GLU:OE1	1:B:161:ARG:NH2	2.34	0.61
1:B:243:PRO:HD2	1:B:244:TYR:H	1.65	0.60
1:A:79:ASN:HD22	1:A:79:ASN:C	2.04	0.60
1:B:361:GLU:HB3	1:B:362:PRO:CD	2.31	0.60
1:A:478:LEU:H	1:A:478:LEU:CD1	2.13	0.60
1:B:505:THR:HG21	1:B:509:PHE:HB2	1.83	0.60
1:A:238:ILE:HG12	5:A:689:HOH:O	2.02	0.59
1:A:316:LEU:HD11	1:A:413:TRP:CD1	2.38	0.59
1:A:505:THR:HG21	1:A:509:PHE:HB2	1.83	0.59
1:B:409:ASP:HA	1:B:412:LYS:CE	2.33	0.59
1:B:13:PRO:HG3	1:B:95:PHE:CE1	2.37	0.59
1:A:479:ILE:N	1:A:479:ILE:HD12	2.18	0.59
1:B:316:LEU:HD11	1:B:413:TRP:CD1	2.38	0.59
1:A:361:GLU:HB3	1:A:362:PRO:CD	2.31	0.59
1:B:224:GLU:H	1:B:224:GLU:CD	2.06	0.59
1:A:58:HIS:HA	1:A:112:ALA:HB2	1.85	0.59
1:B:479:ILE:HD12	1:B:479:ILE:N	2.18	0.59
1:A:24:PHE:O	1:A:28:ILE:HG13	2.02	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:22:ASN:HA	1:B:25:ILE:HG22	1.85	0.58
1:A:224:GLU:H	1:A:224:GLU:CD	2.06	0.58
1:A:65:ASP:OD1	1:A:65:ASP:N	2.31	0.58
1:A:98:TRP:CD2	1:A:113:PRO:HA	2.38	0.58
1:B:98:TRP:CD2	1:B:113:PRO:HA	2.38	0.58
1:B:24:PHE:O	1:B:28:ILE:HG13	2.02	0.58
1:A:189:PRO:HA	1:A:307:ASN:HA	1.85	0.58
1:B:152:HIS:CE1	1:B:161:ARG:NH2	2.72	0.58
1:A:13:PRO:HG3	1:A:95:PHE:CE1	2.38	0.58
1:A:152:HIS:CE1	1:A:161:ARG:NH2	2.72	0.58
1:B:189:PRO:HA	1:B:307:ASN:HA	1.85	0.58
1:A:409:ASP:HA	1:A:412:LYS:CE	2.33	0.58
1:A:417:LEU:N	1:A:417:LEU:HD23	2.19	0.58
1:A:238:ILE:HD13	1:A:238:ILE:N	2.18	0.57
1:B:238:ILE:HD13	1:B:238:ILE:N	2.18	0.57
1:B:477:ASP:O	1:B:481:LYS:HG3	2.03	0.57
1:A:156:GLU:HB2	1:A:161:ARG:HH21	1.68	0.57
1:A:22:ASN:HA	1:A:25:ILE:HG22	1.86	0.57
1:A:477:ASP:O	1:A:481:LYS:HG3	2.03	0.57
5:A:724:HOH:O	1:B:519:TRP:HE3	1.86	0.57
1:B:56:HIS:HA	1:B:111:ALA:CB	2.34	0.57
1:B:47:VAL:HG13	1:B:66:GLN:HE22	1.70	0.57
1:B:149:HIS:O	1:B:152:HIS:HB3	2.05	0.57
1:A:56:HIS:HA	1:A:111:ALA:CB	2.34	0.57
1:B:550:PRO:HB2	1:B:552:GLN:NE2	2.16	0.57
1:B:58:HIS:HA	1:B:112:ALA:HB2	1.85	0.57
1:A:149:HIS:O	1:A:152:HIS:HB3	2.05	0.56
1:A:361:GLU:O	1:A:365:ARG:HB2	2.05	0.56
1:B:79:ASN:HD21	1:B:82:ASP:H	1.54	0.56
1:A:417:LEU:HB3	1:A:418:PRO:CD	2.35	0.56
1:B:40:ILE:HD11	1:B:57:THR:HG22	1.88	0.56
1:B:417:LEU:HB3	1:B:418:PRO:CD	2.35	0.56
1:A:156:GLU:HB2	1:A:161:ARG:HE	1.70	0.56
1:B:156:GLU:HB2	1:B:161:ARG:HH21	1.68	0.56
1:B:361:GLU:O	1:B:365:ARG:HB2	2.05	0.56
1:B:543:PRO:HB3	1:B:550:PRO:CG	2.36	0.56
1:A:338:GLU:HB3	5:A:670:HOH:O	2.04	0.56
1:A:133:VAL:HG21	1:A:154:TYR:HE2	1.69	0.56
1:A:543:PRO:HB3	1:A:550:PRO:CG	2.36	0.56
1:B:61:HIS:CE1	1:B:422:HIS:HD1	2.24	0.56
1:A:210:LEU:C	1:A:210:LEU:HD23	2.26	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:79:ASN:HD21	1:A:82:ASP:H	1.54	0.56
1:B:156:GLU:HB2	1:B:161:ARG:HE	1.70	0.56
1:A:519:TRP:CH2	1:B:211:ARG:HG3	2.40	0.56
1:B:133:VAL:HG21	1:B:154:TYR:HE2	1.69	0.55
1:B:61:HIS:ND1	1:B:422:HIS:ND1	2.51	0.55
1:A:47:VAL:HG13	1:A:66:GLN:HE22	1.70	0.55
1:B:409:ASP:OD1	1:B:409:ASP:N	2.39	0.55
1:B:388:ASP:N	1:B:388:ASP:OD1	2.37	0.55
1:A:238:ILE:O	1:A:238:ILE:HG22	2.07	0.55
1:A:505:THR:CG2	1:A:513:ILE:HD12	2.37	0.55
1:B:210:LEU:HD23	1:B:210:LEU:C	2.26	0.55
1:A:40:ILE:HD11	1:A:57:THR:HG22	1.88	0.55
1:B:349:GLY:H	1:B:352:ASN:ND2	2.02	0.55
1:A:200:MET:HB3	1:A:265:ILE:HG13	1.89	0.54
1:A:409:ASP:OD1	1:A:409:ASP:N	2.39	0.54
1:A:489:ARG:NH2	5:A:630:HOH:O	2.40	0.54
1:B:417:LEU:N	1:B:417:LEU:HD23	2.19	0.54
1:A:36:ASN:HB3	1:A:76:ALA:O	2.08	0.54
1:A:550:PRO:HB2	1:A:552:GLN:NE2	2.16	0.54
1:A:9:PRO:HG3	1:A:21:PHE:CZ	2.42	0.54
1:A:349:GLY:H	1:A:352:ASN:ND2	2.02	0.54
1:B:151:LEU:HD23	1:B:166:LEU:HD22	1.89	0.54
1:A:24:PHE:CE1	1:A:28:ILE:HD11	2.43	0.54
1:A:388:ASP:N	1:A:388:ASP:OD1	2.37	0.54
1:B:505:THR:CG2	1:B:513:ILE:HD12	2.37	0.54
1:A:300:ARG:HH21	1:A:308:VAL:HA	1.72	0.54
1:B:9:PRO:HG3	1:B:21:PHE:CZ	2.43	0.54
1:B:238:ILE:HG22	1:B:238:ILE:O	2.06	0.54
1:B:24:PHE:CE1	1:B:28:ILE:HD11	2.43	0.54
1:B:272:ASN:OD1	1:B:273:PRO:HD2	2.08	0.54
1:A:300:ARG:NH2	1:A:308:VAL:HA	2.23	0.54
1:B:300:ARG:HH21	1:B:308:VAL:HA	1.72	0.53
1:B:537:PRO:HD2	1:B:538:ASN:H	1.73	0.53
1:A:11:THR:O	1:A:72:SER:HB3	2.08	0.53
1:A:229:LYS:HD2	1:A:231:GLU:OE2	2.08	0.53
1:A:61:HIS:CE1	1:A:422:HIS:HD1	2.24	0.53
1:B:11:THR:O	1:B:72:SER:HB3	2.08	0.53
1:B:36:ASN:HB3	1:B:76:ALA:O	2.08	0.53
1:A:272:ASN:OD1	1:A:273:PRO:HD2	2.08	0.53
1:B:229:LYS:HD2	1:B:231:GLU:OE2	2.07	0.53
1:B:398:ARG:HA	1:B:401:THR:HB	1.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:200:MET:HB3	1:B:265:ILE:HG13	1.89	0.53
1:B:284:PRO:HG2	1:B:379:PRO:O	2.09	0.53
1:A:479:ILE:H	1:A:479:ILE:CD1	2.21	0.53
1:A:61:HIS:CE1	1:A:422:HIS:ND1	2.77	0.53
1:B:400:LYS:HB3	1:B:405:ILE:HB	1.90	0.53
1:B:478:LEU:HD21	5:B:664:HOH:O	2.09	0.53
1:B:422:HIS:CD2	1:B:424:PHE:CZ	2.97	0.53
1:A:422:HIS:CD2	1:A:424:PHE:CZ	2.97	0.53
1:B:479:ILE:CD1	1:B:479:ILE:H	2.21	0.53
1:A:398:ARG:HA	1:A:401:THR:HB	1.91	0.52
1:A:485:GLN:O	1:A:489:ARG:HG3	2.09	0.52
1:A:537:PRO:HD2	1:A:538:ASN:H	1.73	0.52
1:B:300:ARG:NH2	1:B:308:VAL:HA	2.23	0.52
1:A:188:THR:HG21	5:A:691:HOH:O	2.08	0.52
1:A:151:LEU:HD23	1:A:166:LEU:HD22	1.89	0.52
1:A:211:ARG:HG3	1:B:519:TRP:CH2	2.44	0.52
1:A:475:LYS:O	1:A:481:LYS:HD2	2.09	0.52
1:B:61:HIS:CE1	1:B:422:HIS:ND1	2.77	0.52
1:B:485:GLN:O	1:B:489:ARG:HG3	2.09	0.52
1:A:284:PRO:HG2	1:A:379:PRO:O	2.09	0.52
1:A:400:LYS:HB3	1:A:405:ILE:HB	1.91	0.52
1:B:447:CYS:HB2	1:B:448:GLN:HE22	1.75	0.52
1:A:61:HIS:ND1	1:A:422:HIS:ND1	2.51	0.52
1:B:133:VAL:CG2	1:B:154:TYR:CE2	2.93	0.52
1:B:515:GLU:O	1:B:518:ASN:ND2	2.43	0.52
1:B:475:LYS:O	1:B:481:LYS:HD2	2.09	0.51
1:A:515:GLU:O	1:A:518:ASN:ND2	2.43	0.51
1:A:16:LEU:HD13	1:A:20:ASP:HB2	1.93	0.51
1:A:447:CYS:HB2	1:A:448:GLN:HE22	1.75	0.51
1:B:21:PHE:CE2	1:B:25:ILE:HG21	2.45	0.51
1:A:133:VAL:CG2	1:A:154:TYR:CE2	2.93	0.51
1:A:552:GLN:CD	1:A:552:GLN:H	2.14	0.51
1:B:407:THR:HB	1:B:409:ASP:OD1	2.11	0.51
1:A:407:THR:HB	1:A:409:ASP:OD1	2.11	0.51
1:B:108:TYR:CZ	1:B:504:ARG:HG2	2.46	0.51
1:B:447:CYS:C	1:B:448:GLN:HE21	2.14	0.51
1:A:108:TYR:CZ	1:A:504:ARG:HG2	2.46	0.51
1:A:21:PHE:CE2	1:A:25:ILE:HG21	2.45	0.51
1:B:198:SER:O	1:B:240:HIS:HD2	1.94	0.51
1:A:198:SER:O	1:A:240:HIS:HD2	1.94	0.51
1:A:443:THR:HA	1:A:491:LEU:HD21	1.92	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:443:THR:HA	1:B:491:LEU:HD21	1.92	0.50
1:B:440:TYR:O	1:B:444:LYS:HB2	2.12	0.50
1:B:447:CYS:HB2	1:B:448:GLN:NE2	2.26	0.50
1:B:552:GLN:H	1:B:552:GLN:CD	2.14	0.50
1:A:350:ARG:HD2	5:A:729:HOH:O	2.11	0.50
1:B:16:LEU:HD13	1:B:20:ASP:HB2	1.93	0.50
1:A:555:HIS:CB	1:A:559:LYS:HE3	2.31	0.50
1:B:200:MET:CE	1:B:251:ASP:HB3	2.42	0.50
1:B:6:GLU:CB	1:B:39:VAL:HG21	2.41	0.50
1:A:6:GLU:CB	1:A:39:VAL:HG21	2.41	0.50
1:A:200:MET:CE	1:A:251:ASP:HB3	2.42	0.50
1:B:479:ILE:H	1:B:479:ILE:HD12	1.76	0.50
1:A:408:TYR:N	5:A:620:HOH:O	2.44	0.50
1:A:447:CYS:HB2	1:A:448:GLN:NE2	2.26	0.50
1:B:332:GLU:HB3	1:B:333:PRO:HD2	1.94	0.50
1:A:198:SER:HB3	1:A:240:HIS:HA	1.93	0.50
1:B:230:PRO:HA	1:B:233:GLN:CG	2.42	0.49
1:A:332:GLU:HB3	1:A:333:PRO:HD2	1.94	0.49
1:B:198:SER:HB3	1:B:240:HIS:HA	1.93	0.49
1:A:185:VAL:HG12	1:A:186:GLY:N	2.27	0.49
1:A:440:TYR:O	1:A:444:LYS:HB2	2.12	0.49
1:B:555:HIS:CB	1:B:559:LYS:HE3	2.31	0.49
1:B:132:GLU:CG	1:B:133:VAL:N	2.75	0.49
1:B:185:VAL:HG12	1:B:186:GLY:N	2.27	0.49
1:A:201:GLU:HG2	1:A:263:THR:OG1	2.13	0.49
1:A:447:CYS:C	1:A:448:GLN:HE21	2.14	0.49
1:B:526:ARG:HD3	1:B:526:ARG:HA	1.58	0.49
1:A:230:PRO:HA	1:A:233:GLN:CG	2.42	0.49
1:A:190:TYR:CE1	1:A:270:MET:HG3	2.48	0.48
1:A:47:VAL:HG13	1:A:48:ASP:H	1.78	0.48
1:A:350:ARG:HD3	1:A:350:ARG:HA	1.75	0.48
1:B:309:PRO:HG2	1:B:460:VAL:HB	1.94	0.48
1:B:457:THR:HG22	1:B:458:PHE:N	2.28	0.48
1:A:132:GLU:CG	1:A:133:VAL:N	2.75	0.48
1:A:457:THR:HG22	1:A:458:PHE:N	2.28	0.48
1:A:479:ILE:N	1:A:479:ILE:CD1	2.77	0.48
1:B:190:TYR:CE1	1:B:270:MET:HG3	2.48	0.48
1:B:47:VAL:HG13	1:B:48:ASP:H	1.78	0.48
1:A:295:ILE:O	1:A:298:PRO:HD2	2.14	0.48
1:A:368:TRP:NE1	1:A:372:LYS:HD2	2.29	0.48
1:A:237:LYS:HD2	1:B:500:TRP:NE1	2.29	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:7:PHE:C	1:B:8:ARG:HG3	2.32	0.48
1:A:479:ILE:H	1:A:479:ILE:HD12	1.76	0.47
1:B:67:ASP:HB2	1:B:70:LEU:HD22	1.97	0.47
1:A:391:GLU:N	5:A:677:HOH:O	2.26	0.47
1:A:390:PRO:O	1:A:396:ARG:HD2	2.14	0.47
1:B:229:LYS:HB3	1:B:231:GLU:OE2	2.14	0.47
1:A:309:PRO:HG2	1:A:460:VAL:HB	1.94	0.47
1:A:463:ARG:HD2	5:B:660:HOH:O	2.14	0.47
1:B:201:GLU:HG2	1:B:263:THR:OG1	2.13	0.47
1:B:295:ILE:O	1:B:298:PRO:HD2	2.14	0.47
1:B:368:TRP:NE1	1:B:372:LYS:HD2	2.29	0.47
1:A:538:ASN:HB2	1:A:540:ILE:CD1	2.39	0.47
1:A:67:ASP:HB2	1:A:70:LEU:HD22	1.96	0.47
1:B:278:SER:HA	1:B:356:ALA:HA	1.96	0.47
1:B:55:THR:HG21	1:B:58:HIS:CE1	2.49	0.47
1:A:527:PHE:CE2	1:A:531:LEU:HD11	2.50	0.47
1:B:433:GLY:N	5:B:622:HOH:O	2.47	0.47
1:A:151:LEU:HD23	1:A:166:LEU:CD2	2.44	0.47
1:A:200:MET:HE1	1:A:251:ASP:HB3	1.96	0.47
1:A:276:TYR:CE1	1:A:356:ALA:HB1	2.49	0.47
1:A:423:LEU:O	1:A:471:ILE:HB	2.15	0.47
1:B:151:LEU:HD23	1:B:166:LEU:CD2	2.45	0.47
1:B:405:ILE:HA	1:B:406:PRO:HD2	1.56	0.47
1:A:218:PRO:HD2	5:A:685:HOH:O	2.15	0.47
1:A:55:THR:HG21	1:A:58:HIS:CE1	2.49	0.47
1:B:276:TYR:CE1	1:B:356:ALA:HB1	2.49	0.47
1:A:300:ARG:HG3	1:A:462:MET:HA	1.97	0.47
1:B:346:LEU:O	1:B:347:ASN:HB2	2.15	0.47
1:A:114:ARG:NH1	1:A:511:ASP:OD2	2.47	0.47
1:A:316:LEU:HD11	1:A:413:TRP:NE1	2.30	0.47
1:B:390:PRO:O	1:B:396:ARG:HD2	2.14	0.47
1:B:423:LEU:O	1:B:471:ILE:HB	2.15	0.47
1:A:316:LEU:CD1	1:A:413:TRP:CD1	2.98	0.47
1:A:349:GLY:CA	1:A:352:ASN:HD21	2.28	0.47
1:A:536:ASP:N	1:A:537:PRO:HD3	2.16	0.47
1:B:350:ARG:HD3	1:B:350:ARG:HA	1.75	0.47
1:A:47:VAL:CG1	1:A:48:ASP:N	2.78	0.46
1:B:114:ARG:NH1	1:B:511:ASP:OD2	2.47	0.46
1:B:200:MET:HE1	1:B:251:ASP:HB3	1.96	0.46
1:A:257:SER:HA	5:A:683:HOH:O	2.15	0.46
1:A:359:GLY:O	1:A:364:ARG:NE	2.48	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:7:PHE:C	1:A:8:ARG:HG3	2.32	0.46
1:A:361:GLU:N	1:A:364:ARG:HH21	2.13	0.46
1:B:527:PHE:CE2	1:B:531:LEU:HD11	2.50	0.46
1:B:10:LEU:HD12	1:B:70:LEU:HD21	1.98	0.46
1:A:278:SER:HA	1:A:356:ALA:HA	1.96	0.46
1:A:307:ASN:N	1:A:307:ASN:OD1	2.47	0.46
1:A:93:PHE:CD1	1:A:93:PHE:N	2.83	0.46
1:B:316:LEU:CD1	1:B:413:TRP:CD1	2.98	0.46
1:B:47:VAL:CG1	1:B:48:ASP:N	2.78	0.46
1:A:79:ASN:ND2	1:A:79:ASN:C	2.69	0.46
1:B:277:GLN:O	1:B:357:LEU:N	2.41	0.46
1:B:361:GLU:N	1:B:364:ARG:HH21	2.13	0.46
1:A:412:LYS:HG3	1:A:412:LYS:H	1.37	0.46
1:A:132:GLU:O	1:A:140:CYS:HA	2.16	0.46
1:A:229:LYS:HB3	1:A:231:GLU:OE2	2.14	0.46
1:A:346:LEU:O	1:A:347:ASN:HB2	2.15	0.46
1:A:491:LEU:HA	1:A:491:LEU:HD23	1.78	0.46
1:B:416:TRP:HB3	1:B:472:VAL:HG21	1.98	0.46
1:B:300:ARG:HG3	1:B:462:MET:HA	1.97	0.46
1:B:540:ILE:HD13	1:B:540:ILE:N	2.31	0.46
1:B:79:ASN:ND2	1:B:79:ASN:C	2.69	0.46
1:A:295:ILE:HD12	1:A:378:ILE:HD11	1.97	0.46
1:A:526:ARG:HD3	1:A:526:ARG:HA	1.58	0.46
1:B:359:GLY:O	1:B:364:ARG:NE	2.48	0.46
1:B:540:ILE:HD12	1:B:540:ILE:HG23	1.63	0.46
1:A:188:THR:HB	1:A:189:PRO:CD	2.46	0.45
1:A:22:ASN:HA	1:A:25:ILE:CG2	2.46	0.45
1:B:349:GLY:CA	1:B:352:ASN:HD21	2.28	0.45
1:B:479:ILE:CD1	1:B:479:ILE:N	2.77	0.45
1:A:309:PRO:O	1:A:460:VAL:HG23	2.16	0.45
1:A:383:PHE:CD1	1:A:383:PHE:N	2.85	0.45
1:B:132:GLU:O	1:B:140:CYS:HA	2.16	0.45
1:B:309:PRO:O	1:B:460:VAL:HG23	2.16	0.45
1:B:553:TYR:HD2	1:B:558:TRP:CD1	2.34	0.45
1:B:188:THR:HB	1:B:189:PRO:CD	2.46	0.45
1:B:307:ASN:N	1:B:307:ASN:OD1	2.47	0.45
1:B:538:ASN:HB2	1:B:540:ILE:CD1	2.40	0.45
1:A:332:GLU:CB	1:A:333:PRO:HD2	2.47	0.45
1:B:197:HIS:HA	1:B:266:GLY:O	2.16	0.45
1:A:217:LEU:CD2	1:B:516:THR:HG23	2.47	0.45
1:A:416:TRP:HB3	1:A:472:VAL:HG21	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:156:GLU:CD	1:A:161:ARG:NH2	2.70	0.45
1:A:367:LEU:O	1:A:371:ILE:HG13	2.17	0.45
1:A:454:PHE:C	1:A:454:PHE:CD1	2.90	0.45
1:A:67:ASP:N	1:A:67:ASP:OD1	2.49	0.45
1:B:316:LEU:HD11	1:B:413:TRP:NE1	2.30	0.45
1:A:65:ASP:O	1:A:68:TYR:HB2	2.17	0.45
1:B:295:ILE:HD12	1:B:378:ILE:HD11	1.97	0.45
1:B:409:ASP:HA	1:B:412:LYS:NZ	2.31	0.45
1:B:423:LEU:HD21	1:B:488:MET:CG	2.44	0.45
1:B:93:PHE:N	1:B:93:PHE:CD1	2.83	0.45
1:A:197:HIS:HA	1:A:266:GLY:O	2.17	0.45
1:A:409:ASP:HA	1:A:412:LYS:NZ	2.31	0.45
1:B:367:LEU:HD23	1:B:367:LEU:HA	1.66	0.45
1:B:383:PHE:N	1:B:383:PHE:CD1	2.84	0.45
1:A:132:GLU:HA	5:A:693:HOH:O	2.17	0.45
1:A:361:GLU:N	1:A:362:PRO:HD2	2.32	0.45
1:A:423:LEU:HD21	1:A:488:MET:CG	2.44	0.45
1:A:62:HIS:O	1:A:62:HIS:ND1	2.50	0.45
1:B:22:ASN:HA	1:B:25:ILE:CG2	2.46	0.45
1:B:332:GLU:CB	1:B:333:PRO:HD2	2.47	0.45
1:B:324:LYS:NZ	1:B:332:GLU:O	2.40	0.45
1:B:361:GLU:N	1:B:362:PRO:HD2	2.32	0.45
1:A:447:CYS:CB	1:A:448:GLN:NE2	2.81	0.44
1:A:505:THR:CG2	1:A:506:HIS:N	2.72	0.44
1:A:553:TYR:HD2	1:A:558:TRP:CD1	2.34	0.44
1:B:151:LEU:CD2	1:B:166:LEU:HD21	2.48	0.44
1:B:155:LEU:HD22	1:B:160:LEU:HB2	1.99	0.44
1:B:108:TYR:HD1	1:B:505:THR:C	2.20	0.44
1:A:426:SER:HA	1:A:427:PRO:HD2	1.63	0.44
1:B:102:ILE:CG1	1:B:175:SER:HB2	2.47	0.44
1:A:252:GLY:C	1:A:254:PHE:N	2.71	0.44
1:A:10:LEU:HD12	1:A:70:LEU:HD21	1.98	0.44
1:A:277:GLN:O	1:A:357:LEU:N	2.41	0.44
1:B:367:LEU:O	1:B:371:ILE:HG13	2.17	0.44
1:B:387:GLU:HA	1:B:387:GLU:OE1	2.17	0.44
1:B:65:ASP:O	1:B:68:TYR:HB2	2.17	0.44
1:A:540:ILE:HD13	1:A:540:ILE:N	2.31	0.44
1:B:156:GLU:CD	1:B:161:ARG:NH2	2.70	0.44
1:B:179:ASN:OD1	1:B:184:GLY:HA3	2.17	0.44
1:A:519:TRP:CE3	1:B:211:ARG:HG3	2.49	0.44
1:B:454:PHE:CD1	1:B:454:PHE:C	2.90	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:62:HIS:ND1	1:B:62:HIS:O	2.50	0.44
1:A:480:GLN:O	1:A:484:VAL:HG23	2.18	0.44
1:A:549:TRP:CH2	1:A:558:TRP:HB3	2.53	0.44
1:A:102:ILE:CG1	1:A:175:SER:HB2	2.47	0.44
1:A:367:LEU:HA	1:A:367:LEU:HD23	1.66	0.44
1:A:428:ILE:HD12	1:A:428:ILE:HG23	1.60	0.44
1:A:443:THR:O	1:A:443:THR:HG22	2.18	0.44
1:A:290:LYS:HG3	1:A:433:GLY:HA3	2.00	0.44
1:A:387:GLU:OE1	1:A:387:GLU:HA	2.17	0.44
1:B:413:TRP:CZ2	4:B:600:FAD:HM72	2.53	0.44
1:A:151:LEU:CD2	1:A:166:LEU:HD21	2.48	0.44
1:A:179:ASN:OD1	1:A:184:GLY:HA3	2.17	0.44
1:B:344:LYS:HG3	1:B:345:GLN:N	2.33	0.44
1:B:480:GLN:O	1:B:484:VAL:HG23	2.18	0.44
1:A:37:VAL:HG13	1:A:75:VAL:CG2	2.46	0.43
1:A:108:TYR:HD1	1:A:505:THR:C	2.20	0.43
1:B:101:SER:O	1:B:124:GLY:HA3	2.17	0.43
1:A:101:SER:O	1:A:124:GLY:HA3	2.17	0.43
1:A:187:TYR:CD2	1:A:187:TYR:N	2.81	0.43
1:A:332:GLU:CB	1:A:333:PRO:CD	2.95	0.43
1:A:413:TRP:CZ2	4:A:600:FAD:HM72	2.53	0.43
1:B:61:HIS:CE1	1:B:422:HIS:CE1	3.06	0.43
1:A:241:LEU:HB3	1:B:463:ARG:O	2.17	0.43
1:A:540:ILE:HG23	1:A:540:ILE:HD12	1.63	0.43
1:B:447:CYS:CB	1:B:448:GLN:NE2	2.80	0.43
1:A:155:LEU:HD22	1:A:160:LEU:HB2	1.99	0.43
1:A:452:LEU:HD23	1:A:452:LEU:HA	1.68	0.43
1:A:76:ALA:HA	1:A:77:PRO:HD2	1.69	0.43
1:B:332:GLU:CB	1:B:333:PRO:CD	2.95	0.43
1:A:361:GLU:N	1:A:362:PRO:CD	2.80	0.43
1:B:201:GLU:OE1	1:B:211:ARG:HD3	2.18	0.43
1:A:431:VAL:HA	1:A:465:MET:HE2	2.01	0.43
1:A:12:LEU:HB3	1:A:13:PRO:HD2	2.01	0.43
1:A:160:LEU:HA	1:A:160:LEU:HD23	1.71	0.43
1:A:201:GLU:OE1	1:A:211:ARG:HD3	2.18	0.43
1:A:211:ARG:HD3	1:B:519:TRP:CH2	2.53	0.43
1:A:311:ILE:HG12	1:A:353:PHE:HD1	1.84	0.43
1:A:9:PRO:HG3	1:A:21:PHE:CE2	2.54	0.43
1:B:549:TRP:CH2	1:B:558:TRP:HB3	2.53	0.43
1:B:13:PRO:HG3	1:B:95:PHE:CZ	2.53	0.43
1:B:9:PRO:HG3	1:B:21:PHE:CE2	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:13:PRO:HG3	1:A:95:PHE:CZ	2.53	0.43
1:B:252:GLY:C	1:B:254:PHE:N	2.71	0.43
1:A:403:GLN:HG3	1:A:405:ILE:HG13	2.00	0.43
1:A:222:ARG:HB2	1:A:223:PRO:HD2	2.01	0.43
1:B:290:LYS:HG3	1:B:433:GLY:HA3	2.00	0.43
1:B:555:HIS:O	1:B:559:LYS:HG3	2.19	0.43
1:A:222:ARG:HA	1:A:223:PRO:HD3	1.76	0.42
1:A:231:GLU:H	1:A:231:GLU:HG3	0.96	0.42
1:A:142:VAL:O	1:A:264:LYS:HA	2.19	0.42
1:A:344:LYS:HG3	1:A:345:GLN:N	2.33	0.42
1:A:361:GLU:HB2	1:A:364:ARG:NH2	2.34	0.42
1:A:61:HIS:CE1	1:A:422:HIS:CE1	3.06	0.42
1:B:14:PRO:HB2	5:B:749:HOH:O	2.19	0.42
1:B:142:VAL:O	1:B:264:LYS:HA	2.19	0.42
1:A:385:PHE:CB	1:A:386:PRO:HD2	2.38	0.42
1:A:188:THR:CB	1:A:189:PRO:CD	2.98	0.42
1:A:304:ALA:HA	1:A:367:LEU:HD22	2.01	0.42
1:B:156:GLU:CG	1:B:161:ARG:CZ	2.98	0.42
1:B:188:THR:CB	1:B:189:PRO:CD	2.98	0.42
1:B:302:GLY:C	1:B:303:MET:HG3	2.40	0.42
1:B:428:ILE:HG23	1:B:428:ILE:HD12	1.60	0.42
1:B:62:HIS:O	1:B:481:LYS:HE3	2.19	0.42
1:A:478:LEU:N	1:A:478:LEU:CD1	2.79	0.42
1:B:181:VAL:O	1:B:255:SER:HB2	2.20	0.42
1:B:361:GLU:HB2	1:B:364:ARG:NH2	2.34	0.42
1:B:443:THR:O	1:B:443:THR:HG22	2.18	0.42
1:A:177:LEU:HD22	1:A:265:ILE:HG22	2.01	0.42
1:A:181:VAL:O	1:A:255:SER:HB2	2.20	0.42
1:A:108:TYR:CE1	1:A:504:ARG:HG2	2.54	0.42
1:B:12:LEU:HB3	1:B:13:PRO:HD2	2.01	0.42
1:B:361:GLU:N	1:B:362:PRO:CD	2.80	0.42
1:B:108:TYR:CE1	1:B:504:ARG:HG2	2.54	0.42
1:A:242:PHE:HA	1:A:243:PRO:HD3	1.87	0.42
1:A:62:HIS:O	1:A:481:LYS:HE3	2.19	0.42
1:B:222:ARG:HB2	1:B:223:PRO:HD2	2.01	0.42
1:B:243:PRO:CD	1:B:244:TYR:H	2.32	0.42
1:B:304:ALA:HA	1:B:367:LEU:HD22	2.01	0.42
1:B:311:ILE:HG12	1:B:353:PHE:HD1	1.83	0.42
1:B:491:LEU:HA	1:B:491:LEU:HD23	1.78	0.42
1:B:59:ASP:HA	1:B:60:PRO:HD2	1.93	0.42
1:B:160:LEU:HA	1:B:160:LEU:HD23	1.71	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:403:GLN:HG3	1:B:405:ILE:HG13	2.00	0.42
1:A:156:GLU:CG	1:A:161:ARG:CZ	2.98	0.42
1:A:16:LEU:CD1	1:A:21:PHE:N	2.83	0.42
1:A:195:MET:CE	1:B:195:MET:CE	2.97	0.42
1:B:177:LEU:HD22	1:B:265:ILE:HG22	2.01	0.42
1:B:16:LEU:CD1	1:B:21:PHE:N	2.83	0.41
1:B:431:VAL:HA	1:B:465:MET:HE2	2.02	0.41
1:A:12:LEU:HA	1:A:13:PRO:HD3	1.73	0.41
1:A:302:GLY:C	1:A:303:MET:HG3	2.40	0.41
1:A:555:HIS:O	1:A:559:LYS:HG3	2.19	0.41
1:B:18:LEU:HD12	1:B:18:LEU:HA	1.48	0.41
1:B:416:TRP:O	1:B:417:LEU:HD23	2.19	0.41
1:A:237:LYS:HD2	1:B:500:TRP:CD1	2.56	0.41
1:A:416:TRP:O	1:A:417:LEU:HD23	2.19	0.41
1:B:151:LEU:HG	1:B:166:LEU:HD21	2.03	0.41
1:A:217:LEU:CD2	1:B:516:THR:CG2	2.98	0.41
1:B:67:ASP:OD1	1:B:67:ASP:N	2.49	0.41
1:B:252:GLY:C	1:B:254:PHE:H	2.24	0.41
1:A:156:GLU:CB	1:A:161:ARG:NE	2.80	0.41
1:A:553:TYR:HD2	1:A:558:TRP:NE1	2.19	0.41
1:B:156:GLU:CB	1:B:161:ARG:NE	2.79	0.41
1:B:536:ASP:N	1:B:537:PRO:HD3	2.16	0.41
1:A:213:GLY:HA3	5:A:717:HOH:O	2.20	0.41
1:A:517:TYR:CE1	1:B:246:PHE:CB	3.04	0.41
1:A:537:PRO:HD2	5:A:742:HOH:O	2.19	0.41
1:A:151:LEU:HG	1:A:166:LEU:HD21	2.03	0.41
1:A:185:VAL:CG1	1:A:186:GLY:N	2.84	0.41
1:A:323:ASP:OD1	1:A:326:SER:OG	2.29	0.41
1:A:64:MET:HG2	1:A:68:TYR:CD2	2.56	0.41
1:B:305:LEU:HA	1:B:305:LEU:HD23	1.89	0.41
1:B:50:SER:O	1:B:54:PRO:N	2.54	0.41
1:A:311:ILE:O	1:A:457:THR:HG23	2.21	0.41
1:B:12:LEU:HA	1:B:13:PRO:HD3	1.72	0.41
1:B:202:VAL:HA	1:B:261:ILE:O	2.21	0.41
1:A:177:LEU:HB2	1:A:265:ILE:CG2	2.52	0.40
1:A:305:LEU:HD23	1:A:305:LEU:HA	1.89	0.40
1:A:414:ILE:HD11	4:A:600:FAD:C7M	2.40	0.40
1:B:156:GLU:CB	1:B:161:ARG:CZ	2.99	0.40
1:B:417:LEU:CD2	1:B:417:LEU:N	2.84	0.40
1:B:64:MET:HG2	1:B:68:TYR:CD2	2.56	0.40
1:B:6:GLU:CB	1:B:39:VAL:CG2	3.00	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:151:LEU:CD2	1:A:166:LEU:CD2	2.99	0.40
1:A:252:GLY:C	1:A:254:PHE:H	2.24	0.40
1:A:272:ASN:HA	1:A:273:PRO:HD3	1.85	0.40
1:A:344:LYS:CG	1:A:345:GLN:N	2.85	0.40
1:A:47:VAL:HG22	1:A:66:GLN:HE22	1.87	0.40
1:A:243:PRO:CD	1:A:244:TYR:H	2.32	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:330:ARG:NH2	1:A:330:ARG:NH2[2_765]	2.15	0.05

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	546/560 (98%)	503 (92%)	38 (7%)	5 (1%)	17 31
1	B	546/560 (98%)	503 (92%)	38 (7%)	5 (1%)	17 31
All	All	1092/1120 (98%)	1006 (92%)	76 (7%)	10 (1%)	17 31

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	48	ASP
1	B	48	ASP
1	A	199	GLY
1	A	388	ASP
1	B	199	GLY
1	B	388	ASP
1	A	327	TYR

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Mol	Chain	Res	Type
1	B	327	TYR
1	A	328	SER
1	B	328	SER

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	470/482 (98%)	449 (96%)	21 (4%)	27	51
1	B	470/482 (98%)	449 (96%)	21 (4%)	27	51
All	All	940/964 (98%)	898 (96%)	42 (4%)	27	51

All (42) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	7	PHE
1	A	16	LEU
1	A	64	MET
1	A	65	ASP
1	A	79	ASN
1	A	95	PHE
1	A	114	ARG
1	A	122	ASP
1	A	169	PRO
1	A	177	LEU
1	A	248	PRO
1	A	251	ASP
1	A	301	LEU
1	A	314	ILE
1	A	409	ASP
1	A	422	HIS
1	A	448	GLN
1	A	464	GLU
1	A	503	TYR
1	A	505	THR

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Mol	Chain	Res	Type
1	A	552	GLN
1	B	7	PHE
1	B	16	LEU
1	B	64	MET
1	B	65	ASP
1	B	79	ASN
1	B	95	PHE
1	B	114	ARG
1	B	122	ASP
1	B	169	PRO
1	B	177	LEU
1	B	248	PRO
1	B	251	ASP
1	B	301	LEU
1	B	314	ILE
1	B	409	ASP
1	B	422	HIS
1	B	448	GLN
1	B	464	GLU
1	B	503	TYR
1	B	505	THR
1	B	552	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (30) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	56	HIS
1	A	66	GLN
1	A	79	ASN
1	A	91	ASN
1	A	128	ASN
1	A	152	HIS
1	A	197	HIS
1	A	240	HIS
1	A	352	ASN
1	A	448	GLN
1	A	485	GLN
1	A	518	ASN
1	A	520	ASN
1	A	552	GLN
1	A	555	HIS
1	B	56	HIS

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Mol	Chain	Res	Type
1	B	66	GLN
1	B	79	ASN
1	B	91	ASN
1	B	128	ASN
1	B	152	HIS
1	B	197	HIS
1	B	240	HIS
1	B	352	ASN
1	B	448	GLN
1	B	485	GLN
1	B	518	ASN
1	B	520	ASN
1	B	552	GLN
1	B	555	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

### 5.6 Ligand geometry [i](#)

Of 6 ligands modelled in this entry, 2 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
2	ACT	B	601	-	1,3,3	4.27	1 (100%)	0,3,3	0.00	-
4	FAD	A	600	1	51,58,58	1.24	4 (7%)	60,89,89	1.59	6 (10%)
4	FAD	B	600	1	51,58,58	1.23	4 (7%)	60,89,89	1.59	7 (11%)
2	ACT	A	601	-	1,3,3	4.20	1 (100%)	0,3,3	0.00	-

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
4	FAD	A	600	1	-	6/30/50/50	0/6/6/6
4	FAD	B	600	1	-	6/30/50/50	0/6/6/6

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	601	ACT	CH3-C	4.27	1.54	1.48
4	A	600	FAD	C4X-C10	4.24	1.43	1.38
2	A	601	ACT	CH3-C	4.20	1.54	1.48
4	B	600	FAD	C4X-C10	4.14	1.43	1.38
4	B	600	FAD	C4-N3	3.64	1.39	1.33
4	A	600	FAD	C4-N3	3.63	1.39	1.33
4	A	600	FAD	O5B-C5B	-3.58	1.31	1.44
4	B	600	FAD	O5B-C5B	-3.57	1.31	1.44
4	A	600	FAD	C2-N1	-2.67	1.32	1.38
4	B	600	FAD	C2-N1	-2.65	1.32	1.38

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	600	FAD	C4-N3-C2	7.56	121.53	115.14
4	B	600	FAD	C4-N3-C2	7.48	121.46	115.14
4	A	600	FAD	C4X-C4-N3	-5.13	116.42	123.43
4	B	600	FAD	C4X-C4-N3	-5.10	116.46	123.43
4	A	600	FAD	C1'-N10-C9A	2.51	120.27	118.29
4	B	600	FAD	C1'-N10-C9A	2.47	120.24	118.29
4	B	600	FAD	O4B-C4B-C5B	-2.21	102.09	109.37
4	A	600	FAD	O4B-C4B-C5B	-2.21	102.12	109.37
4	A	600	FAD	C5A-C6A-N6A	2.11	123.55	120.35
4	B	600	FAD	C5A-C6A-N6A	2.10	123.55	120.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	600	FAD	C5X-C9A-N10	2.08	119.22	117.72
4	B	600	FAD	C5X-C9A-N10	2.04	119.19	117.72
4	B	600	FAD	O4B-C1B-C2B	-2.00	104.00	106.93

There are no chirality outliers.

All (12) torsion outliers are listed below:

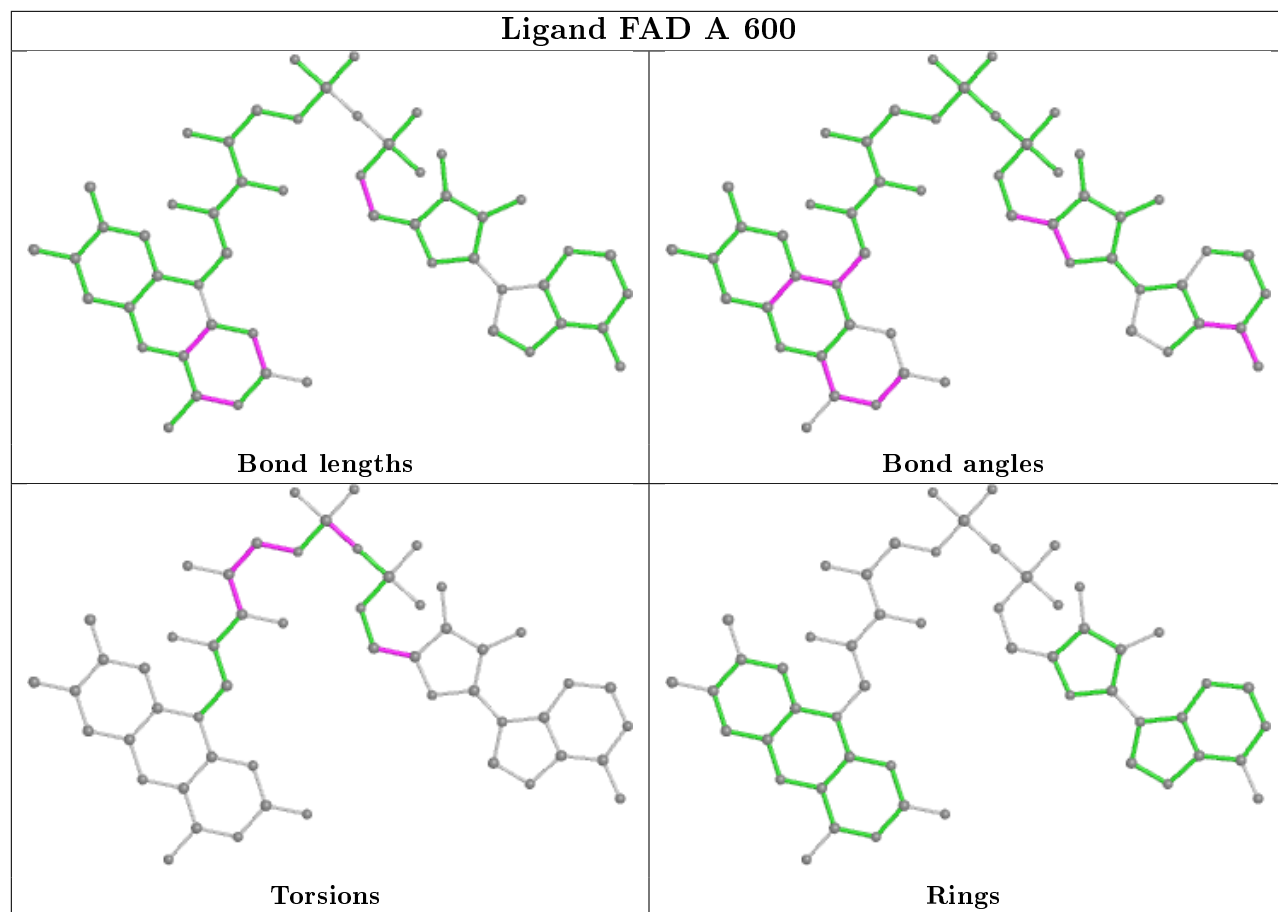
Mol	Chain	Res	Type	Atoms
4	B	600	FAD	C3'-C4'-C5'-O5'
4	B	600	FAD	O4'-C4'-C5'-O5'
4	A	600	FAD	C3'-C4'-C5'-O5'
4	A	600	FAD	O4'-C4'-C5'-O5'
4	B	600	FAD	C4'-C5'-O5'-P
4	A	600	FAD	C4'-C5'-O5'-P
4	B	600	FAD	C2'-C3'-C4'-O4'
4	A	600	FAD	C2'-C3'-C4'-O4'
4	B	600	FAD	O4B-C4B-C5B-O5B
4	A	600	FAD	O4B-C4B-C5B-O5B
4	B	600	FAD	PA-O3P-P-O2P
4	A	600	FAD	PA-O3P-P-O2P

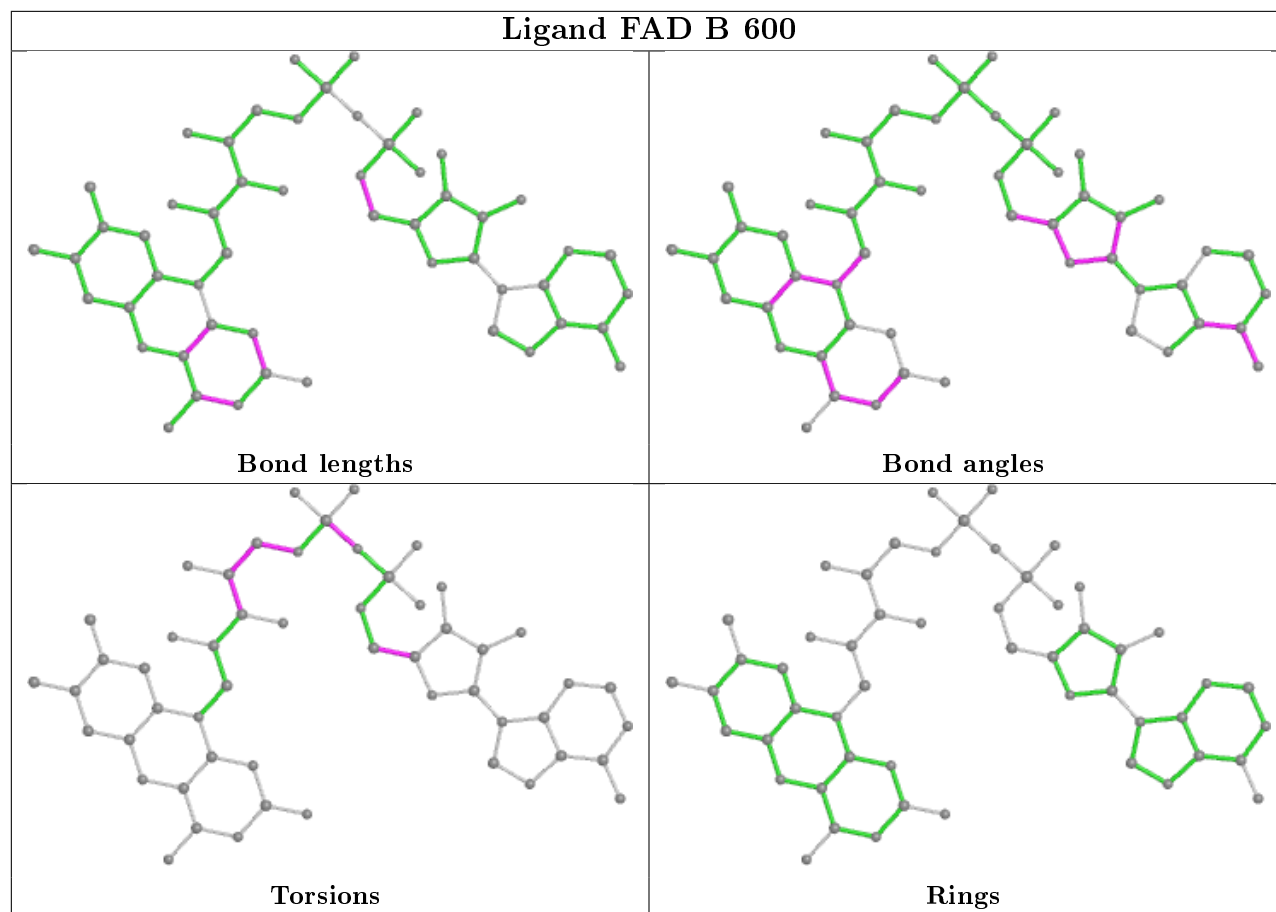
There are no ring outliers.

2 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	600	FAD	6	0
4	B	600	FAD	5	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.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

### 6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

### 6.4 Ligands

EDS was not executed - this section is therefore empty.

### 6.5 Other polymers

EDS was not executed - this section is therefore empty.