



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 3, 2020 – 07:48 am BST

PDB ID : 1KFY
Title : QUINOL-FUMARATE REDUCTASE WITH QUINOL INHIBITOR 2-[1-(4-CHLORO-PHENYL)-ETHYL]-4,6-DINITRO-PHENOL
Authors : Iverson, T.M.; Luna-Chavez, C.; Croal, L.R.; Cecchini, G.; Rees, D.C.
Deposited on : 2001-11-24
Resolution : 3.60 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

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

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

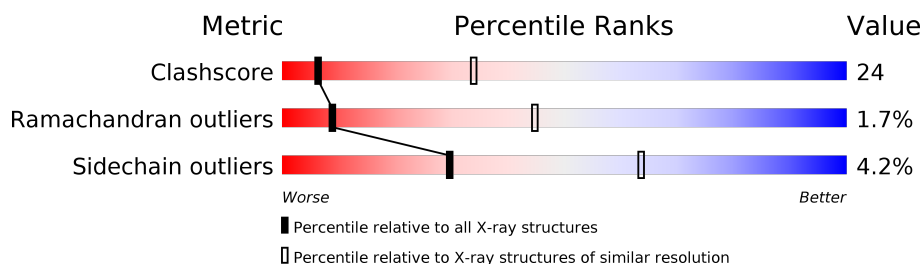
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.60 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	1353 (3.70-3.50)
Ramachandran outliers	138981	1307 (3.70-3.50)
Sidechain outliers	138945	1307 (3.70-3.50)

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 ≥ 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	602	
1	M	602	
2	B	243	
2	N	243	
3	C	130	
3	O	130	
4	D	119	
4	P	119	

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
10	BRS	B	700	-	-	X	-
8	F3S	N	245	-	-	X	-
9	SF4	N	246	-	-	X	-

2 Entry composition

There are 11 unique types of molecules in this entry. The entry contains 16957 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 FUMARATE REDUCTASE FLAVOPROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	577	Total	C	N	O	S	0	0	0
			4448	2775	802	840	31			
1	M	577	Total	C	N	O	S	0	0	0
			4448	2775	802	840	31			

- Molecule 2 is a protein called Fumarate reductase iron-sulfur protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	243	Total	C	N	O	S	0	0	0
			1888	1189	323	357	19			
2	N	243	Total	C	N	O	S	0	0	0
			1888	1189	323	357	19			

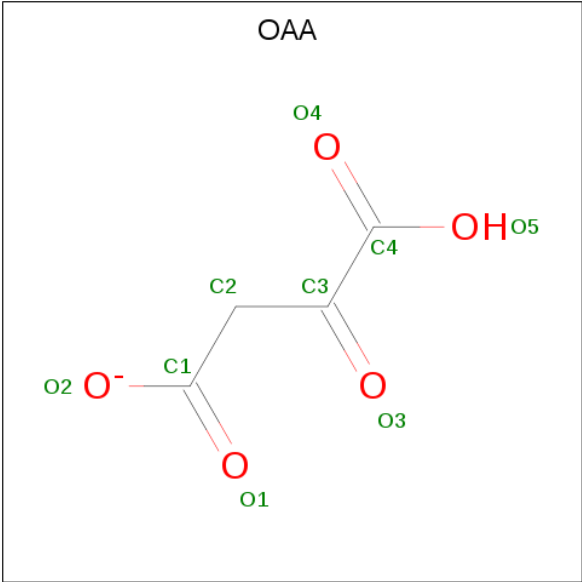
- Molecule 3 is a protein called FUMARATE REDUCTASE 15 KDA HYDROPHOBIC PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	130	Total	C	N	O	S	0	0	0
			1058	720	166	169	3			
3	O	130	Total	C	N	O	S	0	0	0
			1058	720	166	169	3			

- Molecule 4 is a protein called FUMARATE REDUCTASE 13 KDA HYDROPHOBIC PROTEIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	119	Total	C	N	O	S	0	0	0
			926	626	151	142	7			
4	P	119	Total	C	N	O	S	0	0	0
			926	626	151	142	7			

- Molecule 5 is OXALOACETATE ION (three-letter code: OAA) (formula: C₄H₃O₅).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			9	4	5		
5	M	1	Total	C	O	0	0
			9	4	5		

- Molecule 6 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: C₂₇H₃₃N₉O₁₅P₂).



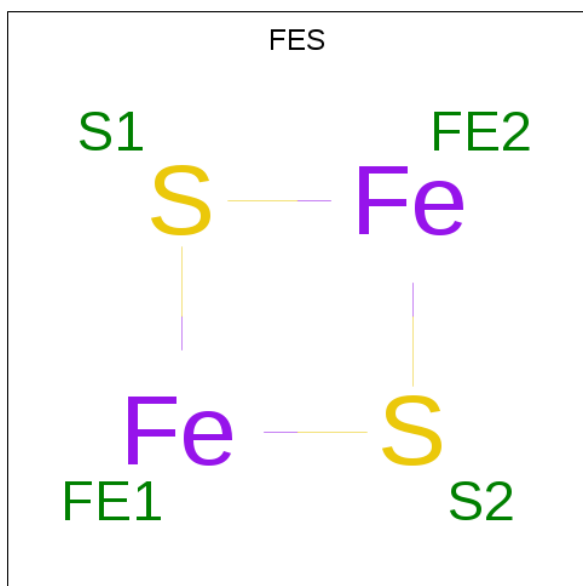
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	A	1	Total	C	N	O	P	0	0
			53	27	9	15	2		

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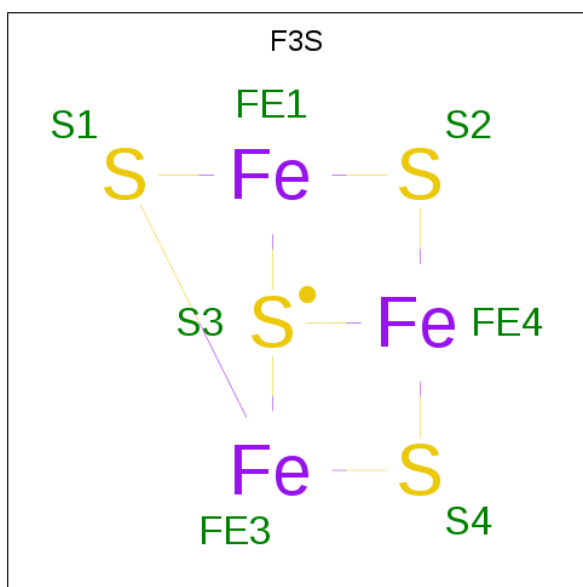
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	M	1	Total	C	N	O	P	0	0
			53	27	9	15	2		

- Molecule 7 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe_2S_2).



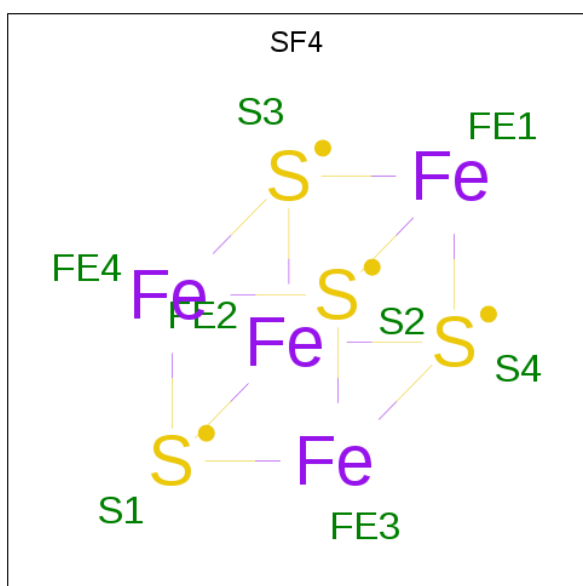
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	B	1	Total	Fe	S	0	0
			4	2	2		
7	N	1	Total	Fe	S	0	0
			4	2	2		

- Molecule 8 is FE3-S4 CLUSTER (three-letter code: F3S) (formula: Fe_3S_4).



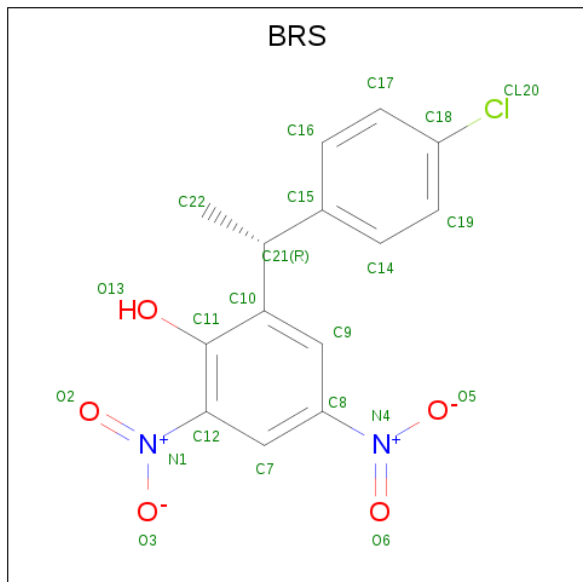
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	B	1	Total	Fe	S	0	0
			7	3	4		
8	N	1	Total	Fe	S	0	0
			7	3	4		

- Molecule 9 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe_4S_4).



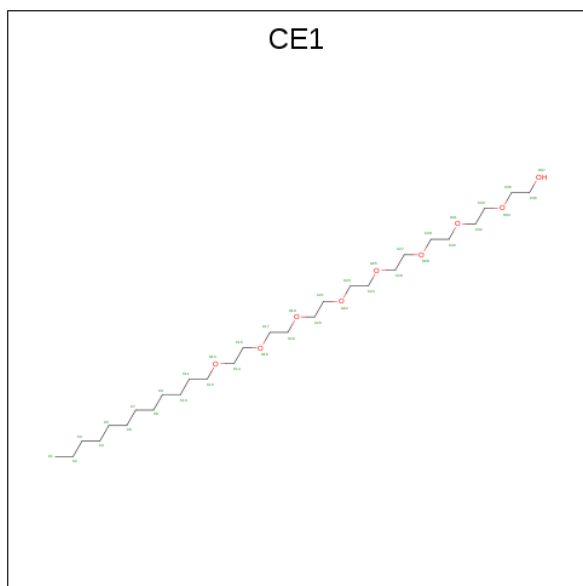
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	B	1	Total	Fe	S	0	0
			8	4	4		
9	N	1	Total	Fe	S	0	0
			8	4	4		

- Molecule 10 is 2-[1-(4-CHLORO-PHENYL)-ETHYL]-4,6-DINITRO-PHENOL (three-letter code: BRS) (formula: $C_{14}H_{11}ClN_2O_5$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
10	B	1	Total	C	Cl	N	O	0	0
			22	14	1	2	5		
10	N	1	Total	C	Cl	N	O	0	0
			22	14	1	2	5		

- Molecule 11 is O-DODECANYL OCTAETHYLENE GLYCOL (three-letter code: CE1) (formula: $C_{28}H_{58}O_9$).



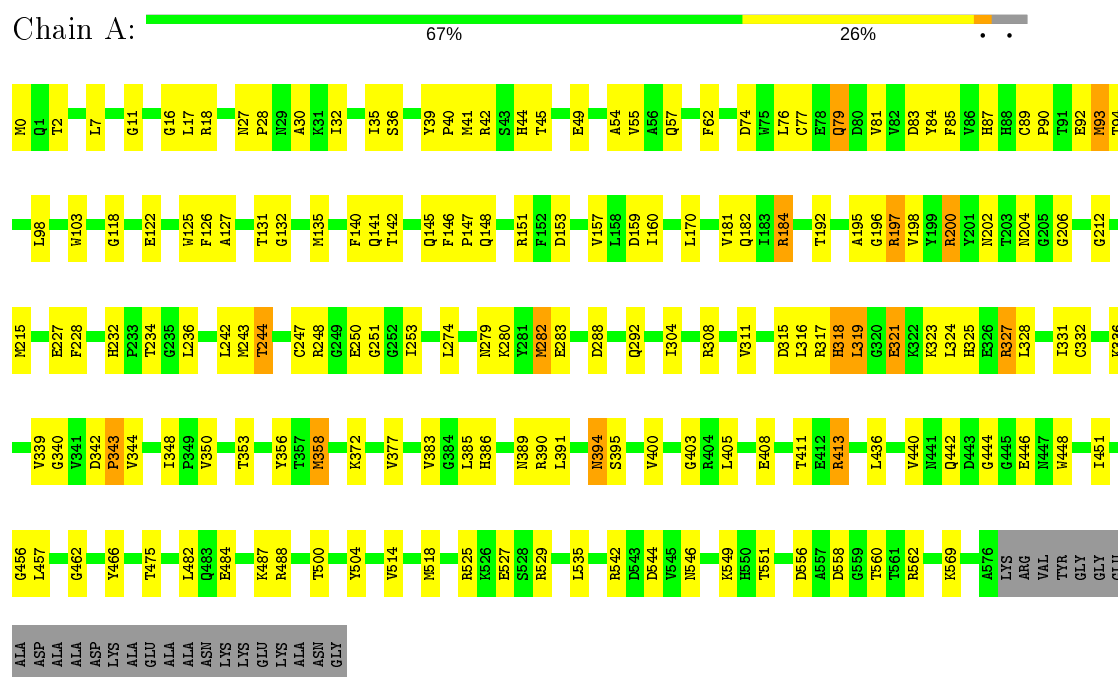
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
11	D	1	Total 37	C 28	O 9	0	0
11	O	1	Total 37	C 28	O 9	0	0
11	P	1	Total 37	C 28	O 9	0	0

3 Residue-property plots

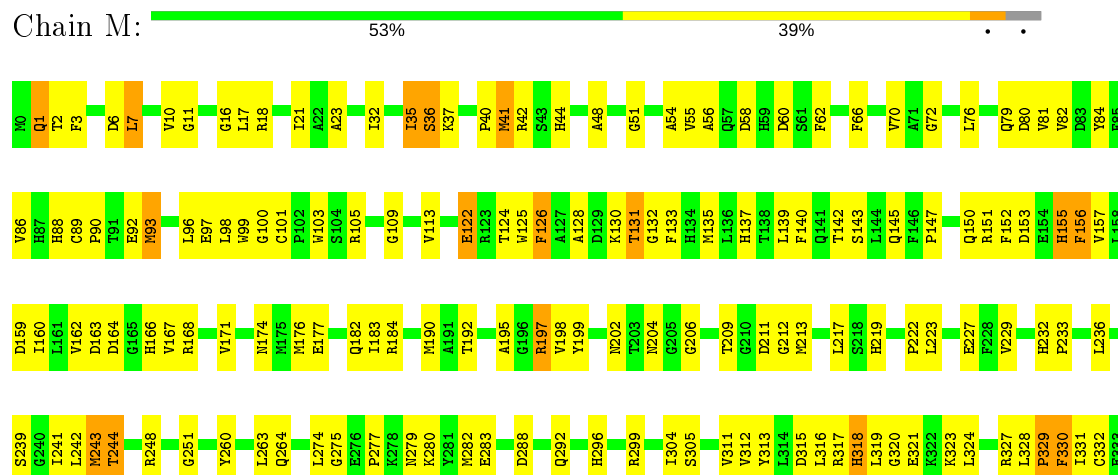
These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded according 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.

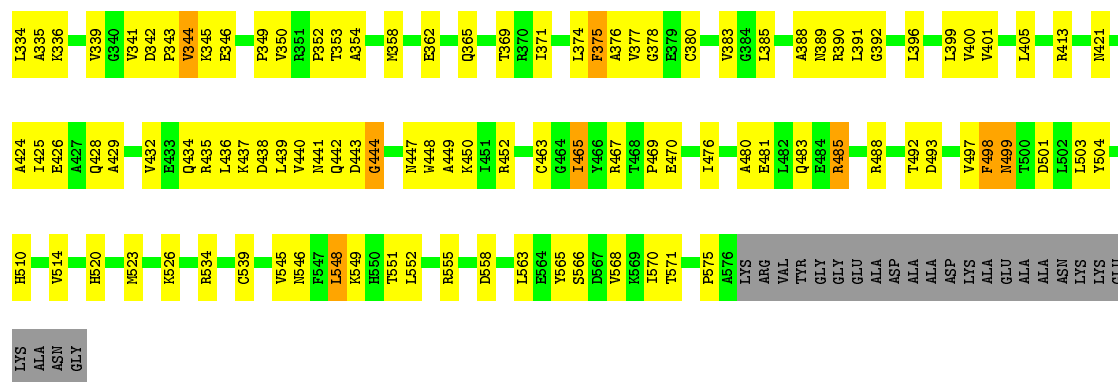
Note EDS was not executed.

• Molecule 1: FUMARATE REDUCTASE FLAVOPROTEIN

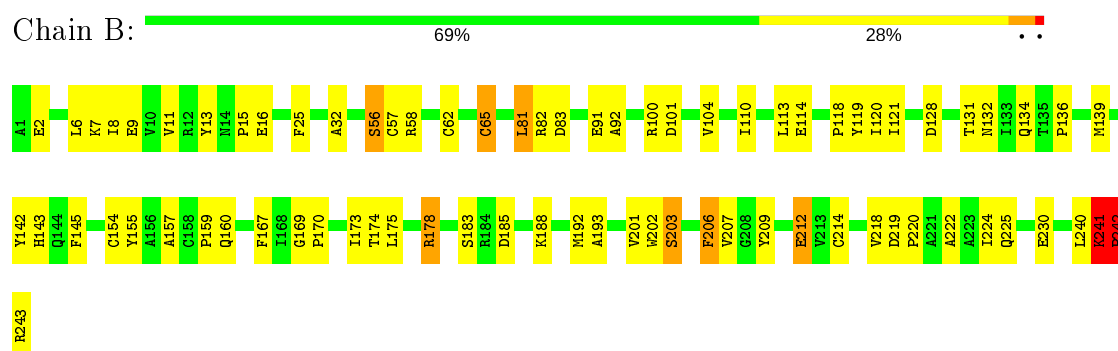


• Molecule 1: FUMARATE REDUCTASE FLAVOPROTEIN





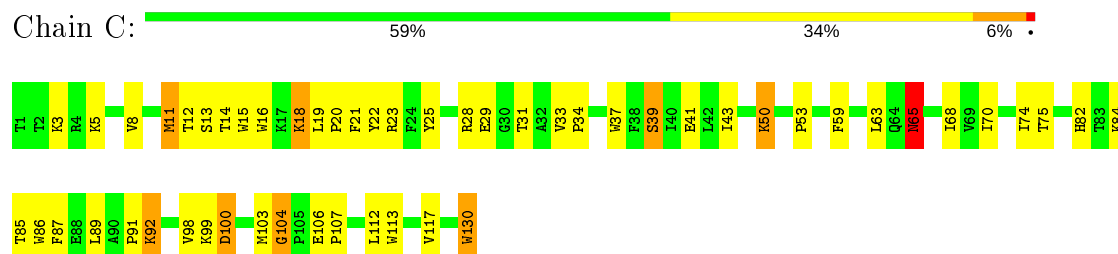
• Molecule 2: Fumarate reductase iron-sulfur protein



• Molecule 2: Fumarate reductase iron-sulfur protein

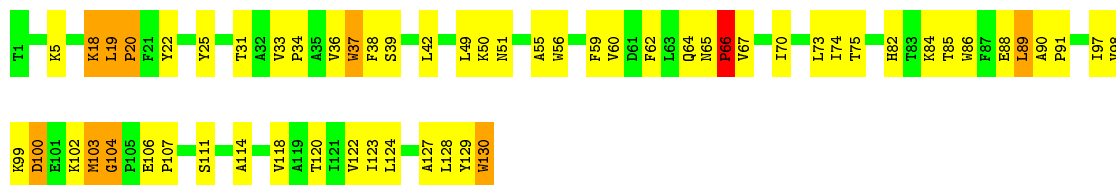


• Molecule 3: FUMARATE REDUCTASE 15 KDA HYDROPHOBIC PROTEIN



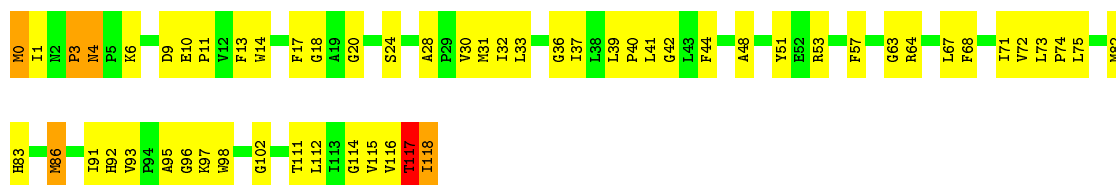
• Molecule 3: FUMARATE REDUCTASE 15 KDA HYDROPHOBIC PROTEIN

Chain O:  55% 37% 7%



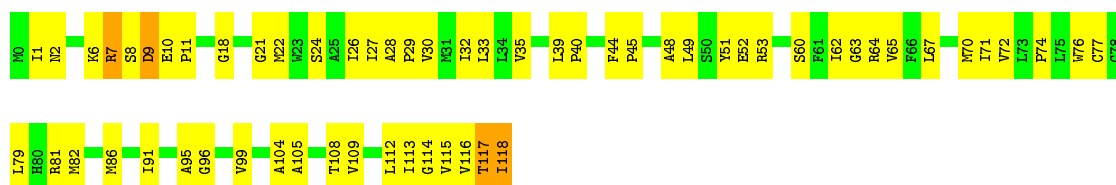
• Molecule 4: FUMARATE REDUCTASE 13 KDA HYDROPHOBIC PROTEIN

Chain D:  52% 43% 5%



• Molecule 4: FUMARATE REDUCTASE 13 KDA HYDROPHOBIC PROTEIN

Chain P:  50% 47% 3%



4 Data and refinement statistics

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

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	96.15Å 137.81Å 270.99Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 3.60	Depositor
% Data completeness (in resolution range)	(Not available) (50.00-3.60)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
Refinement program	CNS	Depositor
R, R_{free}	0.264 , 0.301	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	16957	wwPDB-VP
Average B, all atoms (Å ²)	50.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: OAA, SF4, BRS, F3S, FES, CE1, FAD

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	0.67	1/4540 (0.0%)	0.81	1/6139 (0.0%)
1	M	0.57	0/4540	0.76	0/6139
2	B	0.62	1/1931 (0.1%)	0.82	1/2617 (0.0%)
2	N	0.58	1/1931 (0.1%)	0.79	2/2617 (0.1%)
3	C	0.78	3/1094 (0.3%)	0.86	3/1496 (0.2%)
3	O	0.72	2/1094 (0.2%)	0.83	2/1496 (0.1%)
4	D	0.69	2/956 (0.2%)	0.91	3/1303 (0.2%)
4	P	0.66	1/956 (0.1%)	0.84	1/1303 (0.1%)
All	All	0.64	11/17042 (0.1%)	0.81	13/23110 (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
3	O	0	1

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	130	TRP	CB-CG	-8.82	1.34	1.50
4	D	117	THR	CA-C	-6.44	1.36	1.52
3	C	104	GLY	C-O	-6.43	1.13	1.23
3	O	104	GLY	C-O	-6.29	1.13	1.23
1	A	77	CYS	CB-SG	-6.04	1.72	1.82
3	O	130	TRP	CB-CG	5.67	1.60	1.50
4	P	117	THR	CA-C	-5.49	1.38	1.52
2	N	242	PRO	CA-C	-5.36	1.42	1.52
3	C	65	ASN	C-O	-5.12	1.13	1.23
4	D	3	PRO	C-O	-5.09	1.13	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	65	CYS	CB-SG	-5.05	1.73	1.81

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	117	THR	N-CA-C	8.57	134.14	111.00
3	C	65	ASN	N-CA-C	7.78	132.01	111.00
4	D	117	THR	CB-CA-C	-6.08	95.18	111.60
2	B	241	LYS	C-N-CD	-5.95	107.52	120.60
3	O	130	TRP	CA-CB-CG	5.85	124.82	113.70
2	N	58	ARG	NE-CZ-NH1	-5.83	117.38	120.30
3	O	66	PRO	N-CA-C	5.83	127.25	112.10
4	D	117	THR	C-N-CA	-5.55	107.83	121.70
3	C	65	ASN	C-N-CD	-5.49	108.53	120.60
1	A	248	ARG	NE-CZ-NH2	-5.30	117.65	120.30
2	N	154	CYS	CA-CB-SG	-5.19	104.65	114.00
3	C	65	ASN	CB-CA-C	-5.16	100.08	110.40
4	P	117	THR	CB-CA-C	-5.11	97.79	111.60

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	O	129	TYR	Sidechain

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	4448	0	4335	150	0
1	M	4448	0	4335	263	0
2	B	1888	0	1837	72	0
2	N	1888	0	1837	121	0
3	C	1058	0	1108	63	0
3	O	1058	0	1108	64	0
4	D	926	0	971	78	0
4	P	926	0	971	74	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	A	9	0	2	1	0
5	M	9	0	2	2	0
6	A	53	0	31	7	0
6	M	53	0	31	10	0
7	B	4	0	0	0	0
7	N	4	0	0	0	0
8	B	7	0	0	0	0
8	N	7	0	0	2	0
9	B	8	0	0	0	0
9	N	8	0	0	7	0
10	B	22	0	11	11	0
10	N	22	0	11	5	0
11	D	37	0	58	5	0
11	O	37	0	58	1	0
11	P	37	0	58	2	0
All	All	16957	0	16764	810	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 24.

All (810) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:135:MET:SD	1:A:135:MET:CE	2.01	1.48
1:A:44:HIS:NE2	6:A:703:FAD:HM82	1.06	1.37
1:M:44:HIS:NE2	6:M:803:FAD:HM82	1.04	1.35
4:D:6:LYS:HG3	4:P:6:LYS:HB3	1.27	1.16
1:A:44:HIS:CE1	6:A:703:FAD:HM82	1.83	1.14
1:M:44:HIS:CE1	6:M:803:FAD:HM82	1.85	1.11
2:B:225:GLN:NE2	10:B:700:BRS:H222	1.66	1.09
1:M:421:ASN:HD22	1:M:424:ALA:HB2	1.15	1.08
2:B:225:GLN:HE21	10:B:700:BRS:C22	1.68	1.06
1:M:251:GLY:HA2	1:M:277:PRO:HG2	1.41	1.03
2:B:225:GLN:HE21	10:B:700:BRS:H222	0.88	1.01
3:C:50:LYS:HD2	4:D:118:ILE:O	1.59	1.01
2:N:148:CYS:SG	9:N:246:SF4:S2	2.59	0.99
9:N:246:SF4:S2	9:N:246:SF4:S4	2.60	0.99
3:C:12:THR:HG22	3:C:14:THR:H	1.22	0.99
1:M:469:PRO:HG3	1:M:534:ARG:HH21	1.28	0.99
3:O:50:LYS:HG3	4:P:118:ILE:HA	1.39	0.98
2:N:116:ILE:HG21	2:N:176:ALA:HB2	1.42	0.98

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:O:19:LEU:H	3:O:19:LEU:HD23	1.27	0.97
1:M:421:ASN:HD22	1:M:424:ALA:CB	1.77	0.97
2:N:54:ARG:HE	2:N:103:VAL:HG13	1.31	0.96
3:C:50:LYS:HD2	4:D:118:ILE:C	1.87	0.93
1:M:316:LEU:HB3	1:M:319:LEU:HD12	1.48	0.93
3:C:50:LYS:HD3	4:D:118:ILE:HG22	1.49	0.91
1:M:447:ASN:HD21	1:M:449:ALA:HB3	1.34	0.90
1:M:42:ARG:HH21	2:N:150:ASN:HB2	1.35	0.90
4:P:117:THR:HG22	4:P:118:ILE:N	1.88	0.89
3:O:50:LYS:CG	4:P:118:ILE:HA	2.02	0.89
1:A:413:ARG:HH11	1:A:413:ARG:HB2	1.34	0.89
2:N:189:LYS:H	2:N:189:LYS:HD3	1.37	0.88
3:C:99:LYS:O	3:C:100:ASP:HB2	1.74	0.87
4:D:92:HIS:HB3	2:N:243:ARG:HB2	1.55	0.87
2:N:225:GLN:NE2	10:N:800:BRG:H222	1.90	0.87
2:B:241:LYS:O	2:B:243:ARG:N	2.08	0.86
1:M:155:HIS:CD2	1:M:174:ASN:HA	2.10	0.85
4:P:117:THR:O	4:P:118:ILE:C	2.13	0.85
4:D:64:ARG:NH1	4:D:117:THR:HG23	1.92	0.85
4:D:0:MET:HG2	4:D:1:ILE:H	1.39	0.84
1:M:437:LYS:HG2	1:M:441:ASN:HD21	1.42	0.84
2:N:214:CYS:SG	2:N:218:VAL:HG23	2.16	0.84
3:O:31:THR:HG21	3:O:82:HIS:HB2	1.58	0.84
1:M:304:ILE:HD12	1:M:304:ILE:H	1.39	0.84
1:M:197:ARG:HD2	1:M:206:GLY:HA2	1.58	0.83
1:M:98:LEU:HD11	2:N:127:ALA:HA	1.60	0.83
2:B:15:PRO:HB2	3:C:5:LYS:H	1.43	0.81
1:A:356:TYR:CE2	1:A:390:ARG:HD3	2.14	0.81
3:O:50:LYS:CD	4:P:118:ILE:HA	2.11	0.81
1:A:7:LEU:HD21	1:A:32:ILE:HG12	1.61	0.81
1:A:484:GLU:HG3	1:A:488:ARG:NH1	1.96	0.80
2:N:11:VAL:HG21	2:N:91:GLU:HG2	1.63	0.80
1:M:465:ILE:H	1:M:465:ILE:HD13	1.45	0.80
3:O:33:VAL:HB	3:O:34:PRO:HD3	1.63	0.80
1:M:425:ILE:O	1:M:428:GLN:HB2	1.83	0.79
3:C:33:VAL:HB	3:C:34:PRO:HD3	1.63	0.79
2:N:157:ALA:HB1	2:N:209:TYR:CD2	2.18	0.79
1:A:413:ARG:HB2	1:A:413:ARG:NH1	1.96	0.78
1:M:152:PHE:HB3	1:M:155:HIS:ND1	1.98	0.78
3:O:128:LEU:HD22	4:P:44:PHE:HB2	1.66	0.77
1:A:184:ARG:HH11	1:A:184:ARG:HG2	1.48	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:50:LYS:CD	4:D:118:ILE:HG22	2.12	0.77
1:A:413:ARG:HH11	1:A:413:ARG:CB	1.97	0.77
2:B:13:TYR:OH	3:C:5:LYS:O	2.01	0.77
1:M:421:ASN:ND2	1:M:424:ALA:HB2	1.95	0.77
1:M:549:LYS:HD2	1:M:565:TYR:HB3	1.67	0.76
4:D:92:HIS:HB3	2:N:243:ARG:CB	2.14	0.76
1:M:316:LEU:HD22	1:M:319:LEU:HD11	1.68	0.76
2:N:225:GLN:HE21	10:N:800:BRS:H222	1.51	0.75
4:D:63:GLY:O	4:D:67:LEU:HD23	1.87	0.75
2:N:159:PRO:HG2	2:N:207:VAL:HG21	1.68	0.75
3:O:104:GLY:O	3:O:107:PRO:HD2	1.86	0.75
3:O:50:LYS:HD2	4:P:117:THR:HG22	1.68	0.74
1:A:44:HIS:NE2	6:A:703:FAD:HM81	1.99	0.74
2:N:116:ILE:HG21	2:N:176:ALA:CB	2.18	0.74
1:M:488:ARG:HB3	1:M:488:ARG:NH1	2.03	0.74
4:D:48:ALA:O	4:D:53:ARG:HD3	1.87	0.74
1:A:279:ASN:O	1:A:280:LYS:HB2	1.88	0.74
4:D:64:ARG:HH22	4:D:117:THR:HG21	1.52	0.74
1:A:192:THR:OG1	1:A:212:GLY:HA3	1.88	0.73
1:M:311:VAL:HG11	1:M:349:PRO:HB2	1.71	0.73
10:B:700:BRS:HC19	4:D:18:GLY:HA2	1.71	0.72
1:M:447:ASN:ND2	1:M:449:ALA:HB3	2.04	0.72
3:C:19:LEU:HD12	3:C:20:PRO:HD2	1.70	0.72
1:M:331:ILE:HD12	1:M:331:ILE:H	1.53	0.72
1:M:96:LEU:HD21	1:M:139:LEU:HD21	1.70	0.72
1:A:0:MET:SD	1:A:182:GLN:HG3	2.29	0.72
1:M:311:VAL:HG12	1:M:312:VAL:O	1.89	0.72
4:D:64:ARG:NH2	4:D:117:THR:HG21	2.04	0.72
4:D:0:MET:CG	4:D:1:ILE:H	2.00	0.71
1:M:11:GLY:O	1:M:16:GLY:HA3	1.89	0.71
1:M:469:PRO:HG3	1:M:534:ARG:NH2	2.05	0.71
2:B:241:LYS:C	2:B:243:ARG:H	1.94	0.71
1:M:436:LEU:O	1:M:440:VAL:HG23	1.89	0.71
2:N:222:ALA:O	2:N:226:GLN:NE2	2.24	0.71
1:A:323:LYS:HG3	1:A:327:ARG:HH11	1.56	0.71
1:M:48:ALA:HB3	1:M:132:GLY:HA3	1.73	0.70
1:M:549:LYS:HA	1:M:568:VAL:HG23	1.73	0.70
4:P:105:ALA:O	4:P:109:VAL:HG23	1.90	0.70
3:O:97:ILE:HD13	3:O:102:LYS:HA	1.73	0.70
1:M:497:VAL:HG21	2:N:15:PRO:HG2	1.73	0.70
1:M:437:LYS:HG2	1:M:441:ASN:ND2	2.07	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:M:510:HIS:O	1:M:514:VAL:HG23	1.91	0.70
1:M:260:TYR:CE1	1:M:264:GLN:NE2	2.60	0.70
3:O:19:LEU:CD2	3:O:19:LEU:H	2.02	0.70
1:M:174:ASN:ND2	1:M:177:GLU:HG2	2.07	0.69
1:M:174:ASN:HD22	1:M:177:GLU:H	1.40	0.69
1:M:192:THR:OG1	1:M:212:GLY:HA3	1.91	0.69
4:D:6:LYS:CG	4:P:6:LYS:HB3	2.14	0.69
4:P:77:CYS:O	4:P:81:ARG:HG3	1.93	0.69
1:M:358:MET:SD	1:M:390:ARG:N	2.65	0.69
1:M:332:CYS:HA	1:M:343:PRO:HG2	1.74	0.69
1:M:444:GLY:HA3	1:M:488:ARG:O	1.93	0.69
3:O:130:TRP:O	4:P:53:ARG:NH2	2.26	0.69
10:B:700:BRS:HO13	4:D:14:TRP:HE1	0.78	0.69
1:M:342:ASP:HB3	1:M:345:LYS:HB3	1.75	0.68
3:O:75:THR:HG22	4:P:32:ILE:HD13	1.73	0.68
1:M:44:HIS:CD2	6:M:803:FAD:C8M	2.74	0.68
3:C:99:LYS:O	3:C:100:ASP:CB	2.35	0.68
1:A:484:GLU:HG3	1:A:488:ARG:HH12	1.57	0.68
1:M:10:VAL:HG13	1:M:157:VAL:HG21	1.75	0.68
11:D:710:CE1:H171	11:D:710:CE1:H211	1.76	0.67
1:A:7:LEU:CD2	1:A:32:ILE:HG12	2.23	0.67
1:M:327:ARG:O	1:M:328:LEU:HD23	1.94	0.67
1:A:103:TRP:O	2:B:139:MET:HE1	1.95	0.67
4:D:13:PHE:HE2	4:D:97:LYS:HE2	1.58	0.67
4:P:51:TYR:HD1	4:P:52:GLU:HG3	1.60	0.67
1:M:182:GLN:NE2	1:M:429:ALA:HB1	2.10	0.67
2:N:11:VAL:CG2	2:N:91:GLU:HG2	2.25	0.66
1:A:372:LYS:HE3	1:A:413:ARG:HE	1.60	0.66
1:A:324:LEU:CD1	1:A:344:VAL:HG22	2.26	0.66
3:C:50:LYS:HB3	4:D:118:ILE:HG22	1.78	0.66
3:O:86:TRP:HE1	4:P:22:MET:HE2	1.61	0.66
1:M:162:VAL:HG13	1:M:166:HIS:O	1.96	0.66
1:M:202:ASN:HA	1:M:353:THR:HG22	1.78	0.66
4:D:0:MET:HG2	4:D:1:ILE:N	2.11	0.65
3:O:50:LYS:HG3	4:P:118:ILE:CA	2.24	0.65
1:A:390:ARG:HH22	5:A:702:OAA:C4	2.09	0.65
1:A:204:ASN:N	1:A:204:ASN:HD22	1.91	0.65
2:B:81:LEU:HD23	2:B:81:LEU:N	2.12	0.65
1:M:304:ILE:HD12	1:M:304:ILE:N	2.11	0.65
1:M:93:MET:HB3	1:M:125:TRP:CE3	2.31	0.65
1:M:204:ASN:N	1:M:204:ASN:HD22	1.95	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:M:217:LEU:HG	1:M:555:ARG:HB3	1.79	0.64
1:A:232:HIS:CE1	1:A:242:LEU:HD11	2.33	0.64
1:A:57:GLN:NE2	1:A:122:GLU:HG2	2.12	0.64
1:M:41:MET:HB2	1:M:137:HIS:CE1	2.32	0.64
2:N:135:THR:HG23	2:N:136:PRO:HD2	1.80	0.64
4:P:24:SER:O	4:P:28:ALA:HB3	1.98	0.64
1:M:168:ARG:HD3	1:M:425:ILE:CD1	2.28	0.63
1:M:435:ARG:HH12	1:M:439:LEU:HD22	1.62	0.63
2:N:81:LEU:HD12	2:N:81:LEU:N	2.12	0.63
4:D:13:PHE:CE2	4:D:97:LYS:HE2	2.33	0.63
10:N:800:BRS:HC19	4:P:18:GLY:HA2	1.80	0.63
3:O:86:TRP:HE1	4:P:22:MET:CE	2.11	0.63
4:P:39:LEU:HD13	4:P:49:LEU:HB3	1.81	0.63
1:A:250:GLU:CB	1:A:319:LEU:HD11	2.28	0.63
2:B:15:PRO:CB	3:C:5:LYS:H	2.09	0.63
2:N:40:LEU:HB3	2:N:53:TYR:CE2	2.34	0.63
2:N:54:ARG:NE	2:N:103:VAL:HG13	2.09	0.63
2:N:202:TRP:HE1	2:N:231:SER:HG	1.46	0.63
3:C:87:PHE:O	3:C:91:PRO:HD3	1.99	0.62
1:M:242:LEU:HD12	1:M:243:MET:N	2.14	0.62
4:P:51:TYR:CD1	4:P:52:GLU:HG3	2.34	0.62
1:A:27:ASN:ND2	1:A:30:ALA:HB2	2.15	0.62
1:M:435:ARG:HA	1:M:438:ASP:OD2	1.99	0.62
1:A:251:GLY:O	1:A:318:HIS:NE2	2.23	0.62
2:B:6:LEU:HD23	2:B:81:LEU:HD13	1.82	0.62
4:D:112:LEU:O	4:D:116:VAL:HG22	2.00	0.62
2:N:57:CYS:HB3	2:N:62:CYS:HB3	1.79	0.62
4:D:64:ARG:NH2	4:D:117:THR:CG2	2.62	0.62
1:M:44:HIS:NE2	6:M:803:FAD:C8	2.61	0.62
2:B:32:ALA:O	2:B:82:ARG:NH1	2.32	0.62
1:M:51:GLY:HA2	1:M:131:THR:HG21	1.82	0.62
4:P:60:SER:O	4:P:64:ARG:HG3	2.00	0.62
1:M:122:GLU:CD	1:M:122:GLU:H	2.03	0.62
1:M:168:ARG:HD3	1:M:425:ILE:HD11	1.80	0.62
3:O:59:PHE:O	3:O:62:PHE:HB3	2.00	0.62
1:M:399:LEU:HD11	6:M:803:FAD:H4'	1.80	0.62
2:N:81:LEU:H	2:N:81:LEU:CD1	2.13	0.61
1:A:253:ILE:HG13	1:A:315:ASP:HB3	1.82	0.61
1:A:197:ARG:HD2	1:A:206:GLY:HA2	1.82	0.61
2:N:196:ASN:ND2	2:N:234:ASP:OD1	2.32	0.61
1:A:358:MET:CE	1:A:389:ASN:HA	2.30	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:M:156:PHE:CD2	1:M:503:LEU:HD22	2.36	0.61
4:D:64:ARG:HH12	4:D:117:THR:HG23	1.61	0.61
3:O:50:LYS:HD2	4:P:118:ILE:HA	1.81	0.61
2:B:155:TYR:CE2	2:B:169:GLY:HA3	2.36	0.61
1:A:436:LEU:O	1:A:440:VAL:HG23	2.01	0.61
4:D:64:ARG:CZ	4:D:117:THR:HG23	2.30	0.61
1:M:390:ARG:NH1	1:M:392:GLY:HA2	2.15	0.61
3:C:130:TRP:O	4:D:53:ARG:NH2	2.32	0.60
1:M:448:TRP:CH2	1:M:504:TYR:HB3	2.36	0.60
2:N:201:VAL:HG23	2:N:202:TRP:N	2.16	0.60
2:N:39:ALA:O	2:N:43:ILE:HG12	2.02	0.60
1:M:444:GLY:HA3	1:M:488:ARG:C	2.22	0.60
2:B:155:TYR:CZ	2:B:169:GLY:HA3	2.37	0.60
2:N:116:ILE:HG22	2:N:191:ARG:HD3	1.83	0.60
1:A:321:GLU:OE1	1:A:321:GLU:HA	2.00	0.60
1:M:275:GLY:O	1:M:277:PRO:HD3	2.01	0.60
1:M:21:ILE:HG21	1:M:99:TRP:CH2	2.36	0.60
2:N:169:GLY:O	2:N:173:ILE:HG13	2.02	0.60
4:P:64:ARG:HB3	4:P:115:VAL:HG22	1.84	0.59
2:B:15:PRO:HB2	3:C:5:LYS:N	2.16	0.59
1:M:447:ASN:HD22	1:M:450:LYS:HG2	1.66	0.59
2:N:135:THR:HG22	2:N:137:ALA:H	1.66	0.59
1:A:42:ARG:HD2	1:A:42:ARG:N	2.18	0.59
2:N:113:LEU:HD11	2:N:175:LEU:HD22	1.85	0.59
1:A:11:GLY:O	1:A:16:GLY:HA3	2.03	0.59
1:M:329:PRO:HG2	1:M:330:PHE:H	1.67	0.59
1:M:396:LEU:HG	6:M:803:FAD:C2	2.32	0.59
3:O:19:LEU:HD21	3:O:22:TYR:CE2	2.38	0.59
1:A:324:LEU:HD12	1:A:344:VAL:HG22	1.84	0.59
4:D:73:LEU:HB2	4:D:74:PRO:HD3	1.85	0.59
2:N:194:GLN:HE22	4:P:1:ILE:HG21	1.68	0.59
4:D:64:ARG:HH22	4:D:117:THR:CG2	2.16	0.58
1:M:236:LEU:HD22	1:M:339:VAL:HG11	1.84	0.58
1:M:311:VAL:HG11	1:M:349:PRO:CB	2.33	0.58
1:M:331:ILE:CD1	1:M:331:ILE:H	2.15	0.58
1:M:331:ILE:HD12	1:M:331:ILE:N	2.18	0.58
3:O:106:GLU:HB2	3:O:107:PRO:HD3	1.83	0.58
1:A:323:LYS:HG3	1:A:327:ARG:NH1	2.18	0.58
10:N:800:BRG:HC19	4:P:18:GLY:CA	2.33	0.58
2:B:8:ILE:HD11	2:B:81:LEU:HD11	1.86	0.58
3:O:99:LYS:O	3:O:100:ASP:CG	2.41	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:67:LEU:O	4:D:71:ILE:HG13	2.04	0.58
2:N:225:GLN:NE2	2:N:228:LYS:HD2	2.18	0.58
1:A:18:ARG:NH1	1:A:92:GLU:OE1	2.37	0.58
4:D:36:GLY:C	4:D:37:ILE:HG13	2.24	0.58
1:M:82:VAL:HG22	1:M:385:LEU:HD12	1.84	0.58
1:A:204:ASN:N	1:A:204:ASN:ND2	2.52	0.58
1:M:499:ASN:HD21	1:M:501:ASP:HB3	1.68	0.58
1:M:476:ILE:HG23	1:M:520:HIS:CE1	2.39	0.58
2:N:81:LEU:H	2:N:81:LEU:HD12	1.69	0.58
4:P:10:GLU:N	4:P:11:PRO:CD	2.67	0.58
1:A:44:HIS:CD2	6:A:703:FAD:C8M	2.81	0.58
3:C:113:TRP:O	3:C:117:VAL:HG23	2.04	0.58
4:P:39:LEU:N	4:P:40:PRO:HD2	2.18	0.58
1:M:171:VAL:HB	1:M:432:VAL:HG11	1.86	0.57
1:M:311:VAL:HG13	1:M:350:VAL:O	2.02	0.57
1:M:296:HIS:ND1	1:M:299:ARG:NH2	2.52	0.57
1:M:332:CYS:O	1:M:336:LYS:HG3	2.04	0.57
2:B:57:CYS:HB3	2:B:62:CYS:HB3	1.86	0.57
1:M:155:HIS:HD2	1:M:174:ASN:HA	1.66	0.57
2:N:119:TYR:CE1	2:N:121:ILE:HD11	2.40	0.57
1:A:527:GLU:OE1	1:A:529:ARG:HD2	2.05	0.57
1:M:358:MET:SD	1:M:389:ASN:HA	2.44	0.57
1:M:183:ILE:N	1:M:183:ILE:HD12	2.20	0.57
3:O:36:VAL:HG23	3:O:37:TRP:N	2.20	0.57
1:A:448:TRP:CH2	1:A:504:TYR:HB3	2.40	0.56
1:M:545:VAL:HG12	1:M:546:ASN:ND2	2.19	0.56
3:O:106:GLU:H	3:O:106:GLU:CD	2.08	0.56
3:O:60:VAL:O	3:O:64:GLN:HG3	2.06	0.56
1:M:288:ASP:O	1:M:292:GLN:HG3	2.05	0.56
1:M:435:ARG:O	1:M:438:ASP:HB2	2.05	0.56
3:C:130:TRP:CD1	3:C:130:TRP:N	2.69	0.56
2:N:206:PHE:CE1	2:N:225:GLN:HG3	2.40	0.56
1:A:28:PRO:HA	1:A:148:GLN:HE21	1.70	0.56
1:A:141:GLN:HB3	2:B:118:PRO:O	2.06	0.56
4:D:86:MET:HA	4:D:86:MET:HE3	1.87	0.56
1:M:48:ALA:HB3	1:M:132:GLY:CA	2.36	0.56
2:N:97:PRO:HG2	2:N:105:ASP:HB3	1.87	0.56
4:D:83:HIS:O	4:D:86:MET:HB2	2.06	0.56
2:N:12:ARG:NH2	2:N:101:ASP:OD1	2.38	0.56
4:P:28:ALA:N	4:P:29:PRO:HD2	2.20	0.56
3:O:33:VAL:O	3:O:36:VAL:HG22	2.06	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:395:SER:OG	6:A:703:FAD:H2'	2.06	0.56
1:M:162:VAL:HG22	1:M:167:VAL:HA	1.86	0.56
1:M:213:MET:CE	1:M:380:CYS:HA	2.36	0.56
4:P:35:VAL:O	4:P:40:PRO:HD3	2.06	0.56
2:N:155:TYR:CE2	2:N:169:GLY:HA3	2.41	0.56
1:M:17:LEU:HD13	1:M:140:PHE:N	2.21	0.55
1:M:217:LEU:HG	1:M:555:ARG:CB	2.37	0.55
2:N:151:CYS:N	9:N:246:SF4:S4	2.79	0.55
1:A:250:GLU:HB3	1:A:319:LEU:HD11	1.87	0.55
2:B:57:CYS:O	2:B:58:ARG:HB2	2.05	0.55
1:M:174:ASN:ND2	1:M:177:GLU:CG	2.69	0.55
1:M:476:ILE:HG23	1:M:520:HIS:HE1	1.71	0.55
1:M:213:MET:HE3	1:M:380:CYS:HA	1.87	0.55
2:B:16:GLU:HG2	3:C:3:LYS:HB3	1.89	0.55
3:C:75:THR:HG22	4:D:32:ILE:HD13	1.89	0.55
1:M:113:VAL:HA	1:M:124:THR:O	2.06	0.55
1:A:328:LEU:O	1:A:332:CYS:SG	2.49	0.55
1:A:35:ILE:HG22	1:A:36:SER:N	2.20	0.55
2:B:134:GLN:HE21	2:B:139:MET:CE	2.20	0.55
3:C:85:THR:O	3:C:89:LEU:HD12	2.05	0.55
1:M:549:LYS:HD2	1:M:565:TYR:CB	2.37	0.55
2:N:241:LYS:CG	2:N:241:LYS:O	2.55	0.55
2:N:241:LYS:CD	2:N:241:LYS:O	2.55	0.55
2:B:2:GLU:OE2	2:B:2:GLU:HA	2.05	0.55
2:N:233:LYS:O	2:N:237:ILE:HD13	2.06	0.55
3:O:18:LYS:HD2	3:O:19:LEU:HD22	1.87	0.55
1:A:546:ASN:O	1:A:549:LYS:HE2	2.07	0.55
3:O:70:ILE:O	3:O:73:LEU:HB2	2.07	0.55
2:N:175:LEU:O	2:N:178:ARG:HB3	2.06	0.54
1:M:323:LYS:HG2	1:M:327:ARG:HH21	1.71	0.54
4:D:4:ASN:HD22	4:P:2:ASN:ND2	2.05	0.54
4:P:51:TYR:CD1	4:P:52:GLU:N	2.72	0.54
2:B:81:LEU:HD23	2:B:81:LEU:H	1.72	0.54
3:C:65:ASN:HB3	3:C:68:ILE:H	1.72	0.54
1:M:195:ALA:O	1:M:198:VAL:HG22	2.06	0.54
1:M:76:LEU:HD12	1:M:388:ALA:HB2	1.89	0.54
1:M:545:VAL:C	1:M:546:ASN:HD22	2.09	0.54
3:C:33:VAL:HA	4:D:82:MET:CE	2.37	0.54
1:M:548:LEU:HD21	1:M:575:PRO:HG3	1.89	0.54
1:M:239:SER:HB2	1:M:241:ILE:HG13	1.89	0.54
1:M:42:ARG:HH21	2:N:150:ASN:CB	2.14	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:M:499:ASN:O	1:M:503:LEU:HG	2.07	0.54
2:N:157:ALA:HB1	2:N:209:TYR:HD2	1.71	0.54
3:C:11:MET:HE2	3:C:15:TRP:CD1	2.43	0.54
1:M:84:TYR:HE2	1:M:405:LEU:HD22	1.73	0.54
4:D:10:GLU:N	4:D:11:PRO:HD2	2.22	0.54
2:N:13:TYR:HB2	2:N:21:PRO:HB3	1.90	0.54
2:B:56:SER:O	2:B:58:ARG:HG3	2.08	0.54
11:D:710:CE1:H362	4:P:76:TRP:NE1	2.24	0.54
1:M:84:TYR:CE2	1:M:405:LEU:HD22	2.43	0.54
2:B:170:PRO:HA	2:B:224:ILE:HD11	1.90	0.53
1:M:304:ILE:CD1	1:M:304:ILE:H	2.16	0.53
3:O:74:ILE:HA	11:O:811:CE1:H151	1.90	0.53
4:P:64:ARG:O	4:P:115:VAL:HG21	2.08	0.53
1:A:232:HIS:HD2	1:A:234:THR:H	1.56	0.53
1:A:89:CYS:HB2	1:A:90:PRO:HD3	1.90	0.53
2:B:110:ILE:O	2:B:114:GLU:HG3	2.08	0.53
1:M:499:ASN:HA	2:N:100:ARG:HH21	1.73	0.53
1:A:93:MET:HB3	1:A:125:TRP:CZ3	2.44	0.53
1:A:556:ASP:HB2	1:A:558:ASP:OD2	2.08	0.53
4:P:113:ILE:O	4:P:117:THR:N	2.41	0.53
1:M:204:ASN:ND2	1:M:204:ASN:N	2.52	0.53
1:M:44:HIS:CE1	1:M:204:ASN:HA	2.44	0.53
1:A:18:ARG:HG2	1:A:400:VAL:HA	1.91	0.53
1:A:442:GLN:OE1	1:A:487:LYS:HA	2.08	0.53
1:A:395:SER:HB3	6:A:703:FAD:N1	2.24	0.53
2:B:225:GLN:HE21	10:B:700:BRS:C21	2.20	0.53
3:C:59:PHE:CE1	3:C:63:LEU:HD11	2.44	0.53
2:N:220:PRO:O	2:N:223:ALA:N	2.41	0.53
4:P:62:ILE:HG23	4:P:63:GLY:N	2.24	0.53
1:A:159:ASP:OD2	1:A:160:ILE:N	2.42	0.53
2:N:139:MET:HA	2:N:142:TYR:CE2	2.44	0.53
3:C:50:LYS:CG	4:D:118:ILE:HG22	2.39	0.53
1:M:279:ASN:O	1:M:280:LYS:HB2	2.09	0.53
2:B:169:GLY:O	2:B:173:ILE:HG13	2.09	0.53
1:M:36:SER:HA	6:M:803:FAD:N3A	2.24	0.53
4:P:62:ILE:O	4:P:65:VAL:HG22	2.09	0.53
2:N:225:GLN:O	2:N:229:VAL:HG23	2.09	0.52
2:N:12:ARG:NH1	2:N:50:ASP:OD1	2.23	0.52
3:O:19:LEU:HD23	3:O:19:LEU:N	2.06	0.52
1:M:209:THR:O	1:M:209:THR:HG22	2.09	0.52
1:M:497:VAL:HG21	2:N:15:PRO:CG	2.38	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:N:135:THR:CG2	2:N:136:PRO:HD2	2.40	0.52
2:N:81:LEU:CD1	2:N:81:LEU:N	2.71	0.52
2:B:207:VAL:HG22	3:C:25:TYR:CE1	2.45	0.52
3:C:50:LYS:HE2	3:C:50:LYS:HA	1.91	0.52
1:M:97:GLU:OE2	2:N:132:ASN:ND2	2.42	0.52
4:P:117:THR:O	4:P:118:ILE:OXT	2.27	0.52
1:M:66:PHE:HD1	1:M:82:VAL:HG12	1.74	0.52
2:N:241:LYS:O	2:N:241:LYS:HD2	2.09	0.52
1:A:142:THR:O	1:A:145:GLN:HG2	2.08	0.52
2:B:157:ALA:HB1	2:B:209:TYR:CD2	2.45	0.52
1:M:199:TYR:CE1	1:M:229:VAL:HG11	2.44	0.52
1:M:41:MET:CE	2:N:150:ASN:HD22	2.23	0.52
3:C:98:VAL:HG23	3:C:98:VAL:O	2.10	0.52
1:A:253:ILE:CG1	1:A:315:ASP:HB3	2.39	0.52
1:A:358:MET:HE2	1:A:389:ASN:HA	1.92	0.52
1:M:390:ARG:HD2	1:M:391:LEU:O	2.10	0.52
3:C:50:LYS:HB3	4:D:118:ILE:CG2	2.39	0.52
1:M:10:VAL:CG1	1:M:157:VAL:HG21	2.40	0.52
2:B:120:ILE:HD13	2:B:185:ASP:HB2	1.92	0.51
2:B:212:GLU:HG3	3:C:21:PHE:CE2	2.44	0.51
4:D:24:SER:O	4:D:28:ALA:HB3	2.10	0.51
1:M:105:ARG:HG3	2:N:134:GLN:O	2.10	0.51
1:M:195:ALA:O	1:M:198:VAL:HG13	2.11	0.51
3:O:120:THR:HG23	4:P:30:VAL:HB	1.92	0.51
1:A:184:ARG:NH1	1:A:184:ARG:HG2	2.21	0.51
1:A:54:ALA:HB3	1:A:125:TRP:NE1	2.25	0.51
1:M:435:ARG:NH1	1:M:439:LEU:HB2	2.25	0.51
1:M:103:TRP:HH2	1:M:135:MET:SD	2.33	0.51
1:A:446:GLU:HB2	1:A:488:ARG:O	2.11	0.51
1:A:462:GLY:HA3	1:A:475:THR:OG1	2.09	0.51
3:C:87:PHE:CD2	3:C:112:LEU:HD13	2.46	0.51
3:O:127:ALA:O	3:O:128:LEU:HD23	2.10	0.51
3:O:65:ASN:O	3:O:66:PRO:C	2.47	0.51
1:A:200:ARG:HG3	1:A:457:LEU:HD23	1.93	0.51
2:B:134:GLN:HE21	2:B:139:MET:HE3	1.75	0.51
4:D:114:GLY:O	4:D:117:THR:HA	2.11	0.51
4:D:4:ASN:ND2	4:P:2:ASN:ND2	2.58	0.51
1:M:232:HIS:O	1:M:352:PRO:HA	2.10	0.51
1:M:99:TRP:CD2	1:M:142:THR:HG21	2.45	0.51
1:M:6:ASP:HB3	1:M:7:LEU:HD23	1.91	0.51
2:N:225:GLN:HE21	10:N:800:BRS:C22	2.21	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:O:97:ILE:CD1	3:O:102:LYS:HA	2.41	0.51
1:M:199:TYR:OH	1:M:229:VAL:HG21	2.11	0.51
2:N:2:GLU:HA	2:N:2:GLU:OE1	2.10	0.51
2:B:113:LEU:O	2:B:113:LEU:HD23	2.09	0.51
1:M:488:ARG:HB3	1:M:488:ARG:CZ	2.41	0.51
1:M:96:LEU:HD21	1:M:139:LEU:CD2	2.40	0.51
2:N:155:TYR:CZ	2:N:169:GLY:HA3	2.46	0.51
1:A:316:LEU:O	1:A:319:LEU:HB2	2.09	0.51
1:A:44:HIS:NE2	6:A:703:FAD:C8	2.68	0.51
2:B:145:PHE:HA	2:B:218:VAL:HG13	1.93	0.51
1:M:130:LYS:O	1:M:133:PHE:HB3	2.11	0.51
1:M:176:MET:O	1:M:497:VAL:HA	2.10	0.51
1:M:222:PRO:CG	1:M:362:GLU:OE1	2.59	0.51
1:A:253:ILE:HA	1:A:283:GLU:HG2	1.92	0.50
1:M:213:MET:HB3	1:M:223:LEU:HD21	1.92	0.50
1:A:184:ARG:CG	1:A:184:ARG:HH11	2.18	0.50
3:C:104:GLY:HA2	3:C:107:PRO:HD2	1.92	0.50
4:D:28:ALA:O	4:D:32:ILE:HG13	2.11	0.50
1:M:233:PRO:HG2	1:M:248:ARG:HH22	1.76	0.50
1:A:525:ARG:NH1	1:A:527:GLU:OE1	2.42	0.50
1:M:400:VAL:HG23	1:M:401:VAL:N	2.26	0.50
1:A:148:GLN:N	1:A:148:GLN:OE1	2.40	0.50
1:M:435:ARG:O	1:M:435:ARG:HD2	2.11	0.50
1:A:94:THR:HA	2:B:131:THR:HG22	1.92	0.50
1:M:44:HIS:NE2	6:M:803:FAD:HM81	2.08	0.50
1:A:500:THR:HB	1:A:504:TYR:CZ	2.46	0.50
3:C:82:HIS:HE1	3:C:86:TRP:CE3	2.30	0.50
2:N:235:PHE:HE1	4:P:8:SER:O	1.95	0.50
1:A:228:PHE:O	1:A:358:MET:HB2	2.12	0.50
4:P:117:THR:HG22	4:P:118:ILE:CA	2.41	0.50
1:M:23:ALA:HB3	1:M:32:ILE:HD13	1.93	0.50
1:M:488:ARG:CB	1:M:488:ARG:NH1	2.74	0.50
1:M:98:LEU:HD11	2:N:127:ALA:CA	2.38	0.50
2:N:9:GLU:HG3	2:N:25:PHE:CZ	2.47	0.50
2:B:241:LYS:O	2:B:241:LYS:HG3	2.11	0.50
1:M:499:ASN:C	1:M:499:ASN:HD22	2.15	0.50
2:N:110:ILE:O	2:N:114:GLU:HG3	2.11	0.50
1:A:170:LEU:HD12	1:A:170:LEU:C	2.31	0.49
1:M:452:ARG:NH2	2:N:45:ASP:OD2	2.45	0.49
3:O:50:LYS:HD2	4:P:118:ILE:CA	2.41	0.49
1:A:336:LYS:O	1:A:340:GLY:HA2	2.11	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:50:LYS:CB	4:D:118:ILE:HG22	2.42	0.49
1:M:251:GLY:CA	1:M:277:PRO:HG2	2.29	0.49
3:C:28:ARG:HD2	3:C:29:GLU:OE2	2.13	0.49
1:M:1:GLN:HG2	1:M:2:THR:N	2.27	0.49
3:O:84:LYS:HG3	3:O:85:THR:N	2.27	0.49
1:A:244:THR:HG22	1:A:331:ILE:HG13	1.92	0.49
2:N:96:PHE:HB3	2:N:104:VAL:HB	1.93	0.49
1:A:358:MET:HE3	1:A:389:ASN:HA	1.93	0.49
1:A:390:ARG:HD2	1:A:395:SER:HB2	1.94	0.49
4:D:0:MET:CG	4:D:1:ILE:N	2.72	0.49
4:D:102:GLY:HA2	11:D:710:CE1:H62	1.93	0.49
1:M:488:ARG:CB	1:M:488:ARG:HH11	2.25	0.49
2:N:225:GLN:HE22	2:N:228:LYS:HD2	1.76	0.49
4:P:30:VAL:O	4:P:33:LEU:HB3	2.12	0.49
1:M:324:LEU:O	1:M:328:LEU:N	2.42	0.49
2:N:208:GLY:N	8:N:245:F3S:S1	2.81	0.49
3:O:36:VAL:HG11	4:P:82:MET:CE	2.43	0.49
1:A:288:ASP:O	1:A:292:GLN:HG3	2.13	0.49
2:B:119:TYR:O	2:B:121:ILE:HG13	2.13	0.49
4:D:30:VAL:HG13	4:D:31:MET:N	2.27	0.49
1:M:222:PRO:HG3	1:M:362:GLU:OE1	2.12	0.49
4:P:7:ARG:HG2	4:P:8:SER:N	2.28	0.49
1:M:321:GLU:HA	1:M:324:LEU:HB3	1.95	0.49
1:M:375:PHE:N	1:M:375:PHE:CD1	2.81	0.49
1:M:421:ASN:ND2	1:M:424:ALA:CB	2.61	0.49
1:A:391:LEU:O	1:A:394:ASN:HB2	2.13	0.49
2:B:175:LEU:O	2:B:178:ARG:HB3	2.13	0.49
3:C:106:GLU:HB2	3:C:107:PRO:HD3	1.95	0.49
3:C:50:LYS:CD	4:D:118:ILE:C	2.73	0.49
2:N:221:ALA:O	2:N:225:GLN:HG2	2.13	0.49
3:O:103:MET:CG	3:O:104:GLY:N	2.76	0.49
3:O:31:THR:O	3:O:34:PRO:HD2	2.13	0.49
1:A:232:HIS:NE2	1:A:242:LEU:HD11	2.28	0.49
2:B:222:ALA:HB2	3:C:92:LYS:HE3	1.95	0.49
2:B:225:GLN:CG	10:B:700:BRS:H222	2.43	0.48
3:C:31:THR:O	3:C:34:PRO:HD2	2.13	0.48
1:M:311:VAL:HG12	1:M:312:VAL:N	2.28	0.48
1:M:40:PRO:HB2	1:M:140:PHE:CD1	2.48	0.48
1:A:85:PHE:CD2	1:A:385:LEU:HD11	2.49	0.48
1:M:66:PHE:CD1	1:M:82:VAL:HG12	2.48	0.48
3:O:103:MET:HG2	3:O:104:GLY:N	2.28	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:P:72:VAL:HG11	4:P:108:THR:HG23	1.94	0.48
4:P:86:MET:HE3	4:P:91:ILE:HD12	1.95	0.48
4:D:93:VAL:N	2:N:243:ARG:O	2.40	0.48
1:M:7:LEU:CD1	1:M:23:ALA:HB1	2.43	0.48
3:O:85:THR:O	3:O:89:LEU:HD12	2.14	0.48
1:A:184:ARG:NH1	1:A:184:ARG:CG	2.76	0.48
3:C:12:THR:CG2	3:C:13:SER:N	2.77	0.48
1:M:465:ILE:N	1:M:465:ILE:HD13	2.21	0.48
1:A:127:ALA:HB3	1:A:131:THR:HA	1.96	0.48
1:M:233:PRO:HG2	1:M:248:ARG:NH2	2.29	0.48
1:M:448:TRP:CG	1:M:449:ALA:N	2.81	0.48
1:A:308:ARG:HH12	1:A:339:VAL:HA	1.79	0.48
4:D:86:MET:CE	4:D:91:ILE:HD12	2.43	0.48
2:N:182:ASP:OD2	2:N:184:ARG:HD3	2.14	0.48
1:M:463:CYS:HA	1:M:467:ARG:HE	1.78	0.47
1:M:469:PRO:HB3	1:M:523:MET:HE1	1.96	0.47
1:M:546:ASN:N	1:M:546:ASN:HD22	2.10	0.47
1:M:548:LEU:CD2	1:M:575:PRO:HG3	2.44	0.47
1:M:54:ALA:O	1:M:55:VAL:C	2.51	0.47
2:N:44:LYS:HD3	2:N:51:LEU:O	2.14	0.47
3:O:65:ASN:OD1	3:O:65:ASN:O	2.32	0.47
3:O:130:TRP:C	4:P:53:ARG:NH2	2.67	0.47
2:B:159:PRO:CG	2:B:207:VAL:HG21	2.44	0.47
3:O:50:LYS:HD2	4:P:117:THR:CG2	2.41	0.47
1:M:304:ILE:HG12	1:M:313:TYR:HE2	1.79	0.47
2:N:241:LYS:HG3	2:N:241:LYS:O	2.14	0.47
3:C:28:ARG:NH1	3:C:29:GLU:OE2	2.38	0.47
4:D:92:HIS:HA	2:N:243:ARG:OXT	2.15	0.47
1:M:2:THR:HG22	1:M:3:PHE:N	2.29	0.47
4:P:6:LYS:HG3	4:P:6:LYS:H	1.36	0.47
2:B:192:MET:O	2:B:193:ALA:C	2.52	0.47
2:N:201:VAL:CG2	2:N:202:TRP:N	2.77	0.47
3:O:98:VAL:HG23	3:O:103:MET:HB2	1.96	0.47
4:P:86:MET:HE3	4:P:91:ILE:HB	1.97	0.47
1:A:126:PHE:N	1:A:126:PHE:CD2	2.82	0.47
1:A:342:ASP:C	1:A:344:VAL:H	2.18	0.47
2:B:81:LEU:CD2	2:B:81:LEU:N	2.77	0.47
1:M:546:ASN:O	1:M:549:LYS:HE3	2.15	0.47
1:M:58:ASP:C	1:M:60:ASP:H	2.18	0.47
1:M:7:LEU:HD11	1:M:23:ALA:HB1	1.97	0.47
1:M:17:LEU:O	1:M:21:ILE:HG13	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:250:GLU:HB2	1:A:319:LEU:HD11	1.95	0.47
2:B:7:LYS:HE2	2:B:25:PHE:CD2	2.50	0.47
1:M:421:ASN:ND2	1:M:424:ALA:H	2.13	0.47
1:A:408:GLU:O	1:A:411:THR:HB	2.15	0.47
1:A:49:GLU:HG3	1:A:244:THR:HB	1.96	0.47
1:M:159:ASP:OD2	1:M:160:ILE:N	2.48	0.47
1:M:89:CYS:N	1:M:90:PRO:HD2	2.30	0.47
2:B:100:ARG:NE	2:B:101:ASP:OD2	2.43	0.46
1:M:88:HIS:O	1:M:401:VAL:HG22	2.15	0.46
2:N:12:ARG:NE	2:N:101:ASP:OD1	2.48	0.46
1:A:247:CYS:SG	1:A:331:ILE:HG21	2.56	0.46
2:B:11:VAL:HG21	2:B:91:GLU:HG2	1.97	0.46
10:B:700:BRS:HC21	4:D:14:TRP:HZ2	1.80	0.46
1:M:251:GLY:HA2	1:M:277:PRO:CG	2.29	0.46
1:M:184:ARG:NH2	1:M:426:GLU:HG2	2.30	0.46
3:O:22:TYR:O	3:O:25:TYR:HB3	2.15	0.46
3:O:51:ASN:HB2	3:O:55:ALA:CB	2.45	0.46
4:P:48:ALA:HA	4:P:53:ARG:HD3	1.97	0.46
1:A:182:GLN:OE1	1:A:184:ARG:NH1	2.46	0.46
1:A:451:ILE:HG23	1:A:482:LEU:HD22	1.96	0.46
1:A:466:TYR:CD2	1:A:535:LEU:HD21	2.51	0.46
2:N:28:VAL:HG22	2:N:43:ILE:HD11	1.97	0.46
1:A:145:GLN:HB3	2:B:119:TYR:CZ	2.50	0.46
4:D:53:ARG:HG2	4:D:53:ARG:HH11	1.81	0.46
4:D:57:PHE:CZ	4:D:63:GLY:HA2	2.51	0.46
4:P:114:GLY:O	4:P:118:ILE:HG22	2.14	0.46
1:M:219:HIS:O	1:M:371:ILE:HD11	2.15	0.46
1:M:481:GLU:O	1:M:485:ARG:HG2	2.15	0.46
1:A:556:ASP:OD2	1:A:562:ARG:NE	2.49	0.46
1:A:55:VAL:HG21	1:A:62:PHE:CD2	2.51	0.46
1:A:94:THR:HG23	2:B:131:THR:HG22	1.97	0.46
1:A:317:ARG:C	1:A:319:LEU:H	2.19	0.46
2:B:134:GLN:NE2	2:B:139:MET:HE2	2.31	0.46
2:B:241:LYS:C	2:B:243:ARG:N	2.58	0.46
1:M:162:VAL:HG13	1:M:166:HIS:C	2.36	0.46
1:M:342:ASP:OD1	1:M:344:VAL:HG22	2.16	0.46
2:B:188:LYS:NZ	2:B:230:GLU:HG3	2.30	0.46
10:B:700:BRS:HC19	4:D:18:GLY:CA	2.43	0.46
1:M:428:GLN:O	1:M:432:VAL:HG23	2.15	0.46
1:M:551:THR:HG23	1:M:563:LEU:HD22	1.98	0.46
4:P:1:ILE:HD12	4:P:1:ILE:N	2.31	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:P:26:ILE:HG22	4:P:27:ILE:HG13	1.96	0.46
1:A:542:ARG:NH2	1:A:544:ASP:OD2	2.46	0.46
1:M:206:GLY:HA3	2:N:55:TRP:CZ3	2.51	0.46
3:O:84:LYS:HE2	3:O:88:GLU:CD	2.36	0.46
1:A:304:ILE:HD12	1:A:304:ILE:H	1.80	0.46
4:D:9:ASP:HB2	11:P:810:CE1:H242	1.98	0.46
1:M:330:PHE:HB3	1:M:331:ILE:HD12	1.97	0.46
1:M:18:ARG:HG2	1:M:400:VAL:HA	1.98	0.46
1:M:421:ASN:O	1:M:425:ILE:HG13	2.17	0.46
1:A:514:VAL:HG12	1:A:518:MET:HE2	1.98	0.45
1:M:174:ASN:ND2	1:M:177:GLU:H	2.11	0.45
3:O:18:LYS:HD2	3:O:19:LEU:CD2	2.46	0.45
3:O:38:PHE:CE2	3:O:42:LEU:HD11	2.52	0.45
3:C:8:VAL:HG12	3:C:8:VAL:O	2.14	0.45
1:M:339:VAL:O	1:M:341:VAL:HG23	2.16	0.45
2:N:109:PHE:CE2	2:N:113:LEU:HD22	2.51	0.45
2:N:158:CYS:HA	8:N:245:F3S:S4	2.56	0.45
3:O:128:LEU:O	4:P:45:PRO:HG2	2.17	0.45
2:B:214:CYS:SG	2:B:218:VAL:HB	2.56	0.45
3:C:98:VAL:HG22	3:C:103:MET:HB3	1.98	0.45
1:M:570:ILE:HG22	1:M:571:THR:N	2.31	0.45
2:N:28:VAL:CG2	2:N:43:ILE:HD11	2.46	0.45
2:B:57:CYS:O	2:B:58:ARG:CB	2.63	0.45
1:M:35:ILE:CD1	1:M:155:HIS:HB3	2.46	0.45
2:N:236:LEU:HD23	2:N:236:LEU:C	2.37	0.45
1:A:250:GLU:O	1:A:319:LEU:HD11	2.17	0.45
4:D:42:GLY:O	4:D:44:PHE:N	2.48	0.45
1:M:151:ARG:NH1	1:M:153:ASP:OD2	2.49	0.45
4:P:51:TYR:HD1	4:P:52:GLU:H	1.55	0.45
3:C:12:THR:HG22	3:C:13:SER:N	2.30	0.45
1:M:184:ARG:HH11	1:M:184:ARG:HG3	1.82	0.45
1:M:92:GLU:HB3	1:M:400:VAL:HB	1.99	0.45
4:P:53:ARG:NH1	4:P:53:ARG:HG2	2.32	0.45
2:B:240:LEU:C	2:B:242:PRO:HD3	2.37	0.45
3:C:70:ILE:O	3:C:74:ILE:HG13	2.16	0.45
1:M:145:GLN:O	1:M:147:PRO:HD3	2.16	0.45
1:M:299:ARG:HE	1:M:299:ARG:HB2	1.54	0.45
1:M:493:ASP:OD2	1:M:499:ASN:CG	2.55	0.45
2:N:168:ILE:HD11	2:N:173:ILE:HG12	1.99	0.45
1:A:236:LEU:HD11	1:A:243:MET:HE3	1.98	0.45
1:M:492:THR:HG22	1:M:492:THR:O	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:P:67:LEU:O	4:P:71:ILE:HG13	2.16	0.45
1:M:150:GLN:HG3	1:M:152:PHE:CE1	2.51	0.44
1:M:341:VAL:HG13	1:M:346:GLU:HB2	1.99	0.44
1:M:480:ALA:O	1:M:483:GLN:HB2	2.17	0.44
1:M:1:GLN:HG2	1:M:2:THR:H	1.83	0.44
1:M:105:ARG:NH1	2:N:134:GLN:H	2.15	0.44
2:N:198:GLN:O	2:N:203:SER:HB2	2.17	0.44
2:N:214:CYS:SG	9:N:246:SF4:S1	3.15	0.44
3:O:33:VAL:HB	3:O:34:PRO:CD	2.42	0.44
4:P:95:ALA:O	4:P:96:GLY:C	2.55	0.44
1:A:282:MET:HB3	1:A:283:GLU:OE1	2.17	0.44
3:C:39:SER:O	3:C:43:ILE:HG13	2.18	0.44
4:D:117:THR:HB	4:D:118:ILE:O	2.17	0.44
4:D:39:LEU:HB3	4:D:40:PRO:CD	2.47	0.44
1:M:377:VAL:HG22	1:M:378:GLY:N	2.33	0.44
1:A:17:LEU:HD22	1:A:140:PHE:HA	1.99	0.44
4:D:20:GLY:HA2	4:D:73:LEU:HB3	2.00	0.44
4:D:30:VAL:CG1	4:D:31:MET:N	2.81	0.44
4:D:72:VAL:O	4:D:75:LEU:HB2	2.18	0.44
2:N:126:THR:OG1	2:N:129:GLN:HG3	2.18	0.44
2:N:218:VAL:O	2:N:219:ASP:HB3	2.18	0.44
4:P:112:LEU:O	4:P:116:VAL:HG22	2.18	0.44
3:C:15:TRP:CD2	3:C:16:TRP:N	2.85	0.44
2:N:170:PRO:HG2	2:N:171:ALA:H	1.82	0.44
4:P:79:LEU:HD12	4:P:104:ALA:HB2	1.98	0.44
1:A:2:THR:HA	1:A:182:GLN:O	2.18	0.44
1:A:244:THR:HG22	1:A:331:ILE:CG1	2.47	0.44
1:A:356:TYR:CZ	1:A:390:ARG:HD3	2.51	0.44
2:B:206:PHE:CE1	2:B:225:GLN:HG3	2.53	0.44
4:P:109:VAL:O	4:P:112:LEU:HB3	2.17	0.44
2:B:201:VAL:HG23	2:B:202:TRP:N	2.32	0.44
1:M:399:LEU:HD11	6:M:803:FAD:C4'	2.46	0.44
1:A:151:ARG:NH1	1:A:153:ASP:OD2	2.49	0.44
2:B:160:GLN:HA	2:B:160:GLN:OE1	2.17	0.44
2:B:81:LEU:O	2:B:83:ASP:N	2.51	0.44
3:C:106:GLU:H	3:C:106:GLU:CD	2.22	0.44
4:D:40:PRO:O	4:D:41:LEU:HD23	2.18	0.44
1:A:386:HIS:ND1	1:A:390:ARG:HG3	2.33	0.44
4:D:64:ARG:NH1	4:D:115:VAL:O	2.51	0.44
1:M:328:LEU:N	1:M:329:PRO:CD	2.81	0.44
1:M:434:GLN:HA	1:M:434:GLN:NE2	2.33	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:86:MET:CE	4:D:86:MET:HA	2.44	0.43
1:M:190:MET:O	1:M:376:ALA:HA	2.18	0.43
2:N:75:LEU:HD11	2:N:215:PRO:HG3	2.00	0.43
3:O:49:LEU:HD13	3:O:56:TRP:CE3	2.53	0.43
3:C:37:TRP:CZ2	3:C:41:GLU:OE1	2.71	0.43
1:M:2:THR:CG2	1:M:3:PHE:N	2.81	0.43
1:M:526:LYS:HA	1:M:534:ARG:NH1	2.33	0.43
2:N:133:ILE:O	2:N:133:ILE:HG22	2.17	0.43
3:O:111:SER:O	3:O:114:ALA:HB3	2.18	0.43
3:O:124:LEU:HA	3:O:124:LEU:HD23	1.79	0.43
1:A:304:ILE:N	1:A:304:ILE:HD12	2.33	0.43
1:A:324:LEU:O	1:A:328:LEU:N	2.46	0.43
4:D:4:ASN:CG	4:D:4:ASN:O	2.56	0.43
2:N:159:PRO:CG	2:N:207:VAL:HG21	2.44	0.43
1:A:40:PRO:HB2	1:A:140:PHE:CD1	2.53	0.43
2:B:240:LEU:O	2:B:242:PRO:CD	2.66	0.43
1:M:316:LEU:HD22	1:M:319:LEU:CD1	2.43	0.43
3:O:65:ASN:O	3:O:67:VAL:N	2.51	0.43
1:M:274:LEU:HD22	1:M:318:HIS:CD2	2.53	0.43
1:M:304:ILE:HG22	1:M:305:SER:N	2.34	0.43
1:M:35:ILE:CG1	1:M:36:SER:N	2.81	0.43
1:M:435:ARG:HH12	1:M:439:LEU:CD2	2.27	0.43
3:O:86:TRP:CH2	4:P:21:GLY:HA3	2.54	0.43
2:B:136:PRO:HB2	3:C:100:ASP:OD1	2.18	0.43
3:C:87:PHE:O	3:C:91:PRO:CD	2.67	0.43
1:M:2:THR:HA	1:M:182:GLN:O	2.18	0.43
2:N:44:LYS:NZ	2:N:49:PRO:O	2.42	0.43
4:P:79:LEU:HD23	4:P:82:MET:CE	2.49	0.43
2:B:167:PHE:CD1	2:B:203:SER:HB3	2.54	0.43
1:M:331:ILE:HA	1:M:334:LEU:HD12	2.01	0.43
1:M:439:LEU:O	1:M:442:GLN:HB3	2.19	0.43
2:N:149:ILE:HG12	9:N:246:SF4:S3	2.59	0.43
1:A:83:ASP:O	1:A:87:HIS:HD2	2.02	0.43
4:D:64:ARG:CZ	4:D:117:THR:CG2	2.96	0.43
1:M:320:GLY:O	1:M:324:LEU:HB2	2.19	0.43
1:A:311:VAL:HB	1:A:350:VAL:O	2.19	0.43
1:M:449:ALA:HB1	2:N:45:ASP:OD2	2.18	0.43
1:A:343:PRO:HG3	1:A:348:ILE:HD11	2.00	0.42
1:A:377:VAL:HG21	1:A:403:GLY:HA2	2.01	0.42
2:B:225:GLN:HG3	10:B:700:BRS:H222	2.00	0.42
4:D:13:PHE:HZ	11:D:710:CE1:H102	1.83	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:95:ALA:O	4:D:96:GLY:C	2.57	0.42
1:M:315:ASP:OD1	1:M:317:ARG:HG3	2.19	0.42
3:O:73:LEU:HA	3:O:73:LEU:HD23	1.79	0.42
3:O:90:ALA:N	3:O:91:PRO:HD2	2.33	0.42
4:P:9:ASP:C	4:P:11:PRO:HD2	2.39	0.42
1:A:118:GLY:HA2	1:A:279:ASN:HD21	1.84	0.42
1:M:184:ARG:HG3	1:M:184:ARG:NH1	2.33	0.42
4:D:98:TRP:NE1	11:D:710:CE1:H141	2.34	0.42
1:M:493:ASP:OD2	1:M:499:ASN:ND2	2.53	0.42
1:M:66:PHE:O	1:M:70:VAL:HG23	2.18	0.42
3:O:118:VAL:O	3:O:122:VAL:HG23	2.19	0.42
1:A:274:LEU:HA	1:A:274:LEU:HD23	1.73	0.42
1:A:39:TYR:O	1:A:40:PRO:C	2.58	0.42
2:B:6:LEU:CD2	2:B:81:LEU:HD13	2.48	0.42
2:N:26:TYR:HB3	2:N:47:LEU:HD13	2.00	0.42
1:A:135:MET:CG	1:A:135:MET:CE	2.94	0.42
1:A:202:ASN:HA	1:A:353:THR:HG22	2.00	0.42
1:A:84:TYR:OH	1:A:405:LEU:HD13	2.19	0.42
4:D:48:ALA:HA	4:D:53:ARG:HD3	2.01	0.42
1:A:157:VAL:HG12	1:A:215:MET:CE	2.49	0.42
1:M:105:ARG:HH12	2:N:134:GLN:H	1.68	0.42
3:O:123:ILE:HD12	4:P:30:VAL:HG11	2.00	0.42
3:O:19:LEU:HA	3:O:20:PRO:HD3	1.90	0.42
3:C:82:HIS:CE1	3:C:86:TRP:CE3	3.08	0.42
2:N:150:ASN:HA	9:N:246:SF4:S4	2.60	0.42
2:N:58:ARG:HD2	2:N:58:ARG:HH11	1.66	0.42
2:N:61:ILE:HG13	2:N:61:ILE:O	2.19	0.42
2:N:67:MET:SD	2:N:102:LEU:HD13	2.60	0.42
1:A:196:GLY:HA3	1:A:204:ASN:OD1	2.20	0.42
1:M:369:THR:HG23	1:M:374:LEU:O	2.19	0.42
3:O:19:LEU:CD2	3:O:19:LEU:N	2.72	0.42
2:B:154:CYS:SG	2:B:170:PRO:HG2	2.60	0.42
3:C:15:TRP:CE3	3:C:16:TRP:N	2.88	0.42
10:B:700:BRS:O5	3:C:89:LEU:HB2	2.19	0.42
1:M:434:GLN:HA	1:M:434:GLN:HE21	1.84	0.42
1:M:552:LEU:HD11	1:M:566:SER:OG	2.20	0.42
1:M:72:GLY:O	1:M:389:ASN:HB3	2.20	0.42
1:M:100:GLY:C	2:N:184:ARG:HH22	2.24	0.42
4:P:22:MET:O	4:P:26:ILE:HD13	2.19	0.42
1:A:181:VAL:HG12	1:A:182:GLN:N	2.34	0.42
3:C:15:TRP:O	3:C:18:LYS:HG2	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:M:100:GLY:O	1:M:101:CYS:C	2.58	0.42
1:M:498:PHE:CD2	2:N:103:VAL:HG21	2.55	0.42
2:N:95:ASN:O	2:N:161:PHE:HE2	2.02	0.42
3:O:36:VAL:CG2	3:O:37:TRP:N	2.82	0.42
11:P:810:CE1:H171	11:P:810:CE1:H211	2.02	0.42
3:C:33:VAL:HB	3:C:34:PRO:CD	2.43	0.41
1:M:152:PHE:O	1:M:155:HIS:HB2	2.20	0.41
1:M:242:LEU:HD12	1:M:242:LEU:C	2.40	0.41
1:A:200:ARG:NH1	1:A:457:LEU:HD21	2.35	0.41
1:A:558:ASP:OD2	1:A:558:ASP:N	2.54	0.41
3:C:53:PRO:HD3	4:D:51:TYR:CZ	2.54	0.41
4:D:67:LEU:HD22	4:D:67:LEU:N	2.34	0.41
1:M:155:HIS:O	6:M:803:FAD:H2A	2.19	0.41
1:M:2:THR:HG23	1:M:184:ARG:HG2	2.01	0.41
1:M:316:LEU:O	1:M:317:ARG:C	2.58	0.41
1:M:222:PRO:HG2	1:M:362:GLU:OE1	2.20	0.41
2:N:201:VAL:HG23	2:N:202:TRP:CD2	2.55	0.41
3:O:99:LYS:O	3:O:100:ASP:OD1	2.38	0.41
4:P:24:SER:O	4:P:28:ALA:CB	2.67	0.41
1:M:329:PRO:HG2	1:M:330:PHE:N	2.34	0.41
1:A:413:ARG:HD3	1:A:413:ARG:HA	1.73	0.41
1:A:62:PHE:CE2	1:A:90:PRO:HG2	2.55	0.41
1:A:81:VAL:HG21	1:A:383:VAL:O	2.21	0.41
2:B:174:THR:OG1	2:B:220:PRO:HA	2.19	0.41
4:D:67:LEU:HD13	4:D:67:LEU:HA	1.88	0.41
1:M:316:LEU:HB3	1:M:319:LEU:CD1	2.33	0.41
1:M:443:ASP:CG	1:M:444:GLY:N	2.74	0.41
4:P:70:MET:O	4:P:74:PRO:HG2	2.20	0.41
1:A:198:VAL:O	1:A:456:GLY:HA2	2.21	0.41
2:B:142:TYR:O	2:B:143:HIS:C	2.57	0.41
1:M:150:GLN:HG3	1:M:152:PHE:HE1	1.86	0.41
1:M:263:LEU:CD1	1:M:283:GLU:HA	2.50	0.41
1:M:390:ARG:HH22	5:M:802:OAA:C4	2.34	0.41
2:N:116:ILE:HD11	2:N:168:ILE:HD12	2.01	0.41
2:N:220:PRO:O	2:N:221:ALA:C	2.59	0.41
2:N:12:ARG:HH22	2:N:50:ASP:C	2.24	0.41
1:A:146:PHE:HA	1:A:147:PRO:HD2	1.88	0.41
2:B:9:GLU:HG3	2:B:25:PHE:CZ	2.55	0.41
3:C:23:ARG:HH11	3:C:23:ARG:HB3	1.86	0.41
1:M:375:PHE:N	1:M:375:PHE:HD1	2.19	0.41
2:N:214:CYS:HB2	9:N:246:SF4:S1	2.60	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:N:224:ILE:O	2:N:227:GLY:N	2.54	0.41
1:A:195:ALA:O	1:A:198:VAL:HG22	2.20	0.41
1:A:247:CYS:HB3	1:A:316:LEU:HD21	2.03	0.41
1:A:41:MET:HG2	1:A:42:ARG:HD2	2.02	0.41
1:A:98:LEU:HD23	2:B:132:ASN:ND2	2.36	0.41
4:D:42:GLY:HA2	4:D:44:PHE:CE2	2.56	0.41
1:M:335:ALA:HA	1:M:339:VAL:HG22	2.03	0.41
1:A:227:GLU:OE1	1:A:551:THR:OG1	2.26	0.41
1:A:232:HIS:CD2	1:A:242:LEU:CD1	3.04	0.41
1:A:76:LEU:HA	1:A:76:LEU:HD23	1.79	0.41
3:C:59:PHE:CZ	3:C:63:LEU:HD11	2.55	0.41
4:D:68:PHE:HD1	4:D:111:THR:HG22	1.85	0.41
1:M:100:GLY:O	2:N:184:ARG:NH2	2.52	0.41
1:M:329:PRO:CG	1:M:330:PHE:H	2.32	0.41
1:M:80:ASP:OD2	1:M:365:GLN:HG2	2.21	0.41
1:M:534:ARG:HD3	1:M:539:CYS:HB3	2.03	0.41
1:A:157:VAL:O	1:A:215:MET:HE2	2.20	0.41
1:M:37:LYS:NZ	1:M:211:ASP:OD2	2.54	0.41
2:N:202:TRP:NE1	2:N:231:SER:OG	2.48	0.41
2:B:212:GLU:HG3	3:C:21:PHE:HE2	1.85	0.41
1:M:279:ASN:O	1:M:280:LYS:CB	2.69	0.41
1:M:176:MET:SD	2:N:99:GLU:HG3	2.61	0.41
1:A:232:HIS:CD2	1:A:234:THR:H	2.35	0.41
4:D:117:THR:O	4:D:118:ILE:C	2.54	0.41
1:M:242:LEU:HD11	1:M:244:THR:HA	2.03	0.41
1:M:81:VAL:HG21	1:M:383:VAL:O	2.20	0.41
2:N:192:MET:O	2:N:193:ALA:C	2.58	0.41
4:D:30:VAL:O	4:D:33:LEU:HB3	2.22	0.40
1:M:105:ARG:NH1	1:M:109:GLY:O	2.53	0.40
1:M:122:GLU:N	1:M:122:GLU:OE2	2.49	0.40
1:M:353:THR:HG22	1:M:354:ALA:N	2.36	0.40
2:N:155:TYR:HE1	2:N:171:ALA:CB	2.33	0.40
2:N:226:GLN:HE21	2:N:226:GLN:HB2	1.60	0.40
1:A:321:GLU:CA	1:A:321:GLU:OE1	2.68	0.40
2:B:92:ALA:HB1	2:B:104:VAL:CG1	2.51	0.40
2:B:219:ASP:OD2	3:C:92:LYS:HE2	2.22	0.40
1:M:311:VAL:CG1	1:M:312:VAL:N	2.84	0.40
1:M:62:PHE:HB3	1:M:86:VAL:HG23	2.02	0.40
2:N:180:ASN:OD1	2:N:188:LYS:HA	2.21	0.40
4:P:72:VAL:HG12	4:P:76:TRP:CD1	2.56	0.40
1:A:89:CYS:N	1:A:90:PRO:CD	2.84	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:22:TYR:O	3:C:25:TYR:HB3	2.21	0.40
1:M:126:PHE:N	1:M:126:PHE:CD2	2.89	0.40
2:N:160:GLN:NE2	2:N:205:THR:CG2	2.84	0.40
4:P:62:ILE:HG23	4:P:63:GLY:H	1.85	0.40
1:A:283:GLU:N	1:A:283:GLU:OE1	2.44	0.40
1:M:56:ALA:HB2	1:M:125:TRP:HE1	1.86	0.40
1:M:242:LEU:HD21	5:M:802:OAA:O1	2.22	0.40
4:P:53:ARG:HH11	4:P:53:ARG:HG2	1.87	0.40
1:A:45:THR:O	1:A:132:GLY:HA3	2.21	0.40
1:A:413:ARG:HH11	1:A:413:ARG:CA	2.34	0.40
1:A:79:GLN:HB2	1:A:569:LYS:O	2.22	0.40
1:A:93:MET:HB3	1:A:125:TRP:CE3	2.57	0.40
4:D:75:LEU:HA	4:D:75:LEU:HD23	1.84	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	575/602 (96%)	525 (91%)	43 (8%)	7 (1%)	13	51
1	M	575/602 (96%)	506 (88%)	59 (10%)	10 (2%)	9	45
2	B	241/243 (99%)	218 (90%)	19 (8%)	4 (2%)	9	45
2	N	241/243 (99%)	212 (88%)	23 (10%)	6 (2%)	5	36
3	C	128/130 (98%)	116 (91%)	9 (7%)	3 (2%)	6	38
3	O	128/130 (98%)	114 (89%)	10 (8%)	4 (3%)	4	32
4	D	117/119 (98%)	103 (88%)	13 (11%)	1 (1%)	17	57
4	P	117/119 (98%)	106 (91%)	10 (8%)	1 (1%)	17	57
All	All	2122/2188 (97%)	1900 (90%)	186 (9%)	36 (2%)	9	45

All (36) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	242	PRO
1	M	1	GLN
1	M	244	THR
3	O	18	LYS
1	A	79	GLN
1	A	244	THR
1	A	321	GLU
2	B	56	SER
3	C	18	LYS
1	M	79	GLN
2	N	56	SER
1	A	318	HIS
1	M	128	ALA
1	M	318	HIS
2	N	128	ASP
3	O	66	PRO
3	O	100	ASP
2	B	183	SER
2	N	101	ASP
2	N	115	ALA
2	N	183	SER
1	A	282	MET
3	C	100	ASP
1	M	131	THR
1	M	329	PRO
1	M	344	VAL
3	O	103	MET
1	A	343	PRO
2	B	241	LYS
4	D	117	THR
1	M	282	MET
3	C	65	ASN
1	M	444	GLY
2	N	242	PRO
4	P	99	VAL
1	A	444	GLY

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	460/475 (97%)	448 (97%)	12 (3%)	46	74
1	M	460/475 (97%)	435 (95%)	25 (5%)	22	57
2	B	205/205 (100%)	197 (96%)	8 (4%)	32	65
2	N	205/205 (100%)	196 (96%)	9 (4%)	28	63
3	C	111/111 (100%)	106 (96%)	5 (4%)	27	62
3	O	111/111 (100%)	105 (95%)	6 (5%)	22	57
4	D	97/97 (100%)	91 (94%)	6 (6%)	18	53
4	P	97/97 (100%)	94 (97%)	3 (3%)	40	71
All	All	1746/1776 (98%)	1672 (96%)	74 (4%)	30	63

All (74) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	74	ASP
1	A	93	MET
1	A	184	ARG
1	A	197	ARG
1	A	200	ARG
1	A	319	LEU
1	A	325	HIS
1	A	327	ARG
1	A	358	MET
1	A	394	ASN
1	A	413	ARG
1	A	560	THR
2	B	65	CYS
2	B	81	LEU
2	B	128	ASP
2	B	178	ARG
2	B	203	SER
2	B	206	PHE
2	B	212	GLU
2	B	242	PRO
3	C	11	MET
3	C	39	SER
3	C	50	LYS
3	C	84	LYS

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Mol	Chain	Res	Type
3	C	92	LYS
4	D	0	MET
4	D	3	PRO
4	D	4	ASN
4	D	17	PHE
4	D	86	MET
4	D	118	ILE
1	M	7	LEU
1	M	35	ILE
1	M	36	SER
1	M	41	MET
1	M	93	MET
1	M	122	GLU
1	M	126	PHE
1	M	143	SER
1	M	155	HIS
1	M	156	PHE
1	M	163	ASP
1	M	164	ASP
1	M	197	ARG
1	M	227	GLU
1	M	243	MET
1	M	330	PHE
1	M	375	PHE
1	M	413	ARG
1	M	465	ILE
1	M	470	GLU
1	M	485	ARG
1	M	498	PHE
1	M	499	ASN
1	M	548	LEU
1	M	558	ASP
2	N	46	ASN
2	N	100	ARG
2	N	128	ASP
2	N	148	CYS
2	N	178	ARG
2	N	185	ASP
2	N	189	LYS
2	N	206	PHE
2	N	226	GLN
3	O	5	LYS

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Mol	Chain	Res	Type
3	O	19	LEU
3	O	20	PRO
3	O	37	TRP
3	O	39	SER
3	O	89	LEU
4	P	7	ARG
4	P	9	ASP
4	P	118	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (43) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	57	GLN
1	A	59	HIS
1	A	87	HIS
1	A	141	GLN
1	A	204	ASN
1	A	232	HIS
1	A	279	ASN
1	A	292	GLN
1	A	434	GLN
2	B	134	GLN
2	B	194	GLN
2	B	225	GLN
3	C	51	ASN
3	C	72	ASN
3	C	82	HIS
4	D	59	GLN
1	M	27	ASN
1	M	137	HIS
1	M	174	ASN
1	M	182	GLN
1	M	204	ASN
1	M	230	GLN
1	M	264	GLN
1	M	292	GLN
1	M	366	ASN
1	M	421	ASN
1	M	434	GLN
1	M	441	ASN
1	M	447	ASN
1	M	499	ASN

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Mol	Chain	Res	Type
1	M	520	HIS
1	M	546	ASN
2	N	95	ASN
2	N	129	GLN
2	N	150	ASN
2	N	160	GLN
2	N	177	HIS
2	N	225	GLN
2	N	226	GLN
3	O	65	ASN
3	O	72	ASN
3	O	95	ASN
4	P	2	ASN

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](#)

15 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
9	SF4	B	246	2	0,12,12	0.00	-	-		

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
8	F3S	N	245	2	0,9,9	0.00	-	-		
11	CE1	D	710	-	36,36,36	1.12	2 (5%)	35,35,35	1.56	8 (22%)
7	FES	N	244	2	0,4,4	0.00	-	-		
6	FAD	M	803	1	51,58,58	1.74	10 (19%)	60,89,89	1.67	10 (16%)
11	CE1	P	810	-	36,36,36	1.05	3 (8%)	35,35,35	1.68	11 (31%)
5	OAA	A	702	-	2,8,8	3.97	2 (100%)	2,10,10	2.52	1 (50%)
9	SF4	N	246	2	0,12,12	0.00	-	-		
6	FAD	A	703	1	51,58,58	1.70	10 (19%)	60,89,89	1.83	12 (20%)
10	BRS	B	700	-	21,23,23	2.47	10 (47%)	26,33,33	1.80	8 (30%)
10	BRS	N	800	-	21,23,23	2.28	6 (28%)	26,33,33	1.56	6 (23%)
7	FES	B	244	2	0,4,4	0.00	-	-		
8	F3S	B	245	2	0,9,9	0.00	-	-		
5	OAA	M	802	-	2,8,8	1.05	0	2,10,10	0.80	0
11	CE1	O	811	-	36,36,36	1.06	0	35,35,35	1.61	10 (28%)

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
9	SF4	B	246	2	-	-	0/6/5/5
8	F3S	N	245	2	-	-	0/3/3/3
11	CE1	D	710	-	-	17/34/34/34	-
6	FAD	A	703	1	-	6/30/50/50	0/6/6/6
6	FAD	M	803	1	-	6/30/50/50	0/6/6/6
11	CE1	P	810	-	-	14/34/34/34	-
5	OAA	A	702	-	-	2/2/8/8	-
9	SF4	N	246	2	-	-	0/6/5/5
7	FES	N	244	2	-	-	0/1/1/1
10	BRS	B	700	-	-	6/12/16/16	0/2/2/2
10	BRS	N	800	-	-	5/12/16/16	0/2/2/2
7	FES	B	244	2	-	-	0/1/1/1
8	F3S	B	245	2	-	-	0/3/3/3
5	OAA	M	802	-	-	2/2/8/8	-
11	CE1	O	811	-	-	17/34/34/34	-

All (43) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	N	800	BRS	C12-N1	6.60	1.57	1.45
6	M	803	FAD	O4B-C1B	5.11	1.48	1.41
5	A	702	OAA	O3-C3	4.96	1.30	1.22
6	M	803	FAD	C9A-N10	4.89	1.45	1.38
6	A	703	FAD	C4X-C10	4.82	1.43	1.38
10	B	700	BRS	C17-C16	4.80	1.47	1.38
10	B	700	BRS	C12-N1	4.67	1.54	1.45
6	A	703	FAD	O4B-C1B	4.44	1.47	1.41
6	M	803	FAD	C4-N3	4.40	1.40	1.33
6	M	803	FAD	C1'-N10	4.03	1.52	1.48
10	B	700	BRS	C8-N4	4.02	1.54	1.45
6	A	703	FAD	C2B-C1B	-3.73	1.48	1.53
10	B	700	BRS	C17-C18	3.66	1.45	1.38
10	B	700	BRS	C15-C21	3.45	1.58	1.52
10	B	700	BRS	C18-CL20	3.35	1.81	1.74
6	A	703	FAD	P-O5'	-3.21	1.46	1.59
6	M	803	FAD	C4A-N3A	3.16	1.40	1.35
6	A	703	FAD	C4-N3	3.16	1.38	1.33
10	N	800	BRS	C15-C21	3.05	1.58	1.52
10	N	800	BRS	C8-N4	3.02	1.52	1.45
6	A	703	FAD	C10-N1	2.86	1.36	1.33
6	A	703	FAD	C9A-N10	2.79	1.42	1.38
10	N	800	BRS	C11-C10	2.76	1.43	1.39
6	A	703	FAD	C2A-N3A	2.72	1.36	1.32
5	A	702	OAA	C2-C3	2.63	1.54	1.51
6	M	803	FAD	C4X-C10	2.60	1.41	1.38
10	N	800	BRS	C12-C11	2.60	1.46	1.40
10	N	800	BRS	C16-C15	2.60	1.43	1.39
6	M	803	FAD	P-O5'	-2.55	1.49	1.59
11	D	710	CE1	O25-C26	2.51	1.52	1.42
10	B	700	BRS	C19-C14	2.50	1.43	1.38
10	B	700	BRS	C16-C15	2.49	1.43	1.39
11	P	810	CE1	C30-C29	2.47	1.61	1.49
11	D	710	CE1	C27-C26	2.47	1.61	1.49
6	M	803	FAD	C2B-C1B	-2.33	1.50	1.53
6	A	703	FAD	C4A-N3A	2.28	1.38	1.35
6	M	803	FAD	C2A-N3A	2.22	1.35	1.32
10	B	700	BRS	C12-C11	2.19	1.45	1.40
11	P	810	CE1	O28-C29	2.17	1.51	1.42
6	A	703	FAD	O2'-C2'	-2.11	1.38	1.43
10	B	700	BRS	C14-C15	2.06	1.42	1.39
6	M	803	FAD	C10-N1	2.03	1.35	1.33
11	P	810	CE1	C35-C36	2.03	1.60	1.49

All (66) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	703	FAD	C4X-N5-C5X	6.65	123.42	116.77
6	A	703	FAD	C4-N3-C2	6.43	120.58	115.14
6	M	803	FAD	C4X-N5-C5X	6.21	122.98	116.77
6	A	703	FAD	N3A-C2A-N1A	-5.25	120.47	128.68
6	M	803	FAD	N3A-C2A-N1A	-5.23	120.50	128.68
6	M	803	FAD	C4-N3-C2	4.95	119.33	115.14
10	N	800	BRS	C9-C10-C21	-3.43	117.89	122.21
10	B	700	BRS	C9-C10-C11	3.31	120.96	117.49
5	A	702	OAA	O3-C3-C2	3.31	125.97	120.75
10	B	700	BRS	C17-C18-CL20	3.09	124.19	119.35
10	N	800	BRS	C7-C12-C11	-3.03	118.51	122.51
11	O	811	CE1	O16-C17-C18	3.02	124.00	110.39
10	B	700	BRS	O2-N1-C12	2.99	124.14	119.03
6	A	703	FAD	C4X-C4-N3	-2.98	119.35	123.43
6	M	803	FAD	C4'-C3'-C2'	-2.95	107.22	113.36
11	P	810	CE1	O25-C26-C27	2.92	123.56	110.39
10	B	700	BRS	C19-C18-C17	-2.82	117.59	121.24
11	P	810	CE1	O22-C23-C24	2.71	122.60	110.39
6	M	803	FAD	C4X-C10-N10	-2.69	117.54	120.30
10	N	800	BRS	O2-N1-C12	2.69	123.63	119.03
6	A	703	FAD	C4X-C10-N10	-2.67	117.56	120.30
10	N	800	BRS	C7-C8-N4	2.61	121.05	118.75
10	B	700	BRS	C14-C19-C18	2.61	121.99	119.24
6	M	803	FAD	C1'-N10-C9A	2.60	120.34	118.29
6	A	703	FAD	C1'-N10-C9A	2.52	120.28	118.29
11	P	810	CE1	O22-C21-C20	2.52	121.77	110.39
11	D	710	CE1	O16-C17-C18	2.51	121.71	110.39
11	O	811	CE1	O19-C18-C17	2.51	121.69	110.39
10	B	700	BRS	C22-C21-C10	-2.49	107.86	112.16
6	M	803	FAD	C4-C4X-C10	-2.45	118.33	119.95
11	P	810	CE1	O28-C29-C30	2.45	121.44	110.39
11	D	710	CE1	O13-C14-C15	2.39	121.17	110.39
10	N	800	BRS	C9-C10-C11	2.39	119.99	117.49
11	O	811	CE1	O28-C27-C26	2.34	120.95	110.39
11	D	710	CE1	O22-C21-C20	2.29	120.73	110.39
6	A	703	FAD	C4-C4X-C10	-2.29	118.44	119.95
6	A	703	FAD	C5'-C4'-C3'	2.29	116.63	112.20
11	O	811	CE1	O22-C23-C24	2.27	120.61	110.39
11	O	811	CE1	O25-C26-C27	2.26	120.59	110.39
10	B	700	BRS	C7-C12-C11	-2.26	119.53	122.51
6	M	803	FAD	C2A-N1A-C6A	2.25	122.61	118.75
11	O	811	CE1	O16-C15-C14	2.25	120.54	110.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	D	710	CE1	O13-C12-C11	2.25	122.07	110.26
11	O	811	CE1	O34-C35-C36	2.24	119.91	110.07
6	A	703	FAD	C4-C4X-N5	2.23	121.14	118.60
11	D	710	CE1	O28-C29-C30	2.23	120.43	110.39
11	P	810	CE1	O31-C32-C33	2.22	120.41	110.39
11	D	710	CE1	O22-C23-C24	2.22	120.40	110.39
11	P	810	CE1	O13-C12-C11	2.20	121.84	110.26
11	O	811	CE1	O25-C24-C23	2.19	120.26	110.39
10	N	800	BRS	C22-C21-C10	-2.15	108.45	112.16
11	D	710	CE1	O31-C32-C33	2.15	120.09	110.39
11	P	810	CE1	O16-C17-C18	2.15	120.09	110.39
6	M	803	FAD	C4X-C4-N3	-2.13	120.52	123.43
11	P	810	CE1	O25-C24-C23	2.10	119.87	110.39
11	O	811	CE1	O31-C30-C29	2.10	119.84	110.39
6	A	703	FAD	C4'-C3'-C2'	-2.08	109.03	113.36
11	D	710	CE1	O19-C18-C17	2.07	119.72	110.39
11	O	811	CE1	O13-C14-C15	2.07	119.72	110.39
10	B	700	BRS	C7-C8-N4	2.06	120.56	118.75
6	A	703	FAD	C7M-C7-C6	-2.05	115.45	120.34
11	P	810	CE1	O37-C36-C35	2.04	123.67	111.81
6	M	803	FAD	C5'-C4'-C3'	2.03	116.12	112.20
6	A	703	FAD	C7M-C7-C8	2.02	124.88	120.74
11	P	810	CE1	O13-C14-C15	2.01	119.45	110.39
11	P	810	CE1	O19-C18-C17	2.01	119.44	110.39

There are no chirality outliers.

All (75) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	M	803	FAD	N10-C1'-C2'-O2'
6	M	803	FAD	N10-C1'-C2'-C3'
6	M	803	FAD	PA-O3P-P-O5'
6	A	703	FAD	N10-C1'-C2'-O2'
6	A	703	FAD	N10-C1'-C2'-C3'
6	A	703	FAD	PA-O3P-P-O5'
11	P	810	CE1	O28-C29-C30-O31
11	P	810	CE1	O13-C14-C15-O16
11	D	710	CE1	O34-C35-C36-O37
11	O	811	CE1	C17-C18-O19-C20
11	D	710	CE1	O28-C29-C30-O31
11	D	710	CE1	O25-C26-C27-O28
11	D	710	CE1	O13-C14-C15-O16

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Mol	Chain	Res	Type	Atoms
11	P	810	CE1	O22-C23-C24-O25
11	P	810	CE1	C11-C10-C9-C8
11	O	811	CE1	C7-C8-C9-C10
11	P	810	CE1	O34-C35-C36-O37
11	D	710	CE1	C2-C3-C4-C5
11	O	811	CE1	O25-C26-C27-O28
11	P	810	CE1	O25-C26-C27-O28
11	D	710	CE1	C6-C7-C8-C9
11	O	811	CE1	C6-C7-C8-C9
11	O	811	CE1	O34-C35-C36-O37
11	O	811	CE1	C36-C35-O34-C33
11	O	811	CE1	C3-C4-C5-C6
11	D	710	CE1	C36-C35-O34-C33
11	P	810	CE1	C36-C35-O34-C33
11	P	810	CE1	C33-C32-O31-C30
6	A	703	FAD	C5'-O5'-P-O3P
5	A	702	OAA	C1-C2-C3-O3
5	A	702	OAA	C1-C2-C3-C4
5	M	802	OAA	C1-C2-C3-O3
5	M	802	OAA	C1-C2-C3-C4
10	B	700	BRS	C11-C10-C21-C15
11	O	811	CE1	O28-C29-C30-O31
11	O	811	CE1	C32-C33-O34-C35
11	D	710	CE1	C11-C10-C9-C8
10	N	800	BRS	C11-C10-C21-C15
11	D	710	CE1	C11-C12-O13-C14
11	D	710	CE1	C24-C23-O22-C21
11	O	811	CE1	C20-C21-O22-C23
11	P	810	CE1	C4-C5-C6-C7
11	D	710	CE1	C14-C15-O16-C17
11	P	810	CE1	C24-C23-O22-C21
6	M	803	FAD	O4B-C4B-C5B-O5B
11	P	810	CE1	C6-C7-C8-C9
10	B	700	BRS	C11-C10-C21-C22
11	D	710	CE1	C18-C17-O16-C15
6	A	703	FAD	O4B-C4B-C5B-O5B
11	D	710	CE1	O22-C23-C24-O25
11	D	710	CE1	O16-C17-C18-O19
11	P	810	CE1	O16-C17-C18-O19
10	N	800	BRS	C11-C10-C21-C22
11	O	811	CE1	C11-C12-O13-C14
10	N	800	BRS	C9-C10-C21-C15

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Mol	Chain	Res	Type	Atoms
10	B	700	BRS	C9-C10-C21-C15
11	O	811	CE1	C24-C23-O22-C21
10	B	700	BRS	C9-C10-C21-C22
11	O	811	CE1	O16-C17-C18-O19
10	N	800	BRS	C16-C15-C21-C22
11	O	811	CE1	O22-C23-C24-O25
11	D	710	CE1	O19-C20-C21-O22
11	O	811	CE1	O19-C20-C21-O22
11	O	811	CE1	O31-C32-C33-O34
11	P	810	CE1	O19-C20-C21-O22
6	M	803	FAD	C5B-O5B-PA-O1A
6	M	803	FAD	C5'-O5'-P-O1P
6	A	703	FAD	C5'-O5'-P-O1P
11	O	811	CE1	O13-C14-C15-O16
10	B	700	BRS	C14-C15-C21-C22
10	B	700	BRS	C16-C15-C21-C22
10	N	800	BRS	C14-C15-C21-C22
11	D	710	CE1	C30-C29-O28-C27
11	D	710	CE1	O31-C32-C33-O34
11	P	810	CE1	O31-C32-C33-O34

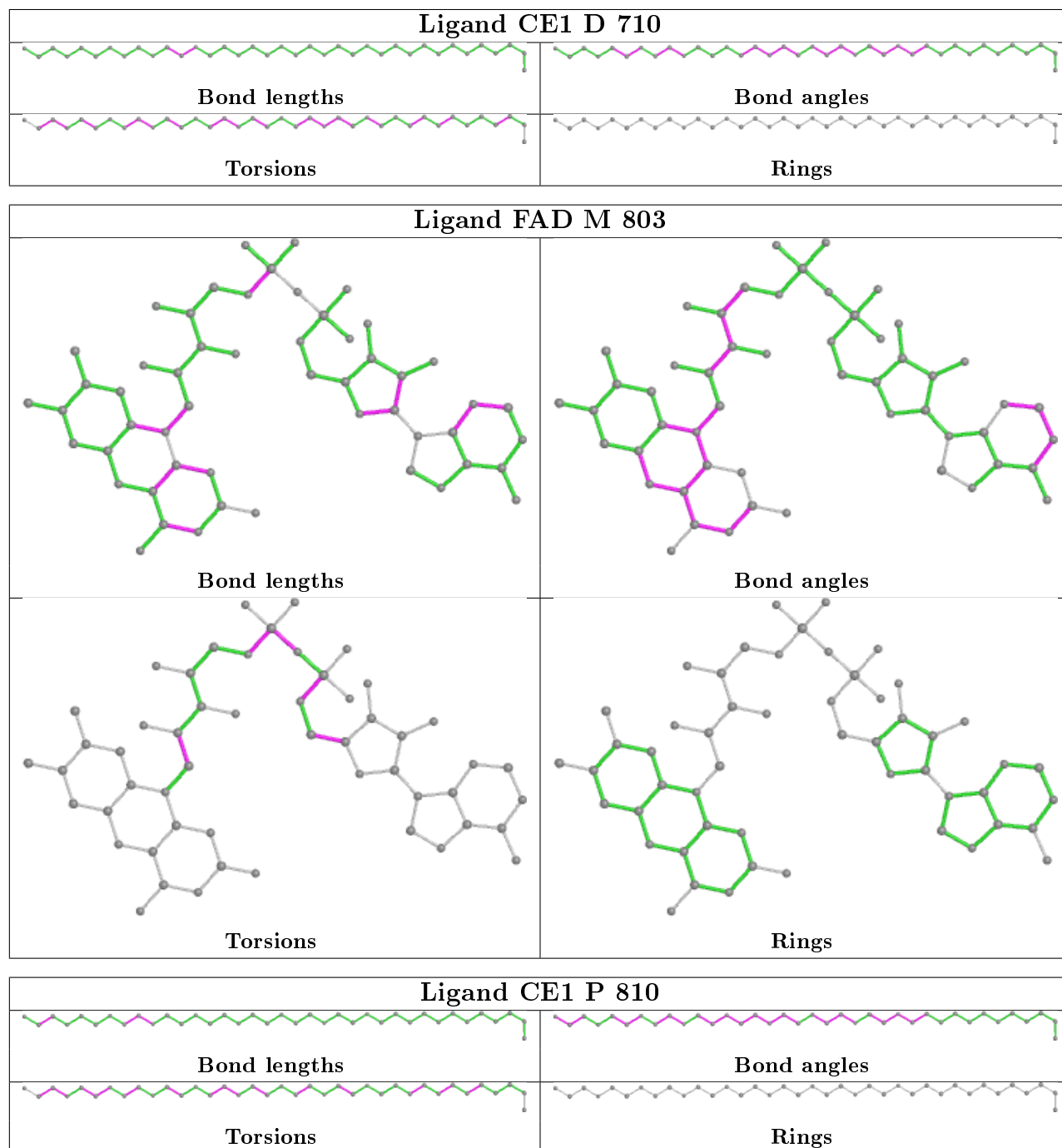
There are no ring outliers.

11 monomers are involved in 53 short contacts:

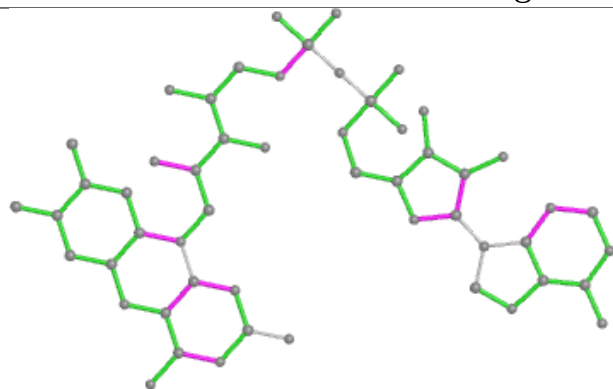
Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	N	245	F3S	2	0
11	D	710	CE1	5	0
6	M	803	FAD	10	0
11	P	810	CE1	2	0
5	A	702	OAA	1	0
9	N	246	SF4	7	0
6	A	703	FAD	7	0
10	B	700	BRS	11	0
10	N	800	BRS	5	0
5	M	802	OAA	2	0
11	O	811	CE1	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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.

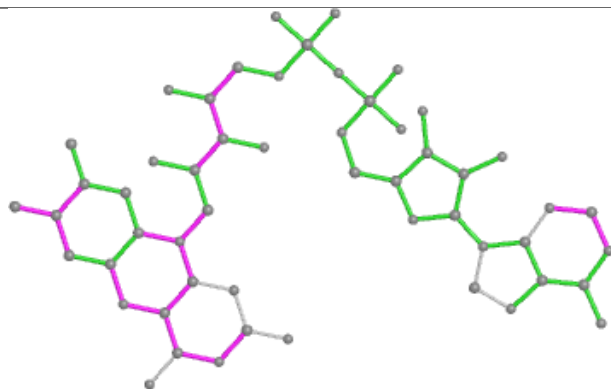
Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD 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.



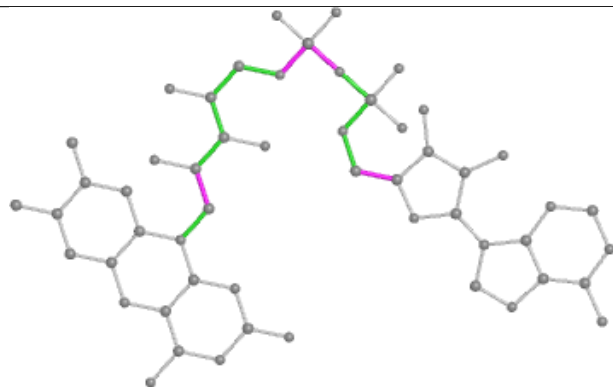
Ligand FAD A 703



Bond lengths



Bond angles

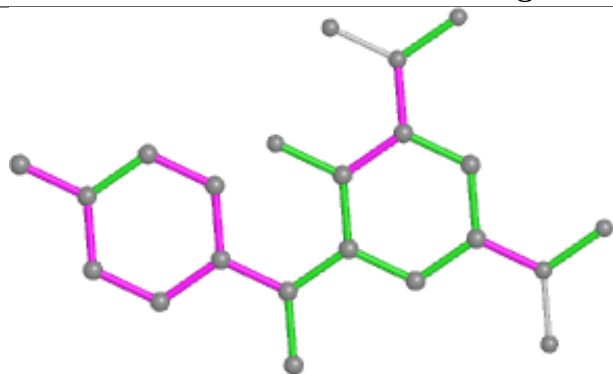


Torsions

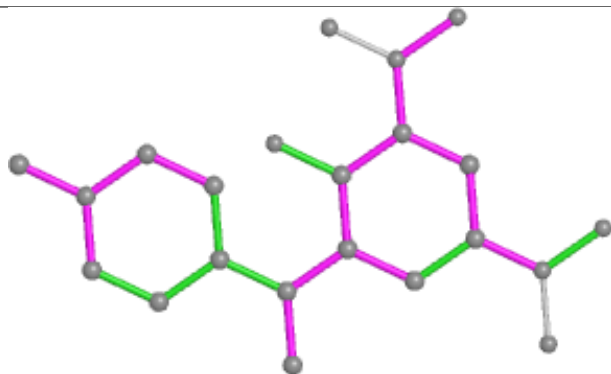


Rings

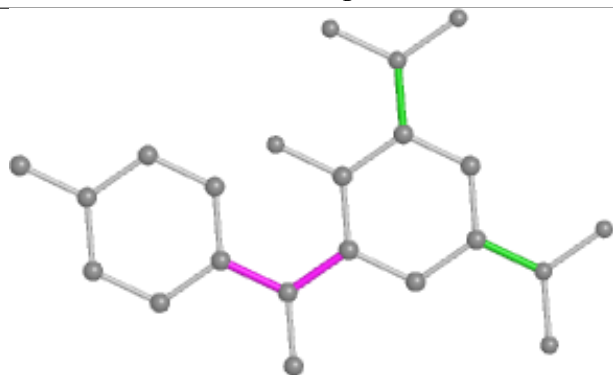
Ligand BRS B 700



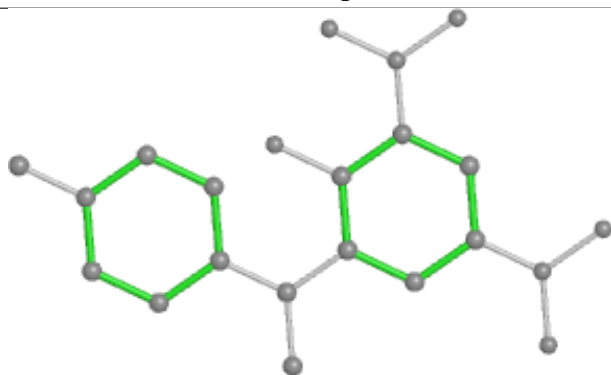
Bond lengths



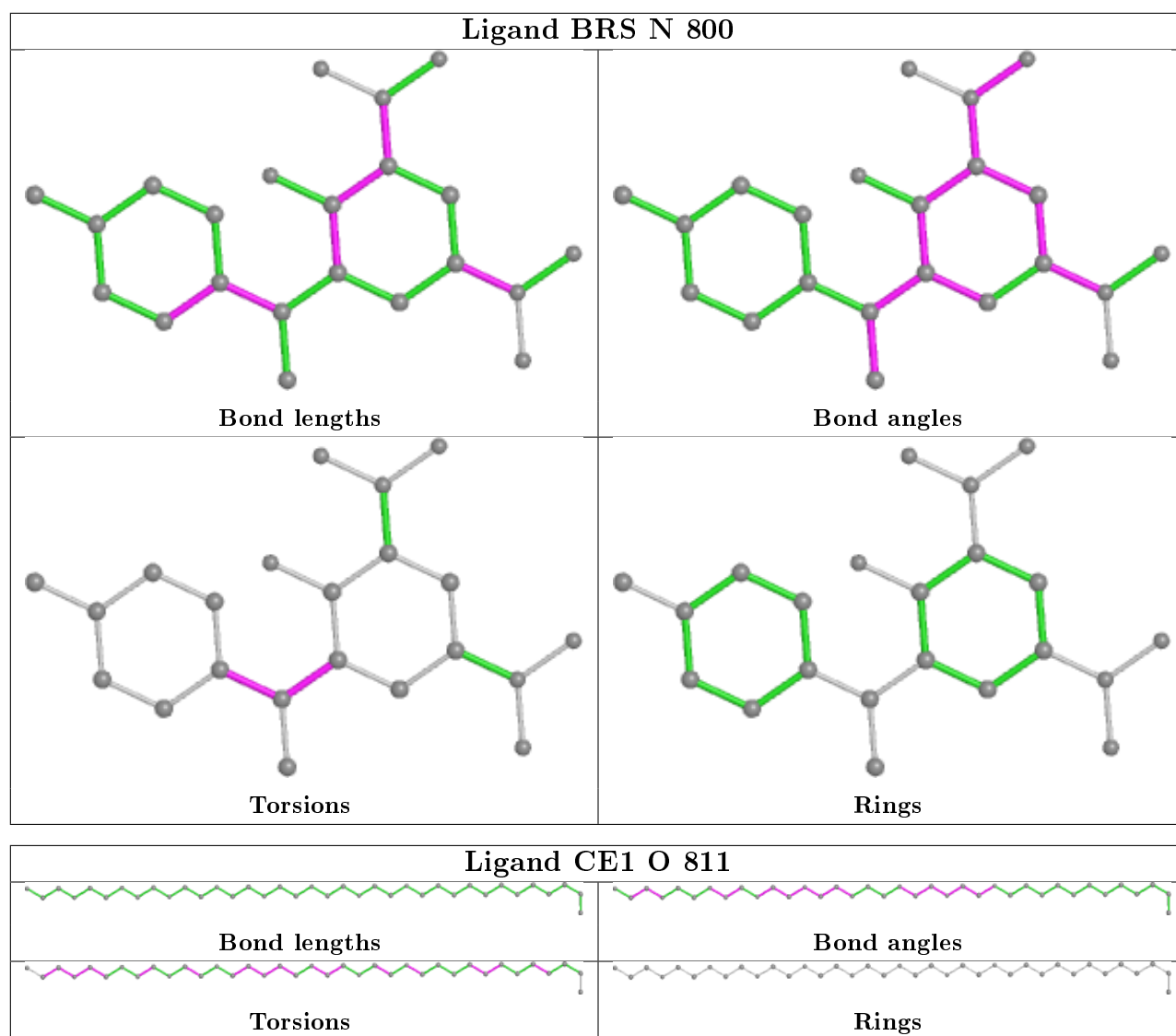
Bond angles



Torsions



Rings



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.