

Supplemental Table 1 Biochemical analysis of LSD1 mutants

#	Mutation	Location	K_m [μM]	k_{cat} [min^{-1}]	k_{cat} / K_m [$\text{min}^{-1} \mu\text{M}^{-1}$]
1	<i>Wildtype</i>		7.9±0.2	3.8±0.1	0.5±0.02
2	ΔTOWER		N.D.	N.D.	N.D.
3	K661A	Catalytic chamber	N.D.	N.D.	N.D.
4	L329A	Catalytic chamber	N.D.	N.D.	N.D.
5	M332A	Catalytic chamber	4.1±0.6	0.8±0.1	0.2±0.04
6	V333A	Catalytic chamber	N.D.	N.D.	N.D.
7	F538A	Catalytic chamber	N.D.	N.D.	N.D.
8	N660A	Catalytic chamber	N.D.	N.D.	N.D.
9	L659A	Catalytic chamber	N.D.	N.D.	N.D.
10	W695A	Catalytic chamber	N.D.	N.D.	N.D.
11	S760A	Catalytic chamber	3.9±0.5	3.0±0.1	0.8±0.10
12	Y761F	Catalytic chamber	4.3±0.6	1.4±0.1	0.3 ±0.05
13	V334A	Pocket I	N.D.	N.D.	N.D.
14	Y571F	Pocket I	6.2±1.2	2.8±0.2	0.5±0.09
15	H812A	Pocket I	N.D.	N.D.	N.D.
16	F558A	Pocket II	N.D.	N.D.	N.D.
17	E559A	Pocket II	N.D.	N.D.	N.D.
18	F560A	Pocket II	N.D.	N.D.	N.D.
19	Y807A	Pocket II	9.2±0.7	3.3±0.1	0.4±0.03
20	N540A	Pocket III	N.D.	N.D.	N.D.
21	D555A	Pocket III	N.D.	N.D.	N.D.
22	D556A	Pocket III	N.D.	N.D.	N.D.
23	Y763A	Pocket III	N.D.	N.D.	N.D.
24	A539E	Other active site	N.D.	N.D.	N.D.
25	V567A	Other active site	N.D.	N.D.	N.D.
26	F179A	SWIRM-oxidase interface	6.9±1.0	3.8±0.2	0.6±0.09
27	Q180A	SWIRM-oxidase interface	7.0±1.7	3.4±0.2	0.5±0.12
28	L222A	SWIRM-oxidase interface	7.3±1.1	1.2±0.1	0.2±0.03
29	I266A	SWIRM-oxidase interface	8.2±0.3	3.7±0.3	0.5±0.04
30	V344A	SWIRM-oxidase interface	3.2±0.7	2.4±0.1	0.7±0.17
31	V345A	SWIRM-oxidase interface	N.D.	N.D.	N.D.
32	S346A	SWIRM-oxidase interface	8.4±1.0	4.4 ±0.2	0.5±0.07
33	L815A	SWIRM-oxidase interface	N.D.	N.D.	N.D.
34	R182A	SWIRM-oxidase cleft	N.D.	N.D.	N.D.
35	L816A	SWIRM-oxidase cleft	N.D.	N.D.	N.D.
36	L819A	SWIRM-oxidase cleft	5.8±1.4	2.5±0.2	0.4 ±0.11
37	R824A	SWIRM-oxidase cleft	14.2±2.2	2.1±0.1	0.1±0.02
Mutants that did not behave like <i>wildtype</i> LSD1					
38	ΔSWIRM		N.D.	N.D.	N.D.
39	R316A	Oxidase domain core	N.D.	N.D.	N.D.
40	N340A	Pocket I	N.D.	N.D.	N.D.
41	T810A	Pocket I	N.D.	N.D.	N.D.
42	A809Y	Other active site	N.D.	N.D.	N.D.
43	W221A	SWIRM-oxidase interface	N.D.	N.D.	N.D.
44	F264A	SWIRM-oxidase interface	N.D.	N.D.	N.D.
45	L578A	SWIRM-oxidase interface	N.D.	N.D.	N.D.
46	P341A	SWIRM-oxidase cleft	N.D.	N.D.	N.D.
47	P341D	SWIRM-oxidase cleft	N.D.	N.D.	N.D.
48	R820A	SWIRM-oxidase cleft	N.D.	N.D.	N.D.

K_m and V_{max} values were determined by direct fitting of linear initial velocities determined at substrate concentrations of 1-80 μM to the Michaelis-Menten equation. N.D., not determined, n=3