Supplementary material

Exploring the interaction between *Salvia miltiorrhiza* and xanthine oxidase: Insights from computational analysis and experimental studies combined with enzyme channel blocking

Hongjin Tang[a], Lin Yang[a], Wei Li[a], Jiahuang Li[b], Jun Chen[a,*]

[a] *State Key Laboratory of Natural Medicines, China Pharmaceutical University, Nanjing 210009, P. R. China*

[b] *State Key Laboratory of Pharmaceutical Biotechnology, Nanjing University, Nanjing 210023, P. R. China*

Abbreviations: ROS, reactive oxygen species; XO, xanthine oxidase; ECB, enzyme channel blocking; RMSD, root mean square deviation; Mo-pt, molybdenum-pterin.

* Corresponding author. Tel.: +86-25-8327-1382; Fax: +86-25-8327-1379 (J. Chen);
E-mail address: chenj2002cpu@126.com (J. Chen).

Table A1 The list of chemicals identified in *Salvia miltiorrhiza* and their docking scores when binding to the active site of XO

No.	Compound name	Total score	Crash	Polar	Similarity	Cscore
36	Lithospermic acid	8.3944	-4.9245	4.6823	0.489	5
60	Rosmarinic acid	7.8221	-4.3792	5.9801	0.560	5
67	Salvianolic acid D	7.4581	-2.8659	3.4154	0.451	3
66	Salvianolic acid C	7.2273	-1.7861	2.8672	0.506	5
64	Salvianolic acid A	6.7127	-0.5927	3.0305	0.564	4
56	Protocatechuic aldehyde	6.486	-0.5114	4.7028	0.578	4
29	Isoferulic acid	6.4479	-1.0147	2.322	0.569	5
38	Methyl rosmarinate	6.4082	-1.0099	2.4675	0.606	3
73	Salvinal	6.311	-2.4227	2.3573	0.439	3
9	Caffeic acid	5.9897	-0.4422	3.0594	0.558	4
55	Protocatechuic acid	5.8856	-0.3942	3.5676	0.606	3
86	Tanshinone I	5.7885	-0.6277	1.0357	0.323	5
84	Tanshinol A	5.7519	-2.0567	1.7557	0.391	4
96	Salvianic acid A	5.6747	-4.4618	3.8229	0.507	4
69	Salvianolic acid F	5.4057	-1.6401	2.4885	0.522	3
6	Ailanthoidol	5.3489	-0.8669	1.0973	0.387	3
58	Przewaquinone B	5.2951	-1.8829	3.0771	0.336	4
8	Baicalin	5.293	-5.566	4.3101	0.521	5
30	Isoimperatorin	5.1775	-1.1061	0.8784	0.358	2
20	Dihydrotanshinone I	5.1641	-1.8317	1.0977	0.348	3
39	Methyl salvianolic acid C	4.8022	-3.6735	2.9717	0.593	2
33	Isotanshinone IIA	4.5321	-1.0001	1.0439	0.291	4
90	Trijuganone A	4.364	-3.474	1.3032	0.496	5
51	Neosalvianen	4.3611	-1.0253	0.9748	0.276	2
18	Dihydroisotanshinone I	4.3384	-1.5276	1.1045	0.351	2
42	Methylenedihydrotan-shinquinone	4.3033	-4.011	0.7991	0.418	5
32	Isotanshinone I	4.1677	-2.3586	0.7497	0.398	5
95	Tetrahydrotanshinone	4.1455	-4.3783	0.8341	0.421	4
91	Trijuganone B	4.1455	-4.3783	0.8341	0.421	4
63	Salvianen	4.0879	-1.0698	1.0155	0.278	2
31	Isosalvianolic acid C	4.0649	-1.4141	1.7252	0.468	2
24	Ethyl lithospermate	3.9946	-3.3855	2.7249	0.514	4
3	1,2-Dihydrotanshinone I	3.8467	-0.459	1.0279	0.284	2
57	Przewaquinone A	3.8284	-0.5256	1.0466	0.314	2
1	1,2,5,6-Tetrahydrotanshinone I	3.6495	-4.4866	0.8352	0.422	5
85	Tanshinol B	3.5862	-0.5533	0.8442	0.204	2
48	Monomethyl lithospermate	3.5588	-2.1249	2.587	0.397	2
71	Salvianolic acid I	3.3552	-3.7372	1.9153	0.544	5
50	Neo-przewaquinone A	3.2339	-0.4712	1.1654	0.282	2

72	Salvianolic acid J	3.1838	-4.0033	2.8277	0.591	2
41	Methylene tanshinquinone	3.1771	-1.7713	1.0656	0.267	2
15	Danshenxinkun C	3.1385	-1.7703	0.8681	0.347	2
26	Formyltanshinone	3.0835	-2.7299	2.6277	0.331	2
14	Danshenxinkun B	2.9203	-6.2017	0.0027	0.429	3
83	Tanshinlactone	2.8011	-2.5449	0.0246	0.279	3
53	Nortanshinone	2.7455	-2.4192	2.0959	0.33	5
2	1,2-Didehydromiltirone	2.5469	-0.8633	0.0043	0.221	2
74	Salviolone	2.359	-1.522	0.0002	0.315	2
21	Dimethyl lithospermate	2.3413	-6.6067	2.6944	0.536	2
4	1-Ketoisocryptotanshinone	2.3259	-1.2388	0.5983	0.305	2
61	Salviaflaside	2.2305	-4.1102	1.7061	0.602	2
13	Danshenxinkun A	2.2054	-5.0723	1.484	0.463	2
22	Epicryptoacetalide	2.1485	-1.515	0	0.156	2
49	Neocryptotanshinone	2.0995	-3.8463	0.8266	0.414	2
87	Tanshinone IIA	2.0646	-7.4906	1.5611	0.514	5
62	Salvianan	1.747	-1.0248	0	0.214	2
40	Methyl tanshinonate	1.7341	-7.3313	1.9829	0.429	5
65	Salvianolic acid B	1.7199	-4.2854	2.4577	0.426	2
59	Przewaquinone C	1.7127	-5.0802	0.0036	0.455	3
47	Miltirone	1.6982	-1.3903	0	0.214	2
94	3-Hydroxymethylenetanshinquinone	1.609	-5.1553	0.8405	0.464	2
5	15,16-Dihydrotanshinone I	1.4597	-6.6285	3.6513	0.507	4
54	Prolithospermic acid	1.3966	-6.5959	2.2038	0.507	4
16	Danshenxinkun D	1.3698	-9.0608	0.9152	0.415	5
52	Nor-salvioxide	1.2695	-5.0081	0.9298	0.213	4
19	Dihydroisotanshinone II	1.0809	-2.9534	0.6968	0.28	2
79	Tanshinaldehyde	0.7592	-6.7751	0.8588	0.429	2
7	Ammonium-potassium lithospermate B	0.4991	-5.9303	1.3813	0.563	2
88	Tanshinone IIB	0.4287	-7.0848	0.9944	0.453	4
75	Sibiriquinone A	0.3059	-5.8454	0.6447	0.388	2
43	Miltiodiol	0.166	-8.8386	1.0983	0.478	3
76	Sibiriquinone B	0.1483	-8.0284	0.1522	0.425	2
44	Miltionone I	-0.1404	-9.132	1.8345	0.509	5
28	Isocryptotanshinone	-0.2517	-1.9524	0.2248	0.174	2
81	Tanshindiol B	-0.3428	-7.9731	1.4426	0.501	5
11	Cryptoacetalide	-0.379	-5.3185	1.0311	0.247	2
34	Isotanshinone IIB	-0.5395	-8.1363	0.6295	0.455	4
80	Tanshindiol A	-0.5969	-8.3711	1.4418	0.562	3
82	Tanshindiol C	-0.8565	-7.8315	0.8776	0.425	5
27	Hydroxytanshinone IIA	-1.3262	-8.2014	1.034	0.431	4
37	Magnesium lithospermate B	-2.1566	-2.8616	1.3880	0.220	3
68	Salvianolic acid E	-2.2926	-3.4844	1.1539	0.204	2
70	Salvianolic acid G	-2.4379	-7.4452	0.2299	0.496	3

45	Miltionone II	-2.8208	-10.0377	1.0889	0.405	4
25	Ferruginol	-3.8513	-10.4627	0.0005	0.366	2
23	Epidanshenspiroketallactone	-4.0021	-7.6704	0.0685	0.226	2
78	Sugiol	-4.9704	-10.9129	0.0599	0.375	2
10	Carnosol	-6.5732	-11.6863	0	0.377	1
89	Tigogenin	-13.2787	-19.8064	0	0.384	5
35	Lithospermate B	-17.8161	-22.7176	1.4625	0.538	3
46	Miltipolone	-23.9001	-28.9125	0.2529	0.374	2
77	Stigmasterol	-25.2197	-28.6903	0.0265	0.443	1
93	β-Sitosterol	-27.5419	-30.8643	0	0.35	2
17	Daucosterol	-35.5223	-40.4018	0.0059	0.288	2
92	Ursolic acid	-48.7974	-58.6257	0.0179	0.348	3