Supplementary Table 1. Common genes between ulcerative colitis (UC) and *Coscinium fenestratum* alkaloids according to differentially expressed genes from GSE59071 between UC tissues and normal tissues

Gene name	Log_2FC	*P*-value	Adj *P*-value	Gene class
MMP3	3.79	3.75E-09	1.85E-07	Up
IDO1	3.42	4.78E-11	5.16E-09	Up
MMP1	3.26	1.39E-07	3.58E-06	Up
PTGS2	2.74	6.21E-09	2.81E-07	Up
NOS2	2.74	2.33E-08	8.39E-07	Up
MMP12	2.54	5.73E-07	1.12E-05	Up
TGM2	2.12	3.09E-11	3.52E-09	Up
SELE	2.10	1.51E-06	2.47E-05	Up
PIM2	1.98	6.31E-07	1.21E-05	Up
MMP9	1.81	5.23E-06	6.95E-05	Up
ICAM1	1.76	3.21E-07	6.96E-06	Up
PFKFB3	1.71	1.60E-08	6.10E-07	Up
SERPINE1	1.68	4.29E-05	0.000393	Up
EDNRA	1.65	6.55E-07	1.25E-05	Up
CTSK	1.59	3.19E-06	4.62E-05	Up
MMP2	1.56	1.16E-05	0.000135	Up
FPR2	1.55	3.13E-05	0.000305	Up
ALPL	1.54	1.96E-06	3.09E-05	Up
MME	1.41	6.77E-06	8.62E-05	Up
CXCR2	1.40	7.05E-05	0.000588	Up
CXCR4	1.37	3.21E-07	6.96E-06	Up
KDR	1.35	2.55E-06	3.82E-05	Up
FPR1	1.35	7.04E-05	0.000587	Up
ENPP2	1.31	4.96E-07	9.97E-06	Up
FFAR2	1.31	8.35E-05	0.000681	Up
TFPI	1.30	9.50E-07	1.69E-05	Up
PLA2G2A	1.29	1.32E-05	0.000149	Up
FLT1	1.28	4.22E-07	8.72E-06	Up
BACE2	1.25	5.20E-13	1.18E-10	Up
FYN	1.22	5.20E-09	2.42E-07	Up
CDC25B	1.21	6.21E-10	4.17E-08	Up
LYN	1.21	3.81E-08	1.24E-06	Up
SCD	1.21	6.26E-08	1.86E-06	Up
XBP1	1.20	2.45E-11	3.00E-09	Up
F3	1.20	8.95E-10	5.70E-08	Up
PDE4B	1.19	5.86E-09	2.66E-07	Up
LRRK2	1.19	8.32E-05	0.000678	Up
BCL6	1.18	1.46E-05	0.000163	Up
EPHA2	1.16	2.57E-08	9.06E-07	Up
HIF1A	1.15	1.26E-07	3.27E-06	Up
STAT1	1.09	1.50E-07	3.81E-06	Up
TEK	1.08	8.63E-08	2.41E-06	Up
JAK3	1.06	5.74E-07	1.12E-05	Up
PLK2	1.04	1.13E-09	6.84E-08	Up
RIPK2	1.01	7.41E-07	1.38E-05	Up
GRK5	1.01	1.32E-06	2.21E-05	Up
TBXAS1	1.00	3.09E-11	3.52E-09	Up
ABCG2	−3.33	7.08E-12	1.07E-09	Down
CA1	−2.44	2.78E-05	0.000276	Down
ABCB1	−2.27	4.23E-10	3.02E-08	Down
PHLPP2	−2.11	1.28E-13	3.88E-11	Down
ANPEP	−1.99	1.78E-07	4.37E-06	Down
HSD17B2	−1.77	2.28E-11	2.81E-09	Down
ENPP1	−1.67	5.64E-13	1.26E-10	Down
NAAA	−1.50	6.41E-11	6.56E-09	Down
CA7	−1.40	0.000909	0.00492	Down
CA2	−1.39	2.47E-06	3.72E-05	Down
HPGD	−1.36	1.02E-06	1.79E-05	Down
EPHX2	−1.35	2.64E-06	3.93E-05	Down
PPARG	−1.33	2.81E-09	1.46E-07	Down
MAOA	−1.33	1.83E-05	0.000197	Down
CA4	−1.33	0.000073	0.000605	Down
TDP2	−1.30	1.32E-11	1.81E-09	Down
NR1H4	−1.26	3.05E-05	0.000298	Down
CPT1A	−1.17	6.67E-14	2.17E-11	Down
HSD11B2	−1.08	0.00128	0.00654	Down
THRB	−1.06	5.73E-05	0.000497	Down
SLC1A1	−1.05	9.62E-06	0.000115	Down

Supplementary Table 2. Top genes with a degree over the average from the protein-protein interaction network between the 59 genes after hiding disconnected genes

Gene name	Betweenness centrality	Closeness centrality	Degree
PTGS2	0.2285	0.6042	24
MMP9	0.1388	0.5686	22
KDR	0.0591	0.5524	22
HIF1A	0.1093	0.5686	22
ICAM1	0.0649	0.5631	22
CXCR4	0.1006	0.5472	21
MMP2	0.0611	0.5370	19
SELE	0.0134	0.5273	17
PPARG	0.1715	0.5472	17
STAT1	0.0560	0.5225	15
SERPINE1	0.0314	0.5000	15
FLT1	0.0070	0.4874	14
MMP3	0.0062	0.4874	12
MMP1	0.0041	0.4874	12
CXCR2	0.0297	0.4640	11
TEK	0.0019	0.4394	9
NOS2	0.0363	0.4833	9
F3	0.0114	0.4496	9

Supplementary Table 3. The topology of the alkaloids in the *Coscinium fenestratum* alkaloids-compounds-hub genes network

Compound	Betweenness centrality	Closeness centrality	Degree
Dehydrodiscretamine	0.1451	0.5263	6
Berberrubine	0.0794	0.5263	6
Thalifendine	0.0525	0.5000	5
(*S*)-Tetrahydrocolumbamine	0.0451	0.5000	5
Rotundine	0.0491	0.4762	4
Oxyberberine	0.0582	0.4762	4
Jatrorrhizine	0.0285	0.4545	4
Berberine	0.1993	0.4545	4
Palmatine	0.0222	0.3704	3
Canadine	0.0034	0.4000	2
Berberrubine chloride	0.0066	0.4167	2

Supplementary Table 4. Molecular docking information of the key active compounds in *Coscinium fenestratum* alkaloid and ulcerative colitis-related hub genes

Target	PDB ID	Alkaloid	Binding energy (kcal/mol)	Bond interaction	
				Conventional hydrogen bond, carbon hydrogen bond, Pi-donor Hydrogen bond, Pi-sigma, amide-Pi stacked, alkyl, Pi-alkyl, Pi-cation, Pi-anion, unfavorable acceptor-acceptor, unfavorable donor-donor	Van der Waals
PTGS2	5IKQ	Thalifendine	−9.7	ARG44, VAL46, CYS47, GLY135, LEU152, PRO153, PRO156, GLN461, ARG469	CYS36, HIS39, CYS41, GLN42, ASN43, GLY45, TYR130, TYR136, GLU465, LYS468
		Dehydrodiscretamine	−9.3	GLY45, CYS47, LEU152, PRO153, GLU465, ARG469	CYS36, HIS39, CYS41, ARG44, VAL46, TYR130, GLY135, PRO156, GLN461, LYS468
		Berberrubine	−9.1	CYS36, ARG44, CYS47, TYR130, GLY135, LEU152, PRO153, PRO156, ARG469	HIS39, CYS41, GLN42, ASN43, GLY45, VAL46, TYR136, GLN461, LYS468
		(*S*)-Tetrahydrocolumbamine	−8.7	ALA199, HIS207, THR212, HIS214, TYR385, HIS386, LEU390, LEU391, GLN454	ALA202, GLN203, PHE210, ASN382, TRP387, HIS388, VAL447
CXCR4	3ODU	Thalifendine	−9.3	TRP94, ALA98, HIS113, TYR116	LEU41, ASP97, VAL112, SER285
		Dehydrodiscretamine	−8.7	TRP94, ASP97, ALA98, HIS113, GLU288	GLU32, VAL112, TYR116, ARG183, HIS281, SER285
		Berberrubine	−9.1	TRP94, ASP97, TRP102, VAL112, HIS113, ARG188, HIS203, GLU288	PHE93, TYR116, GLN200, TYR255
		(*S*)-Tetrahydrocolumbamine	−8.3	TRP94, ASP97, TRP102, VAL112, HIS113, TYR255, ILE259, ILE284, GLU288	PHE93, TYR116, CYS186, ARG188
MMP3	1G49	Thalifendine	−9.0	LEU697, VAL698, HIS701, GLU716, ALA717, LEU718, TYR723, LEU726	TYR720, LEU722, HIS724, ARG731, and PHE732
		Dehydrodiscretamine	−8.2	LEU697, HIS701, THR715, GLU716, LEU718, LEU726, ARG731	VAL698, ALA717, TYR720, LEU722, TYR723, HIS724, PHE732
		Berberrubine	−9.3	VAL663, LEU697, HIS701, ALA717, HIS724	LEU664, ALA665, VAL698, GLU702, THR715, LEU718, TYR720, PRO721, LEU722, TYR723
		(*S*)-Tetrahydrocolumbamine	−9.0	LEU697, HIS701, LEU718, LEU726, ARG731	VAL698, GLU716, ALA717, TYR720, LEU722, TYR723, HIS724, PHE732
FLT1	3HNG	Thalifendine	−8.7	LEU882, VAL891, VAL892, LEU1013, HIS1020, ILE1038	ASP807, ALA874, GLU878, ILE881, ILE885, HIS887, CYS1018, CYS1039, ASP1040
		Dehydrodiscretamine	−8.5	ALA874, GLU878, LEU882, ILE1038, ASP1040	ASP807, ILE881, ILE885, VAL891, VAL892, LEU1013, CYS1018, HIS1020, CYS1039, GLY1042, LEU1043
		Berberrubine	−9.1	LEU882, VAL892, ILE1019, ARG1021, CYS1039	ASP807, LYS861, GLU878, ILE881, ILE885, VAL891, VAL909, LEU1013, CYS1018, HIS1020, ILE1038, ASP1040
		(*S*)-Tetrahydrocolumbamine	−8.4	ASP807, ALA874, ILE881, LEU882, VAL891, VAL892, ASP1040	THR877, GLU878, ILE885, LEU1013, ILE1019, HIS1020, ARG1021, ILE1038, CYS1039
KDR	6GQP	Thalifendine	−8.8	LEU840, VAL848, ALA866, VAL916, CYS919, LYS920, LEU1035, PHE1047	GLY841, LYS868, VAL899, GLU917, PHE918, GLY922, CYS1045
		Dehydrodiscretamine	−8.8	LEU840, VAL848, ALA866, PHE918, CYS919, LEU1035	GLY841, ARG842, GLY922, ASN923, THR926, PHE1047
		Berberrubine	−8.7	LEU840, VAL848, ALA866, LYS868, VAL916, CYS919, LEU1035, PHE1047	VAL899, GLU917, PHE918, LYS920, PHE921, GLY922, CYS1045, ASP1046
		(*S*)-Tetrahydrocolumbamine	−8.3	LEU840, VAL848, ALA866, VAL916, CYS919, LEU1035	VAL899, GLU917, PHE918, LYS920, GLY922, PHE1047

Supplementary Table 4. Continued

Target	PDB ID	Alkaloid	Binding energy (kcal/mol)	Bond interaction	
				Conventional hydrogen bond, carbon hydrogen bond, Pi-donor Hydrogen bond, Pi-sigma, amide-Pi stacked, alkyl, Pi-alkyl, Pi-cation, Pi-anion, unfavorable acceptor-acceptor, unfavorable donor-donor	Van der Waals
MMP2	8H78	Thalifendine	−7.5	LEU82, LEU83, ALA84, VAL118, HIS121, TYR143	HIS131, ALA140, PRO141, ILE412, THR144
		Dehydrodiscretamine	−7.6	LEU83, ALA84, VAL118, HIS121, HIS125, HIS131	PHE5, LEU82, HIS85, ALA86, ALA122, PRO141, ILE142, TYR143
		Berberrubine	−7.9	HIS121, LEU138, ALA140, TYR143	LEU117, PRO135, GLY136, ALA137, ILE142, THR144, THR146, ASN148, PHE149, ARG150
		(*S*)-Tetrahydrocolumbamine	−7.5	LEU117, HIS121, LEU138, ALA140, TYR143, THR146, ASN148	VAL118, PRO135, GLY136, ALA137, ILE142, THR144, PHE149, ARG150
MMP9	1GKC	Thalifendine	−7.5	LEU187, LEU188, VAL398, HIS401, TYR423	GLY186, ALA189, LEU397, GLU402, LEU418, PRO421, MET422, ARG424
		Dehydrodiscretamine	−7.5	LEU188, ALA189, ALA191, GLU402, HIS405, HIS411, PRO421, TYR423	PHE110, GLU111, LEU187, HIS190, HIS401, MET422
		Berberrubine	−7.8	GLU111, LEU188, GLU402, HIS405, HIS411	PHE110, GLY186, LEU187, HIS190, ALA191, HIS401, PRO421, MET422, TYR423
		(*S*)-Tetrahydrocolumbamine	−6.9	LEU187, ALA189, HIS405, HIS411	GLY186, LEU188, HIS190, TYR393, VAL398, HIS401, GLU402, PRO421, MET422, TYR423
SELE	1G1T	Thalifendine	−6.5	HIS25, ARG54, VAL63, LYS86, ASP89	TYR12, SER16, LYS55, VAL56, GLN66, ASP87
		Dehydrodiscretamine	−6.1	TYR12, ASP13, SER16, GLN20, HIS25, VAL63	ARG54, VAL56, VAL61, GLN66
		Berberrubine	−7.0	LYS55, ARG84, GLN85, LYS86, ASP89	ARG54, ASN58, ASP87, GLU88
		(*S*)-Tetrahydrocolumbamine	−6.3	TYR12, ARG54, VAL56, VAL61, VAL63, GLN66	SER16, HIS25
ICAM1	1IC1	Thalifendine	−6.7	ASP60, TRP84, ALA114, ARG116, GLY137	ARG13, GLN58, GLU59, VAL82, GLY112, GLY113, VAL136, GLU138
		Dehydrodiscretamine	−6.6	GLN58, ASP60, TRP84, ALA114, ARG116, ALA117	ARG13, GLU59, VAL82, PRO115
		Berberrubine	−6.7	ASP60, TRP84, ALA114, ARG116, ALA117	ARG13, GLN58, GLU59, VAL82, PRO115, VAL136
		(*S*)-Tetrahydrocolumbamine	−6.2	ASP60, TRP84, ALA114, ARG116	ARG13, GLU59, GLY112, GLY113, PRO115, ALA117, GLU138
HIF1A	1H2M	Thalifendine	−4.8	GLY815, GLU816, LEU818, LEU819	LEU822
		Dehydrodiscretamine	−4.7	SER797, TYR798, GLU801	LEU795, THR796, ASP799, CYS800, VAL802
		Berberrubine	−4.8	GLY815, GLU816, LEU818, LEU819, LEU822	NA
		(*S*)-Tetrahydrocolumbamine	−4.4	TYR798, GLU801	ASP799, CYS800

PDB ID, Protein Data Bank Identification code; NA, not available.