Supporting Information

Anti-MMP-2 Activity and Skin-Penetrating Capability of the Chemical Constituents from *Rhodiola rosea*

Tzong-Huei Lee¹, Chieh-Chih Hsu², George Hsiao³, Jia-You Fang⁴,⁵, Wei-Min Liu⁶, Ching-Kuo Lee²,⁷

Affiliations

¹Institute of Fisheries Science, National Taiwan University, Taipei, Taiwan
²Graduate Institute of Pharmacognosy, Taipei Medical University, Taipei, Taiwan
³Graduate Institute of Medical Science and Department of Pharmacology, College of Medicine, Taipei Medical University, Taipei, Taiwan
⁴Research Center for Industry of Human Ecology, Chang Gung University of Science and Technology, Kweishan, Taoyuan, Taiwan
⁵Pharmaceutics Laboratory, Graduate Institute of Natural Products, Chang Gung University, Kweishan, Taoyuan, Taiwan
⁶Department of Obstetrics and Gynecology, Taipei Medical University Hospital, Taipei, Taiwan
⁷School of Pharmacy, Taipei Medical University, Taipei, Taiwan

Correspondence

*Prof. Dr. Ching-Kuo Lee*
Graduate Institute of Pharmacognosy
Taipei Medical University
250 Wu-Xin Street
Taipei 110
Taiwan
Phone: +886 2 27 36 16 61, ext. 6150
cklee@tmu.edu.tw
Fig. 1S $^1$H NMR spectrum of compound 1 (500 MHz, CD$_3$OD).

Fig. 2S $^{13}$C NMR spectrum of compound 1 (125 MHz, CD$_3$OD).
Fig. 3S COSY spectrum of compound 1.

Fig. 4S HSQC spectrum of compound 1.
Fig. 5S HMBC spectrum of compound 1.

Fig. 6S HRESIMS of compound 1.
Fig. 7S IR spectrum of compound 1.

Fig. 8S $^1$H NMR spectrum of compound 2 (500 MHz, CD$_3$OD).
Fig. 9S $^{13}$C NMR spectrum of compound 2 (125 MHz, CD$_3$OD).

Fig. 10S COSY spectrum of compound 2.
Fig. 11S HSQC spectrum of compound 2.

Fig. 12S HMBC spectrum of compound 2.
Fig. 13\textsuperscript{S} \textsuperscript{1}H NMR spectrum of compound 3 (500 MHz, CD\textsubscript{3}OD).

Fig. 14\textsuperscript{S} \textsuperscript{13}C NMR spectrum of compound 3 (125 MHz, CD\textsubscript{3}OD).
Fig. 15S COSY spectrum of compound 3.

Fig. 16S HSQC spectrum of compound 3.
Fig. 17S HMBC spectrum of compound 3.