

# **Concise Synthesis of Catechin Metabolites 5-(3',4'-Dihydroxyphenyl)- $\gamma$ -Valerolactones (DHPV) in Optically Pure Form and Their Stereochemical Effects on Skin Wrinkle-Reducing Activities**

**Joonseong Hur<sup>1</sup>, A-Ram Kim<sup>2</sup>, Hyun Su Kim<sup>3</sup>, Changjin Lim<sup>4</sup>, Taewoo Kim<sup>3</sup>, Tae-Aug Kim<sup>2</sup>, Jaehoon Sim<sup>5,\*</sup>, Young-Ger Suh<sup>3,\*</sup>**

<sup>1</sup> Natural Products Research Institute, Korea Institute of Science and Technology (KIST), 679 Saimdang-ro, Gangneung 25451, Republic of Korea

<sup>2</sup> Department of Biochemistry, School of Medicine, CHA University, 335 Pangyo-ro, Bundang-gu, Seongnam 13496, Gyeonggi-do, Republic of Korea

<sup>3</sup> Department of Pharmacy, College of Pharmacy and Institute of Pharmaceutical Sciences, CHA University, 120 Haeryong-ro, Pocheon 11160, Gyeonggi-do, Republic of Korea

<sup>4</sup> College of Pharmacy, Jeonbuk National University, Jeonju 54896, Republic of Korea

<sup>5</sup> College of Pharmacy, Chungnam National University, Daejeon 34134, Republic of Korea

\* Correspondence: ygsuh@snu.ac.kr or ygsuh@cha.ac.kr; Tel.: +82-31-850-9300 (Y.-G.S.), jsim@cnu.ac.kr; Tel.:+82-42-821-5938 (J.S.)

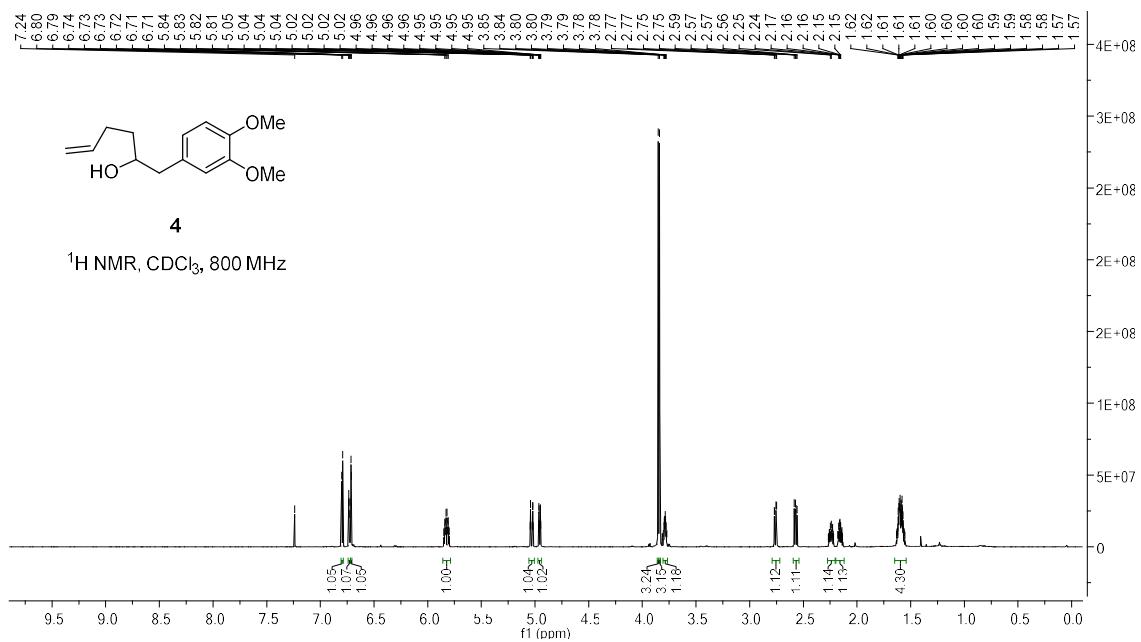


Fig. 1S  $^1\text{H}$  NMR of 4

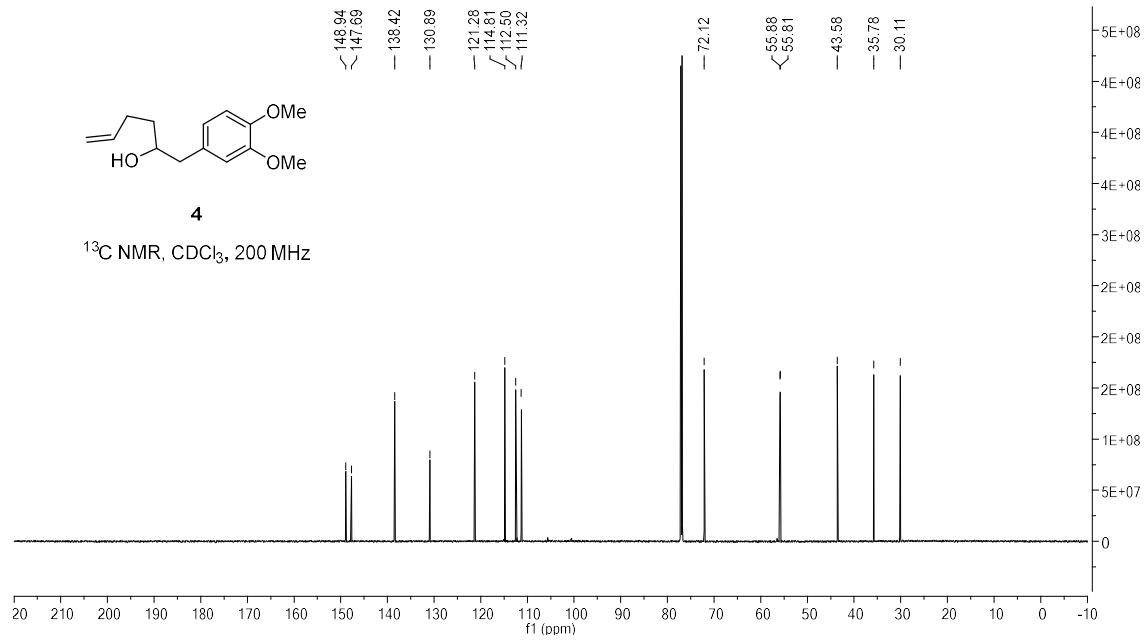
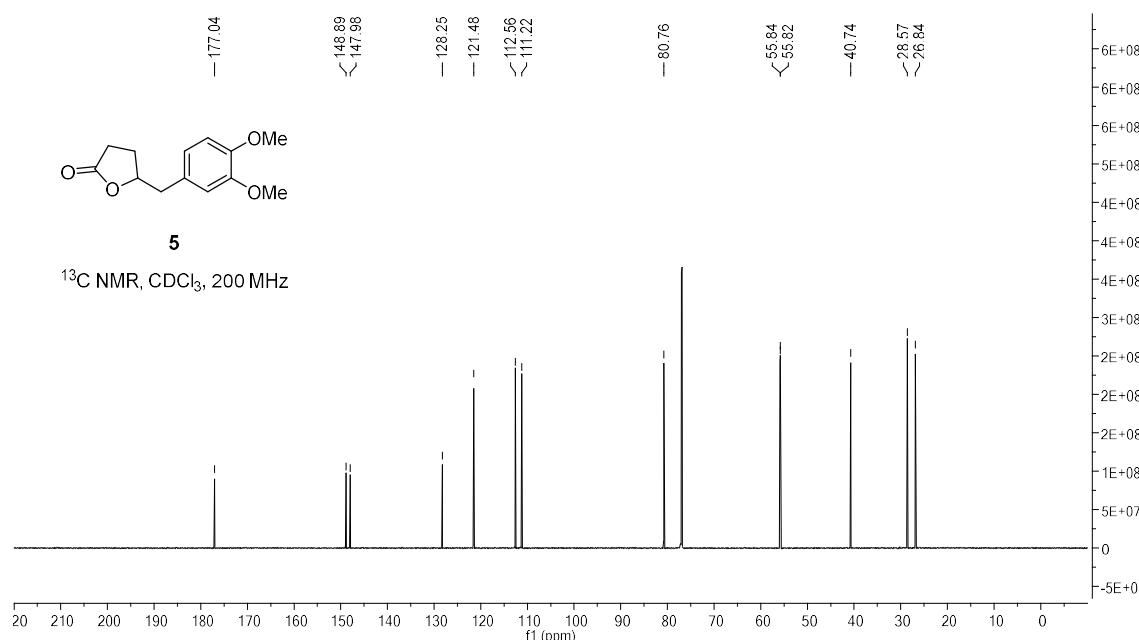
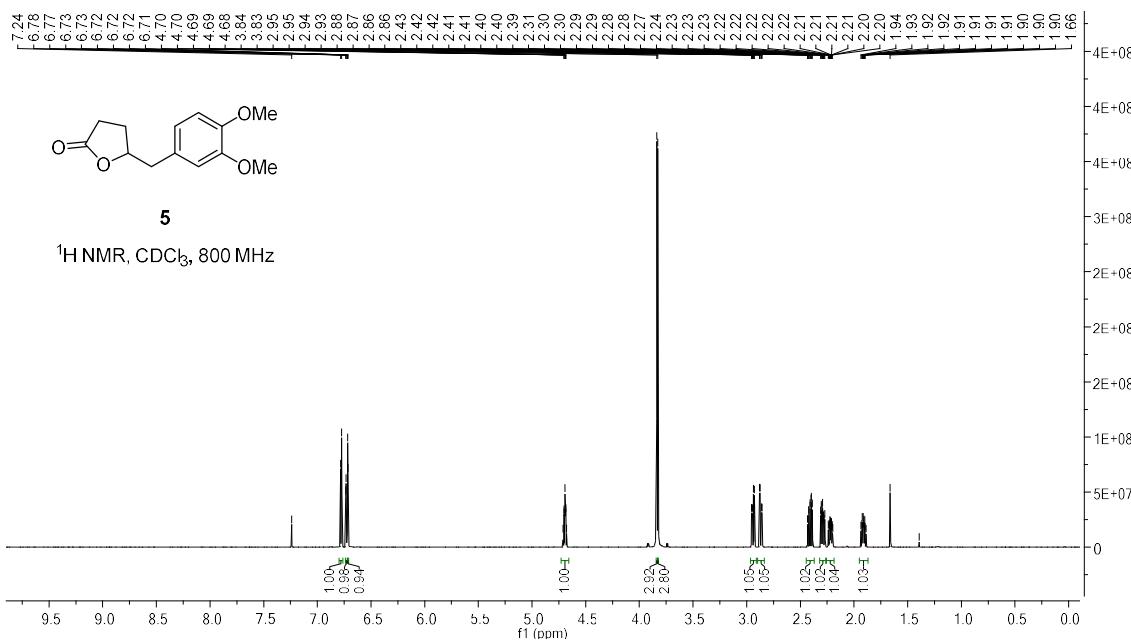
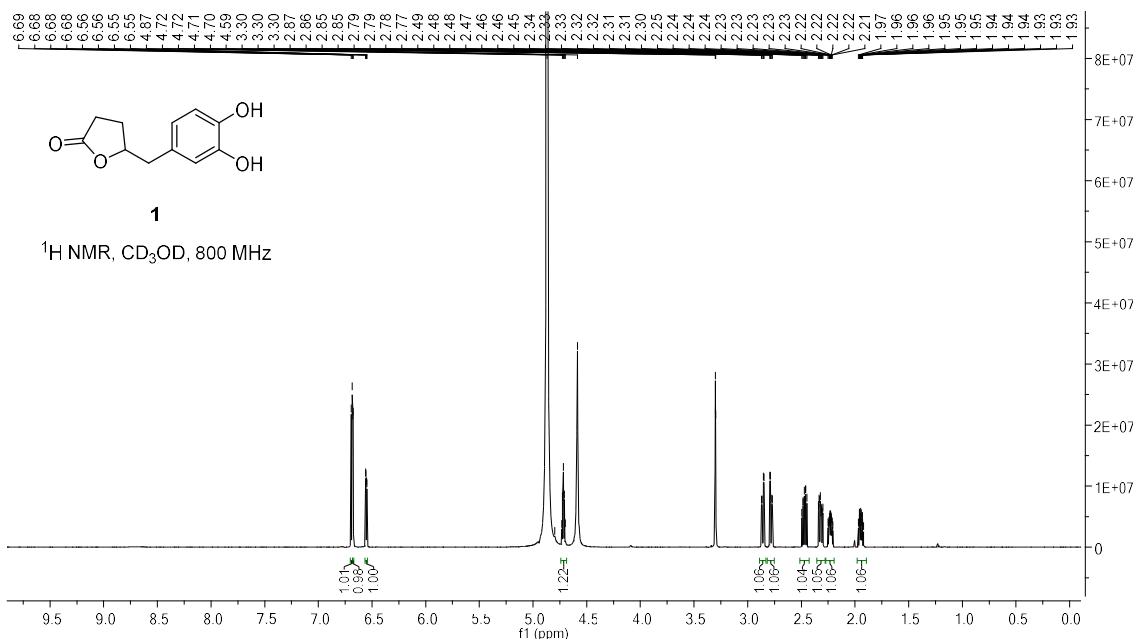
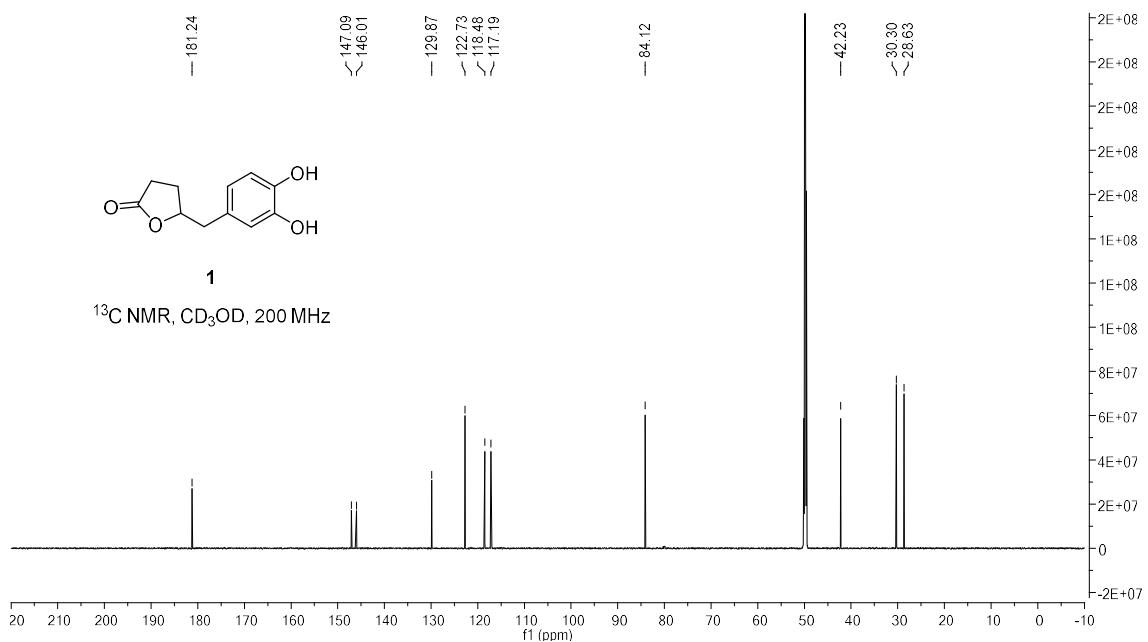


Fig. 2S  $^{13}\text{C}$  NMR of 4

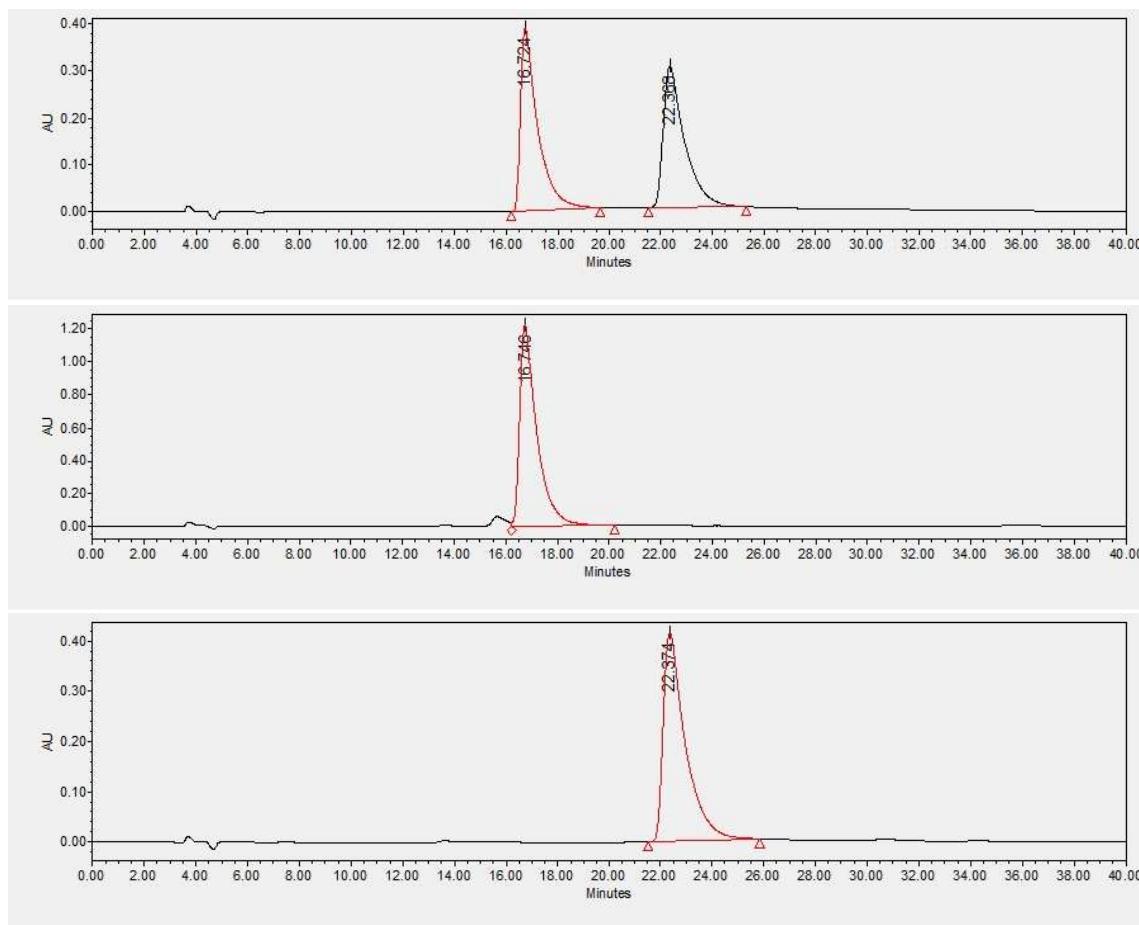




**Fig. 5S**  $^1\text{H}$  NMR of **1**



**Fig. 6S**  $^{13}\text{C}$  NMR of **1**



**Fig. 7S** Chiral HPLC chromatogram of *rac*-**1** (top), (*R*)-**1** (middle), (*S*)-**1** (bottom). All chromatograms were obtained under the following conditions; Column, DAICEL CHIRALPAK® AD-H, 4.6 x 250 mm, 5  $\mu$ m; detection, UV 210 nm; flow rate 0.8 mL/min; Mobile phase, A: Isopropylalcohol, B: Hexane; Isocratic, A:B = 15:65