

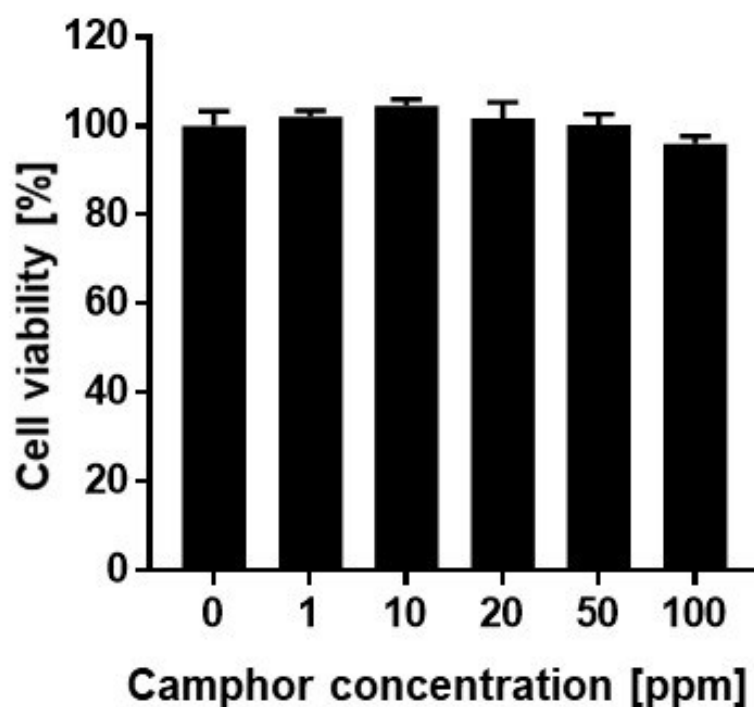
Supplementary Materials

## Enhancement of Efficacy of Retinoids through Enhancing Retinoid-Induced RAR Activity and Inhibiting Hydroxylation of Retinoic Acid, and Its Clinical Efficacy on Photo-Aging

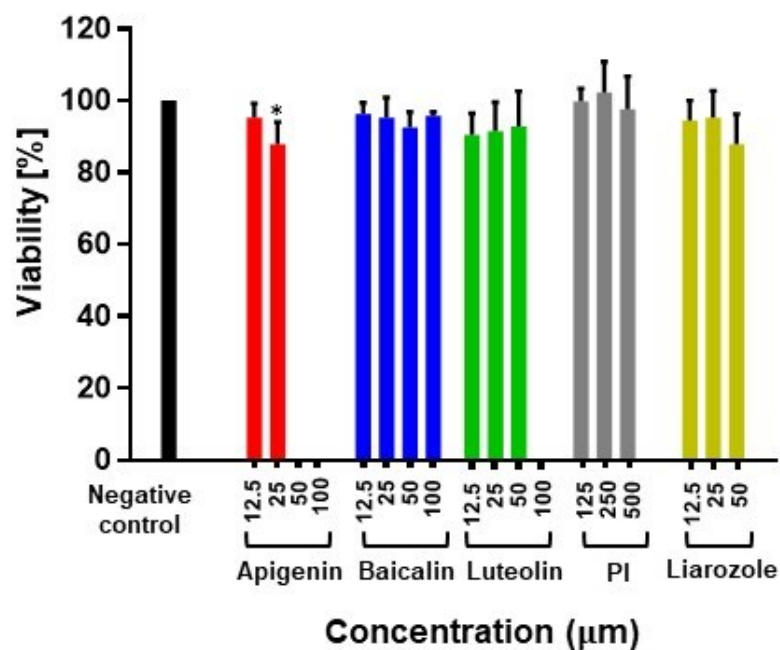
Seongsu Kang, Hyejin Lee, Seung-Hyun Jun \*, Sun-Gyoo Park and Nae-Gyu Kang \*

LG Household and Health Care R&D Center, Seoul 07795, Korea

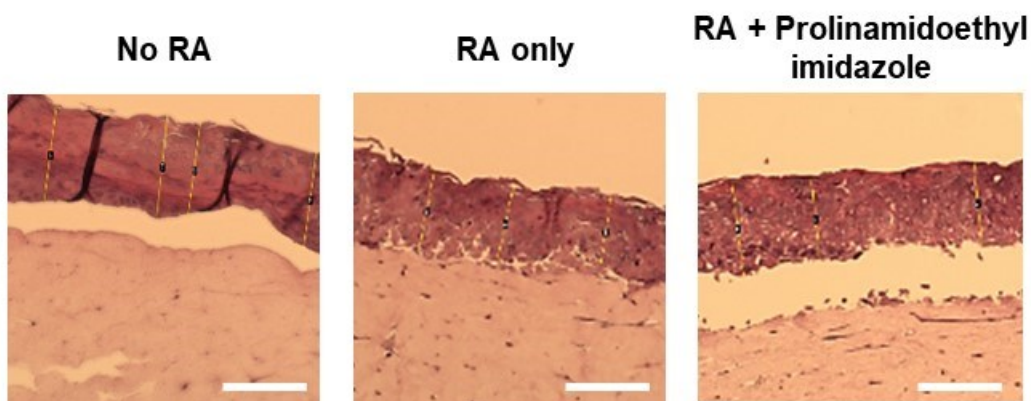
\* Correspondence: junsh@lghnh.com (S.-H.J.); ngkang@lghnh.com (N.-G.K.);  
Tel.: +82-2-6980-1239 (S.-H.J.); +82-2-6980-1533 (N.-G.K.)



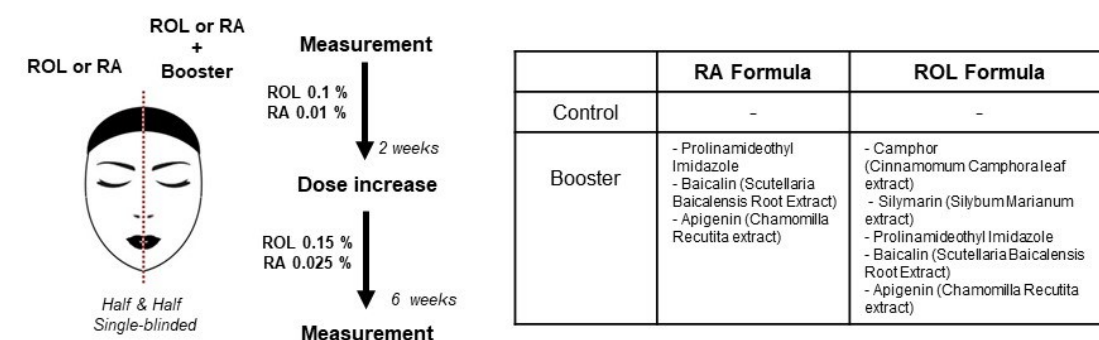
**Supplementary Figure S1.** Cell viability for camphor treatment. CCK-8 (Cell Counting Kit-8, Dojindo, Rockville, Maryland, USA) was performed.



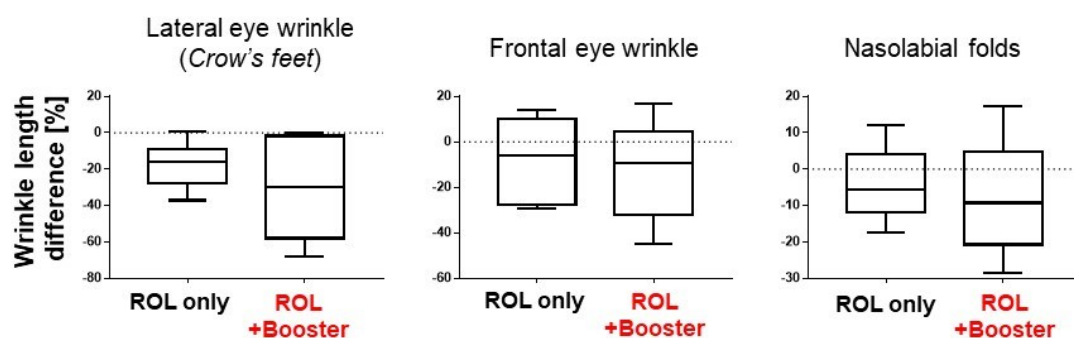
**Supplementary Figure S2.** Cell viability for RA hydroxylation inhibitors treatment. CCK-8 (Cell Counting Kit-8, Dojindo, Rockville, Maryland, USA) was performed. The.



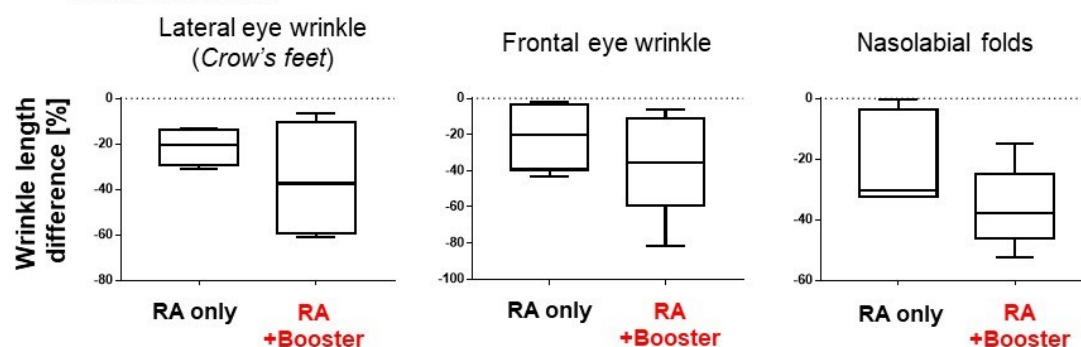
**Supplementary Figure S3.** Epidermis thickening effects of RA and hydroxylation inhibitors in *ex-vivo* experiments. Artificially reconstituted of 3D skin model was used. The tissue was stained by hematoxylin-eosin (H&E). Scale bar, 50  $\mu\text{m}$ .



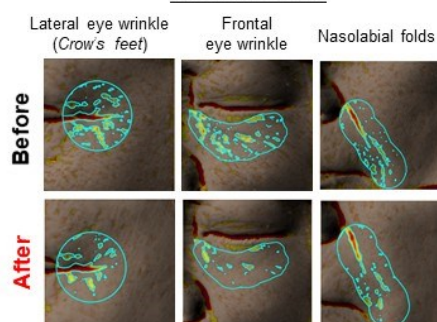
### <Retinol>



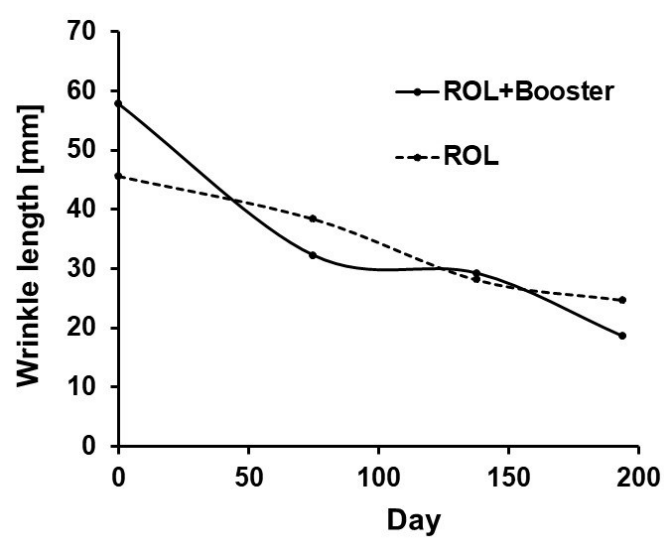
### <Retinoic acid>



### Retinoic acid



**Supplementary Figure S4.** *In-vivo* study for retinoids and retinoids/booster. Half & half, and single-blinded clinical test was performed for 6 weeks. Three types of wrinkles were measured by Antera 3D.



**Supplementary Figure S5.** Long-term use of retinol/booster for 194 days. Improvement of crow's feet was analyzed. Data for the most responsive human subject was shown. All data was analyzed by Antera 3D.