

Activation of intestinal olfactory receptor stimulates glucagon-like peptide-1 secretion in enteroendocrine cells and attenuates hyperglycemia in type 2 diabetic mice.

Ki-Suk Kim¹, In-Seung Lee¹, Kang-Hoon Kim¹, Jiyoung Park¹, Yumi Kim¹, Jeong-Hee Choi², Jin-Sung Choi², and Hyeung-Jin Jang^{1,*}

¹Department of Biochemistry, College of Korean Medicine, Kyung Hee University, 26, Kyungheedaero, Dongdaemun-gu, Seoul, 02447, Republic of Korea

²College of Pharmacy, The Catholic University of Korea, Bucheon, Gyeonggi-do, 14662, South Korea

*Correspondence and requests for materials should be addressed to H.-J.J. (email: hjjang@khu.ac.kr)

Supplementary Table S1. Sequence information for siRNA duplexes.

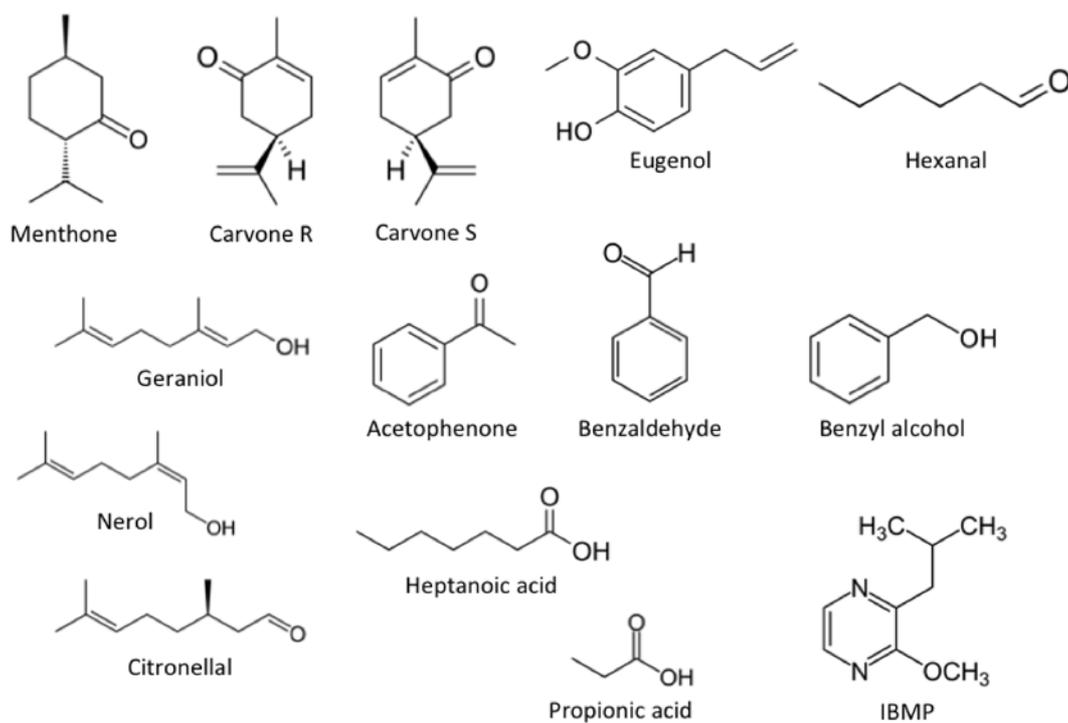
Gene	Forward	Reverse
<i>OR1A1</i>	CUGAUGUUCGCCUUCACAA (dTdT)	UUGUGAAGGCGAACAUUCAG (dTdT)
<i>ORIG1</i>	CUCCUACUCAGGGUGUCUA (dTdT)	UAGACACCCUGAGUAGGAG (dTdT)
<i>GNAL</i>	CGGACCAUUUCUAUCAUCU (dTdT)	AGAUGAUAGAAAUGGUCCG (dTdT)
<i>CNGA2</i>	GACUUGGGAUAAAUCGUGU (dTdT)	ACACGAUUUAUCCCAAGUC (dTdT)
<i>GNAT3</i>	CGAGUGAAAACGACUGGAA (dTdT)	UCCAGUCGUUUUCACUCG (dTdT)

The product name of each siRNAs: *OR1A1* siRNA, 118058 duplex; *ORIG1* siRNA, 1108121 duplex; *GNAL* siRNA, 10630000 duplex; *CNGA2* siRNA, 1033221 duplex; *GNAT3* siRNA, 1175215 duplex.

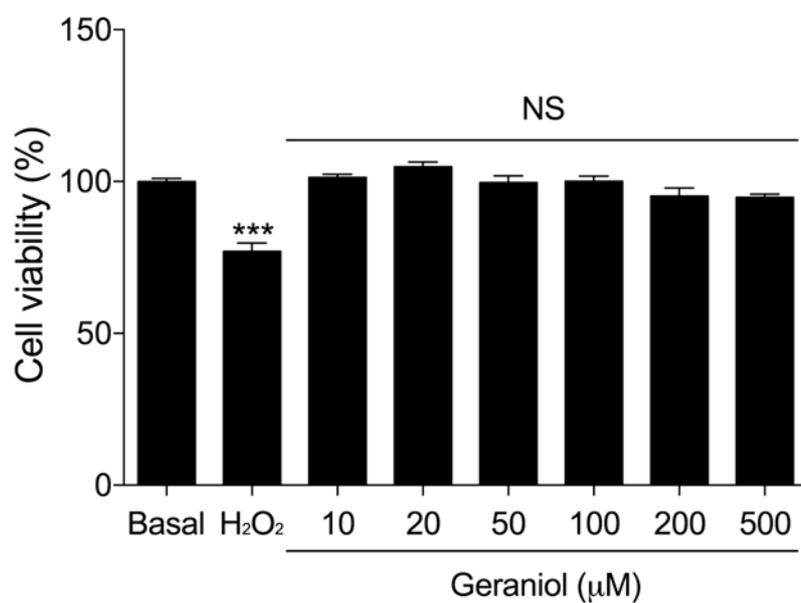
Supplementary Table S2. Sequence information for real-time PCR primers.

Gene	Forward	Reverse
<i>GAPDH</i>	GCCACATCGCTCAGACACC	CCCAATACGACCAAATCCGT
<i>GNAT3</i>	CTATGACATGGTCCTCGTGGAA	GATACTGTTGAACAGGTGAAGGCTT
<i>OR1A1</i>	TCAGCCGCCCACTTCACT	CCAGCAATAAGCCAGATACAAGAC
<i>ORIG1</i>	CCCTGGGCTCTGCATCTTC	AGGGAGTGGAGGGCATTCA
<i>GNAL</i>	CCGGGCTCAAGGGATTCT	AAATTAGCCAAGCATGGTAGCAA
<i>CNGA2</i>	GCTGGTGCTGGATTATGTCTCA	TGCGCAATCGGATGAAGAG

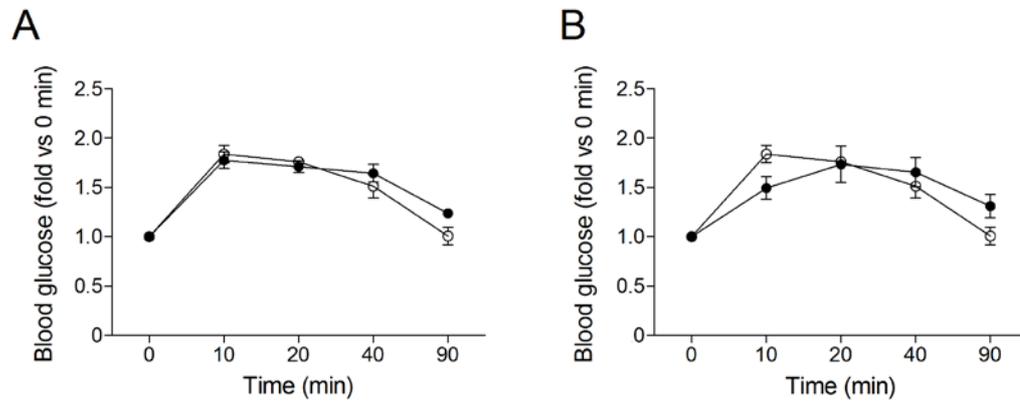
Supplementary Figure and legends



Supplementary Fig. S1. Chemical structure of odorants.



Supplementary Fig. S2. Cell viability assay using geraniol. Error bars show SEM. Statistics, ANOVA followed by Dunnett's post-hoc. *** $p < 0.001$. H₂O₂, hydrogen peroxide. NS, non-significant.



Supplementary Fig. S3. Effects of lower doses of geraniol (a, 2 mmol/kg; b, 0.7 mmol/kg) on blood glucose levels of the *db/db* mice during OGTT (2 g/kg). $n=4-7$. Error bars show SEM.