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Pheophorbide a isolated from *Gelidium amansii* inhibits adipogenesis by down-regulating adipogenic transcription factors in 3T3-L1 adipocytes

Ji Sook Han[1], **Mi Hwa Park**[2], **Ji Hye Kang**[1], **Hak Ju Kim**[3] and **You Jin Jeon**[4]
[1]Pusan National University, Republic of Korea
[2]Silla University, Republic of Korea
[3]Seojin Biotech Co., Ltd., Republic of Korea
[4]Jeju National University, Republic of Korea

Background: Adipocyte lipid accumulation causes adipocyte hypertrophy and adipose tissue increment, leading to obesity. Thus, this study investigated the anti-adipogenic effects of pheophorbide A isolated from *Gelidium amansii* in 3T3-L1 adipocytes.

Methods: Upon differentiation of 3T3-L1 pre-adipocytes into adipocytes, they were treated with pheophorbide A (0–83 μM).

Results: Pheophorbide A inhibited triglyceride accumulation and stimulated glycerol release in a dose-dependent manner in 3T3-L1 adipocytes. In addition, pheophorbide A significantly decreased leptin levels in 3T3-L1 adipocytes. Pheophorbide A inhibited adipogenesis via suppression of the expression of adipogenic transcriptional factors including peroxisome proliferator-activated receptor γ (PPARγ), CCATT/enhancer binding protein α (C/EBPα), sterol regulatory element binding protein 1c (SREBP1c), and fatty acid synthase (FAS). It also induced the expression of phosphorylation of AMP-activated protein kinase (AMPK).

Conclusion: Pheophorbide A isolated from *Gelidium amansii* inhibit adipogenesis by down-regulating adipogenic transcription factors in 3T3-L1 adipocytes. These results suggest that pheophorbide A may be useful for the prevention or treatment of obesity owing to its inhibitory effect on adipogenesis.

Biography

Ji Sook Han is a Professor and is doing research on developing a bioactive compound from natural plants, especially seaweeds, and investigating its effect for the prevention and treatment of obesity and type 2 diabetes. The active compound containing in seaweeds may be a good anti-diabetic source by improving insulin secretary defect or insulin resistance. It may also be a potential anti-obesity source owing to its inhibitory effect on adipogenesis. She evaluates the effect and mechanism of a bioactive compound isolated from natural plant through *in vitro* and *in vivo* study.

hanjs@pusan.ac.kr

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