

## Biomimetic Mineralization Using Bovine Carbonic Anhydrase II, and Hemocytes from Regenerated Shell

이승우\*, 박승빈, 최청송<sup>1</sup>  
KAIST; <sup>1</sup>서강대학교  
(swlee21th@korea.com\*)

It is known that the growth of mollusk shells including nacre (mother of pearl) is influenced by biopolymers such as carbonic anhydrase and hemocyte. Hemocytes extracted from regenerated shell were shown to play a key role in the rapid growth of calcium carbonate crystals. In this study, we compared hemocytes extracted from regenerated shell with bovine carbonic anhydrase II in terms of their ability to promote the growth of calcium carbonate crystals. On the basis of scanning electron microscopy (SEM) and Fourier transform infrared (FT-IR) analysis, a high growth rate of calcium carbonate crystals was identified under artificial seawater and atmospheric temperature. The function and role of hemocytes from regenerated shell are discussed at the molecular point as compared to aragonite-specific soluble proteins. Our findings suggest that hemocytes function as a soluble protein, with repeated GX (G: Gly, X: Asp, Asn or Glu) or negative charged amino-acid domains binding calcium and specific surface features for catalyzing rapid shell regeneration.