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Growth Variability of Intussusceptive Membrane Assembly in the Calcium Phosphate System

In current research, ultra sound waves have been shown to have no effect on the developing fetus. However, a relationship may exist at a more fundamental level between the growth of a eukaryotic cellular membrane and a high energy carrying wave. This relationship may be modeled by artificial membrane development through intussusception of the $\text{Ca}^{2+}/(\text{PO}_4)^{3-}$ system. This experiment was designed to examine the effects of temperature and wave energy on artificial membrane development through intussusception of the $\text{Ca}^{2+}/(\text{PO}_4)^{3-}$ system. It was hypothesized that artificial membrane growth would have a direct relationship with temperature and that artificial membrane growth would have an inverse relationship with wave energy. Membranes of $\text{Ca}_3(\text{PO}_4)_2$ were grown at 25°C and 37°C and were also grown in the presence of a Class II laser and 9MHz and 17MHz ultrasonic sound waves. It was found that membrane growth rate and final height was higher (23.5mm) at 25°C than 37°C (16.0mm). It was also found that the mean final membrane height was lower for membranes grown under the presence of 9 MHz (19.0mm) and 17MHz (14.3mm) ultrasonic waves and a Class II laser (14.8mm). However, the growth rate for the membranes grown under the 17MHz wave and the laser was more constant. The results were found to be statistically significant using ANOVA and T-test analysis. The first hypothesis was rejected and the second hypothesis was supported by the data.