

**Detection and cloning of Phospholipase C-zeta (PLC $\zeta$ ) gene fragments from testes of *Rattus tiomanicus* (Malayan wood rat).**

ABSTRACT

PLC-zeta is a novel, sperm-specific phospholipase-C that is highly effective in causing Ca<sup>2+</sup> oscillation and activation in mouse eggs during fertilization. Upon sperm-oocyte fusion, PLC-zeta diffuse into the oocyte cytosol and stimulate the inositol1, 4, 5-trisphosphate (IP<sub>3</sub>) pathway thus increasing IP<sub>3</sub> levels and activating IP<sub>3</sub> receptor-mediated Ca<sup>2+</sup> release from intracellular stores. This event will trigger oocyte activation, essential for embryo development. The importance of PLC-zeta was demonstrated when PLC-zeta removal from sperm extracts stops Ca<sup>2+</sup> release in eggs. In addition, sperm from transgenic mice expressing short hairpin RNAs targeting PLC-zeta mRNA has been shown to reduce PLC-zeta protein and significantly disturbs the calcium oscillatory behavior of eggs inseminated with these sperm. *Rattus tiomanicus* (Malayan wood rat) is the predominant rodent pest targeting oil palm estates in Malaysia. Various methods have been used to control their population. In the current study, PLC-zeta expression was detected using one-step RT-PCR from the testes. The PLC-zeta sequence of *R. tiomanicus* showed strong similarity on alignment with PLC-zeta sequence of *R. norvegicus*. Discovery of a highly conserved PLC-zeta among rodents and understanding of the molecular properties of PLC-zeta can lead to further development of alternative approaches of controlling them in a more environmental friendly way. Disruption of the expression of PLC-zeta in *R. tomianicus* could lead to poor fertility in the male thus lowering the population of this pest and its deleterious effects to the agriculture sector especially oil palm, one of the most broadly grown crops in South East Asia.

**Keyword:** Phospholipase C zeta; *Rattus tomianicus*; PCR; Cloning