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**Phospholipases and matrix vesicles release**

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Phospholipase D (PLD) catalyzes the hydrolysis of phospholipids, forming phosphatidate and a head group. The products of phospholipid hydrolysis affect cell signaling, differentiation, proliferation and maturation. In addition, phosphatidate induces membrane curvature and is suspected to facilitate exocytosis or endocytosis of vesicles. We reasoned that secretion of matrix vesicles (MVs) would increase upon activation of PLD due to alteration of plasma membranes or of actin cytoskeleton of mineralizing cells. MVs are vesicles secreted by mineralizing cells, initiating apatite formation. Here, we will report the effects of PLD on mineralization induced by chondrocytes. The presence of two PLD isoforms (PLD1 and PLD2) was ascertained by measuring their RNA level expression in primary chondrocytes. Mineralization process induced by primary chondrocytes isolated from wild type and from KO PLD mouse models were compared. As probed by cresolphtaline assay, calcium deposition decreased slightly in primary chondrocytes extracted from KO PLD1 and from KO PLD2 mouse model. These findings were correlated with a decrease in TNAP activity, as well as a decrease of RNA expression levels of *runx2* and *ocn* for KO PLD2 mouse model. MVs extracted from primary chondrocytes of KO PLD1 mouse were compared to MVs extracted from primary chondrocytes of wild types. Taken together these findings suggest that the activity of PLD regulates finely the mineralization process and may influence secretion of functional MVs.