Dilantin (5-5 diphenylhydantoin, DPH) is an anti-epileptic drug that is used to control seizures and is known to cause birth defects in women and infertility in men. Previous studies have used the rat model to study DPH effects on male infertility. Since rats metabolize DPH rather quickly, mice are a better model to use to study DPH effects since they metabolize DPH in a comparable to humans. The purpose of this study is to characterize the effects of DPH on sperm-ZP binding and on levels of proacrosin protein expression in sperm, in order to better understand the effects of DPH on male infertility. Administration of 55 mg/kg of DPH to NSA mice for 7 days via intraperitoneal injection caused a 60% reduction in sperm binding to the zona in the DPH treated mice compared to the 0.001 N NaOH vehicle control group. The effects of DPH on proacrosin protein using standard immunofluorescence with confocal microscopy and by Western blot analysis. DPH treated mice showed a mean fluorescence intensity of 2535.66 ± 115.07 compared to the NaOH treated group with a mean fluorescence intensity of 3609.46 ± 112.26 resulting in a significant decrease of 29.75%. Preliminary Western blot analysis confirmed a 50-95% reduction in proacrosin protein expression. Using calcium ionophore A23187 to induce the acrosome reaction, it was determined that DPH does not alter the ability of
sperm cells to exocytose their acrosomal contents. This study suggests that reduced binding of DPH treated sperm to the ZP is at least in part altered by reduction of proacrosin protein expression.