

Development of an Adult Rat Hippocampal Slice Culture System to Study Seizure in Women with Preeclampsia

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Previous research has correlated seizure activity with increased excitatory collateral expression in the rat hippocampus [1]. Eclampsia is a condition where a subpopulation of pregnant women experienced seizures. Changes in the cerebral vasculature have been hypothesized to create an environment that elicits microglial activation and eclamptic seizure. Microglia activation facilitates a release of tumor necrosis factor alpha (TNF- α), an inflammatory peptide that can lower the seizure threshold [2]. Those studies used hippocampal slices obtained from neonatal rats and subject to long-term (23 days) culture. However, long-term slice culture from neonatal rats present a challenge for seizure studies because of the increase in excitability that occurs inherently over time in long-term slice culture [3]. Additionally they do not permit direct examination of pregnancy on neuronal excitability. Shorter-term culture hippocampal slices avoid these drawbacks, but have the disadvantage of being more technically challenging to achieve. The goal of the current study is to determine the conditions required for preparing short-term hippocampal slice cultures from adult rats. Because pregnancy induced seizure involves activation of microglia by factors in serum, it is critical to establish culture conditions that minimize baseline microglia activation levels. Microglia activation was quantified using immunofluorescence, electrophysiology, as well as western blots specific for TNF- α .

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3. Lindroos, M.M., et al., *Maturation of cultured hippocampal slices results in increased excitability in granule cells*. Int J Dev Neurosci, 2005. **23**(1): p. 65-73.

