

# Modelling Fetal ECOG/EEG during Labour

Martin G. Frasch, MD, PhD  
Assistant Research Professor  
Department of Obstetrics-Gynecology, Faculty of Medicine  
Université de Montréal/University of Montreal  
CHU Sainte-Justine Research Center

## Description

During labour, fetal well-being is typically monitored by measuring fetal heart rate (FHR). FHR monitoring, however, has low positive predictive value for detecting acidemia. As for early detection of fetal inflammation, no reliable noninvasive methods exist. Both conditions (fetal acidemia and inflammation) are associated with increased risk for brain injury at birth with lasting neurological deficits that often can only be diagnosed years after birth.

We have showed that fetal electroencephalogram (EEG) is feasible during labour and would enhance the ability to detect early onset of acidemia. In order to develop more robust techniques for online detection of fetal acidemia during labour, it will be desirable to have a physiology-based mathematical model for fetal EEG under stress, e.g., when the supply of fetal oxygen is reduced because of a variety of causes.

## Objectives

During the workshop, data from animal experiments will be provided for the participants. The primary goal is to develop a quantitative (Hodgkin-Huxley-type) neuronal model capable of generating EEG signals that mimic the observed patterns from animal experiments. A secondary objective is to find a robust approach that can be used to fit model parameters using the experimental data.

## Background literature

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