

**Malignant hyperthermia: Possible diagnostic tool by electromyography****Charles H Williams**

The Williams Research Laboratory, USA

The evaluation of the action potential at the myoneural junction in several muscles of the Malignant Hyperthermia susceptible pig shows that the amplitude of the action potential voltage is increased dramatically at the myoneural junction. The duration of the amplitude of the action potential is also significantly increased. These data, along with our other findings lead us to develop a hypothesis that the sodium channels at the myoneural junction were leaky in that they did not close as quickly as normal pig sodium channels and thereby allow an influx of sodium ions into muscle cells that had to be pumped out by the Na-K ATPase. The pumping is an energetic process that requires the expenditure of ATP energy sources and simultaneously produced heat. The flow of sodium ion into muscle cells was a concentration dependent process that dis

not expend energy. We observed core temperatures up to 118°F. core temperature over 106°F are highly lethal. Other high body temperatures may be caused by the same heat generating mechanism during other disease states. The sodium channel futile cycle provides a mechanism for generation heat to maintain a normal body temperature in warm blooded animals. We would not expect to find this heat generating mechanism in cold-blooded animals. It would be nice to have a detector that would measure sodium ion flow during the action potential. The changes in sodium ions at the membrane of the muscle are designed to maintain the -90mv charge across the membrane. Loss of the membrane charge leads to a lethal situation and the death of the organism.

e:chwilliams2135@sbcglobal.net

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