

## 8<sup>th</sup> European Clinical Microbiology and Immunology Congress

&

## 3<sup>rd</sup> World congress on Biotechnology

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## Malignant hyperthermia - a genetic disease of sodium channel function

**M**alignant hyperthermia is inherited as a dominant gene in pigs and in humans. It is characterized by a rapidly increasing body temperature up to 118°F with a metabolic rate over 10x normal, an intense peripheral vasoconstriction with blood pressures over 400 mmHg and a fatal outcome in most cases.

The MH syndrome is triggered by exercise, hauling to market, breeding activity, hot weather and other stress factors. In humans, the cases are triggered by depolarizing muscle relaxants, halothane anesthesia and other halogenated anesthesia compounds. Non-depolarizing muscle relaxants such as pancuronium and vecuronium are safer to use. Organon 9426 (rocuronium) is safe to use and provides carry over protection against the development of MH.

The widespread use of sevoflurane in humans has reduced the incidence of MH to 1:550,000. Only two cases of MH have been reported in the USA during the past 30 years.

The MH susceptible pig is an outstanding animal model for research purposes and has enabled the development of new muscle relaxants and anesthesia agents that are safer for human use.

The sodium channels in MH susceptible animals are leaky and allow the influx of sodium into muscle cells which must be pumped out by sodium-potassium ATPase, thereby using ATP and generating heat.

### Speaker Biography

Charles H Williams completed his PhD in 1968 and then a post-doctoral at the Institute for Enzyme Research with David E Green on mitochondrial studies. He moved to Missouri as an associate professor of biochemistry and as an assistant professor of medicine. He relocated to TTUHSC-El Paso in 1982, where MH research was his primary area of interest. He has published over 50 papers in refereed journals and has presented posters and lectures at many international events. He has also awarded with US Patent #5,030,633 in July 9, 1991 for the use of androstane derivative against malignant hyperthermia. He (editor and author or co-author on 7 of 14 Chapters) has published over 50 manuscripts, published abstracts, presentations at various meetings and two books published, one of those books is experimental malignant hyperthermia, New York, Springer Verlag, 1988.

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