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MULTIPLE MECHANISMS OF H-CHANNEL DYSFUNCTION IN INHERITED AND ACQUIRED EPILEPSY

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Hyperpolarization-activated cyclic nucleotide-gated ion channels (better known as h- or HCN channels) are gaining increasing attention for their influence on the excitability of CNS neurons. Recently it has become apparent that dysfunction of h-channels may play a role in both inherited and acquired epilepsies, so that pharmacological manipulation of h-channels may have antiepileptic efficacy. In this workshop, we will review the expanding evidence for an “h-channelopathy” in epilepsy, and explore how the multiple molecular mechanisms of h-channel regulation may suggest new therapeutic strategies. Thomas Budde will discuss the involvement of h-channels in animal models of absence epilepsy and the underlying molecular defects responsible for generation of epileptic discharges; Tallie Z. Baram will review the mechanisms by which experimental febrile and other developmental seizures alter the expression of the HCN channels; Finally, Nicholas Poolos will discuss pharmacological targeting of h-channel dysfunction by post-translational modification

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