Bio

ACADEMIC APPOINTMENTS
• Emeritus Faculty, Acad Council, Anesthesiology, Perioperative and Pain Medicine

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS
My laboratory tries to find out how pharmacologic agents used in the practice of anesthesia (general anesthetic and analgesic agents) lead to therapeutically desireable endpoints including unconsciousness, immobility and absence of pain. The old idea that general anesthetics are uniformly non-specific "membrane stabilizers" has given way to the realization that these agents exert specific actions on particular ion channels and intracellular signalling systems. Currently we are identifying anesthetic effects on ligand-gated and second messenger-operated ion channels in mammalian neurons, using both receptor-specific evoked potentials from isolated superfused spinal cord and whole cell patch clamp of neurons in situ in spinal cord slices. The goal of the research program is to construct a manageable set of actions which alone or in combination are both necessary and sufficient to bring about an anesthetic state. Most recently we have focused attention on mechanisms of spinal sensitization that contribute to chronic pain following injury and also to the development of tolerance to anesthetic and analgesic agents. We have described and partially characterized long term potentiation (LTP) in isolated spinal cord. We have also discovered long-lasting increases in spinal cord excitability following exposure to opioids such as morphine and to ethanol; these changes may be related to mechanisms of tolerance, dependence, and withdrawal.

Publications

PUBLICATIONS
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• Acute and chronic ethanol exacerbates formalin pain in neonatal rats NEUROSCIENCE LETTERS
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• Acute and chronic ethanol does not affect incisional pain in neonatal rats NEUROSCIENCE LETTERS
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• Mechanical alldynia and thermal hyperalgesia upon acute opioid withdrawal in the neonatal rat PAIN
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Exaggerated nociceptive responses on morphine withdrawal: roles of protein kinase C epsilon, and gamma PAIN
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Cheng, G., Kendig, J. J.
2002; 136 (5): 673-684

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Acetylcholine receptors do not mediate isoflurane’s actions on spinal cord in vitro ANESTHESIA AND ANALGESIA
Wong, S. M., Sonner, J. M., Kendig, J. J.
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Enflurane actions on spinal cords from mice that lack the beta(3) subunit of the GABA(A) receptor Annual Meeting of the Association-of-University-Anesthesiologists
Wong, S. M., Cheng, G., Homanics, G. E., Kendig, J. J.
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Enflurane directly depresses glutamate AMPA and NMDA currents in mouse spinal cord motor neurons independent of actions on GABA(A) or glycine receptors ANESTHESIOLOGY
Cheng, G., Kendig, J. J.
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Patch clamp studies of motor neurons in spinal cord slices: a tool for high-resolution analysis of drug actions ACTA PHARMACOLOGICA SINICA
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The NMDA receptor antagonist MK-801 differentially modulates mu and kappa opioid actions in spinal cord in vitro. *Pain.*
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