Biomarkers for Epileptogenesis, Neurocognitive, and Neurobehavioral Comorbidities
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Raman Sankar, MD, PhD
Professor of Neurology and Pediatrics
David Geffen School of Medicine at UCLA
## Disclosures

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<tr>
<th>Name of Commercial Interest</th>
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<td>Lundbeck, UCB, Supernus, Acorda, Upsher-Smith</td>
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<td>Lundbeck, UCB, GSK, Cyberonics, Supernus</td>
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Learning Objectives

• To understand an overview of our present understanding of the relationship between epilepsy and several comorbidities
• To evaluate neuroimaging, physiological, biochemical biomarkers
• To update the audience as to what laboratory models inform us on epileptogenesis and the evolution of comorbidities
A biomarker is defined as an objectively measured characteristic of a normal or pathologic biologic process. Identification and proper validation of biomarkers of epileptogenesis (the development of epilepsy) and ictogenesis (the propensity to generate spontaneous seizures) might predict the development of an epilepsy condition; identify the presence and severity of tissue capable of generating spontaneous seizures; measure progression after the condition is established; and determine pharmacoresistance.
Several different types of comorbidities exist in epilepsy.

Rochelle Caplan, MD

- **Cognitive comorbidities** are learning problems that cause difficulty in school and can have lasting effects on educational and professional success.

- **Psychiatric comorbidities** are behavior and mood problems including Attention Deficit Disorder (ADD), depression, anxiety disorders and combinations of these conditions.
Bruce Hermann, PhD:
With comorbidities, “the norm has been to assume, to some degree, that a lot of these difficulties are attributable to recurrent seizures and medications and so on,”
But, he says, “the most recent research indicates that some cognitive and psychological comorbidities actually predate the onset of seizures.”

Ann Berg, PhD:
“Increasingly there’s a sense with this essential comorbidity that it’s not that one condition is causing the other, but maybe they’re caused by the same thing. They’re reflective of the same brain disorder.”

http://www.epilepsyfoundation.org/aboutepilepsy/relatedconditions/Comorbidites-in-Epilepsy.cfm
Effects of Midbrain Raphe Lesions or Systemic $p$-Chlorophenylalanine on the Development of Kindled Seizures in Rats

RONALD RACINE

Department of Psychology, McMaster University, Hamilton, Ontario

AND

DONALD V. COSCINA

Section of Biopsychology, Clarke Institute of Psychiatry, University of Toronto, Toronto, Ontario

(Received 7 August 1978)
The dorsal noradrenaline bundle system plays an inhibitory role in the development of the seizure discharges and the behavioral convulsions in hippocampal and amygdaloid kindling.
Kindling epileptogenesis in immature rats leads to persistent depressive behavior
Andréy Mazarati a,*, Don Shin a, Stéphane Auvin a,b, Rochelle Caplan a,c, Raman Sankar a,d

Comorbidity between epilepsy and depression: Experimental evidence for the involvement of serotonergic, glucocorticoid, and neuroinflammatory mechanisms
Eduardo Pineda, Don Shin, Raman Sankar, and Andrey M. Mazarati
Model-dependent in laboratory experiments
Etiology-dependent in clinical situations
Role of Biomarkers in clarifying relationships?

American Epilepsy Society | 2013 Annual Meeting