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## Mechanisms of epileptogenesis and preclinical approach to antiepileptogenic therapies

Short title: Epileptogenesis and antiepileptogenic therapies

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### Abstract

The prevalence of epilepsy is estimated 5-10 per 1000 population and around 70% of patients with epilepsy can be sufficiently controlled by antiepileptic drugs (AEDs). Epileptogenesis is the process responsible for converting normal into an epileptic brain and mechanisms responsible include among others: inflammation, neurodegeneration, neurogenesis, neural reorganization and plasticity. Some AEDs may be antiepileptogenic (diazepam, eslicarbazepine) but the correlation between neuroprotection and inhibition of epileptogenesis is not evident. Antiepileptogenic activity has been postulated for mTOR ligands, resveratrol and losartan. So far, clinical evidence gives some hope for levetiracetam as an AED inhibiting epileptogenesis in neurosurgical patients. Biomarkers for epileptogenesis are needed for the proper selection of patients for evaluation of potential antiepileptogenic compounds.

**Keywords:** Epilepsy, Epileptogenesis, Antiepileptic drugs, Antiepileptogenic compounds, Traumatic brain injury

### Introduction

It is thought that epilepsy with 65 million people affected worldwide is the most common, chronic, serious neurological disease [1]. The prevalence of epilepsy is 5-10 per

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