

# Neurogenesis dewasa dan mitokondria berperan pada plastisitas hipokampus pada model mencit penyakit neurodegeneratif = Adult neurogenesis and mitochondria play a role in hippocampal plasticity in mouse models of neurodegenerative diseases

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## Abstrak

Certaines rgions du cerveau adulte, comme l'hippocampe, produisent des nouveaux neurones qui participent certaines capacits d'apprentissage et de mmoire. Dans les maladies neurod g n ratives comme la maladie d'Alzheimer MA , ils sont alt r s. Dans des souris mod les de la MA, nous avons montr que ces nouveaux neurones souffraient de plus d'une rduction de leur contenu mitochondrial. Les mitochondries, 'centrales lectriques' des cellules, sont cruciales pour la transmission synaptique. Nous montrons que deux souris mod les diff rents, de MA et de dysfonctionnement mitochondrial, pr sentent une alt ration pr coce des performances de mmoire li es ces nouveaux neurones, qui ont une capacit synaptique rduite et moins de mitochondries. De plus, la manipulation g n tique des prog niteurs hippocampiques, chez le premier, rtablit les mitochondries et les synapses. Chez le second, l'exercice physique augmente les mitochondries et restaure les capacits mn siques perdues.

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Some regions of the adult brain, such as the hippocampus, produce new neurons that participate in certain learning and memory capacities. In neurodegenerative diseases, such as Alzheimer's AD , this adult neurogenesis is altered. In a mouse model of AD, we showed that these new neurons have a reduced mitochondrial content and less synaptic capacities. Mitochondria, 'power plants' of cells, are particularly important in neurons and for synaptic transmission. We show that two different mouse models, of AD or of mitochondrial dysfunction, exhibit early impairment of memory performance related to these new neurons, which have less synaptic capacity and fewer mitochondria. In addition, we demonstrate that genetic manipulation of hippocampal progenitors in the former restores mitochondria and synapses. In the second, physical exercise increases mitochondria and restores lost memory abilities. Mitochondria are thus central in cognitive processes related to adult hippocampal neurogenesis.