



UNIVERSITE DE MONTPELLIER
FACULTE DES SCIENCES



Session :1...../.....

Durée de l'épreuve :.....2.....heures

Date : 17 / 01 / 2018

Documents autorisés :.....

Licence Master

.....

Mention : Master Biologie-Santé

Matériels autorisés :.....

Parcours :

.....

Libellé + Code de l'UE : Vieillessement et Sénescence HMBS362

Merci de bien vouloir renseigner le cadre ci-dessus

SUJET

Le vieillissement est un processus biologique complexe qui induit des modifications moléculaires et cellulaires et dans certains cas des pathologies comme le cancer, les maladies cardio-vasculaires ou encore des maladies neurodégénératives.

Répondez aux questions ci-dessous en utilisant les connaissances et les réflexions qui vous ont été présentées dans tous les champs d'étude de ce module sur le vieillissement.

Utilisez votre esprit d'analyse et de synthèse. Soignez votre présentation.


1/ Quels sont les rôles de mitochondries dans le vieillissement ?

Vous pouvez développer différents aspects présentés dans cette revue actuellement publiée.



Review

The Aging Mitochondria

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Abstract: Mitochondrial dysfunction is a central event in many pathologies and contributes as well to age-related processes. However, distinguishing between primary mitochondrial dysfunction driving aging and a secondary mitochondrial impairment resulting from other cell alterations remains challenging. Indeed, even though mitochondria undeniably play a crucial role in aging pathways at the cellular and organismal level, the original hypothesis in which mitochondrial dysfunction and production of free radicals represent the main driving force of cell degeneration has been strongly challenged. In this review, we will first describe mitochondrial dysfunctions observed in aged tissue, and how these features have been linked to mitochondrial reactive oxygen species (ROS)-mediated cell damage and mitochondrial DNA (mtDNA) mutations. We will also discuss the clues that led to consider mitochondria as the starting point in the aging process, and how recent research has showed that the mitochondria aging axis represents instead a more complex and multifactorial signaling pathway. New working hypothesis will be also presented in which mitochondria are considered at the center of a complex web of cell dysfunctions that eventually leads to cell senescence and death.

2/ L'exercice physique est préconisé dans la prévention du vieillissement. Commentez le résumé de l'article et la figure ci-dessous.

Levin et al. *European Review of Aging and Physical Activity* (2017) 14:20
DOI 10.1186/s11556-017-0189-z

European Review of
Aging and Physical Activity

REVIEW ARTICLE

Open Access

The beneficial effects of different types of exercise interventions on motor and cognitive functions in older age: a systematic review



Oron Levin¹, Yael Netz² and Gal Ziv^{3*}

Abstract

The decline in cognitive and motor functions with age affects the performance of the aging healthy population in many daily life activities. Physical activity appears to mitigate the decline or even improve motor and cognitive abilities in older adults. The current systematic review will focus mainly on behavioral studies that look into the dual effects of different types of physical training (e.g; balance training, aerobic training, strength training, group sports, etc.) on cognitive and motor tasks in older adults with no known cognitive or motor disabilities or disease. Our search retrieved a total of 1095 likely relevant articles, of which 41 were considered for full-text reading and 19 were included in the review after the full-text reading. Overall, observations from the 19 included studies conclude that improvements of both motor and cognitive functions were found mainly in interventions that adopt physical-cognitive training or combined exercise training. While these findings advocate the use of multimodal exercise training paradigms or intervention to improve cognitive-motor abilities in older adults, the sizeable inconsistency among training protocols and endpoint measures complicates the generalization of this findings.

Keywords: exercise, Motor functions, Cognitive functions, Cognitive-motor training, Brain

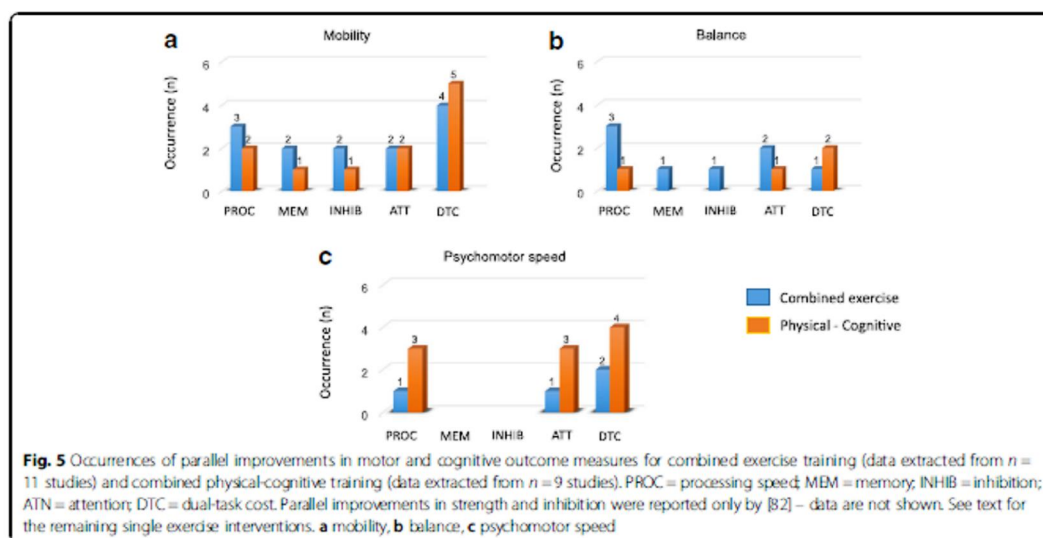


Fig 5 Occurrences of parallel improvements in motor and cognitive outcome measures for combined exercise training (data extracted from $n = 11$ studies) and combined physical-cognitive training (data extracted from $n = 9$ studies). [PROC = processing speed, MEM = memory, INHIB = inhibition, ATN = attention, DTC = dual task cost. Parallel improvements in strength and inhibition were reported only by [82] ref Berryman et al., 2014, data are not shown. See text for the remaining single exercise intervention. **a** mobility, **b** balance, **c** psychomotor speed.