BQA 510012 – TÓPICOS ESPECIAIS EM BIOQUÍMICA: EXERCÍCIO FÍSICO E NEUROPLASTICIDADE

Nº de Créditos: Dois (02) **Total Horas-Aula:** Trinta h/a (30)
Docentes: Alexandra Susana Latini – BQA/CCB (Coordenador – 1 crédito)
Aderbal Silva Aguiar Jr – bolsista pós-doc (1 crédito)

EMENTA:

Efeitos e mecanismos básicos do exercício físico no sistema nervoso central (SNC), com foco em mecanismos de neuroplasticidade, estresse oxidativo e neurodegeneração.

METODOLOGIA DE ENSINO:

- Seminário individual, discussão de artigos científicos, aulas expositivas e práticas, quadro, equipamento audiovisual.

AVALIAÇÃO:

- Seminários
- Participação na disciplina
- Opinião: exercício e SNC, 3000 palavras todo documento. Citações e referências estilo Vancouver.

CONTEÚDO PROGRAMÁTICO E CRONOGRAMA:

DIA 1 (manhã e tarde): Exercício físico e neuroplasticidade. Distribuição de artigos para apresentação de seminários. Disponíveis em: http://www.4shared.com/account/dir/som0Q_e5/_online.html?rnd=6#dir=141965061
DIA 2 (manhã). Grupo de seminários. Exercício físico, neurotrofinas e neurogênese.
DIA 2 (tarde). Grupo de seminários. Exercício físico e estresse oxidativo no SNC.
DIA 3 (manha). Grupo de seminários. Exercício físico e doenças neurodegenerativas.
DIA 3 (tarde). Apresentação (escrita e oral) de Relatório (opinião) corrigido (R1, pares de alunos).
DIA 4. Entrega DVD com conteúdo disciplina + relatórios corrigidos (R2).

BIBLIOGRAFIA RECOMENDADA & LINKS DE INTERESSE:

1. Adlard, P. A., V. M. Perreau, et al. (2005). "Voluntary exercise decreases amyloid load in a transgenic model of Alzheimer's disease." J Neurosci 25(17): 4217-4221.
2. Aguiar, A. S., Jr., G. Boemer, et al. (2010). "High-intensity physical exercise disrupts implicit memory in mice: involvement of the striatal glutathione antioxidant system and intracellular signaling." Neuroscience 171(4): 1216-1227.
3. Aguiar, A. S., Jr., A. A. Castro, et al. (2011). "Short bouts of mild-intensity physical exercise improve spatial learning and memory in aging rats: Involvement of hippocampal plasticity via AKT, CREB and BDNF signaling." Mech Ageing Dev.
4. Carro, E., J. L. Trejo, et al. (2001). "Circulating insulin-like growth factor I mediates the protective effects of physical exercise against brain insults of different etiology and anatomy." J Neurosci 21(15): 5678-5684.
5. Clark, P. J., W. J. Brzezinska, et al. (2008). "Intact neurogenesis is required for benefits of exercise on spatial memory but not motor performance or contextual fear conditioning in C57BL/6J mice." Neuroscience 155(4): 1048-1058.
6. Fabel, K., B. Tam, et al. (2003). "VEGF is necessary for exercise-induced adult hippocampal neurogenesis." Eur J Neurosci 18(10): 2803-2812.
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factor plasticity by engaging mechanisms of epigenetic regulation." Eur J Neurosci 33(3): 383-390.
8. Meshi, D., M. R. Drew, et al. (2006). "Hippocampal neurogenesis is not required for behavioral effects of environmental enrichment." Nat Neurosci 9(6): 729-731.
9. Miyai, I., Y. Fujimoto, et al. (2000). "Treadmill training with body weight support: its effect on Parkinson's disease." Arch Phys Med Rehabil 81(7): 849-852.
10. Neeper, S. A., F. Gomez-Pinilla, et al. (1996). "Physical activity increases mRNA for brainderived
neurotrophic factor and nerve growth factor in rat brain." Brain Res 726(1-2): 49-56.
11. Pereira, A. C., D. E. Huddleston, et al. (2007). "An in vivo correlate of exercise-induced neurogenesis in the adult dentate gyrus." Proc Natl Acad Sci U S A 104(13): 5638-5643.
12. Petzinger, G. M., B. E. Fisher, et al. (2010). "Enhancing neuroplasticity in the basal ganglia: the role of exercise in Parkinson's disease." Mov Disord 25 Suppl 1: S141-145.
13. Petzinger, G. M., J. P. Walsh, et al. (2007). "Effects of treadmill exercise on dopaminergic transmission in the 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine-lesioned mouse model of basal ganglia injury." J Neurosci 27(20): 5291-5300.
14. Radak, Z., T. Kaneko, et al. (2001). "Regular exercise improves cognitive function and decreases oxidative damage in rat brain." Neurochem Int 38(1): 17-23.
15. Radak, Z., A. Toldy, et al. (2006). "The effects of training and detraining on memory, neurotrophins and oxidative stress markers in rat brain." Neurochem Int 49(4): 387-392.
16. Ristow, M., K. Zarse, et al. (2009). "Antioxidants prevent health-promoting effects of physical exercise in humans." Proc Natl Acad Sci U S A 106(21): 8665-8670.
17. Ruscheweyh, R., C. Willemer, et al. (2009). "Physical activity and memory functions: An interventional study." Neurobiol Aging.
18. Russo-Neustadt, A. A., R. C. Beard, et al. (2000). "Physical activity and antidepressant treatment potentiate the expression of specific brain-derived neurotrophic factor transcripts in the rat hippocampus." Neuroscience 101(2): 305-312.
19. Schmidt-Hieber, C., P. Jonas, et al. (2004). "Enhanced synaptic plasticity in newly generated granule cells of the adult hippocampus." Nature 429(6988): 184-187.
20. Teixeira, A. M., P. Reckziegel, et al. (2009). "Intense exercise potentiates oxidative stress in striatum of reserpine-treated animals." Pharmacol Biochem Behav 92(2): 231-235.
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22. Tillerson, J. L., W. M. Caudle, et al. (2003). "Exercise induces behavioral recovery and attenuates neurochemical deficits in rodent models of Parkinson's disease." Neuroscience 119(3): 899-911.
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26. Vucckovic, M. G., Q. Li, et al. (2010). "Exercise elevates dopamine D2 receptor in a mouse model of Parkinson's disease: in vivo imaging with [(1)F]fallypride." Mov Disord 25(16): 2777-2784.