



Stereological evidence of CA3 pyramidal cells degeneration and cognitive decline following short term bilateral adrenalectomy in Wistar rats

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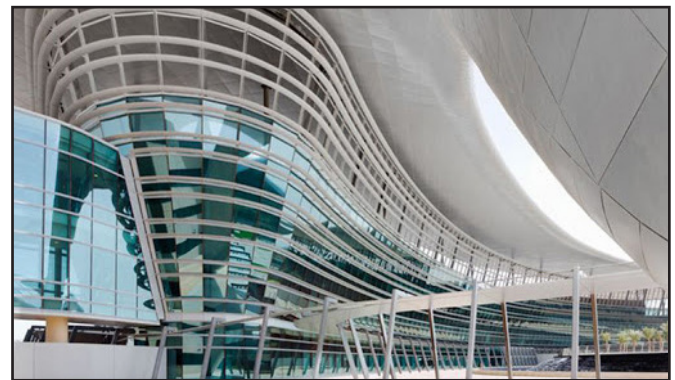
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Abstract:

The development of animal models to study cell death in the brain is a delicate task. One of the models that have been discovered in the late eighties is the induction of neurodegeneration through glucocorticoids withdrawal by adrenalectomy in Wistar rats. Such model is one of the few noninvasive models to study neurodegeneration. In the adrenalectomy models, the withdrawal of glucocorticoids through the removal of the adrenal glands leads to a massive granule cell death in the rat's hippocampus following short and long term adrenalectomy.

In the current study we aimed to investigate the impact of the absence of glucocorticoids (0.5, 2, 4, 12 hours, and 1, 3, 7, 14 days) on different hippocampal pyramidal neuronal populations in Wistar rats. In addition, the underlying mechanism(s) of degeneration in these neurons was investigated by measuring the levels of two important growth factors in the hippocampus, Insulin growth factor-1 (IGF-1) and β -nerve growth factor (β -NGF). Moreover, we studied whether the biochemical and histological changes in the hippocampus, after short-term, adrenalectomy have an impact on the behavior of Wistar rats.

The stereological counting in different areas of the hippocampus post adrenalectomy revealed neuronal death in the dentate gyrus (DG) but it did not reach a statistical significance on the third day in the hippocampus of adrenalectomized (ADX) rats compared the sham operated. Seven days later, in addition to the significant progress of the cell death in the DG, we observed a significant degeneration of CA3 pyramidal cells in ADX rats compared to the sham operated. Moreover, 14 days postoperatively our results showed a considerable amount of cell death all over the DG and pyramidal cells of CA3 of the hippocampus of ADX rats compared to sham operated. No significant changes were observed in the number of CA2 and CA1 neurons.



Biography:

He has a bachelor degree in biochemistry from of El Haj-Lakhdar University, Batna, Algeria in 2006. He moved to university of Constantine-1 between 2006-2009 where he obtained his Master degree in in molecular and cellular toxicology. He got his PhD from the same university. He joined college of medicine and health sciences for seven years, UAE University, UAE. He taught as an adjunct faculty at New York institute of technology. Abu Dhabi. Since 2019 as assistant professor, he joined Life and Environmental Sciences Department. College of Natural and Health Sciences. Abu Dhabi campus. Zayed university. His main research is investigating inflammation at the hippocampus

Publication of speakers

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