ALTERNATIVE PATHWAY OF THE RENIN-ANGIOTENSIN SYSTEM IN MICE HIPPOCAMPUS

Sgarbi, P.H.; Pereira, G.L.; Faria, J.H.F.; Moraes, G.O.I.; Pereira, M.G.A.G.

1 Department of Biochemistry, Institute of Biomedical Science, Federal University of Alfenas, Minas Gerais, Brazil.

The renin-angiotensin system (RAS) is classically involved in blood pressure regulation and water-electrolyte balance. More recently, brain RAS has been associated with other physiological events, such as learning and memory, and also with pathological situations such as Alzheimer’s disease and epilepsy. In all these cases, the hippocampus is the main focus to understanding the biological process and/or pathogenesis. The angiotensin converting-enzyme (ACE), AT1 and AT2 receptor represents the classical Angiotensina II signaling pathway. Nevertheless, alternative pathways have been described in the literature. In the previous studies, our group showed that angiotensin (1-7) [Ang-(1-7)] is the main metabolite of angiotensin I (AngI) in normal and epileptic rat hippocampi. In this study, we analyzed the peptide profile of RAS components in mice hippocampi. The hippocampus (Swiss mice) was removed and then frozen. The proteolytic activities of the hippocampus toward AngI were investigated by determining the HPLC profiles of angiotensin fragments generated. All experiments were conducted in accordance with the local Animal Care and Use Committee (protocol number 23087.002184/2014-49). Our preliminary results demonstrate that in mice hippocampi, as well as rats, the main peptide formed using AngI as substrate is Ang-(1-7). To evaluate the possible enzymatic activities involved in the Ang (1-7) formation we are using specific RAS inhibitors. This preliminary results demonstrated that the hippocampal RAS has the same alternative pathway in different models. Furthermore, these data support a potential new application for centrally acting drugs that target RAS.

Acknowledgements: CNPq, Profa. Dra. Maisa R. P. L. Brigagão and Prof. Dr. Eduardo Brandt Oliveira. Keywords: renin-angiotensin system, hippocampus, Ang-(1-7).