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BSc Biochemistry, University of Vila Real, 2008
MSc of Cell and Molecular Biology, University of
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Current Position

PhD student at the University of Leuven, since 2010

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Keywords

BACE1 – Axonal Guidance – Alzheimer's Disease – Secretases – Biomarkers

Science

BACE1 is the rate limiting enzyme in the generation of A β and therefore it is a very attractive drug target for the therapy of Alzheimer's disease. Although BACE1 knockout mice lack brain A β , they display a complex phenotype suggesting a role of BACE1 in processing of other substrates besides APP. Recently we identified a list of novel BACE1 substrates in primary neurons and validated L1 and CHL1 *in vitro* and *in vivo*. Currently we want to understand the functional relevance of BACE1 for the thalamocortical phenotypes observed in CHL1 KO mice. To address this issue we are studying the misguidance of the thalamocortical axons by anterograde and retrograde axonal tracing in BACE1 KO mice and the functional relevance of BACE1 on the Sema3A-induced growth cone collapse.

In parallel with this main topic of research, I have developed a highly specific and sensitive BACE1 ELISA, which allows measuring accurately BACE1 levels in human samples. We found that BACE1 levels in CSF of AD patients and other neurological disorder (OND) patients are slightly increased when compared to those of a non-neurological disorder control group (NND). BACE1 levels in CSF were well correlated with total-tau and hyperphosphorylated tau levels in the CSF, suggesting that the recorded alterations in BACE1 levels correlate with cell death and neurodegeneration.

Fellowships

FCT (Fundação para a Ciência e Tecnologia) PhD scholarship, Portugal 2011-2015

Publications

Barao S, Zhou L, Adamczuk K, Vanhoutvin T, Leuven Fv, Demedts D, Vijverman AC, Bossuyt X, Vandenberghe R, De Strooper B. (2013) *BACE1 levels correlate with phospho-tau levels in human cerebrospinal fluid* Curr Alzheimer Res.10(7): 671-8.

Zhou L, **Barão S**, Laga M, Bockstael K, Borgers M, Gijssen H, Annaert W, Moechars D, Mercken M, Gevaert K, De Strooper B. (2012) *The neural cell adhesion molecules L1 and CHL1 are cleaved by BACE1 protease in vivo* J Biol Chem. 287(31):25927-40