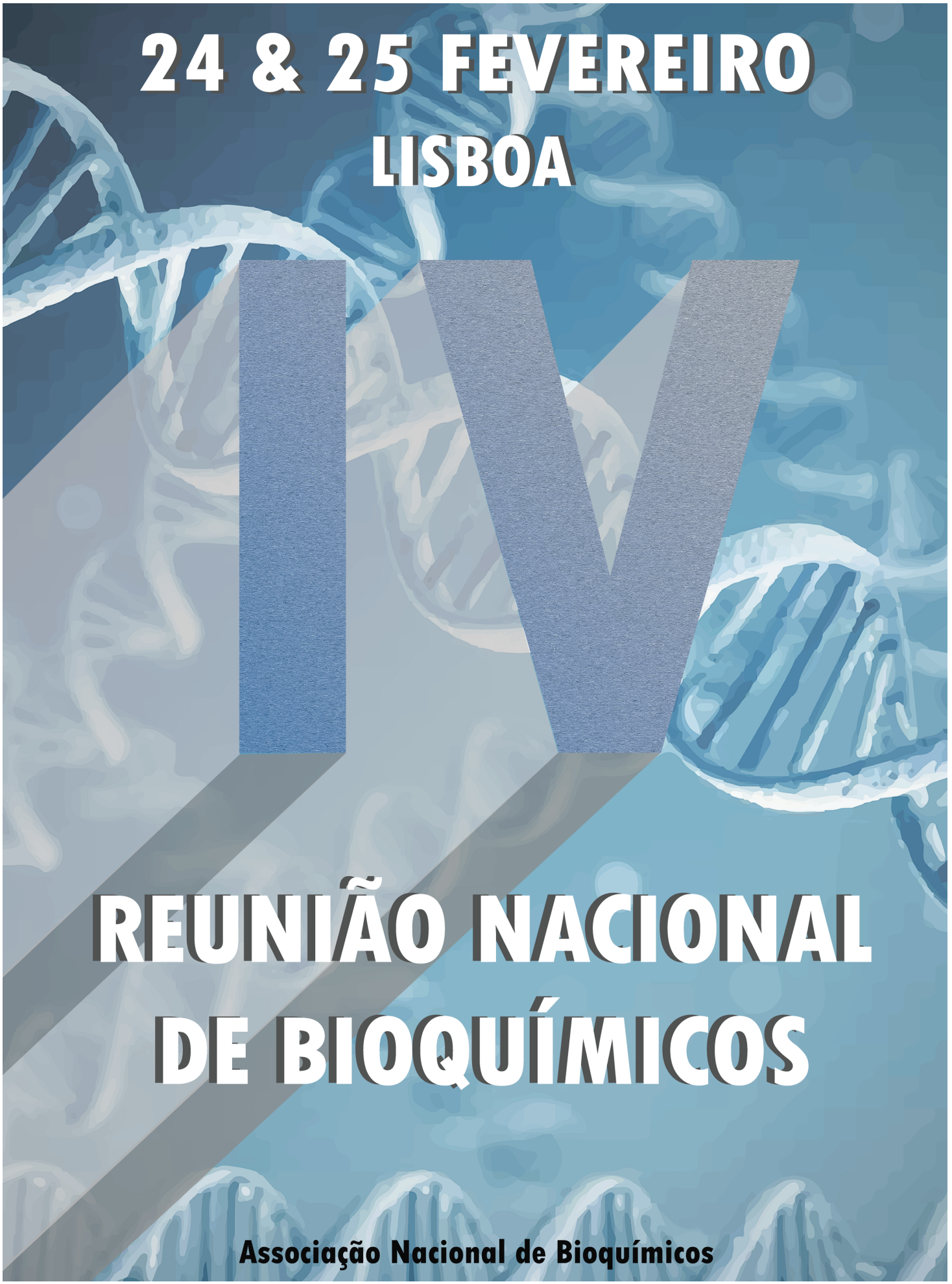
24 & 25 FEVEREIRO
LISBOA
IV
REUNIÃO NACIONAL
DE BIOQUÍMICOS
Associação Nacional de Bioquímicos

IV Reunião Nacional de Bioquímicos Short Talks

A Reunião Nacional de Bioquímicos é uma conferência promovida pela Associação Nacional de Bioquímicos de dois em dois anos. Nela, os participantes têm a possibilidade de participar em diversos workshops que contribuem para a sua formação bem como assistir a apresentações e debates que envolvem temáticas atuais.

As short talks são uma iniciativa que ocorre pela primeira vez na quarta edição desta conferência. Aqui, os participantes têm a oportunidade de realizar uma apresentação oral sobre a sua área de investigação e resultados obtidos perante um júri.

Neste livro encontram-se as autobiografias de cada participante e respetivos *abstracts* das suas apresentações.

Carla Henriques

Carla Henriques finished her BSc in Biochemistry in 2015, followed by her MSc in Biomedical Research in the branch of Neurobiology in 2017, both at University of Coimbra. Her master thesis was focused on the morphometric characterization of microglia, the brain immune resident cells. These cells have been implicated in mood disorders, thus she correlated morphological features with anxiety, in a gender-specific manner. Carla is now starting her PhD in Integrative Biology and Biomedicine at Instituto Gulbenkian de Ciência.

Gender-specific organizational and activational effects of adenosine A2A receptor in microglia morphology in the prefrontal cortex

Carla Henriques[1,2], Miguel Mateus-Pinheiro[1,2], Rita Gaspar[1,2], Joana Mendes Duarte[1,2], Helena Pinheiro[1,2], Carlos A. Fontes Ribeiro[1,2,3,4], Rodrigo A. Cunha[2,3,5], António F. Ambrósio[1,2,3,4], Catarina A. Gomes[1,2,3,4]

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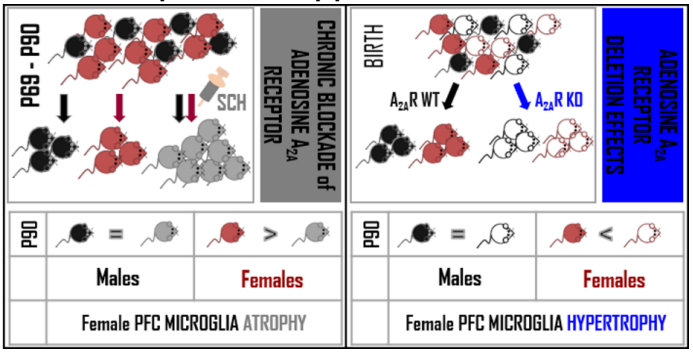
Microglia (brain immune cells) have imperative functions along life, being implicated in neuropsychiatric disorders. The adenosine A2A receptors (A2AR) modulate microglia morphology, which is intimately related with their function. In the prefrontal cortex, adult females present more complex microglia than males. The chronic blockade of A2AR at adulthood promoted an atrophy in female microglia, while their genetic deletion early in development lead to a hypertrophy. Concluding, the A2AR promote opposite activational and organizational effects in a gender-specific manner.



Support: FCT (PD/BD/114116/2015 and Strategic Projects PEst UID/NEU/04539/2013), FEDER-COMPETE (POCI-01-0145-FEDER-007440), (CENTRO-01-0145-FEDER-000008: BrainHealth 2020), Research Support Office, Faculty of Medicine, University of Coimbra, Portugal), and Santander Totta.

Daniela Antunes

Daniela has a BSc and a Master's in Biochemistry (University of Coimbra). She started as a trainee in medical mycology, in a group dedicated to study infectious agents and the host response. Here, she made part of a scientific team dedicated to develop a technological project and performed her master project thesis under the supervision of Prof Teresa Gonçalves. Due to the increasing relevance of fungal infections and sensitization, her MSc work was to study the mechanisms of interaction between the different fungal cell wall components and the innate immune system.

Using cell wall nanoparticles to study *Alternaria infectoria* interaction with macrophages

Antunes D[a], Almeida MC[a], Fernandes C[a], Pina-Vaz C[d], Borges O[c], Gonçalves T[a,b]

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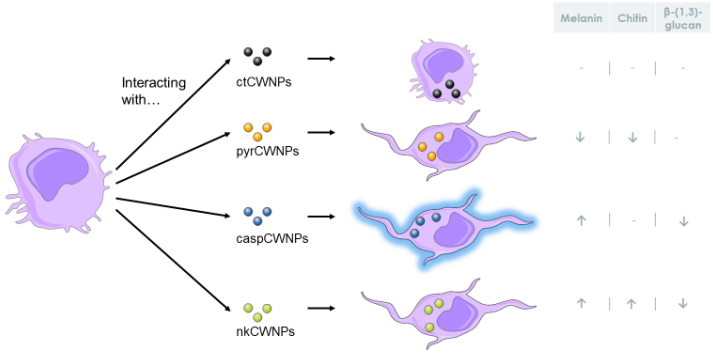
[d] FMUP – Faculty of Medicine, University of Porto, Porto, Portugal

The first fungal structures to interact with human cells are the cell wall components. We developed a model of fungal cell wall nanoparticles (CWNPs) from *Alternaria infectoria*. The components were modulated with an inhibitor of β(1,3)-glucan synthesis, caspofungin (casCWNPs); an inhibitor of chitin synthases, nikkomycin Z (nkCWNPs); and an inhibitor of DHN-melanin synthesis, pyroquilon (pyrCWNPs). When interacting with macrophages (RAW 264.7 cells) we proved that DHN-melanin and chitin are immunosuppressive, masking the inner layers containing stimulatory components.



This work was supported by FEDER funds through the Operational Programme Competitiveness Factors - COMPETE and national funds by FCT under the strategic project UID / NEU / 04539 / 2013; and also HealthyAging2020:CENTRO-01-0145-FEDER-000012 of Centro2020 and Portugal2020, European Union Funds (FEDER and COMPETE)

Daniela Costa

Graduated in Biochemistry, Daniela Costa also holds a master's degree in Cellular and Molecular Biology at the University of Coimbra. She acquired a broad laboratorial experience regarding translational neurosciences. At the Center for Neurosciences and Cell Biology, she worked in gene therapy applied to Machado Joseph's and Alzheimer's (AD) diseases and developed her dissertation about neurovascular stress and proteostasis. She published a chapter about the role of cerebrovascular endothelial cells in AD. Recently, she engaged a Michael J. Fox Foundation's project at the University of Bordeaux.

Ghrelin – a dark horse for proteostatic dysregulation in endothelial cells?

Daniela AD Costa[1,2], Ana I Plácido[1,3], Rita Carvalho[3,4], Henrique Girão[3,4] and Cláudia MF Pereira[1,3*]

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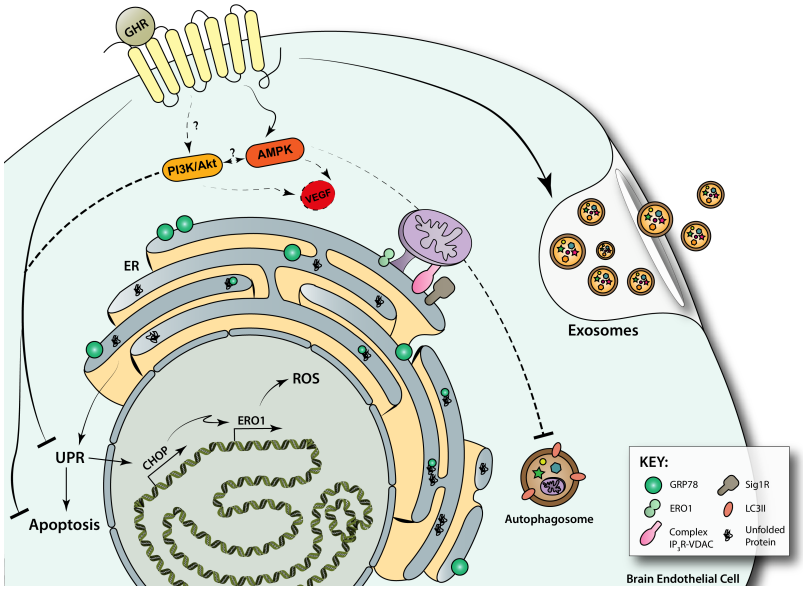
Endothelial dysfunction has been associated with accumulation of unfolded proteins within the endoplasmic reticulum (ER) and is recognized as a major promoter of neurodegenerative processes. Our work addresses the role of ghrelin (GHR) on ER stress using a brain endothelial cell line. GHR was found to modulate the ER stress response signaling and to prevent oxidative stress, macroautophagy and apoptosis in stressed brain ECs. Morphological and functional rearrangements were shown promoted by GHR, which was demonstrated to stimulate the release of exosomes. Altogether, these results acknowledge GHR as a promising therapeutic strategy for ER stress-associated brain disorders.



Keywords: Brain and cardiac endothelial cells · Proteostasis · ER Stress · Unfolded Protein Response · Ghrelin

Eurico Serrano

I completed both my Bachelor and Master's degree in Biochemistry at Faculty of Sciences and Technology of University of Coimbra. For my thesis, I worked in the lab of Professor Carmen Alpoim where I studied the role of stroma-derived cytokines in dedifferentiation of lung carcinoma cells into cancer stem cells. Currently, I have a research grant at Center for Neurosciences and Cell Biology to study mechanisms of cancer resistance to chemotherapy under supervision of Professor Carmen Alpoim.

Stroma-derived IL-6, G-CSF and Activin-A role in dedifferentiation of lung carcinoma cells into cancer stem cells

Eurico Serrano[1,2], Carlos Rodrigues[1,2] e Carmen Alpoim[1,2,3]

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Cancer stem cells (CSCs) are responsible for tumors' heterogeneity and they mediate therapy resistance, tumor relapse and metastasis. Our results show that differentiated malignant tumor cells can establish with normal stromal fibroblasts a paracrine loop mediated by IL-6, Activin-A and G-CSF which drives cellular dedifferentiation to CSCs. However, by scavenging these cytokines from the media and/or blocking exosomes' mediated communication it was possible to abrogate CSCs formation thus turning these mechanisms into potential therapeutic targets in cancer therapy.

Fábio Leite

Fábio Leite is a bachelor in Biochemistry from Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa (FCT/UNL). During his bachelor he worked to expand his knowledge doing internships in StabVida, YDreams, REQUIMTE/CQFB and IMM, where he did his bachelor project in "Biophysical techniques for the evaluation of the antitumor effect of biologically active peptides in human cells". Today, Fábio is on the 2nd year of his master's degree in Bioorganic Chemistry at FCT/UNL. He is also a monitor in a first-grade subject at FCT/UNL, a private tutor and President of Projeto PATA.

Synthesis and characterization of designed small protein-based scaffolds for biocatalysis

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Proteases have a broad range of applications in industry. Yet, due to the size of the proteins and their stability, these processes are still expensive. Therefore, it is of great interest to have proteins of reduced size that could mimic their functions.

This work focusses on the synthesis and characterization of two computational designed small proteins containing a zinc site with potential protease activity. Their apparent zinc dissociation constant was determined by circular dichroism spectroscopy at different pH values. Currently, their activity is being explored using 4-nPA as a model substrate.

Fábio Sousa

Fábio has a BSc in Biochemistry and a MSc in Cellular and Molecular Biology (University of Coimbra). He performed his MSc Thesis in the Retinal Dysfunction and Neuroinflammation Lab under supervision of Doctor Filipa Baptista. His MSc project aimed to evaluate the impact of maternal diabetes on offspring's development and memory, as well as understanding the underlying cellular and molecular mechanisms in the hippocampus.

Maternal diabetes impairs the offspring development and short-term memory

Fábio J. Sousa[1,2], Raquel G. Correia[1,2], Catarina A. Gomes[1,2,3], António F. Ambrósio[1,2,3], Filipa I. Baptista[1,2]

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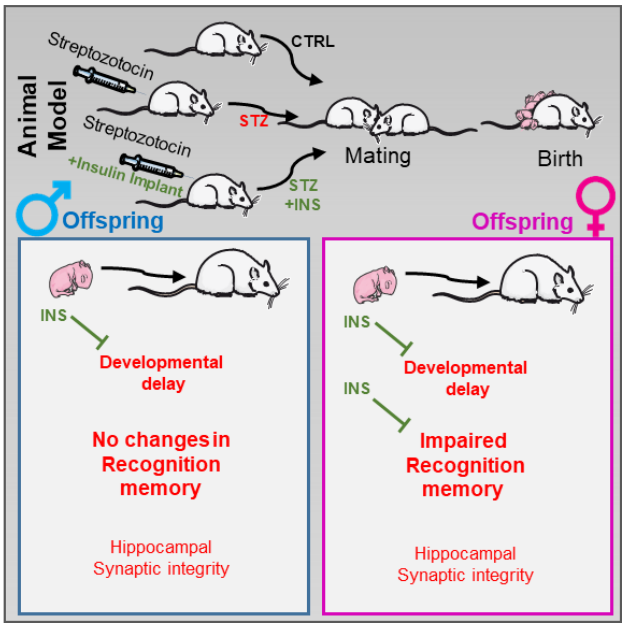
Diabetes during pregnancy has been associated with an increased risk of neurodevelopmental disorders and cognitive impairments in the offspring. We showed a developmental delay in the offspring of diabetic dams, which was prevented by insulin administration to mothers. Remarkably, memory was impaired in female offspring, but not in males. These behavioural changes were paralleled with hippocampal synaptic integrity preservation. Further studies are needed to assess functional and molecular changes underlying the deleterious effects of maternal diabetes on the offspring.



This work was supported by Foundation for Science and Technology (SFRH/BPD/86830/2012; PEst UID/NEU/04539/2013), COMPETE-FEDER (POCI-01-0145-FEDER-007440), and Centro 2020 Regional Operational Programme (CENTRO-01-0145-FEDER-000008: BrainHealth 2020; CENTRO-01-0145-FEDER-000012: HealthyAging 2020).

Inês Tavares

Inês Moura Tavares, Msc, Laboratório de Citonegética e Genómica da Faculdade de Ciências e Tecnologia da Universidade de Coimbra

I detain a Bachelor and Master's degree in Biochemistry from Faculty of Sciences and Technology of University of Coimbra. My Bachelor included an internship that I did at Cytogenetic and Genomics Laboratory of Faculty of Medicine of University of Coimbra. Here, I gained an interest in genetics and subsequently developed my Master thesis where I studied the genetic profile of Cholangiocarcinoma. Currently I have a been awarded a scholarship from Liga Portuguesa Contra o Cancro to continue this project.

Genomic and epigenetic profile of Cholangiocarcinoma

Tavares I[1], Ribeiro IP[1,2], Martins R[2,3,4], Abrantes M[2,3], Botelho F[2,3], Tralhão JG[2,3,4], Melo JB[1,2,5], Carreira IM[1,2,5]

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[5]CNC-IBILI – Group of Aging and Brain Diseases: Advanced Diagnosis and Biomarkers, Coimbra, Portugal;

This study aims to characterize intrahepatic and extrahepatic cholangiocarcinomas through genomic and epigenetic approaches. Copy number alterations were frequently observed in chromosomes 2, 3, 6, 11, 12, 14, 16, 18 and Y where are several genes related to carcinogenesis, CHFR, GSTP1, PYCARD, TP53, BRCA1, STK11 and GATA5. Methylation in MSH6, ESR1, PAX5, KLLN, PAX6, WT1, GSTP1, CDH13 and GATA5 genes were also found. These results are important to better characterize this neoplasm and to design novel study approaches to identify potential genetic and epigenetic biomarkers.

Mariana Santos Vidal Tomás

Cytogenetic and Genomics Laboratory, Faculty of Medicine, University of Coimbra

I detain a master's degree in Cellular and Molecular Biology and a bachelor's degree in Biochemistry, both obtained at Faculty of Sciences and Technology of University of Coimbra. Following my strong interest in human genetics, I have developed my master's thesis at the Cytogenetic and Genomics Laboratory, University of Coimbra, under the supervision of Professor Isabel Carreira regarding the evaluation of copy number variations in Retinal Angiomatous Proliferation. Currently I hold a research grant at the same laboratory in order to further develop my project.

Molecular screening of Retinal Angiomatous Proliferation and Typical exudative AMD using MLPA: an attempt to genotype the phenotype

Tomás M[1], Pires LM[1,2], Esteves L[1], Val M[1,2], Marques JP[3,4], Marques M[3], Laíns I[2,5,6], Silva R[2,3,5], Carreira IM[1,2,7,8]

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Retinal angiomatous proliferation (RAP) is an aggressive subtype of exudative age-related macular degeneration (AMD), characterized by the abnormal growth of capillaries beginning within the retina. This project aims to evaluate genetic alterations within some of the genes most commonly associated with AMD such as: *CFH, CFHR3*, *CFHR1* and *ARMS2*. Of all analysed genes, A69S SNP in *ARMS2* was the one that established the best genetic distinction between controls and patients.

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