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News

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Five more European Research Council grants for researchers in Portugal

Cell division, antimicrobial resistant bacteria, control of coordinated movement and the development of the thymus. These are the research interests of the latest five “Portuguese” winners of prestigious **European Research Council** (ERC) starting grants.

Nuno Alves and Ana Carvalho (both at the IBMC – **Instituto de Biologia Molecular e Celular**), Ana Cecília Roque (**UCiBio@REQUIMTE** at Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa), Raquel Oliveira (**Instituto Gulbenkian de Ciência**) and Megan Carey (**Champalimaud Foundation**) will each receive grants of around €1.5 million, for five years, to develop the proposals that they successfully put forward to the very challenging ERC review boards.

These five scientists have set out to address some of the greatest challenges in their respective fields. Their results hold the potential to bring major advances in understanding health and disease, including infectious diseases, cancer, autoimmunity and neurological movement disorders.

Ana Carvalho and Raquel Oliveira are both interested in unraveling the intricate and highly regulated processes that take place when a cell divides, during mitosis. Raquel will explore recent evidence that suggests that chromosomes are not mere passive bystanders, but rather play a more active role in their separation and in influencing the surveillance mechanisms that control the process of cell division. She will investigate how abnormal chromosome structure may lead to errors in mitosis and how these impact on the development of an organism (the mighty fruit fly, her chosen model organism). Ana Carvalho’s research focuses on the final stages of cell division, after chromosomes have segregated, and a contractile ring forms to divide the cytoplasm of the mother cell into two new daughter cells, each with its own set of chromosomes.

Nuno Alves’ organ of choice is the thymus, where T-cells of the immune system are generated and mature. T-cells fight off pathogens and yet are tolerant to self. It is within microenvironments of the thymus, lined by thymic epithelial cells, that T-cells mature and are selected, so that those that recognise molecules of the body (self) are eliminated and only the pathogen-recognising T-cells remain. When these processes go awry, immunodeficiency and autoimmunity may occur. Nuno’s goal is to study these microenvironments, specifically the nature and regulation of the progenitors of the thymic epithelial cells (TEC). By understanding the molecular and cellular processes that control the renewal of these progenitor cells and their effect on the differentiation of different types of T-cells, it may be possible to modulate these processes, with major advances in health sciences.

To develop tools for rapid identification of antimicrobial resistant bacteria, a global threat that is spreading at an alarming pace, is the challenge taken up by Ana Cecília Roque. Her approach is based on a new field in diagnostics, based on the detection of

microbial volatile metabolites, using nose sensors. Her group recently discovered a new class of stimulus-responsive gels which show great potential to advance the field of odour detection. Ultimately, her research may lead to the quick identification of pathogenic bacteria, including those with acquired antimicrobial-resistances, with great impact on disease control.

Megan Carey is the only non-Portuguese in the group, although she has been at the Champalimaud Neuroscience Programme for several years now. With her ERC Starting Grant, Megan will continue her research into the functioning of the cerebellum and, specifically, into understanding which neural circuits in the cerebellum contribute to coordinated locomotion. She expects her results to establish causal relationships between the activities of neural circuits and coordinated motor control, which could open up new avenues for understanding controlled movement in health and disease.

These five ERC Grantees join 36 others that, between 2007 and 2013, obtained Starting, Advanced and Consolidator Grants to carry out research in Portugal.

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