

**EUROPEAN SOCIETY OF ENDODONTOLOGY ANNUAL RESEARCH GRANT
2012**

Every year the ESE offers the chance for researchers to apply for up to 20000 Euros to help fund a research project. Information about ESE Research grants can be found at:

<http://www.e-s-e.eu/research/index.html>

Information about those who have won the prize in previous years and the publications from the research can be found at:

<http://www.e-s-e.eu/research/annual-research-grant-past-awards.html>

All applications are reviewed by the Research committee and this year an award of 10000 Euros has been made to each of 2 projects:

The pivotal role of complement activation in pulp progenitor cell migration after pulp injury and therapeutic application of pulp capping materials

Imad About

AND

Analysis of the ability of histone deacetylase inhibitors (HDACi) to solubilise bio-active dentine matrix proteins for promotion of tissue repair mechanisms

Henry Duncan

A description of the projects funded and information about the winners can be found below

The pivotal role of complement activation in pulp progenitor cell migration after pulp injury and therapeutic application of pulp capping materials

Imad About



PROJECT ABSTRACT

The complement activation is among the most powerful cascades in the plasma. It has long been recognized that after infection or tissue damage and inflammation, it immediately provides the required signals for homeostasis and the subsequent tissue healing. The complement can be activated mainly by an infectious agent but also by traumatic injuries or after a contact of the complement proteins with biomaterials such as polymers, metals, or ceramics. This activation leads to the production of potent and biologically active components mainly involved in the vasodilatation of blood vessels and the subsequent recruitment of leucocytes to the inflammatory site. However, recent works have demonstrated that in addition to the immune cells, several non-immune cell types (endothelial cells, astrocytes, cells from intestine, skin, heart...) as well as human mesenchymal stem cells express the complement fragments receptors.

This project is designed to investigate the interactions between the complement fragments and pulp progenitor cells and particularly the possible involvement of the complement activation in the efficient and quick recruitment of pulp progenitor cells to the injury site. This will be done under normal conditions and after applying pulp capping materials.

The work would report on a previously unexplored and efficient mechanism by which pulp progenitor cells migrate to the injury site to regenerate dentin. The involvement of pulp capping materials in the complement activation would provide an additional explanation to the efficient dentin bridge synthesis after some pulp capping treatments and might pave the way for the development of more efficient future pulp capping materials.

Imad About

Professor Imad About was born in Nablus, Palestine in 1962. He obtained a BSc in biology in 1984 from an-Najah National University, Nablus, Palestine; a Master's Degree of Biochemistry in 1987 and a PhD of Biochemistry in 1992 from the University of Aix-Marseille III, Marseille, France. After a post doctorate in at the National Institute of Health and Medical Research, Marseille, France, Imad ABOUT joined the university "la Méditerranée" as assistant professor at the faculty of dentistry of Marseille in 1996, became associate professor in 2000 and was appointed as Professor of Oral Biology in 2002 at the same university. Imad About is currently a member of the "Institut des Sciences du Mouvement CNRS & Université d'Aix-Marseille" and Director of IMEB Research Laboratory (Interface Matrice Extracellulaire-Biomatériaux) at the faculty of dentistry, Aix-Marseille Université, Marseille, France.

Imad About research group is involved in investigating the role of progenitor and non-progenitor cells in dentin regeneration, the early steps of pulp healing and the effects of biomaterials on these events and he is involved in developing dental materials. He is one of the main academic members involved in Biodentine development which has been released in 2010.

Imad About is responsible for a Master course in Biomaterials at the faculty of medicine at Aix-Marseille Université, Marseille, France and for teaching Immunology, Biochemistry stem cells and tissue regeneration courses at the faculty of dentistry at Aix-Marseille Université, Marseille, France.

Imad About has published more than 100 peer reviewed papers, abstracts and book chapters. He is a member of the Editorial Board of leading reviews in the dental fields: Journal of dental Research, Journal of Endodontis, etc and a renowned and invited speaker in many specialized international meetings. He is frequently involved in reviewing research publications for 15 leading specialized reviews in the dental, scientific and medical fields.

Member of the scientific committee of the faculty of dentistry and member of the Université de la Méditerranée Committee of technology transfer from the research laboratories to the industrial application and acts as a national and international expert in research project funding evaluation.

Analysis of the ability of histone deacetylase inhibitors (HDACi) to solubilise bio-active dentine matrix proteins for promotion of tissue repair mechanisms

H.F. Duncan



PROJECT ABSTRACT

The clinical decision to preserve the dental pulp, or part of it, has recently been reemphasized and is particularly important if the tooth is immature and root formation is incomplete. However, vital pulp treatment is currently considered unpredictable due to, at least in part, failure of the material to control inflammation and to allow predictable new matrix deposition. Acetylation of the histone proteins in chromatin by the application of histone deacetylase inhibitors (HDACi) is associated with alterations in gene expression with associated beneficial effects on repair mechanisms including mineralization, inflammation and stem cell recruitment. Therapeutic these effects could be harnessed to augment biologically driven dental restorative materials, which subsequently have the potential to improve the predictability of the healing response at the exposure site.

Our recent studies have highlighted the potential therapeutic application of HDACi in stimulating mineralization in dental pulp cells, however, there has been no previous research into the effects of HDACi on solubilisation and release of bio-active dentine matrix components which are important in driving regenerative events.

This work could contribute to restorative dental treatment strategies by facilitating topical application of HDACi to release growth factors and other molecules with bio-active potential, which are ‘fossilised’ within the dentine matrix, thereby mediating cell behaviour and stimulating repair.

HENRY F. DUNCAN, BDS, FDS RCS, MClin Dent, MRD RCS

Lecturer/Consultant in Endodontics, Division of Restorative Dentistry and Periodontology,
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Dr Hal Duncan gained his BDS degree from the University of Glasgow in 1993. After several practice and dental school appointments, he worked in specialist endodontic practices in Ireland and England until 2002. He received his specialist endodontic training in Guy's Hospital, London 2002-06 under the tutelage of the late Professor Tom Pitt Ford. During and after his training he completed a collaborative research project with Dr Ram Nair in the University of Zurich on vital pulp treatment and MTA.

Since 2008, he has worked at Trinity College Dublin as a lecturer, consultant and lead academic in Endodontics. His time is divided between teaching, clinical treatment and research, within which he is currently undertaking an external PhD with the University of Birmingham, UK with Professors Tony Smith, Garry Fleming and Paul Cooper, investigating the regenerative effects of epigenetic modifying agents on damaged pulpal tissue in vital pulp treatment. He is the current President of the Irish Endodontic Society and an active member of the European Society of Endodontology. Dr Duncan has contributed to leading Endodontic textbooks and published several articles in several peer-reviewed international journals.