



European Society of Endodontology

Annual Research Grants 2018

The European Society of Endodontology (ESE) awards an annual research grant to support a pilot research project or to purchase equipment for research in the field of Endodontology.

Award €20,000 to Dr Sadia Ambreen Niazi



Project:

Title: Endodontic infection- mediated systemic interactions pose global cardiometabolic risk.

Summary: Root canal treatment for endodontic infection (EI) is not only time consuming and painful for the patients, but have a significant financial cost. EI are caused by microorganisms present in the root canal space of the tooth and their interactions with the immune system of host. RCT success rates have increased, but failure rates are still unacceptably high, leading to repeated RCT, surgical intervention or extraction. Recently, there has been a conceptual shift in dental practice with the realization that EI can be a high risk factor for serious conditions like cardiovascular disease, diabetes, hypertension, and skeletal infections etc. Given these facts, endodontic infections pose a major global health problem. So far, our knowledge of root canal microbial communities is lacking. Further, understanding of the impact of EI on general health is also limited. Therefore, in this proposal we will characterize and correlate the extensive endodontic microbial communities with those on dentists' gloves using state-of-the-art genetic analysis techniques. Characterizing these communities will allow for a more effective targeted treatment that will not only increase success rates of RCT but also prevent occurrence of EI, resulting in significant cost savings. Further, we will use the latest techniques to identify the presence of microbes, microbial components and host inflammatory mediators in the blood and saliva of endodontic patients, allowing us to ask specific questions about the links between endodontic infection and life threatening conditions such as cardiovascular disease. Excitingly, these studies will allow us to understand how EI trigger disease in other parts of the body, and identify health risks for the development of cardiovascular disease.

Thus, this preliminary study will add significantly to our current knowledge regarding host-microbiome interactions, and will lay the foundation for larger-scale studies leading to validation of endodontic biomarkers of cardiovascular disease and a revised approach to prevention and treatment that will have a significant impact on the general health of the global population.

Dr Sadia Ambreen Niazi

I am an academic clinician with a special research interest in Endodontic Microbiome and Host immune response. I completed my PhD in Endodontics from King's College London in 2011. I have established a research programme in Endodontics Microbiology, centred on the characterization and control of "Endodontic Biofilms". My work has contributed towards conceptual and technical advancements in Endodontics. I have pioneered the development of a nutrient-stressed multi-species *in vitro* endodontic biofilm model, which has been widely used to investigate the antibacterial and disrupting efficacy of various endodontic chemo-mechanical agents. My microbiology research contributions have been integral in the invention of the "SafeRoot device" at KCL, which is now being used in a clinical trial to detect remaining bacteria at the end of RCT to improve its success rate. Furthermore, utilizing my extensive experience in gene sequencing, I have profiled the cultivable microbiota of endodontic biofilms and made a significant breakthrough in confirming *P. acnes* and *S. epidermidis* as nosocomial endodontic pathogens and contaminated gloves are the potential source of these nosocomial infections leading to root canal failure. My background knowledge in the basic science of endodontic biofilms and my clinical involvement, gives me a uniquely strong position in clinical and translational research. I am now extending my research to investigate the systemic interactions of EI leading to cardiometabolic risks.

I am an Academic Clinical Fellow (Endodontics) at Guy's and St Thomas' NHS Foundation Trust, London, UK. Along with leading my research work, I divide my time between managing and treating patients at the Postgraduate unit at Guys Dental Hospital and King's College Hospital and teaching undergraduate/postgraduate dental students at King's College London. I have supervised over 20 Masters and PhD research projects related to endodontic microbiology and dental materials. I have co-authored 13 high quality peer-reviewed publications and have written book chapters. My contributions in this field are recognized by invitations as speaker at conferences/meetings/other institutions both nationally and internationally and peer review articles for scientific journals. I regularly collaborate within KCL and other leading research institutes in the UK, Europe and Asia.

Award €20,000 to Roda Seseogullari Dirihan



Project:

Title: Optimization of Dentine-Pulp Regeneration by Using a Smart Multilayer Scaffold

Summary: Design smart system using optimize cell – scaffold microenvironment towards basic scientific discovery and high-quality tooth tissue regeneration as an application of regenerative endodontic therapy. This project will involve biomimetic nanofibrous scaffolds in both injectable and implantable forms,

controlled release systems for multiple growth and differentiation factors, and various stem cells developed for optimal tooth tissue regeneration using both implantable and injectable nanofibrous scaffolds with self-assembling and phase separation technologies. These scaffold and delivery systems have shown remarkable capacity in controlling stem cell differentiation and tooth tissue regeneration, aiming to regenerate clinical useful tooth tissue to treat dental patients in the long-term on the broad topics of smart scaffolds, stem cells and tooth regeneration, and specifically on the “Optimization of Dentin/Pulp Regeneration by Using a Smart Multilayer Scaffold.”

Roda Seseogullari Dirihan

Roda Seseogullari-Dirihan is a dentist and specialist in prosthodontics. She obtained the PhD degree in Department of Cariology and Restorative Dentistry, University of Turku in 2016. Her current portfolio includes high level lab skills, teaching and research experience with over 20 peer review academic publications (H-index of 7), about 50 proceeding papers, international collaborations, co-leading number of projects. She is the winner of the most prestigious awards in dentistry (‘NOF Hatton Award 2013’ from International Association of Dental Research and ‘Paffenbarger Award 2014’ from Academy of Dental Materials). During her PhD, she has contributed to teaching in variety of courses, mentorship/co-supervision for several projects of PhD candidates, visiting researchers, undergraduate students in the university. During her PhD, she published more than 10 peer-review journal articles, around 40 proceeding papers in international meetings and has a role in 18 research projects apart from her own research project. The researcher has a reviewer role in high impact journals in dentistry such as Journal of Dental Research, Dental Materials, Archives of Oral Biology, Caries Research, Journal of Adhesive Dentistry. Beside being an active member of Adhesive Dentistry Research Group as a postdoc researcher, she is Ambassador of Continental European Division of International Association of Dental Research and has also international as well as national scientific association memberships (Finnish Dental Society, Academy of Dental Materials, International Association of Dental Research Continental European Division and Scandinavian Division). Currently, she has teaching responsibility for Dental Morphology, Cariology and Endodontics courses in Department of Cariology and Restorative Dentistry at University of Turku which are closely relevant to her research.