CIDR

CENTER FOR INNOVATIVE DENTAL RESEARCH

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The aim of Centre of Innovative Dental Research is to conduct qualitative and quantitative study related to dentistry. This center also conducts case based studies and clinical trials on dental biomaterials. The objective of this research group is to provide an opportunity for faculty to actively engage in research and produce publications that can improve the quality of oral health care in Pakistan. This clinical discipline of dentistry at Bahria University is particularly involved in managing the patients and conducting data's for publications. Restorative research group covers a diverse range of interdisciplinary areas and has strong links with patient benefit. The goal of our research is to develop an informed opinion on a topic. This goal is only achieved when we have carefully and widely read what others have written on our topic; analyzed, compared and evaluated those ideas; and come up with our own conclusions.

KEY RESEARCH AREAS:

- Oral cancer
- Pre-cancerous lesions and conditions
- Biomaterials for hard tissue regeneration
- Development of novel dental adhesives
- Oral mucosal lesions
- Lateral cephalometry
- Salivary Proteins analysis in
- Conservative dentistry, Material used in clinical dentistry
- Clinical trials in vivo and vitro for materials used in dentistry.
- OHRQoL, and condylar resorptions

CLINICAL SERVICES

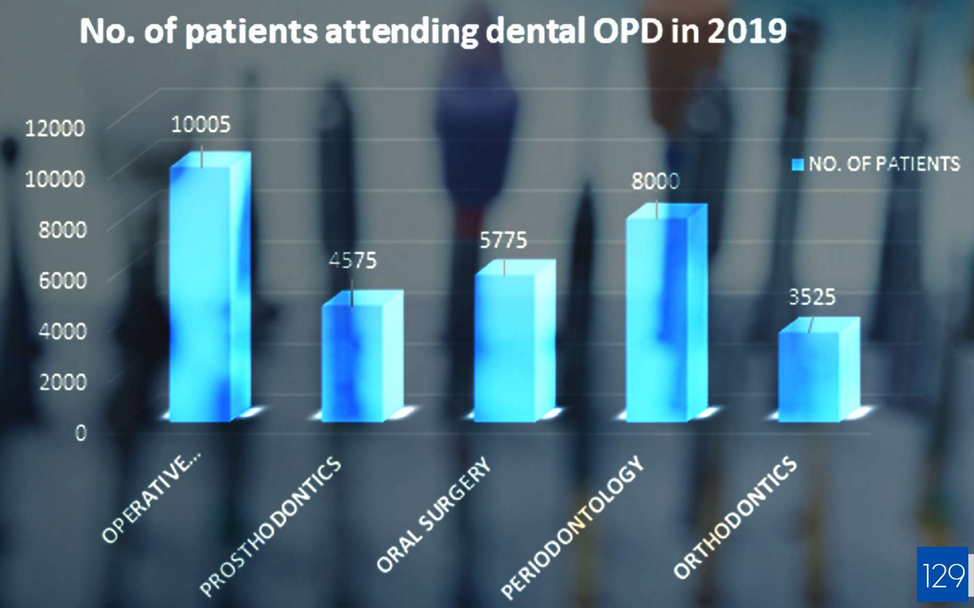
At Bahria University Dental College we aim to provide high quality dental health services. Our team comprises of highly trained specialist and dental health professionals capable of delivering services of high quality. Under the supervision of senior faculty, dental students and residents (dentists in training) tend to provide high-quality treatment at reduced costs. With the latest technologies and modern dental materials we provide comprehensive oral health services with a strong focus on specialized treatment requirements. Services offered include:

DENTAL DIAGNOSTIC SERVICES:

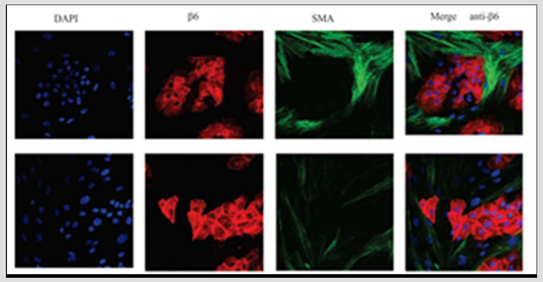
- Periapical, bite wing and Occlusal x-rays, OPG and intra oral biopsy services for cancer patients.
- Smear, Elisa and PCR services
- Oral cancer screening

CLINICAL DENTAL SERVICES:

- All dental procedures such as filling, crown and bridge work, orthodontic appliance and full mouth rehabilitation, denture work and major and minor surgical procedures.

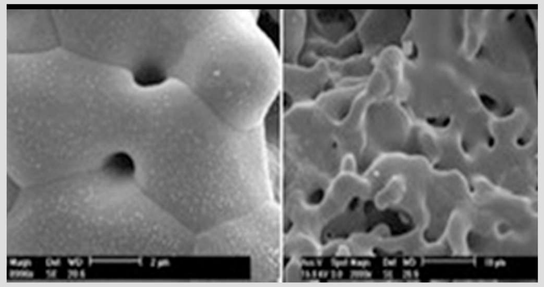


RESEARCH PORTFOLIO



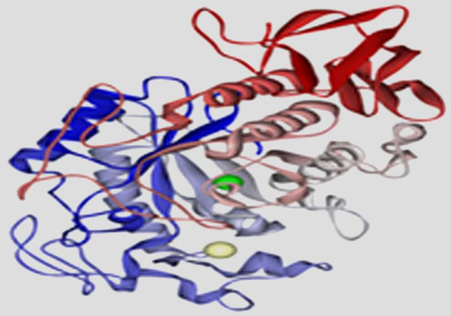
Integrin αvβ6 Promotes TGF-β 1-dependent Myofibroblastic Transdifferentiation in Oral Submucous Fibrosis

Oral submucous fibrosis (OSF) is a chronic progressive fibrosing disorder of the oral cavity. Commonly in fibrosis, TGF-β1 promotes the transdifferentiation of fibroblasts into α-smooth muscle actin (SMA)-secreting myofibroblasts. Integrin αvβ6 is not detectable on normal oral keratinocytes but is upregulated during tissue remodelling. αvβ6 is a key activator of TGF-β1 through its interaction with its latency associated peptide. The objective of this study was to investigate the role of αvβ6 integrin in the pathogenesis of OSF. The αvβ6 expression was examined in 41 OSF cases compared with 14 cases of fibroepithelial hyperplasia by immunohistochemistry. TGF-β1 activation assays were carried out using a keratinocyte cell line expressing high levels of αvβ6 (VB6). VB6 cells were co-cultured with HFFF2 fibrblasts and SMA expression examined by Western blotting and confocal microscopy. The αvβ6 was highly expressed in 54% of OSF cases. αvβ6 activated TGF-β1, which was significantly reduced by antibody blockade. Co-culture experiments revealed markedly increased SMA expression by fibroblasts, indicating myofibroblast transdifferentiation, which was αvβ6-dependent. In vitro findings were confirmed by immunochemistry, which demonstrated SMA-. pSmad2 and Smad4-positive myofibroblasts in OSF connective tissue. Finally, treating oral keratinocytes with the areca nut alkaloid arecoline upregulated αvβ6 expression..



Novel Bioactive Scaffolds for Craniofacial Bone Regeneration

Bone regeneration has gained attention for the past decades in the field of tissue engineering. While constant research on the materials applied in this field sometimes it is necessary to evaluate the technique of fabrication and different process involved in characterization. The current day research focus upon such materials which requires less time and are more efficient and biocompatible with the human biological system. The designing of scaffold for bone repair it is a challenge to compete with the controlled porosity of the scaffold over the bone and to have maximum success in the scaffold, it must have adequate size porosity and evenly distributed pores. Current study is based on the fabrication of porous ceramic hydroxyapatite (HA) scaffold by a novel biological gas foaming technique for its fabrication. This study is based on the production of Nano sized and Micro sized porous scaffolds by using yeast cells with sugar as a new gas foaming technique, result shows a controlled porosity distribution and even sized pores which is essential for controlled cellular adhesion, extracellular matrix deposition and altogether contributes in bone formation and repair of the diseased bone or traumatized bone. This scaffold also demonstrates better physical and chemical properties due to its chemical composition and uniformity of pores. This technique is less time consuming and more efficient for bone regeneration applications.



Enzymatic analyses of saliva during physical exercise of different intensity

Saliva secretion is controlled by the autonomic nervous system, with sympathetic activation resulting in the secretion of protein rich saliva whereas parasympathetic activation results in the secretion of mucins and water. Saliva composition depends on the relative contribution of the different salivary glands. Therefore, secretion and composition of whole saliva show large inter- and intra-individual variations. Physical exercise is a strong activator of the sympathetic nervous system, which may affect saliva composition. Especially above the anaerobic threshold, the exercise intensity above which the blood lactate concentration increases exponentially, the concentrations of a number of salivary constituents, including electrolytes, catecholamine, lactate, lysozyme, amylase,lactoferrin, LL-37, defensin HNP1-3 and chromogranin A increase. During exercise the viscosity of saliva also increases. In this study we will analyze the effects of physical exercise, as a sympathetic stimulus, on salivary flow rate and its effects of the rate of secretion of MUC5B, amylase, albumin, lysozyme and total protein concentration

Community - Oral Health Services

The dental section of BUMDC is committed to supporting community-based initiatives for providing dental education and services to underprivileged population. Therefore the Department of Community Dentistry is undertaking the "Community Support Program" (CSP) with a vision to provide high quality dental health and hygiene awareness and preventive sessions as well as services that is accessible and affordable to local community. This enables to collect data from the community for research and innovation.

CSP over a period of 7 years has benefited numerous public and private sector school children and college students, by spreading oral health awareness. Not only these, CSP has extended its services to reach out to special school children, the Homes for senior citizens, EDHI homes , Multinet Company, Central Prison for Women Karachi, their care takers and residential areas via organizing dental camps. Furthermore, the department aims to giving its undergraduate students a skill developing exposure and experience to learn clinical diagnosis through this community practice.

Identification of Benign Migratory Glossitis in Diabetic and Hypertensive Patients

Benign migratory glossitis (BMG) is a benign, usually asymptomatic mucosal lesion of dorsal surface of the tongue, characterized by depapillated erythematous patches separated by white irregular borders. As the etiology of BMG is unknown therefore, identification of the risk factors is challenging for the clinician while dealing with this pathology. Risk factors include psoriasis, fissured tongue, diabetes mellitus, hypersensitivity and psychological factors. Despite being a common oral condition, this disease has not been addressed earlier in Pakistan. Hence, we aim to investigate the occurrence of BMG among diabetic and hypertensive patients and its association with oral hypoglycemic and antihypertensive drugs.

KEY RESEARCHERS

Prof. Dr. Wahab Bakhsh

Professor Dr. Wahab Bakhsh Kadri is serving as Principal Dental Section and Head of the Department of Oral & Maxillofacial Surgery at Bahria University Medical and Dental College. He completed his Fellowship in Oral Surgery from College of Physicians and Surgeons Pakistan. He has served as treasurer of Pakistan Association of Maxillofacial Surgeons (PAOMS) till 2017 and is serving as the Vice President of Academy of Continuing Dental Education (ACDER). He is also Fellow of International Association of Oral & Maxillofacial Surgeons. His Clinical Practice & research interests involve Pre-Malignant & Malignant Lesions, Facial Trauma, TMJ disorders, and Implants. He has published eighteen articles in local and international reputed journals. He has been invited as guest speaker in different national and international conferences. He has conducted and supervised many surgical skills workshops in different universities.

Dr. Kulsoom Fatima Rizvi

Dr. Kulsoom Fatima Rizvi is serving as Vice Principal Dental, Associate Professor & Head of Preventive and Community Dentistry at Bahria University Medical and Dental College. She did her post-graduation from King's College London and Royal College of Surgeon, England. Actively participates as guest speaker at Conferences and Seminars nationwide. She has won the award for Best Researcher for the year 2016 at BUMDC. She has the prestige of 17 research publications in both reputed journals . Her research work has been presented at the FDI Annual World Dental Congress, She has also achieved awards for her research work at The First All Pakistan DUHS - DICE Health 2015 Exhibition and Virtual Student Research Competition held in 2016. Her excellence at academic is evident by the Distinguished Teacher Award year 2017 presented at BUMDC.

Dr. Shama Asghar

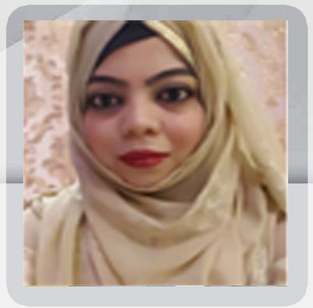
Dr. Shama Asghar, is an Associate Professor and Head of Department of Operative/endodontic and Paedodontic at Bahria University Medical and Dental College, Karachi. She is fellow of College of Physicians and Surgeons. Her research focuses on different clinical trials to assess the success and failure rate of various in-vitro and in-vivo restorative procedures. At international she is doing collaborative research with Faculty of Dentistry, Altinbas University Turkey and Hail University of Saudi Arabia. At national level, she is doing collaborative project with Dow University of Health Sciences and Baqai University. Received Distinguished Teacher Award year 2018 presented at BUMDC.

Dr. Daud Mirza

Dr. Daud Mirza is an Associate Professor & Head of Oral Pathology department at Bahria University Medical & Dental College, Karachi. He did his Master with Distinction in Experimental Oral Pathology from Queen Mary, University of London, His research areas include, precancerous lesions and conditions and oral mucosal lesions He has published 33 research publications and 65 research citations. Furthermore, he has been awarded the Best Faculty Researcher award in 2014 and 2016 and also the best faculty contestant award in 2015.

Dr. Kiran Mehboob Bana

She is currently working as senior lecture in the department of Oral Medicine and diagnosis JBUMDC. She is actively engaged in departmental research projects, student research and performing duties as a Medical Education Coordinator in dental section. She has published her articles in various national and international journals. Her areas of research include health promotion and disease prevention, oral epidemiology and dental/medical education. Apart from the academic responsibilities she also works as an assistant editor in JBUMDC.



Dr. Mazia Jawaid

She is a Senior Registrar in the Orthodontics Department of BUMDC. Her basic research interest revolves around the field of Orthodontics where she tries to cover various topics that have the potential to prove themselves beneficial for both the practitioners and patients. She recently got an Impact Factor publication in JPMA. Her work was on OHRQoL which has hardly been worked upon nationally. Her study found out that OHRQoL is greatly affected during Orthodontic treatment and this helps in preparing the patient for it psychologically, along with allowing the clinicians to incorporate methods to improve the quality of life. Currently she is working on finding condylar resorptions in patients coming for Orthodontic treatment.

Dr. Beenish Fatima

Dr. Beenish Fatima Alam is Assistant Professor and head of Oral Biology Department at BUMDC. She graduated from Queen Mary University of London having completed masters in Oral Biology with Merit. Dr Beenish is a Member of Royal College of Surgeons of Edinburgh and Member of ABSTD (Association of Basic Science Teachers in Dentistry). She has numerous publications to her credit. Her main research interests are maxillofacial injuries, Minimally Invasive Dentistry, Medical Education and Saliva Analysis.

Dr. M. Arqam Najmi

Senior Lecturer, Department of Science of Dental Materials, at BUMDC. He pursued his Postgraduate Degree from University of Sheffield which he obtained with upper Merit. His research interest includes characterization of dental tissues, synthesis of bone regenerative scaffolds and in-vitro testing of dental adhesives. He participated in 24th European Dental Materials conference, London, where he presented his novel approach for craniofacial tissue regeneration. He has also presented in various national conferences. Currently he is involved in research in collaboration with university of Oslo & BUMDC.