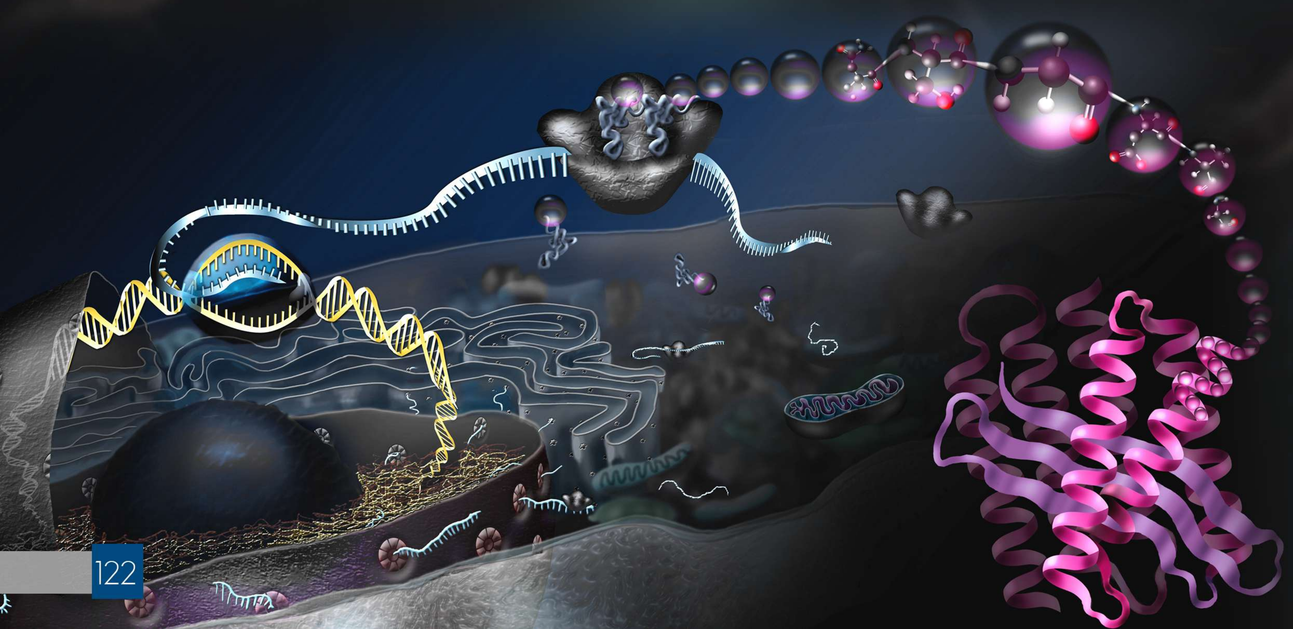
RCBS

RESEARCH CENTRE FOR BIOLOGICAL SCIENCES

rcbs@bahria.edu.pk

Research Centre for Biological sciences provides a platform where several academic disciplines or professional specialists combine to conduct or perform innovative research to achieve excellence in medical field. The objective of centre enables the Scientists, Medical Doctors and Clinicians to explore diagnostic and various treating ways in basic and clinical research for improvement of health care system. RCBS focuses on providing advanced understanding of biological processes at the molecular level from genomics to proteomics through adaptation of modern techniques. On the basis of services offered, RCBS is divided into two units. One is offering diagnostic services to patients in the field of Hematology, Biochemistry, Microbiology and histopathology while other facilitate health care and food industries by addressing their problems in form of biosolutions by development and validation of innovative methods with provision of variety of comprehensive range of biochemical and microbiological tests, to the food, pharmaceutical, cosmetic, dairy, beverage, chemical and allied industries. We are continually adding new laboratory services to meet and exceed growth demands of our clients



KEY FOCUS AREAS OF RCBS

Laboratory Diagnosis

Conduction of pathology tests on clinical specimens to obtain information about the health of a patient to aid in diagnosis, treatment, and prevention of disease.

Molecular Cell Biology

Investigation of molecular basis of human disease including breast cancer, osteoporosis, diabetes and other disorders

Biotechnology

Utilization of biological resources for industrial process

Medicinal Chemistry

Isolation of commercially important bioactive components from indigenous bio sources and Enzyme Inhibition Studies on phytopharmaceuticals And Synthetic Lead Compounds

Clinical Nutrition

Integration of recent developments in the field of clinical nutrition and to explore the association between nutrition and chronic diseases, so that preventive and treating ways can be identified to manage problems like osteoporosis

Food safety and Security

Evaluation of food commodities /crop varieties for nutritive quality and consumer acceptance

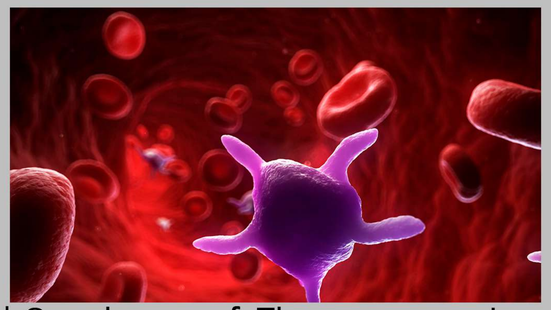
Pharmaceuticals & Nutrceuticals

Development of Nutritive solutions by evaluating Utilization of herbs and medicinal plants as nutraceuticals for management and treatment of various diseases. Mass multiplication of crop varieties and Medicinal Plants For Extraction of Commercially Important Bioactive Compounds by tissue culture technique required in Food and Pharmaceutical Industries.

RESEARCH & SERVICES PORTFOLIO

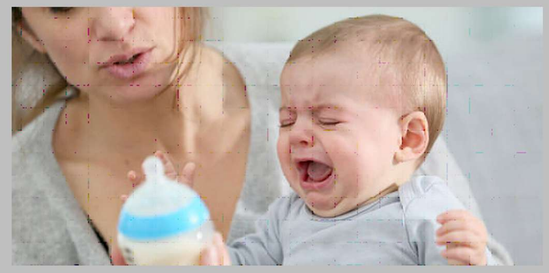
Exploration of Diagnostic Significane of Bone Markers in Osteoporosis

Osteoporoisis a disease in which bones become porous, weaker and almost nearer to fracture. It is an asymptomatic disease and even your Doctor might not be aware of osteoporosis until someone had suffered from clinically significant fracture break unexpectedly. Diabetes Mellitus can be diagnosed by blood sugar but no such test was available for diagnosis of osteoporosis. We explored the diagnostic significance of two bone markers, osteocalcin and telopeptide C in Pakistani osteoporotic females and found telopeptide C as predominant marker of bone degeneration. Its significantly increased levels can predict the risk of osteoporosis in future and preventive measures can be taken prior to th e occurence of disease. This work was identified as outstanding work by International Osteoporosis Foundation when presented in 1st Eurpeon Congress on Osteoprosis held in Spain and now act as basis of future research for point of care diagnosis.



Synthesis of Therapeutic Inhibitor of Platelet Aggregation

There are various labs available to count platelets but there is no specific lab exist in Pakistan regarding platelet aggregation studies. This project was done in collaboration with Ohio University, USA and Karachi Institute of Biotechnology & Genetic Engineering. After getting training for platelet aggregation studies from USA, we performed this project on synthesis of innovative antiplatelet compounds. The function of platelet aggregation is vital when one of your blood vessels gets damage. It sends out signals that are picked up by platelets. The platelets then rush to the site of damage, aggregate and form a plug, or clot, to repair the damage. On the other hand, in pathological conditions, platelet aggregation becomes lethal when platelet aggregates intravascularly as arterial thrombosis as a result of haemorrhage into ruptures in atherosclerotic plaques. In this project, we synthesized acylated derivatives of anthrarobin and performed platelet aggregation studies and found excellent results with complete inhibition at 10uM concentration with exploration of molecular signailling pathway. This led us to the invention of new compounds as platelet inhibitor to be used for drug development by pharmaceutical industries



Value added Enzyme based formulations against gastrointestinal disorders

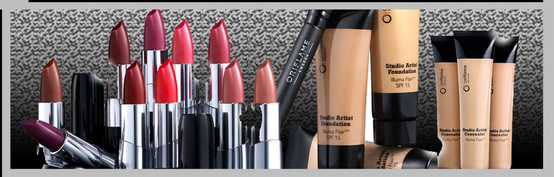
People with lactose intolerance don't make enough of the enzyme lactase, which is needed to digest lactose. We have developed various enzyme solutions for pharmaceutical industries including lactase enzyme prepartion for lactose intolerant people. Baby born with lactose intolerance would have severe diarrhea and be unable to tolerate the lactose in his mother's breast milk or in formula made from cow's milk. To relief the symptoms, this formulation is developed to treat lactose intolerance.

Identification of Lead Compound For Drug Development

There are various drugs which perform its mechanism of action by blocking specific enzyme activity involved in progression of particular disease. In this project, multiple methods have been developed to screen phytopharmaceuticals and synthetic compounds which may act as potential candidate for drug development based on their efficacy. More than 2000 compounds are screened and analyzed in our lab to determine the therapeutic effect of medicinally important plants and synthetic analogues against Cancer, Alzheimers disease, Ulcer by exploring their potential to inhibit the enzymes involved in the progression of these diseases.

Method Development and Validation for Monosodium Glutamate in Spices

Monosodium glutamate (MSG) is a flavor enhancer commonly added to Chinese food, canned vegetables, soups and processed meats. It is commonly used by food industries to enhance the flavor of their product. The optimal palatability concentration for MSG is between 0.2 – 0.8% (w/w) and its use tends to be self-limiting as over-use decreases its palatability.The largest palatable dose for humans is about 60 mg/kg body weight. However, there are some studies showing certain amount of MSG has possible toxic effects and may be associated with myocardial and hepatic diseases Therefore, MSG as a food ingredient has been the subject of health studies. We developed and validated method on High Performance Liquid Chromatography technique to extract and quantify MSG content in national spices for the first time in Pakistan. The developed method enables the scientist to detect the over dosage of MSG present in spices to ensure food safety.



Development and Validation for Cosmetic Products

Unfortunately in Pakistan, there are no proper cosmetic safety standards guidelines or legislative body to approve cosmetics and neither any testing laboratory which is specific for the testing of safer cosmetics. We are developing testing facilities for detecting antiaging, whitening and antiallergic properties of skin care products by developing invitro enzyme inhibition methods to verify their claims. In this way, substandard skin care products can be screened and filter from the market and consumer can select and identify quality safe product available. In addition to this we are working to develop Cosmeceuticals with natural bioactive ingredients having therapeutic effect.

KEY RESEARCHERS

Dr. Mehreen Lateef

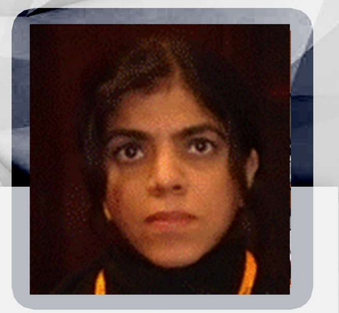
Dr. Mehreen Lateef is Head of Research Centre of Biological Sciences at Bahria University Medical and Dental College. She did her PhD in Biochemistry from University of Karachi in collaboration with Heritage College of Osteopathic Medicine, Ohio University, USA. She has been associated 10 years with Pharmaceutical Research Centre of Pakistan Council of Scientific and Industrial Research Complex Karachi. She has research experience in the field of Enzymology and Clinical and Analytical Chemistry. She is involved in testing of variety of food and pharmaceutical samples and developed various testing methods for food quality and food safety.She not only contributed to projects like Isolation of commercially important bioactive components from indigenous bio sources and Enzyme Inhibition Studies On Phyto pharmaceuticals And Synthetic Lead Compounds but also involved in Method Development and Validation for food, pharmaceutical and cosmetic industries. She has 73 national and international publications and 3 national patents at her credit.

Dr. Yasmeen Zamir

Dr. Yasmeen Zamir Ahmed is PhD in Marine Biology. She is currently working as Assistant Professor, Maritime Studies, Department of Humanities and Social Sciences, Bahria University, Karachi. She has ten years of experience in the microbial ecology/antagonistic substances research. During this period she has been involved in teaching, marine resource research and publications, monitoring and evaluation of various marine related programs in different capacities, training and capacity building of the marine biology students.She has been closely associated with establishment of Aquatic Diagnostic Laboratory (ADL), Microbiology and Molecular Biology Unit at Bahria University, Karachi. She has number of collective publications. She is currently working in establishing a state of the art microbiology unit for antibacterial studies at Multi Disciplinary Research Laboratory (MDRL), Bahria University Medical and Dental College. Her primary areas of research includes mangrove ecology, marine aquaculture, physical oceanography, nutrient dynamics, etc.

Ms. Marium,

Ms. Marium has professional degree of specialized clinical laboratory science and involved in clinical testing related to patient diagnosis and treatment. She did her MPhil in Biotechnology and involved in molecular biology and pathology projects related toDNA extraction and isolation . She worked on hepatitis, osteoporosis and oral cancer projects and have a no. of variety of international publications and national publications



Dr. Shizma Junejo

Dr. Shizma Junejo has done MBBS from Dow Medical College Karachi in the year 2003. After MBBS she did house job for one year at Civil Hospital Karachi, six months in General Surgery and six months in General Medicine. To continue with the learning process as a medical graduate , she made a move to England to pursue her quest for knowledge and goal of attaining postgraduate degree. She completed her postgraduate education successfully in 2011 with a Master's degree in Clinical Nutrition from Roehampton University London. Following her Master's degree in Clinical Nutrition she has exhibited immense upscale progress in terms of a growing interest in research. She performed her research on areas like Weight and mental health, Feeding practice between primigravida and multigravida female, Malnutrition, Food safety and security.

Ms. Shafaq Mahmood

Ms. Shafaq Mahmood is a Research Associate at Multidisciplinary Research Lab (MDRL),Bahria University Medical and Dental College Karachi. She did her M.Sc. in Biochemistry from University of Karachi and one year diploma in Medical Technology from Aga Khan University Hospital respectively. She has six years' experience in Jumma Research Lab AKU and Centre for Human Genetics and Molecular Medicine, SIUT Karachi, Pakistan. During this period she worked as a Research Associate and has been involved in different Molecular and Tissue culture based internationally or HEC funded research projects. She has been involved in Hepatitis, Tuberculosis and Renal Allograft projects and have International and national publications.

Syeda Ailya Batool

Syeda Ailya Batool received B.S degree in Biotechnology from Jinnah University for Women, Karachi, Pakistan in 2017. She has an expertise on PLANT TISSUE CULTURE, Thesis on (Invitro callus induction, identification of salt tolerant calli and regeneration of Helianthus Annuus L) .She was intern at Jinnah Post Medical Centre Karachi in different sectors such as Microbiology, Molecular Biology, and Biochemistry. She was alsoengaged in Project at Molecular biology lab, Food Quality & Safety Research Centre, PARC, University of Karachi, and Expertise on DNA Extraction.