

Department of Sports Biosciences

Department of Sports Biosciences aims to develop national and global recognition in Sports Science research. The department has established well equipped lab for research opportunities and skill development in the area of Sports Biosciences. The expansion of lab and procurement of state of the art instruments is being worked on continuously. We are committed to excellence and our faculty is highly experienced in sports science practice and scientific research in their respective disciplines. The faculty uses their global research experience and professional network to ensure that the students get relevant and up to date education and training as per their interests and aspirations. Our MSc students have secured jobs at reputed organizations such as Sports Authority of India (SAI) as well as in private sector. And they have scope in multiple job opportunities like Sports scientists, Sports performance analyst, Sports development officer, Exercise physiologist, Sports nutritionist, Sports governance, Sports science consultants and multiple opportunities in fitness industry. The research work in the department is conducted in many diverse fields: Oxidative stress in Sports, Recovery and sports performance of athlete, Sports cardiology, mitochondrial dynamics in Sports science, Biomarkers in Sports Injury, Proteomics and metabolomics in Sports Science.

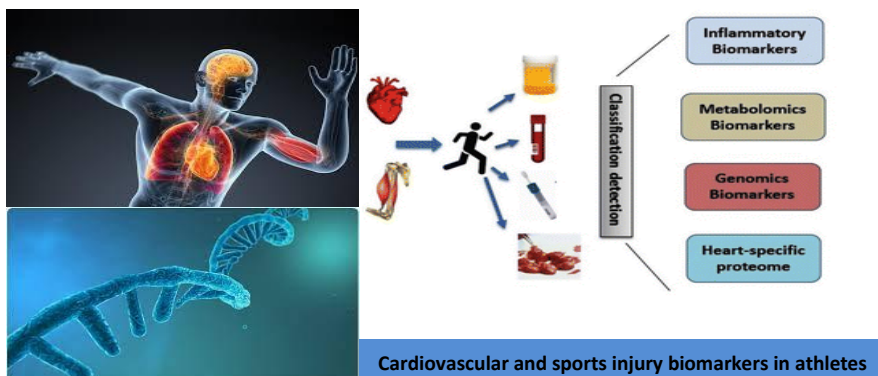




Dr. Neha Singh

Sports Cardiology, Biomarkers and therapeutics in Sports injury

Sports cardiology research in our lab will include cardiovascular evaluation of athletes before event participation, understanding the cause of sudden cardiac death and developing prediction models to prevent it and allow intervention in time to avoid such calamity in athletes. Furthermore, the cardiovascular health of athletes post pandemic will also be addressed. Biomarker discovery and validation will also be one of the research areas where cardiovascular health and sports injury related novel biomarkers will be studied for tracking changes in health, performance and recovery of athletes. Sports injury happens frequently during different sports events or trainings. Depending on the type of sports or physical activity, the injuries can be of multiple types such as strain, sprain, tendon injuries, fractures and many more related to specific sports. There are a number of therapies which can be used for treatment of sports injuries based on the type of injury or tissue damage. The research in our lab will be focused on plant based alternative medicine where novel therapies will be explored using traditional Indian medicinal plants which are free of side effects and easy to acquire. In addition, research will also include the novel modified RNA technology based therapeutics for sports injuries.



Dr. Hemanth Naick B

Dr. Hemanth Naick B lab is focused mainly in uncovering the inter-organellar association dynamics of Endoplasmic reticulum–mitochondria (ERM). ERM is One of the recently discovered novel inter-organellar association: ERM is visualized by electron microscopy and fluorescence microscopy in animal cells and yeast. Interestingly, in these contacts, ER and mitochondrial membranes are close enough but do not fuse suggesting that the two organelles are tethered together by specific protein-protein interactions apposing these organelle membranes ([Kornmann, Osman et al. 2011](#), [Michel and Kornmann 2012](#)). Recent reports reveal that ER contact directs mitochondrial (ERM) dynamics ([Rowland and Voeltz 2012](#)) where Ca²⁺ is released from the ER to mitochondria at ERM sites, which seems to be important for mitochondrial function, division and regulation of apoptosis. In addition, ERM also facilitates exchange of metabolites such as ROS and lipids between these two organelles. Moreover, regulation of replication stress (RS) and checkpoint control is energy-demanding processes, which require active mitochondrial functions ([Vincent, Kwong et al. 2008](#)). We expect that ERM plays a crucial role replication stress recovery mechanisms by maintaining mitochondrial homeostasis and its biogenesis. The role ERM plays in chromatin-based changes associated with replication stress is not known. The broader goal of this project is to improve our understanding of how chromatin-based changes during replication stress eventually remodel changes in the cellular cytoplasmic segment where ERM could be used as a good functional readout to help us integrate whole cell response to RS, mechanistically. This is an important open problem in the field of RS.

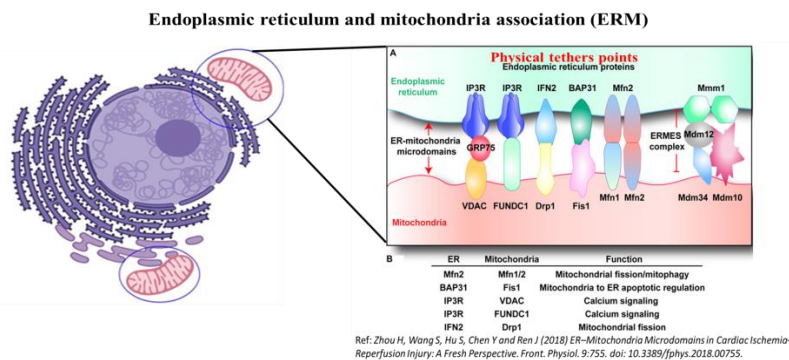
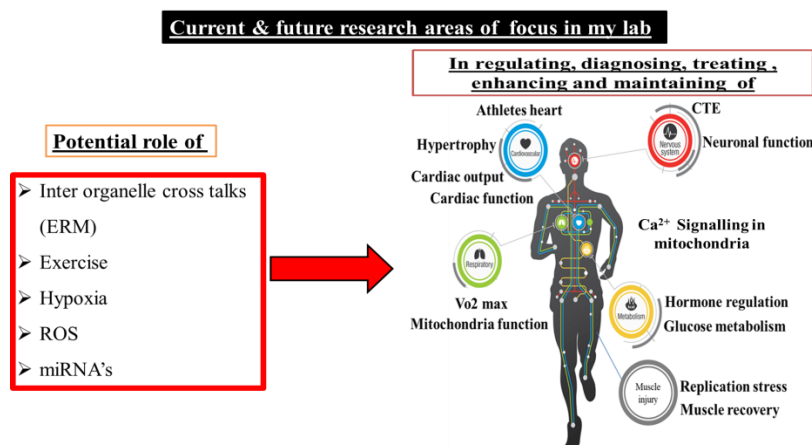
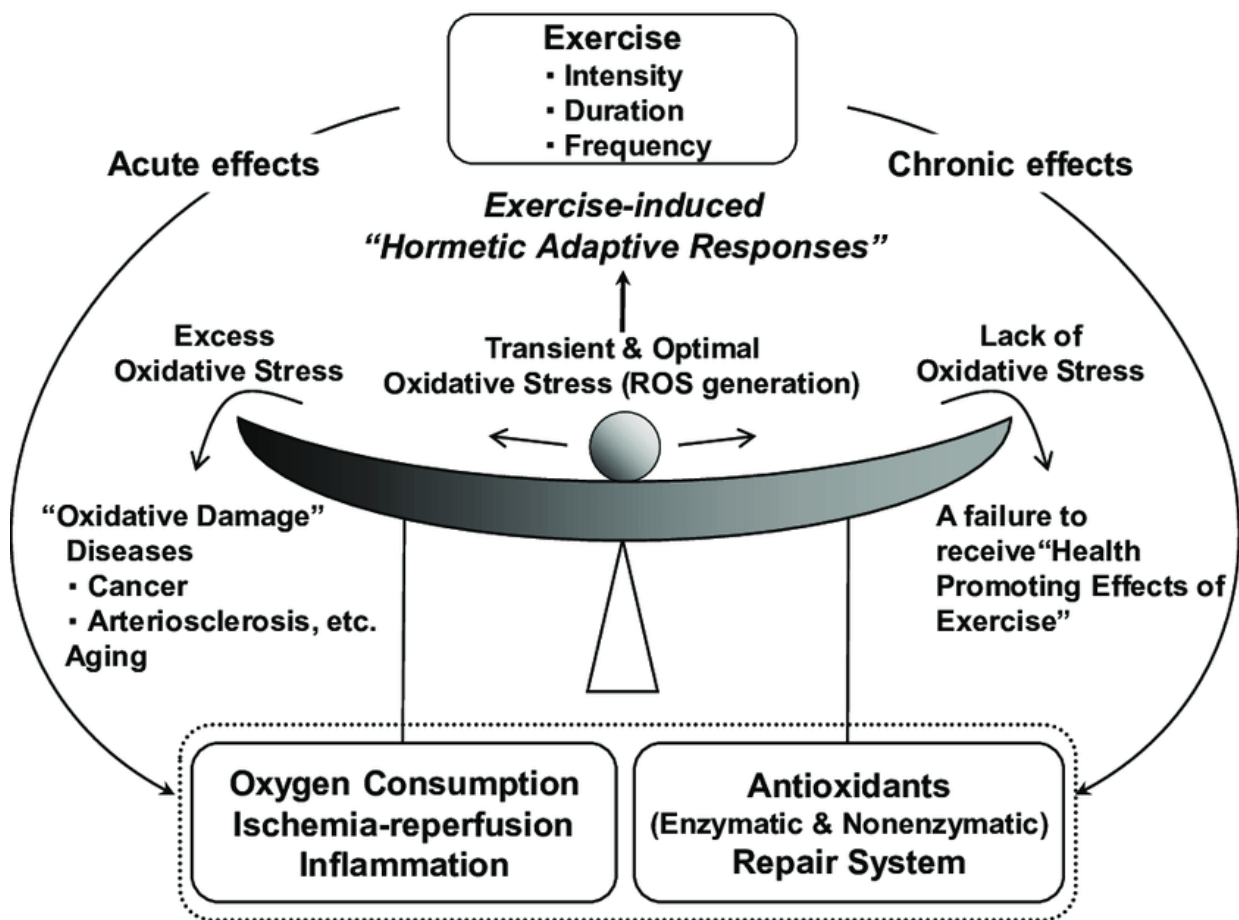


Figure 1: Endoplasmic reticulum–mitochondria (ERM): Proteins involved in ERM formation.



Dr. Sunil G Purohit

Area of research of Dr Sunil G Purohit is to identify the various free radicals generated during different modes of exercise. His research will also focus on to find out the antioxidant status of the athletes during such exercises and to know how this free radicals and antioxidant status affect the various physiological adaptations, immunological defense system, recovery and performance of the athletes.



During exercise physiological modifications leads to increase in the production of free radicals causes oxidative damage to biomolecules. But on the other hand latest studies showed that at cellular level free radicals play vital role in physiological adjustments that take place after training. Therefore, optimum physical training program having proper training load to recovery ratio will produce the moderate and short-term increase in free radicals, which can activate molecular mechanisms useful for physiological adaptation at the cellular level and protect itself from states of oxidative stress or there may be increase in the antioxidant and the immunological defense systems of the athletes.

Further, the research will focus on the assessment of various biomarkers in order to evaluate the recovery and performance of the athletes during training and competitions.