

# Need for more research and publication in clinical and experimental physiology

Physiology as a research subject in medical science has contributed enormously to understand the pathophysiology of diseases and in evolving the physiological basis of medical practice. The advancements in medical research and practice have been possible due to research development in experimental and clinical physiology. Therefore, the Nobel Prize in the field of medical research has been designated as 'Nobel Prize in Physiology and Medicine'.

Experimental physiology (or medicine) refers to the investigations undertaken in humans or animals as appropriate to the model system, to identify the mechanisms of pathophysiology of a disease, or to demonstrate proof of concept evidence of the validity and importance of new discoveries or treatments.<sup>[1]</sup> Research in experimental physiology precedes the research in clinical physiology and medicine, before the initiation of clinical trials for treatment and prevention of diseases. Alfred Nobel, the founder of Nobel Prize was interested in experimental physiology and had set up his own laboratories in France and Italy to conduct physiology research experiments and had also donated generously to Ivan Pavlov's physiology research laboratory in Russia.<sup>[2]</sup>

Clinical physiology research aims at effective translation of results from basic health research laboratories for their subsequent application in clinical medicine.<sup>[3]</sup> A research that translates laboratory data into the discoveries for health benefits of the population is known as translational research.<sup>[4]</sup> Experimental medicine (or physiology) is a core element of medical science overarching translational research strategy to drive the translation of discoveries from the laboratory and clinical research into implications of different kinds of health requirement of the society. The clinical physiology research provides the critical link of fundamental discoveries in experimental physiology to the clinical medicine.

The major areas of experimental and clinical physiology research include biomarker development, genetic assessment of a disease, disease-model research, clinical research, patient cohort research, stem cell research, and clinical trials. Biomarker development and evaluation aims at evaluating the role of potential biomarkers (the surrogate indicators of a biologic state) in assessing disease heterogeneity and underlying pathophysiologic mechanisms and assisting in early diagnosis of disease and the response of the body to interventions. Genomic research assesses gene distribution and genetic markers of the disease and heritable susceptibility of the individual to disease and treatment. The disease-model research aims at evaluation and validation of the animal models of disease such as experimental diabetes, hypertension, and obesity, for understanding the disease process. Clinical research translates the findings of the disease-model research into the phase of disease intervention. The patient cohort research is the study to create small and extensively defined groups of patients to help detect, treat, or prevent diseases.<sup>[5]</sup> Stem cell research has the potential to develop lifesaving treatments and to widen translational strategy.<sup>[6]</sup>

Research in physiology includes all these components of experimental (assessing biomarkers and genomics of the disease and studying the disease process in the animal models) and clinical (patient cohort studies, stem cell research, and clinical trials) research. However, adequate attempts have not been made for proper application of data obtained from basic science laboratories for patient management. Often scientists remain satisfied with few publications from their discoveries. Among the basic science researchers, physiologists are endowed with more research skill and insight for proper interpretation and application of laboratory data. Therefore, scientists in the field of physiology can effectively bridge the gap between laboratory discoveries and clinical medicine. Physiology research laboratories, especially in medical schools, colleges, and universities should be well equipped with facilities for such basic and advanced medical research. However, in many countries, especially in developing nations, due to various reasons the focus in medical institutions is more on patient management and less on research. Therefore, the basic science departments like physiology, biochemistry, and pharmacology lack adequate research environment. Physiologists in medical institutes should be provided with ample facilities for

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research and encouraged to take up novel experimental and clinical research.

In medical curriculum, research has been made mandatory for postgraduate and doctoral courses.<sup>[7]</sup> However, often the data obtained from these studies are not converted into suitable publication and the information is not made available to the scientific community. One reason could be the lack of suitable journals to publish together the data of basic and clinical studies. There are many journals for publication of information separately for experimental medicine or for clinical medicine, and there are few journals for both clinical and experimental medicine. Presently, there is limited scope for publication of data from both clinical and experimental physiology in a single gazette. Though clinical and experimental physiology is same as clinical and experimental medicine, at present the basic science researchers are not sure if their manuscripts could be suitable for publication in these clinical and experimental medicine journals. Therefore, there is a need for a journal for combined publications of both clinical and experimental physiology research articles. We are sure this new journal 'International Journal of Clinical and Experimental Physiology (IJCEP)' will provide an appropriate forum for publication of findings of both clinical and experimental physiology research and will be the suitable medium to disseminate the knowledge of experimental and clinical physiology and medicine to the scientific world.

Apart from basic, systemic, applied, and clinical physiology, recently two other aspects of physiology have emerged and gained momentum. The first is the molecular and genomic physiology that explains the derangements at molecule and gene levels, and the second is the preventive physiology that envisages the application of physiology knowledge in disease prevention through lifestyle modifications and yoga. Therefore, in IJCEP, besides having section editors for basic, experimental, systemic, applied, and clinical physiology, we have exclusive editorial expertise for molecular, genomic, and preventive physiology. We trust

IJCEP will fulfill the aspiration of millions of researchers in the field of clinical and experimental physiology and medicine across the globe.

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