

Physiology as an integrative subject with interdisciplinary prospects

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INTRODUCTION

Physiology has its identity and root as old as Human history. The discipline has emerged as a prospective one with its fundamental demand for human health care.

Thus, considering the 'originality,' Alfred Nobel specifically mentioned that the prize be awarded for "physiology or medicine" in his will. Since then, the groundbreaking discoveries made by scientists on neuronal systems, endocrine, olfaction, taste and renal systems and many associated aspects have been awarded. Perhaps the depth and breadth of knowledge of this subject have adorned the clinical field more than any other specific subjects or items have done. Interestingly Physiology deals with both normal health as well as diseased conditions.

Unique yet inclusive

On the scientific view point, the fundamental knowledge of human structure and function has given this subject a unique and extra edge and command over all disciplines. The latter issue defines the subject for its obvious inclusiveness. The beautiful physical mysteries of the physiological phenomena tempted Physicists to work on myriads of issues like hemodynamics, intracellular trafficking, or *in-vivo* imaging and whatnot. They delved into their knowledge hunt for optics, spectroscopy, and rheology. The handshake of Physiologists with Chemists /Biochemists was imminent. This was to enrich and quench the thirst of queries of all these relevant subjects, including Neurochemistry and Psychology. Historically and contemporarily, Mathematics and Statistics have intricate conglomerations with Physiology. As the linkage of data science and knowledge of machine learning was incubating in the recent past, the devil of the COVID pandemic enhanced the alliance, giving Physiologists a huge opportunity to explore the future.

Contribution and Connectivity

Physiology is perhaps one of the most valuable of all scientific disciplines with a direct connection with the public. Therefore, Physiologists have a direct chance to work for the people and investigate the principles of all body functions apart from Physicians who exert holistic knowledge for human health. Unquestionably, Physiology is both a life science in its own right and a medical science for application and direct contribution. "Physiome", a new aspect of Physiology, includes organisms' entirety in frames and functions - considering evolution, its habitat, and societal and behavioral contexts- a holistic look. Thus, it is such an

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exciting and dynamic discipline which crosses many borders with a robust impact on the quality of life.

Studying role of physiological systems of all evolutionarily neighboring and or distant organisms (which is relative) are of exquisite importance. In that regard, next-generation gene sequencing (NGS) has given an extra edge. We had a great lesson during the dreaded aftermath of COVID-19. Understanding immunological phenomena is as important as knowing and working with the genome of viruses, which are of utmost importance to anticipate, prepare and combat future health hazards.

Task

Quite understandably, the teachers, research fellows and young students will become interested in a deeper knowledge of cell signaling or cross-talk of cells and organs at increasingly complex organization levels. A detailed understanding of body functions is a prerequisite for management of diseases.

Thus, molecular techniques and approaches are imminent in the coming days. However, a complete understanding as envisioned by Aristotle, Sushrut or in recent times by Claude Bernard who mentioned *Milieu intérieur* integrating the nervous, endocrine, cardiovascular, circulatory or immune functions. Contemporarily, several terms have been used from Systems Physiology to Physiome- later with more emphasis on genome draft, the related branches have gained importance like Metabolomics and Nutrigenomics, Pharmacogenomics and so on so forth.

Expectations and Prospects

Physiology as an interdisciplinary field has always remained a hotbed of research. The Nobel prize themes and niche areas which are awarded each year mark the diversities and multifarious domains of research. Thus, human health care is at the core of its priority. On the other hand, the recent award of Svante Pääbo on horizontal gene transfer opened another dimension of research. I believe the prospective youngsters and future researchers will take advantage of this

subject learning and will open up new avenues. The liberty of carrying out research from various fields like external environmental influences (exposome) on the human body as a whole, to individual organs to cells, and molecules (exosome) has kept the subject such a lucrative field for scientists.

In recent terms, physiology is immensely important. It is, in fact and in effect, remains 'an essential' -answering all crucial understanding our daily, health and disease.

Thus, my words to young motivated teachers to inculcate young minds with more innovative research that is more appropriate utilizing the best resources available.

In your laboratories and develop more relevant instruments and facilities in UG and PG level.

Start with you must keep an eye on world scenarios and keep yourself abreast with the best of the contemporary world by reading journals and attending online or offline seminars. Experimental skills are part and parcel of the discipline. Thus, it is the essential duty and responsibility of the teachers to arrange hands-on workshops inviting national and international scientists with the best of their developments on a regular basis. I would also advise the teachers to encourage students and researchers to join and participate in international workshops.

Thus invest your best efforts in this wonderful subject with career opportunities.