Clinical Proteomics

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Clinical Proteomics is an emerging interdisciplinary research field that coalesces researchers from many different areas of biomedical research into one of the most likely disciplines to successfully foster the translation of basic scientific knowledge into clinical applications for the benefit of the patient. Major research interests that are expected to profit from the application of proteomic technologies to clinical issues include (i) early detection/diagnosis of disease, (ii) prediction of how a disease will behave over time and how a specific patient will respond to a given treatment, and (iii) identification of novel targets for therapeutic intervention.

Molecular & Cellular Proteomics (MCP)—A major stakeholder in the field of proteomics-made a decision back in 2002 to catalyze and nurture the development of Clinical Proteomics by providing a forum to promote, guide, and stimulate this promising discipline. Accordingly, the Journal has published articles, reviews, and special issues in numerous areas of clinical proteomics, covering most aspects of the continuum going from discovery to application.

Today, clinical proteomics studies are increasingly shifting toward the analysis of tissues and bio-fluids and as a result, concerns such as tissue heterogeneity, abundance of the cell type of interest, marker quantitation, availability of samples with long-term clinical follow-up, as well as experimental design and optimal method selection have become some of the main challenges that researchers face. These and other inherent problems associated with using clinical samples make interdisciplinary joint efforts a necessity for any high-quality clinical proteomics study. Furthermore, the translation of basic proteomic discoveries to a clinical setting is a very long and expensive process that requires broad multidisciplinary collaborations between basic researchers, clinicians, surgeons, pathologists, and epidemiologists as well as infrastructural support and industry participation (Fig. 1).

In this fourth Special Issue we present contributions by invited authors as well as a small selected number of regular articles submitted to the journal. Main areas covered include biomarkers of diseases and conditions (cancer, cardiovascular, urogenital diseases, infection in premature neonates, and infertility), pathway proteomics, and post-translational modifications (chemical and pathway proteomics, tissue phosphoproteins, and proteolytic post-translational modifications), as well as technologies (accurate inclusion mass screening, enhanced detection of low abundance plasma proteins, immunoaffinity mass spectrometry, and membrane proteomics) and essential resources (human protein atlas for expression profiles based on antibodies, antibodypedia, human proteinpedia, the human cancer pathway protein interaction network, and fluid biobanking).

Clearly, the dynamics of Clinical Proteomics are changing rapidly, and as a result there is a pressing need to establish guidelines that will facilitate and stimulate the publication of high-quality articles in this area, and to ensure that the data generated by these studies can be used by other investigators in the best possible way. True to its principles, Molecular & Cellular Proteomics in collaboration with a panel of experts and through subsequent public consultation has elaborated a set of guidelines for preparing manuscripts describing research in clinical proteomics that will be released in the November issue of MCP.

Finally, we would like to thank the contributors to this issue for their willingness to provide the manuscripts and the staff of Molecular & Cellular Proteomics for their expeditious and efficient handling of the articles. We very much hope the reviews and articles in this special issue will provide new and stimulating insights into the opportunities that clinical proteomics continues to hold for the future of molecular medicine in particular and medical sciences in general.

FIG. 1. Stakeholders and resources in translational research. Clinical Proteomics promises to substantially improve our ability to detect, treat and manage human disease.