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## Recent Advances of Proteomics Applied to Human Diseases

Given the intimate roles proteins play in health and disease, it is not surprising that during the past 20 years proteomics has been applied extensively to investigate human diseases to better understand disease mechanisms/pathways and to define new therapeutic targets as well as novel biomarkers for accurate diagnostics/prognostics. There is no doubt that advancements of disease proteomics will expand the frontiers of medicine to impact global health.

This Special Issue of *Journal of Proteome Research* (JPR) features recent progress and advancements of proteomic studies of human diseases, focusing on pathogenesis, pathogenic mechanisms, diagnosis, prognosis, and treatment. It includes two reviews and 64 research articles (a total of 66 articles). The large number of articles published in a single Special Issue reflects the significance and broad interest of this area.

It is especially encouraging to use the occasion of this Special Issue to reflect on how our field has evolved. Compared with disease proteomics articles previously published, this collection of studies shows obvious improvements in this field as follows. First, more advanced proteomic technologies, particularly sophisticated mass spectrometry for protein characterizations, profiling, quantitative analysis, and investigations of post-translational modifications (PTMs), were used. Second, the study designs were more sophisticated and planned more carefully, for example, stringent validation to confirm screening data sets, sufficient sample size, and suitable control groups (i.e., inclusion of diseased controls in addition to the normal control). Third, functional significance of the identified proteins or targets was confirmed in most of these studies. Finally, feasibility for clinical applications was well demonstrated, for example, sensitivity/specificity of novel biomarkers for diagnostics/prognostics.

In addition to the two reviews that update the current knowledge<sup>1,2</sup> and a technical development for clinical tissue preservation,<sup>3</sup> a wide variety of human diseases were investigated in this collection of proteome studies. These include diseases of central nervous system,<sup>4–14</sup> eye,<sup>15,16</sup> lung,<sup>17–22</sup> breast,<sup>23–27</sup> oral cavity,<sup>28</sup> esophagus,<sup>29,30</sup> liver,<sup>31–34</sup> pancreas,<sup>35</sup> colorectum,<sup>36–39</sup> ovarian,<sup>40–42</sup> cervix,<sup>43</sup> muscle,<sup>44,45</sup> skin,<sup>46,47</sup> blood cells,<sup>48</sup> circulatory system,<sup>49,50</sup> and kidney.<sup>51,52</sup> In addition, infection and immunity<sup>53–60</sup> (including Ebola virus infection<sup>53</sup> with the current and largest outbreak in history that affects multiple countries, particularly those in West Africa, and triggers worldwide attention), and metabolic disorders<sup>61–63</sup> were also reported. Moreover, fibrotic pathways<sup>64</sup> and mechanisms of actions as well as therapeutic targets of some anticancer peptides/agents were investigated.<sup>65,66</sup>

We hope that the articles published in this Special Issue will stimulate further improvements to gear up advancements in proteomics applied to human diseases that will ultimately lead to bedside applications in the future.

**Visith Thongboonkerd\***

Medical Proteomics Unit, Office for Research and Development, Faculty of Medicine Siriraj Hospital, and Center for Research in Complex Systems Science, Mahidol

University, 2 Wanglang Road, Bangkoknoi, Bangkok 10700, Thailand

**Joshua LaBaer**

Virginia G. Piper Center for Personalized Diagnostics, Biodesign Institute, Arizona State University, 1001 South McAllister Avenue, Tempe, Arizona 85287-6401, United States

**Gilberto B. Domont**

Proteomics Unit, Institute of Chemistry, Federal University of Rio de Janeiro (UFRJ), Avenida Athos da Silveira Ramos, Rio de Janeiro, 21941-909 RJ, Brazil

### ■ AUTHOR INFORMATION

#### Corresponding Author

\*E-mail: thongboonkerd@dr.com; vthongbo@yahoo.com.  
Phone: +66-2-4192850.

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