

Current developments in biomedical research

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Abstract: *we discuss, in this introduction, why Advanced Biomedicine should be introduced. We believe that introducing this journal to the scientific community shows the importance of keeping a close eye on new trends. The current situation of biomedical sciences clearly warrants a new journal in this field of research. Additionally, the AB journal will attract manuscripts of high quality and scientific relevance.*

Keywords: *Molecular biology, Personalised medicine, Health related Quality of Life, Health care management.*

Editors and publishers of the Natural Sciences Publishing USA are pleased to announce the first edition of the Advanced Biomedicine (AB). We hope that our new launched journal will help to advance the exciting field of biomedical sciences. AB is particularly keen to provide a broad view of medical studies. Therefore, interdisciplinary manuscripts, which may not suit the narrow specialties of other journals, are highly welcome. Here, we suggest five categories of advanced biomedical sciences, with the awareness that classification may be difficult: 1) traditional biomedical studies; 2) animal model technologies; 3) in vitro systems for biomedical studies; 4) Advanced biomedical imaging technologies; and 5) translational research activities. We hope that the broad view of AB from basic and applied to translational studies will play a constructive role in the biomedical research.

Our first proposed category is “traditional biomedical sciences”. This is a multidisciplinary science that applies the principles of natural-related sciences to the clinical practice. It includes several basic medical disciplines e.g. histology, physiology, pathology, pharmacology, toxicology, nanotechnology, biology, bacteriology, virology, mycology and parasitology. In addition, biochemistry, biophysics, bioinformatics, biostatistics and systems biology studies can contribute in this category. Generally, basic studies concern living organisms are highly welcome. Not surprisingly, most of the contributions to our first edition belonged to this category.

For the second category we suggest “animal model technologies”. Rapid advancement in animal model technologies e.g. reporter, transgenic and knockout animals opens the door of possibilities to understand the pathogenesis of several diseases. Beside this, the possibility to establish what is called- humanized animals- will help the researchers to understand the pathophysiological aspects of human diseases using experimental animals (Gorantla et al., 2012; Sommer et al., 2015). AB will carefully consider any mechanistic study advancing our understanding of how biologically and clinically relevant processes can be investigated in experimental and humanized animals. As an example, several studies are recently reported using animal models to understand tuberculosis (Wu et al., 2015), Ebola virus disease (Bird et al., 2015), diabetes (Wijesekara et al., 2015), and hepatitis (Braeuning et al., 2010; Mederacke et al., 2013; Lan et al., 2014;

Shiue et al., 2015). Therefore, we are convinced that animal model studies in the field of anatomy, embryology, histology, physiology, molecular biology, biochemistry, pharmacology, toxicology and microbiology as well as pathology aptly fit into this category.

The third category “in vitro systems for biomedical studies” is of animal welfare and economical relevancies. Currently, much enthusiasm is paid to replace animal experiments using in vitro systems, so called alternative methods. For instance, the European Union has invested more than one hundred million euros into finding and characterizing such alternative methods (e.g., in the FP7 program). Moreover, it has been shown that primary cells (harvested from a healthy organ e.g. neurocytes, hepatocytes) and precursor cells including embryonic stem cells under certain culture conditions have some features similar to the in vivo situation (Zellmer et al., 2010; kim et al., 2015; Reif et al., 2015; Godoy et al., 2015). Though some progress has been made toward this direction, there is no alternative method is able to completely mimic the in vivo conditions. This issue can be explained due to: 1) loss of the exact in vivo microenvironment e.g. blood flow; 2) approximate interaction between different cells is not optimal; and 3) discrepancy between in vivo and in vitro doses. Recently, the dynamic processes of production and degradation of some metabolites can be measured by nuclear magnetic resonance in living cancer cells (Kalfe et al., 2015). This achievement will help the metabolomics researchers on the living cells under different experimental settings. Studies on the in vitro systems as alternatives for animal models are highly invited, particularly, if the in vitro data are compared to the in vivo situation.

“Advanced biomedical imaging technologies” is suggested for the fourth category. Various imaging techniques e.g., radiography, magnetic resonance imaging, micro CT, microscopies are used to visualize the body systems for clinical analysis, diagnostic purposes and medical intervention. On the tissue level, histopathological alterations often constitute a fingerprint of disease mechanisms. Recently, high resolution confocal microscopy based reconstructions and quantifications e.g. liver (Hammad et al., 2014; Friebel et al., 2015, Vartak et al., 2015) represent an important step forward in the three dimensional approach. In this context, a combination of reporter mouse (category 2) and intravital imaging is a cutting-edge technology to investigate the online mechanisms of cell activation, migration, division and apoptosis (Li et al., 2011; Mederacke et al., 2013; Kolaczowska et al., 2015). Research articles using these advanced technologies are highly appreciated. The author(s) should describe the diagnostic and clinical relevance of the tested technology.

As a fifth category, we suggest “translational research activities”. Translational research in a medical context, aims to translate the laboratory findings into a clinical practice. The most advanced technology in this field of research is OMICS (Burton et al., 2015; Vaudel et al., 2016) e.g. proteomics, transcriptomics, metabolomics, genomics and lipidomics. Targeted OMICS are integrated to advance biomarkers into clinical use. Moreover, stem cell-based therapies for degenerative disorders are also one of the translational medicine approaches. We are seeking for the articles that describing translational biomedical technologies.

In conclusion, the current situation of biomedical sciences clearly warrants a new journal in this field of research. Therefore, we believe that AB journal will play an essential and constructive role. Additionally, the AB journal will attract manuscripts of high quality and scientific relevance.

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