Vol.1, No.3, 37-38 (2013)
http://dx.doi.org/10.4236/aer.2013.13004

Letter to the editor

Victor M. Bolanos-Garcia

Department of Biological and Medical Sciences, Oxford Brookes University, Oxford, England;
E-mail: vbolanos-garcia@brookes.ac.uk

Received 22 May 2013; revised 1 August 2013; accepted 9 August 2013

1. THE ORIGINS

It was exactly 180 years ago, when Anselme Payen, a French chemist, discovered the first enzyme, diastase, (nowadays amylase) and 136 years since Wilhelm Kühne first coined the term enzyme. History tells us that it was until 1926 when James B. Sumner purified and crystallised the enzyme urease; few years later, Northrop and Stanley achieved similar results for the digestive enzymes pepsin, trypsin and chymotrypsin and provided irrefutable evidence that pure proteins can be active enzymes. The discovery that enzymes could be crystallised eventually allowed the first structure of a protein enzyme, lysozyme, to be solved by X-ray crystallography by David Chilton Phillips and collaborators. This high-resolution structure of lysozyme marked the beginning of the field of structural biology and the effort to understand how enzymes work at an atomic level of detail.

2. ENZYMES TAKE CENTRE STAGE

These are heady days for those who study enzymes from different standpoints. New genomes are being sequenced, the gene expression products identified and the structures solved at an astonishing pace. Also, rapid advances in biophysical, biochemical, computational, cell and molecular biology techniques have made possible a deeper understanding into the biological roles played by enzymes in health and disease. The choice of the title, Advances in Enzyme Research (AER) reflects both the consolidation of our subject and the recognition of fascinating advances in the Biological and Biomedical Sciences. For instance, the development of new technologies such as high-throughput strategies for the study of genomes, definition of structures at atomic resolution and their use for the development of novel drugs, metabolomics and systems biology among other advances have fuelled an exponential growth in the study of enzymes. A range of biophysical techniques such as isothermal titration calorimetry, analytical ultracentrifugetion, surface plasmon resonance, circular dichroism and mass spectrometry have made possible the fine characterisation of molecular interactions underpinning enzyme function. Powerful molecular simulation techniques have allowed data to be brought together to model the dynamics of enzyme function and structure in space and time. It is clear that in the coming years the study of enzymes such as protein kinases, phosphatases, DNA polymerases and ribozymes will continue to provide insights on disease mechanisms and therefore, will remain a central aspect of cell function and regulation, medicinal chemistry, drug design and enzyme engineering. Single-molecule techniques like atomic force microscopy, voltage and patch clamp, optical tweezers and FRET have permitted the study of protein-protein and protein-ligand interactions in individual systems to an unprecedented level of detail and yet, many aspects of enzyme research remains challenging: the molecular understanding of protein-folding and the underlying thermodynamics and kinetics of the process; molecular details of the stability of proteins in extreme environments and the use of modified enzymes for energy production, food security and industrial biotechnology processes.

3. WHY AER?

In this exciting era of fast-moving advances in research and technology, it is our desire that Advances in Enzyme Research (AER) will allow the readers to keep abreast of the most recent developments in the field. The original provisional division of topics into analytical themes provides a robust framework to identify topical areas. Also, the widespread concern about the appropriate assessment of scientific research, lately expressed in the form of The San Francisco Declaration on Research Assessment (DORA), represents a valuable opportunity for AER: a rigorous peer-review process of full report, short paper and book reviews should ensure that Advances in Enzyme Research (AER) will soon become an obligated reference in the vast field of enzymology and that misused metrics such as journal's impact factors cease to be an unnecessary hurdle for assessing the qual-

ity and relevance of newer, more specialized journals. Therefore, maintaining Advances in Enzyme Research (AER) as an openly accessible journal is very important to provide an effective platform for the world-wide community of scientists, industry experts and academics in which new developments on enzyme research can be promoted, shared, and discussed. The commissioning of special issues on carefully selected topics to guest editors may deserve some consideration as it may bring new ideas and fresh approaches and contribute to consolidate the reputation of the journal.

I look forward to seeing the visibility and influence of our journal growing over the coming years!

