

Editorial

Biotechnology research

Scientific innovation and its derivative benefits have had profound implications to humanity within the last century. The exciting discipline of biotechnology has drawn the interests of traditional biologists, biochemists, microbiologists, medical and agricultural scientists into applying mathematical and engineering models to understanding biology. Furthermore, several scientists in the exact sciences of mathematics, physics, and chemistry have begun to use system approaches to unravel the mystery and complexity of biology. And from the side, diagnostic, biopharmaceutical, biochemical and agricultural industries are rapidly drawing from and applying the research results of biotechnology. Moreover new industries relying on genomics are springing up daily to challenge the way things have been done. The final results may be several years away, but biotechnology will experience a revolution like none before in the life sciences and will affect every facet of our lives, from crop improvement to commerce, and drugs to sustainable development.

Many of the most important and challenging problems of modern science require a multidisciplinary and an integrative approach. Working in areas that fall between the standard disciplines requires that barriers be broken down. Modern biotechnologies have established mechanisms to enable integrative research to develop. Even large companies, subsidiaries and joint ventures, universities, research organizations, small companies and startups are starting to interact in non-traditional ways.

Recent revolutionary advances in genomic sequencing has opened the way for a deepened understanding of the organization of genomes and the way in which variations in the DNA of individuals influence their phenotypes. The fundamental goal of cell biology is to understand physiology in terms of the information encoded in the cell's genome. Molecular biology on the other hand provides a detailed description of the components of biological networks, and the organizational principles of these networks are becoming increasingly apparent. Therefore, the major challenge facing human biologists in the 21st century is in identifying how variations in the human genome contribute to the onset and progression of common disorders which have both genetic and environmental determinants.

In this first special issue of the African Journal of Biotechnology, there are reviews and perspectives by specialists with timely information on biotechnology issues in diverse fields including industrial ecology, *in vitro* culture techniques, transgenic technology, genetic conservation, molecular diagnostics and biopharmaceuticals. The challenge for Africa is two-fold. There is the urgent need to be competent in the application of these innovative researches in industries and to teach the necessary skills to the next generation of scientists. This will require a scheme to lure back skilled African researchers from the western world to the universities and private sector in order to facilitate biotechnology education and industrialization.

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