

THE "GOLDEN AGE" OF BIOTECHNOLOGY IN EUROPE

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ABSTRACT

The European Biotechnology Congress 2011 was held in Istanbul between the 28th of September and the 1st of October 2011. The Congress was organised by the European Biotechnology Thematic Network Association (EBTNA) in conjunction with the Turkish Medical Genetics Association and under the aegis of the Presidency of the Republic of Turkey. The Congress attracted scientists not only from Europe but from across the globe. The main topics covered by the congress were: Medical Genetics, Plant Biotechnology, Industrial Biotechnology, Animal Biotechnology, Regenerative Medicine and Stem Cells, Environmental Biotechnology, Biotechnologies in Infectious and Parasitic Diseases, Nanobiotechnology, Pharmaceutical Biotechnology, Bioinformatics, Assisted Reproductive Methods in Biotechnology, Education and Biotechnology. The application of systems biology approaches to biotechnology emerged as one of the main themes in many sections.

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European Biotechnology Developments

Several plenary talks discussed the current status and trends in European biotechnology including education in biotechnology (2, 4, 5). It was reported that for 2010 the revenues from the European biotechnology increased with 13% and the R&D expenditure increased with 5%. UK and Germany are the leading nations in the field but there is a noticeable shift in Turkey and Russia. Biotechnology and pharmaceutical are the European industries that increase faster than any other industries. Cancer is the fastest growing clinical segment. Each and every country in Europe invests quite considerable amounts into public R&D, including biotech research and development. The funding criteria differ across member states, but the general idea is similar: to advance the knowledge pool of the human kind and to prepare for the forthcoming bio-economy. Policies to support knowledge transfer from research to industry include: creating collaboration activities between enterprises and research institutions; introducing regional grants for industrial research and pre-competitive development; creating link between science and economy and support for University researchers to create companies. The role of life sciences education to develop graduates able to meet a wide variety of future economic, societal and technological needs was also discussed at the Congress.

Systems Biology and Biotechnology

Undoubtedly one of the hot topics at the Congress was the application of systems biology to biotechnology (1, 3, 6, 8). Systems Biology is defined as the quantitative analysis of the dynamic interactions between several components of a

biological system and aims to understand the behaviour of the system as a whole, as opposed to the behaviour of its individual constituents. It applies the concepts of systems engineering to the study of complex biological systems through iteration between computational and/or mathematical modelling and experimentation. Several presentations discussed the application of systems biology to biomedical research, which can be used for rational target identification (7), prediction and avoidance of adverse properties of therapeutics and monitoring of clinical efficacy using surrogate markers and individualized approaches to disease treatment (6). One of the challenges of systems biology is to integrate biology, technology and computation. Once this is achieved it will lead to a great potential of applications in biotechnology and medicine.

REFERENCES

1. Bown J. (2011) *Curr. Opin. Biotech.*, **22S**, S16.
2. Bruschi F., Dundar M., Gahan P.B., Gartland K., Szente M., Viola-Magni M.P., Akbarova Y. (2011) *Curr. Opin. Biotech.*, **22S**, S7-S14.
3. Clyde R.G., Tummala H., Khalil H.S., Goszcz K., Lucka I., Tupone M.G., Zwirek M., Cavicchi L., Vallatur J., Stoyanova V., Mitev V., Zhelev N. (2011) *Curr. Opin. Biotech.*, **22S**, S58.
4. Dundar M. and Akbarova Y. (2011) *Curr. Opin. Biotech.*, **22S**, S3-S6.
5. Gartland K.M.A. (2011) *Curr. Opin. Biotech.*, **22S**, S17.
6. Idowu M.A., Goltsov A., Khalil H.S., Tummala H., Zhelev N., Bown J. (2011) *Curr. Opin. Biotech.*, **22S**, S59.
7. Khalil H.S., Tummala H., Omoboye A.O., Zhelev N. (2011) *Curr. Opin. Biotech.*, **22S**, S115-S116.
8. Tummala H., Khalil H.S., Nikolova E., Mitev V., Zhelev N. (2011) *Curr. Opin. Biotech.*, **22S**, S25.