

## Book Reviews

**S. Brackman, A. Schwienhorst (Eds.), *Evolutionary Methods in Biotechnology: Clever Tricks for Directed Evolution*, Wiley-VCH, Weinheim, Germany (xiii + 214 pp., £90-00, ISBN 3-527-30799-0).**

The Darwinian model of evolution is now understood at the molecular level by the study of genetic evolution throughout species. The current use and development of molecular biology strategies to manipulate nucleic acids allows identification of specific DNA markers from separate species. Such techniques are often regrouped under the term 'Directed evolution', which in this book involves optimisation strategies used to generate, screen, and modify nucleic acid libraries.

*Evolutionary Methods in Biotechnology: Clever Tricks for Directed Evolution* is composed of 13 chapters that present novel techniques and applications for directed evolution of nucleic acids. This volume is complementary to *Directed Molecular Evolution of Proteins*. A short introduction is followed by a first section that focuses upon methods for generation of molecular diversity, such as random mutagenesis, DNA shuffling applications, and DNA recombination by staggered extension process (StEP) methods. DNA shuffling mimics the processes of natural evolution by generating diverse recombined nucleic acid products using restriction enzymes and DNAses. On the other hand, StEP processes involve short cycle PCR. Subsequent chapters deal with screening and/or mass screening technologies such as FACS-based screening of combinatorial peptides and proteins, selection of phage displayed enzymes and selection of target-binding nucleic acids. Target-binding nucleic acids (also known as aptamers) exhibit a defined structure due to their nucleotide sequence and are thereby capable of binding specific nucleic acids or proteins. The following three chapters present the use of computer-based methods to design random codons for subsets of amino acids, and to predict the structure of random generated mutant proteins and RNA molecules. The final chapter presents patenting issues in evolutionary biotechnology, including requirements for patentable products such as novelty, inventiveness and utility.

A CD-ROM containing software tools for library design, mutants selection and predictive algorithms as well as references accompanies this volume. This is a practical oriented book, since it presents currently employed protocols, and will therefore be of particular interest to

researchers and students involved in the use of such directed evolution technologies.

François Meulenet

John F. Kennedy\*

*Chembiotech Laboratories,  
Institute of Research & Development,  
University of Birmingham Research Park,  
Birmingham B15 21, UK*

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\* Corresponding author

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**M. Niaounakis, C.P. Halvadakis, *Olive-Mill Waste Management, Literature Review and Patent Survey*, Typophyto-George Dardanos Publications, Athens, Greece, 2003 (xv + 430 pp., Currently Not For Sale—Free under Request (500 copies only), ISBN 960-402-123-0).**

Amongst the 1743 metric tons of olive oil produced worldwide annually, 98% is produced in the Mediterranean region; Spain, Italy, Greece, Turkey and Tunisia being the biggest producers. The olive oil manufacturing process yields three materials; the olive oil (20%), solid waste (30%) and aqueous liquor (50%). Though other products such as pomace or stones can be extracted from the solid phase, the remaining solid wastes and liquors phases as well as the water used during the extraction process, are generally not used and are collectively known as 'olive-mill waste water' (OMWW). OMWW generation represents 0.55–2 L/kg of olive, and has raised ecological concerns because of its phenolics and acids content that have phytotoxic and biotoxic effects. It is estimated that the load of phenolic compounds within the OMWW is about 1000 times larger than that of domestic sewage. There are now several existing processes that can provide a solution to the OMWW problem. These include detoxification processes, recycling and recovery of valuable components and production process modifications.

*Olive-Mill Waste Management* initially presents background information about the olive oil production industry

and environmental effects, and then details existing technologies available to solve these problems and the possible re-utilisation of OMWW. The anti-microbial and phytotoxic effects of OMWW have been related to its phenolic and organic acids content. In soils, OMWW results in an unbalance of the microorganism ecosystem. Treatment processes existing include physical treatments, such as dilution, sedimentation, filtration, flotation and centrifugation. Sedimentation is the most used technology. It results in the fractioning of two liquid phases; a low chemical oxygen demand (COD) supernatant and a high COD settled sludge that can be removed by precipitation/flocculation processes. The third part of the book presents the potential uses of OMWW. As an example polyphenols can be used as anti-oxidants in cosmetics.

*Olive-Mill Waste Management* provides an excellent introduction and detailed description of olive oil by-products management. It is well illustrated with graphs and pictures of Greek producer's systems. This book is recommended for academic and industrial scientists/researchers will interests in olive oil production and/or recycling technologies.

John F. Kennedy\*  
François Meullenet  
Chembiotech Laboratories,  
Institute of Research and Development,  
University of Birmingham Research Park,  
Birmingham B15 22, UK

Available online 16 December 2004

\* Corresponding author

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**C.Remacle , B. Reusens (Eds.), Functional Foods, Ageing and Degenerative Disease, Woodhead Publishing Ltd, Cambridge, UK, 2004 (xix + 771 pp., £160.00, ISBN 1-85573-725-6.**

Functional foods are defined as food products that play a role with respect to the consumer's well-being. This involves mainly health concerns, especially during childhood and in old age, where degenerative diseases are a growing problem that has been clearly related to the diet in the developed world. Indeed, although it is well known that the diet plays an important role in development of cardiovascular diseases of ageing people, it also has a direct influence on the susceptibility to degenerative diseases during early life.

*Functional foods, ageing and degenerative disease* is a collection of reviews presenting the current issues, functions and role of functional foods for the development of degenerative diseases. The first three chapters present respectively the regulatory context of food legislation in the EU, diet and prevention of degenerative disease during pregnancy, and functional foods for age-related diseases. For example, studies have demonstrated that the diet of pregnant women exerts prenatal and early postnatal influences on the developing baby by acting on intra-uterine development and the quality of breast-milk for adequate growth and gut flora development. The following six chapters focus on the role of functional foods for bone and oral health and include examples such as the effects of functional foods with respect to osteoporosis and dental health.

The next three chapters focus on the role of functional foods for the control of obesity, and the subsequent five chapters on functional foods with gut health and immune functions. The fourth and final part includes ten reviews on the incidence of functional foods on cancer prevention. For example, plant phenolic compounds are thought to inhibit overexpression of cyclooxygenase- (Cox-2) and hence cancer. Chemoprevention through the consumption of phytochemicals is becoming readily acceptable although little is known about the mechanisms. In summary, this collection of informative reviews will be of great interest both to new comers and experimented scientists with research interests in all areas of functional food development and function.

John F. Kennedy\*  
François Meullenet  
Chembiotech Laboratories,  
Institute of Research and Development,  
University of Birmingham Research Park,  
Birmingham B15 23, UK

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\* Corresponding author

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**E. Heftmann (Ed.), Chromatography 6th Edition—Fundamentals and Applications of Chromatography and Related Differential Migration Methods. Part A: Fundamentals and Techniques, Elsevier Sciences, Amsterdam, The Netherlands, 2004 (xi + 518pp., \$245, ISBN 0-444-51107-5).**

The better understanding of the chemical and biological properties of macromolecules involves a prerequisite