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Pharmaceutical Sciences –

Selected Papers

Edited by

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Introduction

David M. Wood

This book offers a collection of papers covering the whole of journey of medicine development and pharmaceutical sciences. They are based on presentations at the International Conference on Pharmaceutical Science organised by the Athens Institute of Education and Research (ATINER) held in Athens, Greece. The book is divided into five parts with each part looking at a different part of pharmaceutical science and the medicines discovery process. It is hoped that these essays will show the readers the diversity of pharmaceutical sciences and how each part of the journey joins to the next.

Pharmaceutical Screening

The brain is the powerhouse of the body. Changes in its chemistry lead to a huge number of primary and secondary health problems. The development of new methods of determining if a new compound will pass the blood-brain barrier is therefore essential. Sonia Al-Qadi, Morten Schiøtt, Steen Honoré Hansen, Peter Aadal Nielsen and Lassina Badolo detail the production of such an assay in their paper '*An Insect-Based Ex Vivo Blood Brain Barrier Efflux Assay*'. They detail the use of locusts blood brain barriers as potential to screen or categorise potential new compounds, providing a alternative methods for lead compound selection.

Pharmaceutical Delivery

Development of a drug into a medicine is the key goal of the pharmaceutical scientist. The medicines discovery process does not end with the synthesis of a new chemical, and includes the metamorphosis of a chemical into something a patient is able to use. In their paper '*Starch Pickering emulsion: a safe vehicle for topical drug delivery*', Joana Marto, Luís Gouveia, Lídia Gonçalves, Aida Duarte, Pedro Pinto, Teresa Cidade, Eduardo Oliveira, António J Almeida and Helena M. Ribeiro characterise the use of an emulsion for use in drug delivery. They are able to produce a preservative free emulsion increasing the safety profile of the product and making it available to patients who are sensitive to common antimicrobial preservatives and surfactants. Their method has wide applications not just to the pharmaceutical industry but also to the cosmetics and food industries.

Pharmaceutical Manufacture

The pharmaceutical manufacturing and up-scale is an area that is often missed off pharmaceutical science lectures. It is clear that in post-big pharma world, the ability to show manufacturing potential at an earlier stage in the medicine development process is of critical importance to smaller biotech companies wishing to sell their technology. Two papers are presented here showing different aspects of the manufacturing process.

The first paper in this section, by Sara Raposo, Manuela Urbano and Helena Ribeiro, entitled '*Scale up of a low energy process for the production of oil in water emulsions'* examine the risk associated to the scale transposition of a cold processed oil in water emulsion and to calculate the production costs savings when compared to a more traditional hot process. The group examined three different methods and showed clear differences between the resulting emulsion in terms of droplet size, polydispersity index. Their up-scale method resulted in an increase in the stability of the final emulsion. This work is an excellent example of how the up-scale manufacturing process must be examined early to ensure that further research into a potential new drug is reflective of the final medicine produced.

The second paper in this section, '*Impact evaluation of changes in the manufacturing line of cyproterone acetate through analysis of comparative dissolution profile*' by Terezinha de Jesus Andreoli Pinto, Wesley Anderson De Oliveira, Daniela Dal Molim Ghisleni and Rogério Takao Okamoto, tackles the problem of ensuring bioequivalence when changing manufacturing methods. Using cyproterone acetate as an example, they show how the dissolution profiles are independent of the compressor machine used, therefore satisfying the requirements of the regulatory bodies.

Pharmaceutical Safety

Safety of medicines is of paramount importance if patients are going to trust their medicines. Distrust of medicines can lead to vast social problems, as was seen with the MMR vaccine. It is therefore essential that the safety of any new medicines is examined carefully. Caroline Magnani, Bruna Galdorfini Chiari, Vera Lucia Borges Isaac, Marcos Antonio Corrêa and Hérida Regina Nunes Salgado in their paper, '*in vitro* safety evaluation of caffeic acid' examine caffeic acid, for its use in topical products. Caffeic acid and other Cinnamic acids have been shown have a variety of antioxidant effects *in vitro* and are therefore sort after by the cosmetics industry.

Patient Use of Medicines

Finally we have work by Rachel H. Mack, providing the link crucial between patient's use of medicine and pharmaceutical science and providing the ideal circular nature of the drug discovery process.

The paper examines the use of Mack's Educational Programme; an innovative educational process designed for healthcare professionals to help patients with chronic pain decrease their dependency on prescription medicines. Mack evaluates an educational tool to improve the use of the Prescriptions Drug Monitoring Program, a tool to help healthcare providers can use in the clinical setting when making decisions to prescribe narcotic medications. Her work improved the use and understanding of the system and is applicable to a wide variety of healthcare settings, and applicable to all patients. Her work has the ultimate aim of helping to reduce patient dependency on prescription medicines and therefore reduce side effects and abuse, but also to reduce the cost of medicine abuse through earlier signposting and early treatment.