Inaugural Editorial: Food Digestion

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Food

Fundamental research related to food covers a wide and diverse range of disciplines including nutrition, physiology, physics, chemistry, microbiology and botany to name but a few. Food is at the heart of many global challenges such as food security, obesity and the ageing population. These challenges are, and will, affect an increasing proportion of the human population. Understanding the fundamental bases of how food interacts with the human body at the molecular, physical and biological levels is vital if we are to optimise the delivery of health and nutrition to the population from the food that is available. This fundamental, mechanistic understanding requires an increasingly multidisciplinary approach to understand how food can be used to deliver optimal health throughout the life course.

These global challenges have led to a fundamental change in direction of food research both in academia and in industry. The food industry is now less likely to promote food quality in terms of taste, texture and flavour; instead, the emphasis is on how the food delivers health and well-being through, for instance, reduced salt, fat and sugar, or increased levels of phytochemicals and other micronutrients. The health claims made by these foods are under increased scrutiny and require physiological validation, hence there has been a concurrent increase in academic research defining the fundamental physical and chemical mechanisms by which food and food structure can deliver these health benefits. This research has to be truly

multidisciplinary in order to provide robust mechanisms underpinning the physiological response to specific foods.

One of the major diet-related challenges facing developed countries is the rising tide of obesity. The recent trends in obesity are a culmination of many factors including human evolution, changes in agricultural practices, the year round availability of energy dense foods and our increasingly sedentary lifestyle. Unfortunately, public health policy strategies do not appear to be working, as we are more informed than we have ever been about what constitutes a healthy diet and lifestyle, yet many individuals do not act on this knowledge. One solution therefore is to develop strategies by which the food we eat can deliver optimal nutrition, but also deliver the taste, flavour and satisfaction that consumers demand. To develop these strategies and incorporate them into everyday, widely consumed foods, requires fundamental, multidisciplinary research to understand how the principal physical, chemical and material properties of food influence the physiological processes of digestion, absorption and metabolism.

Some examples of this approach include the design of “smart” food structures to specifically promote satiation through supramolecular structuring in the stomach, or satiety through engineered resistance to digestion and thus triggering neurohormonal signals which reduce appetite. Our improved knowledge of mechanisms underpinning the poor bioavailability of essential micronutrients is stimulating more rational, informed approaches to improve bioavailability, such as targeted delivery. Such approaches were previously expensive, and thus limited to drug delivery applications, but as the technology is becoming more widespread, it is becoming more accessible and affordable to be used in food.

The progressive multidisciplinary nature of this field of research has facilitated the creation of this journal—*Food*

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Digestion. It will act as a focus for research articles that often fall in the gaps between journals covering the fundamentally different disciplines involved. *Food Digestion* will contain original articles and reviews that describe interrelationships between foods and all aspects of the biophysical, physiological and neuroendocrine processes occurring during digestion, uptake and metabolism, both in vivo and in vitro. There is particular emphasis on the role of food structure over the entire range of length scales from molecular and nanoscale upwards, also foods containing prebiotics, probiotics, genetically engineered microorganisms and other agents which influence digestion in its broadest sense.

The success of this journal will depend strongly on the quality of its papers, and the scientific discussion that they will generate amongst the different scientific communities that we hope the journal will bring together. We have an international editorial board of highly esteemed and respected individuals who have kindly agreed to aid us with this undertaking, including Dr Jianshe Chen, who in fact proposed the original idea for this journal. It is therefore my great pleasure, at this very exciting milestone in this unique field of research, to invite you to submit research articles and reviews to *Food Digestion*, and thus contribute to its future growth and success.