

# Editorial



## Foodborne Infections and Intoxications: Need of a Multidisciplinary Approach for Control

Foodborne infections and intoxications are considerable public health problems with high costs and morbidity. A growing number of pathogens and toxins have been implicated in the etiology of foodborne diseases and new vehicles of transmission have been identified. In addition, outbreaks can spread over wide geographic areas because food is transported across borders. Timely identification of the appropriate vehicle, combined with a rapid appropriate laboratory analysis to identify the causative agent can lead to speedy corrective action. Only a coordinated approach is likely to achieve a permanent and significant reduction in foodborne infections and intoxications. It is necessary to amalgamate diverse and in-depth expertise in food science, veterinary medicine, molecular biology, microbiology, public health and epidemiology, and clinical medicine with the interests of companies seeking new diagnostics, interventions, and preventive measures to produce pathogen-free food in interdisciplinary collaborations.

In the present issue of MOLECULAR NUTRITION & FOOD RESEARCH, we include articles that demonstrate not only the heterogeneity and broadness of the spectrum of foodborne infections and intoxications, but also new techniques for their detection. The review by Ehling-Schulz *et al.* introduces food poisonings caused by *Bacillus cereus* which is an etiologic agent in both gastrointestinal and in non-gastrointestinal infections. Interest in these spore-forming bacteria has grown lately because it seems that *B. cereus*-related diseases, in particular food poisonings, are increasing in number. New insights into the characteristics and identification of the strains causing emetic types of disease are presented. *Staphylococcus aureus* remains the leading cause of food poisoning, and staphylococ-

cal enterotoxins are implicated in the etiology of clinical symptoms. In their article, Becker and co-authors demonstrate that most clinical *S. aureus* isolates harbor a subset of enterotoxin-like superantigens which contribute to their pathogenicity. They also describe a new multiplex PCR-DNA enzyme immunoassay for their detection. The most common foodborne pathogen in many countries is *Salmonella enterica*. A deeper understanding of the expression of genes involved in virulence would explain the capacity of the different species to cause disease in humans. The *sop* genes, encoding effector proteins, interact with various cellular functions of host cells. Tschäpe and his colleagues studied the presence and expression of the effector proteins and influence of environmental conditions on their expression. Ewers *et al.* and Kuczius *et al.* address *E. coli* of different pathogroups. The former contribution describes virulence properties of *E. coli* of serogroup O78 isolated from cattle with diarrhea. The findings of several putative virulence factors of different *E. coli* pathogroups led the authors to suggest that such strains may be potential zoonotic agents. The precise characterization of such strains, as performed in this work, will help to further define their role also in human disease, and to clarify possible routes of infection. Kuczius *et al.* describe a real-time PCR for distinguishing various alleles of Shiga toxin 1-encoding genes in *E. coli*, so as to define the human pathogenic potential of such strains. Werner *et al.* screened different vegetables for antibiotic-resistant coliform bacteria and enterococci to find vehicles that could possibly transmit such organisms. Mycotoxins are produced by many fungal pathogens which can contaminate foods. In addition to their hepatotoxic and nephrotoxic properties, some are regarded as carcinogens. Geisen investigated in his work the influence of environmental conditions on the expression of the ochratoxin A-encoding gene and on ochratoxin A production in *Penicillium nordicum* in an attempt to determine the conditions which would minimize the occurrence of this toxin in foods. In addition he describes a real time PCR system for the specific detection of ochratoxin A encoding genes. Problems of foodborne infections and intoxications can only be solved by combining research data from multiple disciplines using a variety of approaches. This Journal will serve as a forum for the dissemination of all pertinent data and opinions that are concerned with preventing or treating foodborne infections of humans.

A handwritten signature in black ink, appearing to read 'H. Karch'.

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