
Preface

This volume includes 26 contributions presented at the Third International Conference on *Advances in Nutrition and Cancer* held in Naples, Italy, in May 2012 at the National Institute for Cancer Research.

The major aim of the meeting was to illustrate the most recent and innovative projects in this area and to propose novel strategies for chemoprevention as well as molecular epidemiology and dietary intervention programs. During the conference a group of experts from different areas discussed pivotal and current topics on the key issues related to the interactions between human nutrition and malignancies.

Comparing the themes reported here with those discussed in the two previous meetings (1992, 1998), the major scientific advancements certainly derive from the extensive use of molecular biology, molecular epidemiology, and a variety of epigenetic approaches in nutrition research.

Today, cancer affects about 24 million people worldwide and is responsible for over six million deaths each year. Although early diagnosis has made some progress, in most cases tumors are still treated at advanced stages, with limited therapeutic success. Prevention is therefore a fundamental approach for fighting this severe pandemic. In this context the fundamental conclusion of Doll and Peto (1981), suggesting that at least 30 % of all cancers might be prevented by dietary regimens, is still relevant and has been confirmed by a large variety of results: the association among diet, nutrition, and cancer risk is not in question.

The first part of the volume focuses on general aspects relating life style, diet, and cancer. The molecular mechanisms underlying the connections among obesity, energy balance, physical activity, and cancer risk/progression are extensively covered as well as the presumptive association of salt intake and alcoholic and carbonated soft drinks with digestive tract cancers.

A large variety of phytochemicals and natural antioxidants have been characterized and proposed as potential chemopreventive/chemotherapeutic agents. The effects and mechanisms of the action of resveratrol, quercetin, and sulforaphane, as well as the conflicting results on selenium and selenoproteins, are reported in the second part.

It is well known that, in several tissues, diet can modulate the methylation status of the cells and epigenetic factors influenced by diet are receiving major attention in cancer prevention and as therapeutic targets. The third part is devoted to these

fundamental and most promising issues. An interesting new area deals with the adverse intrauterine environments induced by maternal diet, which influence DNA methylation and predispose to diseases in adulthood.

The fourth part deals with the beneficial effects of a functional food, olive oil, in cancer prevention. The evidence of the chemopreventive effects of extra-virgin olive oil, the major source of fat in the Mediterranean diet, associated with low incidence of cardiovascular diseases and of several tumors, such as breast cancer, is analyzed. Special emphasis has been placed on the effects of antioxidants on human hepatoma cells and on their chemical interactions with other food ingredients affecting nutritional and sensory quality.

The last two parts deal with fundamental results such as the epidemiologic evidence that lifestyle (including diet regimen) effectively prevents cancer recurrence.

Space has also been given to anti-angiogenesis: numerous preclinical, chemical, and epidemiological data have demonstrated that angiogenesis inhibition can be applied in cancer prevention and that several diet-derived chemopreventive components have angiogenesis as a common target. The relationship of the human gut microbiome with gastrointestinal malignancies has also been discussed; the understanding of the dynamic interplay between the gut microbiome, the immune system, and dietary exposure may contribute to future cancer prevention strategies.

As demonstrated in this volume, the inter-disciplinary approach has already yielded a rich harvest of basic knowledge concerning cancer development and will provide the seeds for future breakthroughs in clinical progress. The text is intended to furnish the reader with a general view of the state of the art in this very central and solid area of research. We will be satisfied if the multidisciplinary nature of these proceedings informs and stimulates the readers as much as it did the participants in the conference. It is our hope that the volume will encourage further research and understanding of all aspects of this intriguing and complex field.

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Advances in Nutrition and Cancer

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Ragione, F. (Eds.)

2014, XIV, 460 p. 59 illus., 34 illus. in color., Hardcover

ISBN: 978-3-642-38006-8