

F O R E W O R D

Cancer risk assessment is of overriding importance for the severity of the prognosis and for the wide diffusion of carcinogenic agents in living and occupational environments. As a matter of fact, the respiratory tract is the route of entry of most pollutants and lung cancer represents the main cause of death for tumour, accounting for about 35,000 deaths/year in Italy. Although cigarette smoke is the main risk factor, occupational exposure to airborne carcinogenic agents also plays an important role and calls for a correctly planned health surveillance of workers currently or previously at risk. The Department of Occupational Medicine of Italian National Institute for Occupational Safety and Prevention (ISPESL) has just performed a study to identify priorities for research and knowledge transfer in the field of occupational safety and health (OSH). In this study, occupational carcinogenesis was identified as an absolute priority.

This Special Issue of Acta Biomedica entitled "Innovative strategies and biomarkers to assess occupational lung cancer risk" was planned to highlight the results of a project proposed by the Department of Occupational Medicine of the National Institute for Occupational Safety and Prevention (ISPESL) and funded by the Italian Ministry of Health in 2003. The main results of the project were presented in a Workshop organized by the Department of Occupational Medicine and the ISPESL Research Centre at the University of Parma and took place in Rome at the end of June 2007. The workshop was attended by several Italian research groups, and was opened by a lecture given by Prof. A. Seaton, Professor Emeritus of the Aberdeen University and Honorary Senior Con-

sultant, Institute of Occupational Medicine, Edinburgh, Scotland, UK.

Such an inspiring lecture could not be missed and therefore it has been summarized in the Editorial opening of the proceedings of the workshop, entirely dedicated to the project "Innovative strategies and biomarkers to assess gene-environment interaction in occupational lung cancer", which involved eleven participating units performing *in vitro*, clinical, epidemiological and industrial hygiene studies to develop innovative strategies and biomarkers to incorporate gene-environment interactions in the risk assessment of processes implying exposure to lung carcinogenic agents in occupational settings.

The main aims of *in vitro* studies were: (i) to investigate the mechanism(s) of action of the complex mixtures present in working environments, such as those characterizing coke oven and steel plants, (ii) to identify possible interactions between exposure to carcinogenic agents and susceptible genotypes and, (iii) to develop innovative methods for the molecular diagnosis of lung cancer applicable to the subsequent clinical and epidemiological studies. Industrial hygiene studies aimed at characterizing exposure and at applying novel markers in the biological monitoring of workers exposed to carcinogenic mixtures (polycyclic aromatic hydrocarbons and metallic elements).

The objectives of clinical studies were to develop innovative techniques to estimate the dose to the target of lung carcinogens and to identify biochemical markers of lung cancer ("fingerprints") based on the analysis of volatile and non-volatile substances, present in the exhaled breath of lung cancer patients, par-

ticularly those undergoing surgery, who would have the greatest benefit from an early diagnosis. Another aim was to perform a molecular analysis of some specific genes in lung cancer patients and in healthy subjects, thus acknowledging the role of individual susceptibility in a multifactorial and multistage disease. After all, as noted by Darwin, among people belonging to the same population “a grain on the balance will decide who will survive and who will die”.

Epidemiological studies aimed at estimating the etiologic fraction of lung cancer attributable to occupational exposures to carcinogenic substances, thereby indirectly assessing the outcome of the efforts made by occupational health professionals in the identification and removal of risk factors at the workplace. These studies confirmed that primary prevention remains the most effective way to reduce the burden of occupational diseases, thus acknowledging Bernardino Ramazzini’s intuition that prevention is better than cure, a statement laid down in elegant Latin already three centuries ago: *satius est praevenire quam curare, sicut satius est tempestatem praevidere ac effugere quam ab illa evadere* (to prevent is wiser than to cure, as it’s wiser to

foresee and avoid a storm rather than to get in and to escape from it).

Scientists who had participated in the workshop and all those involved in the project were invited to submit a paper for publication. The peer review process took some time and also required a few painful decisions. We thank all the authors for their valuable contribution, patience, and understanding.

We trust that this special issue will provide useful information to update a rapidly evolving field, giving an example of integration among scientists who address the same issue – occupational lung cancer – from different and complementary perspectives, including basic, clinical and epidemiological research.

Sergio Iavicoli, MD PhD

National Institute for Occupational Safety
and Prevention (ISPESL)

Prof Antonio Mutti, MD

Department of Clinical Medicine,
Nephrology and Health Sciences
University of Parma