The latter half of the 20th century brought with it a sharpened awareness that environmental factors can play critical roles in the pathogenesis of many diseases. While this newfound knowledge has led to some changes in public policy and clinical practice, many questions regarding the importance of environmental factors in promoting health and preventing disease have yet to be answered. As we explore the impact of environmental agents on the biologic process, it is increasingly difficult to differentiate significant findings from the insignificant—and to translate basic research findings into clinical practice.

Challenges in environmental medicine are of particular importance to the osteopathic medical profession, as increased public awareness often causes patients to seek physician advice—with the expectation that healthcare providers will be knowledgeable in new areas of research. Given the osteopathic medical profession’s holistic approach to healthcare, a commitment to promoting and advocating public knowledge of and scientific research in environmental medicine seems an appropriate goal. The developments in the field of environmental medicine may present the osteopathic medical profession—and colleges of osteopathic medicine in particular—with significant opportunity to expand current research efforts.

Osteopathic medical professionals addressed key topics in environmental medicine at the 2001 American Osteopathic Association Research Conference, which was held in conjunction with the 2001 Convention in San Diego, Calif, October 7-11, 2001. The theme of this year’s conference, which was chaired by Walter Prozialeck, PhD, Department of Pharmacology, Chicago College of Osteopathic Medicine, Midwestern University, Downers Grove, Ill, was “Environmental Factors in Health and Disease.” One major conference objective was to explore methods of implementing basic research in the environmental health sciences into clinical practice.

All about oxidants and aging; zebrafish and the study of endocrine descriptors

Cutting-edge research in the environmental health sciences being conducted at colleges of osteopathic medicine headlined the opening session titled “Mechanisms of Response to Environmental Agents.” Robert W. Gracy, PhD, University of North Texas Health Science Center, Fort Worth, Tex, reviewed the role environmental oxidants play in the processes of aging and neurodegeneration and presented his research results demonstrating that oxidative damage to proteins is not random, but occurs preferentially to specific “oxidation-sensitive proteins” (OSPs). Recent studies indicate that some of these OSPs may serve as biomarkers for neurode-
generative conditions such as Alzheimer’s disease and that such markers may be useful for detecting disease in early stages, monitoring the progression of disease, and evaluating the efficacy of various modes of therapy.

A presentation about research that uses zebrafish as a model system for studying the effects of endocrine disruptors widely present in the environment and whose biologic significance is largely unknown was presented by Ann Poznanski, PhD, Arizona College of Osteopathic Medicine, Midwestern University, Glendale, Ariz. Dr. Poznanski’s preliminary results indicate that exogenous steroids can profoundly affect the development of forebrain reproductive centers in the zebrafish, and she is attempting to determine whether such effects are relevant to the actions of these compounds in humans and other animals.

**All about the role bacterial pathogens play in Alzheimer’s disease**

In the final presentation of the session, Denah M. Appelt, PhD, Philadelphia College of Osteopathic Medicine, Philadelphia, Pa, discussed her work on the possible role of the bacterial pathogen, *Chlamydia pneumoniae*, in Alzheimer’s disease (AD). Dr. Appelt’s work is based on the findings of Brian J. Balin, PhD, and coworkers at the Philadelphia College of Osteopathic Medicine, that indicate *C. pneumoniae* is present in the autopsied samples from 19 control subjects revealed only one subject with positive results. Since the results of the original study were reported, 15 additional AD brains have been shown by researchers to test positive for *C. pneumoniae*. Dr. Appelt’s studies demonstrate that *C. pneumoniae* may not only gain access to the central nervous system indirectly through the blood-brain barrier within monocytes, but also directly through infection of brain endothelia, thereby contributing to the inflammatory component that is now known to play a key role in the pathogenesis of Alzheimer’s disease.

**All about microbes and chronic disease; Herbal remedies as complicating factors in diagnosis and treatment of disease**

One of the highlights of the second day’s program, which was titled “Environmental Factors in Chronic Disease States,” was a presentation about the role that microbial agents play as environmental factors in chronic diseases such as rheumatoid arthritis, cancer, hypertension, and Alzheimer’s disease by Brian J. Balin, PhD. Referring to his work on the role of *C. pneumoniae* in late-onset, sporadic Alzheimer’s disease, Dr. Balin emphasized that microorganisms can sometimes demonstrate unconventional behaviors and affect the interplay between genetics and the environment, thereby influencing the onset and progression of chronic disease. For example, microorganisms such as *C. pneumoniae* can establish subclinical, asymptomatic...
infections. By the time a patient begins to exhibit clinical symptoms, the long-term effects of the infection may already be irreversible and life-changing.

Wolfgang H. Vogel, PhD, Thomas Jefferson University, Philadelphia, Pa, then discussed the importance of herbal remedies and nutritional supplements as complicating factors in the diagnosis and treatment of disease. Dr. Vogel underscored the fact that these non-traditional remedies are not subjected to the same regulatory scrutiny as prescription drugs and, therefore, their safety and efficacy have often not been evaluated adequately. As both types of medications are widely used, and as they may aggravate existing pathologic conditions or interact with other drugs concurrently taken by patients, it is essential that physicians question patients about their use of these remedies. In addition, healthcare professionals need to familiarize themselves with unbiased sources of information on these agents so that they can counsel their patients appropriately.

All about genetics and the environment; Evaluating the risks of chemicals

The final session of the research conference, titled “Perspectives on Environmental Health Research in the New Millennium,” included speakers from academia, clinical practice, industry, and government who provided unique perspectives on current trends and issues in environmental health research. Of particular note, William D. Atchison, PhD, Michigan State University, East Lansing, Mich, gave an outstanding presentation emphasizing the interplay between genetics and the environment in how individuals respond to environmental pollutants such as lead and methylmercury. Another highlight of this session was a presentation concerning the complex problems that arise when evaluating the safety and risks of industrial and environmental chemicals by Roger O. McClenann, PhD, former president of the Chemical Industry Institute of Toxicology, Research Triangle Park, NC. Dr. McClenann stressed that while sufficient data on humans are available to assess the health risks of certain chemicals, the same data are not available for many others. Currently, it is necessary to make extrapolations from laboratory animal species to humans and from the high doses used in research settings to the low doses that are more likely in human exposures. In many cases, data from animals, such as rats, can adequately predict human toxicity. In other instances, however, rats have unique characteristics and the toxicity data do not accurately predict the presence or absence of effects in humans. Such cases point up the importance of not relying solely on data from a single species to estimate human health risks.

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The Bureau of Research supports an annual Research Conference held each year in conjunction with the AOA Annual Convention and Scientific Seminar. This event promotes research throughout the profession by offering a forum for scientists and clinical investigators to present their research findings. It also provides an opportunity for attendees to discuss mutual research interests that may lead to collaboration, and encourages students of osteopathic medicine to become more involved in research activities.

The conference will be held October 7–10, 2002, in Las Vegas, Nevada. The theme for this year’s conference is “The Role of Complementary and Alternative Medicine in Primary Care Practice” and will be cochaired by Robert J. Theobald, PhD, and Michael L. Kuchera, DO, both of the Kirksville College of Osteopathic Medicine.

The deadline for abstracts is April 15, 2002. For more details on abstract submission, grants, fellowships, and awards, visit our Web site: www.aoa-net.org, under Research & Grants.