

SCIENCE

Patterns of Aging

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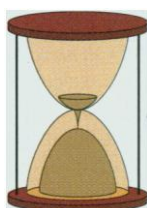
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A Special Report



One of the most profound changes of recent years has been the dramatic aging of populations everywhere. This graying of the world is a tribute to the success of such modern public health measures as vaccines and improved sanitation. At the same time, as the first three reports in the News section that begins this special issue on Patterns of Aging show, it is posing serious problems for societies and governments worldwide as the costs of caring for their elderly populations soar.

But the news on the aging front is not all grim. Indeed, aging research is flourishing as the combined power of genetics and molecular biology provides new clues about the causes of aging. In his Article on the genetics of aging, for example, S. M. Jazwinski describes the isolation of mutants that lengthen or shorten life-spans in species that are extremely amenable to genetic studies, such as yeast, the fruit fly *Drosophila melanogaster*, and the worm *Caenorhabditis elegans*, as well as in rodents and man. The Article by J. R. Smith and O. M. Pereira-Smith describes additional molecules, including tumor suppressors, found to be important in cellular senescence. Such information may one day lead to longer, perhaps healthier, lives.

So far the one environmental manipulation that reliably extends life-span, at least in rodents, is caloric restriction. As R. S. Sohal and R. Weindruch outline in their Article; several lines of evidence now suggest that caloric restriction may lengthen life because it slows down the oxidative damage that may underlie aging. Lithgow and Kirkwood echo this theme in their Perspective, where they argue that the ability to withstand stressors (such as oxidizing molecules) may be the key requirement for a longer life-span.

Two more Articles look at critical physiological systems that decay with age. P. Wise *et al.*'s review on menopause concludes that both the neuroendocrine control system of the brain and the aging ovary contribute to the loss of female reproductive capacity with age, while R. A. Miller describes changes in the immune system that increase the risk of certain diseases with age. And the last two reports in the News section describe some hopeful new results about the aging brain. One story deals with evidence suggesting that the normal brain may not suffer as much damaging neuronal loss with age as once thought, and the other describes a host of efforts aimed at finding ways to treat or prevent the neuronal loss that does occur in Alzheimer's disease. Finally, for links to World Wide Web sites with more information on the topics covered in this Special Issue, visit the Science home page at <http://www.sciencemag.org/>.

—Katrina L. Kelner and Jean Marx, Editors

