



San Jose State University, combined government and other data and found that about 6500 Americans died and 13.2 million were hurt in work-related incidents in 1992. Those data translate into US\$65 billion in direct costs and another US\$106 billion in indirect costs.

In comparison, the direct and indirect costs of heart and blood-vessel diseases totalled US\$164.3 billion, and cancer carried a price tag of US\$170.7 billion. In 1992 AIDS

costs totalled US\$30 billion and Alzheimer disease US\$67.3 billion. The study appeared in the *Archives of Internal Medicine* in July.

Shortage of pediatric ophthalmologists

The Canadian Ophthalmological Society (COS) has warned of a pending shortage of pediatric ophthalmologists. In a letter to members in the COS newsletter, *Perspectives*,

Dr. Ian MacDonald, chair of the COS Council on Eye Care, says not only are there not enough pediatric ophthalmologists but also the shortage extends to those in training as well. MacDonald, chair of the University of Alberta's Department of Ophthalmology, recently collated and reviewed a physician resource survey for the COS. The results are expected to be released at the COS Board of Directors meeting next month.

Research Update • Le point sur la recherche

Lean, mean metabolic machine

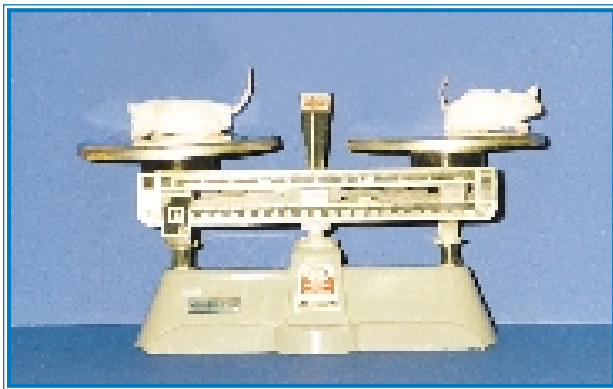
Mice genetically engineered to lack a protein that "turns up" the metabolic rate were expected to be obese but they surprised researchers by staying lean, even when fed a high-fat diet (*Nature*

and non-insulin-dependent diabetes mellitus (NIDDM). Dr. Mary-ellen Harper, a coauthor of the *Nature* article and an assistant professor of biochemistry at the University of Ottawa, explains that "this is a major advance in our understanding of cellular energy me-

Researchers first discovered uncoupling protein 1 (UCP1), which is found in brown adipose tissue and produces heat for the body. A second protein (UCP2) is found in various tissues and is thought to maintain an "idling rate" of tissue oxygen consumption. Messenger RNA for this protein was up-regulated in the mice deficient in UCP1, which may have enabled them to remain lean. Very recent findings suggest there is a family of uncoupling proteins. A new member, UCP3, is found in skeletal muscle in humans. At least 2 other forms are thought to exist in other tissues.

"These proteins must have a fundamental physiologic purpose," Harper says. "Otherwise, why would such energy-wasting processes have stuck around throughout evolution?" Understanding the complex interactions of these proteins in maintaining metabolic rate may eventually lead to new treatments for obesity.

A review of research on obesity and uncoupling proteins by Harper was published in the August issue of *Clinical and Investigative Medicine* (1997; 20:239-44), which is published by the CMA. — C.J. Brown



Mouse deficient in uncoupling protein 1 (left) was expected to be obese, but remained as lean as control mouse (right), probably because of other newly discovered uncoupling proteins that compensated for the lack of UCP1.

1997;387:90-4). The reason probably lies in newly discovered proteins that compensate for the deficiency of the other protein.

The discovery of the new proteins, dubbed "uncoupling" proteins, is revolutionizing researchers' view of basal metabolic rate, obesity

and the ability of tissues to respond rapidly to the need for ATP [adenosine triphosphate]." She believes the discoveries will improve understanding of people's susceptibility to obesity and NIDDM, which develops in some, but not all, obese people.