Attack of the killer lymphocytes

Immune system cells that attack unwanted bacteria can also turn on certain healthy cells, researchers at Johns Hopkins University have discovered. The finding goes a long way in explaining the link between bacterial infections and the development of autoimmune diseases such as arthritis (*Nat Med* 2000;6:215-8).

"We've found this evidence that the immune system can be fooled, and it suggests subtle changes that could underlie many autoimmune diseases," says Dr. Mark Soloski, an associate professor of medicine at Johns Hopkins.

The researchers infected mice with salmonella bacteria, then observed the behaviour of a typical bacteria-fighting immune cell, the cytotoxic lymphocyte (CTL), as it approached infected body cells. Cells invaded by bacteria normally give clear signals that they're infected. Attracted by this protein "flag," CTLs dock with the infected cells and trigger their rapid self-destruction. (This protein flag in infected mice is one that is common to certain bacteria associated with human arthritis, including *Borrelia burgdorferi*, which causes Lyme disease.) However, the researchers also found that the bacterial flag was almost identical to parts of a "universal housekeeping molecule" found in humans, mice and all living organisms that help proteins keep their shape. When the researchers coaxed the mouse cells to display this salmonella flag, their CTLs would readily attack. But they also went into attack mode if the cells displayed a piece of the mouse's own housekeeping molecule or the identical human version. "These cells have the potential to go over and destroy our own cells," notes Soloski. "Surprisingly, we found these cells were a dominant response in over half the animals. . . . There are hints the same thing is going on in humans."

It is still too early to assume a cause-and-effect relation between certain bacteria and specific autoimmune diseases, he adds. "We're not moving yet to state that arthritis is caused by a bacterial infection, but we're looking closely [at the idea] that some forms of arthritis may be triggered by this." — *Donalee Moulton*, Halifax

Saving saliva function during treatment for head and neck cancer

Two Edmonton doctors have pioneered a new surgical procedure that significantly boosts quality of life for patients with head and neck cancer by preserving saliva functioning.

The novel method, developed by Drs. Naresh Jha and Hadi Seikaly of the University of Alberta, involves permanently moving 1 of the 6 main (submandibular) saliva glands from under the jaw to beneath the chin, where it is more easily shielded from radiation during treatment. This rerouting of blood flow, nerve supply, and saliva drainage to the relocated gland, which adds only 45 minutes to initial cancer surgery, is performed before radiation therapy starts.

Preliminary results of the team's prospective trial (*Int J Radiat Oncol Biol Phys* 2000;46[1]:7-11) confirm that the approximately 300 mL of saliva produced daily by a single gland is enough to prevent dry mouth. "We all know that patients can function with one kidney or one lung," says Jha, an associate professor in the U of A's Department of Oncology. "Our hope was that if we were able to save one major salivary gland, it would produce enough saliva to take care of the dryness problem."

Cancer of the head or neck is typically managed with some combination of surgery, radiation treatment and chemotherapy. The radiation component, however, destroys all of the patients' saliva glands, leaving patients with a permanent dry mouth (xerostomia). Besides causing problems with speech, chewing, tasting and swallowing, this condition also leads to loss of appetite and body weight, and to tooth decay.

Jha estimates that the new procedure could benefit up to three-quarters of all patients with head and neck cancer. The remaining 25% of patients with cancer of the nasopharynx or oral cavity, or with bilateral neck nodes, are not eligible for the operation.

Since getting the green light for their prospective trial from the Alberta Cancer Board in June 1999, Seikaly has successfully performed 30 of the operations through Edmonton's Cross Cancer Institute. While they won't have long-term follow-up results for at least another year, the pair is continuing to do the procedure outside of the trial. "Based on the very favourable preliminary results," says Seikaly, assistant clinical professor in the Department of Otolaryngology, Head and Neck Surgery, "we feel it is unethical not to offer it to patients." — *Greg Basky*, Saskatoon

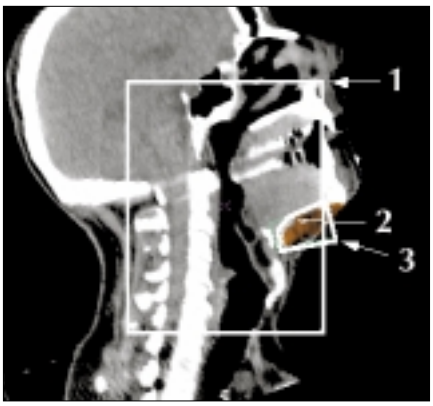

Diagram shows how the relocated salivary gland is shielded from radiation: 1) area affected by radiation (radiation field); 2) wire defining posterior border of salivary gland relocated to below the chin; 3) area shielded from radiation during therapy.