



## Alternative centre for cancer treatment opens in US

Alternative cancer treatments appear to be entering the mainstream in the US. This spring the Gerson Institute opened its first “alternative cancer treatment centre” in Arizona. The centre, which has been licensed by the Arizona Department of

Health, employs physicians, homeopathic doctors and nurses. The institute, founded by the late Dr. Max Gerson, uses a therapy that stresses the importance of diet, detoxification and “therapeutic supplementation to reactivate and strengthen the immune system.” The Arizona centre joins an existing Gerson facility operating in Mexico.

No scientific proof of the Gerson

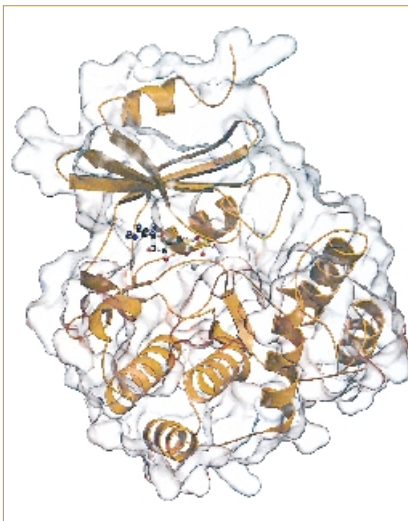
treatments has been published in a major peer-reviewed journal, although a report on melanoma treatment appeared in *Alternative Therapies in Health and Medicine* in September 1995. Many insurance companies still balk at paying for the treatment. The institute says about 60% of patients treated in Mexico have been reimbursed by their insurance carriers.

### Research Update • Le point sur la recherche

#### “Pacman” enzyme gobbles antibiotics

Canadian researchers have characterized an enzyme that allows some enterococci and staphylococci to resist aminoglycoside antibiotics (*Cell* 1997;89:887-95). The discovery of the enzyme’s structure provides vital clues to antibiotic resistance and how to combat it.

The enzyme, aminoglycoside kinase APH(3’)-IIIa, acts like the old



Three-dimensional structure of aminoglycoside kinase APH(3’)-IIIa. The transparent surface shows the shape of the enzyme, the gold ribbon shows the actual fold of the polypeptide chain and the balls and sticks show the ADP molecule, which is used as a cofactor.

arcade game known as Pacman or like a crocodile, says principal investigator Dr. Albert Berghuis, an assistant professor of biochemistry at McMaster University. Normally, when antibiotics are taken to combat bacterial infections “the aminoglycosides should sit on top of the ribosomes [of the bacteria] that synthesize proteins,” stopping the synthesis process and killing the bacteria. However, in resistant bacteria “the enzyme captures the antibiotic and modifies it such that the antibiotic does not want to sit on top of the ribosome. So now the antibiotic is a harmless compound — harmless to the bacteria, that is. If we think of the enzyme as a crocodile, we now know the size, shape and strength of its jaws and can thus design a bait to prevent the crocodile from detoxifying antibiotics.”

This mechanism is the one involved in resistance to aminoglycosides such as amikacin, streptomycin and gentamicin, which are used mainly in hospitals rather than in the community. Other types of antibiotic resistance involve different mechanisms. The enzyme in question is found on opportunistic enterococci and staphylococci, which have been implicated in some outbreaks of antibiotic resistance in hospitals.

One of the discoveries by

Berghuis and his team is the enzyme’s startling similarity to eukaryotic protein kinases. Protein kinases are enzymes involved in processes such as growth and blood-glucose regulation, and accidental mutations in these enzymes often lead to cancer. The similarity between enzymes involved in antibiotic resistance and those involved in cancer implies that aminoglycoside kinases are not new enzymes, created by our misuse of antibiotics, but are more than a billion years old. Berghuis believes that the enzymes are remnants of ancient biologic warfare waged long before human evolved.

“What has happened over the last 50 years through the overuse of antibiotics is that we have carefully selected for bacteria that still retained these left-over defence systems,” Berghuis explained. “These resistant strains are now displacing most ‘normal’ bacteria in our ecosystem.” — C.J. Brown

#### Chickenpox running scared

A vaccine against chickenpox is receiving its first trial in Canada, with 3 hospitals taking part in a manufacturer-sponsored trial of the vaccine’s safety. Dr. Francisco Diaz-Mitoma of the University of Ottawa, a prin-



cial investigator, says 500 children will be enrolled through the Children's Hospital of Eastern Ontario in Ottawa, the Vancouver Children's Hospital and the IWK Grace Health Centre in Halifax.

Although chickenpox is usually just an annoying childhood ailment, Diaz-Mitoma said 1 in 200 children who contract it are admitted to hospital with complications such as hepatitis, encephalitis, arthritis or pneumonia. For malnourished children or children with immunosuppression caused by leukemia, chickenpox can be life threatening. The disease can also lead to lost work days for parents, a significant rate of illness in adults and outbreaks in hospital wards. The vaccine, manufactured by SmithKline Beecham, has proved more than 90% effective in other countries, not only in healthy children but also in those with leukemia, who stand to benefit from the prevention of chickenpox and its sequelae.

A similar vaccine was launched in Japan in 1984 but had to be stored at  $-20^{\circ}\text{C}$  to maintain its potency. The new formulation can be stored at  $2^{\circ}\text{C}$  to  $8^{\circ}\text{C}$ , making it much easier to include in routine vaccination schedules. SmithKline Beecham is sponsoring this trial and plans to seek approval for the vaccine's use in Canada.

The vaccine contains an attenuated form of the varicella virus; as a result, up to 4% of children vaccinated in previous trials have had a minor rash and chickenpox lesions (usually less than 10) following vaccination. However, these effects are not as severe as the disease itself. It

is not yet known what impact vaccination has on the risk of shingles. —  
*C.J. Brown*

## Culprit unmasked in multiple myeloma

Multiple myeloma is caused by the recently discovered Kaposi's sarcoma-associated herpesvirus, US researchers have found (*Science* 1997;276:1851-4). Multiple myeloma is the second most common type of blood cancer in the US. Research had focused on why it develops in only 25% of patients with a precursor condition (MGUS). The researchers believe that both MGUS and the virus, which infects the dendritic cells in the bone marrow, may be needed for multiple myeloma. The virus does not infect the actual cancer cells, leading researchers to suspect that it causes cancer by producing a protein (interleukin-6) that stimulates the growth of myeloma cells.

## Finasteride over watchful waiting

A pooled analysis of 3 studies involving data from 49 countries shows that finasteride significantly reduces the risk of acute urinary retention and the need for surgical intervention over 2 years of use in men with benign prostatic hyperplasia (*Urology* 1997;49:839-45). One of the studies included in the analysis (the Proscar safety plus efficacy Canadian 2-year study [PROSPECT]) was published in *CMAJ* (1996;155:1251-9); the other studies are the Proscar worldwide efficacy and safety

study (PROWESS) and the Scandinavian reduction of the prostate (SCARP) study. In these combined studies, finasteride resulted in a 57% decrease in the hazard rate for acute urinary retention and a 34% reduction in the hazard rate for surgery, compared with placebo.

## In the news . . .

### Putting an end to fears about power lines

Concern about a possible link between high-voltage power lines and leukemia was sparked in 1979 with the publication of a study showing there was twice the risk of cancer among children living near power lines. Now a rigorous case-control study has found no evidence of such a link. The new study (*N Engl J Med* 1997;337:1-7) examined 638 children under age 15 with acute lymphoblastic leukemia (ALL) and 620 controls. Data collectors blinded to the children's health measured magnetic fields in the children's bedrooms and other parts of their houses, and in the houses where the mothers had lived while pregnant. The distance to power lines and the configuration of those lines was also examined. Analysis showed that the risk of ALL was not associated with either the magnetic-field levels in the home or the distance or configuration of power lines.