
CEA news: The good and the bad

When scientific hopes are dashed, they sometimes produce consolation prizes. Such appears to be the case for the carcinoembryonic antigen (CEA), which was acclaimed a decade ago as a promising diagnostic marker for colon cancer. Both the good and bad news were among the conclusions of a recent National Institutes of Health consensus development conference on CEA.

The eight-member conference panel, led by David M. Goldenberg of the University of Kentucky Medical Center, included both basic and clinical investigators of CEA. Their task, over a three-day period, was to review all data on CEA as a cancer marker and to provide physicians and the public with guidelines on when the antigen should and should not be used to manage cancer.

Among their comments about CEA, the panel noted that although elevated levels of the antigen in the blood at first appeared to be specific for colon cancer (SN: 4/4/70, p. 346), it has since become apparent that elevated levels can also be found in patients with other kinds of cancers, especially of the gastrointestinal tract,

pancreas, ovary, lung and breast; patients with ulcerative colitis, Crohn's disease, pancreatitis, liver disease, lung infections and other inflammatory disorders; patients with benign neoplasms; and cigarette smokers. Thus, the panel concluded, elevated CEA levels should not be used to screen an asymptomatic population for colon cancer or for any other cancer. Nor should CEA be used to independently diagnose colon cancer or any other cancer in a symptomatic population, the scientists said.

The panel noted, however, that CEA monitoring is valuable for determining whether colorectal cancer retreats or spreads during the course of therapy. In fact, the panel members agreed, CEA is "the best presently available noninvasive technique" for this purpose. On the other hand, they cautioned, it is too soon to say whether CEA monitoring is valuable for tracking other cancers during the course of therapy.

The conference members also identified some areas for future research that may improve the value of CEA in managing cancer, such as studying CEA in combination with other tumor markers, and seeing whether CEA in fluids other than blood is more specific as a marker for various cancers than is the presence of CEA in the blood. □

HDL's: Possible role in cancer

Sometimes the public can't seem to win where disease prevention is concerned. This appears to be the case with the blood components known as high density lipoproteins (HDL's). During the past several years evidence has been accumulating suggesting that HDL's help prevent heart disease (SN:2/4/78, p. 72; 4/22/78, p. 244). Now, according to a report in the Sept. 20 LANCET, HDL's appear to be only a modest preventive against fatal heart attacks. What's more, they appear to be a risk factor for cancer. These disclosures come from Ancel Keys of the University of Minnesota School of Public Health in Minneapolis.

In 1947 Keys and his colleagues launched a long-term, prospective study of heart attack risk factors. They gave 284 business and professional men detailed physical examinations, kept track of the men over subsequent years to see which died from heart attacks, then looked to see whether the heart attack victims had shared certain physical characteristics while young. If the difference between the two groups on a particular physical factor was statistically significant, then it was probably not due to chance, and the investigators could conclude that the factor helped predispose the victims to their heart attacks.

One of the factors for which subjects had been measured was blood levels of HDL's. Now, a quarter-century later, 55 of

the subjects have died from heart attacks, and Keys has determined that their mean HDL level when they were young and healthy was 43.38 milligrams per deciliter, whereas the mean HDL level of subjects who are still healthy was 45.97 mg/dl. Thus, the HDL's of the men who died from heart attacks had been lower than those of still-healthy subjects. However, the difference in mean HDL's between the heart attack victims and still-healthy subjects is not statistically significant, suggesting, contrary to previous studies, that if HDL's protect against fatal heart attacks at all, their protection is modest at best.

But the data from this long-term prospective study have revealed an unexpected link between HDL's and cancer. The mean HDL level when young of the 30 men who died from cancer was 49.71 mg/dl, compared with 45.97 mg/dl for still-healthy subjects — a statistically significant difference. In contrast, 48 men in the study died from accidents, strokes, pneumonia, emphysema or causes other than heart attacks and cancer, and their mean HDL levels when young measured 46.84 mg/dl, compared with 45.97 mg/dl for still-healthy subjects — a nonsignificant difference. Thus, whether high levels of HDL's protect against fatal heart attack or not, they definitely seem to be a risk factor for cancer, and Keys concludes that their presence thus, "may be a mixed blessing for long-term survival." □

Particle shower sprays upward

In an attempt to observe neutrinos reaching earth from cosmic sources, detectors were placed deep in a mine in the Kolar Gold Fields in India. These detectors have recorded a phenomenon that is quite startling, according to a report by Gaurang B. Yodh of the University of Maryland to the Wisconsin Miniconference on Neutrinos with Mass, held recently at Cable, Wis. Yodh is not a participant in the work, but is acquainted with the people doing it. Krishnaswamy et al. and Achar et al. are the main groups, he says.

The surprise is so-called anomalous cascades. These are huge showers of particles appearing in the detectors, sometimes more than 1,000 different particles per shower, all diverging from a common point of origin. This suggests that something very energetic struck an atomic nucleus in the rock to produce the cascade.

That something has to have a great deal of energy, upwards of a trillion electronvolts (1 TeV). The cascades tend to enter the detector horizontally, and at least one came vertically from underneath. It seems only neutrinos have the penetration to pass through the whole earth like that to generate the cascade. So interesting are these phenomena that a detector now operating in the Baksan Valley in the USSR will look for them, and another is planned in the Homestake Mine in South Dakota. However the cascades may affect the questions about neutrinos now agitating particle physicists, they are themselves, as Yodh says, "a challenge to theorists to explain." □

Microelectronics: Job boon or peril?

Like it or not, the world has embarked on a microelectronic revolution that is expected to surpass the industrial revolution in the breadth and speed of cultural and technological changes it carves. A report by the Worldwatch Institute in Washington outlines the potential sweep of its influence, including what jobs may get swept under the carpet in the streamlining of our society.

Spawned by the development of the transistor in 1947, microelectronics first began to make their mark in 1959 with the introduction of the integrated circuit (IC) — a packaged batch of transistor circuitry wired together on a small silicon chip. In time, other electronic components such as diodes and resistors made their chip debut. But a major breakthrough came in 1971 when the firm Intel Corp. ushered in microprocessors that essentially offered the entire central processing unit of a computer — complex circuitry to process