In another experiment, the diets of nearly mature females were spiked with 0.5 to 0.05 percent CLA for 38 weeks, beginning just 2 weeks before a single dose of a chemical carcinogen. Though animals in the group receiving the highest dose developed less than half as many mammary tumors as untreated rats, even those receiving the least CLA showed evidence of protection: They developed just 78 percent as many cancers as untreated animals.

Concludes Ip's team, "CLA is by far the most powerful naturally occurring fatty acid known to modulate [tumor formation]."

"What makes this really amazing is that [the lowest active dose] is within the range of what people can eat," says Michael W. Pariza, director of food microbiology and toxicology at the University of Wisconsin-Madison.

First isolated 10 years ago from hamburger, CLA now appears "to be present in any warm-blooded animal," notes Pariza, one of CLA's discoverers. Studies he has headed indicate that the highest concentrations of CLA occur in red meats, turkey, milk, and cheese (SN: 2/11/89, p.87).

But before people use the new findings to sanction pigging out on bacon, heavy cream, and high-fat cheeses, Ip urges caution. CLA keeps company with some unhealthful companions. Not only do animal products tend to carry high proportions of saturated fats and cholesterol — risk factors for heart disease — but they also contain CLA's parent, linoleic acid. Excessive quantities of linoleic acid have been associated with fostering cancer development.

If CLA continues to prove promising, Ip suspects manufacturers will respond by chemically or microbially treating foods to convert more of their ordinary linoleic acid into CLA.

Research by Pariza's team now suggests that CLA may also prove beneficial in treating cachexia, a wasting that occurs when the body catabolizes — burns up — muscle in an attempt to meet the high energy demands of fighting certain chronic diseases, such as malaria or cancer.

The Madison-based researchers fed some mice and chickens normal diets; others got diets supplemented with 0.5 percent of either fish oil or CLA. After a week or two, all animals received an injection of a bacterial poison that induces temporary cachexia. Untreated animals and those supplemented with fish oil suffered twice the weight loss of animals supplemented with CLA, Pariza and his coworkers report in the Feb. 28 BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS.

Even more important, Pariza points out, in contrast to several other promising treatments being considered for cachexia, "CLA reversed the catabolic effects without suppressing the immune system." Indeed, he says, these new data suggest "that CLA really is a growth factor — a nutrient that hasn't been previously identified." He now suspects that CLA achieves its many beneficial effects through some common pathway involving hormonelike substances in the body known as prostaglandins.

— J. Raloff

Map of Mars helps solve a dark mystery

A new perspective on old images of the Red Planet may provide planetary scientists with a better understanding of several Martian features, including a vast dark region that has puzzled researchers for decades.

Astronomers have long speculated about the processes that formed and preserved Cerberus, a dark, gently sloping region just north of the Martian equator that has roughly half the width of the United States. Many areas of Mars are coated with a highly reflective layer of fine dust and appear bright red.

But Cerberus remains dark, its whale-shaped silhouette contrasting with its bright surroundings. And unlike other dim areas of Mars, Cerberus has no obvious origin. For example, it is not a depression, which could trap dark sand.

Researchers have suggested two theories for the creation of Cerberus' dim countenance. In one scenario, a wind of sand particles periodically scours this section of the Martian surface, removing dust and exposing the dark, underlying bedrock. In the second scenario, sand blankets the area instead of scouring it, forming a dimly reflective surface akin to the black sand beaches of Hawaii. But each proposal poses the same puzzle: Where does the sand come from?

A new global map of Mars, based on pictures taken by both Viking Orbiters between 1976 and 1980, should help solve the riddle. To better study the reflectivity and geology of Mars' surface, Alfred S. McEwen, Laurence A. Soderblom, and their colleagues at the U.S. Geological Survey in Flagstaff, Ariz., used computer technology to combine two types of images taken by the Orbiters.

One set of images, recorded with red and violet filters when the sun stood almost directly overhead, best reveals the color and reflectivity of the surface. However, the flat, overhead lighting makes it difficult to discern topography. In contrast, the other image set — recorded when the sun was low in the sky — has many more shadows, a feature that accentuates the shape and height of the Martian terrain. However, the sun's illumination angle obscures the color and reflectivity of the surface.

Merging the two image sets, a feat that required the processing of some 5,000 pictures, "provides the best of both worlds," McEwen says.

At the annual Lunar and Planetary Science Conference in Houston this week, his team displayed the fruits of their labors: a planetwide map of Mars that reveals both color and topography.

The map sheds new light on dim Cerberus. Researchers already knew from the orientation of bright and dark streaks that prevailing winds blow across the region from northeast to southwest. This suggests that if a source of dark sand exists, it lies in Cerberus' northeast region, McEwen says.

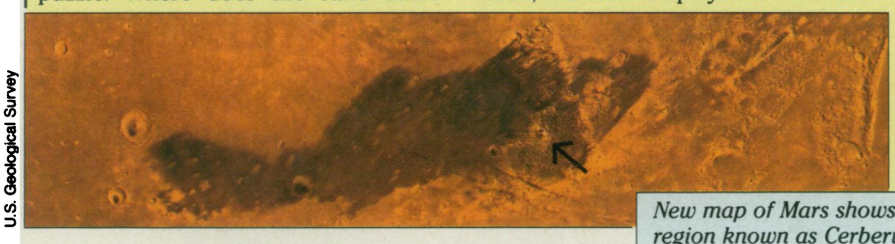
That's intriguing, he adds, because the northeast section has a terrain unlike any other part of Cerberus. The new map shows that this section consists of knobby remnants of ancient highland crust that stick out above a lava flow. The lava indicates past volcanic activity there.

A large body of evidence now suggests that Mars' highland crust contains the planet's major reservoir of water, stored as ground ice since an earlier, wetter epoch on the planet. When a volcano erupts near such a reservoir, the lava slams into the storehouse of ice, causing small explosions, McEwen notes.

The explosions create a glassy material known as palagonite, an excellent source of dark, sand-size material, he adds. Thus, suggest McEwen and his colleagues, a thick deposit of palagonite in the northeast corner of Cerberus appears to have created the entire 2,000-kilometer-long dark region.

With the mystery of Cerberus' formation most likely solved, McEwen says he and his team look forward to comparing their maps to those expected from future missions to the Red Planet, including NASA's Mars Surveyor.

— R. Cowen



U.S. Geological Survey

New map of Mars shows the dark region known as Cerberus, including section of ancient highland crust (arrow).