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# BIOMEDICINE

#### Zinc and rheumatoid arthritis

Rheumatoid arthritis is characterized by swelling of the joints, severe pain and crippling. More effective and safe therapy is desperately needed. A pilot study conducted by Peter A. Simkin, a rheumatologist at the University of Washington in Seattle, now suggests that zinc supplements may alleviate many of the symptoms of rheumatoid arthritis and without bad side effects.

Since 1971 there has been increasing evidence that rheumatoid arthritis patients have far less zinc in their blood than do healthy persons. These results suggest that a zinc deficiency in fluids surrounding joints may be a cause or a serious aggravator of the disease. So Simkin conducted a preliminary trial to see whether oral zinc supplements might help patients.

Zinc sulfate (220 milligrams three times daily) or placebo capsules were added to the existing therapy of 24 rheumatoid arthritis patients for 12 weeks. This double-blind trial was followed by an open 12-week period when all subjects took zinc. During the double-blind phase, zinc-treated patients fared better than controls with regard to joint swelling, morning stiffness, walking time and the patient's own impression of overall disease activity. The indices and joint tenderness also improved with zinc treatment in both groups of subjects during the second 12-week period.

"These encouraging results," Simkin concludes in the Sept. 11 LANCET, "indicate that oral zinc sulfate deserves further study in patients with active rheumatoid arthritis."

#### The complement cascade

When the immune system rallies an attack against a virus, bacterium or other purported enemy of the body, T cells, B cells, antibodies and macrophages are not the only members of the troops that swing into action. Still another important group of fighters is the complement brigade.

How the nine complement proteins fight an enemy is highly complex and not altogether understood. However, research reported in the August Proceedings of the National Academy of Sciences suggests that the proteins kill an enemy cell by producing a stable channel in its lipid membrane.

David W. Michael and his team at Johns Hopkins University School of Medicine have found that the ion permeability of a lipid membrane increases greatly when complement protein numbers 5, 6, 7, 8 and 9 make contact with the membrane in the sequence in which they are numbered. If the proteins do not make contact with the membrane in this sequence, there is no marked change in the permeability of the cell membrane.

However, there is yet little information on the mechanisms by which the complement proteins might produce a channel.

## How vitamin E retards aging

Vitamin E is a promising antiaging agent. Several years ago, for example, Denham Harman of the University of Nebraska School of Medicine gave vitamin E to animals because it is a free radical inhibitor and he believed that free radical reactions, which are ubiquitous in living systems, might be a cause of aging. Sure enough, vitamin E extended the lives of the animals by 30 percent (SN: 3/18/72, p. 188).

Now further insight into how vitamin E may retard aging was reported by Harman at the recent 6th annual meeting of the American Aging Association. Since the immune system declines in effectiveness with age, Harman theorized that the decline might be due to the deleterious changes produced as a result of free radical reactions, and that vitamin E might therefore retard the aging of the immune system. When he gave vitamin E to old mice, it indeed improved their immune systems.

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