Transfer factor helps asthmatics

Transfer factor, a low-molecular-weight material derived from white blood cells, is the wunderkind of the body's immune system. When injected into patients, it can boost their cellular immunity and fight a wide range of enemies — cancer, slow and fast viruses, fungi and bacteria (SN: 2/9/74, p. 86; 12/13/75, p. 377).

Still another use for transfer factor is now emerging — the treatment of respiratory infection-induced asthma. Some asthmatics are subject to frequent respiratory infections which, in turn, trigger asthmatic attacks. These infections and attacks can be so severe that victims must be hospitalized. Antibiotics, bronchodilators and steroid hormone treatments don't help them very much. Amanullah Khan and his colleagues at the Wadley Institutes of Molecular Medicine in Dallas have now attempted to see whether shots of transfer factor, which are known to counter various viral and bacterial conditions, might help reduce viral or bacterial respiratory infections and associated asthmatic attacks in these patients.

Fifteen asthmatics subject to frequent respiratory infection-triggered asthmatic attacks, who hadn't been helped much by available treatments, were entered in a year-long study. Four patients who served as controls received saline injections for the first month of the study. The other 11 patients got shots of transfer factor. After one month, the four patients on saline were also switched to transfer factor. The patients were followed by a physician as well as by their own families, who maintained regular records of their asthmatic attacks, hospital admissions for respiratory infection-induced asthmatic attacks and steroid and antibiotic use for respiratory infection-connected asthma.

From the start of the study, the patients on transfer factor showed a slow, progressive decline in asthmatic attacks. The patients on saline experienced a slight rise in attacks. After patients on saline were switched to transfer factor, however, they experienced a dramatic drop in asthmatic attacks, and then a slow, progressive decline in attacks similar to that of patients on transfer factor from the start of the study. Patients' hospital admissions and antibiotic and steroid use also declined markedly as they continued to use transfer factor. What's more, none of the patients had any bad effects from transfer factor, and their acceptance of the treatment was excellent, as it helped them resume normal activities in life. Fourteen of the 15 patients are still getting transfer factor.

Khan and his co-workers thus conclude, in the April ANNALS OF ALLERGY, that "transfer factor has a role in the management of patients with frequent infections and asthma."

Not all attempts to use transfer factor have been so successful. For example, the idea of using transfer factor to treat multiple sclerosis, an incurable, progressive nervous system disease striking three million people throughout the world, was suggested in the early 1970s by John B. Zabriskie of Rockefeller University. Because a measles virus was suspected of causing multiple sclerosis in persons with an immune system incapable of responding to the virus, Zabriskie and his team injected transfer factor into eight multiple sclerosis patients to see whether it would prime their immune cells against measles virus and also counter their multiple sclerosis. As Zabriskie reported at a 1974 meeting, the patients' immune cells responded to the virus after treatment, and their neurological symptoms also appeared to abate somewhat. Zabriskie cautioned, however, that multiple sclerosis is notorious for the occurrence of spontaneous remissions and that the improvement they saw might not really be due to transfer factor (SN: 6/15/74, p. 383).

Then last year, Torben Fog and his coworkers at the Kommunehospitalet in Copenhagen ran a pilot study to see whether transfer factor might possibly counter multiple sclerosis, and obtained some intimations that it might. So they decided to undertake a carefully controlled double-blind study to see whether they could really document transfer factor's ability to slow or arrest multiple sclerosis.

They included 32 patients in this study, half of whom received transfer factor and half of whom received placebo injections. Each patient was usually examined by the same clinician using a neurological scoring system. To further reduce bias, the examiner was not aware of the scores obtained at the previous examination. Each sign and symptom was graded clinically and converted by a computer program into a total neurological deficit, expressed as a percentage of a hypothetical maximum, which quantified the state of the disease. The total neurological deficit was similar in both patient groups. For each patient, the deficit was plotted against time of study, and the rate of change of neurological deficit was calculated. The trial was planned to last three years with an initial analysis at 12 months, so that if there was no sign of a beneficial effect the trial could be stopped at this point.

As Fog and his colleagues report in the April 22 LANCET, the trial ended at 13 months because there was no significant difference in progression of neurological deficits over time between the placebo and transfer factor groups. None of the 32 patients improved during treatment, and 16 deteriorated significantly. Of these 16, 9 had received transfer factor and 7 placebos. All that transfer factor could be found to do was to temporarily restore patients' lymphocyte (immune cell) reactivity to measles virus. □

Instant biochemistry views photosynthesis

A Concorde jet travels just 60 angstroms in the amount of time an algae chlorophyll pigment remains excited by light. Studies of such fast biological reactions are only possible because experimental tools have improved in time resolution by a factor of a billion in the last 30 years, said Sir George Porter of the Royal Institution of Great Britain in London at the recent meeting of the National Academy of Sciences in Washington.

Although most chemical reactions require more than a few picoseconds, the shortest period currently accessible to laser spectroscopy, there are numerous applications for picosecond research in biology: the primary reactions in vision (SN: 9/17/77, p. 183; 10/1/77, p. 216), oxygen binding to hemoglobin, DNA response to ultraviolet light, and the first events in bacterial and plant photosynthesis.

The most recent advances in instrumentation allow scientists to scan a sample with repeated low-intensity light pulses. Earlier methods required a high-energy probe. In experiments on algae, the high-intensity pulses gave an erroneous measure of the lifetime of chlorophyll excited by light. When more than one photon is absorbed by a chloroplast, the excitations annihilate each other. Now, using light pulses less than 1 percent as intense but still only 5 picoseconds long, Porter and colleagues find the chlorophyll's excited state lasts 485 picoseconds.

Collection of energy for photosynthesis is a process of several steps. The energy that excites the light-catching chlorophyll molecules is usually transferred to "traps," the minority of chlorophyll molecules that provide electrons for photosynthesis. When Porter adds chemical agents to close the traps in the algae *Chlorella pyrenoidosa,* the collecting chlorophyll molecules cannot deliver their energy. He finds that they remain excited three times as long as when all the traps are open.

In space as well as in time, red algae show a clear sequence of reactive steps. A structure called a phycobilisome consists of three layers of pigment outside the algae. Light is absorbed first by the outermost layer and then the energy is transferred to each of the two inner layers and finally to the algae "traps." Porter finds that separating the phycobilisome from the algae, like blocking *Chlorella* traps, lengthens the amount of time the innermost pigment remains excited.

Porter predicts that techniques developed in the next few years will allow scientists to measure reactions as fast as 100 or even 10 femtoseconds. However, experiments using those techniques will be in the realm of physics, not chemistry or biology. "Chemistry is finished," Porter says. "But physics goes on." □