Dr. William S. Lynn Lead Team's Work

Researchers Find Anti-Disease 'Trigger'

By Charles Young

A research team at Duke has identified the first known lipid (fat) molecule that serves as a trigger to attract disease-fighting white blood cells to the site of body injury.

It is a small molecule called HETE (L2-hydroxy eicosotetraenoic acid). The identification of its makeup and behavior could have far-reaching benefits in the understanding and control of human disease.

The discovery came as a result of research into the process known as chemotaxis, which is the reaction of living cells being either attracted to or repelled by a chemical stimulus.

The reaction—or message—sets in motion the body's initial response to injury, and is critical in the defense against infection. White blood cells are summoned to the point of injury where they attack and destroy intruding bacteria.

The team, headed by Dr. William S. Lynn, professor of medicine and associate professor of biochemistry, reported the discovery in "Nature," an English scientific journal with international circulation.

Chemotaxis has been the object of intense study because control of this process offers the promise of understanding and perhaps controlling many different types of disease.

There are other substances in the body that attract white cells but HETE is the only small fat molecule known to do so.

"It's a big break in understanding communication between cells," Lynn said in an interview at Duke. "If the migration of white cells can be controlled, they could be told where to go, and to attack foreign tissue or substances when they get there.

"We don't know how to do that yet," he added. "That's the next step."

Specifically, Lynn's group found that the small molecule HETE is produced by the action of an enzyme in blood platelets on arachidonic acid, which is a major constituent of cell membranes.

Lynn and his co-workers, Dr. Stephen R. Turner and John A. Tainer, a biochemistry graduate student, made the first breakthrough when they discovered that arachidonic acid would ignite when exposed to air and light, which is what would occur in a cut on the body surface. HETE was produced as a byproduct of this ignition.

"We were testing all the fatty acids," he said. "We tested them one by one but none were chemotactic. That is, so long as they weren't exposed to air and light.

"Then we exposed one, accidently at first, and it proved to be very flammable."

In the course of the studies, he said, it was found that one of the oxidized products, HETE, was chemotactic in that it attracted white cells.

In addition, it was shown that the enzyme in blood platelets also reacted with arachidonic acid to produce HETE.

Lynn points out that the body's defense against infection is a complex reaction involving the attraction of specific types of white cells to the damaged tissue. He hopes that the discovery of the message factor and its factory will allow researchers to focus on the way a chemotactic signal is read by these cells.

Since the initial discovery, the team has already found evidence that the type of white cells responding to the chemotactic message is controlled by an interaction between HETE and some small protein molecules.

"That's what we'll be working on," he said. "If such lines of communication can be established, between us and the cells, then we'll be able to tell them what to do as well as where to go."

The group's work is being supported by a grant from the National Institute of Environmental Health Sciences and the Veterans Administration.

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Hospital Audiences, Inc. Helps Local Entertainers To Brighten Hospital Life

Hospital Audiences, Inc., a non-profit service organization which mobilizes and channels the cultural resources of the community for the benefit of the institutionalized and disadvantaged, has come to Duke Hospital.

The organization, which was founded in 1969 in New York City, arranges for persons in hospitals, correctional institutions, rehabilitation centers and nursing homes to view a variety of cultural and sporting events.

Since December, HAI has visited the hospital three times.

On Dec. 10, Francis Perry, a classical guitarist and artist-in-residence at Duke, performed four half-hour musical and singing programs on Prevost, Sims, Long and Osler wards.

On Dec. 15, the university's Ciompi String Quartet performed in the Courtyard Dining Room for a large audience of patients, their families and friends and hospital staff members.

And on Jan. 2, the Carolina Readers' Theater staged an hour-long play entitled "Illustrated Sports" for another group of patients in the Medical Center Board Room.

Bev Rosen, director of rehabilitation for the Comprehensive Cancer Center who coordinates the activities of HAI at the hospital, said the organization has recently become active throughout Durham.

The Durham Arts Council, she said, seeking to expand its community outreach programs, has been working with Hospital Audiences, Inc. to establish an ongoing series of visits by area performers to Duke, Watts, Lincoln and the Veterans Administration hospitals.

The Mary Duke Biddle Foundation provided the council with an initial grant of $5,000 last autumn to help set up the visits. Federal and private funding is being sought to continue the program in Durham.

"This is a beautiful example of marrying the cultural arts resources of a community with those people who are normally cut off from such benefits," Ms. Rosen said. "It gives the hospital an opportunity to offer patients more than just health care. The performances are esteem and morale builders as well as being good entertainment."

Dr. William G. Anlyan, vice president for health affairs, former Hospital Director Dr. Stuart Sessoms and Administrative Director Richard Peck were all enthusiastic about the program when it was proposed, Ms. Rosen said. She added that these men feel the performances also provide a good opportunity for the hospital to become closer to the community it serves.

Another component of the HAI program which will be developed in the months ahead includes events outside the participating institutions. Unsold tickets for plays, musical presentations and football and basketball games will be solicited so that ambulatory patients, nursing home residents and youths from rehabilitation centers, among others, can attend without charge.

Judy Rohlf, administrative assistant in Nursing Services, has been active in informing nursing personnel here of individual performances. She said she encourages charge nurses to identify those patients on their wards who might be able to view the performances when they are scheduled in the evenings. She also said patient and staff response has been excellent so far and that families of patients should be invited whenever possible.

Intercom will announce future events in advance. The next performance will probably be in mid-January, according to Ms. Rosen, and although plans have not yet been finalized, it will probably feature a jazz group from the Triangle area.

Henry Minor of the Durham Arts Council said he hopes to be able to schedule at least one artistic

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IN THE HUDDLE—Members of the Carolina Readers' Theater staged a performance entitled "Illustrated Sports" in the Medical Center Board Room on Jan. 2. Here the group huddles up during a take-off on professional football. The humorous presentation, put on for the benefit of patients and their families, was sponsored by the Durham Arts Council and Hospital Audiences, Inc. *(Photo by David Williamson)*