

A suspicion of research fakery

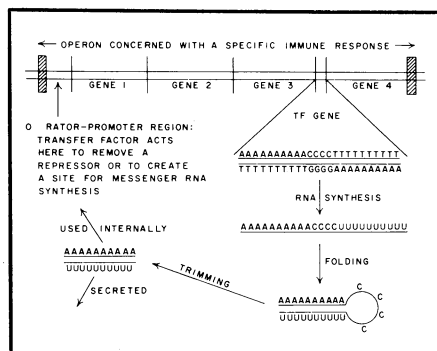
The discovery that an undergraduate student at Harvard University forged or doctored at least four letters of recommendation for medical school, for admission to Phi Beta Kappa and for a scholarship has led to the suspicion that he also manipulated important immunological experiments that he had participated in. The experiments had to do with transfer factor. The results of the experiments are reported in the November PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES.

This bizarre situation brings to mind a similar situation six months ago, when a scientist with the Memorial Sloan-Kettering Cancer Center in New York City was found to have falsified his immunology research results (SN: 6/1/74, p. 348). The scientist admitted to falsification. But the Harvard undergraduate, Stephen Rosenfeld, has not. Although Rosenfeld admits to changing documents, he has steadfastly denied tampering with the research.

Whether the research reported in PNAS was tampered with or not is scientifically important. If the results are genuine, they could considerably advance understanding of the immune system and further efforts to strengthen the immune system against cancer, multiple sclerosis, leprosy and some other major diseases.

Scientists at Harvard are dismayed by Rosenfeld's actions and possible actions. Those who are especially disturbed include David Dressler, an immunologist of impeccable reputation, senior author on the paper and Rosenfeld's mentor; Albert H. Coons, a Harvard immunologist who read the paper for PNAS and approved it, and James D. Watson, who sponsored the paper for publication. Watson, who shared a Nobel Prize with Francis Crick for deciphering the genetic material of life, DNA, is now with the Cold Spring Harbor Laboratory in Cold Spring, N.Y.

Twenty years ago, H. Sherwood Lawrence of the New York Medical Center found that a chemical could be extracted from human lymphocytes that reacts against a specific foreign organism. And if this chemical material was injected into a person lacking immunity to the organism, it would give



A diagram from the report now questioned showing how transfer factor, as an RNA molecule, might work.

the person immunity against the agent and boost his cellular immunity in general. Lawrence dubbed the chemical that could transfer immunity "transfer factor."

Since then, transfer factor has shown promise in strengthening the immune responses of patients with cancer, multiple sclerosis, leprosy and other diseases, thereby improving their condition (SN: 2/9/74, p. 87). Human transfer factor appears to be a small molecule comprised of peptides and nucleotides. Transfer factor has also been passed from humans to primates, and from primates to humans. But passing transfer factor among lower animals hasn't worked. Consequently it has been impossible to determine the chemical nature of transfer factor among lower animals.

The research reported in the PNAS by Dressler and Rosenfeld purportedly does what others have not been able to do—pass transfer factor among lower animals (guinea pigs) and establish the chemistry of this transfer factor. The guinea pig transfer factor appears to be a molecule small enough, like the human transfer factor, to slip through a dialysis bag. But the guinea pig transfer factor appears to be a molecule of RNA. The RNA molecule would apparently be too small to code for antibodies or other proteins involved in immunity. It takes three nucleotides to code for one amino acid. The RNA molecule contains only 30 to 40 nucleotides, which means it could code for a peptide of no more than 10 amino acids. Antibodies and other proteins are made up of hundreds of amino acids. So what might the RNA molecule do then? The investigators suggest that it might serve as a regulatory molecule over certain immune genes.

When SCIENCE NEWS talked with Lawrence, he had not yet read the PNAS paper carefully. But he believes it is quite possible that "human transfer factor might be different from that

in the guinea pig." What's bothering scientists at Harvard, however, is not the nature of the results obtained, but rather certain things that happened before, during and after the experiments that suggest Rosenfeld manipulated the results.

For instance, Watson told SCIENCE NEWS, "Rosenfeld not only cheated in his papers or letters of recommendation, but very likely made up data in the previous lab he was at." During the experiments, Dressler and Rosenfeld had only 30 percent success in obtaining active transfer factor preparations, which suggested that isolation success was capricious, or at least the result of variables not yet understood. Alwin P. Pappenheimer Jr., a Harvard biologist, and several other scientists had occasion to observe the experiments and thought that the red welts on the skin of the guinea pigs, which purportedly were immune reactions to transfer factor injections, looked like burns. But since no one was thinking of fakery at the time, they accepted the evidence as genuine proof that transfer factor had been passed from immune animals to non-immune animals.

And after the experiments were terminated last April, Dressler, Coons and Baruj Benacerraf, a Harvard immunologist, attempted to repeat them. "Neither I, nor Dressler, nor Benacerraf have been able to repeat them," Coons reports.

So what is the consensus over whether the research reported in the PNAS was tampered with or not? "It's absolutely unclear," Dressler told SCIENCE NEWS. "We have no reason to believe that our results were changed improperly other than the highly irrational behavior of the student in another area, and the fact that, for some reason, we had lost the magic touch in making biologically active material. . . ." Watson, however, doesn't think "there is much chance" that the research is authentic.

Because of the bizarre circumstances surrounding the research, Dressler has submitted a letter to the PNAS stating that their "original positive results may not have been obtained by the procedures described. We leave it to the kindness of our scientific colleagues to accept this statement of uncertainty and potential retraction with our sincere apologies."

Why Rosenfeld forged documents and possibly falsified research remains a mystery. He was a straight-A student at Harvard and would undoubtedly have been accepted into medical school without difficulty. SCIENCE NEWS attempted to contact him to discover his motives, but he was unavailable for comment. "It's all inexplicable," Watson laments. □