

Fitzpatrick's Impact on Photobiology and Photomedicine

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Fitzpatrick's impact on photobiology was huge and characteristic of his style, combining magical thinking, hard work, intellect, symbiotic collaborations and a skill at capturing the national and international stage. It was not by chance that PUVA was first described simultaneously in the *New England Journal of Medicine*, the *New York Times* and the opening session of the American Academy of Dermatology.

Fitzpatrick stated that his interests in photobiology stemmed from opportunism, curiosity and serendipity. As a Captain in the U.S. Army, Fitzpatrick was assigned to the Army Chemical Center, where he worked with Aaron Lerner on the biochemistry of melanin pigmentation. After training in Dermatology at Mayo Foundation and a brief faculty position at the University of Michigan, Fitzpatrick became Professor and Head of the Division of Dermatology at the University of Oregon Medical School where he began to work with a long line of Japanese investigators that numbered over 50 persons by the mid 80s after he had moved to Harvard Medical School. Much of this work was centered around the molecular, microscopic and ultra-microscopic mechanism of pigmentation and tanning. This work and his collaboration with Madhu A. Pathak on psoralen biochemistry and photobiology necessitated a better understanding of the cutaneous effects of ultraviolet radiation on human skin.

In the early 70s, there was increasing global concern about ozone depletion and increased levels of damaging ultraviolet radiation at ground level. Fitzpatrick used this public debate to project himself and dermatology onto a national stage by providing government (NIH, NSF, IOM, NAS) supported meetings with large proportions of the existing sparse quantitative data on human cutaneous photobiology. Just prior to this, Fitzpatrick had spent four years of research with Pathak on the development of what he claimed to be the first effective topical chemical agent for sun protection. He published a paper in the *New England Journal of Medicine* promoting a rational approach to the development of topical sun protection agents ("sun screens"). Using this platform, he launched a campaign to educate the consumer about the use of sun screens and to urge industry to be quantitative about product claims.

Fitzpatrick, himself, always claimed that the real "birth" (or rebirth) of photobiology was a Tokyo, Japan conference he organized to celebrate the 100th anniversary of Shiseido.

This 1971 conference was entitled *International Conference on Photosensitization and Photoprotection*. The proceedings, published as an 860-page monograph, *Sunlight and Man* were promoted as "state-of-the-art". Virtually all the world leaders in photobiology contributed chapters to this seminal volume, the first to present all aspects of the new field of *photomedicine*.

Fitzpatrick was a collaborator with M.M. Roth and M.A. Pathak in demonstrating beta-carotene as a photoprotective agent in erythropoetic protoporphyria and proclaimed this as the first application of an *in vivo* photoprotective biological principle to the treatment of human disease. On his deathbed he instructed me and two of his sons to study and reduce to widespread practice the use of orally administered polypodium leucotomos extract as a photoprotective agent.

Fitzpatrick was particularly skilled at synthesizing information. He could identify potentially important topics, isolate the interesting components, and describe concepts in appealing, almost simple terms. His motivational and question-asking skills were so good that it was not possible (even for him and his collaborators) to identify where and when in their interpersonal and intellectual exchanges ideas were formed and answers were demonstrated. He claimed all of photobiology and pigmentation biology as his turf and provoked many investigators to prove his theories were either right or wrong.

Fitzpatrick gave me the opportunities and stimuli to organize the MGH Wellman Laboratories of Photomedicine, the world's largest photomedicine research effort.

During the Fitzpatrick reign and thereafter, while increasing the fundamental molecular understanding of human cutaneous photobiology, Wellman Laboratories made many significant clinical contributions to laser medicine and laser dermatology, photochemotherapy, phototherapy, human cutaneous photobiology, photodynamic therapy and more.

I am very grateful for the influence Thomas B. Fitzpatrick had on my professional life, the entire photobiology research community, and the clinical specialty I have served for more than 30 years. To the study of human cutaneous biology, Fitzpatrick brought light – as a packet of energy, an electrifying field and a magnetic wave.

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Captain Thomas Fitzpatrick, Army Chemical Center, 1948, with permission from Dr. Aaron Lerner.