Identifying and Further Developing Aspirin-like Compounds May Benefit Billions

Daniel Klessig
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CURRENT RESEARCH

Identifying and further developing aspirin-like compounds may benefit billions

Throughout most of human history, medicine has been based on plant remedies. Even in "modern" medicine many drugs have plant origins. Salicylic acid (SA) and its derivatives, collectively termed salicylates, are a prime example. Acetyl SA, commonly called aspirin, has been the most widely used drug worldwide for the past century to reduce pain, fever, inflammation, and the risk of stroke, heart attack, and certain cancers. SA is a critical plant hormone involved in many processes, including plant immunity, in which it plays a central role. In humans aspirin is rapidly converted to SA, which has most of the same pharmacological effects as aspirin. Worldwide 80,000 pounds of aspirin are produce annually and approximately 100 billion tablets are consumed.

To understand SA's mechanisms of action in plants, Dr. Daniel Klessig, of the Boyce Thompson Institute at Cornell University, used classical biochemical approaches and, more recently, genome-wide, high-throughput screens to identify more than two dozen proteins, which bind SA and as a result have altered activities (i.e. its targets; Manohar et al., 2015). Similar screens uncover many novel targets in humans, several of which, like their plant counterparts, are associated with immunity or disease development. Their studies of human SA targets are also uncovering new derivatives of aspirin/SA that are more effective and potent than what we currently have.

Dr. Klessig trained as a graduate student under Nobel Laureate James Watson. His early research on human adenoviruses, which provided some of the first evidence for split genes and RNA splicing (Klessig 1977), began an incredible career of discovery and innovation. Beginning in the...

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AFFILIATION

Cornell University

EDUCATION

- Ph.D. in Biochemistry and Molecular Biology 1978,Harvard University
- Honours B.Sc. in Molecular Biology (1st Class) 1973,University of Edinburgh -Edinburgh, Scotland, UK
- B.S. in Biochemistry (Summa cum laude) 1971,University of Wisconsin

AWARDS

- Marshall Scholar in UK (similar to Rhodes Scholar), 1971-1973
- Searle Scholar, 1982-1985
- McKnight Scholar, 1983-1986
- Faculty Research Award from American Cancer Society, 1984-1988
- Fellow of the American Academy of Microbiology, 2001
- and 2 more...

RESEARCH AREAS

Life Science, Immunology / Inflammatory, Neurological / Cognitive, Oncology / Cancer

FUNDING REQUEST

Your contributions will support the research of Dr. Klessig as he studies SA targets and their possible applications for treatments in humans. Donations of at least $50K-$100K per year are required to continue these studies and additional donations would support the work of additional scientists, in order to speed up discovery. In choosing to support his research you will be a part of creating more potent, natural derivatives of aspirin that will affect billions of people globally.