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Current Opinion in Chemical Biology

Editorial overview: From the iceman to modern medicine☆

Yimon Aye and Paul J Hergenrother

Current Opinion in Chemical Biology 2019, **50**:A1–A2

For a complete overview see the Issue

Available online 6th June 2019

https://doi.org/10.1016/j.cbpa.2019.04.021

Yimon Aye (Guest editor and author)

Laboratory of Electrophiles and Genome Operation (LEAGO), École Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland
e-mail: yimon.aye@epfl.ch

Born and raised in Burma, Yimon Aye received her undergraduate and PhD degrees in Physical Sciences, from Oxford (UK) and Harvard Universities, respectively, and postdoc training in Life Sciences at MIT. In her independent career that began mid-2012, she set out to understand the mechanisms of electrophile signaling through the development and applications of REX-technologies. Her lab also studies genome-maintenance mechanisms. In mid-2018, she established the Laboratory of Electrophiles and Genome Operation at EPFL.

Paul J Hergenrother (Editor)

Department of Chemistry, University of Illinois, Urbana, IL 61802, USA
e-mail: hergenro@illinois.edu

Paul J Hergenrother received his B.S. in chemistry from the University of Notre Dame in 1994. He obtained his PhD in 1999 at the University of Texas at Austin. After an American Cancer Society post-doctoral fellowship at Harvard University, he joined the University of Illinois in 2001. The Hergenrother laboratory seeks to use small molecules to identify and validate novel targets for the treatment of intractable diseases, including cancer, degenerative disorders, and multi-drug resistant bacteria.

Here we present our special issue focusing on novel pharmaceutical interventions. It is packed with ideas and proposals about new ways to tackle what is one of the greatest, and most long-standing problems humans have faced, that of promoting health and longevity. In these days, we have almost all been touched in some ways by illness and needed the wonders of modern medicine. We are thus rightly acutely aware of the need for medicines and the continuing need for experts to be given their freedom to explore new ideas to develop them. But, if we need more proof, we should, perhaps, be aware of how medicine has changed since the dawn of the age of man. Ötzi, the iceman who died somewhere around 3200 BC, was found to have vermicidal fungus as one of his few possessions. This crude, and by our standards ineffective treatment (Ötzi suffered from parasitic worms), nonetheless serves as a link to show the deep routes of our struggle for wellness. It further highlights how through scientific knowledge unavailable to Ötzi and his contemporaries in antiquity, our modern ability to cure and diagnose has been honed.

Moving on from the Bronze Age, our classical and modern literature is also filled with references to the scourge of disease and the wonders of healing, brought about by scientific discoveries. From the pioneering work on vaccination by Edward Jenner in the 18th century, to the miracle discovery of penicillin (see review from the Schofield lab), and beyond to the recent development of Car-T cells and monoclonal antibodies, scientific improvements have often preempted medicine. Thus, we should be mindful that the roots of good medicine, therapeutics, and drug design are nourished in some way by the philosophy of science. This is indeed a philosophy that seeks to push back the frontiers and improve the human condition. Ironically, the much-maligned last words of the poisoned philosopher Socrates in 399 BC,

> "Crito, we owe a cockerel to Asclepius [the god of medicine], please see to it that the debt is paid",

in some way presage this current age where there is a real unity of science, psychology and medicine, a conclusion that is astounding given that in the Middle Ages, medical knowledge was described as 'deplorable'.[1] But as we all know, the journey in science is not always smooth and is not even always in the right direction, but through thought, criticism and collective effort, some astounding achievements with revolutionary ramifications can be produced. We are certainly proud to say that there is much in this issue to stimulate the imagination.

☆ Yimon Aye is recognized as the sole author of this Editorial. Yimon Aye and Paul Hergenrother are joint Editors of this section.

[1] Baader G. Early Medieval Latin Adaptations of Byzantine Medicine in Western Europe. Dumbarton Oaks Papers. 1984;38:251–9.

So please take the time to immerse yourself in the new emporium of *Current Opinion*. From an intriguing discourse of suitability of lipids and even membranes as drug targets (Reizman, Loewith, and Winssinger labs), to protein–protein modulators (Arkin), and a good deal of discussion on new ways to carry out screens (Weerapana lab; Peterson lab; Butcher lab; Park lab; Derda lab). We further address polypharmacological anti-viral interventions (Liotta lab), collagenopathies (Shoulders lab), and new ways to combat malaria (Baum lab). There are also sections on modeling pharmacokinetics and pharmacodynamics (Tonge lab), and how to engineer biosensors (Hamachi lab). With so much to offer, feel free to get together with a friend or chaperone (Kapoor lab) and shed more light (Trauner lab) on all the important issues raised: remember, as the Mattevi lab tells us, two heads are better than one. And finally, if all this talk of medicines has got you feeling like you want to cut loose, why not peruse the article on drug-induced protein degradation from the Crews lab?