

## Editorial

### 50th Anniversary of Calcium Channel Research: Biomedical Perspectives

*"it's the human health imperative in the mission that requires from NIH to support good science on behalf of human health - not just to do good science."*

Bernadine P. Healy, NIH Director

Cited by Harvey Mackay in *"Fired Up!: How the Best of the Best Survived and Thrived After Getting the Boot"*, Random House: 2005, p.89

In 1965, about 50 years ago, Professor Dr. Harald Reuter of the University of Bern, Switzerland obtained the first experimentally supported evidence that the calcium channel is a physiologically distinct entity [1, 2]. Further stimulated by the synthesis of nifedipine [3], the parent drug of the dihydropyridine calcium channel blockers family, the field of calcium channel research rapidly encompassed powerful biomedical directions. Today, calcium channels comprise a multifaceted area of biomedical research that has generated a plethora of calcium channel blockers, an important area of the pharmaceutical industry with a billion dollar market. This issue of Current Molecular Pharmacology, convening authors from America, Israel and Europe, brings together leading experts in calcium channel research with the aim of discussing recent developments in research of voltage gated calcium channels and calcium signaling with specific focus on biomedical perspectives. In addition to the authors of this Theme Issue, many other researchers have made substantial contributions to the field, including Drs. Paul D. Allen, Mark E. Anderson, Kurt Beam, Donald M. Bers, Philip M. Best, Martin Biel, Lutz Birnbaumer, Kevin P. Campbell, Heping Cheng, Annette Dolphin, Roger Eckert, Clara Franzini-Armstrong, Hartmut Glossmann, Susan L. Hamilton, Michael M. Harpold, Peter Hess, M. Marlene Hosey, Stephen R. Ikeda, Masaki Kameyama, Tim Kamp, Platon G. Kostuyk, Yoshihisa Kurachi, Michel Lazdunski, W. Jonathan Lederer, H. D. Lux, Eduardo Marbán, Gerhard Meissner, Daniel L. Minor, Jr., Martin Morad, Joël Nargeot, Erwin Neher, Bernd Nilius, Martha C. Nowycky, Shosaku Numa, Edward Perez-Reyes, Daniela Pietrobon, Eduardo Ríos, Guy Salama, Arnold Schwarz, Terry Snutch, Enrico Stefani, Tsutomu Tanabe, Wolfgang Trautwein, D.J. Triggle, Richard W. Tsien, Roger Y. Tsien, James N. Weiss and others. And there is no doubt that yet unknown young researchers will make more dazzling discoveries surpassing today's achievements.

We live now in a rapidly changing world, and Academia, biotechnology and pharmaceutical businesses and governmental agencies have no other choice but to be change leaders to survive, let alone advance. This is not an easy task. First of all, to succeed in the struggle for leadership, they should avoid confusing novelty with innovation. *"The test of an innovation is that it creates value. A novelty only creates amusement"* ([4], p. 85-86). But to create value, modern biomedical research should be in tune with strategic challenges facing the world's health care, above all, cardiovascular diseases, autism and mental disorders. This focus is critical because today research and development in biomedical sciences is one of the major keys to a robust economy. The most quoted supporting exposition is the 2006 study by Drs. Murphy and Topel of the University of Chicago [5] who showed that life-expectancy gains since 1970 added \$3.2 trillion per year to America's national wealth. *"A mere 1% reduction in cancer deaths would be worth \$500 billion and the present value to future generations of a full cure is a nearly incomprehensible \$50 trillion"* - they noted. But cancer is not even the first most frequent cause of death in the developed world - cardiovascular diseases are. A generation-long research of calcium channels has uncovered their multifaceted association with cardiovascular, mental and other major diseases. The task now is to help Academia, businesses and governmental agencies lay out strategic objectives translating important findings in the calcium channel field into medicine and bioeconomy. This includes the need to estimate risks and potential profits of calcium channel research among other priorities and thereby increase efficiency of public investments in bioeconomy [6]. Correspondingly, this Theme Issue concerns itself with the biomedical perspectives of the calcium channel field. It should give the reader a perspective outlook at the current state of calcium channel research with a special focus on the structure-functional diversity of calcium channels as emerging biomedical targets and drivers of diseases.

Another challenge facing current scientific research is the need to understand how many potential studies do not exist, when they could readily have been conducted [7]. In other words, it is important to overcome intellectual arrogance at all levels of the research process as well as the common belief that "smart people" can provide reliable judgment on almost anything [4]. In reality, this belief unintentionally generates disabling ignorance, the major obstacle to free and productive scientific research in developed countries. Indeed, the cognitive bias described by Drs. David Dunning and Justin Kruger of Cornell University (the so-called *Dunning-Kruger effect* [8]) points to a tendency of incompetent (but "smart") people to overestimate their own level of knowledge and to fail to recognize that of others. This Theme Issue, featuring contributions by leading experts in calcium channel research, helps to overcome these problems and provide scientists and experts in Academia, businesses and governmental agencies with an objective picture of the current state and biomedical perspectives of the field.

We congratulate Prof. Reuter with his 80<sup>th</sup> anniversary and celebrate his pivotal discovery as we look ahead to the new horizons of the calcium channel field.

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