

Ardem Patapoutian, awardee in the Biology and Biomedicine category (13th edition)

I am thrilled to share the 13th annual BBVA Foundation Frontiers of Knowledge Award in Biology and Biomedicine with David Julius. This is quite a special award as you know. The wide net that these awards cast to cover frontiers of knowledge both in the sciences and the arts is very farsighted and meaningful. Both disciplines are essential for our societies to evolve as fair and vibrant communities. On a personal level, both arts and sciences are sources of lessons, inspirations, and indeed, much of life's joys. I could not have even imagined as an 18-year old refugee from Lebanon to the United States to have a life in the Sciences, let alone to be recognized in such a manner. Perhaps because of my background I try not to take things for granted and I consider myself privileged to be a scientist. I am indeed very grateful to the committee, colleagues in my scientific fields, including all the members of my laboratory past and present. And special thanks to my wife Nancy and my extended family and friends who have supported me over the years.

David Julius and I are being recognized for our work on identifying and characterizing specialized receptors that our bodies use to sense the physical forces that we experience. Most of Biology research is focused on how our bodies sense chemicals, whether these are the sugar that we consume in desserts or the hormones triggered downstream such as insulin. We have learned quite a bit about sensing such chemicals. But how do we sense stimuli of the physical dimension, such as temperature and pressure? These senses help us recognize a gentle breeze or the prick of a cactus. They also tell us when our blood pressure is increased, or when our bladders are full. My laboratory got interested in this topic because of the allure of basic biology. It is a fundamental question of sensory biology, the last frontier to be described now that our colleagues have studied and largely explained how we see, taste, and smell. To sense temperatures and pressure, we have specialized molecules on our cell surfaces that detect these external signals and open to allow changes in the chemical balance. It seems that there are multiple channels needed to discriminate the various types of physical forces we can detect, and there are tantalizingly more to be discovered still.



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I said my group started our work for the love of pure science, but interestingly we are also uncovering unexpected medical implications for our basic research, in areas such as pain, hypertension, atherosclerosis, and osteoporosis. Who would have predicted that, for example, these receptors that we identified could be involved in protection from malaria, or susceptibility to excess iron in our blood? The general message here is that we should support basic science, science for science's sake, and that important benefits that are more practical in nature will follow. We are living in a golden era of biomedical research, and I hope that young, curious students who are thinking of careers that are both extremely enjoyable and benefit society consider a career in the sciences. And I applaud the BBVA Foundation for recognizing that Science is not just for scientists. If anything, during the last year and a half of this pandemic we have seen the vital importance of not only rational, scientific thinking but also the creation of new medicines for society's health and safety. So thank you for celebrating Science! I accept this award with much gratitude.