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# Mechanosensitive Ion Channels - Crossing the line between the lab and the clinic



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**Abstract:** In this talk, I will present my research on cell mechanics and the mechanisms by which mechanical forces are transduced into messages such as voltage and chemicals such as ATP and  $\text{Ca}^{2+}$ . I discovered mechanosensitive ion channels in 1983. My methodology has included patch clamp, high resolution bright field light microscopy, low light fluorescence microscopy, high speed digital imaging, TIRF, digital image analysis, high voltage EM with tomography, Atomic Force Microscopy, molecular biology, natural product and recombinant protein biochemistry, NMR and microfabrication and microfluidics. We discovered the only known specific inhibitor of mechanosensitive ion channels and uncovered its remarkable mode action by using a combination of electrophysiology and chiral chemistry. In recent years, I have worked in transitional science -- bringing basic science to the clinic and to industry.

**Biography:** Professor Frederick Sachs is the Distinguished Professor of Physiology and Biophysics at University of Buffalo. His research centers on mechanical and electrical biophysics, from molecules to organs, and the development of new tools. He received his BA in Physics from University of Rochester in 1962. He received his PhD in Physiology from Upstate Medical Center, Syracuse in 1969. He was a postdoctoral fellow at the University of Hawaii and staff fellow at the National Institute of Health before joining the State University of New York/Buffalo in 1975. Among his many awards are the Guinness Book of Records in 1984 for the smallest thermometer, Outstanding Inventor Award by the Research Foundation of the State of New York, and Pioneers of Science by the Hauptman-Woodward Institute and the Buffalo Museum of Science. In 2011, he was nominated for the Nobel Prize in Physics for Mechanosensitivity.