Abstract Submitted
for the MAS14 Meeting of
The American Physical Society

Physics Has Often Been in the Forefront of Fundamental Advances in Biology and Medicine RONALD AARON, Northeastern University — At a time when the physical structure of a living cell was essentially unknown, and the existence of an enveloping membrane was only a hypothesis, Julius Bernstein (between 1868 and 1912) developed the hypothesis that the cell is composed of an electrolytic interior surrounded by a thin membrane impermeable to ions. Furthermore he basically proposed the sodium-potassium pump! Max Delbruck in the early 1930's was inspired by new data concerning fruit flies; namely, that when exposed to X-rays and ultraviolet radiation, their mutation was proportional to the concentration of free radicals. Based on this information Delbruck proposed that the gene was a single long-chain molecule and shared a Nobel Prize with Salvador Lurie in 1969. In this presentation we discuss the above, and further such examples, and suggest what is special about the science of physics that produces such remarkable forefront discoveries.

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Date submitted: 07 Jul 2014 Electronic form version 1.4