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Cystic fibrosis improves COVID-19 survival and provides clues for treatment of SARS-CoV

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Systemic pools of ATP are elevated in individuals homozygous for cystic fibrosis (CF) as evidenced by elevated blood and plasma ATP levels. This elevated ATP level seems to provide benefit in the presence of advanced solid tumors (Abraham et al., Nature Medicine 2(5):593–596, 1996). We published in this journal a paper showing that IV ATP can elevate the depleted ATP pools of advanced cancer patients up to levels found in CF patients with subsequent clinical, biochemical, and quality of life (QOL) improvements (Rapaport et al., Purinergic Signalling 11(2): 251–262, 2015). We hypothesize that the elevated ATP levels seen in CF patients may be benefiting CF patients in another way: by improving their survival after contracting COVID-19. We discuss here the reasoning behind this hypothesis and suggest how these findings might be applied clinically in the general population.

Biography

Edward H. Abraham graduated from Harvard University with a college major in engineering, applied physics and chemistry. He was then accepted into the first class of the Harvard - MIT graduate program in Health Sciences and Technology and subsequently received his MD from Harvard Medical School. During his medical school training, he gained valuable research experience working in the laboratories of Professors Judah Folkman, Claude Lechene and Nobel Laureate Konrad Bloch. During his internship, residency and fellowship in pediatrics at Boston Children's HospitalMedical Center, he worked directly with Professor Harry Shwachman and in the laboratory of Professor Jan Breslow focusing on cystic fibrosis (CF). He extended his CF studies with a subsequent post-doctoral research clinical investigator award from NIH. His work focused on membrane biochemistry in the laboratory of Professor Guido Guidotti at Harvard University. During these investigations, he discovered and investigated functions of ATP releasing pathways using biochemical and electrophysiological (patch-clamp) assays. He developed luciferase assays for precise measurement and imaging of extracellular ATP clouds. Dr. Abraham then completed a radiation oncology residency at Massachusetts General Hospital, Boston and subsequent Senior Investigator position with Dr. Paul Okunieff at the National Cancer Institute (NCI) where the role of extracellular ATP in cancer treatment was investigated. He subsequently assumed directorship of the Radiation Oncology Translational Research laboratory at Dartmouth Medical School in Hanover, NH. At Dartmouth he ran clinical trials testing the effects of ATP intravenous infusions on patients with stage IV cancers