



Institute for Research in Biomedicine



ADAPTIVE MODULATOR OF GUT MICROBIOTA FUNCTION

Problem – Challenge

Enteric infections affect up to 1 billion people leading to 2 million death per year worldwide. No effective vaccines exist against major enteric pathogens. In addition, the intestinal ecosystem conditions all aspect of organism’s physiology and alterations of the microbiota, defined as dysbiosis, contribute to the pathogenesis of most clinical conditions.

Solution

MV BioTherapeutics is a Swiss microbiome biotherapeutics & live vaccines company, a spin-off of the Institute for Research in Biomedicine (IRB) in Bellinzona, affiliated to the Università della Svizzera italiana (USI), developing live attenuated vaccines and biotherapeutics. The company capitalizes on the discovery made at IRB that adenosine triphosphate (ATP) released by the microbiota modulates the secretory IgA response in the small intestine. This knowledge led to two technology platforms. The first, ApyraVax, is a “plug-and-play” live attenuated vector able to induce protective mucosal antibodies against enteric pathogens.

Bio Therapeutics aims at reducing enteric infections and cutting down the social costs of such infections by realizing high-value oral vaccines that address currently unmet medical needs. The second platform, ApyraMed, is based on a modified biotherapeutic that improves immune system competence and dysbiosis by adapting the intestinal ecosystem to different clinical conditions. The first ApyraMed-based product is a potent oral enhancer of the immune response against solid tumors in combination with immune checkpoint inhibitors (ICIs). In spite of unprecedented durable responses in different cancers obtained with ICIs, only a limited fraction of patients responds to these drugs. Therefore, combination therapy are needed to improve the therapeutic efficacy. The intestinal microbiota plays a crucial function in the outcome of ICIs therapy. The ApyraMed based biotherapeutic beneficially shapes the gut ecosystem and improves the immune response triggered by ICIs, extending survival in experimental models of solid tumors. Bio Therapeutics aims at translating these findings to ameliorate the therapeutic response to ICIs in oncologic patients.

