



FOR GENERAL RELEASE

New Type of Immunotherapy Uses Mitochondria to Make Immune Systems Younger

HISSET mitochondrial transplant therapy aims to reduce the age of the human immune system by 30 years

Palo Alto, CA – October 11, 2022 – Scientists at [Mitrix Bio](#) are testing a new therapy to boost immune system strength using tiny vesicles called “mitlets” that contain mitochondria. In animal models, injections of mitlets appear to reverse immune weakness, making old immune systems temporarily young again. In multiple tests, old or sick animals receiving the injections reduced cytokine storms and significantly improved survival against bacterial and viral infections.

Mitrix has named the treatment HISSET (Human Immune System Energetic Transplantation). It is believed to be compatible with other immunotherapies such as CAR-T, monoclonal antibodies, and checkpoint inhibitors. After completion of animal testing, HISSET is expected to move into human trials aiming for FDA approval.

“If the results we are seeing translate to humans, the results would be roughly equivalent to making the human immune system 30 years younger,” said Tom Benson, CEO of Mitrix. “This potentially gives doctors another tool to fight infectious diseases such as Covid, pneumonia, sepsis, and blood infections – especially important in this era of pandemics. HISSET could not only provide supplemental mitochondria during illness but could potentially help longer-term treatment of other conditions, notably the battle against cancer.”

Dr. Eric Boilard from Université Laval in Canada initially discovered mitlets in 2014, and the technology has been further researched by Mitrix.

Figure 1: HISSET is a New Type of Immunotherapy

TYPE	MOA	INTRODUCED
Cancer Vaccines (multiple)	Live and attenuated pathogens to attack cancers	1976
Monoclonal Antibodies	Bioreactor-grown antibodies to fight specific pathogens	1986
CAR-T/CAR-NK	T-Cells/NK-Cells with modified antigen sensing target cancer	2011
HISSET (Human Immune System Energetic Transplantation)	Transplant of mitochondria into immune cells in blood, to temporarily improve immune performance	2022

Mitlets are mitochondria-containing extracellular vesicles that platelets, T cells, NK cells, neutrophils, and other immune components are believed to exchange to conserve energy. Mitrix uses special bioreactors to grow young mitlets, which are injected into the body so that immune cells can absorb them and use the mitochondria inside. After a few days, the new mitochondria seem to be discarded so the benefit wears off, but doctors could potentially use multiple injections to extend the effect.

“Mitlets can be compared to rechargeable battery packs which can be swapped back and forth between power tools we buy at the hardware store,” says Boilard. “Mitlets enable immune components to work harder and last longer – a clever evolutionary adaptation that helps our immune systems better fight infections.”

Mitrix will be holding a series of seminars on HSET and releasing peer-reviewed papers.

About Mitrix Bio, Inc.

Mitrix Bio is a Pleasanton, CA-based preclinical biotech startup developing mitochondrial transplantation therapeutics. It was founded by Tom Benson, a former manager at Stanford Linear Accelerator National Lab, with advisors including Dr. Michael Snyder, Chair of the Genetics Department at Stanford University, and Dr. Thomas Rando, Director of the UCLA Broad Stem Cell Research Center and former director of the Glenn Center for the Biology of Aging at Stanford University. Visit www.mitrix.bio for more information.

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Figure 2: Mitlets occur naturally in blood, trading interchangeably between immune cells

