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Scientist Turned Entrepreneur to Tackle Diabetes: Novel Therapy in the Making

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Abstract

The following article discusses the current status of a novel tool, ET-traps, which is an Fc fusion protein that may become a potential therapeutic for use in diabetes, as well as various other diseases associated with pathologically elevated endothelin-1 levels. The ET-traps have a very high and fast association to their target (endothelin-1) and a very slow dissociation once bound to their target.

Dr Arjun Jain, Founder and Managing Director of ET-traps Limited, reminisced about his journey from scientist to entrepreneur.

Keywords: Endothelin-1; ET-traps; Diabetes; Cardiovascular diseases; Neurodegenerative disorders; Cancers

Introduction

A new organization, ET-traps limited, Cambridge has been doing some groundbreaking research in the field of drug development. They have devised a novel approach to target a particular molecule, which has significantly elevated levels in a host of different diseases. It seems amazing that by controlling the levels of the molecule in question, so many hundreds of millions of lives can be dramatically changed.

The ET-traps story took flight back in 2005 when Dr. Arjun Jain, the founder and Managing Director of ET-traps Limited, was a PhD at the University of Cambridge. The idea kept brewing in his mind whilst he was a Marie Curie Post-doctoral research fellow in Bern, Switzerland. He took an innovative approach by sequestering Endothelin - 1, a molecule that shows significantly elevated levels in people suffering from serious ailments like neurodegenerative and cardiovascular diseases as well as diabetes. At that time, many experts in the field felt the idea was impossible.

However, a decade later, the same people have applauded the fantastic work done and now things have started taking a very definite shape. ET-traps Limited has developed a soluble form of a G- protein coupled receptor in terms of its ligand binding ability [1]. We then completed the proof of concept studies in the cellular [2] as well as animal models [3] in the diabetes disease space. We are the world's first to create a soluble binder to endothelin-1 (which binds a GPCR). This is successfully recognised as a major breakthrough for medicine as GPCR is a very important drug target [4,5].

Diabetes is one of the most common diseases affecting millions of people around the globe [6] and is a lifelong condition that causes a person's blood sugar level to become very high. Not only does it have an effect on the blood sugar levels, but also, damages the vital organs of the human body [7-9], which makes this disease a major public health burden. The scientific community has been conducting a lot of research in finding therapeutic tools to treat this disease.

Endothelin-1 is shown to be elevated in diabetes [10,11] and sequestering this molecule would help alleviate the condition. Endothelin (ET)-1 was discovered in 1988. Scientists and clinicians were quick to identify it as a very important molecule, given it was present in all humans and its levels are significantly elevated in different diseases [12]. This includes different cancers, neurodegenerative diseases, cardiovascular diseases as well as diabetes. This molecule is largely responsible for many pathological processes in these diseases. ET-1 is a vasoconstrictor, proinflammatory and proliferative endothelial cell-derived peptide that is of significant importance in the regulation of vascular

function [13,14]. Various studies have talked about the importance of lowering ET-1 levels [2]. Researchers have developed therapeutics to completely block the action of this molecule. Currently, there are endothelin antagonists that are already in clinical use [15]. However, ET-1 is critical for normal physiological functions and using an endothelin antagonist that completely blocks the activity of the molecule is associated with many side effects. It might be more useful to merely sequester the pathologically elevated levels of the same. For this, Dr Jain has developed a novel tool to bind and sequester these pathologically elevated ET-1 levels in different disease models.

He has successfully published the pre-clinical studies in international journals, and it has widely been commended by leading world experts in the field. He is now currently looking forward to taking this venture to the next level of clinical trials. If successful, ET-traps would be a revolutionary drug, which would be able to treat many unmet needs in medical science.

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Conflicts of Interest

Change it to AJ is a member of Accelerate Cambridge.

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