

# Ventricular Assist Device

## Introduction

Ventricular assist devices are mechanical blood pumping devices able to replace the function of one or both ventricles. The main purpose of these is to help people with advanced heart failure to restore hemodynamic, functional status and quality of life.

## Invention

The invention is based on a system having a cannula with two concentric cannulas connected to an axial pump. The end of the inner conduit is at the root of the aorta and the outer conduit in the light of the ventricle. The flow is in the outside of the cannula and blood ejection is performed through the inner passage. The pump can be implanted transapically and provides temporary support to the left ventricle.



## State of Development

A prototype of the concentric tube has been tested on animals. The next step is the development of the new axial pump.

## Advantages

- The insertion procedure is simple: the transapical access is done through minithoracotomy.
- Fast insertion procedure ideal for patients in emergency situations.
- Requires a shorter and simpler extracorporeal circuit than ECMO.
- The concentric cannula is compatible with different types of pumps.

- The external location of the pump body:
  - Implies no limitations on the size of the pump to generate the enough flow of blood.
  - There are no moving parts inside the ventricle.
  - No vibrations or electromagnetics fields are generated inside the ventricle.
- The design allows different sizes of cannula, e.g. small size to be used in children.
- The test results show that up to 88 % of cardiac output could be reached.

## Application

The invention has clinical application. Specifically, it provides temporary support for patients with left ventricular failure in the intensive care unit.

## Market Potential

The invention has a potential world market, especially considering that, according to data from WHO, cardiovascular diseases are the leading cause of death worldwide. Cardiovascular disease wiped out nearly 17 million people in 2011, this means 3 in 10 deaths.

## IPR Position

Patent application number P201331422.

## Inventors

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## Opportunity

We are looking for technology partners for the design and development of the axial pump as well as commercial partners interested in licensing.

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