



New generation of artificial heart

"Our mission is to provide heart failure patients with a state-of-the-art artificial heart, giving them the hope of a longer and serene life" S.Chabane, Co founder & CEO

Heart failure : A leading cause of death

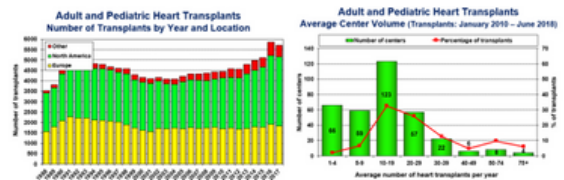
Heart failure is a chronic, irreversible pathology in which the heart muscle is weakened and is no longer able to pump blood efficiently, it affects 64 million people worldwide.

5% of heart failure patients have advanced failure and fail conventional treatments

Global burden of cardiovascular diseases mortality :

+ 60% from 1991 to 2021

3 % of needs for a heart transplant are met



Source: ISHLT

Patients' and surgeons' expectations

A technological innovation offering unique benefits Vs current solutions :

- ✓ No risk of infection : Elimination of transcutaneous connections
- ✓ Improved quality of life for patients : Compliance, return home and remote function monitoring
- ✓ Maximum morphological compatibility

Key competitive advantages

A BETTER MORPHOLOGICAL COMPATIBILITY

- Choice of pneumatic technology allows size optimization
- Design optimization with a deformable envelope and a locking system

TRANSCUTANEAUS CABLE-FREE With wireless energy transfer

- Low energy consumption parts
- Choice of low-energy valves
- Soft external envelope saves energy

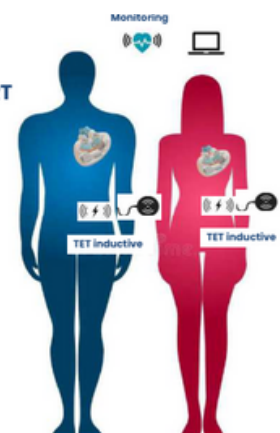
AN IMPROVED BIOLOGICAL AND PHYSIOLOGICAL RESPONSE

- Hemocompatibility & biocompatibility to minimize risk of vascular accidents or bleeding
- High efficiency valves
- Self-regulation
- Optimized ventricle and membranes shapes

➤ **A LARGER POPULATION OF PATIENTS WITH SEVERE HEART FAILURE**

➤ **A LOWER RISK OF INFECTION**

➤ **A LOWER RISK OF MULTI-ORGANS FAILURE**



The team

Co founders



Said Chabane
CEO- Scientific director



Samuel Plumejault
Technical director



Stephanie Gouraud
Chief of Operations



Pr Jean-Ch Roussel
Chief Medical Officer
Phd cardiac surgery



Pr Thomas Senage
Phd cardiac surgery

Scientific Board

Thoracic and Cardiovascular Surgery:

- Jean Christian Roussel – Professor, Head of CTCV CHU Nantes
- Thomas Senage – Professor

Tissue Bioengineering & Biomaterials:

- Nicolas L'Heureux – Laboratory director (Biotis, unit 1026 Inserm/Université de Bordeaux)
- Romain Capoulade, Institut du thorax Nantes – Inserm
- Muriel Vayssade – Phd, University Professor

Systems Dynamics & Research Engineering

- Sylvie Sémat – PhD- Research Engineering – INSA Lyon
- Eric Bideaux – PhD Head of Mechanical Engineering INSA Lyon

Mechanical Materials Engineering

- Samuel Durand – engineer

Computational Fluid Dynamic

- Daniel Pierrat – Calculation Expert engineer

Scientific and Pre-clinical stage

- Olivier Gauthier Professor of Surgery CHUV- Director of ONIRIS School (center for pre-clinical studies)
- Gilles Marcillaud – Surgeon

Key partners



Achievements to date & Timeline to market

2,76 M€ : investments to date



2021

NUMERICAL SIMULATION & HEMODYNAMIC OPTIMIZATION

CFD blood flow simulation/ hemodynamic requirements /development of specific calculation code



2022

SIZE OPTIMIZATION & ANATOMICAL VALIDATION

Virtual implants (scans) & body implants
Functional 50cc version of the device
Miniaturization work in progress.



2023

BIOMATERIALS

CIFRE thesis: Comparative study of the mechanical and hemocompatibility properties of dynamic membranes for the artificial ventricles.



2024

IN-VITRO VALIDATED DEVICE

2031



2025

ENERGY & SELF-CONTROLLED SYSTEM

Target of power consumption reached: 17 Watts => enables power supply via a wireless TET (Transcutaneous Energy transfer) system.



2026

PRECLINICAL TRIALS In vivo/blood/animal

In-vivo validated device



2027



2028

CLINICAL TRIALS /FIRST-IN-MAN

Final device

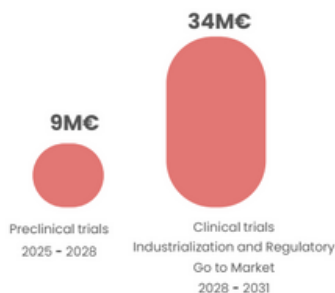


2029

MARKET

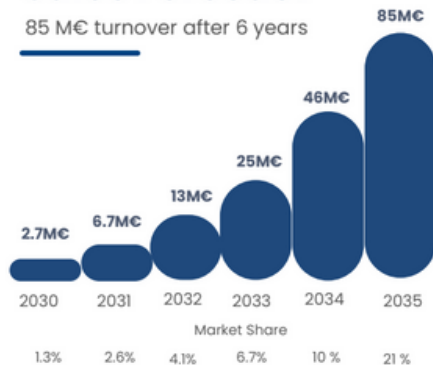
Capital raising

43M€ to access market



Sales Forecast

85 M€ turnover after 6 years



Current Fundraising

Exit strategy planning for investors

