



# VAXINANO

## Executive Summary



### ◆ Growing Zoonosis

In a context of global warming and population increase, new **zoonosis** emerged in the last decade. Added to unmet therapies, **new efficient vaccines become even more critical**. In this context, VAXINANO aims to develop **safer, better and more accessible vaccines**.

### ◆ Identified Issues

**Several vaccine-related issues in the healthcare market** have been identified :

- The **injection** method ;
- The **stability** of vaccines ;
- The **price** of vaccines ;
- The **side effects** of adjuvants;
- The **performance** of the solutions ;
- The **lack or non-existence** of responses to certain pathologies.

**Several issues concerning the animal health :**

- **20 % of agri-food industry economic losses** are due to animal diseases ;
- **High need for new vaccines** against infection and transmission ;

**And issues regarding the One-Health :**

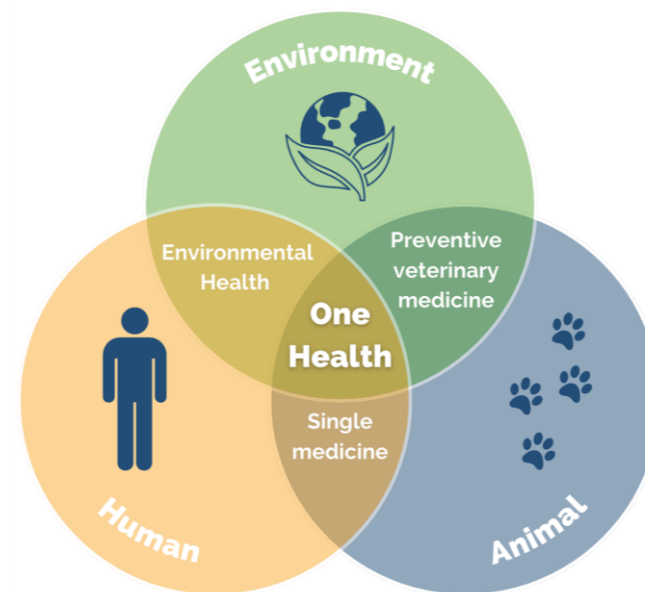
- **60 % of human infectious diseases** have animal origins (zoonosis) ;
- One new disease is emerging every **4 months** and **75%** are zoonotic ;
- Costs of these emerging diseases are estimated at **\$6,7 billion per year** ;

### ◆ Company's Vision

VAXINANO provides a safe and efficient **platform** to develop **vaccine or treatment** against infectious diseases affecting both animals and humans. This platform also allows to **improve existing vaccines** and to reduce or replace the use of antibiotics.

Be able to **mimic the ability of viruses** to pass through the nasal mucosa in order to deliver vaccines **without adjuvants and without toxicity**. They managed to **create nanoparticles** that can cross the mucus and **deliver vaccines nasally in a very efficient way**.

### ◆ One-Health Principle



VAXINANO's **work aligns with the One Health principle** by recognizing the interconnectedness of human, animal, and environmental health.



## ◆ Brief Description

VAXINANO is **specialized in the development of prophylactic and therapeutic vaccines to fight infectious diseases in animal and human health.**

The **patented technology** is based on **maltodextrin nanoparticles** manufactured according to **good manufacturing practices (GMP)** and **used as a powerful mucosal delivery system.**

VAXINANO has achieved **two world firsts** with an **immunotherapeutic treatment against leishmaniasis** and an **inactivated vaccine against toxoplasmosis**. VAXINANO is **the first company** to develop **inactivated nasal vaccines without adjuvant with proven efficacy** against bacterial, parasitic and viral diseases.



July 2016



France (Lille)



11 FTE



+100 Publications



+30 Years

Industrial and academic research



Awards

Innovation Award &  
DeepTech label (BPI France)  
Seal of Excellence (EU)



6 Patents

Worldwide strong IP  
protection



Partnerships

Supply/sale of Nanoparticles  
to Top Pharma players in  
Animal Health



World Premiere

Toxoplasmosis  
Leishmaniosis

## ◆ TOXO Vaccines

VXN-TOXO is **the first vaccine against lethal toxoplasmosis**. With more than **600 animals (450 primates) vaccinated in zoos**, the **number of dead animals has dropped to zero in zoos since the introduction of the vaccination in 2017** and **no adverse effects** has been observed.

## ◆ LEISH Therapeutic Vaccines

VXN-LEISH is **the first immunotherapeutic treatment** against dog leishmaniasis. It is **simpler**, (2 nasal vs 28 oral administrations), **safer** (no adverse effects) and **more effective** (complete healing from cutaneous lesions) than current treatments.

## ◆ CSR



VAXINANO's work is rooted in the "One-Health" principle, notably with the **strong will of the founder-director not to use organic solvents.**



By utilizing bio-based materials, **VAXINANO is respecting the green chemistry principle of using renewable resources.**



Finally, the company **respects a CSR charter** which implements a lot of measures in the areas of ESG.



## ◆ Toxoplasmosis Market

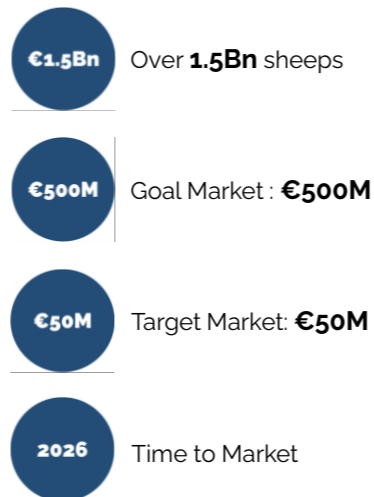
### Priority 1 – ZOO



### Priority 2 – CAT



### Priority 3 – SHEEP



## ◆ Leishmaniosis Market

### BRAZIL Market



### EU Market



## ◆ Go to Market strategy

VAXINANO's mission is to enable the global pharmaceutical industry to deploy a **new generation of vaccines** that are **free of adjuvants** and **side effects** and/or that respond to pathologies that are poorly or not covered. **The technology could be applied to the animal and human health industry without any limits over the mid and long term.**

1 VAXINANO **validates** the efficacy and safety of the vaccines via clinical assays before **licensing** and **transferring** the manufacturing process while **maintaining** the necessary control on nanoparticles manufacturing. The licensee **completes** the clinical tests and **sells** the vaccines worldwide, while **paying** royalties to VAXINANO.

2 VAXINANO **sells** an **exclusive licence** to a company **to use its patented vaccine platform (STELLAR-NP) for a specific pathogen/species target**. The licensee **develops** and **registers** the products created through VAXINANO's platform before **selling** them worldwide while **paying** upfront, milestones and royalties..

## ◆ Added value compared to competitors

Intranasal administration



Low production cost



Stable at room temperature



No variant development



Blocks pathogen transmission

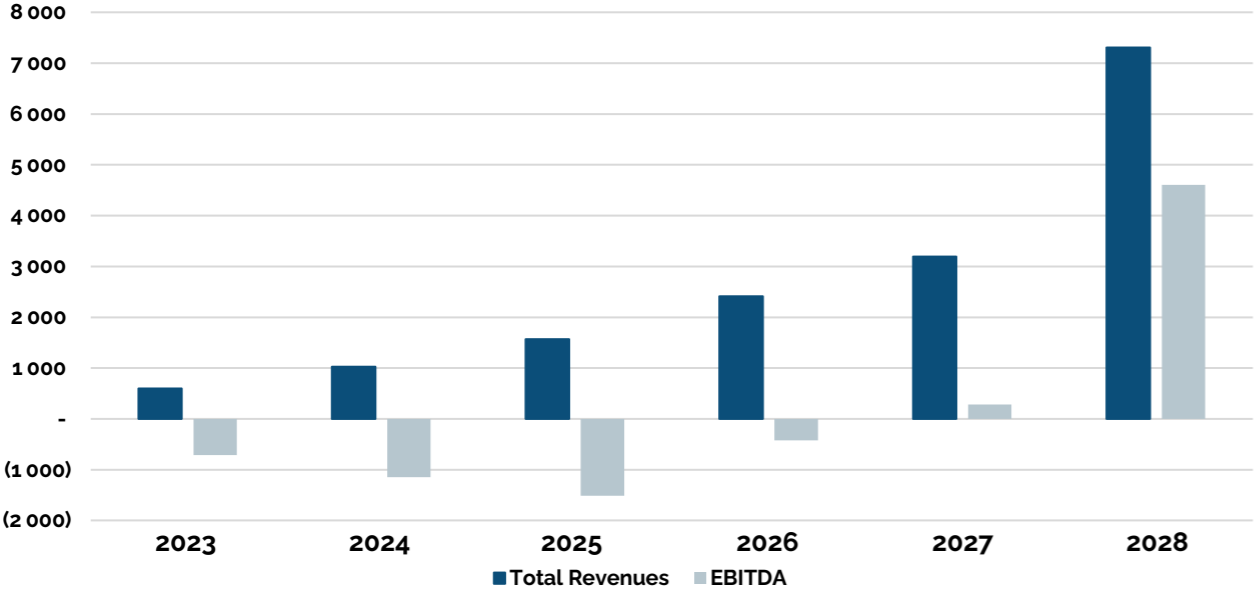


Persistent immunogenicity

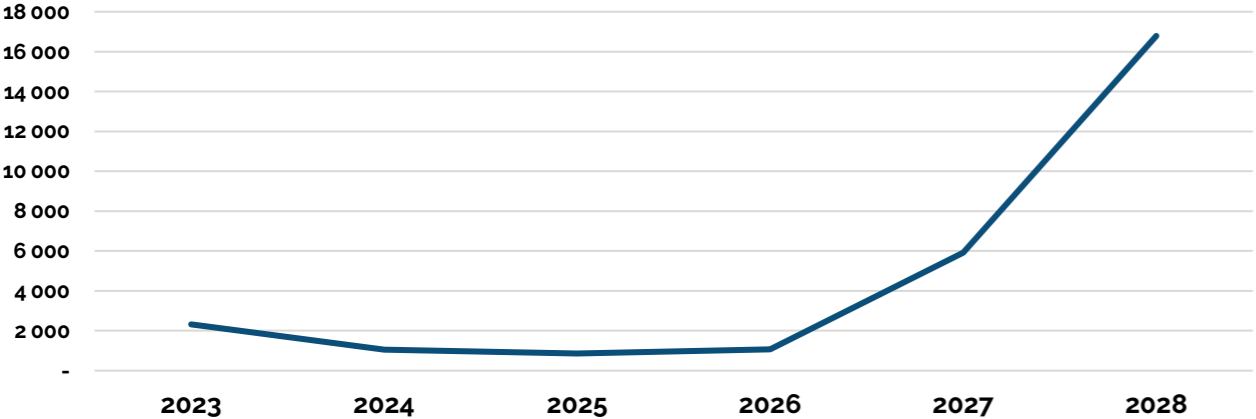




## ◆ Financial Expectations (k€)



Cash Flows at the end of the period



## ◆ Reasons for the financial need

### OBJECTIVES

- To **develop the bioproduction process and to license the vaccine against toxoplasmosis** to pharma companies ;
- To **develop the bioproduction process and to license treatments against leishmaniasis** to pharma companies ;
- To **prepare the launch of the VAXINANO technology's uses for human health.**

### PRIORITIES

- **Structure VAXINANO ;**
- **Pursue the manufacturing** of VXN-vaccines for out-licensing ;
- **Industrial scale-up** the GMP STELLAR-NP manufacturing (1 to 100 million doses) ;
- To **register a first vaccine** or treatment in animal health.

## ◆ Sought funds





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