#ANIMAL HEALTH

SATT technologies at the service of the veterinarian sector

RESEAU SATT

TECHBOOK

Edition #1 | June 2023

In partnership with : SIMV
SYNDICAT DE L'INDUSTRIE DU MÉDICAMENT ET DIAGNOSTIC VÉTÉRINAIRES

EDITO

Vettech is undergoing a huge mutation after COVID-19, Some animal health companies have participated to diagnostic production, and by doing so showed to have the same capabilities as human health companies. Those actors have some specific needs but one major challenge is “One Health”: a new way to envision health not only in one species but in all of them, animals, humans, and its direct impact on the environment.

Our Collaboration with **SIMV (Association of veterinarian medecine and diagnostic companies)** has allowed us to better understand their needs to find new ways to bring innovation to Animal health actors : *« SIMV Counts more than 40 Companies in different fields: Pharmaceuticals, In Vitro Diagnostic and Medical Devices all dedicated to animal health. Through the Years, it has grown into a strong ecosystem putting innovation as a central concern of this field. The Alliance Team of SATT Network will help us to speed up the process, it is a strong asset for us and our members to help them being more innovative in order to bring faster solutions to animalcare. »*
Jean Louis Hunault, SIMV President

This **Techbook** is the result of a long work initiated in 2020, with more than 40 projects selected among the SATTs (French TTOs) by our Team in 4 Strategic Areas MEDTECH, BIOTECH, GREENTECH and DIGITECH. A jury selected the best innovative projects to help you face veterinary health challenges.

Nicolas LAMOUREUX, Medtech Alliance Manager, SATT Network

RESEAU SATT

SIMV
SYNDICAT DE L'INDUSTRIE DU MÉDICAMENT ET DIAGNOSTIC VÉTÉRINAIRES

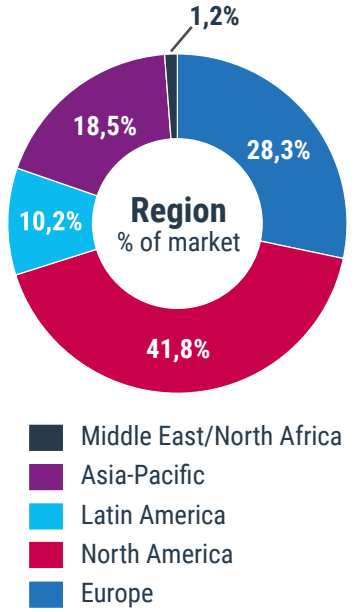
Summary

Animal health, a market focused on innovation

The French veterinary industry is driven by the ambition to become a global leader, with **strong investment in innovation**, representing 12% of revenues invested in R&D, compared with 2% in cosmetics. The French market has revenues of nearly 1.4* million euros, with annual growth estimated at 4.4%. Petfood represents the strongest growth at 8%.

The global market is booming, with an annual growth rate of +10.1% between 2022 and 2030. The largest market is North America, with 41.8% of the market in 2021, followed by Europe with 28.3%. With an aging population, ageing well is a major concern, with growth in wellness estimated at 21,1%. The market is driven by major groups such as Zoetis, Elanco, Merck, Boehringer Ingelheim Animal Health, CEVA, Virbac and Vetoquinol.

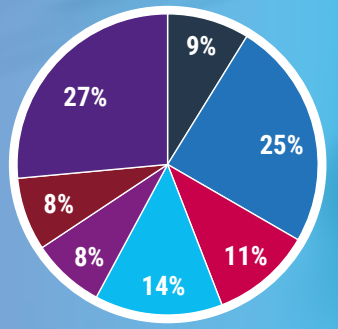
**Gross sales of veterinary drugs consumed in France, source AIEMV*



Worldwide geographic distribution
Animal health sector (2021)

Research and development is divided between innovative therapeutics (recombinant proteins, autogenous vaccines, etc.), which will enable veterinary medicine to be deployed (allowing Zoonose, for example, to be contained); new in vitro diagnostic devices, similar to those developed to test to Covid-19; strategic medicines common to animal and human health, such as anaesthetics, which have proved their effectiveness during health crises; and e-health, which represents one of the main areas of growth of the coming years, with new startups emerging to cover those fields.

AMM Authorization to be blaced on Market



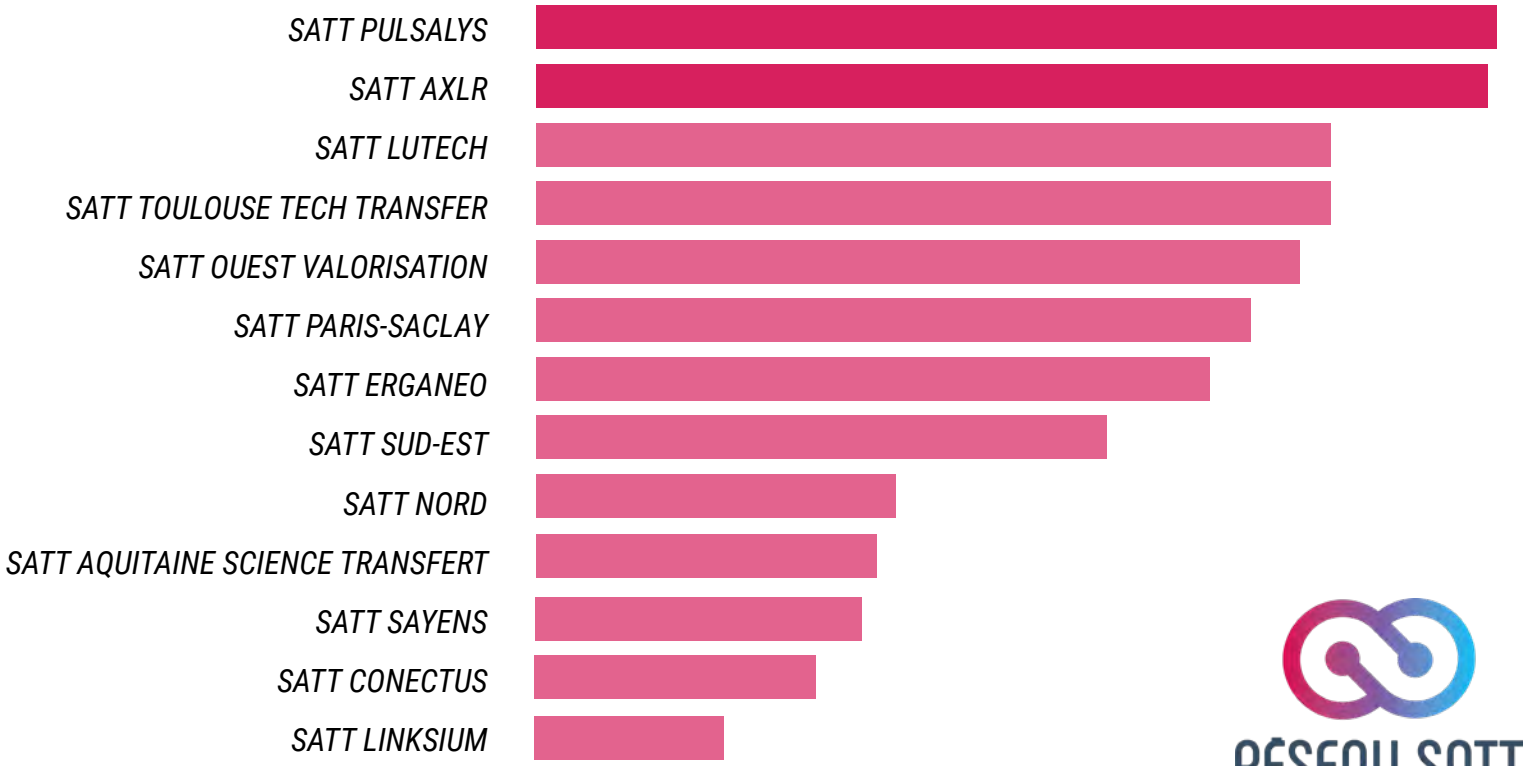
internal pest control *vaccine* *anti infective* *ectoparasiticide* *endoparasiticide* *topical* *others*

Source : @SIMV

How are SATTs helping to overcome those challenges?

2016 in France has been marked with a new government strategy regarding Antibioresistance and One Health. Competitive Clusters are more implicated and identified in this strategy, such as Atlanpole Biotherapies and LyonBiopole.

French Researchers are mainly located in Lyon and Montpellier respectivly helped by SATTs PULSALYS and AXLR.



RÉSEAU SATT

The most active SATT ecosystems in research - Research - SATT perimeters

Volume of scientific production by SATT shareholder members - Main French universities involved in the theme

Source : @SATT Network. This analysis takes into account the volume of scientific articles from universities and institutions within the scope of each SATT.

Focus on partners who place their trust in us

Our main mission is the development and transfer of technologies to existing companies or startups that we help to create. In the first case, the transfer can take the form of co-development, which enables the company to play an active role in developing the technology and adapting it to the target market, or direct licensing. Our recent collaborations and projects include **OligoFeed**, a startup developing food supplements for bees, and **NeoVoice**, a young company specializing in animal welfare.

OLIGOFEED *is a* ***startup*** *supported by SATT Paris-Saclay whose aim is to develop a* ***food supplement for bees*** *that has been validated by science and the beekeeping industry. This non-toxic supplement enables bees to better resist aggressors, promote colony development, increase honey production and significantly reduce colony mortality in winter. This supplement will have the advantage of being easily integrated into beekeepers' practices, and of being inexpensive. This University of Versailles Saint-Quentin-en-Yvelines - CNRS project has* ***benefited from a €512k investment from SATT Paris-Saclay****.*

NeoVoice
Faites parler votre chien

*« **NEOVOICE** is a **pet services startup** that is building a tool to assess the well-being of pets, shared between animal welfare professionals and owners. I met the SATT network's Strategic Alliance team at the Biofit event in November 2022. We discussed a technology developed by one of the SATTs in the field of animal health. Following our discussions, we agreed on a period of technology testing. Today, we are validating the results and working on the next stages of development. Deeptech Meetings event by SATT Network has provided NeoVoice with an opportunity to develop its business by co-constructing a breakthrough technology in conjunction with academic research. »* ***Emilie Nouveau, CEO & Founder NeoVoice***

SATTs, the best services to drive your deeptech projects !

The SATT Network is the partner of choice for companies seeking to improve their competitiveness through technological innovation.

We help you gain you privileged access to the **most promising innovations of French public research**. We transform the discoveries of researchers into robust, closer to industrialization products/ services/processes, to give you access to state-of-the-art, protected technologies. The SATT Network brings together 13 Technology Transfer Offices (SATTs) in France and offers **support services for industrial open innovation strategies and technology scouting**. We can help you reinvent your innovation strategy while limiting your risks.

Deeptech & Innovation, the strengths of the SATT Network

The first local structures in the french Deeptech plan, the SATTs increase your innovation potential.

SATT Key Figures :

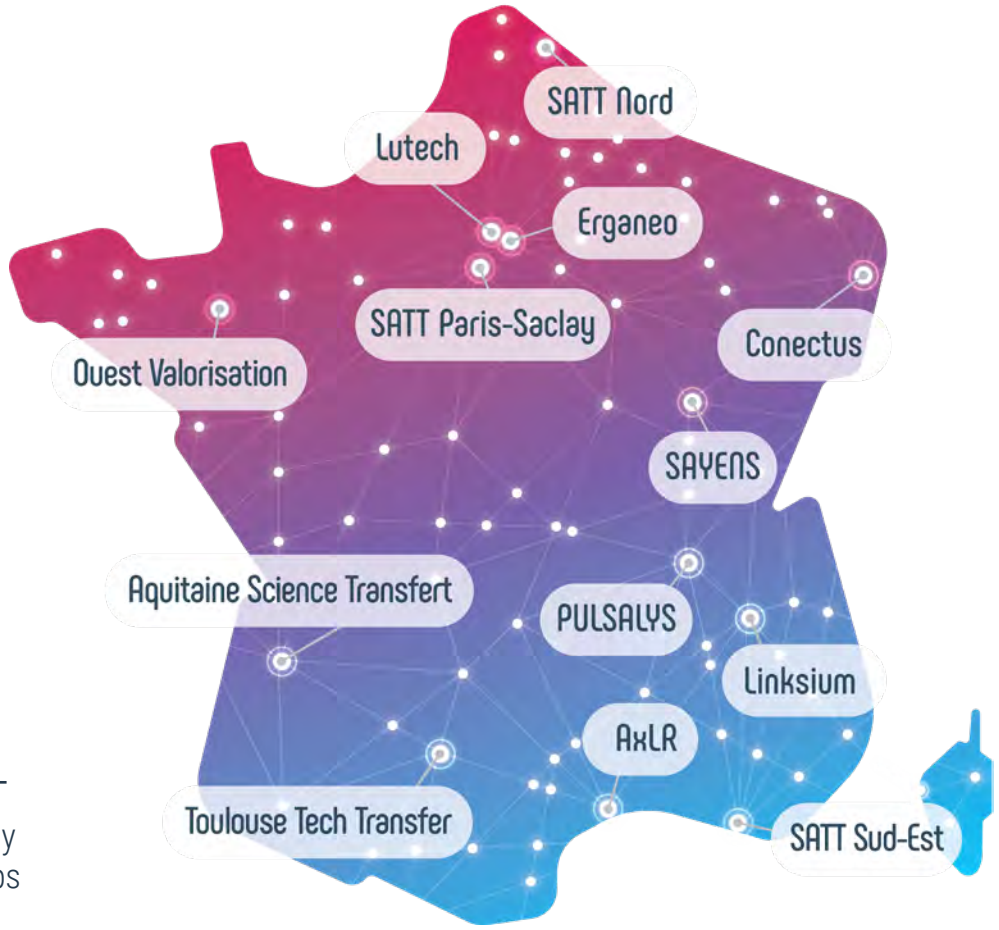
17 674
Disclosures evaluated

3 815
Priority patent applications filed

1 683
License agreements

755
Startups created

1.5
Bn€ raised by SATT startups



The Strategic Alliance Team

The **Strategic Alliance Team** is a national team dedicated to technology transfer and business development. The advantage? You will be dealing with a **single sectorial expert national contact**, who will be your entry point for providing you with a support service and to identify the **best technologies in the SATT catalog**. This national response in terms of offers and services is a time saver for your company.

Laurent AURET
Strategic Alliance Manager

Sandrine GARY-TREHIN
GREENTECH Alliance Manager

Hervé ANSANY
BIOTECH Alliance Manager

Aurélie LEMONDE
DIGITECH Alliance Manager

Nicolas LAMOUREUX
MEDTECH Alliance Manager

Meet us at our next business events

Our team is present throughout the year at business trade shows to **meet companies with innovation needs**. Come and meet us at the next events, where we'll be presenting our services and technologies in the **animal health sector**.

MedFIT
Fostering Innovation in MedTech

MedFIT
October 10th & 11th, 2023
STRASBOURG, FR
www.medfit-event.com

Biofit
FOSTERING INNOVATION & TRANSFER

BioFIT
December 12th & 13th, 2023
Focus on animal health
MARSEILLE, FR
www.biofit-event.com

PITCH SESSION
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By RESEAU SATT

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Tech-365.fr is a unique marketplace for all the latest innovations from French public research that have benefited from SATT expertise.

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ANIMAL HEALTH

TECHNOLOGY PORTFOLIO

RÉSEAU SATT

BIOTECH

ANTIBACTERIAL

RESEAU SATT

SKINNYPEP

Technology matured by SATT LUTECH

Optimization of Small Temporin-SHf Analogs with Antibacterial Activity

#Antibacterial | #Peptide | #Staphylococcus aureus

Short antimicrobial peptides represent attractive compounds for the developement of new antibiotic agents.

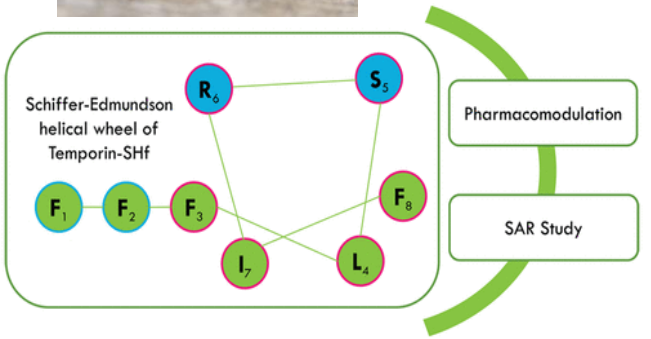
Temporin-SHf is the **smallest natural amphibian antimicrobial peptide** known to date.

A serie of temporin-SHf derivatives containing insertion of a basic arginine residue as well as residues containing neutral hydrophilic and hydrophobic groups were designed to improve the antimicrobial activity.

Three compounds were found to display higher antimicrobial activity with the ability to disrupt (permeabilization/depolarization) the bacterial membrane while retaining the nontoxic character of the parent peptide toward rat erythrocytes and human cells (THP-1 derived macrophages and HEK-293).

Activity against Gram + bacteria (including *multidrug resistant S. aureus*) and clinically interesting Gram – bacteria.

Pelophylax saharicus (Temporin-SHf producing frog)



ACS Chemical Biology **2015** *10* (10), 2257-2266

Alliance Opportunity : Comaturation / Licensing

IP : Patent

TRL : 3

CONTACT BUSINESS

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BIOTECH

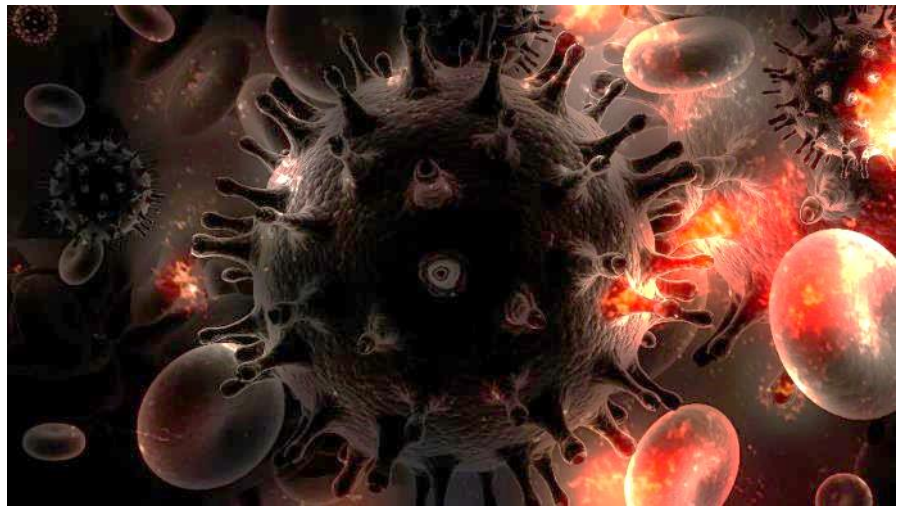
ANTIVIRAL

RESEAU SATT

VIRCO

Technology matured by SAYENS SATT CATALYSEUR D'INNOVATIONS

A collection of corrole-based molecules synthesized and tested on a collection of human and animal viruses



#Corrol | #Antiviral | #dsDNAVirus

A collection of 50 corrole-based molecules has been synthesized and tested on a collection of human and animal viruses (hCMV, HSV1, VACV, MYXV). We have shown, for the first time, that the corrole macrocycle named Fluocovir displays interesting **broad spectrum activities** on **herpes viruses** and **poxviruses,** reaching selectivity index of around 400 in vitro. In vivo studies in animals infected with a pathogenous poxvirus shows that Fluocovir induces symptoms delay and animal keep growing and gaining weight normally.

- ✓ Broad spectrum activity
- ✓ Activity on resistant strains
- ✓ Antiviral synergistic action with gold standard
- ✓ Easy synthesis and available upscaling

Alliance Opportunity : **Comaturation / Licensing**
IP : **Patent**
TRL : **6**

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GREENTECH

BEE KEEPING

RESEAU SATT

Varroas Mites Project

Technology matured by AxLR Occitanie Méditerranée

An innovative program based on AI enabling to count varroa mites of honey bees and facilitate beehives monitoring.

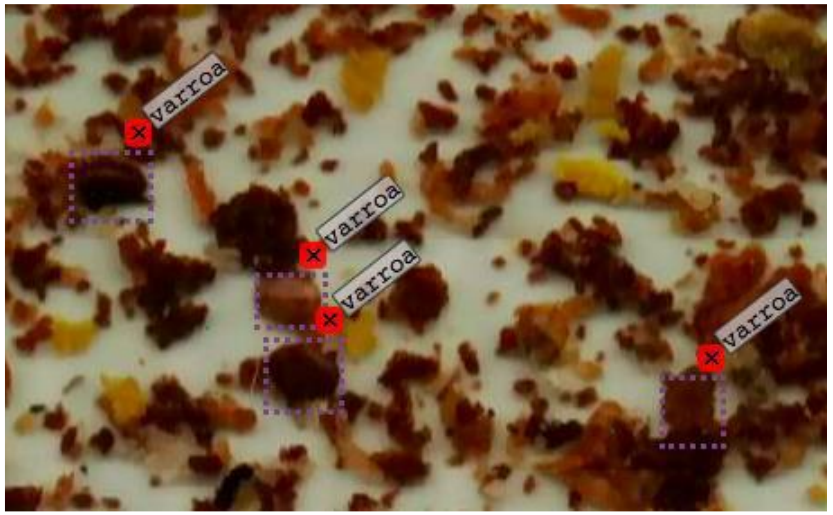
#VarroaMites | #Pesticides | #Ag'Tech

In **beekeeping**, counting varroa mites is a necessary step to assess **the parasite load of a hive**. The "comptage sur lange" method is promoted by the GDS organization (Groupement de Défense Sanitaire).

A module using **deep learning** has been developed. This program allows an **automated**, **fast** and **efficient** counting of varroa mites and a dynamic monitoring of the evolution of the infestation.

Integration of this module into an application would allow the development of a new Decision Support Tool. The software could give **recommendation/alert** and allow the collection of high value added information (practices, treatment efficiency, infestation areas, etc.).

This method is **non destructive**, simple of use and counting results show a very good correlation. We would like to license this technology to an industrial partner. Potential end users are already identified.



Alliance Opportunity : **CoMaturation / Licensing**
IP : **Software**
TRL : **7**

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BIOTECH

BIOFILM ANTIMICROBIAL

RESEAU SATT

PEPINHO

Technology matured by OUEST VALORISATION Ressources d'innovation

A natural compound able to fight against muscle atrophy

#Biofilm | #Peptide | #Natural Product

We propose **new bioinspired peptides** as first in class antimicrobials. Our peptides display an innovative and promising new mechanism of action to control staphylococcal colonization Innovative because its MoA is less susceptible to the **development of bacterial resistance** and promising because they are non bactericidal, encouraging their use as **microbiome balancer**, alone or in combination with other adjuvants.

On the other hand, apart from the commercial appeal of being a product of natural origin, with greater acceptability in the market, these peptides are **not cytotoxic.**

Alliance Opportunity : CoMaturation / Licensing
IP : Patent
TRL : 2

CONTACT BUSINESS

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PROBIO+CELL

New generation of probiotics

Technology matured by SAYENS SATT CATALYSEUR D'INNOVATIONS

#Anaerobic Strain | #Fibrolytic Activity | #Cattle Breeding

- **Strict anaerobic bacterial strain with direct fibrolytic activity**
- Total degradation of cellulose in 48h
- +12% in hay degradation after 72h of incubation
- Perfectly adapted to gastrointestinal ecosystems

PROBIO+CELL

Alliance Opportunity : CoMaturation / Licensing
IP : Patent

CONTACT BUSINESS
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BIOTECH

METAL CONTAMINATION

RESEAU SATT

ECOPRINT

Technology matured by Linksium technology transfer & startup building Grenoble Alpes

a unique technology to characterize the environmental contamination of organisms

#Pesticide Pollution | #Body Contamination | #Environmental

EcoPrint's objective is to develop **an innovative technology to decipher the environmental contamination of bodies**. It is based on a specific bio-affinity strategy, allowing a very sensitive detection of the contamination and the impact of fatty bodies on the environment.
Our sampling technology gives access to the **monitoring of damaged tissues**. It can be performed at home or on site and processed remotely. It is very sensitive and compatible with the low dose environmental cocktail scenario. In addition, it is inexpensive and compatible with a large-scale preventive approach.
Pre-industrial prototypes and proofs of concept of our technology have been performed focusing **on pesticides and more** specifically on glyphosate. Two devices have been designed to explore active and stored pollution in the human/animal body.

Alliance Opportunity : CoMaturation / Licensing
IP : Patent
TRL : 3

CONTACT BUSINESS

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BIOTECH

MUSCULAR

RESEAU SATT

MYOMU

Technology matured by AxLR Occitanie Méditerranée

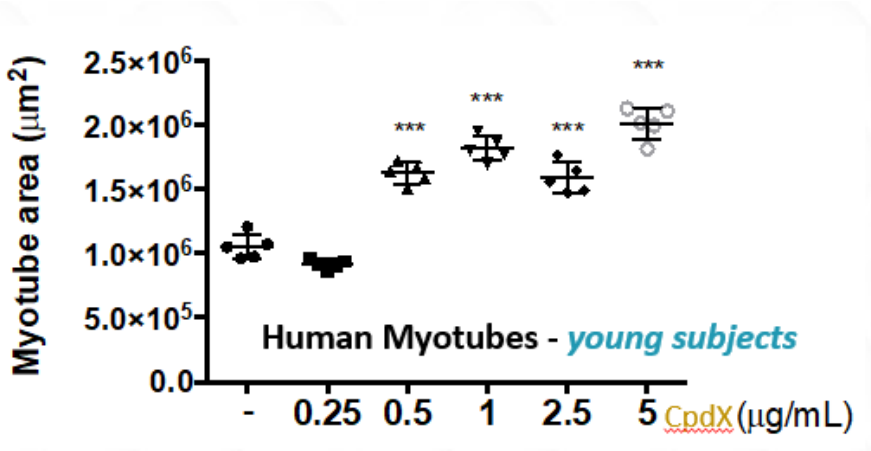
A natural compound able to fight against muscle atrophy

#Sarcopenia | #Natural Compound | #NCE

Muscle atrophy (sarcopenia in aging, cachexia in cancer pathology) is the loss of skeletal muscle mass caused by immobility, aging, malnutrition, medications, or a wide range of injuries. Currently, **no treatment is available**: exercise and adequate nutrition are the only alternatives to reduce muscle loss. The research team identified a natural compound (CpdX) extracted from Rosemary leaves. Its activity on human muscle cells was evaluated and **hypertrophic activity measured**. This molecule increases muscle volume in myotubes obtained after biopsies from young and elderly subjects. The mechanism of action has been evaluated, involving **protein synthesis** and **protein degradation** through the activation of different cellular pathways.

Endurance is significantly improved after an oral administration of CpdX for 18 weeks in 20-month-old mice, as well as the promotion of lipid metabolism and a decrease of the activity of tissue degeneration markers.

This compound is patented for therapeutic and non-therapeutic uses in **human** & **animal health**.



Alliance Opportunity : CoMaturation / Licensing
IP : Patent
TRL : 3

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BIOTECH

NEWCASTLE DISEASE

RESEAU SATT

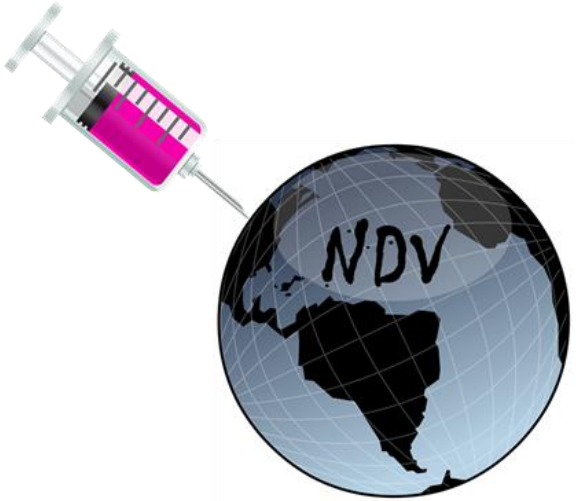
NEWCASTLE DISEASE VACCINE

Technology matured by AxLR Occitanie Méditerranée

This vaccine controls viral shedding and is efficient against recent genotypes

#Newcastle Vaccine | #Poultry | #Viral Shedding

Newcastle Disease is a deadly disease, spread all around the world. Poultry market is increasing. There are more than **20 billions chicken over the world**, 55% of farms being in Asia.
Current vaccines against Newcastle Disease protect against clinical expression but do not prevent shedding and transmission of recent virulent strains.
The team has created an **attenuated vaccine** whose modifications **thwart antigenic drifts** that have accumulated during decades of use and lead today to an imperfect control of virulent strains that circulate, especially in **Asia and Africa, and threaten Europe.** This vaccine protects from clinical expression and avoid viral shedding.
A prototype of the vaccine with **La Sota-XI backbone already exists**. It has been successfully tested in vivo. The technology is patented (TRL 3 in collaboration with CIRAD). Further improvements are currently made thanks to bioinformatics and lab analysis to design a universal vaccine efficient against all genotypes. This vaccine can be adapted to all sorts of backbones.
We are looking for **an industrial partner to develop the "universal" prototype** and run in vivo tests.



Alliance Opportunity : Option/ Licensing
IP : Patent
TRL : 4

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BIOTECH

ONCOLOGY

RESEAU SATT

LUCKy

Technology matured by SATT PARIS-SACLAY

Levilactobacillus brevis strain LBH1073 with unique anti-proliferative activities as alternative approach for pets with cancer

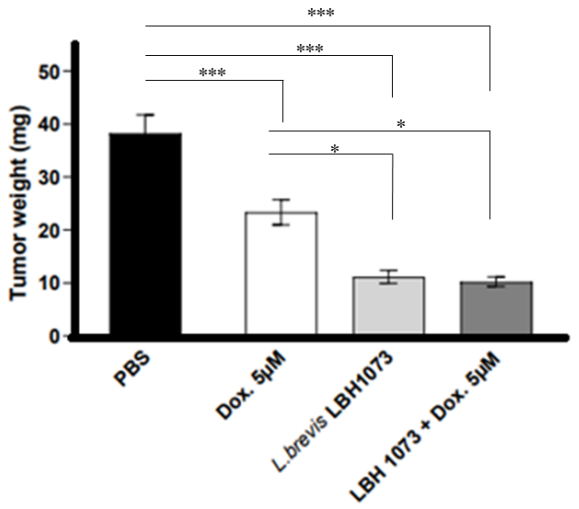
#Probiotics | #Cancer | #Veterinary Medecine

About **1/4 of dogs will develop at least one tumor** during their lifetime while cancer treatments currently available (curative or palliative) remain insufficient or have significant limitations in terms of accessibility, cost and quality of life constraints.

Key Advantages of LUCKy: **Easily accessible** and **non-invasive anticancer** approach that might preserve the quality of life of the animal as well - Genetically characterized strain - QPS/GRAS status

Development stage of LUCKy: **Biochemical** and **functional *in vitro* assays** using various cancer cell lines of different species demonstrating beneficial effects - PoC obtained in *in ovo* models using canine cell lines and establishing significant tumor and metastasis regression, and *in vivo* in rodent demonstrating reduction of the tumors in a colorectal cancer model - Mechanism of action characterized

Intellectual Property: Patent Application filed - Expiring Q2 2039



Alliance Opportunity : Licensing
IP : Patent
TRL : 4

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BIOTECH

VACCINAL APROACH

RESEAU SATT

VACVES

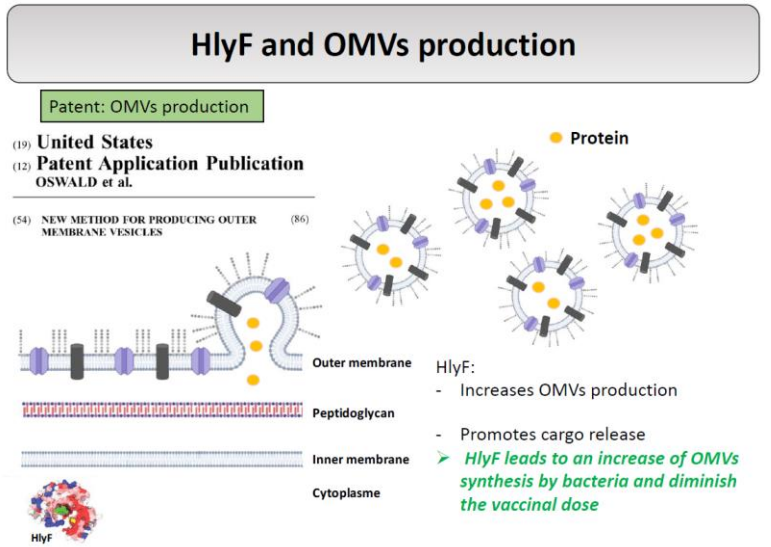
Technology matured by Toulouse Tech Transfer INNOVATIVE IMPACT

Vaccine platform based on outer membrane vesicles

#OMV | #Vaccination | #Immunization

- Use of hlyF protein in Gram- bacteria to massively express OMVs
- Proof of concept: vaccination of chickens with OMVs produced by a strain overexpressing *hlyF*
  - ➢ No effect on chicken growth
  - ➢ **Strong immunization of chickens against APEC infection**
- OMVs can be modified to accomodate several pathogens
- Low production costs and easy scale-up

- Key advantages:
  - OMV production in large quantities
  - Modular induction of the immune response
  - Usable as vaccines adjuvant



Alliance Opportunity : CoMaturation / Licensing
IP : Patent
TRL : 4

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