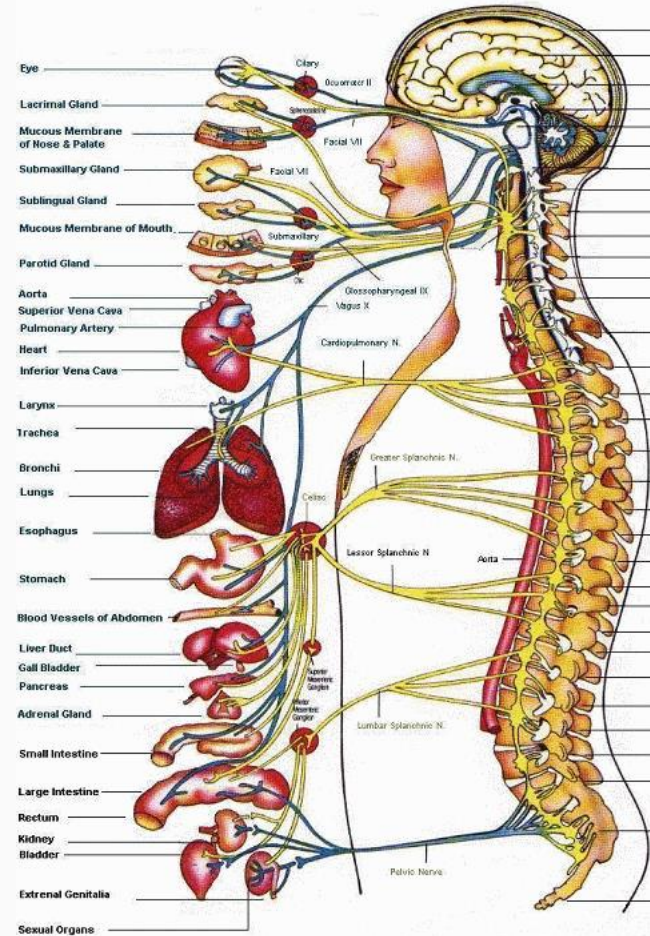


Ananda Devices

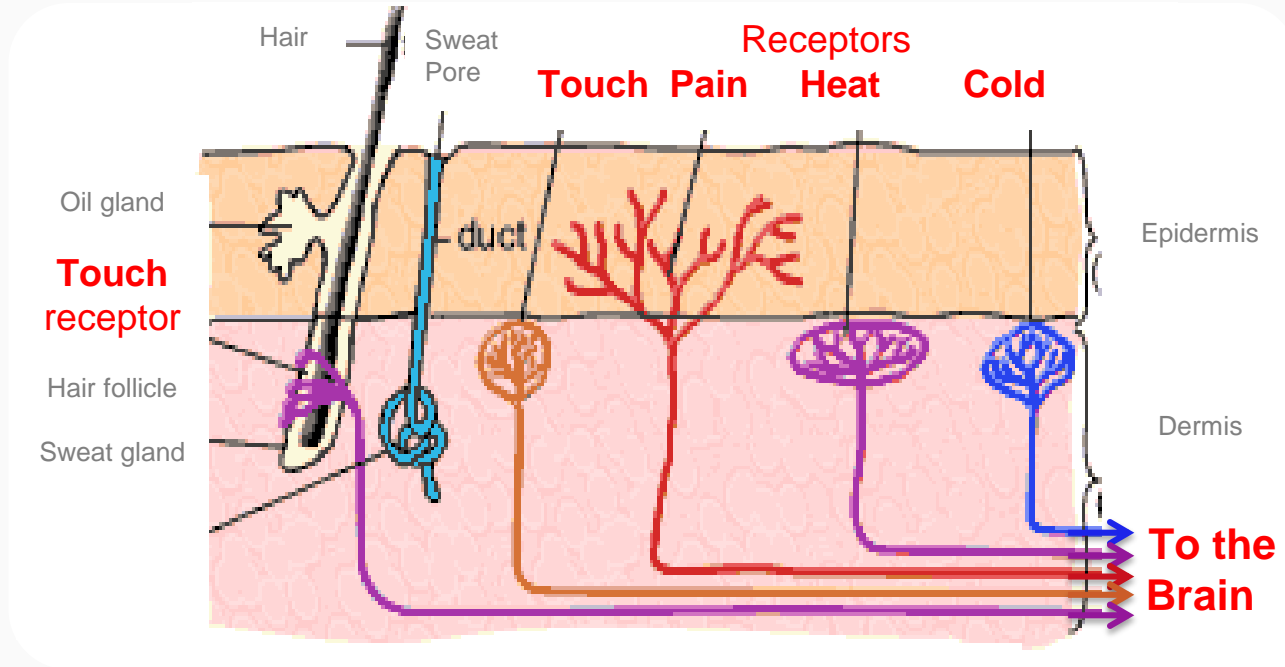
Delivering more predictive human models

Dr Margaret Magdesian, PhD, CEO & Founder

A Tissue without Neurons is not Fully Functional



The Skin is Densely Innervated to Sense the Environment and report to the brain



Neuron-Skin Communication Modulates the Human Response to the Environment/Stimuli through

- ✓ Pain
- ✓ Pruritus
- ✓ Eczema
- ✓ Allergies
- ✓ Skin Aging
- ✓ Inflammation
- ✓ Wound Healing

However

Neuronal
response in
HUMANS \neq Neuronal
response in
ANIMALS

Over **94%** of Drugs that pass
animal tests will **fail** during human
clinical trials.
FDA 2006

We Need Innervated Models of Human Skin

to gain knowledge beyond skin deep

Tissue Innervation

enables more

Predictive,

Functional

models of

Human Tissues

To avoid costs of over

\$28 Billion / year spent in

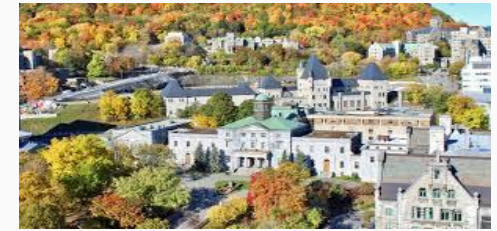
irreproducible research in the US.

Banerjee et al, Drug Discovery Today 2016

Ananda Devices Offer over 20 Years of Experience



UNIVERSIDADE FEDERAL
DO RIO DE JANEIRO



Cell Biology, Pharmacology, Neuroscience, Nanoscience

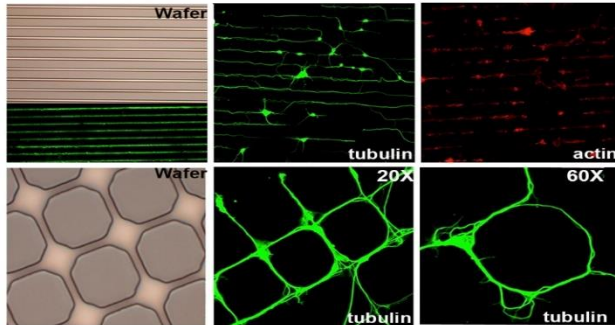


Microfabrication, Microfluidics, Organ-on-a-Chip, Microphysiological Systems

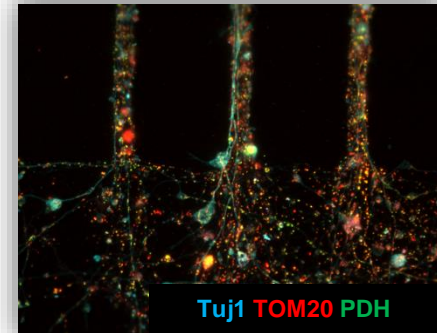
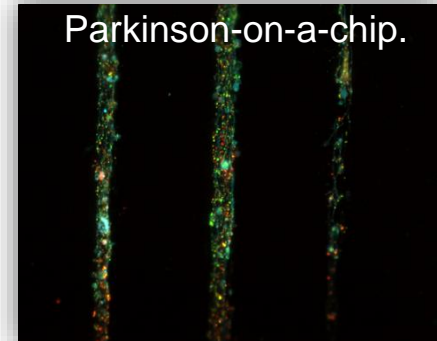
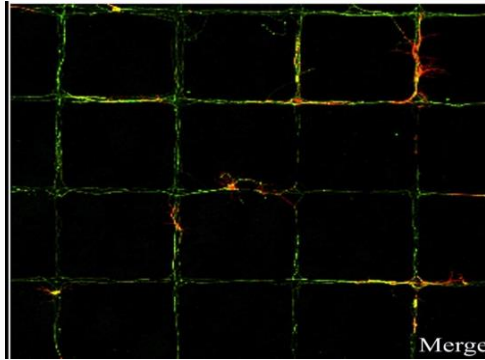


Ananda Devices Controls Neuronal Growth

using organ-on-a-chip technology

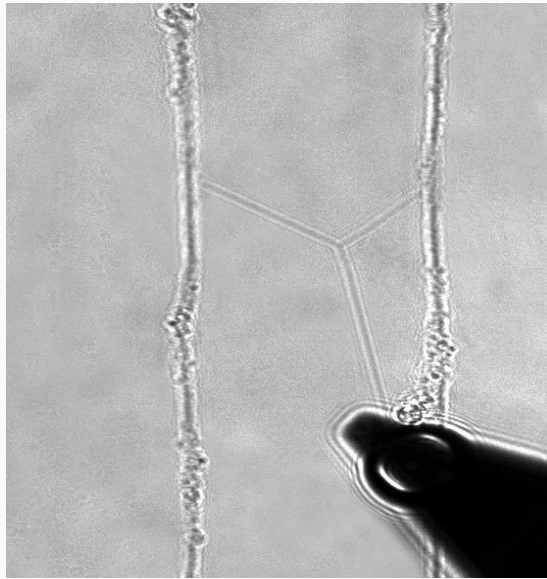


Belkaid et al. BMC Biotechnol. 2013 Oct 11;13:86.



Frédérique Larroquette, McGill University

We Developed Technology to Connect Neurons **60x Faster** than *in vivo*



Magdesian et al., J. Neuroscience 2016



Top 10 discoveries of the year 2016



“... A new way of regenerating the central nervous system”

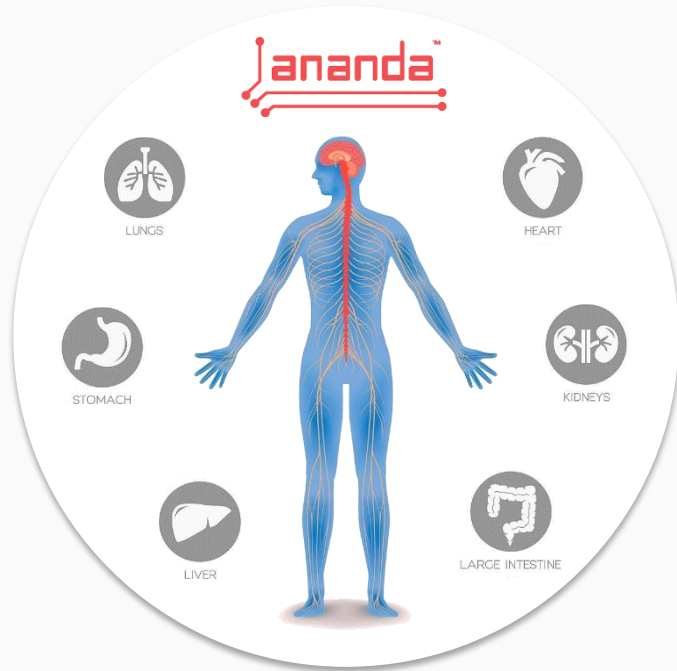


“Similar techniques may allow to restore function after injury”

Ananda Devices Delivers Nervous System on-a-Chip

Enabling more predictive, functional models of Human Tissues:

- ✓ **Brain-on-a-chip**
- ✓ **Spinal Cord-on-a-chip**
- ✓ **Innervated Tissue-on-a-chip**
- ✓ **Co-cultures**



From Past:

Cell lines & animals



Manual & Subjective technology



Single platforms

To Future:

Human cells & Reproducible Results



Automation & Big Data



High Throughput Screening (HTS)

More Predictive Human Organ-on-a-Chip Models Can:

From Past:

Cell lines & animals



Manual & Subjective technology



Single platforms

- ✓ **5X Cost reduction**
- ✓ **2X Faster drug development**
- ✓ **Eliminate the use of animals**
- ✓ **Reduce size of clinical trials**
- ✓ **Reduce hazardous waste**

To Future:

Human cells & Reproducible Results



Automation & Big Data

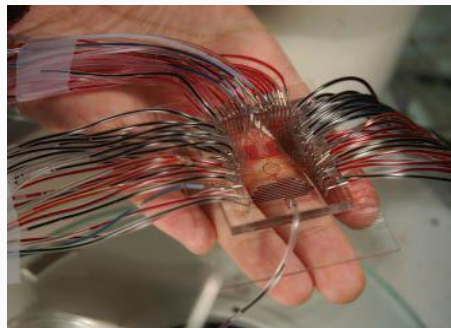


High Throughput Screening (HTS)

Major Challenge is Implementation

- ✓ Difficult access
- ✓ Difficult to use
- ✓ Difficult implementation in daily lab activities
- ✓ Technical Support (Brazil)

Tubing, Pumps & Bubbles



Biggest Challenges of Pharma, Food & Cosmetics' Industries:



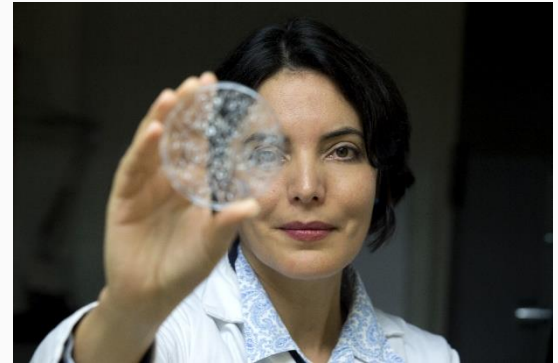
Source: the future of biologics development: Insights to Help Biopharma Companies Win the Race to Market; BipharmaDive; Catalent Biologics

Ananda Devices addresses the major challenges

We are PRO (a *Partner Research Organization*)

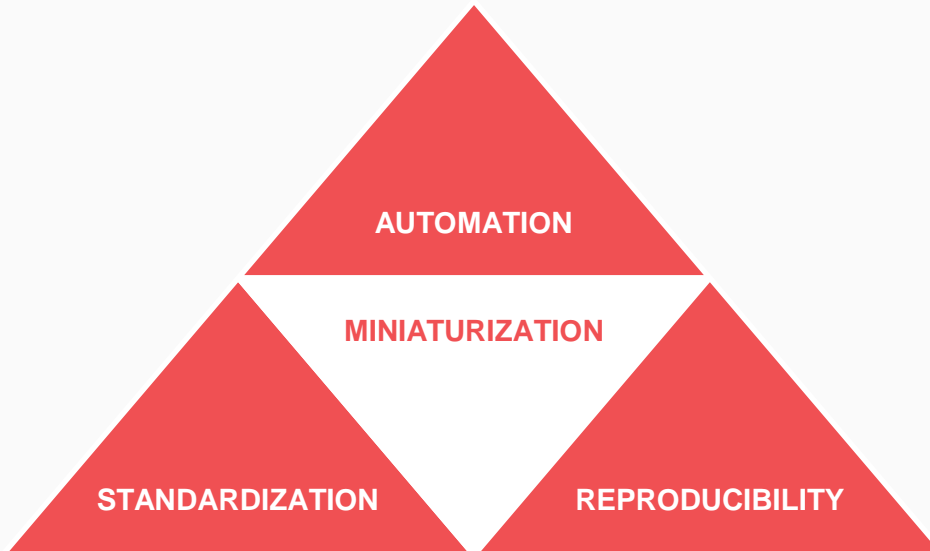
Ananda Devices provides Organ-on-a-Chip solutions to :

- **Accelerate** speed to market;
- **Automate & Optimize** processes;
- **Reduce costs** with biological tests;
- **Provide appropriate expertise and training** for successful implementation



Flexible & Cost-Effective Solutions

to address each lab specific needs



Save Animals



Save Costs



Save Time



Save the Environment

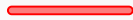
Ananda PROcess™ – 5 steps to innovation



Assessment

Ananda PROcess™ – 5 steps to innovation

1



2

Assessment

Standardization

Expected
Results

**Save more than
20% in reagents
& samples**

Ananda PROcess™ – 5 steps to innovation



Assessment

Standardization

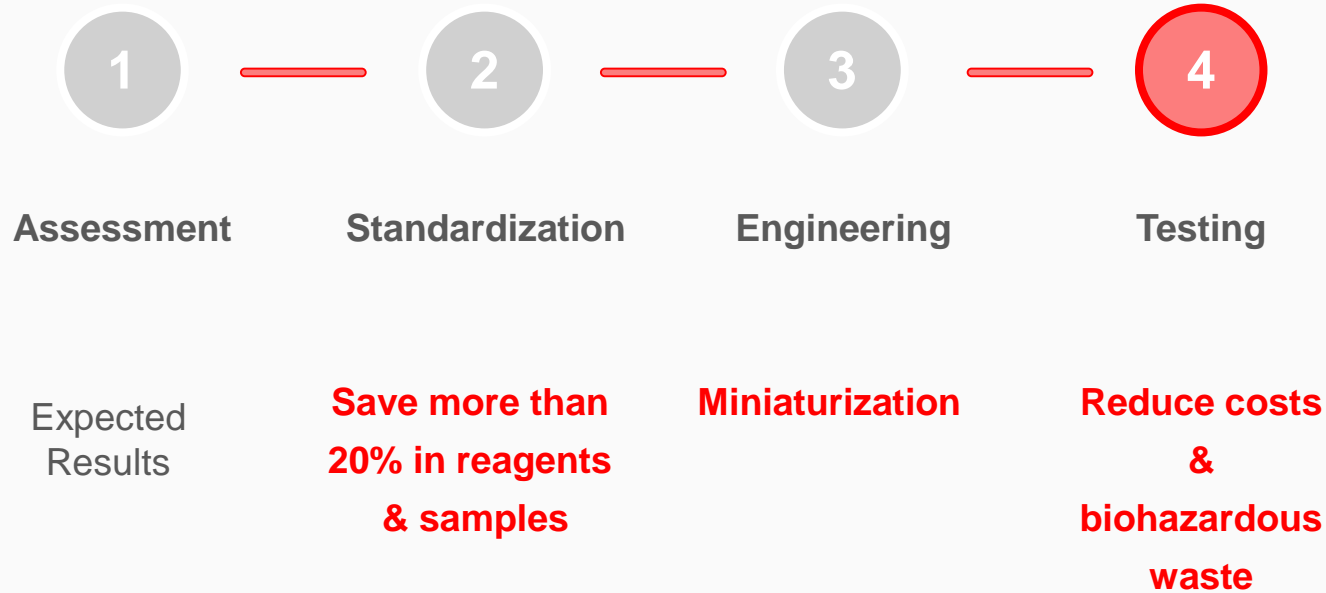
Engineering

Expected
Results

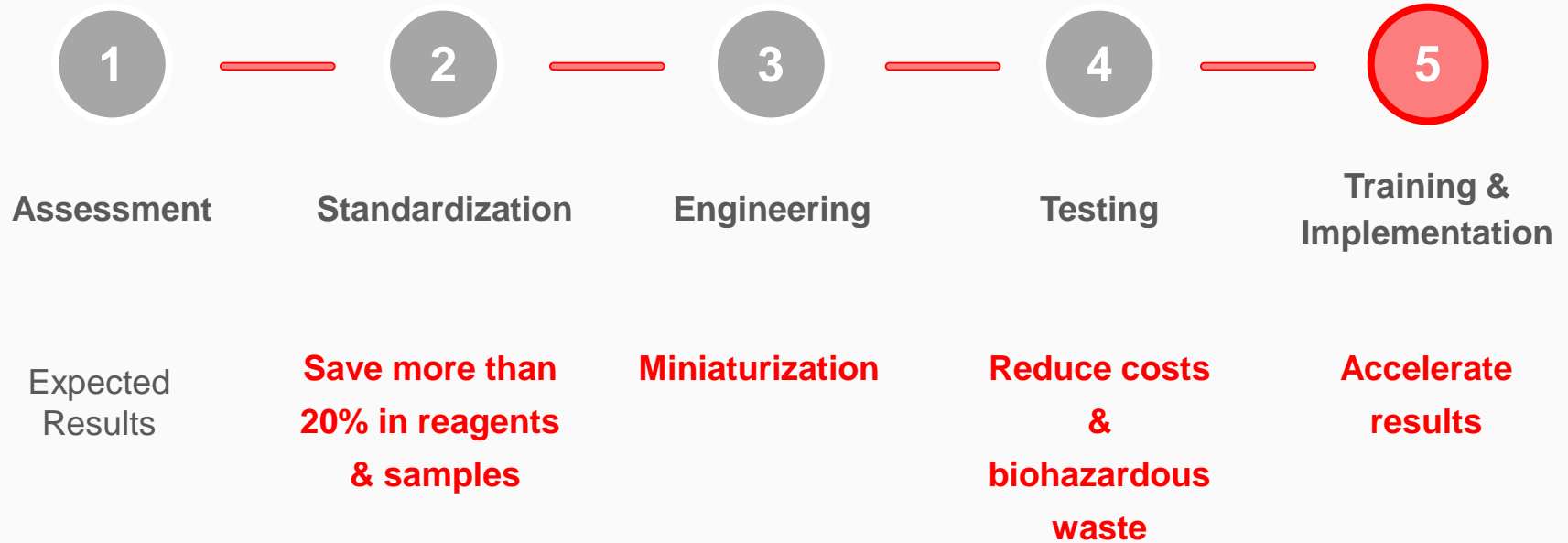
**Save more than
20% in reagents
& samples**

Miniaturization

Ananda PROcess™ – 5 steps to innovation



Ananda PROcess™ – 5 steps to innovation



Ananda Devices' Key Partnerships

We've built a strategic & innovative ecosystem to bring more predictive human models to the market



Team with Expertise in
Neuroscience,
Stem cells & Microfluidics

PhDs & Engineers

Dr Magdesian, PhD

Dr Pimentel, PhD

Mr Lameira, Eng

Mr Hervé, Eng

Ms Robbe, Veterinarian

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**Access to
Human
Tissue & Data**

Hospitals

MNI, McGill *

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MNI, McGill *



**Access to
Validated
Drugs & Data**

Big Pharma & Cosmetics

F-500 Pharma

F-500 Cosmetics*

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Access to
Human
Tissue & Data

Hospitals

MNI, McGill



Access to
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Big Pharma & Cosmetics

F-500 Pharma

F-500 Cosmetics*



State-of-the-art
Manufacturing
Facilities

CRO

CNRC Medical Devices

State-of-the-Art Manufacturing Facilities

Ananda Devices partnership with Canadian National Research Centre (“CNRC”)



Production of organs-on-a-chip and MFDs under strict cleanroom conditions.



Hub of Experts and Technology to Deliver Automation & Big Data

- iPSCs derived **neurons** and organoids **from patients**;
- Profiling multidimensional **clinical, genetic, and imaging data**;
- Network of over **350 scientists and clinicians**, 800 graduate students and post-doctoral fellows;
- The Ludmer Centre for Neuroinformatics and Mental Health: one of **North America's most powerful computing and neuroinformatics** infrastructures, CBRAIN (Canadian Brain Research and Informatics Network).



Success Story – Ananda Devices PRO™

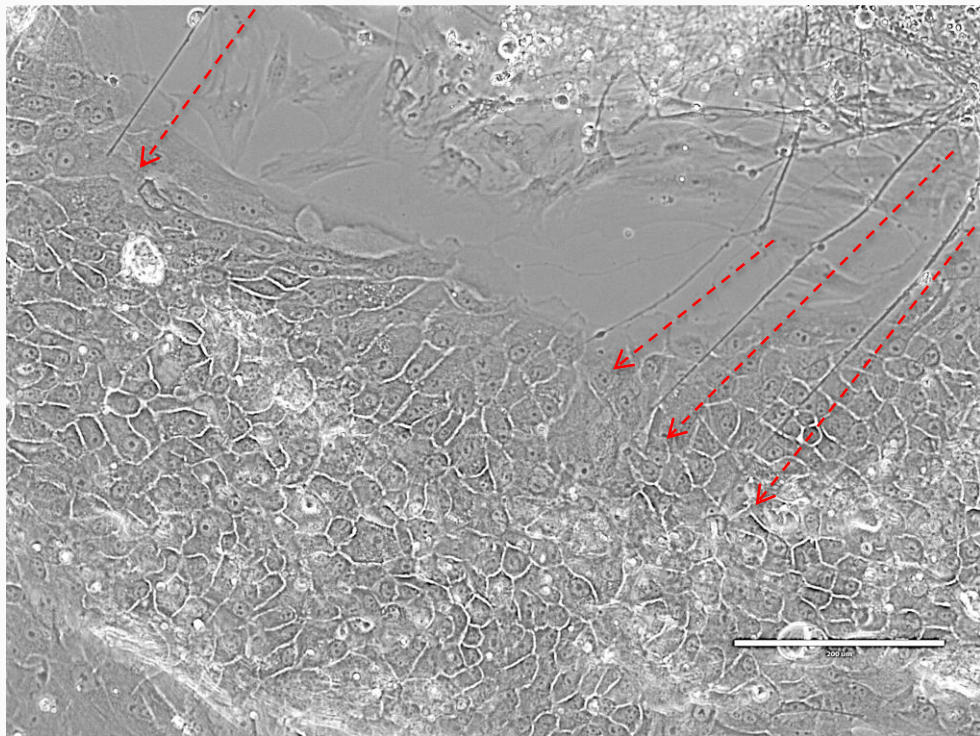
A **Fortune 500 company** contracted us to develop an organ-on-a-chip device to increase predictability of tests. In **6 months** Ananda Devices successfully delivered:

- **100% Human Model** (no use of animals)
- **80% Costs Reduction** with reagents
- **37% Faster Results**
- **Increased Biosafety & Reduction of Biological Waste**



In order to comply with agreements and to maintain the trust of our business partners, we protect our clients' valuable proprietary and confidential information.

Success Story: Ananda Devices Skin Innervation



Human derived sensory neurons entering and anchoring in layers of human keratinocytes

Successful partnership

Ananda Devices

Dr Margaret Magdesian
Dr Luisa Pimentel



IDOR

Dr Stevens Rehen's Lab
Dr Marília Zaluar Guimarães
Gabriela Vitória



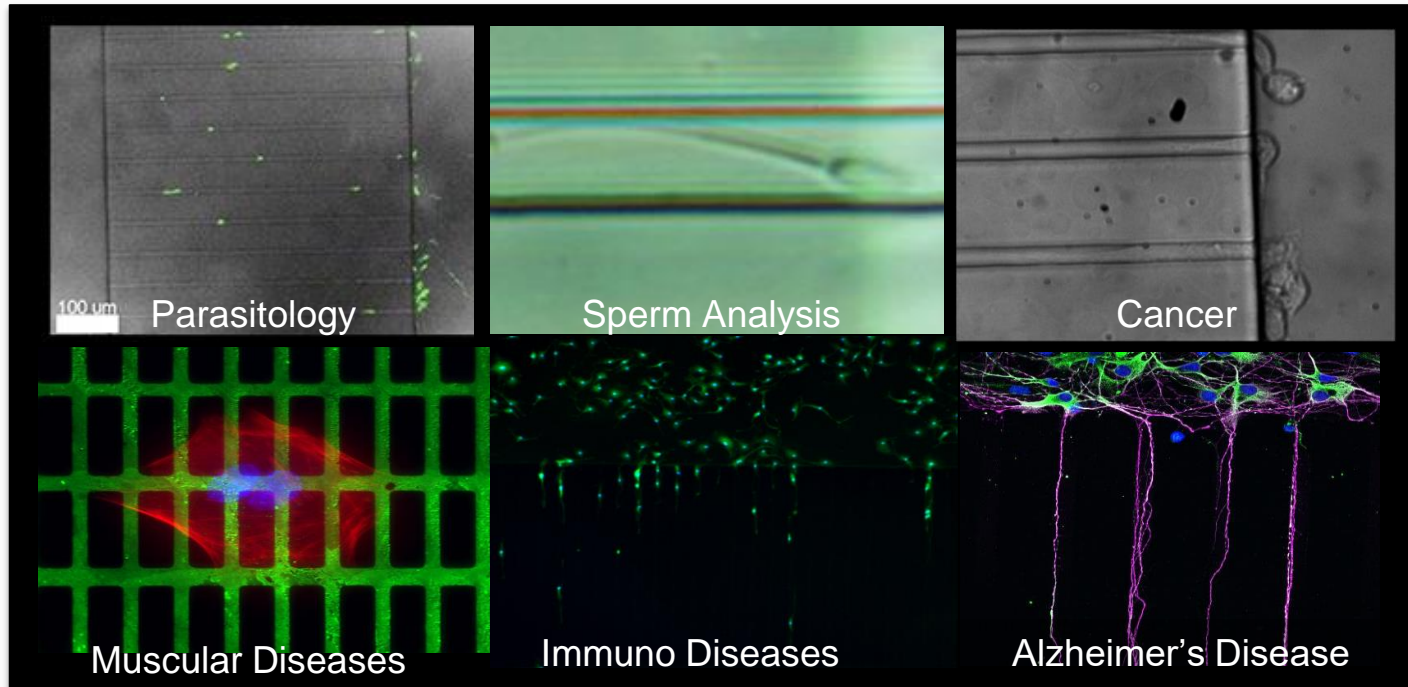
L'Oréal

Dr Lionel Breton
Dr Rodrigo De Vecchi
Dr Vanja Dakic



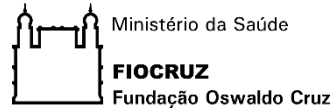
Ananda Devices Provides More Predictive Models

Pictures sent by our customers



Key Opinion Leaders have Validated our Technology

F500 Cosmetic
Company



F500 Pharma
Company



The time is Now.

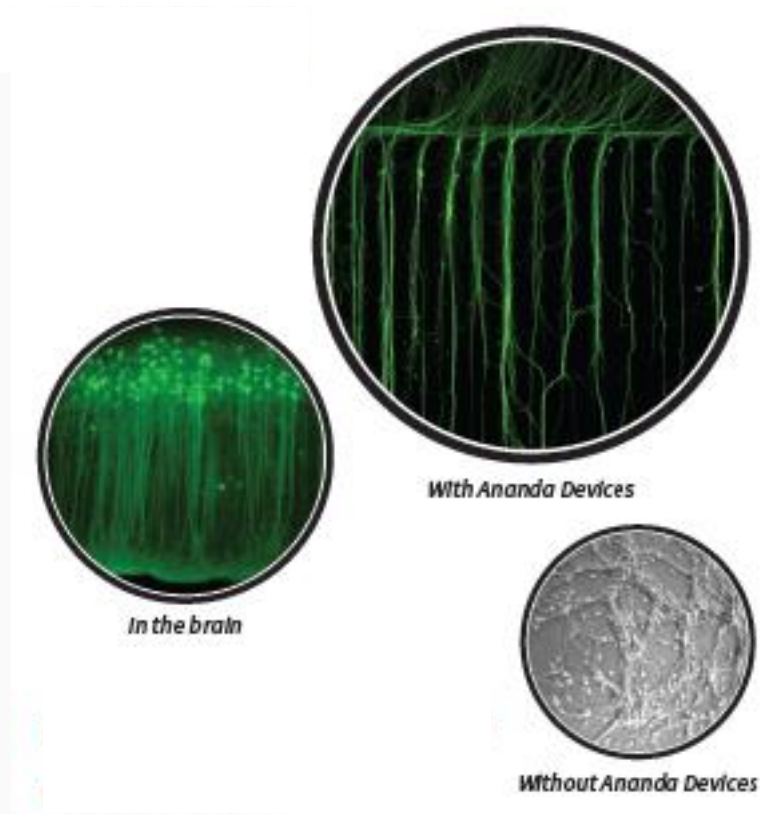
Regulators are making change mandatory



- Over 14 Regulatory Bodies Worldwide are working to regulate the use of Organs-on-a-Chip technology, among those the **FDA**.
- In European countries, India, Israel and in Brazil, regulatory agencies are to eliminate animal testing and replace them with more predictive human models;
- The industry is looking for **more physiologically relevant, efficient and cost effective solutions.**

Ananda Devices Advantages

- ✓ **First** in the market to offer **innervation**;
- ✓ Enable **cell survival** for over **5 weeks**;
- ✓ **User friendly** solutions (no pumps, no tubes);
- ✓ Customized solutions to **increase reproducibility, reduce costs and accelerate development**;
- ✓ **Training** for successful **implementation**;



A Proven Team



Guilherme Lameira, MBA, Eng.
Operations Director



Xavier-Henri Hervé, MBA, Eng.
Executive Advisor



Dr. Margaret Magdesian, PhD
Founder, President



Raquel Robbe, Vet.
Operations Director Brazil



Luisa Pimentel, PhD
Scientific Director

Ananda Devices Awards in Science and Innovation



Top 7 Canadian Ventures



Top 10 Découvertes de l'année 2016



Is Your Lab Ready for Innovation?

Access Ananda Devices' **Competitive Advantage Assessment Guide** and get a report with **Market Trends**

<https://anandadevices.com/guide>

<https://anandadevices.com/guide>

Ananda Devices

anandadevices.com

contact@anandadevices.com

