Une approche pharmaceutique innovante des troubles neurosensoriels de l’oreille interne

Inner Ear
- Vestibule: body balance
- Cochlea: auditory functions

Dr Laurent NGUYEN, Directeur Général
Sensorion
Dysfunction of the Inner Ear
Disabling Loss of Balance and Auditory Functions

Vertigos - Dizziness

Hearing loss - Tinnitus

High unmet medical needs in treating acute crisis & long lasting disorders
The Emerging Inner Ear Segment
On the Radar Screen of VCs and Big Pharmas

**Deals**

**First Developments**
- **Sanofi**: AUDISAN (Aviesan, Inserm - hearing loss, tinnitus)
- **Boehringer Ingelheim Venture Fund**: Acousia (regenerative hearing loss space)
- **Roche**: Inception-Versant (regenerative hearing loss space)

**Venture Capital Investments: ~$100M**
- **Sofinnova Ventures & Partners**: CHF 47M in Auris
- **Pfizer**: £5M Series A in Autifony
- **Orbimed**: $46M in Otonomy

**2012**

**2013**

**2014**

**Inner-ear going Public**
- **Auris Medical**: $60M (IPO on NASDAQ, mkt cap $175M)
- **Otonomy**: $115M (IPO on NASDAQ, mkt cap $430M)

**2 IPOs on NASDAQ**

- **Lilly**: Audion (regenerative hearing loss space)
- **GSK**: Auditory workshop at 2014 ARO - Association for Research in Otolaryngology

**Venture Fund**
From Spin-off to Biotech maturation

**Creation & Scientific maturation: pre-clinical testing**
- Seed $ + JEI/SME status + CIR + Oseo/LR Region/Eurostars grants
- 5 FTEs + Sciences in neurosensorial disorders + platform

**Transformation in Biotech: corporate strategy & pipeline build-up**
- 15 FTEs with academic & pharma industry experience
- Screening platform & pipeline: 1st drug candidate in Phase 1 + 2 follow-on programs
- 6 patent families
- €10m financing (dilutive and non-dilutive)

**Execution & value inflection**
- Phase 2a clinical trial (symptomatic treatment)
- Enter 2nd program in Phase 1 (disease modifier)
- Platform: Targeted partnerships with big pharmas
- Patent estate expansion
Sensorion’s team
An Academic & Industry blend

Laurent Nguyen
CEO
- 20+ years experience as pharmaceutical executive at Hoechst-Roussel, Merck KGaA-Lipha, F. Hoffmann-La Roche Ltd (Global Business Development Director) and Pierre Fabre SA (Vice President, Corporate Licensing & Acquisitions)
- MD, MPH

Eric Wersinger,
Project 100 Leader
- 10+ years research in ophtalmology and inner-ear
- PhD Neurosciences (Paris, France), post-doc studies in cochlear electrophysiology (Johns Hopkins University, USA)

Graham Dixon
CSO/Head R&D
- 20+ years experience as senior R&D management positions at AstraZeneca, CSO at F2G UK, CSO at Entomed, CSO/SVP R&D at Galapagos NV, CSO at Addex Therapeutics
- PhD

Jonas Dyhrfjeld-Johnsen
Project 200 Leader
- 10+ years research in CNS and inner-ear
- PhD in Neuroscience (Copenhagen, Denmark), post-doc studies (Irvine-CA, Harvard Medical School-Boston, USA)

Aurore Brugaud
Operations Manager
- Dual academic research and biotech operations experience
- PhD in Neurosciences (Montpellier, France), post-doc studies in inner ear (Massachusetts Eye and Ear Infirmary and Harvard Medical School, Boston, USA)

Sophie Gaboyard-Niay
Co-founder and Project 300 Leader
- 10+ years of research in inner-ear
- PhD Neurosciences (Montpellier, France), post-doc studies in cell biology (Chicago, USA)
A Powerful Ecosystem in Action

5 KOL EU/US Advisory Panel
11 Senior Pharma consultants
12 CROs
10 non-R&D advisors
Shareholders (VC, Business Angels)
Public & governmental agencies
Associations & networks
Collaborations with academia (Inserm, CNRS)
Neurosensorial Ciliary Cells Protect and Restore Normal Function
Screening Platform
Select the Most Efficient Drug Candidates

In vitro target assay

Functional cellular – ex vivo assay

Pharmacokinetics Local & Systemic

Pharmacodynamics – In vivo disease models

Toxicology – Manufacturing CMC

Potential drug candidates

First in human with the best candidate
From Animal to Human

**Spontaneous nystagmus in Human**

**Spontaneous nystagmus in rat model**
May 2012: reference BJP article on the H4R pathway and the vestibule

July 2012: Exclusive option agreement to develop in vestibular diseases a H4R antagonist in phase 1b in asthma/allergic rhinitis

July 2014: Full licensing agreement
Goal: Reduce severity and duration of acute crisis and restore autonomy faster

SENS-111 molecule
- New chemical entity licensed with existing clinical phase 1 data (documented PK and safety)
- Composition of matter patent granted
- Sensorion work
  - Effect of neuromodulation in animal models
  - Inner ear local/systemic PK ratio
  - Complementary Phase 1b with vestibular caloric testing initiated
  - Use of H4Ra in vestibular disorders patent

Positive POC animal data

Local exposure confirmed
Active Screening Platform in Drug Pipeline Building

Screening platform

- In vitro target assay
- Functional cellular – ex vivo assay
- Pharmacokinetics Local & Systemic
- Pharmacodynamics – in vivo disease models
- Toxicology – Manufacturing CMC

Pipeline building

1. Preclin POC testing
   - Lead candidate selection
   - Pre-EIH package

   - Phase 1
   - Phase 2

   - Product SENS-111: symptomatic treatment of crisis
   - Product series SENS-200: Protection against inner ear damage
   - Product series SENS-300: Prevention of drug-induced ototoxicity

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