

European Veterinary Vaccinology Workshop



Case study presentation

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INNOVATION

Virbac

EXPERIENCE OVERVIEW

Academic

2006



Bachelor's degree

Louis Pasteur University, Strasbourg, FRANCE
Biochemistry and molecular biology

2008



Master's degree

Louis Pasteur University, Strasbourg, FRANCE
Plant biology

2008/09



Research assistant

Ohio State University, Columbus, USA
Department of Plant Cellular and Molecular
Biology (PCMB)

2009/13



PhD + post-doctorate

GEPEA, Nantes University, FRANCE
Process Engineering for Environment and Food
Marine Bioprocessing and Separations

Professional

2014



Biological process engineer

LIPOFABRIK (Polytech'Lille), Lille, FRANCE
Start-up of biological molecules (lipopeptides)
production, purification, formulation and
commercialization

2015/16



Validation project assistant

SANOFI, Rouen, FRANCE
Injectable and biotechnology manufacturing site for
more than 110 countries (European, FDA, Japan
quality standards)

2016/now



Bioprocess development manager

VIRBAC, Nice, FRANCE
Independent pharmaceutical laboratory dedicated
to animal health, currently the world's 8th largest
company for more than 100 countries

ACADEMIC EXPERIENCES

Master's internship – 6 months

Nuclear mRNA targeting to potato mitochondria

Visiting scholar (USA) - 1 year

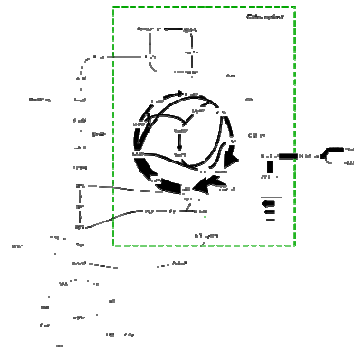
Study of respiratory chain complex I assembly mutants of *Chlamydomonas reinhardtii*

PhD + post-doctorate – 4 years

Systemic analysis of carbon and energy metabolism of *Chlamydomonas reinhardtii*

- Design, characterization and monitoring of photobioreactor fermentation
- Biochemical analytics
- In silico metabolic network reconstruction and metabolic flux analysis

Study of nitrogen autotrophic production by microalgae



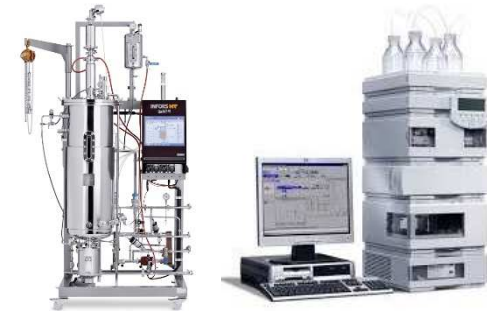
- Molecular biology and biochemistry
- Biological process engineering
- Scientific communications
- Teaching
- Technical management of students

PROFESSIONAL EXPERIENCES

Biological process engineer – 6 months

LIPOFABRIK, start-up specialized in lipopeptides produced from *Bacillus sp.*

- Autonomous project management in a **start-up environment**
- Bacterial fermentation and high-value metabolites extraction and purification
- Quality and purity analysis
- Customer relationship management



Validation project assistant – 1 year

SANOFI, fill and finish site of vaccines

- Writing of validation protocols and reports for processes, equipments, product life cycle (shipping)
- Qualification operations (SAT, criticality management, CAPA, ...)
- Learning of big **pharmaceutical company language and procedures** (cGMP, quality management, QA, QC, qualification, validation, industrialization, ...)



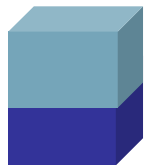
Biological process development manager – since March 2016

VIRBAC



A GLOBAL PRESENCE

862 M€ sales



56%
companion animals

44%
food
producing animals



4,825
employees

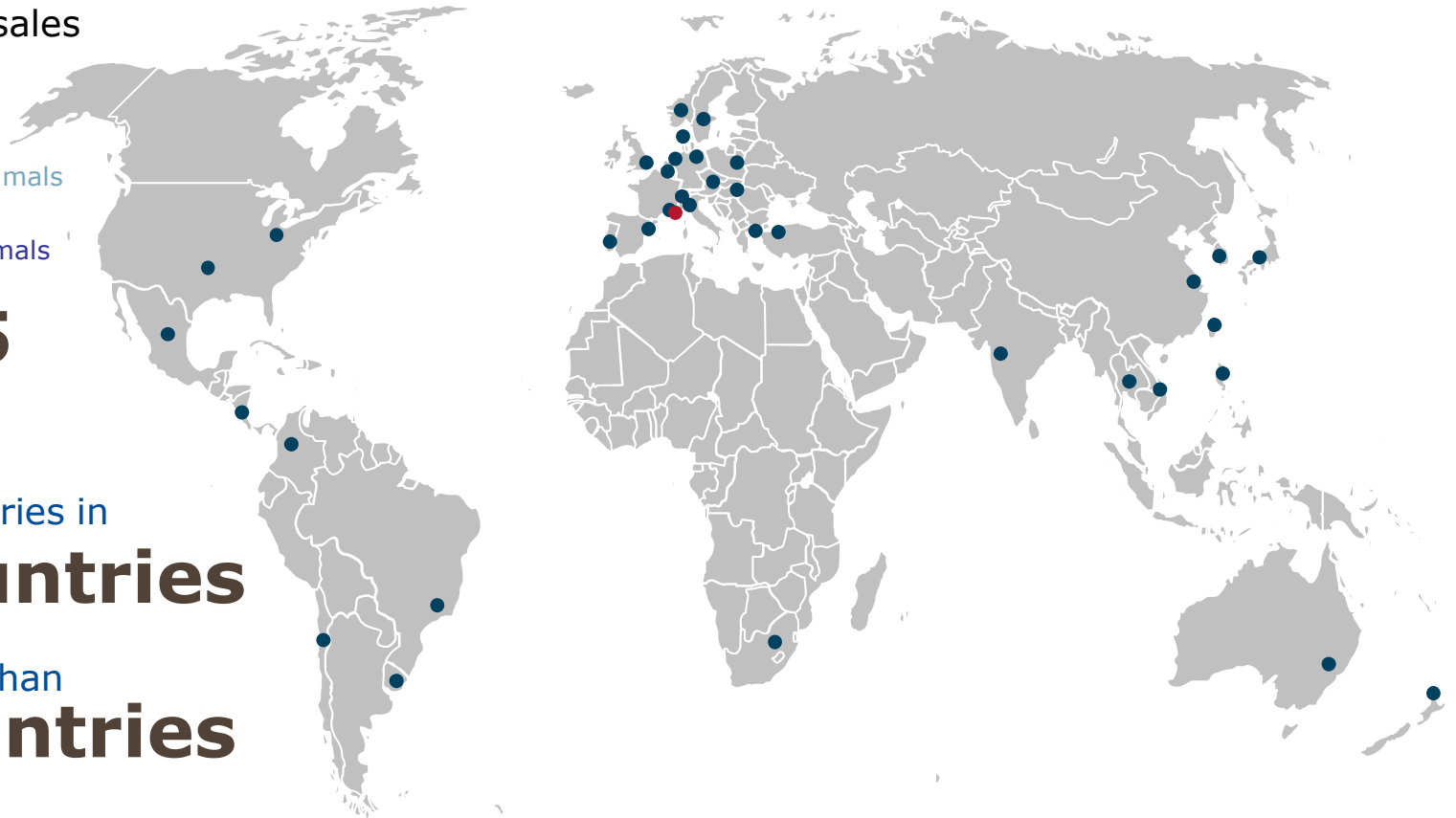


Sales subsidiaries in

33 countries

Present in more than

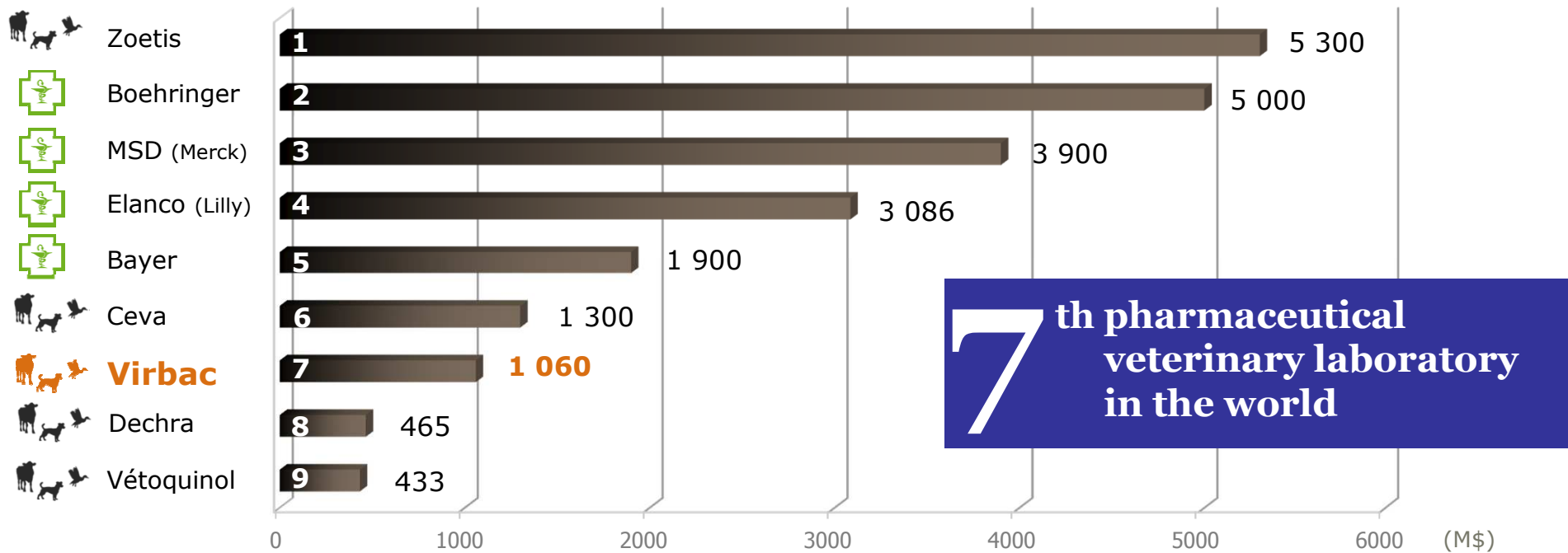
100 countries



100% ANIMAL HEALTH SINCE THE BEGINNING

2018 worldwide ranking

Worldwide market: \$31 billion



Virbac internal sources

MY VIRBAC EXPERIENCE

What a biological process development manager do:

- Upstream process development of bacterial (up to 200 L), cellular and viral (up to 1 L) cultures in GMP/GLP environment
- Downstream process development (cross-flow filtration, chromatography, high pressure homogenization), inactivation (dose definition, kinetics), formulation, fill and finish (freeze drying)
- Vaccine pilot batch manufacturing, formulation et stability
- Management of out-sourced seed manufacturing
- Industrial transfer to production site
- Technical team management
- Strong interactions with R&D departments (analytics, clinic) and MSAT
- Lab management (material organization, room design and layout, cGMP regulation upholding, inspections)



What I learned at Virbac:

- How to develop vaccines in a R&D environment
- Virbac values and team spirit
- Biological project management
- Out-sourced project lead



Thank you for your attention

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INNOVATION



Virbac

A GLOBAL PRESENCE

North America **14%**
33% of the global market

Europe **39%**
24% of the global market

Latin America **17%**
11% of the global market

RoW **13%**
6% of the global market

Far East **17%**
26% of the global market

