

SEQENS

How to rely on public-private
partnerships to innovate?

protéus
BY SEQENS

SEQENS at a glance

SEQENS

An abstract geometric graphic in the bottom right corner. It features a large teal shape on the right, with a light gray parallelogram-like shape overlapping it from the left. The teal shape has a diagonal cutout where the gray shape is located. The overall composition is minimalist and modern.

SEQENS is an integrated global leader in pharmaceutical synthesis and specialty ingredients



3,200

People



€ 1bn

2018E Sales



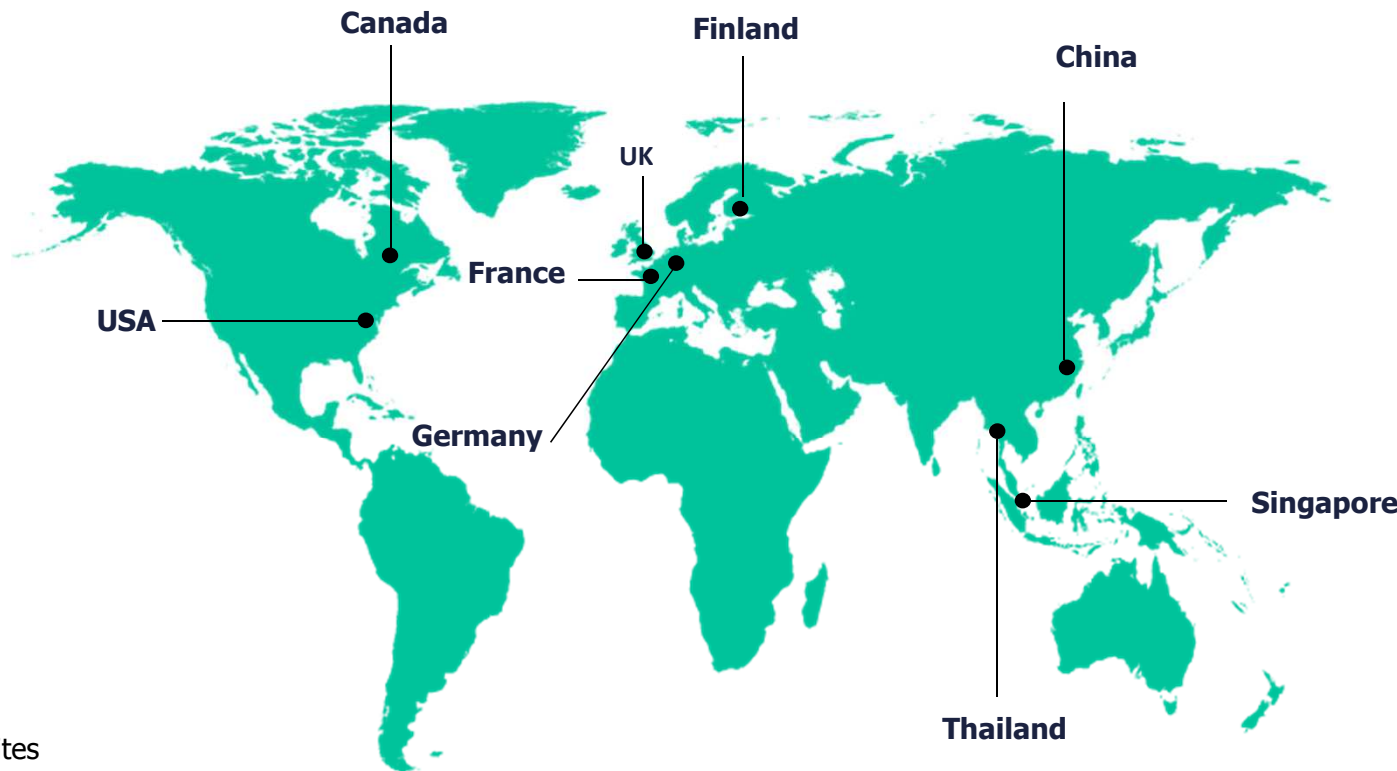
1000+

Customers



24

Manufacturing sites



3 R&D centers

300 scientists & experts



We do custom-made for our clients, thanks to our unique and transversal R&D, technologies and global assets

~50%

Pharmaceutical Synthesis

- CDMO, proprietary APIs, essential drug substances
- Custom development, contract manufacturing pharmaceutical intermediates



Serving Small-Medtech to Large Pharma

~50%

Specialty Ingredients

- Custom manufacturing and catalog products
- Complex molecules serving demanding resilient and growing end-markets



Healthcare, Cosmetics, Electronics, Food

R&D

- 3 state-of the-art R&D centers in Europe and the US
- Broad range of capabilities: chemistry & analytics, biotechnologies, drug development services & applicative R&D

Technologies

- Broad range of technologies spanning all our businesses
- Ability to manufacture most complex molecules

Global Assets

- Worldwide footprint in Europe, US and Asia
- Flexible facilities to manufacture complex molecules
- Supported by competitive facilities for intermediates and large-scale APIs

% of total EBITDA



Protéus at a glance

SEQENS

An abstract graphic design featuring a teal-colored base. On the right side, there is a large, light gray, three-dimensional geometric shape that resembles a stylized letter 'P' or a series of overlapping planes. The shape is composed of several rectangular and triangular facets, creating a sense of depth and perspective. The teal base is visible on the left and bottom edges, and a smaller teal triangular shape is visible on the right side, partially obscured by the gray structure.

Protéus at a glance

1998

Creation, JV between PCAS and Protéus in **2006**, global acquisition by SEQENS in **2017**



Development of tailored enzymes & biobased industrial solutions



> 15 patent families



25 employees



Multidisciplinary team



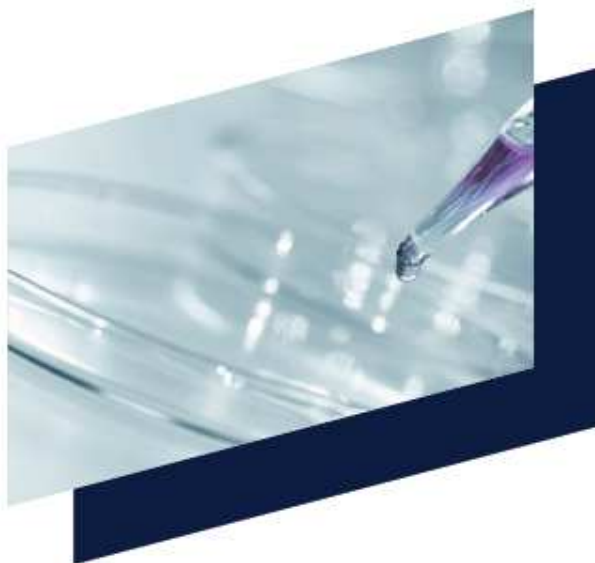
Nîmes, France



Biocatalysis from lab to industrial scale

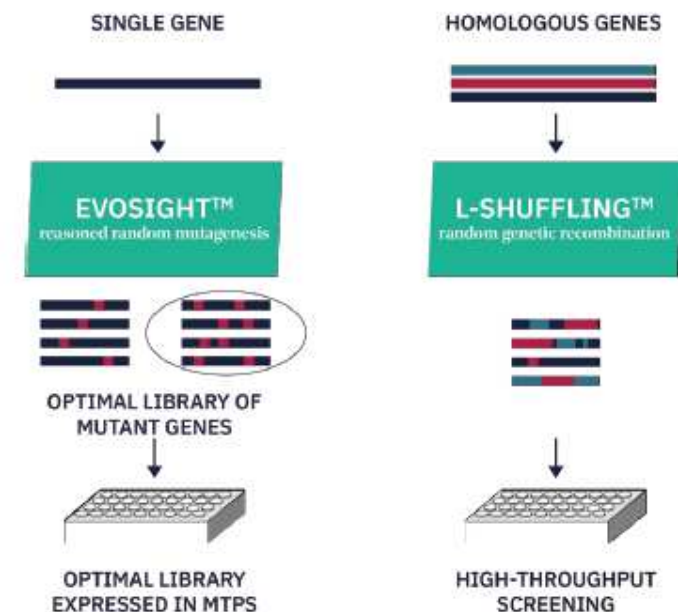
MICROBIOLOGY SCREENING OF SEQUENCES

- Exclusive collection of strains incl. extremophiles and microalgae. Bioinformatic screening among **>1000 sequenced genomes** to select specific enzymatic activities.
- High naturalness processes from efficient native enzymes.



Identify from Nature's diversity the best performing native enzymes

PROTEIN ENGINEERING TAILOR-MADE ENZYMES

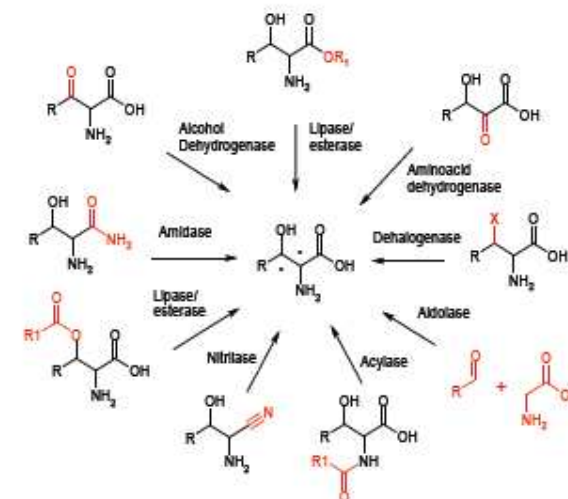


- Directed evolution using proprietary technologies: Evosight™ and L-Shuffling™
- Effective methods for activity screening (Clipso® substrates)

Powerful tools for improving enzyme efficiency for target application

BIOCATALYTIC PROCESS DEVELOPMENT GRAMS TO MULTITONS

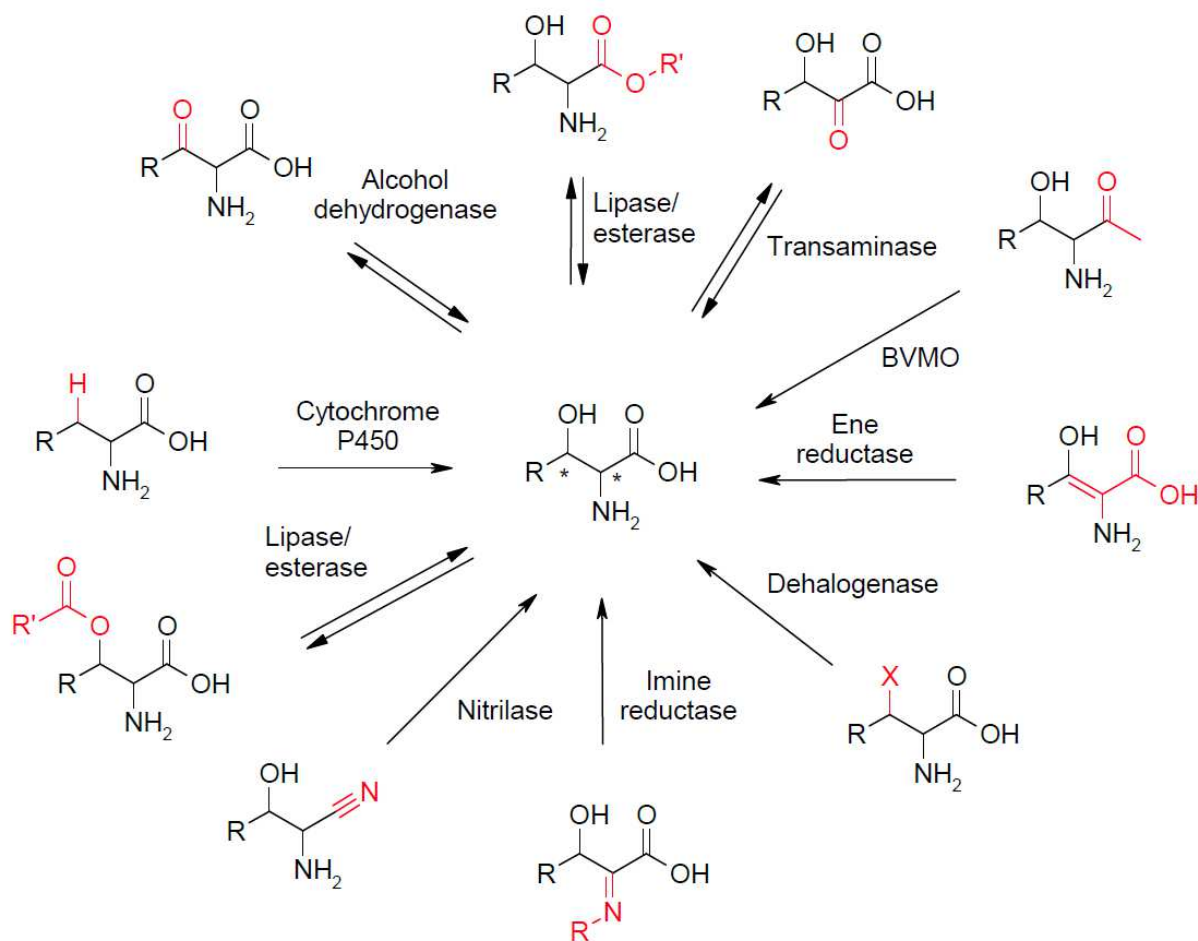
- Enzyme library of >350 enzymes, for chiral and complex molecules synthesis
- Design of Experiments for Bioprocess development
- IP development
- Scale-up & tech transfer
- Multi-ton production for API and fine chemicals within Seqens CDMO capabilities



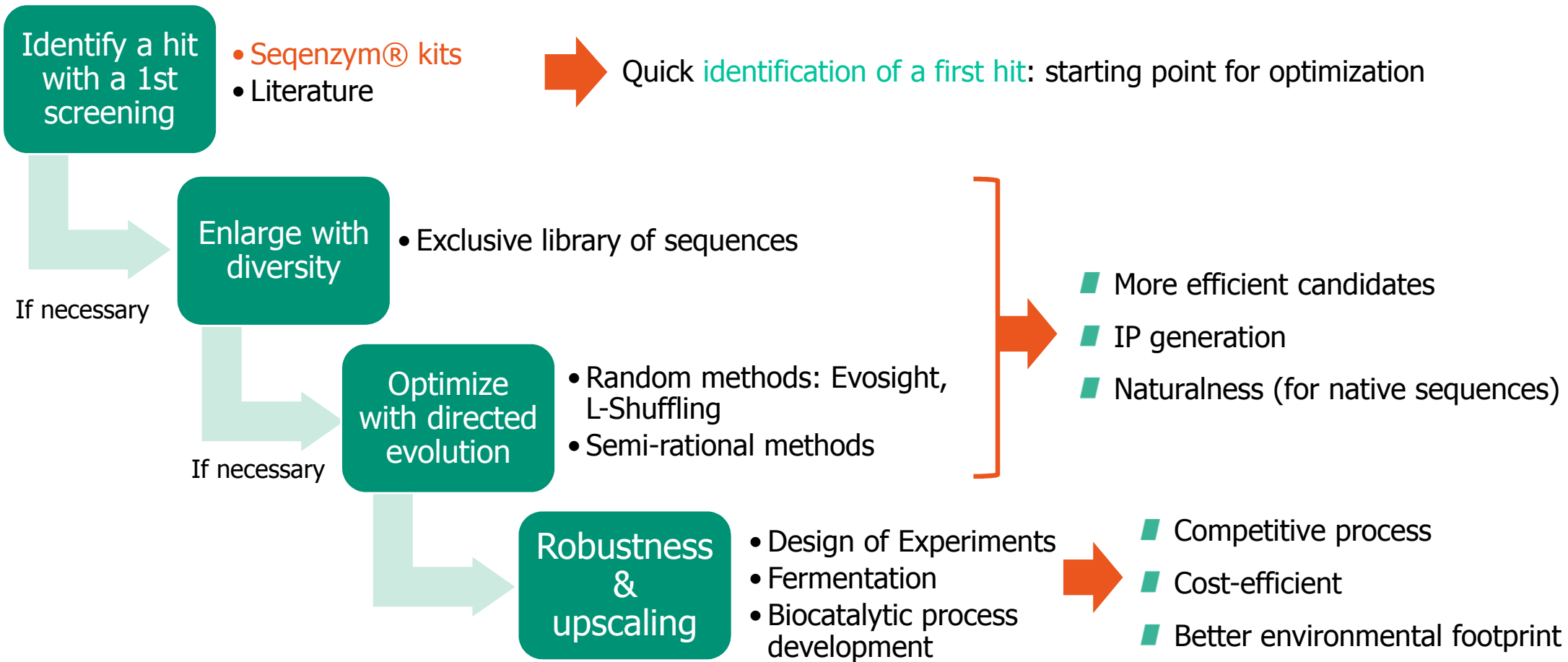
Highly selective biocatalytic steps for increased competitiveness

SEQENZYM[®] kits

■ Enzyme kits available for screening (7 enzyme families)



SEQENZYM platform for efficient biocatalytic process implementation



SEQENZYM



SEQENS Manufacturing Strategy within biocatalysis

protéus Capacities
BY SEQENS

Partner for Scaling-Up

Process Book & Technology Transfer

BIOCATALYST

TARGETED GENES

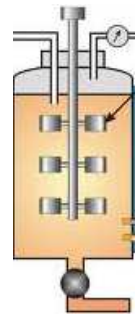
WCB
(Working Cell Bank)



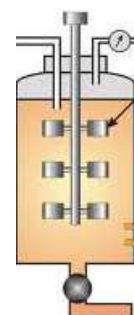
Cryovial
1 mL



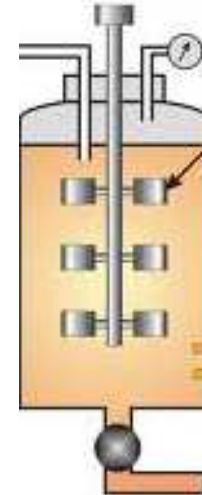
Seeding
Up to
5-L flask



Intermediate
Fermentation
2 to 40L
reactors



Intermediate
Fermentation
20 to 200L
reactors



Main Fermentation
2m³ to 3,5 m³
Reactors => up to
180m³

Centrifugation

10%
Dry matter

Spray-drying
or Lyophilisation
or Immobilisation

INTERMEDIATE/API

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R&D Chemical
Process Definition

Protéus - R&D center

Process Transfer &
Scale-Up SEQENS Site

SEQENS R&D Center (Porcheville)

Pilot &
Manufacture

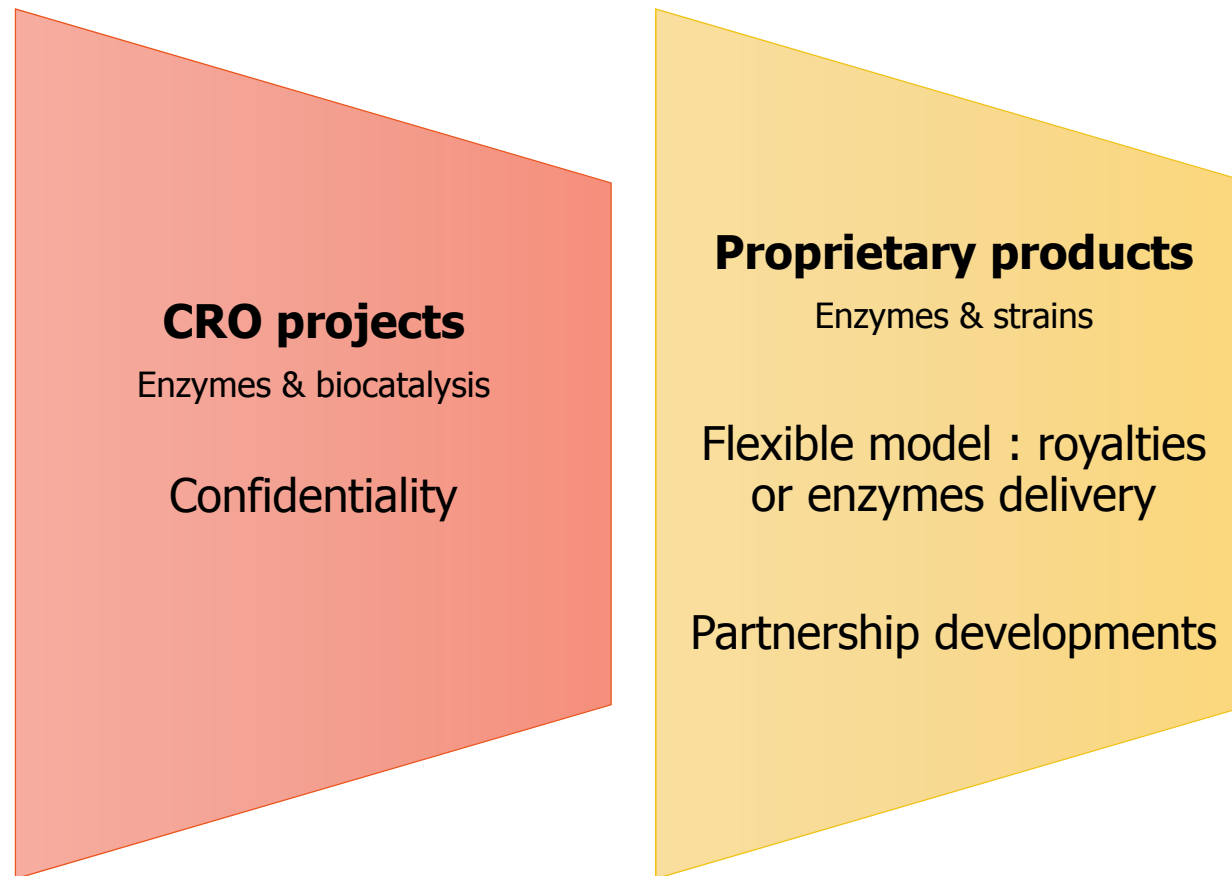
SEQENS Sites

Up to tons

SEQENS



Double business model : CRO & Proprietary products



Collaborative projects _ Sharing of knowledge and know-how

■ DIETETIC (GNIS)

- Utilisation de la DIversité microbienne pour identifier des activités insecticides contre la larve de la chrysomèle du maïs (*Diabrotica virgifera virgifera*)
- Identification of genes, proteins or microbial strains having a CRW activity in vitro
- Approach by sequencing of bacterial genome
- Patent

■ ABACUS (Horizon 2020)

- Algae for a biomass applied to the production of added value compounds
- Publications

■ BIOMINES (ANR)

- Exploration de la Biodiversité Microbienne pour l'identification de Nouvelles Enzymes et Souches CBP (Consolidated BioProcessing)
- Isolation of new efficient cellulolytic strains
- Isolation cellulolytic enzymes (synergy, improvement enzymatic cocktail)
- Publications

■ ACTIFE (ANR)

- Adaptation des Cellulases de *Trichoderma reesei* aux contraintes de la Fermentation Ethanolique
- Protein engineering : EvoSight™ and L-Shuffling™
- Production of an enzymatic cocktail improved
- Patents

- P4SB (H 2020, plastic recycling), VADEBIO (ADEME, Recovery of wood-based furniture wastes through biological treatment to produce molecules of interest) , GREEN EPOXYDE (FUI, Development of biobased epoxy resin) , BIOVANILLIN (ADEME, Depolymerization of Biolignin™ by enzymes) , Etc.



Thanks for your Attention !

SEQENS



Seqens channel



Seqens_group



Seqens

www.seqens.com

