SEQENS

OUR SCIENCE FOR YOUR FUTURE

Seqens innovates in GMP Polymers

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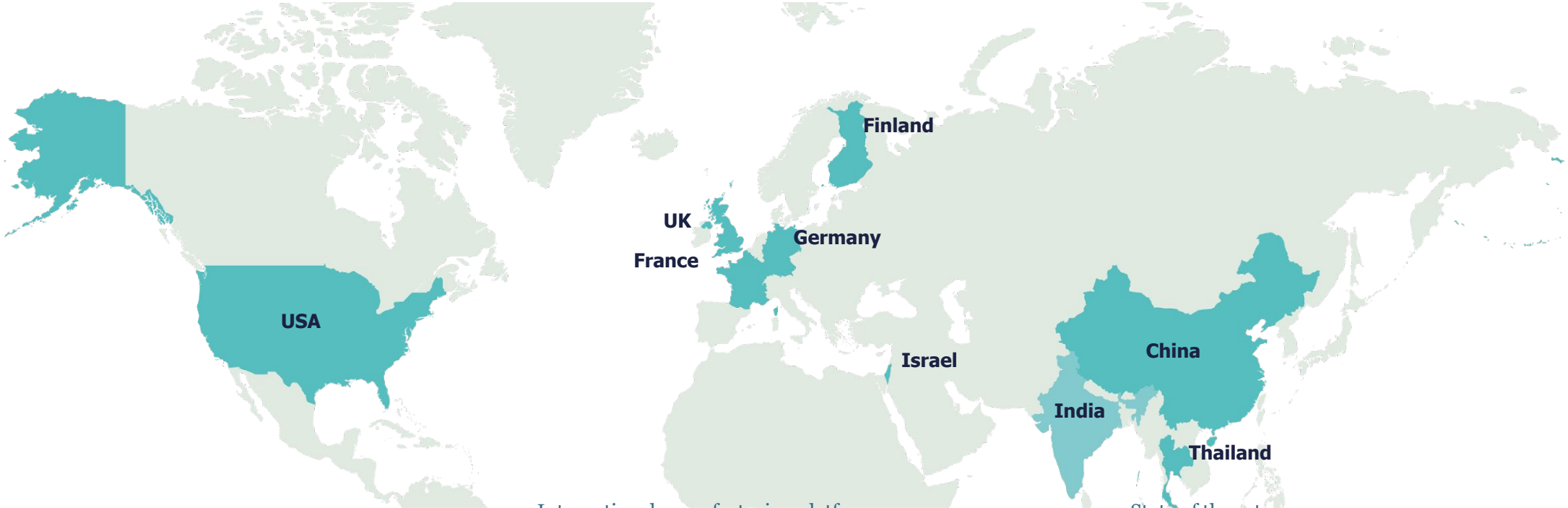
SEQENS is an integrated global leader in pharmaceutical solutions and specialty ingredients



International manufacturing platform with integrated end-to-end capabilities

State of the art science platform

>€1,4BN
Revenue

c.3,500
Employees

1,000+
Clients

23
Manufacturing Sites
(13 cGMP sites)

09
Countries

10 R&D
Centers

>300
Research scientists & experts
(130 PhDs)

>12,000 SQM
Lab surface

16 KILO LABS
up to 50 L
& 7 Pilot Plants

2 EXPANSORB® Catalog: 20+ years expertise on PLGA manufacturing within several on-the-market formulations

TAKE CONTROL OF YOUR DRUG RELEASE

- **EXPANSORB®** GMP poly(lactic acid co-glycolic acid) and poly(caprolactone) **bioresorbable copolymers** are among the best-in-class functional excipients for **controlled-release of injectable drugs**, included in multiple commercial formulations, and commonly used **material for resorbable medical devices**.
- Seqens can provide small or bulk quantities for:
  - Polylactic acid (PLA)
  - Poly Lactic-co-Glycolic Acid (PLGA)
  - Polycaprolactone (PCL)
  - Copolymers with poly(ethylene glycol)
- With over **50 references** & **2 grades**: classic and Low Monomer and Powder.

ANY CUSTOM OR FINE-TUNING NEEDS : EXPANSORB® ON DEMAND

- With a dedicated R&D team and a long-term expertise, Seqens will be your **partner on each formulation development step**, from screening and **finetuning** to manufacturing material enclosed into your commercial formulation:
  - Copolymers with Poly(ε-caprolactone), PEG…
  - Acid, ester, PEG, Saccharide chain termination…
  - IV/Mw
  - Lactide enantiomer ratio (D,L)
  - Residual catalyst amount
  - Residual monomer content
  - Catalysts

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An Unique Offer based on 3 Expert R&D Centers for Drug Delivery Lipids and Polymers

BOSTON'LAB

Small Molecules
Lipids & Polymers

- 1,000 M2 lab-floor
- 5 Kilo Labs
- 1 Pilot Plant
- 30 scientists with > +50% PHD

ARAMON'LAB

Drug Delivery
Polymers

- DDS Polymers dedicated R&D team
- 2 kilo-lab suites (1 for melt polymerization)
- 7 scientists with > 50% PHD

SEQENS'LAB

Small Molecules
Lipids & Polymers

- 4 kilo-labs
- 2 cGMP pilot plants with 11 multipurpose reactors (total capacity of 12 m2)
- 110 Scientists with > 50% PHD)

- More than 25-Years Track-record in organic and polymers and lipids chemistry
- Materials involved several commercially available formulations or medical devices
- Double-sourcing offer with lipid and polymer workshops in EU and US
- In-house development and GMP scale-up capacities for lipids and polymers from kilo lab to big industrial scales
- Full regulatory support (IMPD, DMF Filing)
- Analytical resources and manufacturing units operating according to ICHQ7 and GMP guidelines

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Seqens invests 15 m€ to build a new flagship multipurpose unit for cGMP polymers & lipids in Aramon (France)

CDMO services from clinical to commercial phase to provide a unique complementary GMP offer:

- **Bioresorbable polymers**: PLA/PLGA, PCL
- **Hydrosoluble polymers/Copolymers**
- **Custom PEG/PPG**
- **Copolymers**

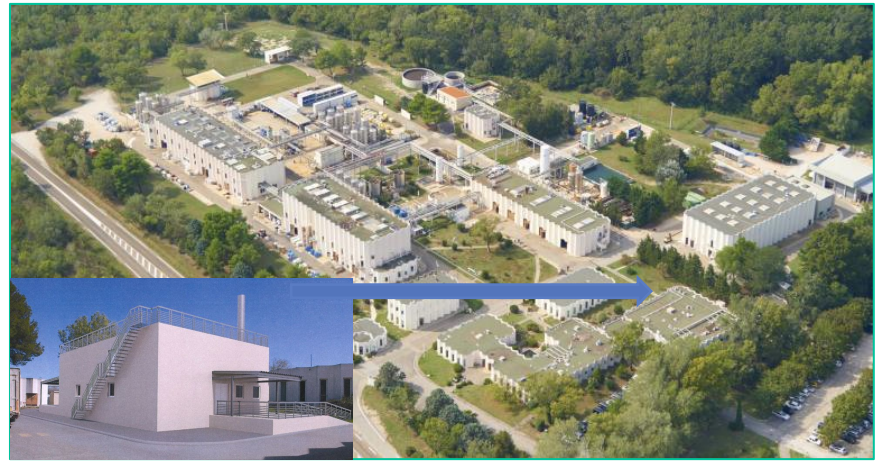
For the target applications:

- **RNA Encapsulation**
- **Injectables**
- **Oncology**
- **Medical devices**
- **Bioavailability enhancement through PEGylation**

Timeline & Project

R&D equipments will be ready to deliver **Q3 2023**
GMP equipments will be ready to deliver **Q2 2024**..

The project is supported by France Relance Program.



SEQENS

5 High-End Pharma Polymer Expertise Center Covering a Complete Range of Polymerization Technology

Chemical Reactions Type

Ring opening polymerizations *(with and without solvent)*

Melt ROP Polymerization
(max 12 millions cP)

Radical Polymerizations
(controlled and uncontrolled)

Polycondensation

- **Custom PEG/PPG via** Ethylene oxide polymerization (lab and industrial scale)
- Glycofurol used as a solvent

- PLA/PLGA
- Polycaprolactone

- Polyethylenimine
- Hydrogels, poly-amino acids
- Poly fumarate co-polymers

- EVA/PVA
- Polyurea/ urethane
- Polyacrylic acid

Chemical Reactions Type

Chemical synthesis/ modifications of polymers

Block copolymer Synthesis

Sol-Gel Processes

Graft Polymerization

GMP Filtration/ Purification

- Polyvinylpyridine modifications
- Polyethylene glycol end group modifications
- Poly(Lactide-co-glycolide) end group modification

- Peg-ylated lipids & linkers synthesis
- Gellan gum derivatives
- Polysaccharide functionalization
- Polysiloxanes

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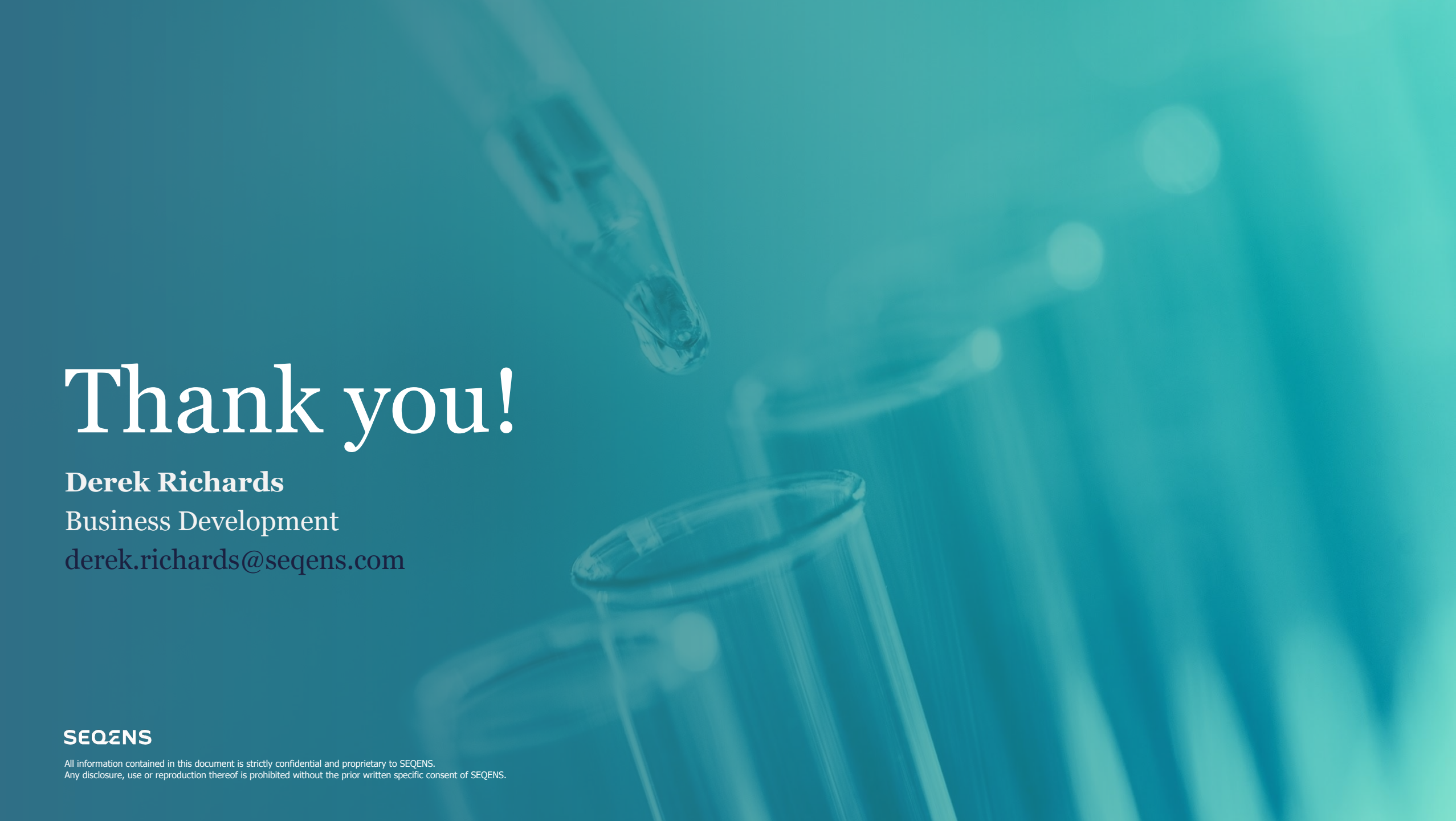
Technologies and Equipments, from Lab to a GMP Commercial Supply completed by a Strong Analytical Asset

	Lab	GMP kg-lab	GMP commercial supply
Synthesis			
Reactors for melt polymerization (specific design with very high torque mixing capabilities)	✓	✓	✓
Reactors for hydrosoluble polymers synthesis	✓	✓	✓
Ethylene/ Propylene oxide for PEG/PPG synthesis	✓	In progress	✓
Polymers post-treatment			
High Speed Dispersion Devices for lab/kilo lab and industrial polymer batch size	✓	✓	✓
Drying	✓	✓	✓
Spray Drying	✓		
Tangential Flow Filtration	✓	✓	✓
Lyophilization	✓	In progress	
Holt-Melt Extruder	✓		
Analytics			
500MHz NMR, Ubbelohde viscosimeter, Brookfield viscosimeter for GMP release tests on site, **Vibrational viscosimeter** for real-time batch monitoring, **Triple detection GPC systems**, **NIR**, …		✓	

- **Dedicated onsite polymer R&D Team**
- **GMP compliant (EU, USFDA)**
- **Holding active excipients DMFs i.e. US and CAN**



Thank you!

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