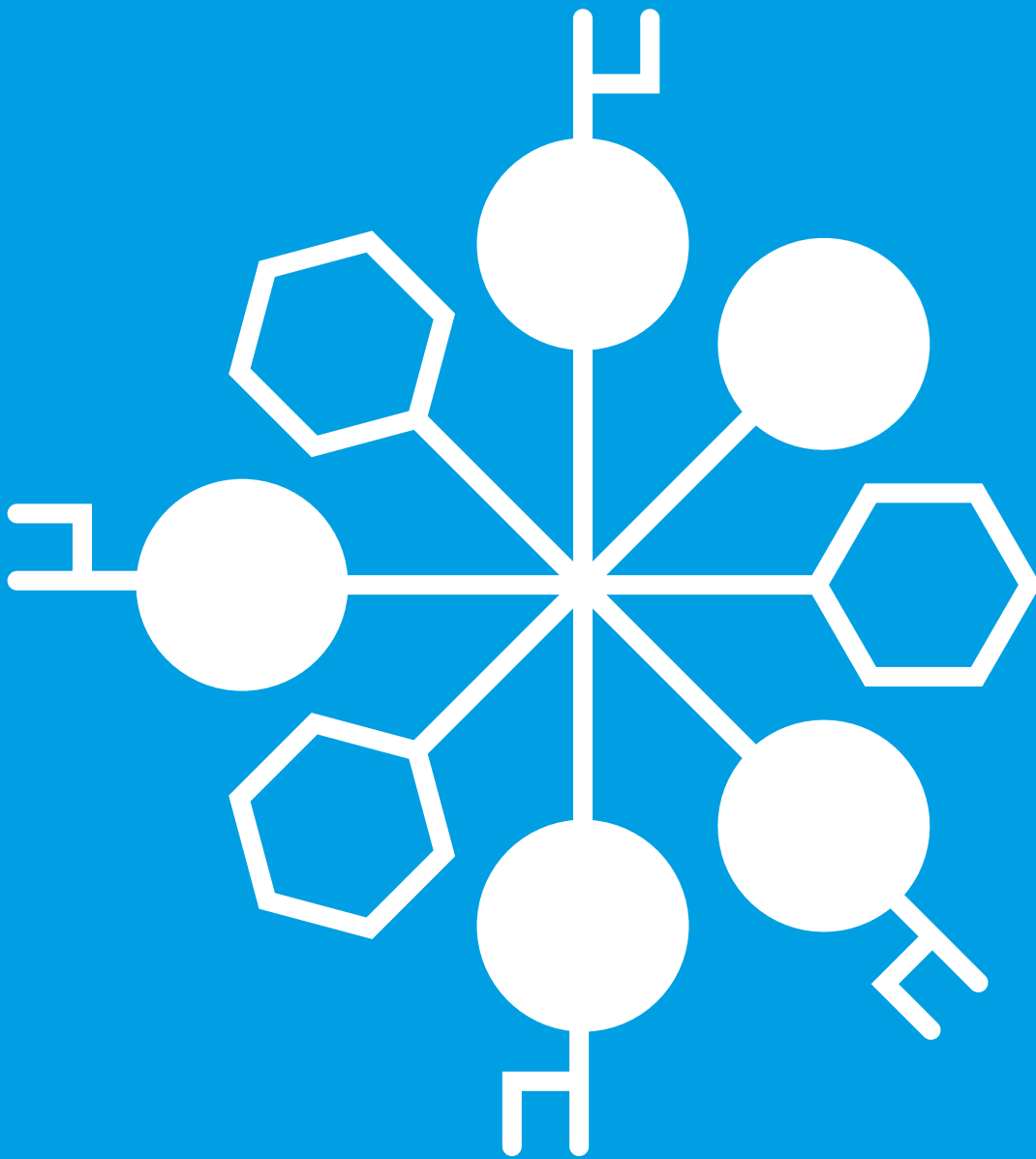


PEPTIDES, LIPIDS & CARBOHYDRATES
TECHNOLOGY PLATFORM







Need small quantities of GMP peptides at a reasonable price?

Looking for a complete, continual stability testing service?

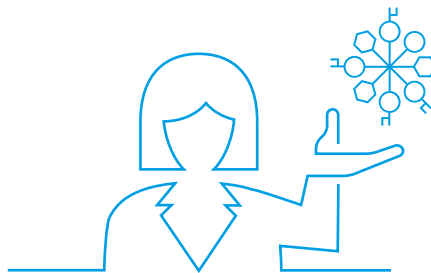
Seeking a more efficient, cost-effective way to manage several third party suppliers?

Aiming for fully-transparent documentation?

Expect guaranteed process knowledge from early phase to commercial?

Want to be up-to-date with recent regulation changes?

Care about green chemistry integrated into process development?



The Right Partner is ONE PARTNER. Working and coordinating with several providers can be demanding and time consuming when outsourcing a project. No matter where your project starts, we believe in the concept of ONE PARTNER providing you an integrated solution spanning the complete product life cycle at all stages, from preclinical to commercial, supported by dedicated regulatory and project management services. A straightforward communication with one supplier

alleviates the need for excess resources required to manage multiple providers. Our organizational structure provides you with one point of contact to help navigate your way to project completion. Through our network of integrated cGMP facilities across Europe and the US organized under five Technology Platforms, we have fostered an efficient exchange between API & Drug Product teams to decrease your development time to market.

YOUR BENEFITS – OUR STRENGTHS



Fast & Lean Process Development Approach

Scientific Expertise

Your project will benefit from our efficient, time-saving development of thousands of process steps using six-sigma.



Meet Collective Sustainability Goals

Toxicology Knowledge

Gain assurance from our in-depth knowledge in handling a wide range of toxicological active compounds, including highly potent APIs, to protect people, products & the environment.



Foster Entre- preneurial Spirit

Flexibility & Transparency

Benefit from our collaborative commitment to react with flexibility & transparency to your changing needs.



Focus on Patient Safety

Our Motto is Quality

Rely on the integrity of our robust quality & regulatory compliance standards at the foundation of every step your project takes, from initial process development through product delivery and beyond.



Faster Time to Market with Reduced Cost

Streamlined Fully- Integrated Supply

Discover how our ONE PARTNER fully-integrated supply services, ranging from back-integration of non-GMP raw materials to Drug Substance, Fill & Finish Drug Products and Packaging, enable faster times to clinical trials & market with reduced costs.



Continuous Exchange & Knowledge Sharing

Transparent Communication

Work closely with our dedicated project management teams to receive regular project updates, gain continual access to your batch records and reach your defined target.

Over 130 Years of Combined Peptide Manufacturing Experience

Receive superior peptides at the forefront of large-scale cGMP manufacturing using both SPPS & LPPS technologies from gram-scale to the largest worldwide multi-ton peptide capacity available.



Proven Peptide Production



Go Green, Go Large

Unique Solvent Handling

Take advantage of our unique solvent recycling concept to enable the largest capacity of peptides available globally.

Expertise in Peptide Vaccines & Antigens



Peptides from APIs to Drug Product

Access to a wide range of peptide cocktails from g-scale APIs to finished dosage Drug Product for clinical trials and commercialization.

Ingenuity at Work



Thinking Outside the Box

Grow from our scientific passion and ingenuity in finding new ways to solve complex problems that help you take the most efficient path to reach your project goals.



Your Goal is our Goal. We turn our strengths into your benefits by keeping in mind that your goal is our goal: to produce high quality pharmaceutical medicines through efficient, lean processes with reduced times to market.

YOUR FULL-SERVICE CDMO FOR A GLOBAL MARKET

Secure Your Supply Chain with our Fully-Integrated Solution



ONE PARTNER provides you with a Fully-Integrated Supply solution spanning your complete product life cycle at all stages, from manufacturing of back-integrated non-GMP Intermediates to secure your supply chain, through preclinical & commercial development and manufacturing of GMP starting materials, APIs, finished dosage Drug Products & Packaging > resulting in reduced time & cost. Your project is all the while supported by dedicated regulatory & project management expertise at every step along your outsourcing path.

06

Aseptic Fill & Finish at CordenPharma Caponago (IT).

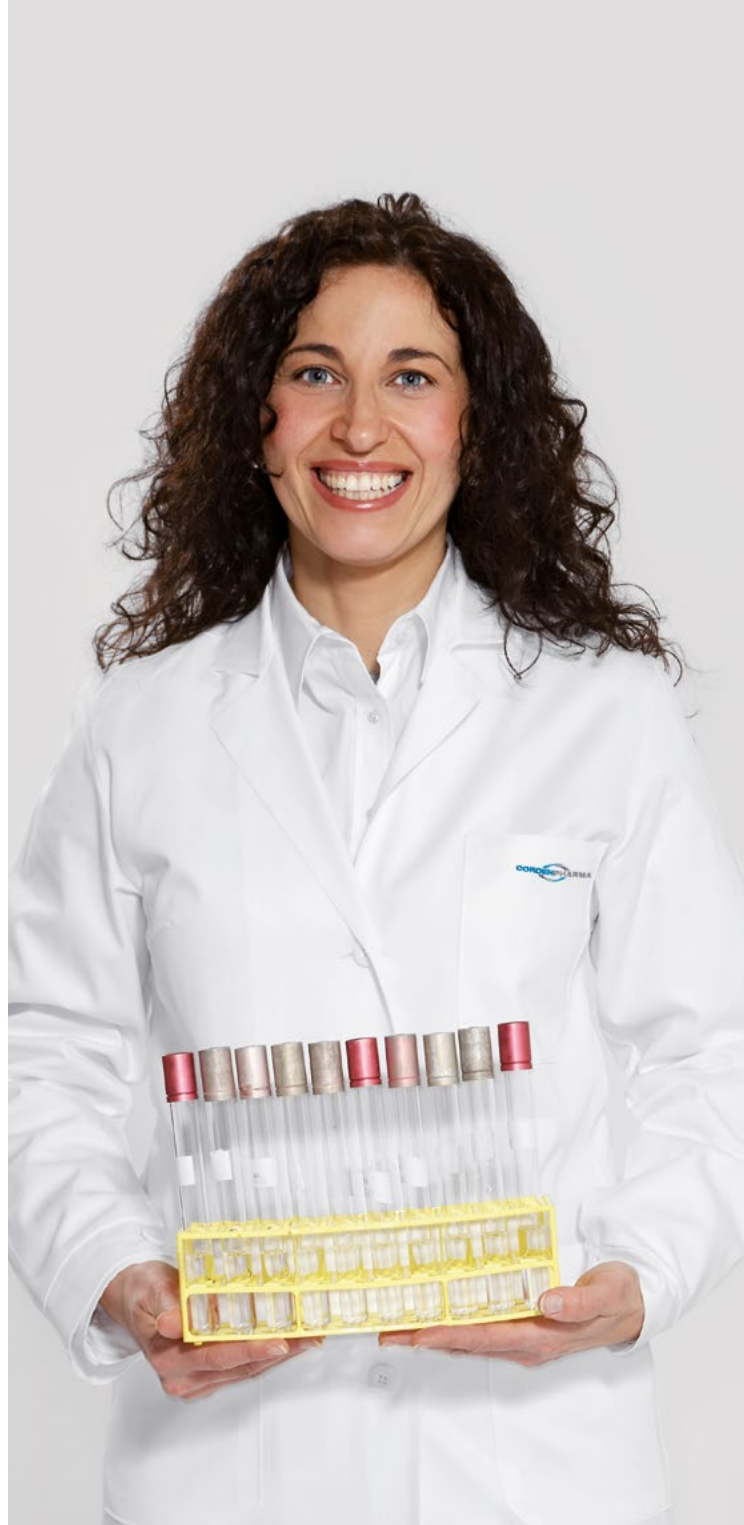


The Backbone of Synthesis – Advanced Bio-Organic APIs

Our scientists have mastered the core principles of synthesizing advanced Bio-Organic APIs, and bring them to bear on every project, large or small. The Peptides, Lipids & Carbohydrates platform supplies you with a specialized combined expertise across three cGMP facilities in early-stage to commercial supply of advanced Bio-Organic APIs, including synthetic Peptides, Lipids, Carbohydrates & Conjugates.

Proprietary process technologies provide access to a wide range of products for cost-effective manufacturing, with robust CMC dossiers that reduce the number of chemical steps required, increasing purity and decreasing raw material costs. An additional benefit includes our unique backward integration of key starting materials, which secures your supply chain in terms of cost & quality.

Furthermore, your benefit expands to the seamless tech transfer of your project within our facility network for the production of Drug Products & Packaging Services. The Injectables Platform provides Aseptic & Terminal Sterilization Fill & Finish in Pre-Filled Syringes (PFS), ampoules, liquid & lyophilized vials, as well as combination device products, packaging / labeling, and clinical trial kit management. We additionally supply peptides for oligonucleotide drug product capabilities as well as LNP formulation. Our Highly Potent & Oncology Platform offers oral & sterile highly potent drug products, packaging, labeling & distribution.



PEPTIDE CENTRE OF EXCELLENCE



08

The Intelligence of Peptides

Benefit from our streamlined process development, scale-up and small to large-scale manufacturing. Our two successfully inspected cGMP facilities, CordenPharma Colorado (USA) and CordenPharma Brussels (BE), produce a wide range of Peptide products for various therapeutic indications. To increase your R&D throughput, our European R&D Center, based in Frankfurt,

Germany, supports our integrated network of facilities with process design development and non-GMP synthesis. This unique concept, combined with open, transparent communication, allows us to infuse your project with the highest degree of flexibility needed to guide you quickly through all clinical phases.

Our peptide development and scale-up approach is enhanced with Quality by Design (QbD) equipment engineering which mimics large-scale production to limit deviations associated with the equipment design. State-of-the-art equipment

combined with innovative technologies efficiently respond to your needs at any scale and stage of development, ultimately resulting in cost-effective Peptide manufacturing.

Our Core Peptide Products & Services

- » Complex peptides & peptidomimetics
- » Proprietary process technologies for cost-effective manufacturing
- » Peptide conjugations (PEGs, proteins, lipids, carbohydrates)
- » Cyclic & multiple disulfide bridge peptides
- » Short peptides (up to 12 residues), often without HPLC purification
- » Arginine-rich peptides
- » Green process design for REACH regulation trend & cosmetic market
- » Design of Experiments (DoE) for peptide synthesis
- » Scale-up know-how

Drying of the final crude API in a filter dryer at CordenPharma Brussels (BE).



TECHNOLOGIES OF PROVEN PEPTIDE PRODUCTION

Solid Phase Peptide Synthesis (SPPS)

- » Gram to multi-100 kilogram quantities under cGMP with dedicated peptide lines
- » More than 10 commercial products & > 50 development projects
- » Large-volume solvent & waste-handling logistics
- » Precipitation & isolation of fragments and final APIs
- » Unique & efficient production of large-scale commercial peptides (e.g. Enfuvirtide (FUZEON®) with up to 920 kg of synthesized fragments per batch > the largest fully-synthetic peptide ever commercially manufactured)

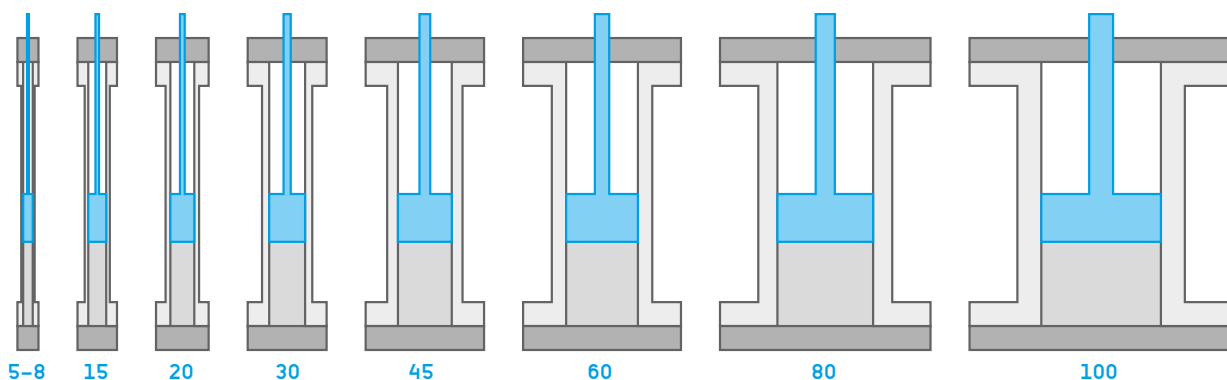
Liquid Phase Peptide Synthesis (LPPS)

- » Technology of choice for cost-effective large-scale manufacturing of short peptides or structures not easily prepared by SPPS
- » Hybrid fragment synthesis coupling shorter SPPS-generated sequences together in a solution
- » Cyclization manufacturing of commercial peptides containing a single or multiple disulfide bridges or cyclized lactam peptides

Purification

- » Reach or exceed the required purity at any scale leveraging preparative High-Pressure Liquid Chromatography (HPLC) technology
- » Automated reverse-phase HPLC with columns up to 100 cm in diameter, supported by different ion exchange chromatography columns

Purification Scale (Increase of diameter in cm) →





CordenPharma Colorado (USA) utilizes more than ten 50m³ tanks to support our green manufacturing concept.

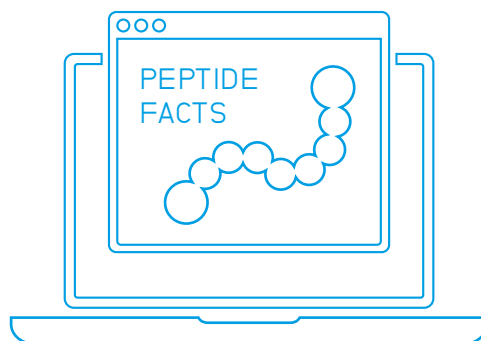
Isolation

- » Traditional final isolation using lyophilization or spray drying
- » Alternate isolation technique via precipitation process saves cost & improves API handling at the drug product site with easy scale-up & transfer
- » Ability to precipitate any peptide upon request (including long peptides with more than 35 AA)

Volume leader
in custom peptide
production

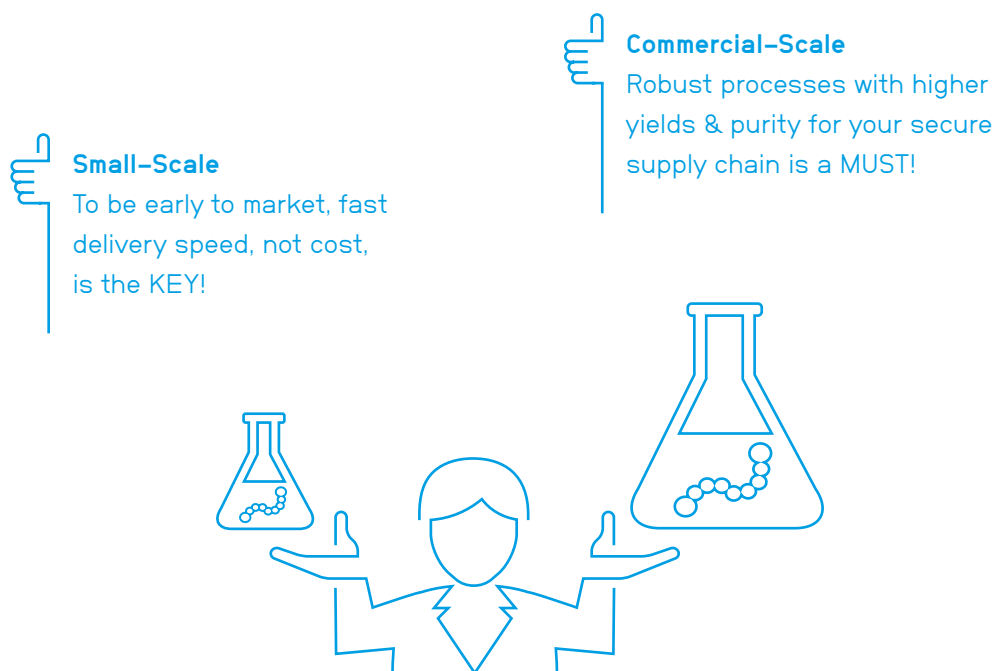
Automated peptide synthe-
sizers ranging from 12 L to
10,000 L for solid-phase
peptide synthesis

Produced the largest
fully-synthetic peptide
ever commercially
manufactured: Enfuvirtide
(FUZEON®) > up to 920 kg
of synthesized fragments
per batch





COMPLETE & FLEXIBLE **SUPPORT SERVICES**



Phase-Appropriate Development & Manufacturing

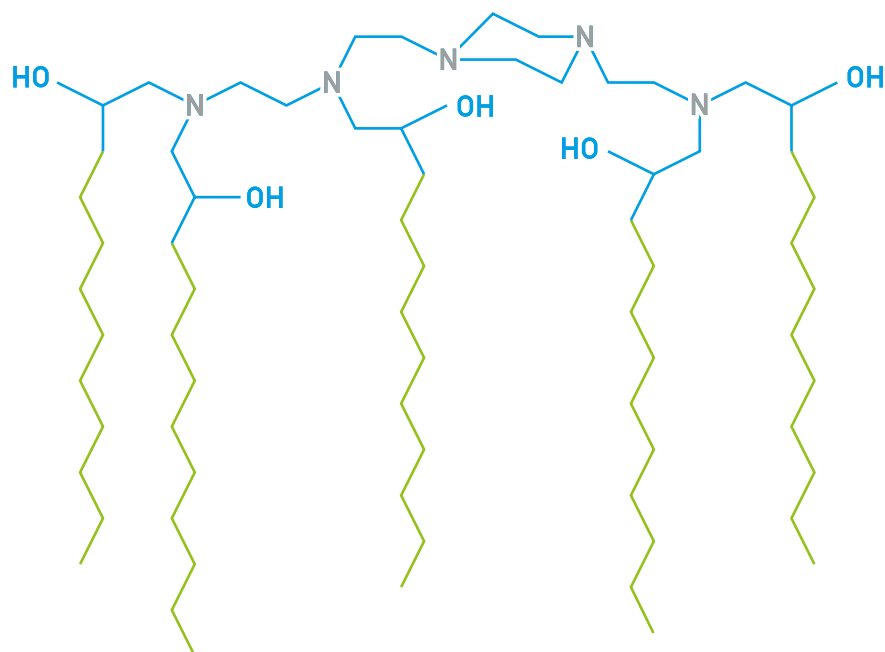
As an industry leader in the peptide market, we understand the regulatory requirements you will encounter along the clinical & commercial stages of your development path.

Analytical Development & Validation Services

METHOD DEVELOPMENT	METHOD VALIDATION
<ul style="list-style-type: none">» Screen for Best Detection» HPLC Columns at Various pHs» Temperatures & Ion-Pairs» Buffer Systems for Impurity Separation» Optimized Separation of Related Substances & Degradants» Forced Degradation Studies	<ul style="list-style-type: none">» System Suitability / Specificity» Linearity, Accuracy & Recovery» Precision & Intermediate Precision» Limit of Detection (LOD)» Limit of Quantification (LOQ)» Stability of Solutions» Robustness

LIPID & CARBOHYDRATE PRODUCTION

C12-200 is a cornerstone for your Lipid NanoParticle (LNP) formulation.



CordenPharma Lipids

To support the rising demand for production of liposomal drugs using phospholipid excipients, CordenPharma draws upon an impressive history of excellence in providing specialized functionalities such as longer shelf-life to render a competitive advantage to your API formulations. With a strong market position in synthetic Lipid process development, scale-up and large-scale manufacturing, including custom & standard lipids, we hold several Drug Master Files (DMFs) to even further expand your access to a broad range of lipid products & services.

Our Lipids Offering

- » Highly efficient, quality excipients
- » Adherence to the latest guidelines of the International Pharmaceutical Excipient Council (IPEC)
- » cGMP certified supplier of high quality liposomal excipients
- » Aid development of target delivery drugs
- » Emphasis on Quality by Design (QbD) & Process Analytical Technology (PAT) for controlled raw materials & lower net costs
- » Comply with Pharmacopeia standards: USP, BP, EU & IP (where a monograph is established)
- » Comply with the GMP API requirements (Eudralex Vol 4, part II)
- » Bovine Spongiform Encephalopathy (BSE) & Transmissible Spongiform Encephalopathies (TSEs) free certification
- » Well-established specification sheets, quality control & test procedures
- » Functionality with lot-to-lot consistency

CordenPharma Carbohydrates

With over a decade of experience in the field of carbohydrate molecules, CordenPharma has gained specialized expertise in complex oligosaccharides. Our carbohydrate portfolio includes multi-kg manufacturing of innovative carbohydrate products for monosaccharide building blocks, GalNAc and conjugates such as glycolipids, phosphatidyl inositols and glycopeptides.

Our complex carbohydrate know-how has been successfully demonstrated on several multi-kg cGMP manufacturing scales, delivering very high quality products showing lot-to-lot consistency, with processes developed according to Quality by Design (QbD) and a manufacturing approach supported by Process Analytical Technology (PAT). Unique back integration of non-GMP raw materials from our sister company Weylchem supports your carbohydrates projects with low cost targets.


Our Carbohydrate Offering

- » Synthesis & manufacturing of complex & conjugated carbohydrates
- » Purification capabilities by Flash Chromatography (LPLC & MPLC): Biotage 15 & 40 cm cartridges, large-scale glass flash columns (40 cm ID)
- » Preparative HPLC columns (10 cm – 100 cm ID)
- » Nanofiltration, aqueous & organic solvent removal – permeate flow up to 60 l / hour at pressure up to 40 bar (ATEX)

CordenPharma Switzerland performing the final carbohydrate purification step to reach the expected 99% purity.







«This was a really exciting project for me because I was able to see how my personal contribution as part of a larger team aided in the successful execution & transfer of the project.»

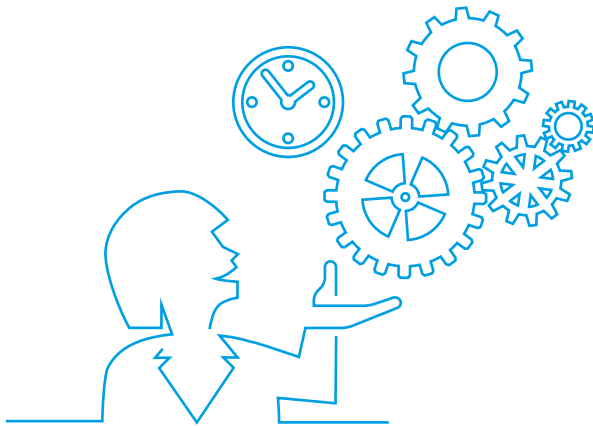
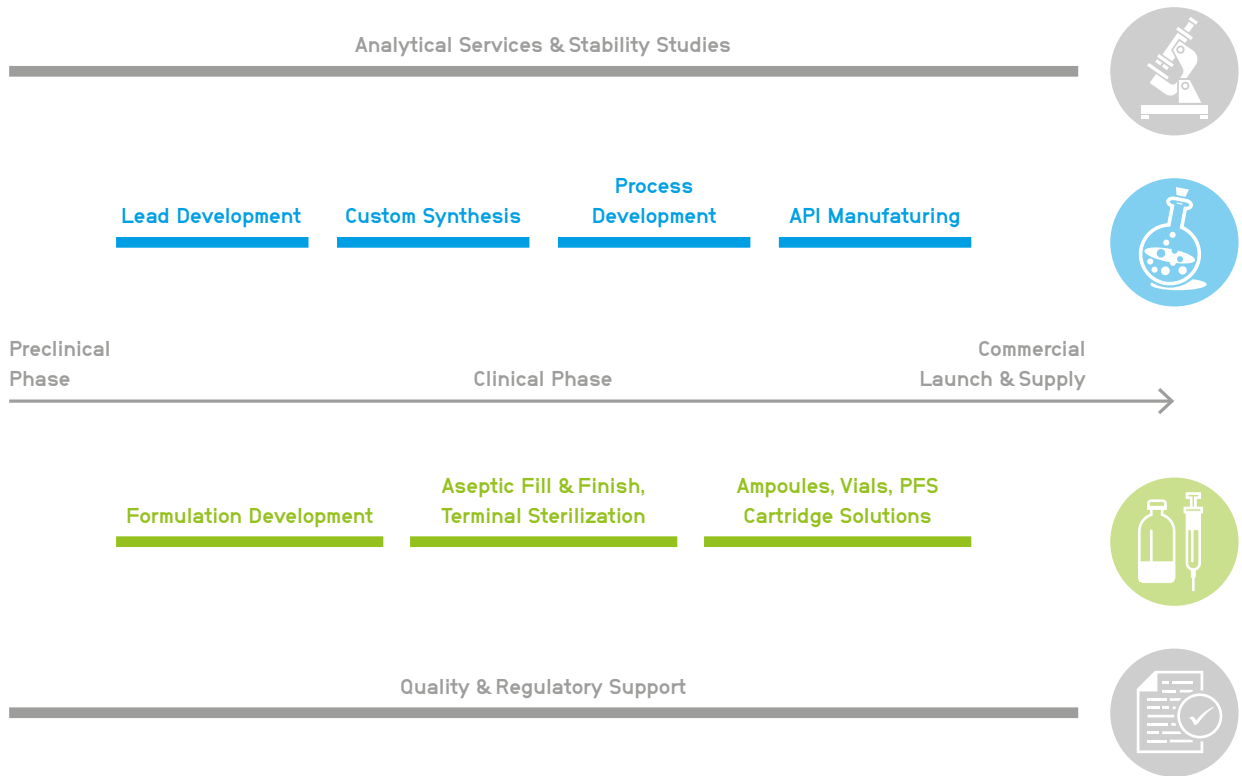
Philippe Gourlet, Head of Production, CordenPharma Brussels

Our team at CordenPharma Brussels (BE) performed rapid & efficient development, scale-up and manufacturing of a Liquid Phase Peptide Synthesis (LPPS) process from low single digit to multiple 100s of kilogram scale in a short period.

The NRP project, which was a short peptide developed without chromatography purification, is not only a success story for our site but also a real demonstration of the strong, efficient collaboration within the CordenPharma integrated facility network.

The strategy of the LPPS process used for the NRP project relied on our extensive expertise in developing & manufacturing short peptides, including the use of state-of-the-art spray-drying for isolation of the final API.

ONE PARTNER PROCESS & PROJECT MANAGEMENT



Streamlined Process Collaboration

Our approach to every project begins with fostering a constant exchange between the applicable API & Drug Product Process Development teams involved. Ongoing alignment with analytical, quality and compliance support guarantees you fast and consistent results, independently of where your project starts.

Aligned Project Management

CordenPharma's Global Project Management Team carefully assigns an appropriate amount of time & resources to each phase of development, while monitoring all tasks to ensure your project progresses in a controlled and timely way. Our project management organization safeguards the alignment of resources with local project managers throughout our network of facilities for your integrated supply projects involving multiple sites and technologies to deliver on our promise – one source, ONE PARTNER.

Your ONE PARTNER Benefits:

- » Single point of contact throughout your project for both APIs & Drug Products
- » Global SOPs mean shorter tech transfer time for materials & documentation
- » Knowledge transfer guaranteed with consolidation of stability testing, analytical methods & physical property
- » One CDA / MSA with single data-entry point ensures ease of sharing data internally & externally and speed of execution
- » Improved data integrity guaranteed by controlled single-source data with integrated project planning

Sampling of a final API to support homogeneity testing plan at CordenPharma Switzerland.



QUALITY & COMPLIANCE FIRST

Our commitment to seek the highest standards of Quality & Compliance First is the backbone of all our activities and projects. We make no compromises in this area. We have and continue to invest heavily in compliance programs, with the objective to meet and surpass applicable regulatory requirements & legislations. Our focus on quality & compliance will be ongoing, with budgeted investment in improvements such as compliance-enhancing IT solutions.



CordenPharma Continuous Improvement Program








You will benefit from the ongoing support of CordenPharma's Continuous Improvement Program, based on the consistent completion of corrective and preventive actions arising from self-initiated proactive third party group-wide gap assessments, agency inspections, as well as internal, annual corporate & customer audits. This approach enables us to not only meet, but surpass general requirements needed to see your project through to completion.

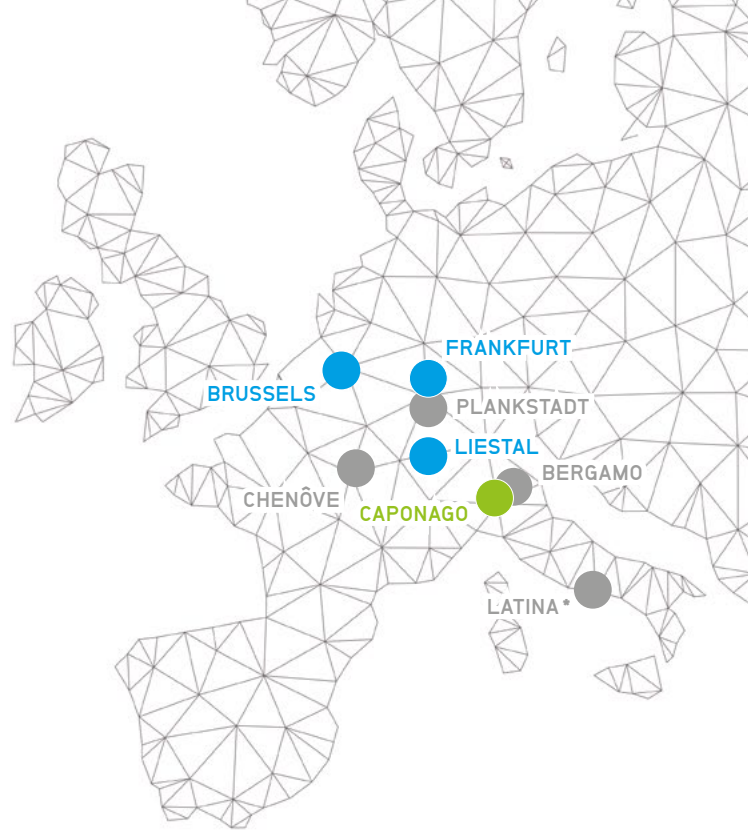


CordenPharma Global Compliance Team

The CordenPharma Global Compliance Team systematically interprets these continuous improvement program audit and assessment results on your behalf to generate corporate policies and global standards enabling employees at all levels to comply with current applicable guidelines and legislations in their daily activities.

Corporate compliance standards & policies are then implemented at all CordenPharma sites globally, with the objective of complete harmonization to foster transparency and straightforward communication, both internally and externally with our customers. The whole organization works together, from the Executive Leadership Team and Facility Managing Directors to the Marketing & Sales team and operators, to make sure all employees effectively comply with implemented policies, Standard Operating Procedures (SOPs), master work instructions, plans & forms to meet all the requirements for your pharmaceutical success.

MARKET	AGENCY	BRUSSELS (BE)	COLORADO (US)	LIESTAL (CH)
	EMA, EU local	●	●	●
	FDA	●	●	●
	PMDA	●	●	●
	TGA		●	
	Health Canada		●	●
	ANVISA	●	●	
	IMPROMTORG			●



OUR MANUFACTURING SITES

MANUFACTURING SITES	PRODUCTS	SERVICES
<p> CordenPharma Colorado, USA</p>	Peptides	<p>Largest Peptide Production & Purification Capacity Worldwide</p> <p>Highly Active Peptide Manufacturing</p> <p>R&D, non-GMP and GMP-Production</p>
<p> CordenPharma Brussels, BE</p>	Peptides	<p>Solid-Phase (SPPS) & Liquid-Phase (LPPS) Peptide Synthesis & Production</p> <p>R&D, non-GMP and GMP-Production</p>
<p> CordenPharma Switzerland, Liestal, CH</p>	<p>Lipids</p> <p>Carbohydrates</p>	<p>Custom & Standard Synthetic Lipid Chemistry</p> <p>APIs, Excipients, Vaccines</p>
<p> CordenPharma Frankfurt, DE</p>	Peptides	R&D & non-GMP Production
<p> CordenPharma Caponago, IT</p>	Integrated Supply	Injectable Drug Product & LNP formulation

* Corden Pharma Latina S.p.A. was acquired by a Third Party (not affiliated to CordenPharma)



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Company



Peptides, Lipids
& Carbohydrates



Highly Potent
& Oncology



Injectables



Small Molecules



Antibiotics