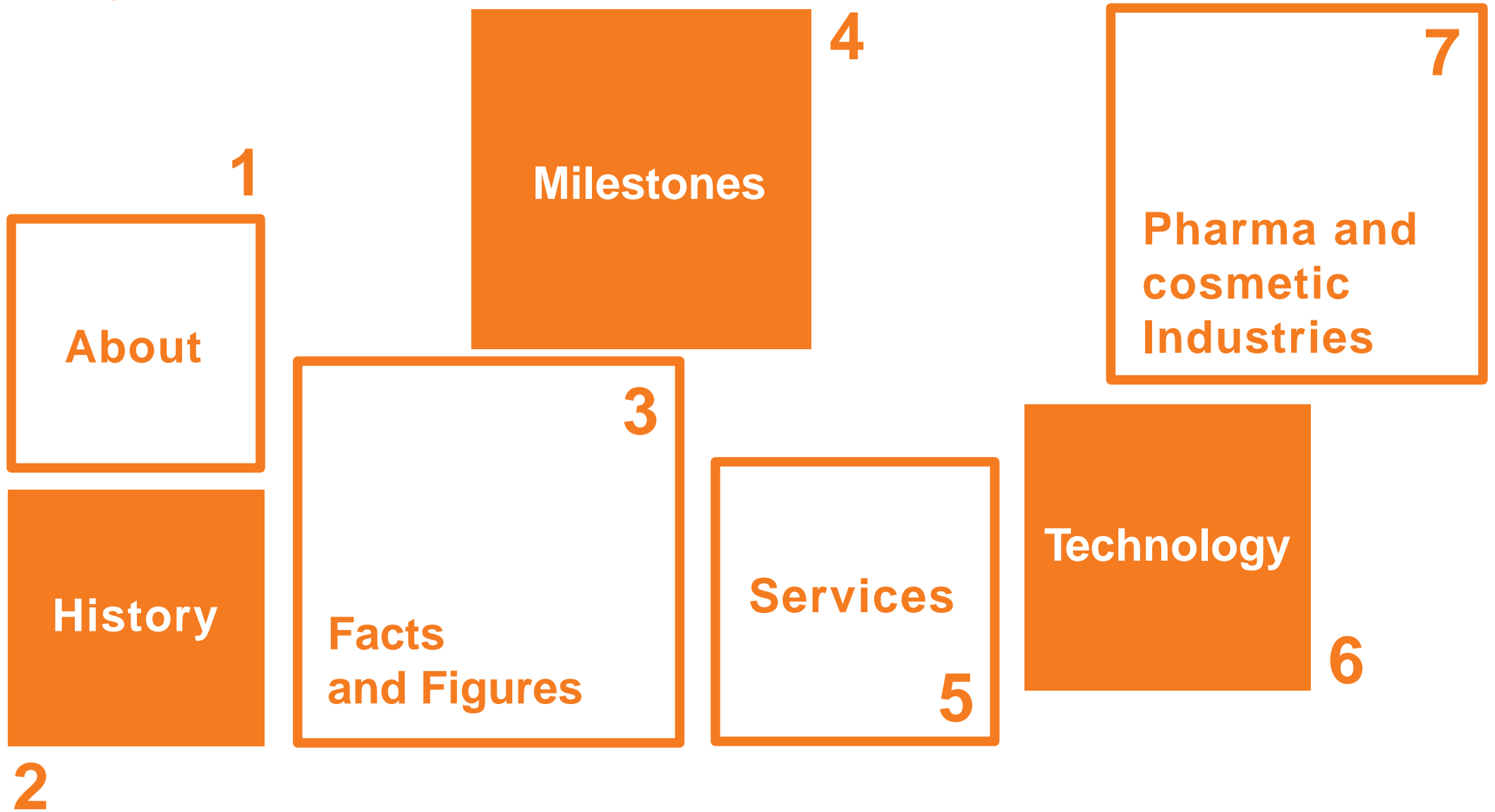




Solutions Synthesized

**Senn Chemicals –  
your CDMO**  
for SWISS quality  
peptides and amino  
acid derivatives

# Inhalt



A low-angle, upward-looking photograph of a modern building's exterior. The building features large white panels with horizontal ridges and sections of red panels. A prominent window with a red frame is visible in the center. The sky is a clear, pale blue. The text "Why Senn Chemicals?" is overlaid in orange in the upper right area.

**Why Senn Chemicals?**



**Dr. Daniel Müller**  
CEO

Senn Chemicals AG was founded in 1963, is family-owned and based in Switzerland.

We are cGMP and ISO certified, and specialized in the production of peptides and amino acid derivatives.

As a contract manufacturer we provide individual solutions starting from small scale for R&D to commercial API production.

# The early days



**Guido A. Senn**  
in 1963

Founded in his garage in Dielsdorf (1963).

What began as a catalog business for carbohydrates and rare sugars evolved into a global custom peptides manufacturer serving pharmaceutical, biotechnology and cosmetic companies worldwide.



# Facts & Figures

Deep know-how  
in high quality  
amino acid  
derivatives  
and peptides –  
since 1963

approved



May 2016 (GMP)  
March 2014 (GMP)  
July 2010 (PAI)  
November 2002 (GMP)

85

Employees

Founded in

1963

Dedicated  
manufacturing  
in

Switzerland

Deep  
know-how

Pharma-  
ceutical  
biotech and  
cosmetic  
industries  
globally

certified



inspected

The Swissmedic logo, featuring a red stylized 'S' above the word 'SWISSmedic' in a bold, sans-serif font.

August 2018  
August 2016  
August 2014  
August 2012

# Milestones

1

Founded in

**1963**

2

**Pioneered**amino acid  
building block  
synthesis

4

Specialized  
in solution phase  
synthesis up to**2'500 I**

5

**Peptides**Fragments  
macrocycles  
complex 40+ mer  
linear/convergent  
strategies

7

Manufacturer of

**GMP  
APIs**

8

Next step:  
Manufacturer of**high  
potent  
APIs**

6

**Growing**in solid phase  
technology incl.  
prep. HPLC and  
lyophilisation

3

**Fmoc,  
Boc, Z**  
protected amino  
acid derivatives

# Your success.

To us, you are not a project and you're not only a client. You are our strategic partner.

Dedicated Project Manager to our clients

Single point of contact and center of communication

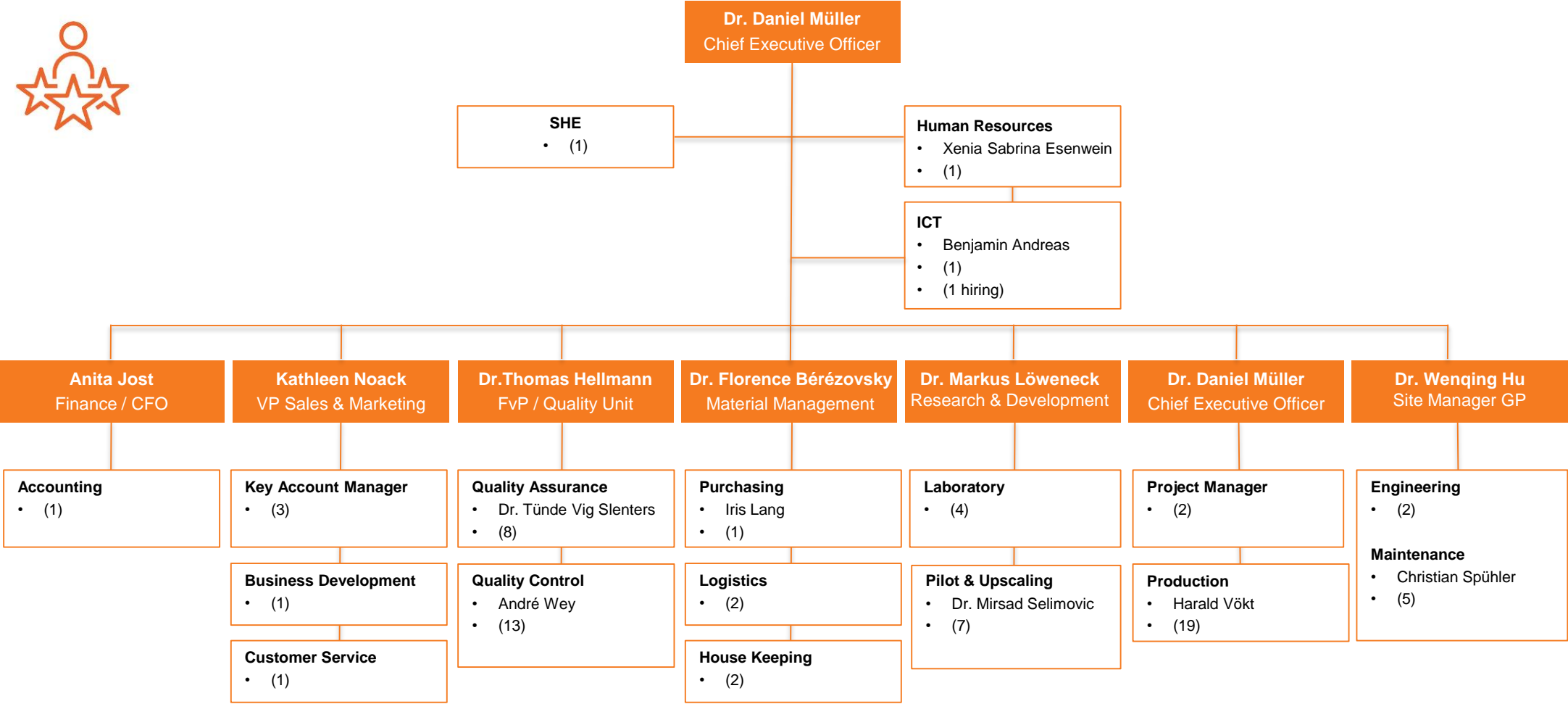
Progress reporting

Knowledge of project details

Supervision from the evaluation to the final completion of deliverables



# Our Team



# Our Products – at Senn Chemicals



## Peptide APIs

cGMP  
FDA inspected  
Solid Phase Synthesis  
Solution Phase Synthesis

## Peptides for pharmaceutical and cosmetic industry

Peptidomimetics

Lipopeptides

Glycopeptides

Peptide Polymers

**Amino Acid Derivatives**

**Carbohydrates**

**Small Molecules**

**Nucleotides**

**Excipients**

**Resins**



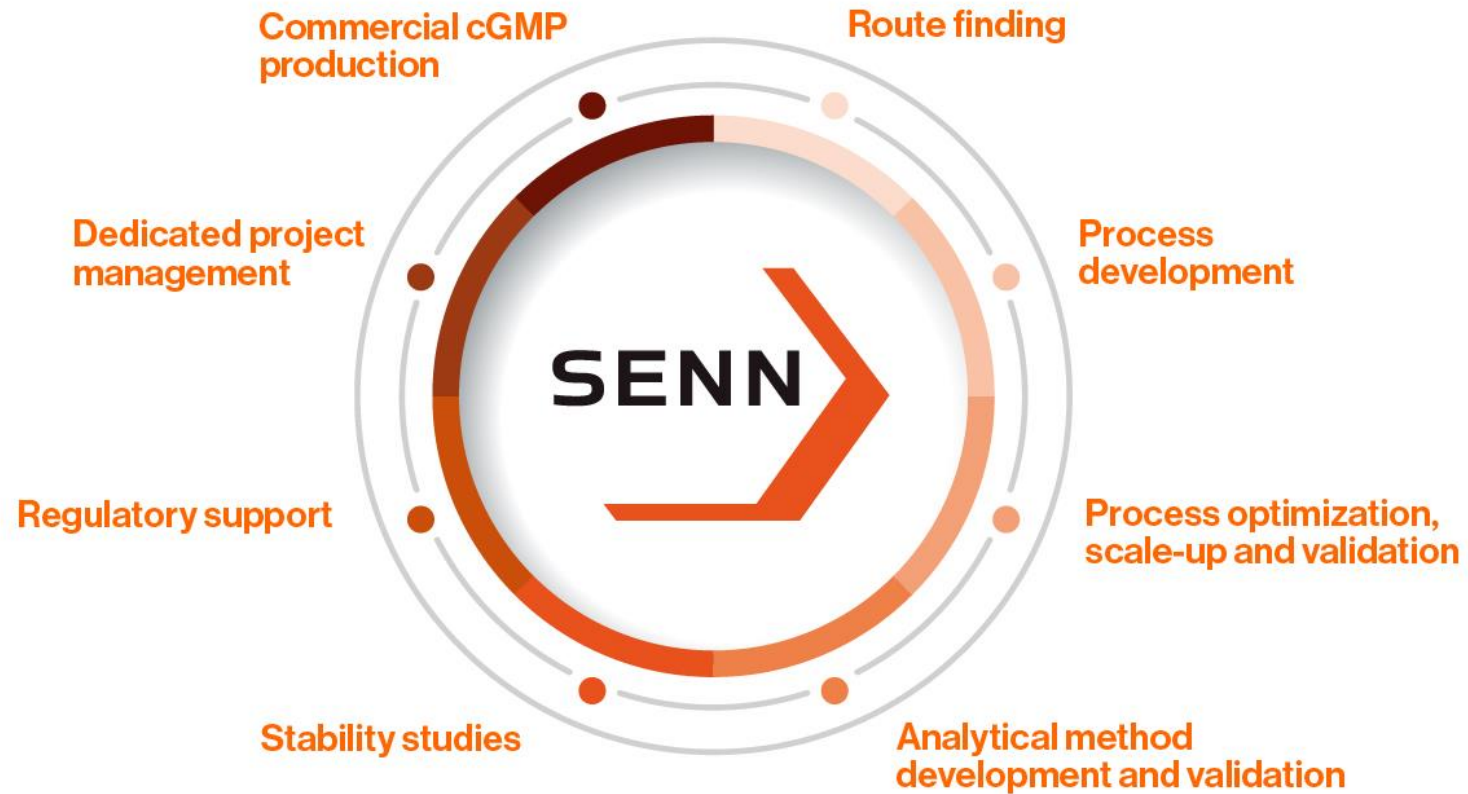
**Amelie Moya  
Rodriguez**

Staff member  
production

A good working environment  
is for me an essential  
element to ensure we  
provide products of ...

high quality

# Our Services –



## Solid Phase Chemistry

### Automated SPPS Reactors

CSBio (80/160 L, operated in GP site)

PTI Prelude

PTI Tribute

Activotec P11

### Semi-automated SPPS Reactors (variable scales)

Lab Lyophilizer (Zirbus Technology, VaCo5)

## Solution Phase Chemistry

Hydrogenators (0.1 L, 2 L, 20 L)

Low Temperature Reactor (20 L) down to minus 120 °C

Glass Reactors, jacketed (3 L, 6 L, 10 L, 20 L, 30 L)

3 Automated Laboratory Reactors (FlexyCUBE, Systag)

## Purification Equipment

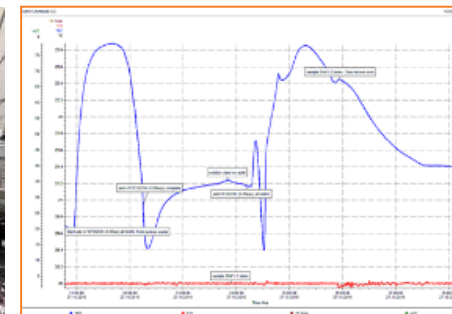
### Preparative HPLC

Semi-preparative HPLC (AlphaCrom)

HPLC-Skid (3L/ min) (AlphaCrom) with 10 cm ID or 20 cm ID DAC column

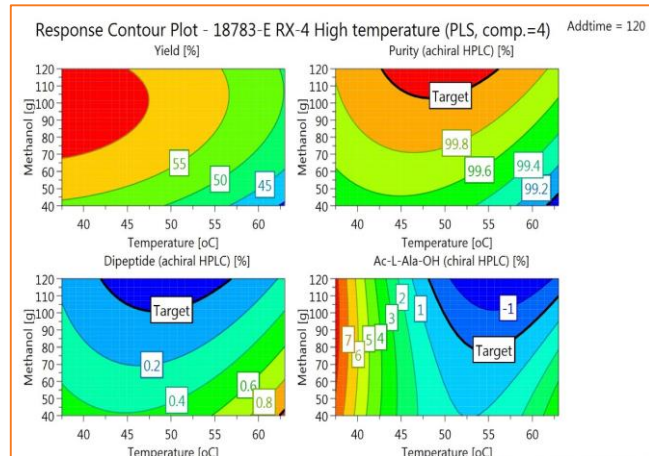
### Preparative MPLC

Automated Purification System (Teledyne Isco)



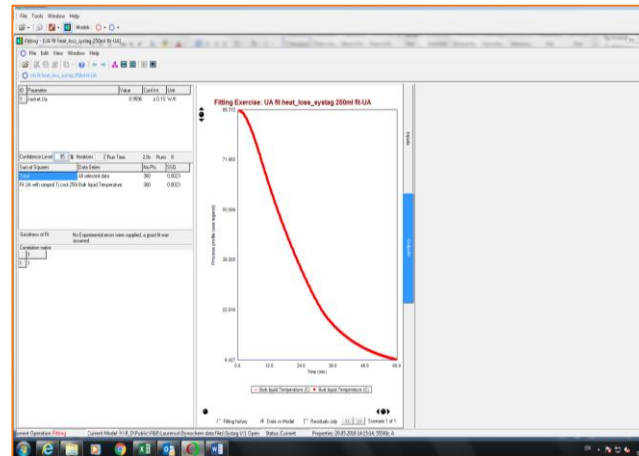
## Modde 11 Pro

Software for advanced DOE and quality analysis for development and manufacturing



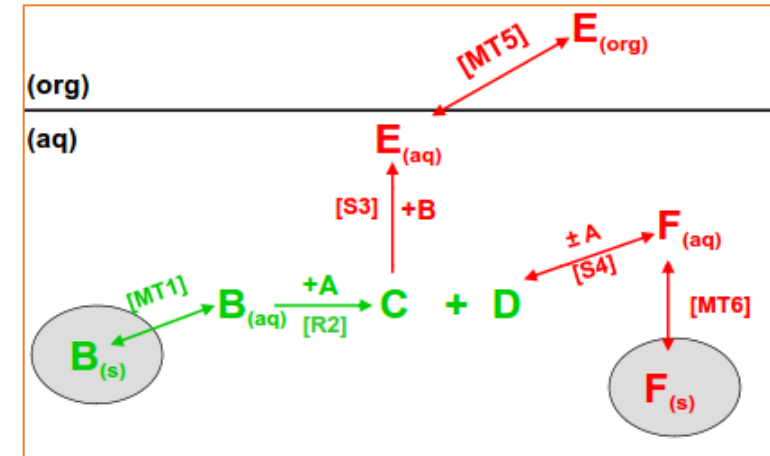
## Dynochem

Process development and scale-up software



## Britest

Tools to define, structure and translate working knowledge into process understanding





# Technology –

## Multi-Purpose Glass-Line Reactors

- 250 to 2'500 L
- - 20 to +120 °C

## Hydrogenation Reactors

- 630 to 2'500 L
- Max. 6 bar

## Solid Phase Reactors

- 80 to 160 L

## Preparative HPLC Chromatography

## cGMP Suites

## Lyophilization

From early  
research to  
commercial  
phase





## Multi-Purpose Reactors

- 100 to 2'500 L
- - 20 to +120 °C
- glass-lined, enamelled, Hastelloy, steel

## Hydrogenation Reactors

- 100 to 2'500 L
- Max. 6 bar

## Filtration

- Nutsche filters (various sizes)
- Pressure filters

## Drying

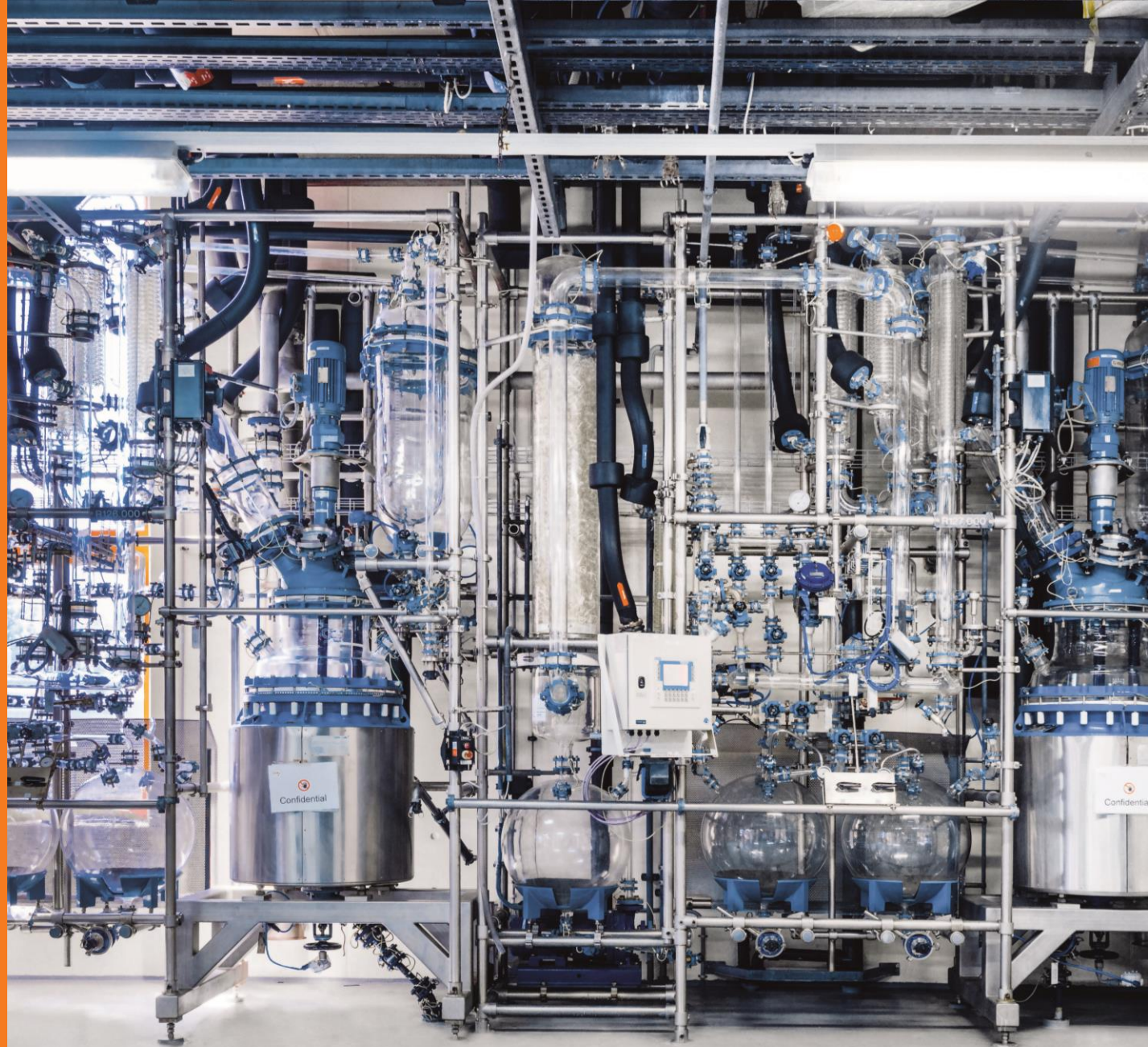
- Vacuum tray driers (various sizes)

## Solid Phase Reactors

- 80 to 160 L

## Preparative HPLC Chromatography

- Production Skid (3 L/min)
- 10 cm ID DAC column
- 20 cm ID DAC column





## **SENN Quality Control to achieve project goals:**

- Method Development
- Method Qualification and Validation
- Stability Studies
- Qualified External Service Laboratories
- Reference Standard Qualification

**Quality Unit & Expertise**

**Quality Control Service**

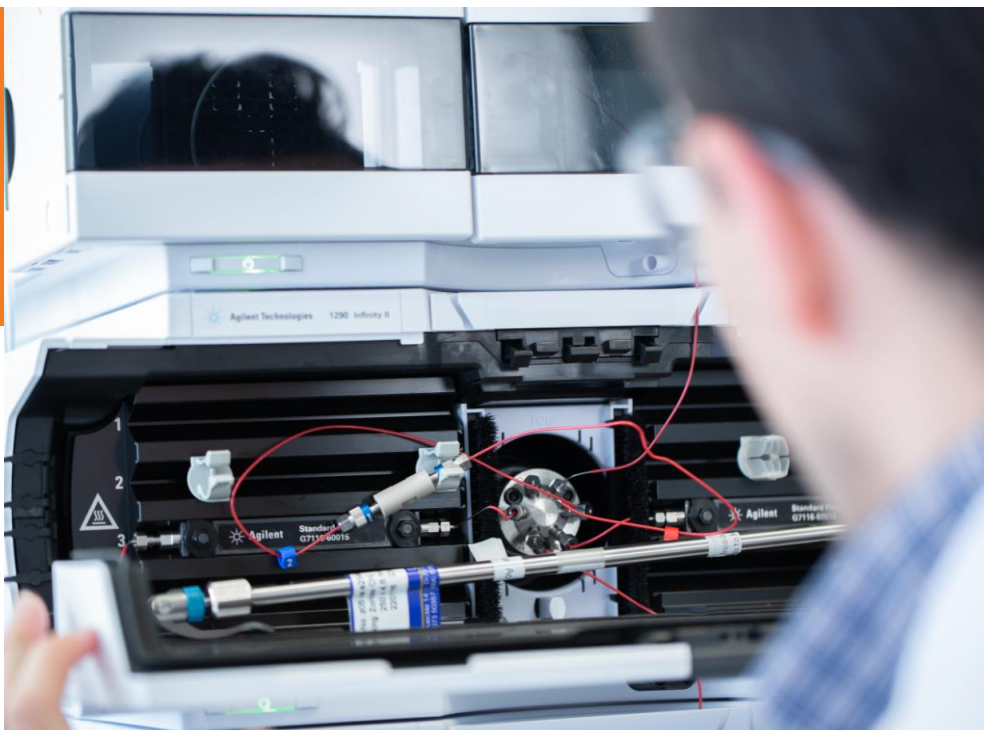


## **State of the art technologies in Quality Control:**

- Physical Characterization
- Impurity Identification
- Residual Solvent Determination
- Pharmacopeia Testing
- Chromatographic Assays
- Spectrometry
- LC-MS
- LC-MS/MS
- HPLC
- GC

**Quality Unit & Expertise**

**Quality Control Technologies**



Qualified contract laboratories used for any additional analytics in agreement with the customer.

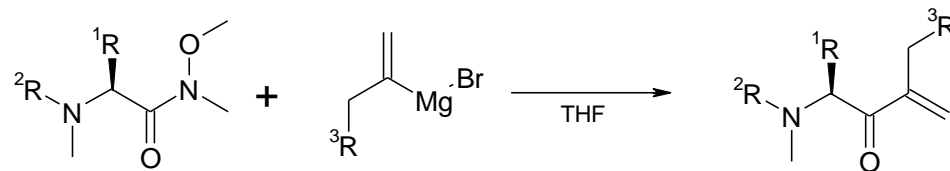
Top  
Swiss  
quality



Acylation	Epoxidation
Alkylation	Esterification
Amidation	Glycosylation
Amination	Grignard
Aminoalkylation	Halogenation
Carboxylation	Hydrogenation
Condensation	Oxidation
Amide Coupling	Polymerization
Cyclization	Transesterification
Enzyme catalyzed reactions	

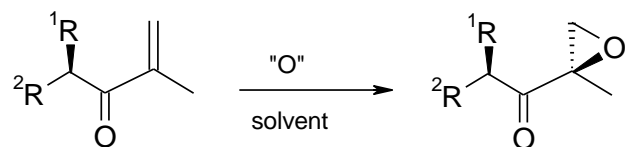






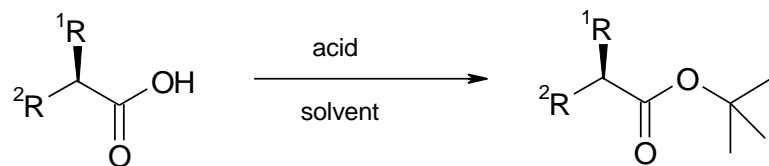
## Grignard-Reactions

### 50-100 kg scale



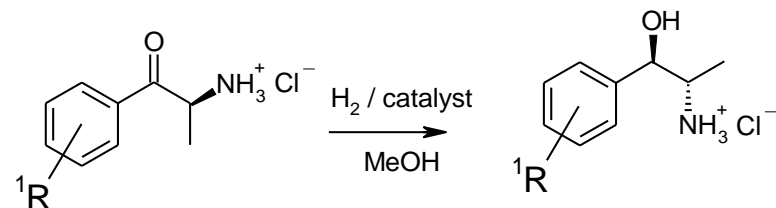
## Epoxidation-Reactions

### 50 kg scale



## Tert-Butylation-Reactions

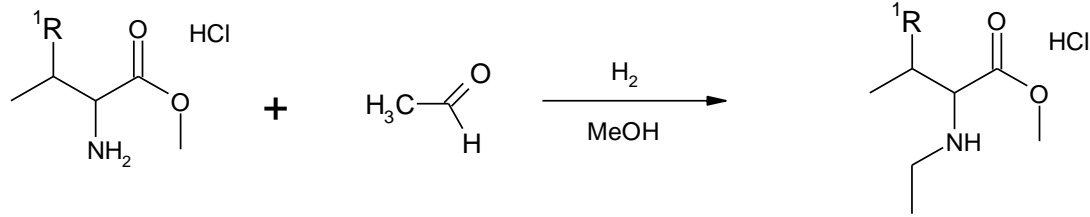
### 25-50 kg scale



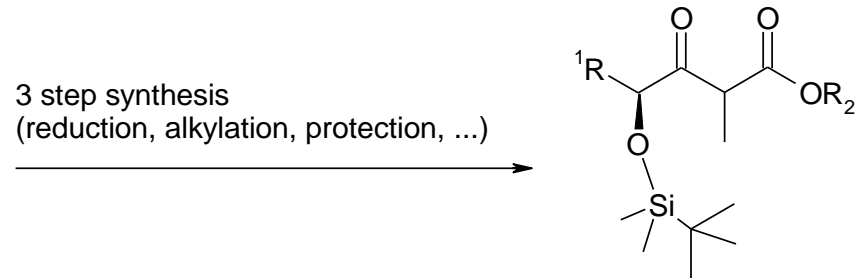
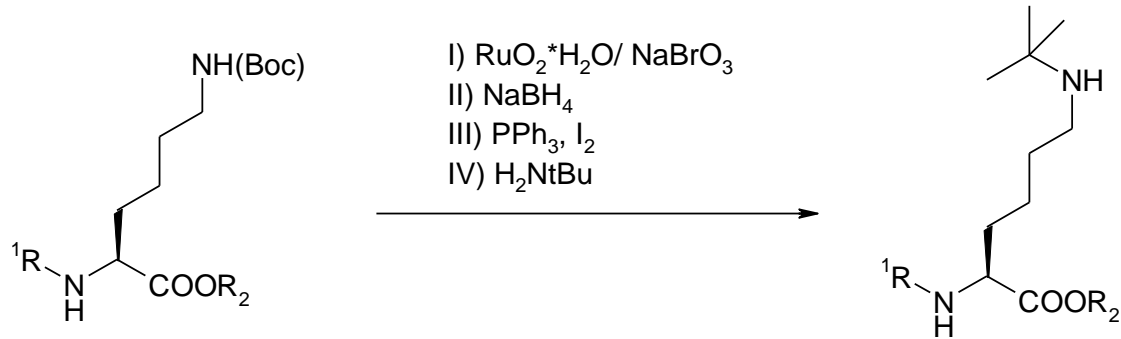
## Stereoselective Reductions

### 20 kg scale

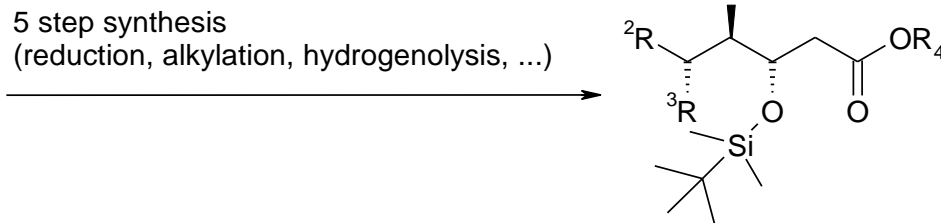
# Portfolio of developed Products



Reductive aminations  
+200 kg scale



Complex synthetic  
processes 1 kg scale



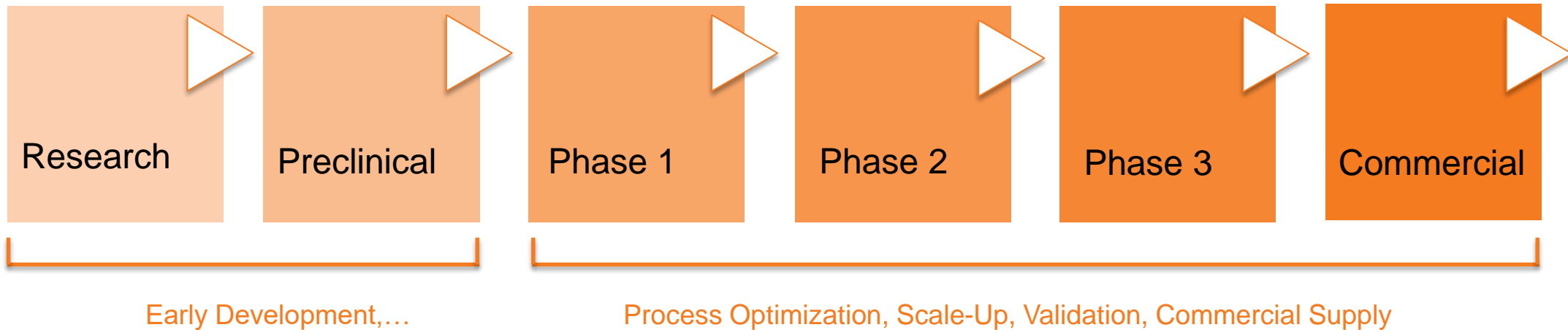


# Serving the pharmaceutical industry

Critical Raw Materials  
Regulatory Starting Materials  
Intermediates  
APIs  
Excipients



# Our Services for pharmaceutical industry



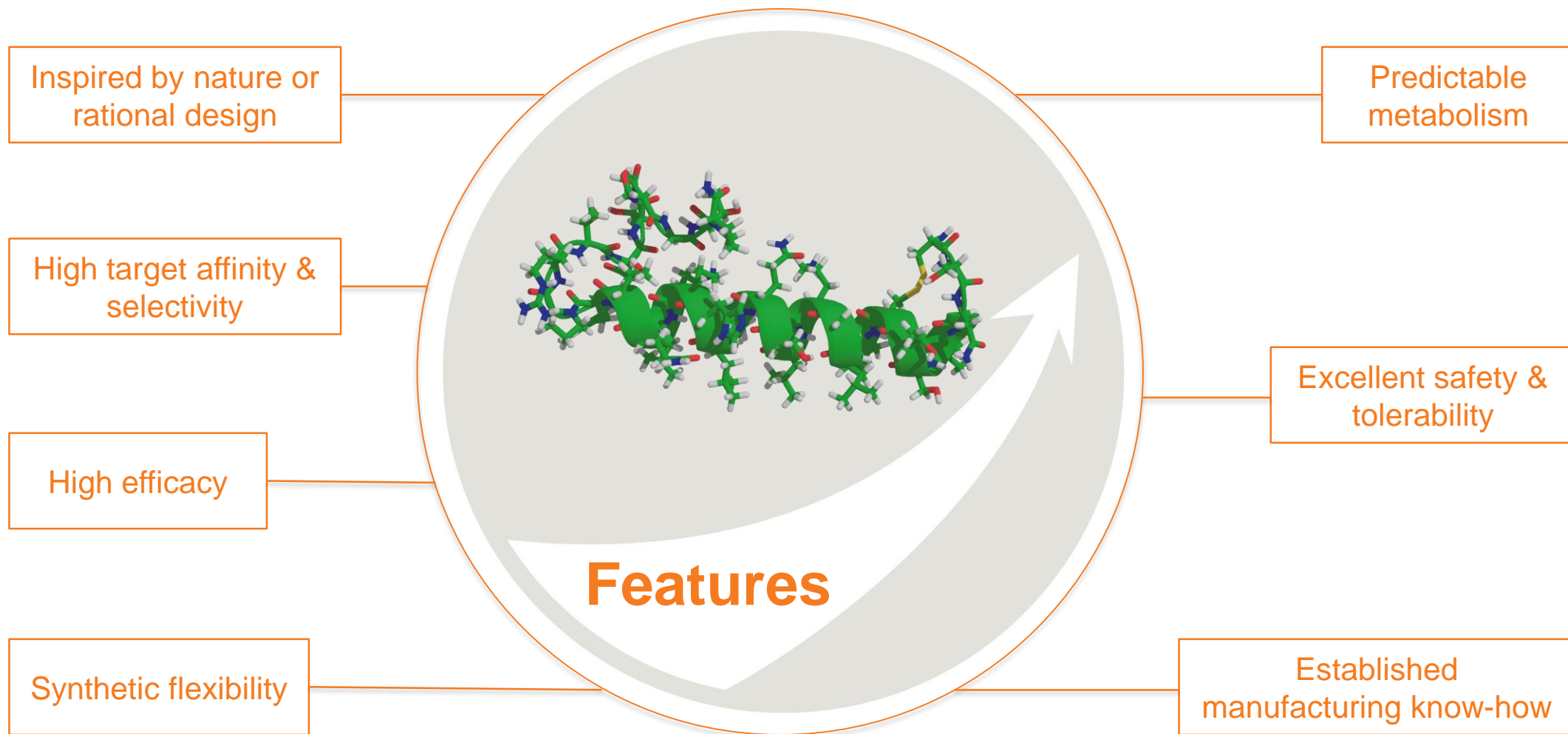
Service according to all Preclinical and clinical phases

For intermediates and APIs

Fragments and Peptides

Project specific requirements upon final requirements and application

# Peptide APIs – at Senn Chemicals



# Peptide APIs – applications



- Chronic kidney disease
- Porphyria
- Obesity
- Diabetes

Metabolic diseases



- Prostate cancer
- Breast cancer
- Uterine fibroids

Oncology

- Irritable bowel syndrome
- Short bowel syndrome



Gastroenterology

## Applications

Further Applications

Personalized medicine

Neurodegenerative diseases

Analgesia

# Cosmetic Peptides – at Senn Chemicals

Peptides have become the most innovative and vital ingredients for the cosmetic industry. Peptides are utilized as active ingredients in cosmetic products due to their unique properties:





# Cosmetic Peptides –

Cosmetic  
peptide  
from R&D to  
commercial  
scale

- Stimulate wound healing
- Improve elasticity and firmness of aged skin
- Reduce the deepness of wrinkles
- Reduce fine lines
- Provide anti-inflammatory activity
- Enhance collagen synthesis
- Stimulate endothelial cell proliferation and angiogenesis
- Affect skin pigmentation  
(lightening or tanning of skin can be enhanced)





# Create your own innovative peptide – Solutions Synthesized

N-Terminus	Sequence [2-30 AA]				C-Terminus	Salt Form
H-	Gly	Ala	Val	Leu	-OH	AcOH
Ac-	Ile	Met	Phe	Trp	-NH <sub>2</sub>	HCl
Pal-	Pro	Ser	Thr	Cys	-R	TFA
Biot-	Tyr	Asn	Gln	Asp		Inner Salt
Any other	Glu	Lys	Arg	His		Any other

# Senn – your partner in peptide chemistry

## **ISS**

Industriestrasse 12  
Management, QA/QC, Logistics

## **GP**

Guido Senn-Strasse 1  
cGMP manufacturing

## **RW**

Ruchwiesenstrasse 6  
R&D, Lab-Scale and Pilot Plant