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OUR SCIENCE FOR YOUR FUTURE

Transitioning Toward Green Engineering

Precision Fermentation as a Sustainable Alternative to Chemical Peptide Synthesis

Case Study of the PeptiCode™ Platform for Sustainable Hexapeptide-9 Production

ADEBIOTECH

June 30, 2026

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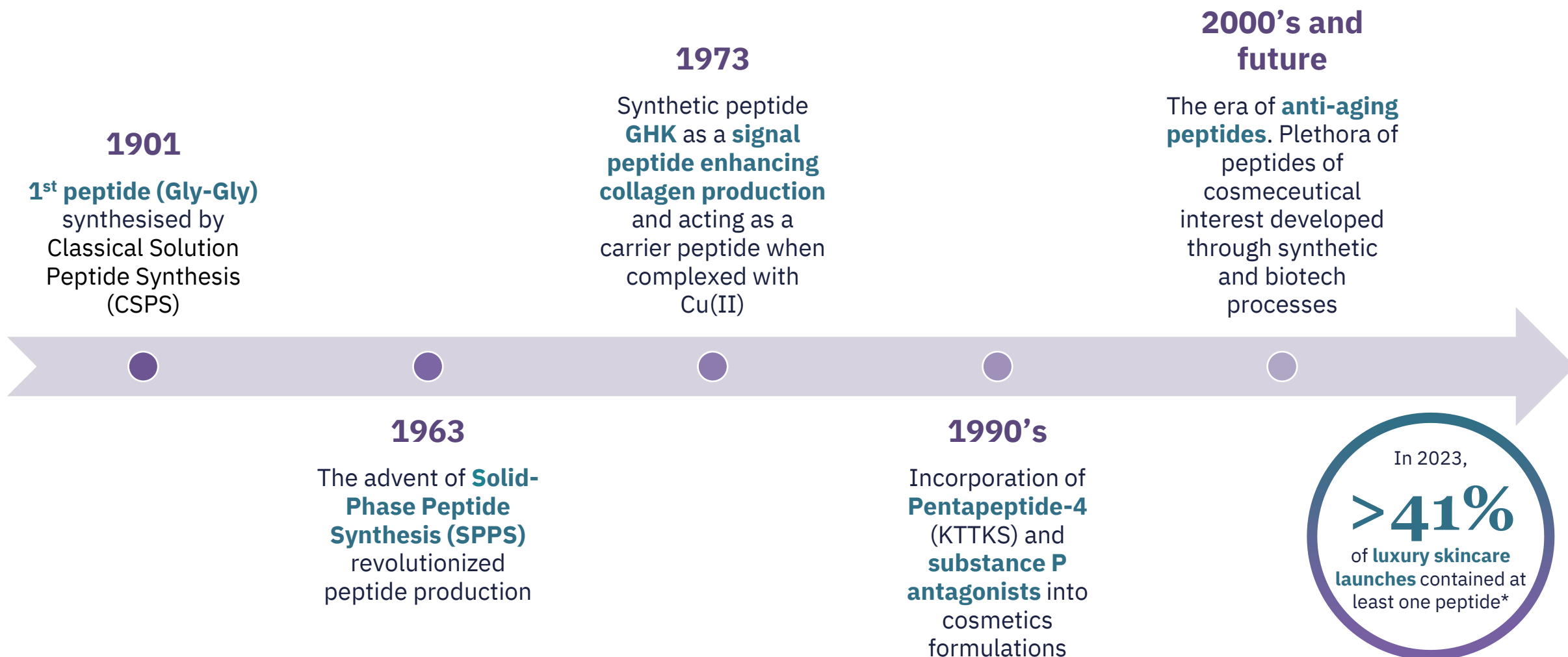
Partnerships & Business Director



Peptides in Cosmetics: Innovation from the start

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A Quick History of Cosmetic Peptides



Comparing Synthetic Processes vs. Biotech Synthesis

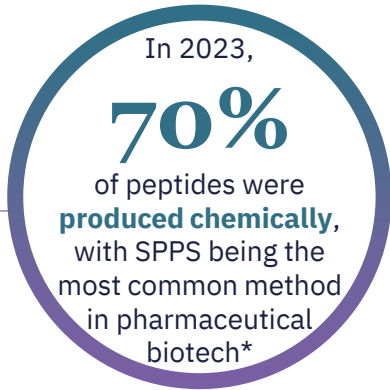
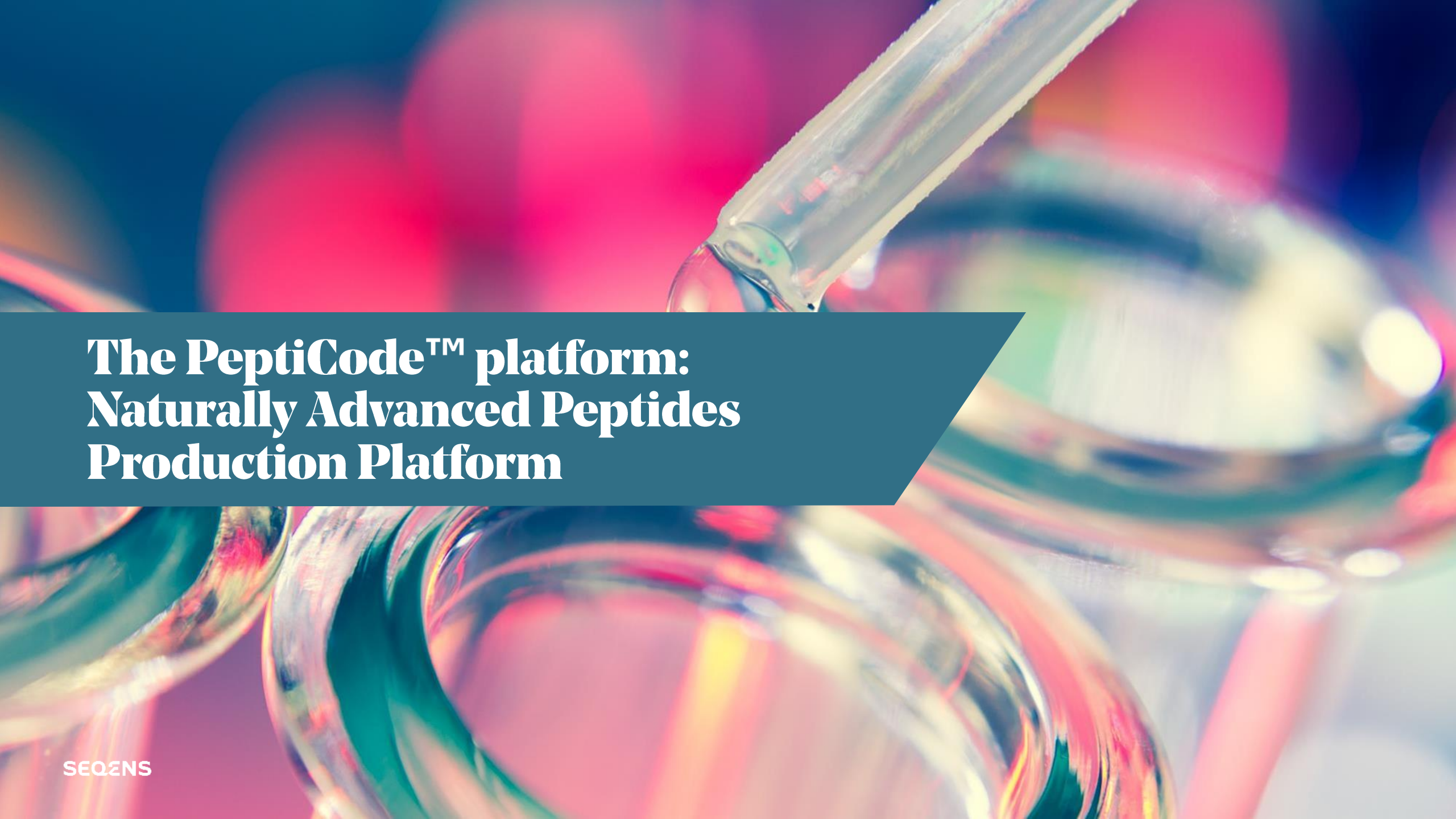


Table 1: Comparison of CSPS, SPPS, LPPS and Biotech synthesis

Aspect	Solid-Phase Peptide Synthesis (SPPS)	Liquid-Phase Peptide Synthesis (LPPS)	Our Biotech Synthesis
Scalability	Multi-kilogram production	Industrial-scale synthesis	Large-scale production
Purity	Moderate (crude product)	High (efficient reactions)	High (precise bio-identical AAs sequences)
Environmental Impact	High solvent/reagent waste	Lower solvent usage	Lower solvent usage, no TFA and PFAS usage, reduction of carbon waste
Key Applications	- Longer peptides and proteins (up to 80 AAs) - Therapeutic - Cosmetic	- Short peptides (< 10 AAs) - Food - Cosmetic	- Short and longer peptides, proteins - Short peptides combination - Food - Cosmetic

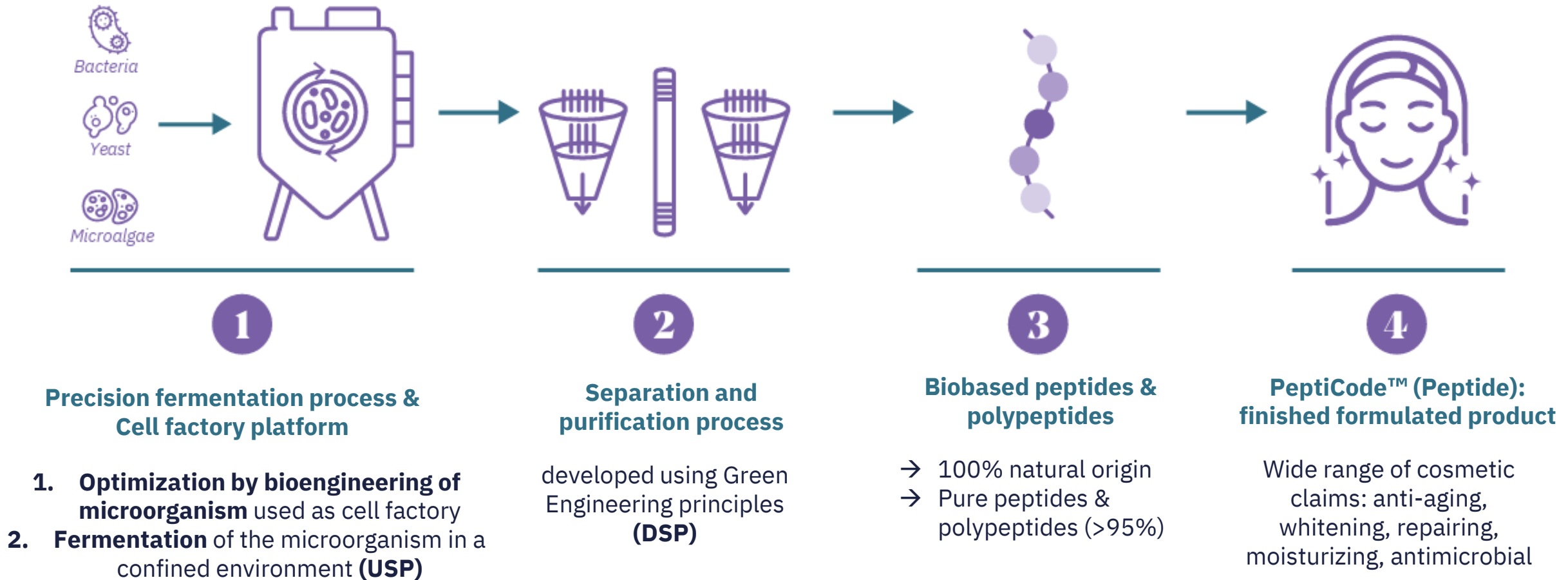
Table 1 adapted from Tang Y, Nie T, Zhang L, Liu X, Deng H. Peptides in Cosmetics: From Pharmaceutical Breakthroughs to Skincare Innovations. Cosmetics. 2025, 12, 107.
*Worldmetrics.org. Peptide Industry Statistics. [Internet, Published in Feb 2026, Consulted in Mar 2026]. Available at: <https://worldmetrics.org/peptide-industry-statistics/>



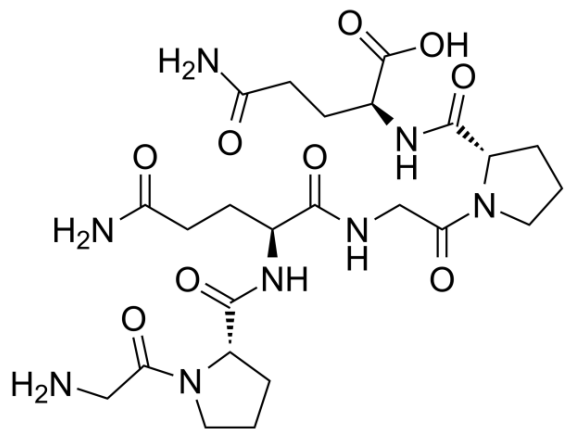
The PeptiCode™ platform: Naturally Advanced Peptides Production Platform

SEQENS Biotechnology PeptiCode™ Platform: Naturally Advanced Peptides Production Platform

SEQENS' unique expertise in **precision bioengineering and fermentation process** to develop innovative peptides and polypeptides.



PeptiCode™ HP-9: Bio-Identical Collagen-Boosting Peptide



PeptiCode™ HP-9 is an **hexapeptide-9** with the sequence Glycyl-L-prolyl-L-glutamylglycyl-L-prolyl-L-glutamine (or Gly-Pro-Gln-Gly-Pro-Gln or GPQGPQ).

It is a peptide present inside the amino acid sequence of **type 4 and 17 collagen**.

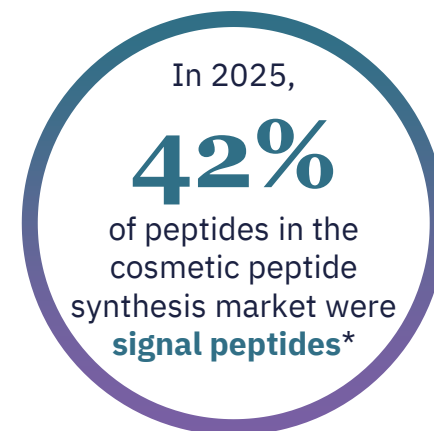
PeptiCode™ HP-9 is a signal peptide:



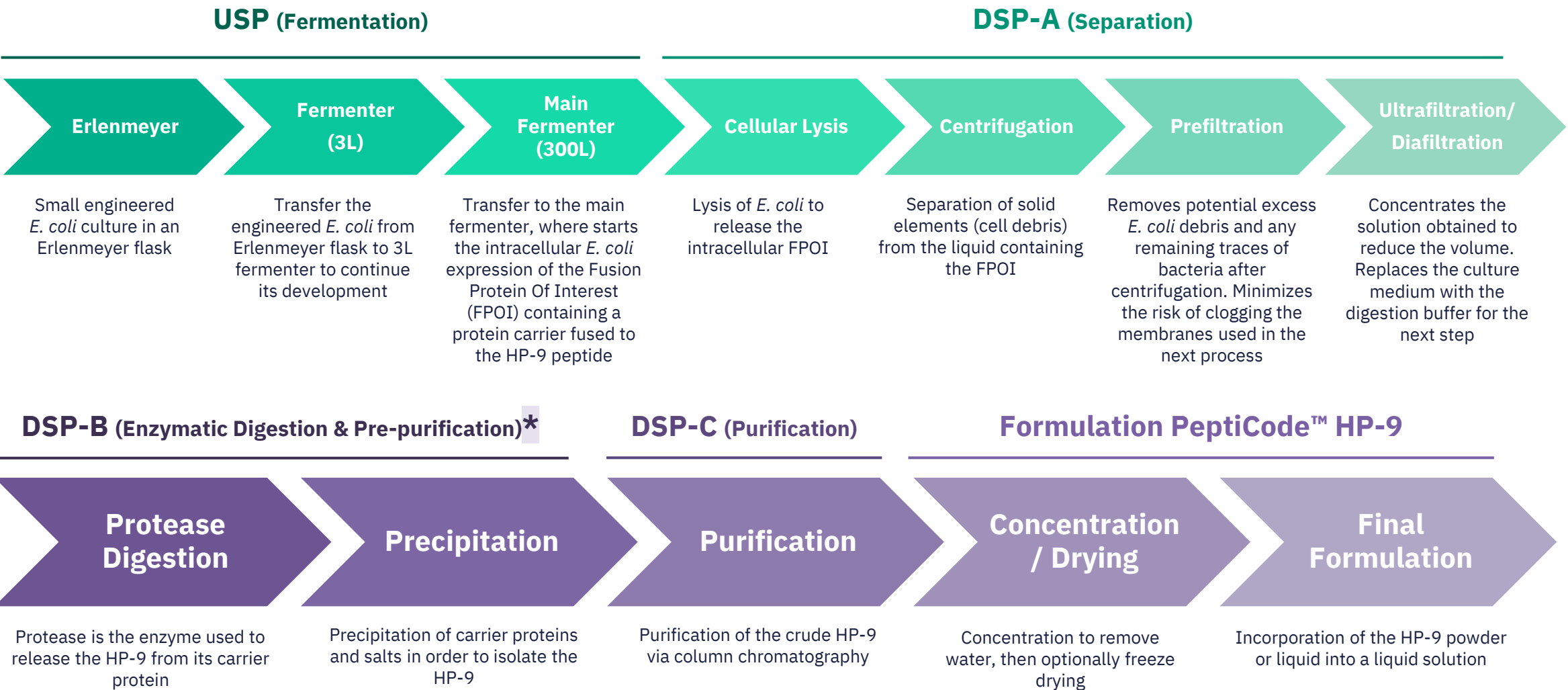
Stimulate ECM protein production, cell growth, and other cell metabolic functions.

Able to modulate skin protein turnover by enhancing collagen production. Ability to signal or mimicking the signal occurring in the synthesis of ECM proteins.

Peptides promoting collagen production and released by the ECM, are called also matrikines.



SEQENS Biotechnology Process for our first European biotech hexapeptide-9: PeptiCode™ HP-9



*Non-necessary step in the case of long peptides

PeptiCode™ HP-9: The first biotech Hexapeptide-9 from our series, Naturally Advanced Anti-Aging Solution

INCI NAME: AQUA, BUTYLENE GLYCOL, HEXAPEPTIDE-9

POINTS OF INTEREST:

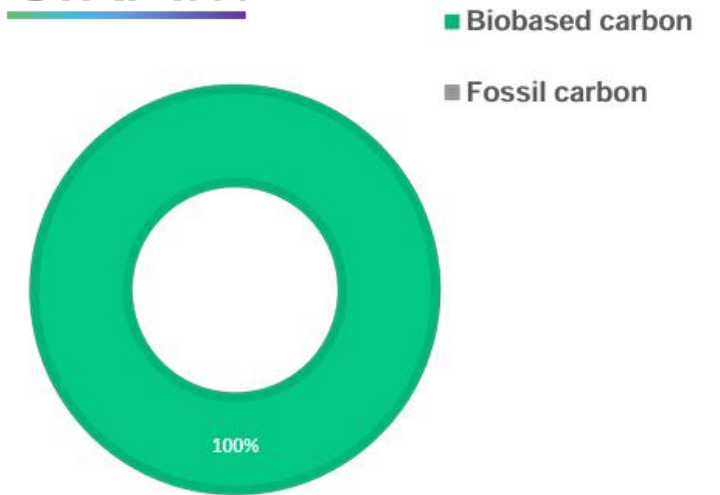
- **100% natural origin for the product and the pure peptide,**
- Respecting the principles of **Green Engineering,**
- Safe and controlled environment for workers,
- Quality analysis and high purity criteria (**> 95%, without other peptides,**
- **No TFA & no PFAS used in production process,**
- **Biodegradable*,**
- **ISO 16128, NOI = 1,**
- Drop-in replacement for the synthetic efficacy equivalency,
- **Anti-aging activity:** signal peptide that stimulates **collagen synthesis*.**

Focus

- **100% biobased carbon content**

(¹⁴C analysis by an independent lab)

CIRAM



Thank you!



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