

BACKGROUND

The Scientific Origin of a New Generation of Biomimetic Chemistry

Executive Summary

Biomimetic Sweden AB was not founded simply to develop new chemical products. It was established to pursue a scientific idea: that high-performance chemistry does not have to rely on substances classified as hazardous to human health or the environment.

More than twenty years of research and product development have resulted in two complementary technology platforms comprising more than twenty-five proprietary chemical formulations for fire protection, cleaning, antimicrobial protection and surface treatment.

The objective has always remained unchanged—to develop practical chemical solutions inspired by nature while maintaining competitive performance and commercial viability.

The Challenge

Every significant scientific breakthrough begins with a question.

More than two decades ago, two representatives from Procter & Gamble (P&G) approached Mats Nilsson with a challenge that would become the starting point of an extensive research programme.

Their question was straightforward:

Would it be possible to develop a flame-retardant technology that could provide the required level of fire protection while being safe for both people and the environment, and suitable for consumer markets?

At that time, no satisfactory answer existed.

Conventional flame-retardant technologies largely depended on substances that were increasingly questioned because of their environmental and health impacts.

Rather than attempting to improve existing chemistries, the decision was made to investigate whether an entirely different scientific approach could provide the answer.

A Different Scientific Philosophy

The research was founded on a simple but demanding principle:

Nature has spent millions of years developing highly efficient chemical systems. Instead of competing with nature, modern chemistry should learn from it.

This philosophy became the foundation of the Biomimetic concept.

The objective was never merely to replace one chemical with another.

The objective was to understand the underlying principles of natural chemistry and translate them into modern industrial applications capable of meeting demanding commercial performance requirements.

The Research Journey

The development programme evolved over more than twenty years.

Because the chemistry differed fundamentally from conventional formulations, there were few existing scientific references that could simply be copied or adapted.

Every formulation required systematic investigation, laboratory verification, optimisation and practical validation.

Throughout the entire programme one principle remained unchanged:

Performance and environmental responsibility should develop together —not at the expense of one another.

From Scientific Idea to Technology Platform

The research eventually resulted in two complementary technology platforms.

MHE (Molecular Heat Eater) focuses on fire prevention, flame retardancy and fire suppression technologies.

Bio-Eco TT comprises a broad family of advanced formulations for cleaning, antimicrobial protection, surface treatment, impregnation and industrial applications.

Together these platforms today represent more than twenty-five proprietary chemical developments covering a broad range of commercial applications.

Scientific Principles

The development philosophy has consistently been based on carefully designed chemical compositions using food-grade weak organic salts and other selected components with favourable environmental characteristics.

Rather than relying on many of the substances traditionally associated with industrial chemistry, the objective has been to develop formulations designed without classified hazardous substances, wherever technically possible.

This approach has required extensive experimentation, because conventional chemical literature offered limited guidance for this type of formulation strategy.

From Research to Innovation

Scientific ideas only become valuable when they solve practical problems. The Biomimetic technology platforms have therefore been developed for applications where performance, safety and sustainability must coexist.

The technologies encompass solutions for:

- Fire prevention and fire suppression
- Flame-retardant treatment of wood, paper and textiles
- Household and industrial cleaning
- Surface protection
- Antimicrobial coatings
- Industrial specialty applications

Each product family has been developed from the same scientific philosophy while addressing different technical challenges.

Why It Matters Today

Society is facing increasing expectations regarding environmental responsibility, chemical safety and sustainable industrial development.

At the same time, industries continue to require products that deliver high technical performance, economic competitiveness and regulatory compliance.

The Biomimetic research programme was initiated long before these issues became central global priorities.

Today, the accumulated research represents a technology platform that is well positioned to contribute to future developments within safer and more sustainable chemistry.

Looking Forward

Biomimetic Sweden AB represents considerably more than a collection of individual products.

It represents a long-term scientific platform built upon one fundamental conviction:

Innovative chemistry should be inspired by nature, validated by science and developed for the benefit of people, industry and the environment.

The work described in this document is therefore not the conclusion of a research programme.

It is the foundation for the next generation of biomimetic chemical technologies.