# “MiST-IC” Tagging System: Sustainability & Biotech Applications

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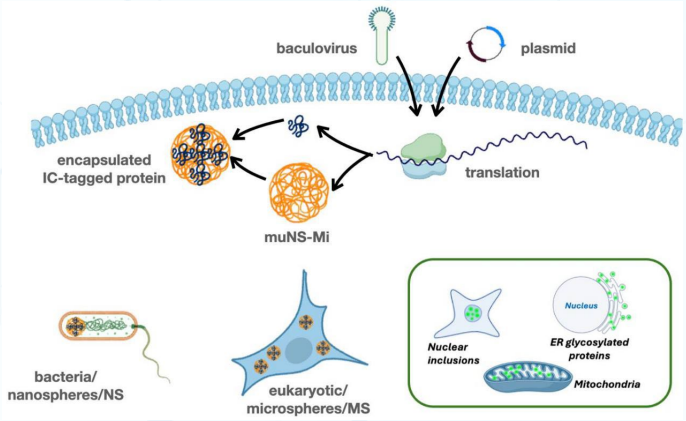
**Intra-Cellular micro or nanospheres (MS/NS) loaded with your (glycol)proteins of interest**




- ✓ Simplicity, cost effective & easy production
  - → *Cells do the work:* ***express & “encapsulate”****.*
- ✓ Proteins properly folded and completely functional.
  - → *Can also work inside ER:* ***glycoproteins****.*
- ✓ Allows highly specific **covalent surface modification** with any desired molecule, unaffecting the activity

## ➢ Enzymatic Immobilization and Recycling

- It works at **wider pH ranges** than the free enzyme.
- Allows **recirculation** of enzymes and **cascade reactions**, e.g., spheres loaded simultaneously with peroxygenases & formate oxidase.

Ongoing: *“**PETzyme** – Enzymatic PET recycling”* (AEI-TED, 2023-2025)

## ➢ Chemical & Thermal Stabilization of Enzymes

- Easy to produce & purify. Lyophilizable
- Proof of Concept: CotA laccase. The activity remains almost unaffected after 30 m @ 90°C / 15 m @ 95°C.
- The encapsulated laccase decolorates the dye RB19 at room temperature.

*“Chemical and thermal stabilization of CotA laccase”. Scientific Reports,* **2021**, *11, 2802;*

## ➢ Toxic or difficult-to-express enzymes, antigens, antibodies…

- Completely **functional**, proteins are properly folded inside spheres.
- Working inside the endoplasmic reticulum: modified **viral glycoproteins**.

*“IC-Tagging methodology applied to the expression of viral glycoproteins and the difficult-to-express membrane-bound IGRP autoantigen”. Scientific Reports,* **2018**, 16286

Patent Families: **(1)** ES2364182 B2; US10059745 B2; EP2535348 B1. **(2)** ES2548784 B2; EP3199636 B1; US11174485 B2. **(3)** P202330185 (2023). **(4)** P202430527 (2024). **(5)** P202430707 (2024).