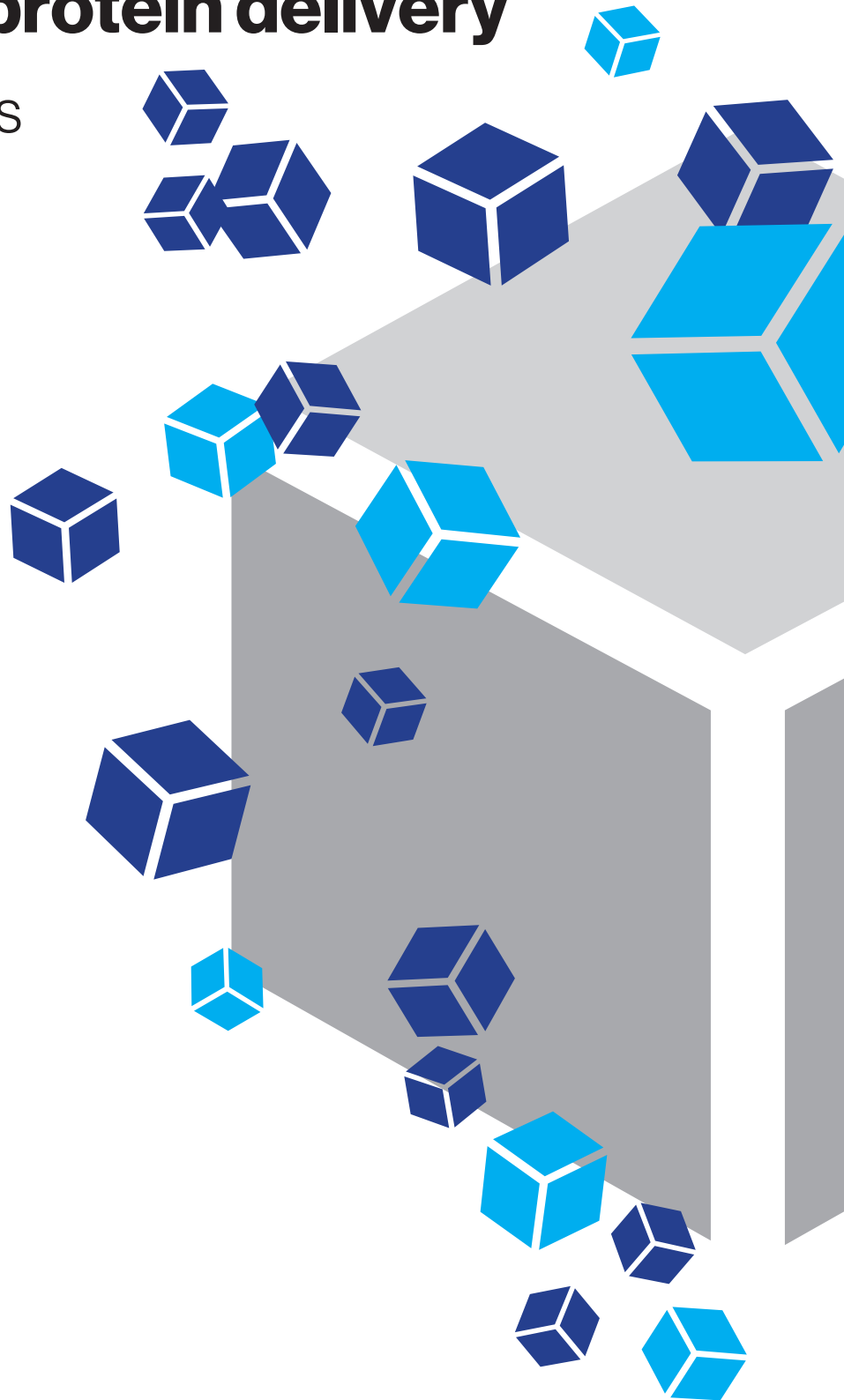


Improving localized and systemic therapeutic protein delivery

In vivo applications

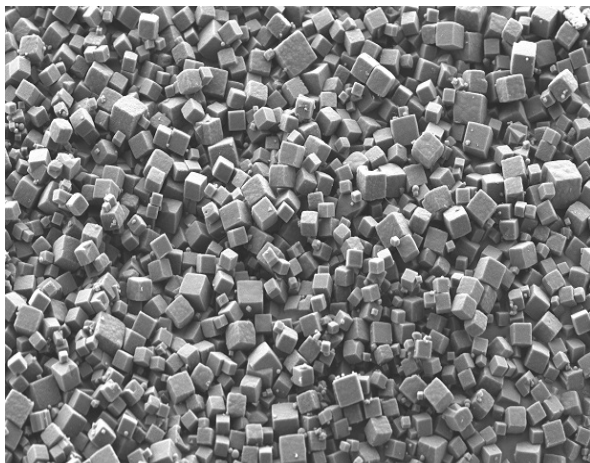


Powered by PODS® technology

Drug Delivery within Therapeutic Research

Why use PODS®?

The instability of conventional recombinant proteins hampers their deployment as therapeutics. POLYhedrin Delivery System (PODS®) technology addresses this problem by placing proteins within a protective sub-micron scale protein crystal lattice. This stabilizes cargo proteins, even at elevated temperatures and over long periods of time.



What is PODS® technology?

PODS® are protease-responsive matrix microparticles, about 0.2-5 microns across, that provide the sustained release of encapsulated therapeutic proteins such as cytokines.

PODS® addresses the problem of protein instability by capturing fully folded proteins within microscopic protein crystals to provide a robust sustained release depot formulation.

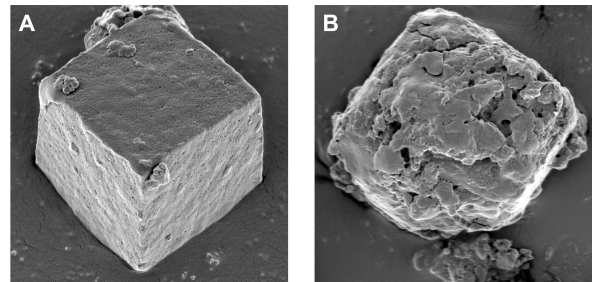
PODS® crystals have been used in applications ranging from cancer immunotherapy to implanted cell survival.

*Sustained-release,
steady-state bioavailability*

How do they work?

PODS® technology exploits the natural properties of the polyhedrin protein which forms crystals when expressed in a cell.

PODS® crystals are formed when a tagged protein of interest (cargo protein) is co-expressed with the *Bombyx mori* cypovirus polyhedrin protein. The polyhedrin protein forms regular, cubic crystals within which a cargo protein specifically binds via a short protein tag. The PODS® crystals slowly release cargo through pores that form in the crystal as it is degraded by resident proteases.



PODS® proteins (A) are degraded by resident proteases, sustainably releasing cargo proteins (B).

Key Benefits of PODS® Proteins

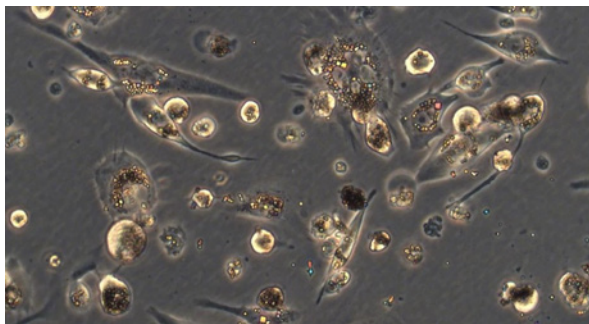
- **Sustained-release:**
maintain zero-order release kinetics over extended periods
- **Non-inflammatory:**
no macrophage or neutrophil activation
- **Biodegradable:**
100% protein
- **Highly stable:**
retains >70% cargo bioactivity after 1 month's use
- **Various administration routes tested:**
vein, bone, joint, back of eye, inner ear, brain, and muscle

Validated Disease Models

Cancer

Development of Trojan horse immunotherapy strategies to treat cancer

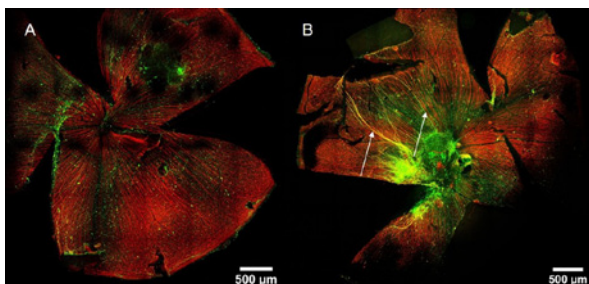
PODS® are readily phagocytosed by mononuclear phagocytes such as macrophages. These immune cells are recruited to inflamed tissues including cancer. The cargo proteins within PODS® crystals are then secreted from these cells in a bioactive format to modulate the disease.



Age-Related Macular Degeneration

Improving the quality of retinal ganglion cells used in cell therapy

PODS® crystals containing BDNF and GDNF improve engraftment and maturation of transplanted retinal ganglion cells implanted into eyes generating greater survival and neurite outgrowth.

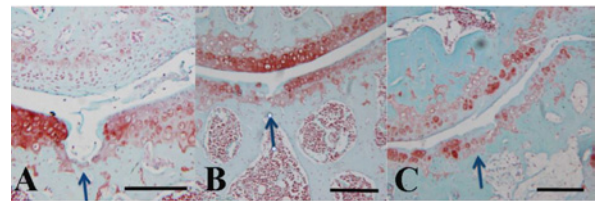


A wide variety of PODS® proteins are available at affordable prices. Custom products can be made on request. Visit www.cellgs.com for more information.

Osteoarthritis

Delivery of therapeutic proteins sustainably locally to the knee

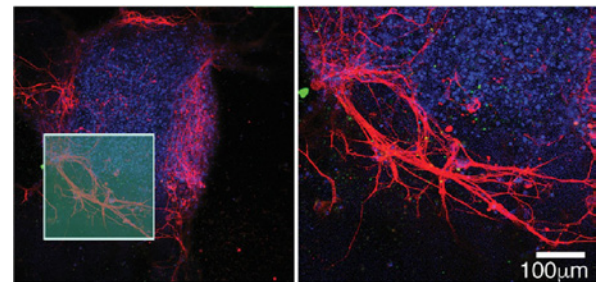
PODS® crystals containing bone morphogenic protein (BMP) addresses the limitations of conventional growth factors by delivering therapeutic efficacy at lower doses of BMP over long periods of time.



Cochlear Implant Integration

Development of artificial niche for stem cell replacement therapy

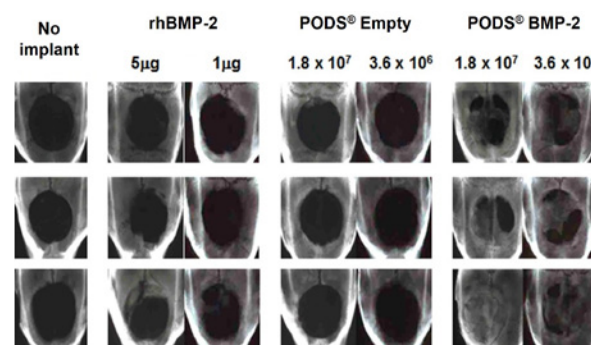
PODS® containing neurotrophic growth factors can be used to establish a gradient that enables engraftment and maturation of otic neuronal precursor cells with the goal of improving cochlear implant integration.



Bone Regeneration

Advancing bone regeneration therapy

PODS® providing sustained availability of BMP-2 over several weeks enable superior healing of critical-sized bone defects.



Cell Guidance Systems' reagents and services enable control, manipulation and monitoring of the cell, both *in vitro* and *in vivo*

Growth Factors

- Recombinant
- PODS® Sustained Release

Exosomes

- Purification
- Detection
- Purified Exosomes
- NTA Service

Cytogenetics Service

- Karyotype Analysis
- Array Hybridization

Defined Surfaces and ECMs

- PeptiGel®
- Matrigen Softwell®
- Matrix Proteins

Other research products

- Primary Human Hepatocytes
- Small Molecules
- Cell Counting Reagent
- Lipid Quantification Assay



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