Seevix Material Sciences
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seevix spidersilk innovations

TECHNICAL DATA SHEET

SPHEROSEEV BIOPOLYMER

Property	SVX characteristics	Details
General description	SpheroSeev biopolymer is a pure protein, biocompatible and biodegradable additive used in 3D cell culture as a scaffold for tissue growth. In addition, SpheroSeev exhibits anti-oxidant activity and can be loaded with active ingredients for controlled release applications. Uses: cancer research, stem cell research, drug discovery bioassays, cultured meat, 3D bioprinting and others.	
Appearance	Milky aqueous dispersion	Aqueous dispersion is at 1 mg/ml SpheroSeev.
Composition (material)	Pure protein	83 KDa protein with a proprietary sequence, conceptually derived from natural dragline spidersilk genes, the 1003 amino acid sequence predicts an amphipathic protein structure.
Composition (structure)	Porous biopolymer composed of nanofibrils	The protein molecules (83KDa) contain β-sheets, analyzed by FTIR, self-assemble into nanofibrils, which are further assembled into a porous biopolymer with a 15μm diameter coiled structure.
Dimensions	~ 15 μm	Coiled spherical porous structure
Chemical durability	Very high	Stable in 6 M Urea, SDS, 6 M Guanidine, HCl (pH 2), NaOH (pH 11), stable in organic solvents. Decomposed by high concentrations of harsh chaotropic agents such as Guanidine thiocyanate.
Stability	Stable following autoclave.	Autoclaved in water at 121 °C.
Thermal resistance	~ 220 °C	Decomposition peak at DSC at ~230°C and at ~300 °C.
Density	1.3 g/cm^3	According to protein density
Anti-radical activity	Anti-radical activity confirmed	DPPH test, with 18 μM SVX, 32% reduction in DPPH activity.
Storage	3-year guarantee at ambient conditions. Up to 1 year after opening at 4^{0}C	• No aggregation occurs during storage • Stable under shipping conditions.
Biocompatibility cellular cytotoxicity	*in vitro* not cytotoxic	• According to ISO-10993-5. • SpheroSeev biopolymer is non-GMO

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Protein amino acid sequence (in one letter code):

MSYYHHHHHHDYDIPTTENLYFQGAMDPEFKGLRRRAQLVRPLSNLDNASGPGGYGPGSQGPSGPGGYGPGGPGSSAAAAA
AAASGPGGYGPGSQGPSGPGGYGPGGPGSSAAAAAAAASGPGGYGPGSQGPSGPGGYGPGGPGSSAAAAAAAASGPGGYGPG
SQGPSGPGGYGPGGPGSSAAAAAAAASGPGGYGPGSQGPSGPGGYGPGGPGSSAAAAAAAASGPGGYGPGSQGPSGPGGYGP
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AASGPGGYGPGSQGPSGPGGYGPGGPGSSAAAAAAAASGPGGYGPGSQGPSGPGGYGPGGPGSSAAAAAAAASGPGGYGPGS
QGPSGPGGYGPGGPGSSAAAAAAAASGPGGYGPGSQGPSGPGGYGPGGPGSSAAAAAAAASGPGGYGPGSQGPSGPGGYGPG
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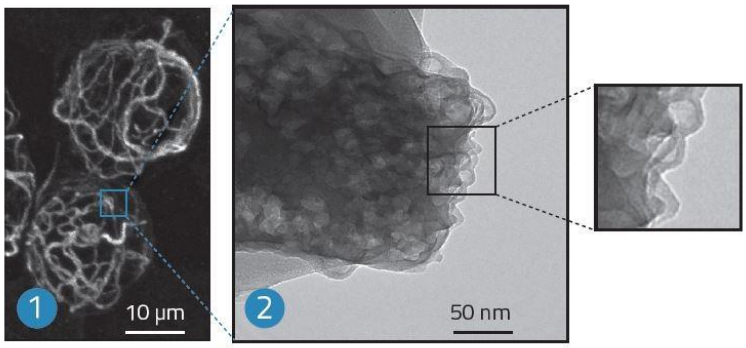
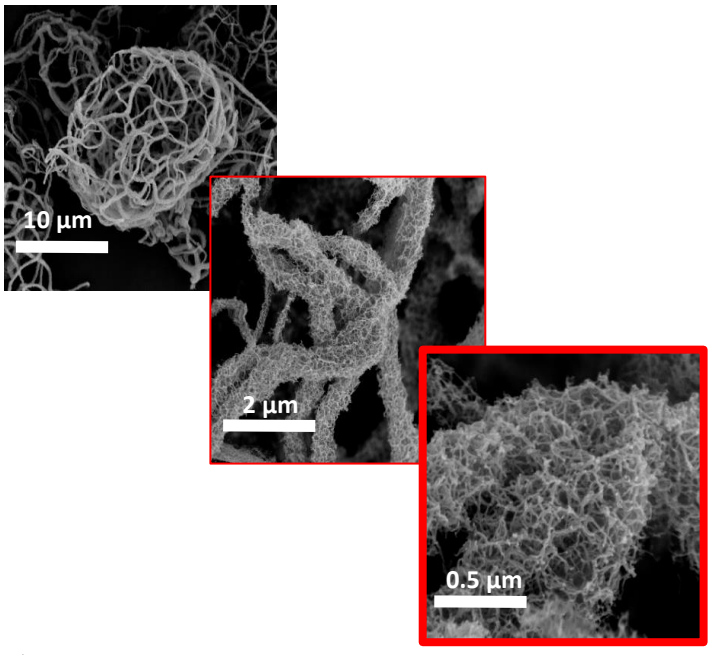
SASASVAASRLSSPAASSRVSSAVSSLVSSGPTNGAAVSGALNSLVSQISASNPGLSGCDALVQALLELVSALVAILSSASIGQVNV
SSVSQSTQMISQALS

(confirmed by AA analysis and MS-MS analysis - QA/QC)





Left:

1. *Confocal image of single stained SpheroSeev fiber.*
2. *TEM image of microfiber (middle) comprised of 10 nm nanofibers.*

Right:

SEM images of dried SVX particles in increasing resolution from top to bottom