

Supporting Information

Tuning Molecular Weights of *Bombyx mori* (*B. mori*) Silk Sericin to Modify Its Assembly Structures and Materials Formation

Mingying Yang,[†] Yajun Shuai,[†] Guanshan Zhou,[†] Namita Mandal,[†] Liangjun Zhu[†] and Chuanbin Mao^{*†}

[†]Institute of Applied Bioresource Research, College of Animal Science, Zhejiang University, Yuhangtang Road 866, Hangzhou, 310058, China

[†]Department of Chemistry & Biochemistry, Stephenson Life Sciences Research Center, University of Oklahoma, 101 Stephenson Parkway, Norman, Oklahoma 73019-5300, United States

E-mail: cbmao@ou.edu

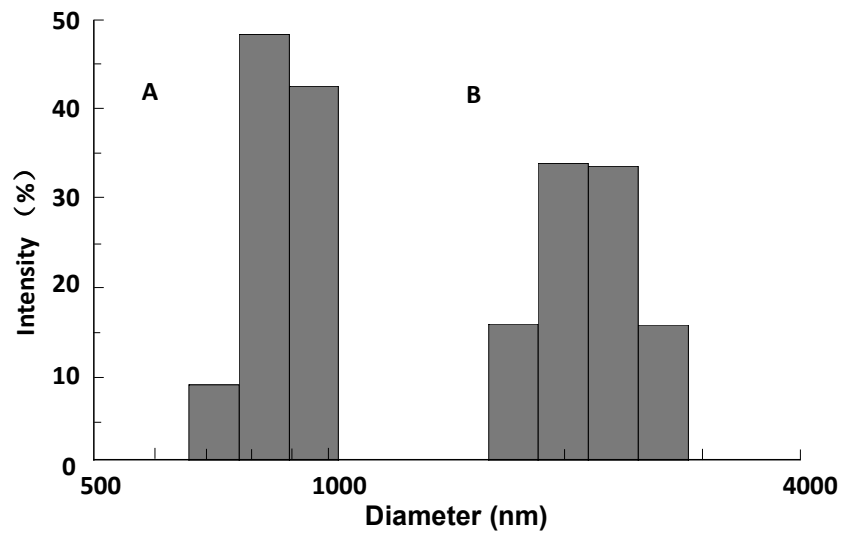


Figure S1. DLS data showing the size distribution of LS (A) and HS (B) in HFA solvent with the concentration of 1 mg/mL. The average diameter of LS and HS particles was about 870 nm and 2160 nm, respectively, indicating that the higher molecular weight resulted in the larger particles in HFA solution.

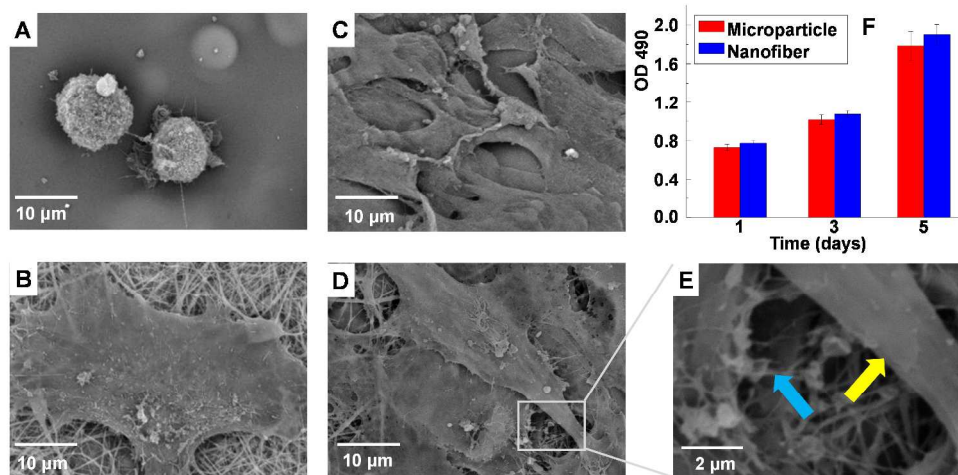


Figure S2. Morphology and proliferation of MG-63 cells on electrospun mats. Morphology of MG-63 cells on (A, C) microparticle mats and (B, D) nanofiber mats after cultured for (A, B) 1 day and (C, D) 5 days. The short pseudopods (Blue arrow) and bridge of cells (Yellow arrow) were observed among the elongated MG-63 cells, which adhered tightly on (E) nanofiber mats. Proliferation of MG-63 cells (F) on the electrospun mats was determined using MTS assay.

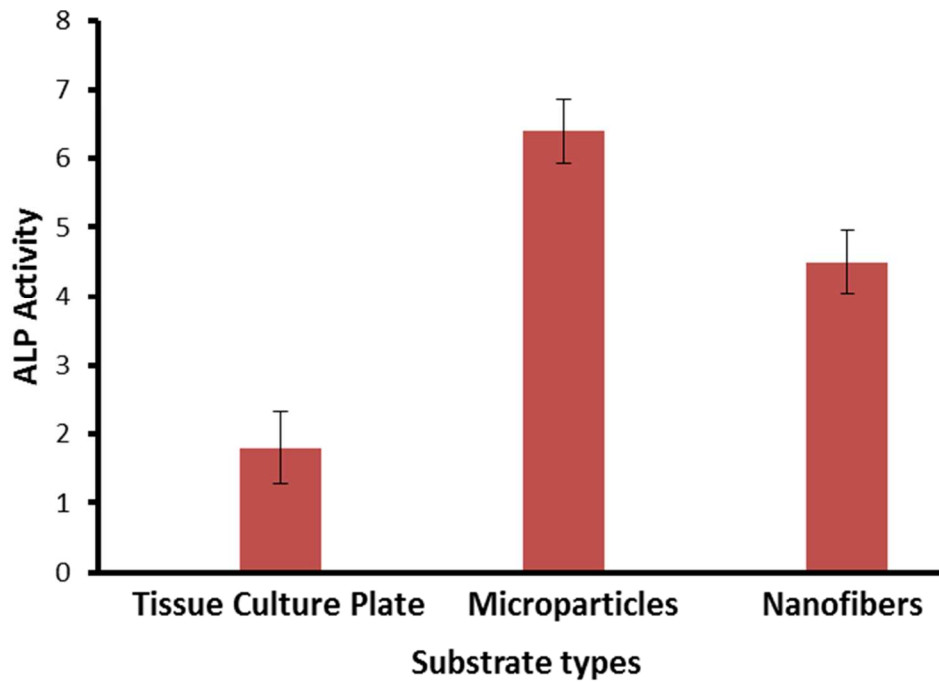


Figure S3. Assay of the enzymatic activity of the early osteogenic differentiation marker, alkaline phosphatase (ALP), showing that two forms of electrospun sericin (microparticles and nanofibers prepared from LS and HS with a concentration of 10 wt%, respectively) promoted the osteogenic differentiation of rat mesenchymal stem cells (MSCs) in comparison to the tissue culture plate. In addition, microparticles showed better capability in promoting the osteogenic differentiation of MSCs than the nanofibers.

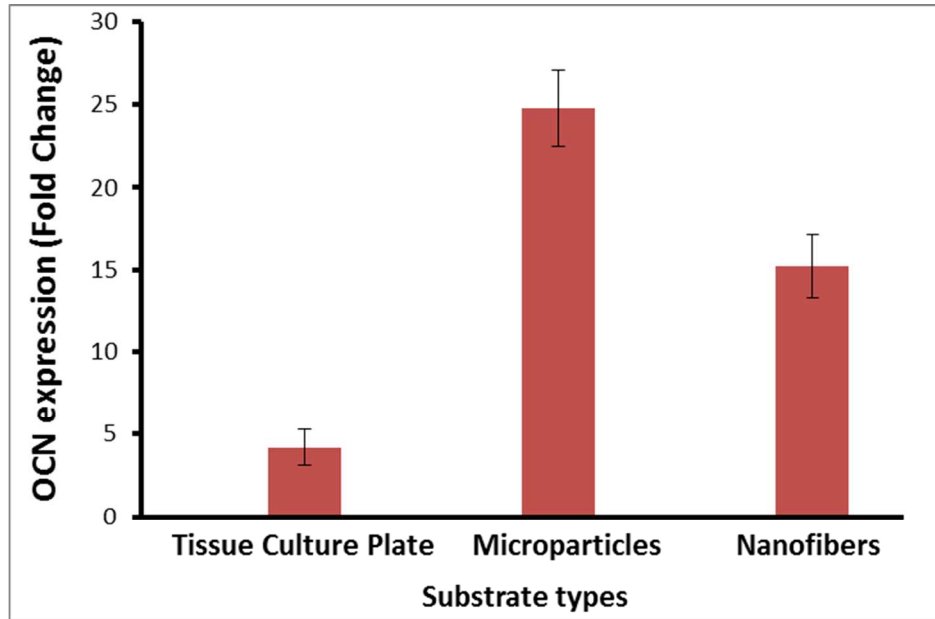


Figure S4. Real-time PCR analysis of the gene expression of the late osteogenic marker, osteocalcin (OCN), showing that two forms of electrospun sericin (microparticles and nanofibers prepared from LS and HS with a concentration of 10 wt%, respectively) promoted the osteogenic differentiation of rat mesenchymal stem cells (MSCs) in comparison to the tissue culture plate. In addition, microparticles showed better capability in promoting the osteogenic differentiation of MSCs than the nanofibers.

Table S1 The amino acid composition analysis of HS and LS

Amino acid	HS	LS	Amino acid	HS	LS
Ala	4.0	5.0	Val	3.2	3.7
Gly	14.5	15.2	Leu	1.0	0.6
Tyr	3.4	3.0	Ile	0.8	0.7
Ser	35.6	34.8	Phe	0.7	0.6
Asp	15.7	15.0	Pro	0.6	1.2
Arg	3.1	3.1	Thr	8.1	8.0
His	1.5	1.6	Met	0.2	0.1
Glu	4.7	4.5	Cys	0.2	0.2
Lys	2.7	2.7			

Each value was calculated as mol% of total amino acids.