

An Engineering Approach for the Enhanced Production of Native-sized Spider Silk Protein in  
*Escherichia coli*

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Naturally found spider silk, showing highly repeated structure and extreme size as well as strength, show attraction to many industrial applications. However, these characteristics hinder its expression in heterologous hosts by creation of extensive secondary structure from the repetitive sequences in mRNA, and the structures decrease ribosome processivity and facilitate mRNA degradation. Here, we present strategies to solve biological problems that occur using the naturally found protein, spider dragline silk protein: increasing available ribosome pool and stabilizing mRNA to stop degradation. Increased titer than those previously reported, was obtained, proving that the strategies used were efficient. [This work was supported by the Technology Development Program to Solve Climate Changes (systems metabolic engineering for biorefineries) (NRF-2012-C1AAA001-2012M1A2A2026556) and by the Intelligent Synthetic Biology Center of Global Frontier Project (2011-0031963) from the Ministry of Education, Science and Technology (MEST)]