

Assembly of native sized spider silk protein in *Escherichia coli*

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Naturally found spider silk and elastin protein attract attention. However, the structure and size of this protein limits expression in heterologous hosts, where the repetitive sequences in mRNA create secondary structures. And these structures decrease ribosome processivity and assist mRNA degradation. We solved these problems using metabolic engineering and increasing the particular tRNA pool, and native-size spider silk protein produced increased titer. The results provide insight into approaches to control expression of proteins containing high molecular weight and highly repetitive sequence. [This work was supported by the Technology Development Program to Solve Climate Changes on Systems Metabolic Engineering for Biorefineries (NRF-2012M1A2A2026556); the Intelligent Synthetic Biology Center through the Global Frontier Project (2011-0031963) of the Ministry of Education, Science and Technology (MEST) through the National Research Foundation of Korea]