Fig. 1 is a flow chart showing various embodiments for producing pure silk fibroin-based protein fragments (SPFs) of the present disclosure.

Fig. 2 is a flow chart showing various parameters that can be modified during the process of producing SPFs of the present disclosure during the extraction and the dissolution steps.

Fig. 3 is a photograph showing dry extracted silk fibroin.

Fig. 4 is a photograph showing an embodiment of a SPF in the form of a solution of the present disclosure.

Figs. 5A-5D are photographs showing dissolved silk in room temperature lithium bromide (LiBr) solutions dissolved in a 60°C oven for 4 hours (sericin extraction temperature and time were varied).

Figs. 6A-6D are photographs showing dissolved silk in room temperature LiBr solutions dissolved in a 60°C oven for 6 hours (sericin extraction temperature and time were varied).

Figs. 7A-7D are photographs showing dissolved silk in room temperature LiBr solutions dissolved in a 60°C oven for 8 hours (sericin extraction temperature and time were varied).

Figs. 8A-8D are photographs showing dissolved silk in room temperature LiBr solutions dissolved in a 60°C oven for 12 hours (sericin extraction temperature and time were varied).

Figs. 9A-9D are photographs showing dissolved silk in room temperature LiBr solutions dissolved in a 60°C oven for 24 hours (sericin extraction temperature and time were varied).

Figs. 10A-10~~C~~D are photographs showing dissolved silk in room temperature LiBr solutions dissolved in a 60°C oven for 168/192 hours (sericin extraction temperature and time were varied).