

# **Photoactivatable Hsp47: An optogenetic tool to regulate collagen assembly & tumor microenvironment**

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## **Abstract:**

Molecular chaperones are folding modulators that play a central role in the conformational quality control of the proteome by interacting with, stabilizing and remodeling a wide range of specific proteins or non-native polypeptides. In pathological conditions like cancer a class of molecular chaperones called Heat shock proteins (Hsp's) causes chaperonopathies. Hsp47, a 47 kDa endoplasmic reticulum-resident heat shock protein involved in collagen maturation and assembly, has recently been discovered to regulate the tumor microenvironment by promoting expression of factors responsible for tumor cell proliferation, invasion and angiogenesis. In this contribution, we present a optogenetic strategies for developing photoactivatable Hsp47, and demonstrate the possibility of photoregulation of collagen assembly & tumor microenvironment related implications in a controlled manner.