

Destroying amyloid proteins with lasers

January 7 2009

Researchers have found that a technique used to visualize amyloid fibers in the laboratory might have the potential to destroy them in the clinic. The technique involves zapping the fluorescently-tagged fibers with a laser, which can inhibit their growth and degrade them.

This study, appearing in this week's JBC, may offer a non-drug alternative to treat amyloid-based disorders like Alzheimer, Parkinson, and Huntington diseases.

Yuji Goto and colleagues had been studying amyloids, dense tangles of protein, to better understand how they form. In an effort to view amyloid formation under a microscope in real-time, they added an amyloid specific dye called thioflavin T (ThT) to the tangles and then hit it with a laser beam to induce fluorescence. Surprisingly, they found that under the right conditions, the laser could actually stop fiber growth and even degrade the amyloids.

Goto and colleagues believe the laser-excited ThT transfers some of its energy to nearby oxygen, resulting in active oxygen species that alters the surrounding protein fibers. These specific experiments focused on beta2-microglobulin, a major component of amyloids associated with dialysis-related amyloidosis (a condition that currently has no good treatment), though they believe a similar approach of light-induced decomposition should work for other types of protein amyloids.

Paper: "Destruction of Amyloid Fibrils of a β 2-Microglobulin Fragment by Laser Beam Irradiation" by Daisaku Ozawa, Hisashi Yagi, Tadato

Ban, Atsushi Kameda, Toru Kawakami, Hironobu Naiki, and Yuji Goto
www.jbc.org/cgi/content/full/284/2/1009

Source: American Society for Biochemistry and Molecular Biology

Citation: Destroying amyloid proteins with lasers (2009, January 7) retrieved 9 April 2024 from
<https://phys.org/news/2009-01-amyloid-proteins-lasers.html>

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