

Epigenetics of aging and cancer: from mechanisms to therapeutic targets

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Epigenetic mechanisms including DNA methylation and histone modifications are important regulators of chromatin structure and gene expression. Malfunction of these epigenetic mechanisms is a prominent hallmark in both the aging process and cancer. The fact that epigenetic aberrations can be potentially reversed, understanding these epigenetic mechanisms can offer new opportunities for therapeutic interventions or extension of healthy lifespan. During this presentation I will describe data, which identify the histone N-terminal acetyltransferase Naa40 as a novel epigenetic regulator of cellular aging. Specifically, I will show that loss of Naa40 activity towards histone H4 extends cellular lifespan by inducing cellular stress-response pathways in a manner that mimics the effect of calorie-restriction. In addition, I will show that in colon cancer cells Naa40 functions as an anti-apoptotic factor and will propose that this epigenetic enzyme should be considered as a therapeutic target.