УДК 61:615.1(043.2)
ББК 5:52.82
ISBN 978-985-21-0251-3

Seyed H. A.

APPLICATION OF MTOR INHIBITORS IN EXTENDING LONGEVITY

Scientific supervisor senior teacher Grigorovich V. V.
Department of Biology
Belarusian State Medical University, Minsk

Cellular aging is an essential biological process the understanding of which lights the prospect of significant increase in the duration of life.

One of the original hypotheses of organismal longevity posits that aging is the natural result of entropy on the cell, tissues and organs. We must understand which cellular programs are responsible for aging and how their dysregulation directs senescence and decline. Some mechanisms which are critical in determination of cellular causes and the cellular responses to aging are: chromosome and telomere regulation, autophagy, mitophagy and mitochondrial dysfunction, transcriptional regulation, protein translation, altered cell communication, stem cell exhaustion, deregulated nutrient sensing.

The purpose of this review is to analyze some valuable publications regarding ageing, and mark the most perspective directions for studies aimed to extend longevity with a more detailed look into the current available evidence that supports the idea that anabolic signaling accelerates aging and decreased nutrient signaling extends longevity.

Researches using chemical inducers of macroautophagy have suggested that administration of the mTOR inhibitors can increase the lifespan of some model organisms such as *Caenorhabditis elegans*, *Drosophila melanogaster*, *Saccharomyces cerevisiae*, *Mus musculus*. One of the first mTOR inhibitors used for such surveys was rapamycin. Although it significantly increased the life span of mice, the side effects of this drug make it not applicable for potential therapy of ageing in humans. Fortunately, a number of other substances is reported to inhibit mTOR signaling. The most perspective of compounds increasing the life span of model organisms are metformin (Cabreiro et al., 2013), caffeine (Lublin et al. 2011), resveratrol (Valenzano et al., 2006), α-ketoglutarate (Chin et al., 2014).

Conclusions. The mTOR inhibition is known to increase the life span of a number of model organisms. This data is the basis for prospects of extending the longevity of humans. However, further research is required to provide evidence for efficient and safe application of mTOR inhibitors on humans.