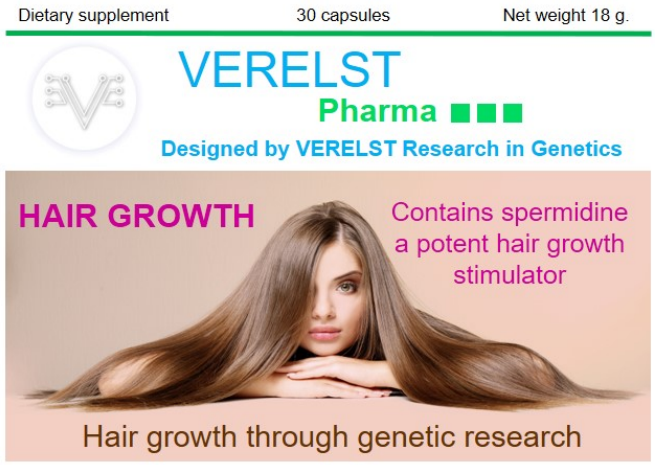
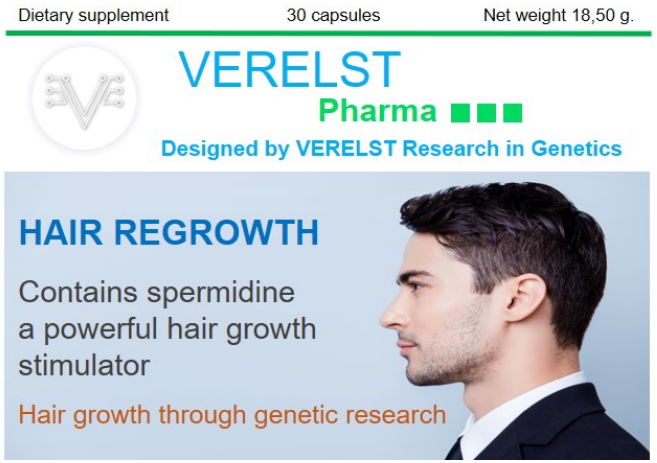
VERELST PHARMA
HAIR GROWTH





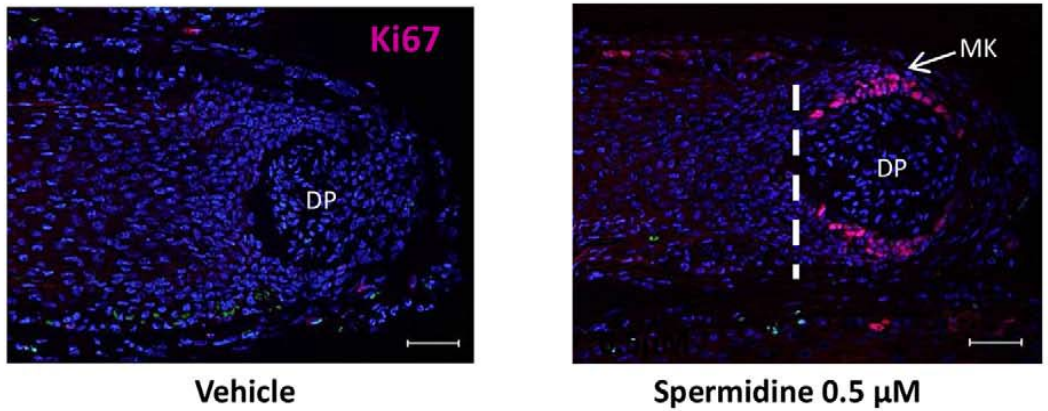
CLINICAL EVIDENCE THAT SUPPORT THE EFFECTIVENESS OF THE MAIN INGREDIENT:

Polyamines - Spermidine

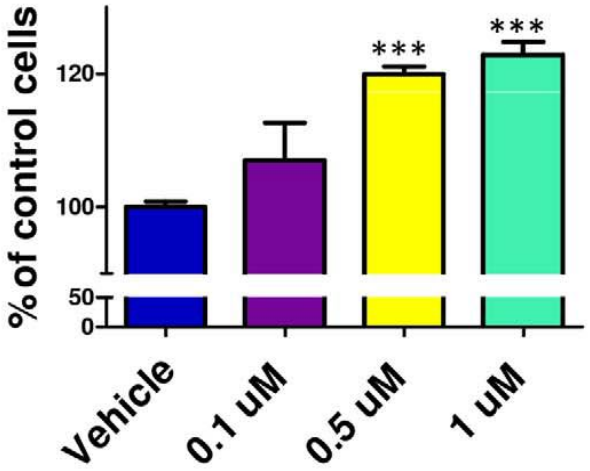
Spermidine increases hair shaft production

A concentration of spermidine 0.5µM was administered for 6 days to cultured cells from human scalp.

The treatment promoted the proliferation of primary epidermal keratinocytes, as revealed by fluorimetric assey.
(DP = dermal papilla, MK = matrix keratinocytes).



The effects was already observed after 2 days, and led to a more than 20 % increase in hair shaft production after 6 days.



Reference:
Ramot et al. Spermidine promoted human hair growth and is a novel modulator of human epithelial stem cell functions. PLOS ONE, July 2011, Vol 6, 7:1-12

A proposed biological mechanism through which spermidine has an anti-ageing effect

By looking at all laboratory experiments on human cells and molecular pathways that are modulated by spermidine, the reason why this molecule promotes longevity and cellular health can be explained by following model.

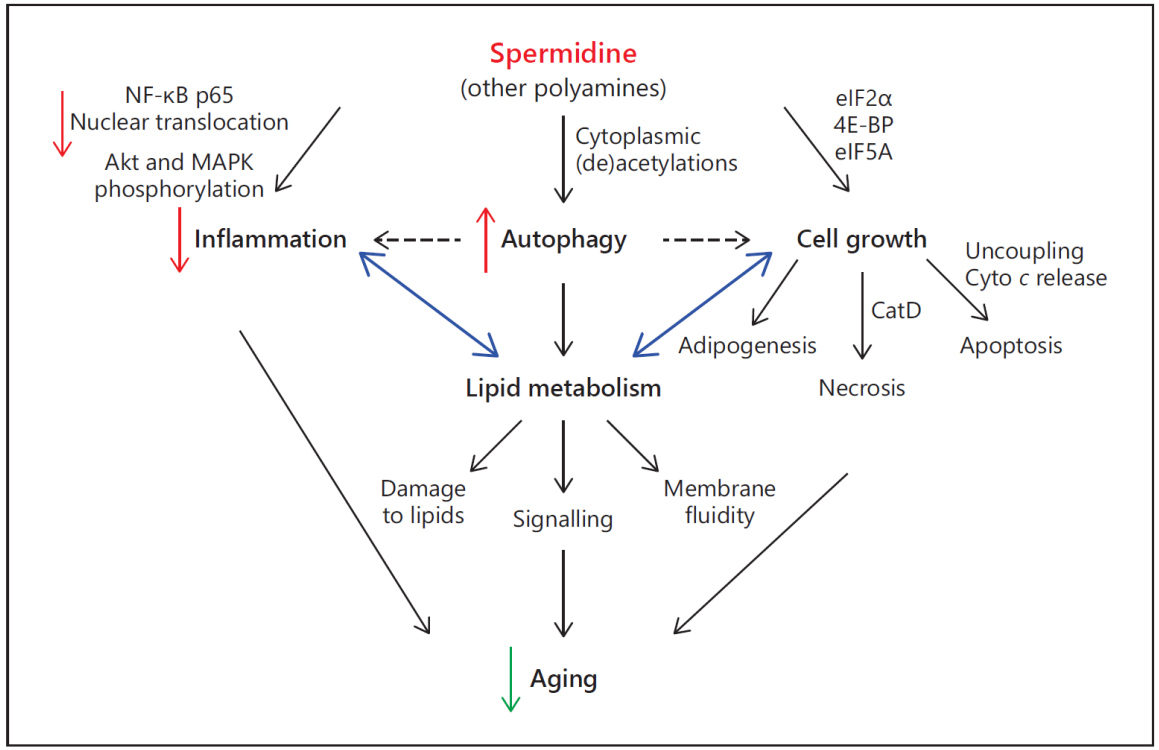
Spermidine acts through three different mechanisms on a molecular level:

1. It triggers the production of anti-inflammatory cytokines and decreases the production of pro-inflammatory cytokines. This way it **reduces chronic inflammation** which is a characteristic of ageing, also referred to as “inflammaging”.

2. It **promotes Autophagy**, which is the main recycling mechanism of the cell. It consists in the destruction and/or re-use of unneeded and damaged molecules and organelles. This keeps the cells healthy and avoids cell-death.

3. By **stimulating cell growth** it avoids cell-death. Our natural levels of spermidine decrease with age and the gradual loss of its effect results in cellular ageing.

The combination of these actions also result in a healthy lipid metabolism that maintains cell membrane fluidity, signalling pathways and avoids cell damage, which has a beneficial effect against ageing.



Reference:

Minois N. Molecular basis of the anti-aging effect of Spermidine and other natural polyamines – a mini-review. Gerontology 2014, 60: 319-326