

**food&health**

 **PhytoCellTec™  
Md Nu**

Apple cell culture extract  
for skin vitality



# PhytoCellTec™ Md Nu

## Biological Source



PhytoCellTec™ Md Nu is a powder preparation that is based on the cultivated fruit cells of a rare Swiss apple variety. Uttwiler Spätlauber is an edible endangered apple (*Malus domestica*) variety that is well-known for its excellent storability and therefore its longevity potential. Mibelle Biochemistry has developed a novel technology named PhytoCellTec™ (PCT) that enables the cultivation of rare and endangered species or varieties in suspension cultures. Those suspension cultures consist of dedifferentiated, totipotent cells, which are stem cells. After harvesting, the cells are then washed, extracted with 15% pure vegetable ethanol and homogenized in order to release the primary and secondary metabolites.

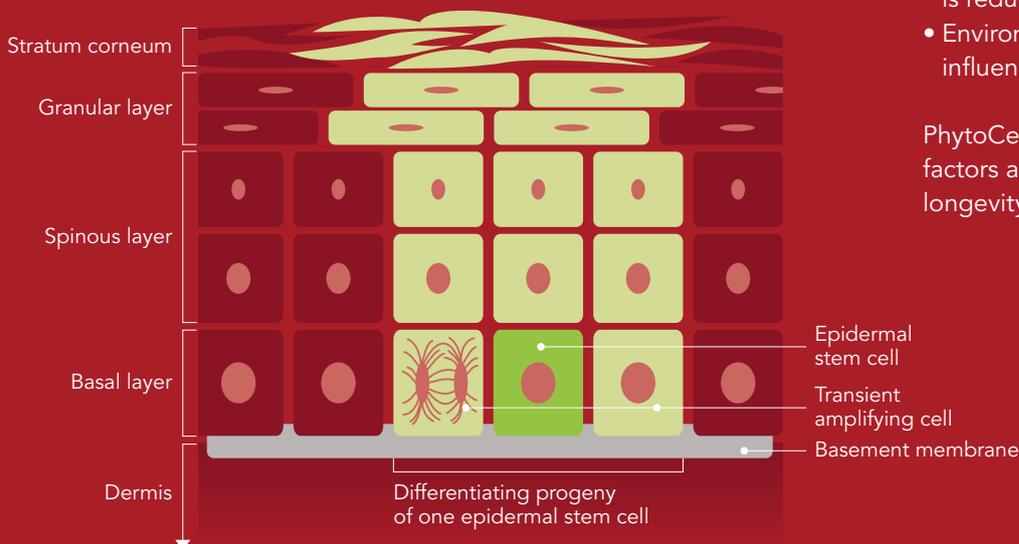
## Mode of Action: Skin Stem Cell Vitality and Aging



Mibelle Biochemistry has developed a novel anti-aging concept by using plant stem cell extracts to rejuvenate and vitalize human skin stem cells. Human stem cells perform various functions, such as self-renewal, differentiation and rejuvenation. Stem cell vitality is particularly influenced by aging processes and needs to be protected and supported if one is to delay preliminary aging:

- Stem cells have a limited life expectancy
- The number and activity of stem cells is reduced in aged tissues
- Environmental and intrinsic stress factors influence stem cell activity

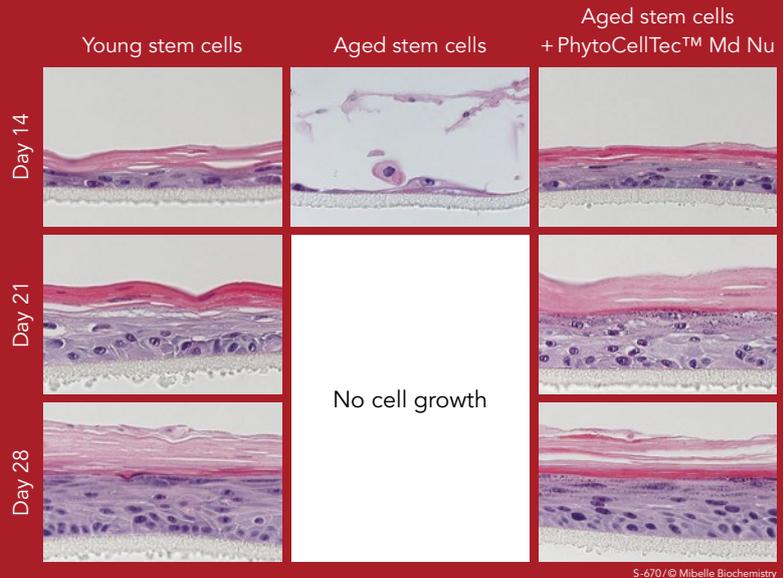
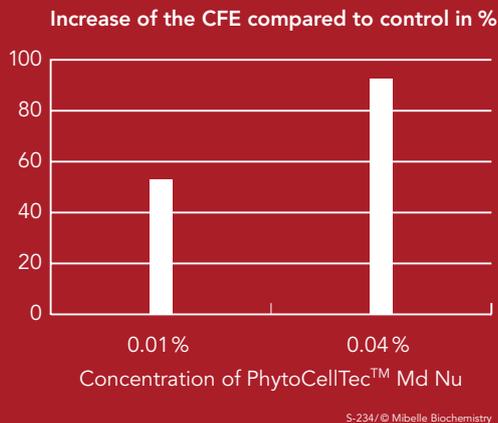
PhytoCellTec™ Md Nu is rich in epigenetic factors and metabolites, which assure the longevity of cells and protect skin stem cells.



# Bioassay Study Results



Skin stem cells have the characteristic of being able to form colonies *in vitro*. The number of colonies formed is a vitality marker of the progenitor/stem cells and is known as colony forming efficiency (CFE). Results showed that CFE was increased by 92% in the presence of 0.04% of PhytoCellTec™ Md Nu in comparison to untreated cells.



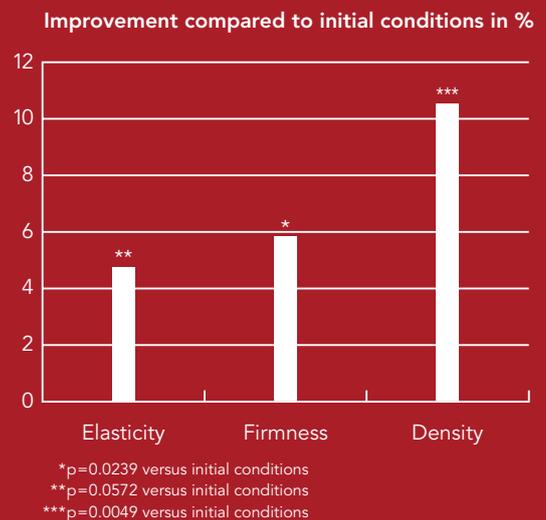
The impact of PhytoCellTec™ Md Nu treatment on aged skin stem cells was investigated using a 3D skin epidermis model, in which aged stem cells lost the capacity to form a 3D epidermis and build new tissues. Results showed that aged skin stem cells treated with PhytoCellTec™ Md Nu are able to form a 3D epidermis that is similar to young stem cells.

# Clinical Study Results



The effects of PhytoCellTec™ Md Nu on skin health were evaluated on a test panel that comprised 31 female volunteers with sun-damaged skin. 10mg of PhytoCellTec™ Md Nu was taken on a daily basis in the preferred drink of the volunteers over a period of 8 weeks. Skin test parameters were analyzed on the forearms at both the beginning and the end of the study.

- Skin firmness increased by 5.9%
- Skin elasticity increased by 4.7%
- Skin density increased by 10.5%





## Suitable Product Applications

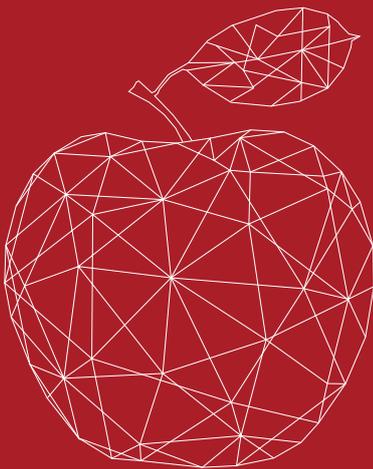
- Skin perfection
- Beauty from within
- Anti-Aging
- Improved vitality, well-being and quality of life

## Product Attributes

- Water-soluble powder suitable for dietary supplement and functional food applications
- Weak sweet taste and weak apple-like odor
- Recommended daily dosage of 10 mg

## Benefits

- PhytoCellTec™ Md Nu is a natural anti-aging ingredient that is prepared from the cultivated fruit stem cells of a rare Swiss apple variety and ultimately spray-granulated onto isomalt
- PhytoCellTec™ Md Nu increases skin stem cell vitality *in vitro*
- Clinically demonstrated improvement of skin density, elasticity and firmness
- Product safety was confirmed via a large number of toxicological models, which included a 90 day feeding study



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