

*Product for anti-oxidation, anti-inflammation, anti-wrinkle*

# SPEEDWELL



the garden of  
**naturalsolution**

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## PLANT STORY



*Veronica officinalis*, commonly called as speedwell, is a herbaceous perennial native to Europe. It is well-known for anti-inflammatory activity and used in herbal medicine for the treatment of eczema and wounds. In 19<sup>th</sup> century, speedwell has been used as a tea substitute in France where it was called “Europe tea” due to its bitter and astringent taste and tea-like smell. Speedwell is an extract of *V. officinalis* and shows anti-oxidant, anti-inflammatory and anti-wrinkle activities.

## RESEARCH PROJECT IN SCOTLAND



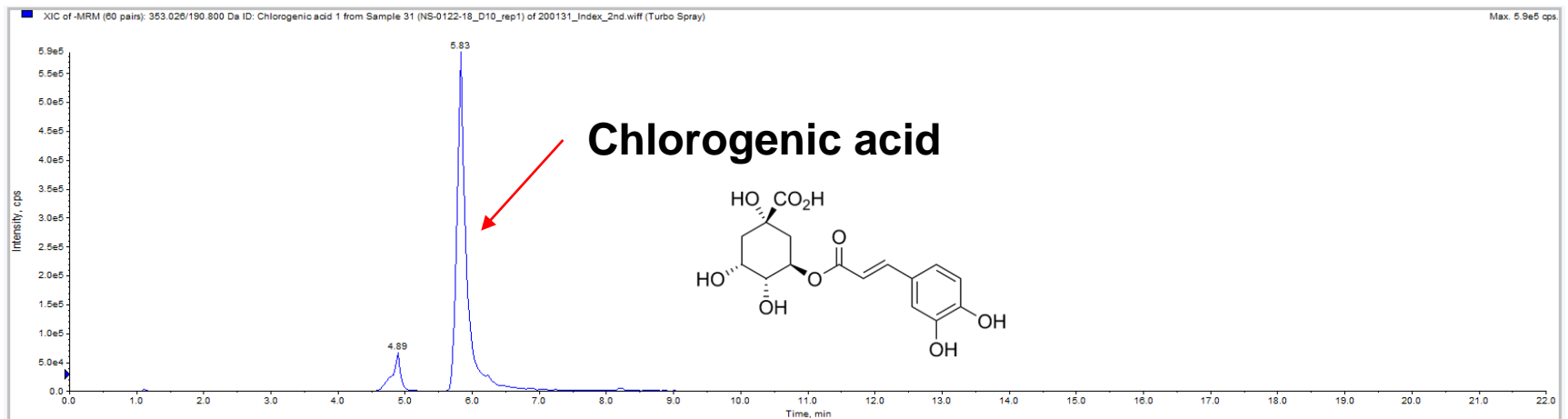
Royal  
Botanic Garden  
Edinburgh



The collaborative research project between Natural Solution and Royal Botanic Garden Edinburgh was started in 2012. The aim of the research is to develop novel ingredients for skincare products using Scottish plants.

The traditional medicinal use and modern knowledge of Scottish plants were surveyed followed by plant cultivation in Scotland as most of the plants in the research are not commercially available. Cultivated plants were then scientifically studied to find new efficacies and skin benefits.

# ACTIVE COMPOUND IDENTIFICATION: CHLOROGENIC ACID

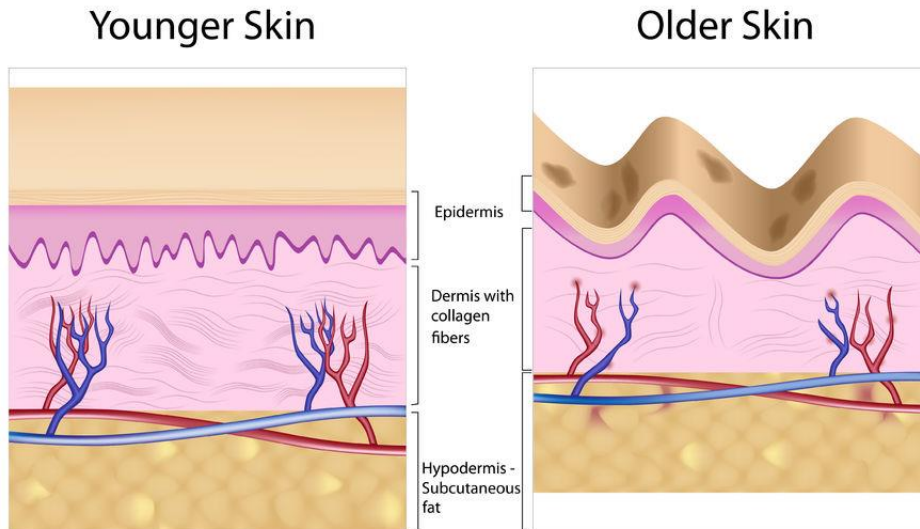


## **IN VITRO EFFICACY EVALUATION**

- 🌿 Anti-oxidant Efficacy
  - 🌿 DPPH Scavenging Activity
- 🌿 Anti-inflammatory Efficacy
  - 🌿 NO Synthesis Inhibition Activity
- 🌿 Anti-wrinkle Effect
  - 🌿 Collagen Synthesis Activity in Fibroblasts



# SKIN AGING AND WRINKLE FORMATION



Skin aging is noted by

- a decrease of elasticity
- formation of wrinkles and fine lines
- degradation of collagen
- thinner and weaker skin
- damaged connective tissues

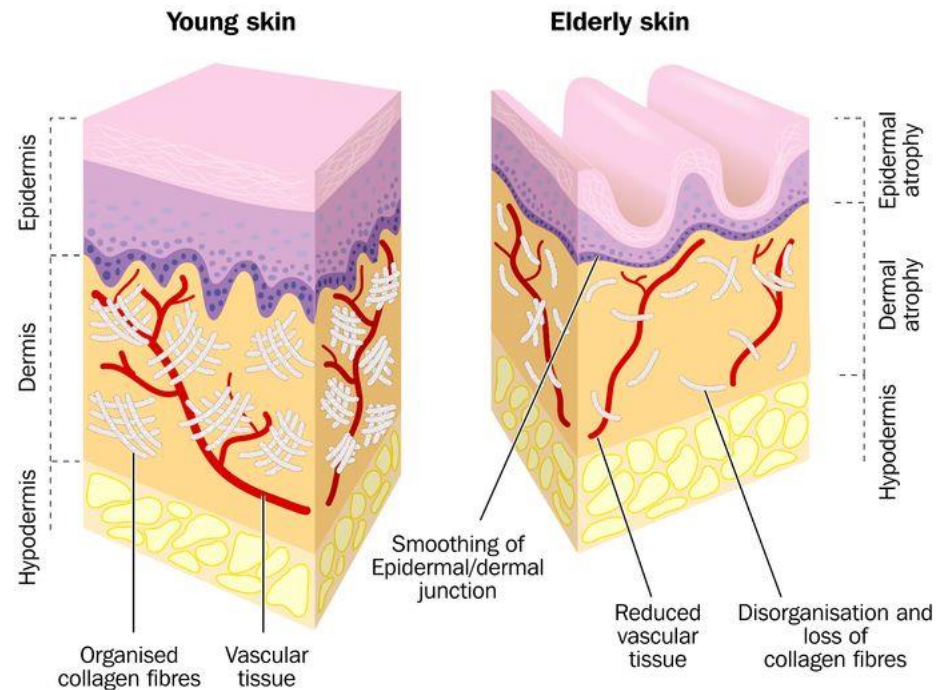
Skin changes with increasing age due to both intrinsic and extrinsic factors. Intrinsic skin aging is determined by genetic factors, hormonal status and metabolic reactions such as oxidative stress. One of the most important extrinsic skin aging is induced by UV radiation by sun exposure, referred to as *photoaging*. Smoking cigarettes and environmental pollution are also important factors in premature skin aging and wrinkle formation

# ANTI-WRINKLE MECHANISM

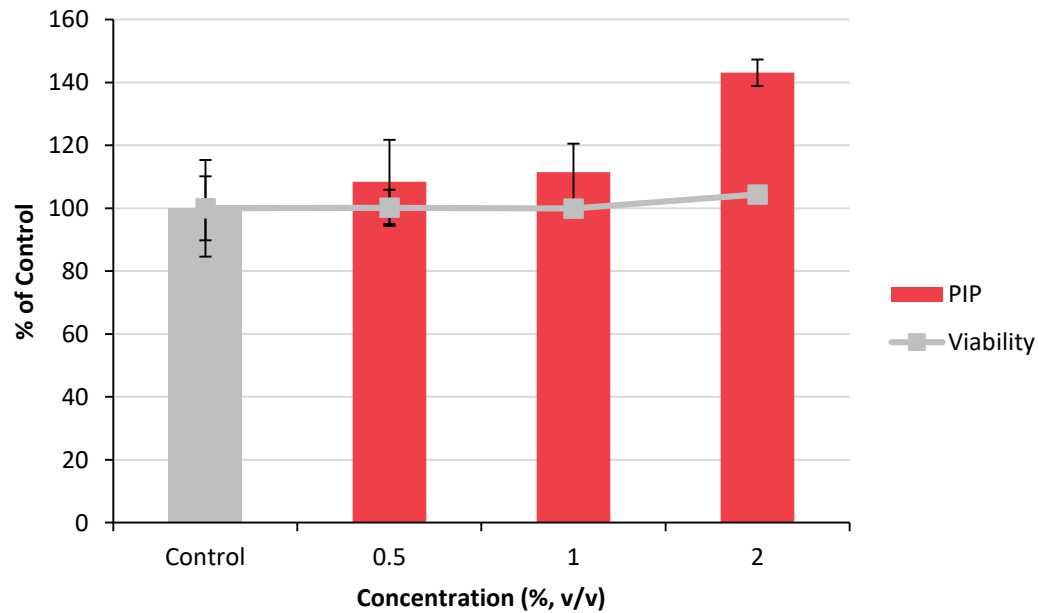
- 🌿 Boosting collagen synthesis
- 🌿 Inhibiting collagen degradation
- 🌿 Inhibiting elastin degradation
- 🌿 Increasing fibroblast proliferation



- 🌿 Preventing wrinkle formation
- 🌿 Increasing skin elasticity
- 🌿 Wrinkle improvement



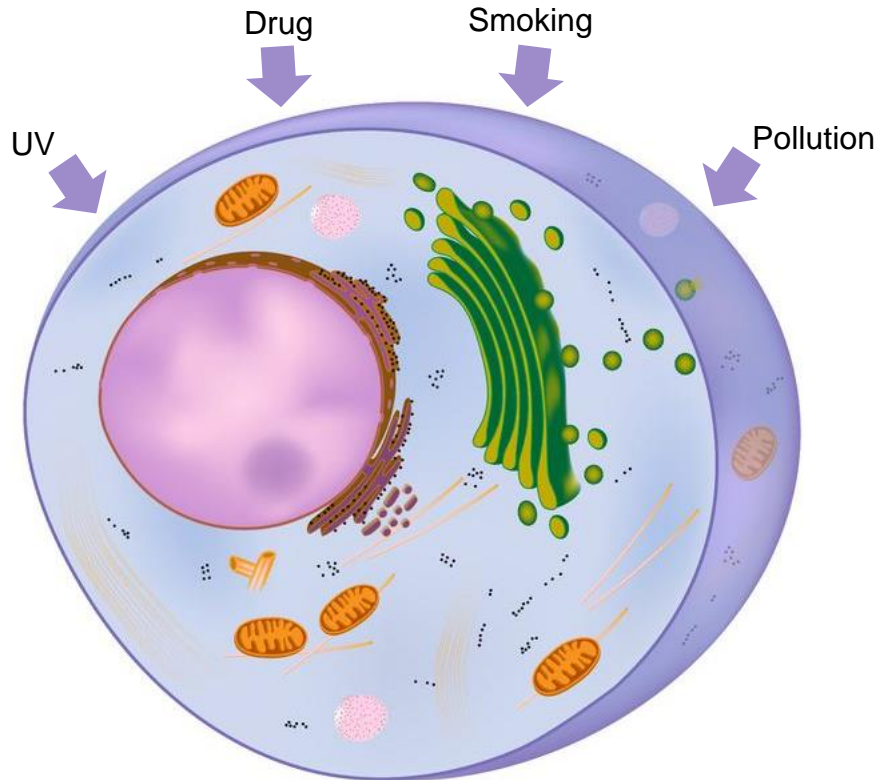
# IN VITRO EVALUATION: ANTI-WRINKLE - COLLAGEN SYNTHESIS ACTIVITY IN FIBROBLASTS





# OXIDATIVE STRESS

*Reactive Oxygen Species (ROS) can be increased by*

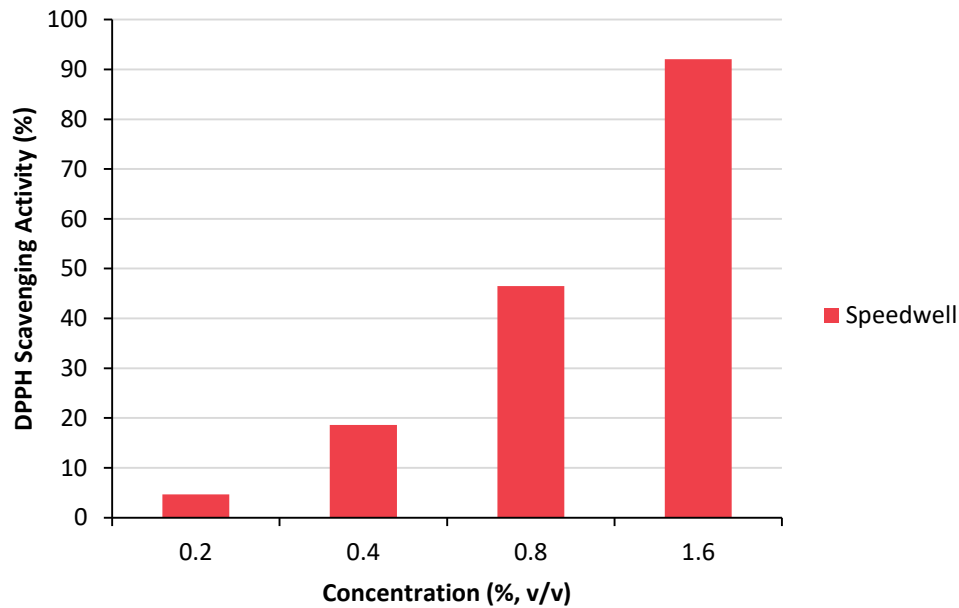


*Intracellular ROS may induce*

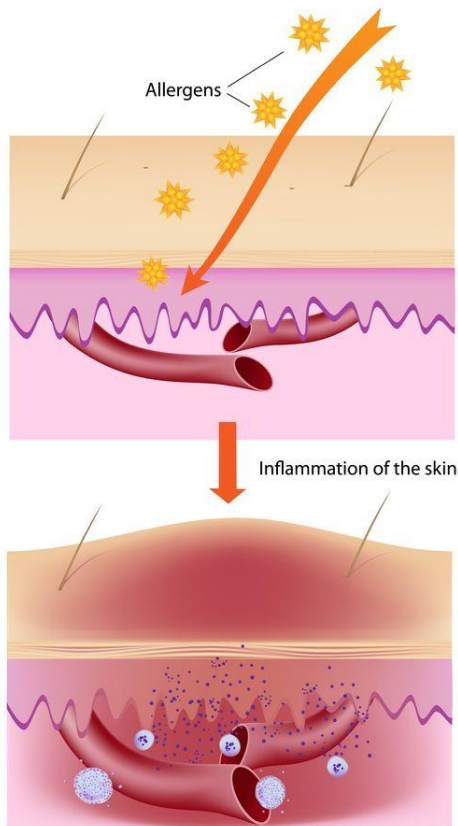
- ✦ DNA damage
- ✦ Lipid peroxidation
- ✦ Amino acid oxidation: protein damage
- ✦ Oxidation of co-factors: enzyme inactivation
- ✦ Chronic inflammation



# IN VITRO EVALUATION: ANTI-OXIDANT - DPPH SCAVENGING ACTIVITY

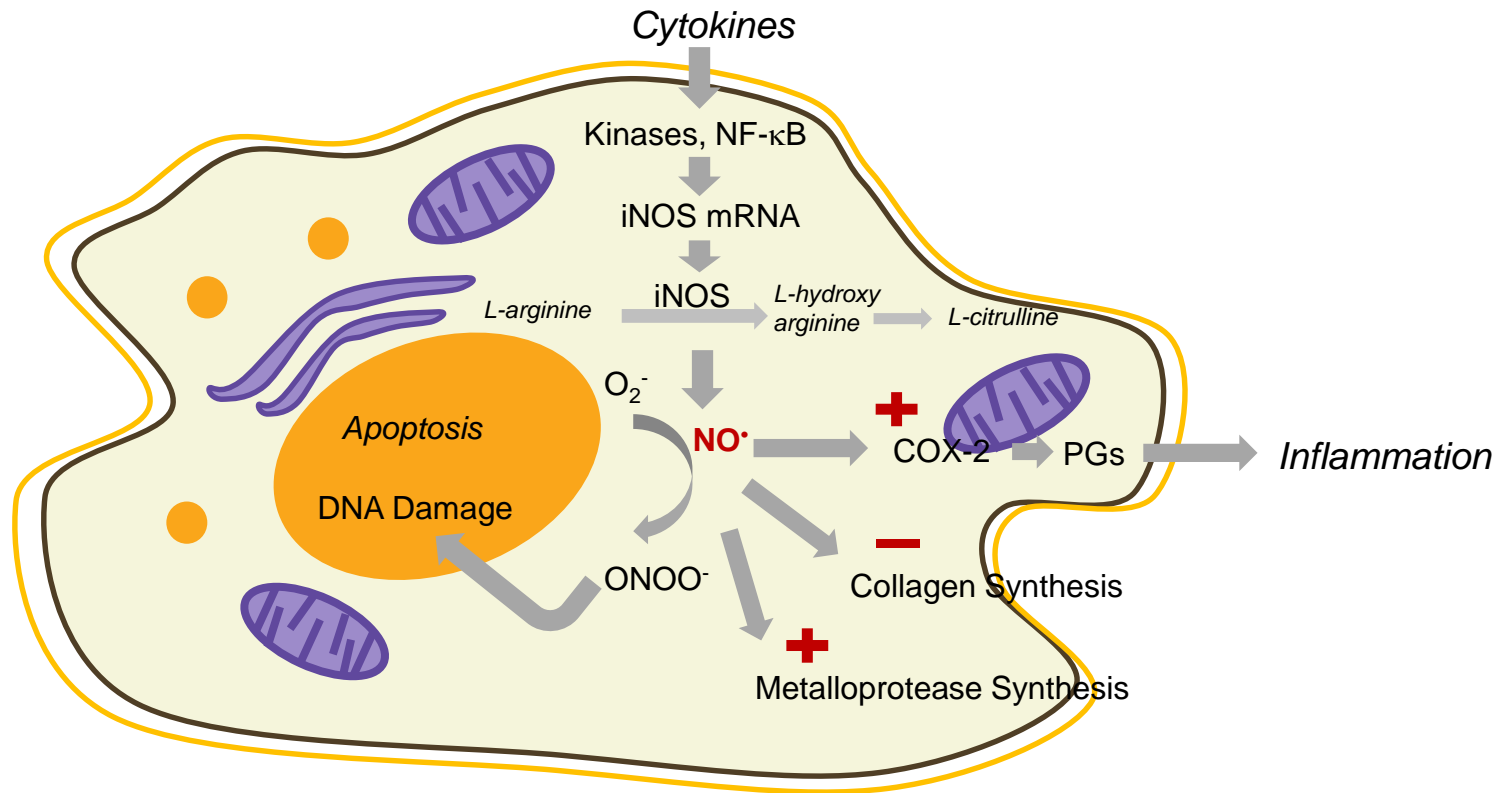


# WHAT IS INFLAMMATION?



Inflammation is part of the complex biological responses to wide range of harmful stimuli including injury, tissue necrosis, infection, and irritants. The purpose of inflammation is to destroy (or contain) the damaging agent, initiate repair processes and return the damaged tissue to useful function. The symptoms of inflammation are redness, swelling, heat, and pain, which are caused by increased blood flow into tissue. The immune system is responsible of protecting our body from the harmful stimuli and of maintaining homeostasis. Disorders of the immune system can result in autoimmune diseases, inflammatory diseases, and cancer. In an attempt to protect the body, the immune system might overreact to the stimuli, and this might cause allergy or inflammatory reactions.

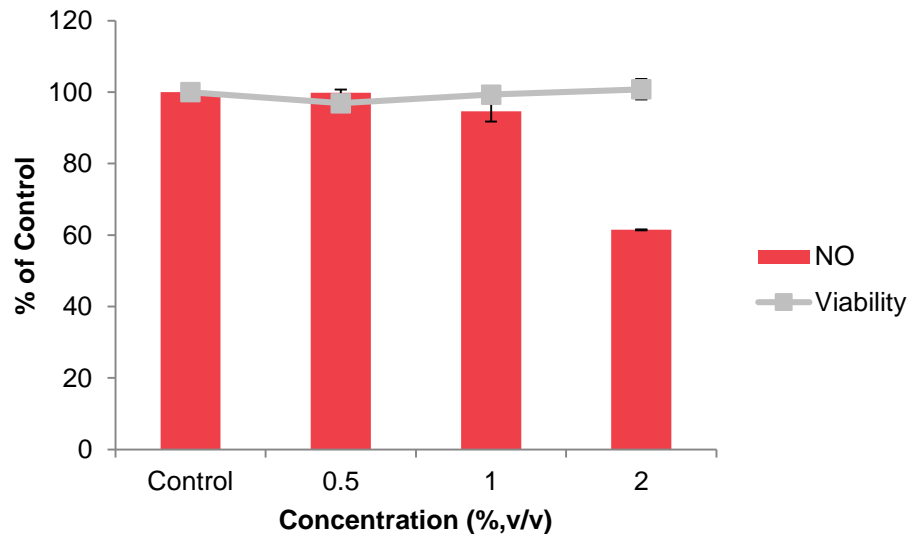
# INFLAMMATION MECHANISM



## IN VITRO EVALUATION: ANTI-INFLAMMATORY

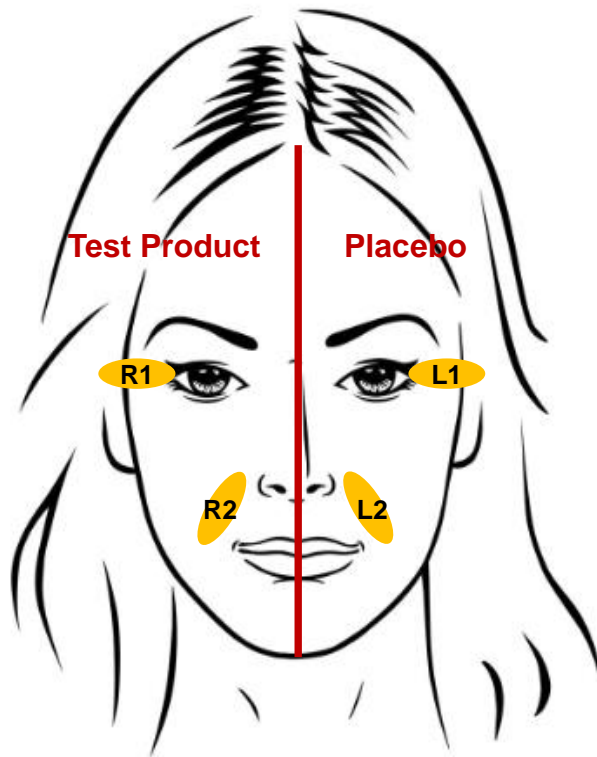
### Anti-inflammatory Effect

NO Synthesis Inhibition in Macrophages (RAW 264.7)



Nitric Oxide (NO) is a signaling molecule with immunomodulatory properties. Macrophages are important cells in inflammatory responses, and have been shown to produce NO through the inducible nitric oxide synthase (iNOS) pathway in response to inflammatory stimulus. The inhibition of expression or enzyme activity of iNOS have been shown to have anti-inflammatory effects. The anti-inflammatory activities of Speedwell were shown by measuring the levels of NO in macrophages.

## IN VIVO EVALUATION: ANTI-WRINKLE EFFECT



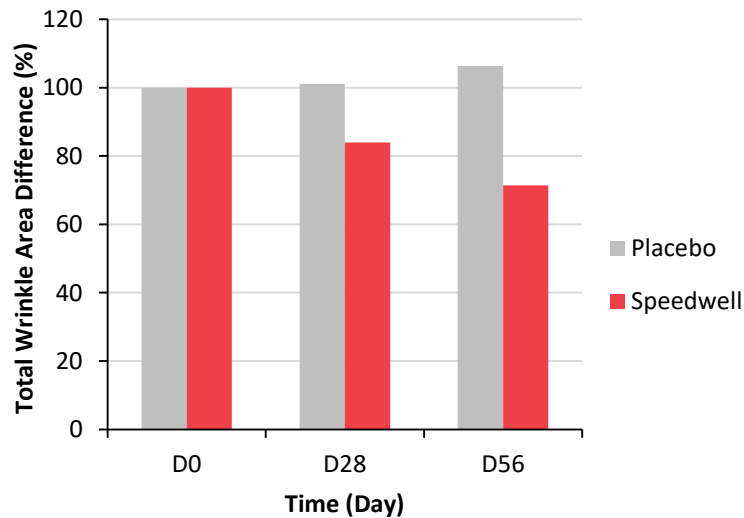
- Target site: R1, L1 - Canthus  
R2, L2 - Nasolabial folds
- Subjects: 18 females aged between 45 to 65 years old
- Test item: Cream with 2% Speedwell
- Application: Twice a day for 8 weeks
- Test instrument:
  - Wrinkle: SILFLO (CuDerm, USA),  
Visioline VL650 (CK Electronic GmbH, Germany)
- Dermatologist's evaluation (Scoring reference):



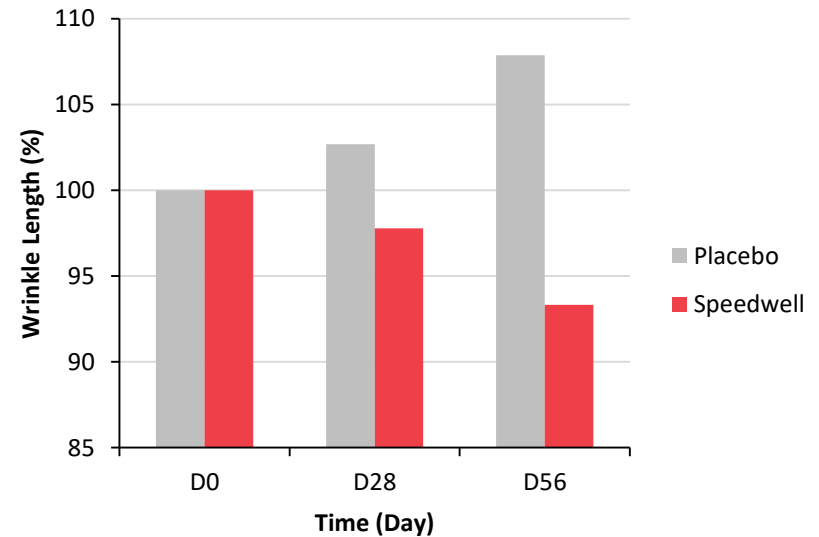
# IN VIVO EVALUATION: ANTI-WRINKLE EFFECT

18 female volunteers aged between 45 and 65 years old applied a cream containing 2% Speedwell twice a day to the eye contour area.

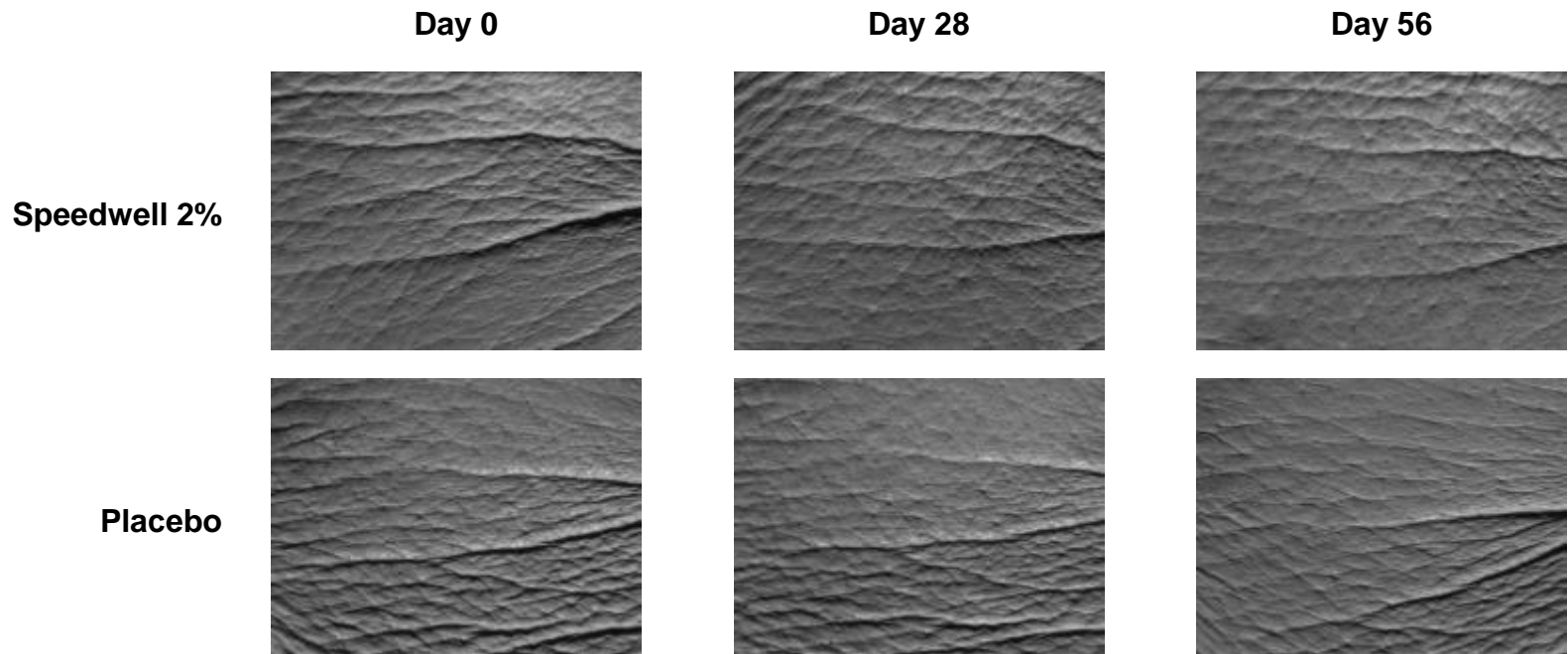
 **Total Wrinkle Area Difference**



 **Wrinkle Length**








# IN VIVO EVALUATION: ANTI-WRINKLE EFFECT - PHOTOGRAPH VISUALIZATION





## PRODUCT INFORMATION

-  **Product Name:** Speedwell(PD)-RSPO, Speedwell(GOL)-RSPO
-  **INCI Name:** Veronica Officinalis Extract
-  **Dosage:** 1 – 3%
-  **Formulation:** Add to the formulation when the temperature is lower than 55°C. Recommended to add after the cooling process.
-  **Storage:** Avoid direct light or UV. Keep it in a cool and dry area.

# The one who knows natural products

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Go with

***Natural Solution!***

*"We are always upgrading to serve you better"*

