

# / APPLIVER FIBROSIS



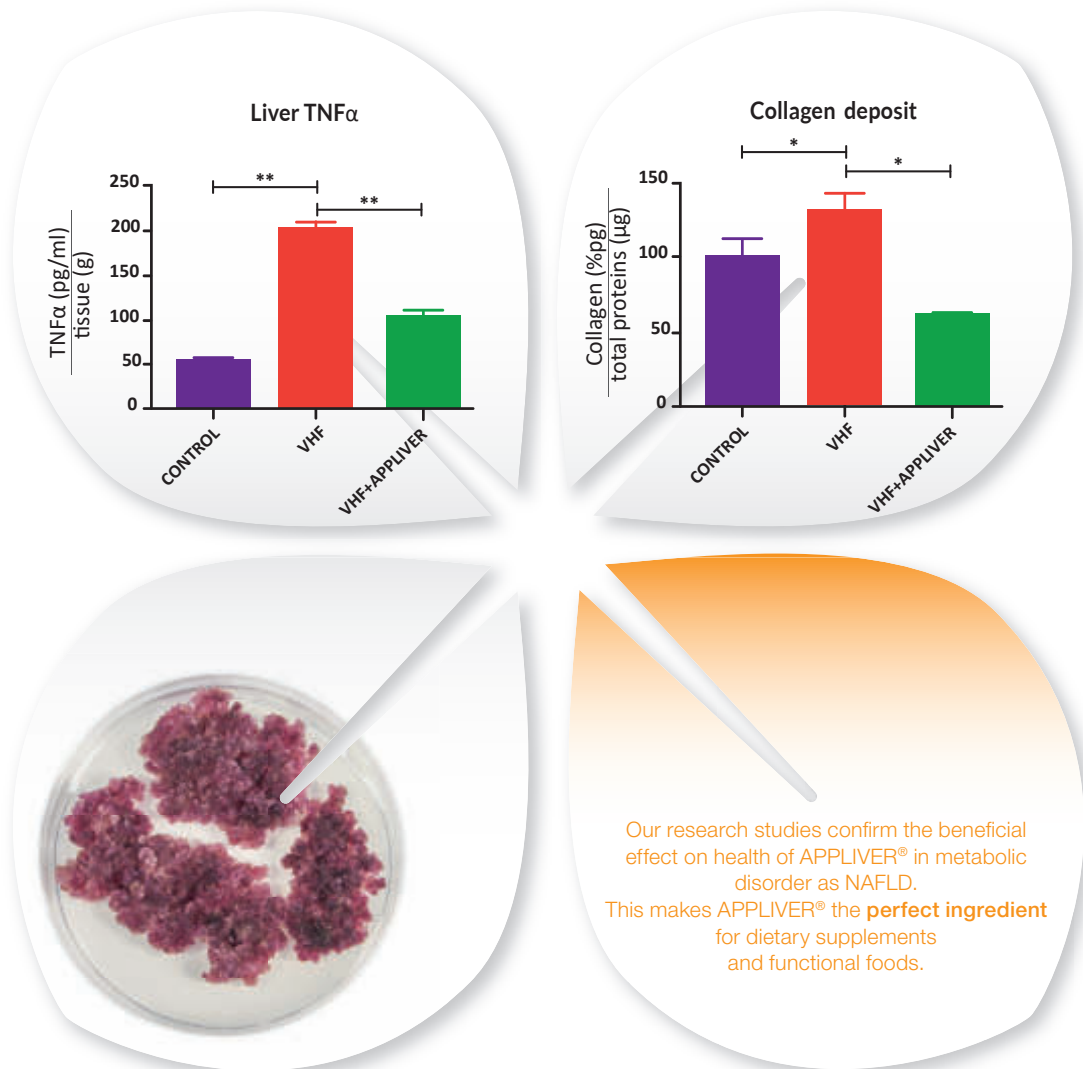
APPLIVER® is the new product obtained by the ABR innovative biotechnological platform NATRISE®. APPLIVER® is a freeze-drying quince stem cells compound obtained by plant cell culture, these stem cells are specifically coming from the fruit of *Cydonia oblonga* that is called quince. The quince is an **apple-shaped fruit**, with a delicious aroma and it is known for its exceptional health activities since ancient times.

Liver diseases are fast emerging as global health priorities. Prevalence of **Non-Alcoholic Fatty Liver Disease (NAFLD)** globally is 25.24% with wide geographical variation across the world and the public health importance of NAFLD arises from its impact on mortality and health care utilisation globally.

In collaboration with Fondazione Italiana Fegato Onlus and the Department of Molecular Medicine of the University of Padua we studied the effects of APPLIVER® on *in vitro* model of NAFLD: human hepatocytes (HuH7) and hepatic stellate cells (LX2) were exposed to free fatty acid alone or in combination with APPLIVER as mono- or co-culture. Non-alcoholic steatohepatitis is the progressive form of NAFLD characterized by steatosis and inflammation, that can evolve into cirrhosis and to a lesser extent to hepatocellular carcinoma. Cytokines are considered crucial players in inflammatory-associated disorders like NAFLD and are considered potential therapeutic targets.

In our study, the APPLIVER® treatment shows a significant decrease of the cytokines production as TNF- $\alpha$  both in serum and in liver tissue. The prominent production of fibrillar type 1 collagen is associated with extracellular matrix remodelling and liver fibrosis. When APPLIVER® is administered, the production of the collagen was decreased both on gene and protein level.

APPLIVER





# Inspired by nature... driven by biotechnology!

## Sustainable biotech ingredients, unique in the world

ABResearch (ABR), leader on the **plant stem cell culture biotechnology**, with its **ISO 9001, FSMA and GMP Food certified facility**, has been developing for many years its own industrial scale production platform, called **NATRISÉ®**, to extract secondary metabolites from plant cell culture for the pharmaceutical, the nutraceutical, and the nutricosmetic market. This innovative production process has many advantages over the conventional methods based on crops harvesting.

**NATRISÉ®** biotechnology is **totally sustainable**:



pesticide  
free



herbicide  
free



water  
saving



soil  
saving



Plant cell cultures platform **NATRISÉ®** ensures a high degree of quality and safety of the product, improves the duplicability and the standardization of the active ingredients, and allows a better planning and a more flexible production process.

Furthermore, the global warming phenomenon is changing season and more and more plants are becoming scarce and rare. For these reasons some of our customers have chosen **NATRISÉ®** platform with our skills and experience **to create their own proprietary plant cell line**.

The more soil allocated to crops for the herbal extraction industry we manage to clear, the more soil we give back to the cultivation of food for human consumption. The less water we use, the more water we give back to our communities. We do not have the ambition to save the world on our own, but we certainly strive to give our contribution.

With the **NATRISÉ®** brand, which will be made available free of charge to those who use ingredients made with ABR platform, we will make together the products easily recognisable by the general public and we will raise awareness of our aim to sustainability.

The human health and the environmental protection are our priority.

**Our skills  
and experience  
for your needs**

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