

# BIORICE

**BIOTECHNOLOGY for the recovery of valuable peptides from industrial RICE by-products and production of added value ingredients for nutraceuticals, functional foods and cosmetics**



[www.biorice.eu](http://www.biorice.eu)

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**Research and Technology Development Performer:** ALMA MATER STUDIORUM - University of Bologna, Italy; FRAUNHOFER UMSICHT Institute for Environmental, Safety and Energy Technology, Germany; STERLAB - Research and development for the health industry, France.

**Small and Medium Enterprises Participant:** PRINCIPIUM EUROPE S.R.L. - Beauty System and Innovations, Switzerland; AMIDERIA IL CERVO S.r.l. - Producing rice starch from Italian rice, Italy; CARMINIA SNC: consultancy company for food industry; FARCODERM FRANCE SAS - European Expertise Network dedicated to Wellness and Beauty, France.

**Start date:** 01 November 2013 - **Duration:** 24 months - **Budget:** Total costs: € 1.606.406,50 - Requested EC contribution: € 1.164.742,92

## ABSTRACT

The BIORICE project aims at filling the gap of knowledge of the involved SMEs on rice protein by-product pre-treatment, peptide isolation and relative bioactivity and safety testing. In particular, BIORICE research activities will produce added value bioactive ingredients (semi-purified digestates and small molecular weight peptides) starting from protein by-products contained in the processing water of the rice starch production stream.

The protein by-products will be pre-treated via biotechnological approaches (enzymatic proteolysis, microbial treatments) and different small molecular weight (< 15 kDa) peptides will be isolated by means of innovative eco-sustainable and not degrading techniques.

## OBJECTIVES

- Bioconvert into value added compounds the rice protein by-products present in the starch production processing water.
- Establish innovative, not disruptive, industry-driven and eco-sustainable protocols to purify and obtain new peptide ingredients.
- Establish a wide range of in vitro and cell-based tests to characterize the bioactivity and an innovative protocol to test safety of the new products.
- Open the possibility for all the involved SMEs to improve their competitiveness against direct competitors by accessing new markets throughout the introduction of innovative ingredients, obtained via biotechnological and natural processes, having new and/or improved bioactivity, and consequently increase their financial turnover and benefit.

## RTD

Plant biotechnology, downstream processing and human tissue engineering

Nutraceutical, food and cosmetic markets

## SMEs

## EXPECTED RESULTS

- Development of **processes to pre-treat** and convert industrial rice by-products in semi-purified digestates containing different proteins, peptides, aminoacids and the consequent active product deriving from this process.
- Development of **protein semi-purified digestates** derived from processes to pre-treat and convert industrial rice by-products.  
*The semi-purified digestates can have applications in baby-food recipes, as sport and elderly protein supplements, as flavours and in specialities for celiac people.*
- Development of a new **process for the production of new peptide ingredients** extracted from protein semi-purified digestates.
- Development of **new ingredients** containing a single small molecular weight peptide and/or a mixture of small peptides which will be characterized at sequence, bioactivity and safety level.  
*The new ingredients can have applications for nutraceutical/functional food and cosmetic formulations.*
- Development of **methodologies for evaluating *In vitro* the skin sensitization activity** and potency of chemicals and finished products based on the use of Langherans' cells in human reconstructed epidermis.  
*Fields of application: cosmetic, food, nutraceutical industry.*



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## SME

Small and Medium Enterprises



[www.principium-bsi.com](http://www.principium-bsi.com)



[www.farcoderm.com](http://www.farcoderm.com)



[www.amideriailcervo.it](http://www.amideriailcervo.it)



[www.carminia.it](http://www.carminia.it)

## RTD

Research and Technology Development



[www.unibo.it](http://www.unibo.it)



[www.umsicht.fraunhofer.de](http://www.umsicht.fraunhofer.de)



[www.sterlab.com](http://www.sterlab.com)