

The PRESTIGE project led to the identification of potential new active ingredients of plant origin with extraordinary antioxidant, detoxifying and oxygenating properties, exploiting the properties of "extremophilic" organisms. In fact, as part of the project, products derived from cultured tomato cells expressing enzymes derived from extremophilic bacteria, belonging to the 2 classes of SuperOxide Dismutase (SOD) and of AcylPEptide Hydrolase (APEH), were identified and developed for applications in the dermo-cosmetic sector, as well as in the nutraceutical and food sector for their unusual properties of resistance to extreme chemical-physical conditions.

Particularly,

- for the cosmetic-dermatological sector, the plant extracts containing the SOD enzyme of *D. radiodurans*, an enzyme resistant to prolonged exposure to UV rays, were developed;
- for the nutraceutical sector, tomato cell extracts containing the SOD of the extremophile *S. solfataricus* found application, thanks to resistance at very low pH such as stomach acid environment;
- for the food sector, in particular for the use of natural preservatives for human food, a tomato cell extract containing the SOD of the extremophile *A. pernix* was identified, thanks to its specific resistance at high salinity conditions;
- for the cosmetic-dermatological sector, the plant extract containing the APEH enzyme of the extremophile *A. pernix* has given promising results due to its ability to increase the natural turnover of the skin's collagen and to eliminate the aged (i.e. damaged) collagen, stimulating its new formation.

Finally, a further goal was to identify and study the characteristics of microalgal strains that can be used as probiotic ingredients in cosmetic products: the study allowed us to select potential strains that can be used for future product development studies.