COENZYME Q PRODUCTION BY METABOLIC ENGINEERED *ESCHERICHIA COLI* STRAINS

Irene Martínez, Pontificia Universidad Católica de Valparaíso, Chile
irene.martinez@pucv.cl
Nataly Maturana, Pontificia Universidad Católica de Valparaíso, Chile
Patricio Zelada, Pontificia Universidad Católica de Valparaíso, Chile
Alvaro Díaz-Barrera, Pontificia Universidad Católica de Valparaíso, Chile

Key Words: coenzyme Q, ubiquinone, *Escherichia coli*, metabolic engineering.

Coenzyme Q (CoQ) plays an important role as an electron transporter in the respiratory chain. It is formed from a benzoquinone ring and an isoprenoid chain of a specific length depending on the organism. CoQ10 has been used in the treatment of different diseases including Parkinsons, Alzheimer and cardiovascular diseases. In addition, it is used as a dietary supplement and in cosmetic applications due to its important antioxidant property. *Escherichia coli* produces CoQ8 naturally but it is able to produce CoQ10 when an heterologous decaprenyl synthase is expressed. *E. coli* is easy to culture and relatively easy to modify genetically which makes it suitable for the development of an industrial-scale process. In a previous work, we constructed strains unable to produce demethylmenaquinone (DMK) and menaquinone (MK), compounds that compete for both chorismate, precursor of the benzoquinone ring, and the isoprenoid chain. In addition, mutant strains unable to produce enterobactin, high affinity siderophore, synthesized from chorismate, were also constructed. These strains where designed as platforms for the generation of novel CoQ-producing strains. In the present work, the production of CoQ was assessed in the mentioned strains at several culture conditions including the use of different carbon sources (glucose, glycerol and succinate) and different culture strategies (batch and continuous) in a Lab-Scale Bioreactor.