Contribution ID: **153** Type: **Poster**

Study of tilapia's egg permeabilization with the optimized electrical parameters

Wednesday 24 May 2017 15:45 (15 minutes)

On the basis of electrical induction of eggs for sex reversal, the egg membrane exposed to a very short high-intensity electric field pulses can be temporarily permeable in specific regions of the egg. During the destabilization period, the membrane is highly permeable to exogeneous molecules present in the surrounding medium. Optimization of protocols has led to a situation where high egg viability can be combined with high percentages of egg permeabilization and hormone transfection. The present study achieved to have over 90% of eggs permeabilized with less than 5% egg death. Conditions traditionally used to achieve this are 1-5 square pulses of 50-1,000 micro-second duration using electric field strengths 0.25-87.50 kV/m. Some issues that might be concerned when performing in vitro electroporation were taken into account. Optimization for each egg clutch is necessary. A good result increases with homogeneity in egg size and conversely that for egg with very large variations in egg size. Eggs size of the semi-major axis of 1.5 mm and semi-minor axis 1.0 mm were selected for electrical inductions throughout this work.

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Session Classification: Poster Presentation I

Track Classification: Biological Physics and Biomedical Engineering