

Scientific Paper:

Sci. Rep. 5, 11956 (2015)

## **Assessing viability of extracorporeal preserved muscle transplants using external field stimulation: a novel tool to improve methods prolonging bridge-to-transplantation time**

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### **Abstract:**

Preventing ischemia-related cell damage is a priority when preserving tissue for transplantation. Perfusion protocols have been established for a variety of applications and proven to be superior to procedures used in clinical routine. Extracorporeal perfusion of muscle tissue though cumbersome is highly desirable since it is highly susceptible to ischemia-related damage. To show the efficacy of different perfusion protocols external field stimulation can be used to immediately visualize improvement or deterioration of the tissue during active and running perfusion protocols. This method has been used to show the superiority of extracorporeal perfusion using porcine *rectus abdominis* muscles perfused with heparinized saline solution. Perfused muscles showed statistically significant higher ability to exert force compared to nonperfused ones. These findings can be confirmed using Annexin V as marker for cell damage, perfusion of muscle tissue limits damage significantly compared to nonperfused tissue. The combination of extracorporeal perfusion and external field stimulation may improve organ conservation research.

Keywords: tissue transplantation, extracorporeal perfusion, external field stimulation, muscle tissue, apoptotic damage, oxygen consumption