

## Chitosan/poly-octanoic acid 2-thiophen-3-yl-ethyl ester blends as a scaffold to maintain myoblasts regeneration potential in vitro

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### Abstract

Satellite cells are a small cell population that function as muscle-specific adult stem cells. When muscle damage occurs, these cells are able to activate, proliferate, and ultimately fuse with each other in order to form new myofibers or fuse with existing ones. For tissue engineering applications, obtaining a sufficient number of myoblasts prior transplantation that maintains their regenerative capacity is critical. This can be obtained by in vitro expansion of autologous satellite cells. However, once plated, the self-renewal and regenerative capacity of myoblasts is rapidly lost, obtaining low yields per biopsy. For this purpose, we evaluated in vitro culture of the murine myoblast cell line C2C12 and mouse primary myoblasts with chitosan and chitosan/poly-octanoic acid 2-thiophen-3-yl-ethyl ester blends (poly(OTE)). The films of chitosan/poly(OTE) blends were heterogeneous and slightly rougher than chitosan and poly(OTE) films. Poly(OTE) presence improved myoblast adhesion in both cell types and prevented complete differentiation, but maintaining their differentiation potential in vitro. We identified that the polymer blend chitosan/poly(OTE) could be a suitable substrate to culture satellite cells/myoblasts in vitro preventing differentiation prior transplantation. © 2016 Wiley Periodicals, Inc. *J Biomed Mater Res Part A*: 105A: 118-130, 2017.

**Keywords:** C2C12 | Pax7 | chitosan | myoblasts | poly(OTE).

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