

Multiple cell types express myokines following intense resistance exercise

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Optimal repair of skeletal muscle following injury requires a significant and well orchestrated inflammatory response. The infiltration of leukocytes, and particularly monocytes/macrophages, in the hours/days following injury is a critical component in the repair of skeletal muscle (Chazaud *et al.*, 2009; Koh & Pizza, 2009). These cells are not only responsible for the clearance of cellular debris, but also the release of factors that help to control the myogenic program of stem cells (Chazaud *et al.*, 2009). While the appearance and functions of these cells have been widely investigated, the factors that are responsible for the recruitment and chemotaxis of leukocytes into skeletal muscle are still somewhat unknown. Our aim was to investigate the effect of a single bout of resistance exercise on the expression and localization of 2 major chemoattractive factors, monocyte chemoattractant protein 1 (MCP-1) and interleukin 8 (IL-8).

Eight young males (22.1±0.2yr) completed three sets of resistance exercise for the leg muscles (leg press, leg extension and squat). Two sets consisted of 8-12 repetitions at 80% 1-RM, whereas in the final set the subjects exercised until exhaustion. Muscle biopsies were obtained before exercise, and 2, 4 and 24 h after exercise. Expression of MCP-1 and IL-8 was analyzed *via* Multiplex analysis (protein) and PCR (gene). Immunohistochemistry was used to establish localization.

Large increases in both gene and protein expression of MCP-1 and IL-8 were evident 2 h following exercise completion, returning to resting levels by 24 h. Neither factor was prevalent within the cytoplasm of myofibres following exercise. MCP-1 was localized predominately to Pax7 and CD68 positive mononucleated cells, but not strictly confined to these cell types. The distribution of IL-8 immunoreactivity was different to that of MCP-1 and seemed to be in close proximity to collagen IV expressing cells.

Both MCP-1 and IL-8 have been identified as major regulators of muscle mediated leukocyte recruitment *in vitro* (Chazaud *et al.*, 2003; Peterson & Pizza, 2009). The present study indicated that both factors increased dramatically in response to a single bout of resistance exercise, which is in accordance with previous literature (Nieman *et al.*, 2004; Hubal *et al.*, 2008). The localization of these factors within a variety of cell types, and the contrasting pattern of expression, suggest a complex and multifaceted response occurs within the muscular microenvironment to regulate inflammation and muscular repair in response to resistance exercise.

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