

# Calcium signaling in insulin action on striated muscle

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© 2014 Elsevier Ltd. Striated muscles (skeletal and cardiac) are major physiological targets of insulin and this hormone triggers complex signaling pathways regulating cell growth and energy metabolism. Insulin increases glucose uptake into muscle cells by stimulating glucose transporter (GLUT4) translocation from intracellular compartments to the cell surface. The canonical insulin-triggered signaling cascade controlling this process is constituted by well-mapped tyrosine, lipid and serine/threonine phosphorylation reactions. In parallel to these signals, recent findings reveal insulin-dependent  $\text{Ca}^{2+}$  mobilization in skeletal muscle cells and cardiomyocytes. Specifically, insulin activates the sarco-endoplasmic reticulum (SER) channels that release  $\text{Ca}^{2+}$  into the cytosol i.e., the Ryanodine Receptor (RyR) and the inositol 1,4,5-triphosphate receptor (IP3R). In skeletal muscle cells, a rapid, insulin-triggered  $\text{Ca}^{2+}$  release occurs through RyR, that is brought about upon S-glutathionylation