S02-2 **Coordinated mechanism of cellular metabolism and inflammatory response in macrophage**

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Growing evidence has suggested that chronic inflammation is important for the pathogenesis of metabolic disorders and atherosclerosis. Among a variety of immune cells, macrophages play pivotal roles in the initiation and progression of those non-communicable diseases.

Recently we found that macrophages switch their cellular metabolism and functional phenotype throughout the course of inflammatory response. In response to inflammatory activation via Toll-like receptor (TLR4), macrophages rapidly activate glycolysis, increase inflammatory cytokine expression, acquire M1-like, pro-inflammatory phenotype. By contrast, macrophages increase unsaturated, anti-inflammatory fatty acid synthesis to show M2-like, anti-inflammatory phenotype in the late inflammatory response at 24 hours following TLR4 activation. This late program of anti-inflammatory fatty acid biosynthesis is dependent on SREBP1. Consistent with this, anti-inflammatory omega-3 fatty acids are decreased in *SREBP1*$^{-/-}$ macrophages, and systemic inflammation was prolonged in *SREBP1*$^{-/-}$ mice. These findings suggest the functional switch from M1-like to M2-like, and the metabolic switch from glycolysis to lipid metabolism is tightly linked and coordinately regulated during inflammatory response, that is important for proper inflammatory activation and resolution.

Collectively, macrophages have endogenous, temporal programs to switch their function by linking inflammatory signals, and cellular metabolism.