Adiponectin, Leptin and the Cardiometabolic Syndrome

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A number of different cell types contribute to the cellular architecture of fat tissue. While the fat cell is making important functional contributions to the systemic metabolic well-being, several additional cell types contribute a supportive role to bestow maximal flexibility on the tissue with respect to many biosynthetic and catabolic processes. The adipocyte has morphed into a cell type whose complexity we only start to appreciate. We now understand that: 1) the contributions of the adipocytes depend on their location, e.g. visceral vs. subcutaneous location. In fact, there are many more distinct fat pads in the body that act as “miniorgans” that play major roles in their local microenvironment; 2) we have different types of fat cells, some of them geared for energy storage (white adipocytes), some of them geared towards energy and heat generation (beige or brown adipocytes); under some physiological conditions, adipocytes can de-differentiate into (myo)fibroblasts and adipocyte precursor cells; 3) the ability to store excess calories and thereby acting as an anti-lipotoxic tissue is a key role for adipose tissue; 4) adipocytes produce hormones and other signaling molecules that integrate the systemic energy reserves and convey that to the brain and other organs; these adipokines should not be judged in isolation but rather be looked upon as a carefully orchestrated group of multiple different components that act in concert; Understanding the mutual influence of adipokines on each other is an essential part of understanding the endocrinology of the fat cell, but also helps us better understand their impact on the cardiometabolic syndrome.