Metabolic alterations in senescence: Mechanisms and opportunities for intervention

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Aging is a complex biological process in which only a few universal denominators of aging have been proposed across organisms. Deregulated metabolism is a well-described hallmark of aging. Decades of genetic research suggest that deregulated metabolism accelerates aging and that preventing such alterations extends healthy lifespan. Cellular senescence is another hallmark of aging; senescent cells accumulate in multiple tissues during aging in various mammals. Therapeutic removal of senescent cells ameliorates various age-related pathologies and extends healthy lifespan. Interestingly, senescent cells also undergo metabolic alterations similar to the deregulated metabolism observed during the aging process. Therefore, understanding how altered metabolism supports senescent status and identifying which altered activities are most relevant to the liabilities of senescent cells will open a tremendous therapeutic opportunity to treat senescence, age-related diseases, and aging. Here, I will discuss metabolic alterations in senescence and how we can leverage this information to target senescence for healthy aging.