

pH neutralization protects against reduction in replicative lifespan following chronological aging in yeast

Chronological and replicative aging have been studied in yeast as alternative paradigms for post-mitotic and mitotic aging, respectively. It has been known for more than a decade that cells of the S288C background aged chronologically in rich medium have reduced replicative lifespan relative to chronologically young cells. Here we report replication of this observation in the diploid BY4743 strain background. We further show that the reduction in replicative lifespan from chronological aging is accelerated when cells are chronologically aged under standard conditions in synthetic complete medium rather than rich medium. The loss of replicative potential with chronological age is attenuated by buffering the pH of the chronological aging medium to 6.0, an intervention that we have previously shown can extend chronological lifespan. These data demonstrate that extracellular acidification of the culture medium can cause intracellular damage in the chronological aging population that is asymmetrically segregated by the mother cell to limit subsequent replicative lifespan.