

Chapter 5: Eat Less, Live Longer: The Science of Hunger and Health

****Chapter Summary:****

In Chapter 5, titled "Eat Less, Live Longer? The Science of Hunger and Health," the narrative revolves around the discovery and potential benefits of rapamycin, a molecule with significant implications for longevity and health. The chapter begins with the author and three friends traveling to Easter Island, inspired by their quest to explore the origins and impacts of rapamycin, a substance named after the island's native name, Rapa Nui. Discovered in a soil sample by a Canadian team in 1964 and further investigated by Suren Sehgal in Montreal, rapamycin was found to have impressive antimicrobial properties and the potential to extend mammalian lifespan, a discovery that stemmed from its ability to inhibit a cellular growth pathway.

Rapamycin's journey from an antifungal agent to a landmark drug in transplant medicine and cancer treatment showcases its diverse applications, including its use in preventing organ rejection and as a coating for arterial stents. The focus then shifts to rapamycin's remarkable impact on aging and health. Experiments have shown that rapamycin can significantly extend the lifespan of mice, even when administered late in their lives, suggesting its potential as a longevity-enhancing drug. This discovery ties into broader themes of caloric restriction and its effects on health and lifespan, underlying mechanisms such as the mTOR pathway, and the implications for human health and aging.

David Sabatini's work on mTOR highlights the pathway's role in balancing growth and nutrient availability, shedding light on the genetic and molecular foundations of longevity. The chapter delves into the practice and principles of caloric restriction, tracing its historical roots and scientific validation as a method to extend lifespan in various species. Through personal anecdotes and scientific exploration, the chapter explores the complexities of translating these findings into human health benefits, addressing challenges and promising developments in using rapamycin and related compounds to delay aging and enhance healthspan.

Rapamycin's potential as a longevity drug underscores the need for further research, particularly in the context of its immune-modulating effects, which could redefine its applications for health, aging, and disease prevention in humans. The narrative concludes with the anticipation of ongoing and future studies that could illuminate rapamycin's role in promoting healthier, longer lives, highlighting the intersections of scientific discovery, medicine, and the quest for understanding the biology of aging.