

# Why Apoptosis of Necessary

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## Introduction

Cell death is a necessary aspect of proper growth and persists throughout adulthood. The human body is made up of roughly  $10^{14}$  cells. Every day, billions of cells die to ensure that the entire organism functions properly. Only because cell division and cell death are perfectly balanced does the body size remain constant. Eventually, the term apoptosis was coined to characterise the morphological processes that lead to controlled cellular self-destruction, and it was first used by Kerr, Wyllie, and Currie in a journal. Apoptosis is a Greek word that means “falling off or dropping off,” as in leaves falling from trees or petals falling from flowers. The death of living stuff is a fundamental and necessary element of the life cycle of organisms, as this comparison emphasises. The name was coined by John Kerr in 1972 and relates to a morphological trait of formation discovered more than a century before, in 1842. Over the last ten years, the number of papers on apoptosis has expanded dramatically, accounting for more than 2% of all papers published in the biological sciences. A chronology of cell death publications can be found. The revelation that many diseases include too much apoptosis (e.g., neuro, spinal muscular atrophy, AIDS) or too little apoptosis (e.g., cancer (either by virus infection or by DNA alterations such as p53 and Bcl-2) or autoimmune diseases) sparked a huge interest in apoptosis (diabetes type I, encephalomyelitis). Apoptosis can be triggered by a variety of poisons and other cellular stressors (e.g., oxidative stress, alcohol).

It is important to note that while apoptosis is a well-defined and possibly the most common type of programmed cell death, other, non-apoptotic types of cell death may also be biologically significant. Many findings have revealed that cell death plays a significant role during physiological processes of multicellular animals, particularly during embryogenesis and metamorphosis since the mid-nineteenth century. In 1964, the term “programmed cell death” was coined to suggest that cell death during development is not random, but rather follows a series of carefully orchestrated stages that lead to geographically and temporally determined self-destruction. Apoptosis is a 20-fold faster process than mitosis. As a result, *in vivo* sightings of dying cells are uncommon. Neighbouring cells engulf and disintegrate apoptotic cells without leaving a trace. A tidy balance between the growth (by differentiation from precursors and proliferation) and reduction (by further differentiation and cell death) in the number of a cell population must be maintained for cell homeostasis to be maintained. Apoptosis kills 50 billions-70 billion cells per day in the ordinary human adult. Between the ages of 8 and 14, an average youngster loses 20 billion to 30 billion cells per day. An 80-year old human would have 2 tonnes of bone marrow and lymph nodes, as well as a 16-kilometre-long stomach if mitosis continued without cell death. The apoptotic mode of cell death is a well-defined and dynamic mechanism that is crucial for the development of multicellular organisms as well as the regulation and maintenance of cell populations in tissues under healthy and pathological situations.

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