How Does the Human Body Eliminate Dead Cells?

The human body is a complicated system which operates much like a self-contained city. Some organs produce new cells, others use cells to perform their jobs, and eventually certain scavenger cells arrive to remove dead cells from the system. In the case of the human body, these scavengers are specialized white blood cells called *macrophages*. Macrophages remove dead cells essentially by eating them, which helps to explain why the word *macrophage* means "big eater" in Greek.

When external skin cells die, there are a number of mechanical and chemical methods used to slough them off. Exfoliants and scrub brushes are often employed to remove dead cells and encourage new cell turnover. But dead cells within the human body are not so easily removed. They go through a much more complicated elimination process, which is not always as efficient or thorough as one might hope.

A cell

Living cells become dead cells through two different processes. Many body cells are programmed to die at a prescribed time, through a process called *apoptosis*. Red blood cells, for example, are programmed to die after 120 days of service. Other cells, such as white blood cells, may be programmed to die an apoptotic death after only a few days. These dead cells may continue to flow through the body's bloodstream or collect in various organs, but they are clearly no longer contributing to the system.

Cells dividing

The other process for creating dead cells is called *necrosis*. Necrotic cell death usually occurs after a trauma or infection or other shock to the system. When cells become necrotic, they may be removed through surgery or other medical intervention, but often they enter the bloodstream in the same way as apoptic cells. The body cannot function well with an overabundance of dead cells, so macrophages take on the mission of breaking down the excess.

A macrophage cell can literally detect dead cells through smell, much like a scavenger bird detects dead animals. Whenever

Rebuild Batteries
Cell Transfection
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dead cells reach the part of the bloodstream patrolled by a macrophage, the macrophages surround them and convert them into easily removed components. At the same time, the macrophage covers the dead cells with a substance known as an antigen. This action tags the cells for further attack from other types of cells in the body's immune system. Ideally, the macrophages and killer T-cells should render both dead cells and foreign invaders harmless enough to re-enter the bloodstream for elimination.

When macrophages become overwhelmed, however, they may allow some dead cells to pass through unprocessed. The DNA from those cells may trigger an inflammatory reaction as the dead cells combine with other substances. This process is the basis for many autoimmune diseases such as Crohn's disease or lupus. Bolstering the body's macrophages is often a course of treatment recommended for autoimmune diseases and even some forms of cancer.

The dead cells are eventually eliminated in a number of ways. Macrophages and other immune system components have essentially digested the body's dead cells, parts of which may be reused. Material from dead cells also makes up part of the solid waste we call fecal matter.

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anon344695
Post 22

@anon21282: When cancer passes into the bloodstream, it is the main form of what is called "metastasis," or spreading of tumor cells from the primary tumor site to other sites via the bloodstream. It is thought that, most of the time, metastatic tumor cells actively break down barriers to the blood vessels in order to enter the bloodstream.

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anon303051
Post 20

@razmi: In cancer, certain genes are either activated or deactivated that cause the cell to be "immortal" so to speak. Normal cells apoptose at a certain point--cancer cells do not.

anon302216
Post 19

If a cell has a lifetime and is removed, why aren't cancer cells replaced and removed? --razmi

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anon268844
Post 16

What is the process to replace dead cells?

anon257961
Post 14

What organ breaks up or gets rid of dead red blood cells?

anon175818
Post 13

Almost all of the stem cells (not regular mature cells) in the body undergo mitosis,in normal conditions, to replace any worn out cells. Even the brain and the heart under go this process but they do it so slow that any brain or myocardial damage is irreversible. However, the GI track replaces its lumen every two or three days. the rate differs for every organ system

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anon165534
Post 12

'How does cancer "pass into the bloodstream"?'

> Cancerous cells pass into your bloodstream because of the blood flow through tissues.

anon151051
Post 11

> why would a unicellular organism survive on its own if a human wouldn't when removing a cell?

anon124525
Post 8

> I have a scar on my forehead that is raised. i pushed it until the skin broke and clear fluid drained from it and it flattened out. It has since healed over and it is raised again. The chemist told me that i have probably dead white skin cells under the skin and surgery is needed. any help much appreciated. thanks. --chris

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anon83623
Post 6

> thank you! really mind fulfilling, and knowledgeable. thanks.

anon60221
Post 5

> we were talking about cells in my science class and I asked my science teacher where dead cells went and this answered my question and now I can tell this to him. -thanks

anon44346
Post 3

> This is exactly the information that I was looking for, explained clearly and succinctly. Thank you! Too many of us don't know to ask this question, let alone find the answer. Understanding this process and exploring alternatives can be literally lifesaving.

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anon21282
Post 2

How does cancer "pass into the bloodstream"?

sgbfishman
Post 1

Very interesting article? I've wondered about this, but, not having a biology background, really had little clue. A set of questions that might be related to this one, and maybe someone can answer is...1) Do body cells reproduce by mitosis, as we learned in first-year biology class? 2) If so, does that account in part for the growth in size of children to adulthood? 3) and again, if so, why don't we keep on growing in size throughout our lives...do the cells stop dividing? Or does one out of each pair of new cells die? Or do only half of the cells of any given tissue reproduce, so as to replace a non-reproducing cell that dies? Or something else I hadn't even thought of?

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