Multidrug Resistance and the Immune System

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In cancer treatment, drug resistance occurs when cancer cells no longer respond to a drug. When this happens, patients will no longer benefit from that drug and have to switch to another treatment option. Unfortunately, once cancer cells become resistant to a chemotherapy drug, they are much more likely to also be resistant to many other chemotherapy drugs as well. This is known as multidrug resistance and is a major reason why chemotherapy treatment fails.

Over the past several decades, scientists have discovered many ways by which cancer cells become multidrug resistant. One way involves the protein known as multidrug resistance 1 (MDR1). MDR1 is a protein normally found in some healthy human cells. It has two major roles. It can prevent some drugs from entering cells and can also transport drugs out of cells. Both of these activities lower the amount of drugs found inside those cells, protecting the cells from the effects of the drugs. Some cancer cells make too much MDR1. This prevents chemotherapy drugs from building up inside cancer cells and prevents the death of the cancer cells.

To combat MDR1's role in cancer treatment resistance, scientists have created drugs that prevent cells from making too much MDR1. These are known as MDR1 inhibitors. A recent study using mice has revealed that MDR inhibitors may have their own problems. The MDR1 inhibitors were shown to hurt the activity of immune cells known as CD8 T cells. CD8 T cells have important roles in fighting infection and killing cancer cells. The study found that MDR1 inhibitors block the early stages of CD8 T cell responses to infections as well as long-term immunity. These findings further our understanding of the immune system and point to safety considerations for the use of MDR1 inhibitors in cancer patients.

Source
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