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Scientists Unlocking the Mystery of How Our Immune System Works

Written by Chuck Green | Published on May 28, 2015



U.K. researchers say immune cells are reacting to ancient biology when they respond to damaged parts of our body.



It seems some of the mystery has been taken out of how immune cells detect wounded or damaged parts of our bodies.

New research, led by University of Bristol academics in collaboration with a team from the University of Sheffield, has identified the triggers that lead these cells to respond when repairing damage.

Using the common fruit fly and time-lapse microscopy, the team led by Will Wood, Ph.D., professor of developmental biology in Bristol's School of Cellular and Molecular Medicine, studied the process and identified why the cells migrate to damaged sites and why they then detect and ingest debris as well as dying cells and invading pathogens.

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Immune Cells Are Part of Ancient Biology

The results suggest that adaptive immune signaling pathways appear to have evolved from a more ancient response designed to help animals distinguish between “damaged self” and “healthy self.”

“We tried to understand how immune cells respond to wounds, which they do every time you get a scratch or a large, nasty wound. An immune response is raised and that triggers an inflammatory response,” said Wood. “That's what we're looking at. How those immune systems detect early damage signals that come from any wound you make.”

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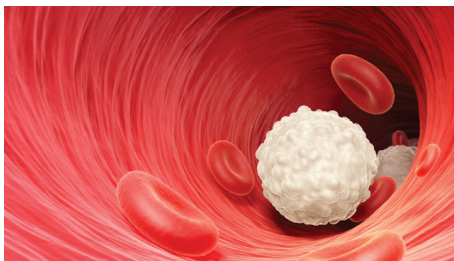
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The hope is the findings, published in [Current Biology](#), could help scientists design therapies to manipulate the cell repair process and direct immune cells away from sites like tumors where they're doing damage and send them to places where they're needed or force them to disperse so they're no longer playing an inflammatory role, explained Wood.



“While inflammation is critical to prevent infection, too much of a response by immune cells can cause or worsen a wide range of human diseases and conditions including autoimmunity, atherosclerosis, and chronic inflammation,” he noted.

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Previous studies had found that hydrogen peroxide is the earliest signal emitted from a wound site.

However, how immune cells detect this chemical and what signaling occurs in these cells downstream to power their rapid migration is unclear, he explained.

“This research is therefore critical for improving human health because it enables us to discover novel points of intervention to manipulate immune cell behavior and allows us to design therapies to direct immune cells away from sites where they are harming the body,” said Wood.

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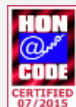
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