MedicalXpress

# Previously unknown immune cell may help those with Crohn's and colitis

November 3 2008

The tonsils and lymphoid tissues in the intestinal tract that help protect the body from external pathogens are the home base of a rare immune cell newly identified by researchers at Washington University School of Medicine in St. Louis. The researchers indicate that the immune cells could have a therapeutic role in inflammatory bowel diseases (IBD) such as Crohn's disease and ulcerative colitis.

Their report will appear in an upcoming issue of the journal *Nature* and is currently available through advanced online publication.

"These cells have an anti-inflammatory effect," says the article's lead author Marina Cella, M.D., research associate professor of pathology and immunology. "In the gut, we have beneficial bacteria, and it's important that the body does not recognize them as something detrimental and start an inflammatory reaction, which could ultimately promote tissue damage and inflammatory or autoimmune diseases such as IBD. The cells we've discovered are important for keeping such harmful inflammatory processes in check."

The cells are a type of natural killer (NK) cells, which are white blood cells classically known to eliminate tumor cells and cells infected by viruses. Because of their killer tendencies, NK cells are carefully controlled and don't act until they receive the right signal.

Some of the signals that activate the newly discovered cells are the same signals that turn on a different immune cell with strong inflammatory

properties that can promote cell death and tissue damage if chronically active. But the anti-inflammatory cells, termed NK-22 cells, that the Washington University researchers discovered have the opposite effect — they promote cell proliferation and wound healing.

"That finding suggests that these cells play a role in maintaining a balance in the immune system between inflammatory processes and anti-inflammatory processes," says coauthor Jason Mills, M.D., Ph.D., assistant professor of pathology and immunology and of developmental biology. "They make sure that factors that turn up inflammation can be counteracted by the coordinated activation of anti-inflammatory effects."

The NK-22 cells are part of the innate immune system, which reacts quickly to invading pathogens. The researchers found that in response to immune signals warning of foreign invaders, the cells produce copious quantities of a compound called IL-22, which is why the researchers chose to name them NK-22 cells.

"NK-22 cells are already present in the mucosal tissue of the gastrointestinal tract, and as soon as they see a pathogen, they react," Cella says. "That is a great advantage to the body because it produces a protective response in the very first hours of pathogenic attack."

Now that immunologists know NK-22 cells exist and what immune factors influence them, they may be able to capitalize on them to treat a variety of inflammatory diseases, the researchers say.

"Diseases such as inflammatory bowel disease result from a defect in the intestine's protective barrier," says senior author Marco Colonna, M.D., professor of pathology and immunology. "If we can develop methods to culture NK-22 cells, we may be able to use them to promote healing and protect the gastrointestinal tract."

Source: Washington University