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Biomarker Predicts Recovery from a Type of Depression

By Amy Maxmen of *Nature* magazine

Image: Jiri Hodan

People who live with clinical depression must also suffer the 'trial and error' approach that psychiatrists take when prescribing antidepressants. Now, a study published this week signifies the beginning of the end of guesswork. In it, a blood test predicts who will respond well to a novel treatment for depression, and who might even fare worse."We haven't had a test like this in psychiatry before," says Andy Miller, a professor of psychiatry at Emory University and an author on the study in *Archives of General Psychiatry*. "There is no brain scan, no physiological measure that tells you whether a patient will respond to one drug more than another."

The test identifies an inflammatory protein in blood, C-reactive protein or CRP, that indicates internal inflammation. Whereas 62% of depressed participants with high CRP levels responded well to the new treatment, only 33% of participants with low CRP levels did.

The correlation was not entirely unexpected, because the drug suppresses inflammation, and Miller thinks that inflammation underlies depression in some people. To test whether a potent anti-inflammatory could soothe the malady, his team recruited 60 people who had lived with major depression for more than a decade and had received no relief from antidepressants.

Half of the participants received monthly treatments of the rheumatoid arthritis drug, Janssen's Infliximab, and half received a placebo. Overall, Infliximab did not seem to work. However, when Miller's team analyzed how the subset of participants with high CRP faired, it turns out they responded well to the drug, with a relief from sadness, suicidal thoughts, anxiety and other symptoms.

Since the late 1980s, researchers have sporadically hypothesized that inflammation can lead to depression. The theory is that depressed behavior might be beneficial in the short term because it reserves an injured animal's energy for healing rather than romping around in the sunlight. Although the hypothesis has never received widespread support, researchers have found that some depressed patients indeed bear elevated levels of inflammatory proteins.

On the basis of the results from this relatively small study, a biologic drug such as Infliximab might be a better option in the anti-inflammatory realm than Cox-2 inhibitors such as aspirin, which come with unwanted side effects, says Miller. Although he knows of no Infliximab-like drug in development for depression, he says that companies might be encouraged by his team's results. What's more, with a biomarker to predict a response, companies will have a better chance of success.

Robert Dantzer, a neuroimmunologist at MD Anderson Cancer Center in Houston, Texas, notes that some of the participants in the low-CRP group fared worse on Infliximab than on placebo. Thus, the CRP test could be as important a tool for excluding depressed patients from taking anti-inflammatory therapies as for predicting responders.

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