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Stimulating a protein in skin cells could improve psoriasis symptoms

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Psoriasis is a common, long-lasting disease that causes itchy or sore patches of thick, red skin with silvery scales. Environmental contaminants can trigger psoriasis and other autoimmune disorders, and it is thought that a protein called the aryl hydrocarbon receptor (AhR), which senses environmental toxins, could play a role. A study published by Cell Press on June 5 in the journal *Immunity* shows that the severity of inflammation associated with psoriasis is unexpectedly suppressed by AhR. The findings suggest that stimulation of AhR could improve symptoms and may represent a novel strategy for treating chronic inflammatory skin disorders.

Although many genetic factors underlying psoriasis have been identified, environmental factors such as components of tobacco smoke could also contribute to the disease. Because AhR is prevalent in skin cells and is known to respond to environmental contaminants such as dioxin, Stockinger suspected that this receptor could play an important role in psoriasis.

"Currently, the focus for therapeutic intervention in psoriasis is on modulating the activity of immune cells," says senior study author Brigitta Stockinger of MRC National Institute for Medical Research. "However, our study suggests that molecules found in skin cells also play an important role in the disease."

In the new study, Stockinger and her team found that triggering of AhR in skin cells with a compound derived from a chemical reaction to UV

light exposure reduced inflammation in skin biopsies from psoriasis patients, whereas preventing activation of the AhR protein increased inflammation. Although psoriasis is a disease with a strong immune reaction, Stockinger and colleagues found that AhR in skin cells, but not immune cells, is important in responding to the trigger to dampen inflammation.

"Because available treatments for psoriasis are not always effective, it might be particularly useful to explore combination therapy with drugs directly targeting the immune system together with different ways of stimulating the AhR pathway," Stockinger says. "The focus of our ongoing studies will be to test whether this combination approach might give added improvement to current therapies."

More information: *Immunity*, Di Meglio et al.: "Activation of the aryl hydrocarbon receptor dampens the severity of inflammatory skin conditions." http://www.cell.com/immunity/abstract/S1074-7613(14)00183-6

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