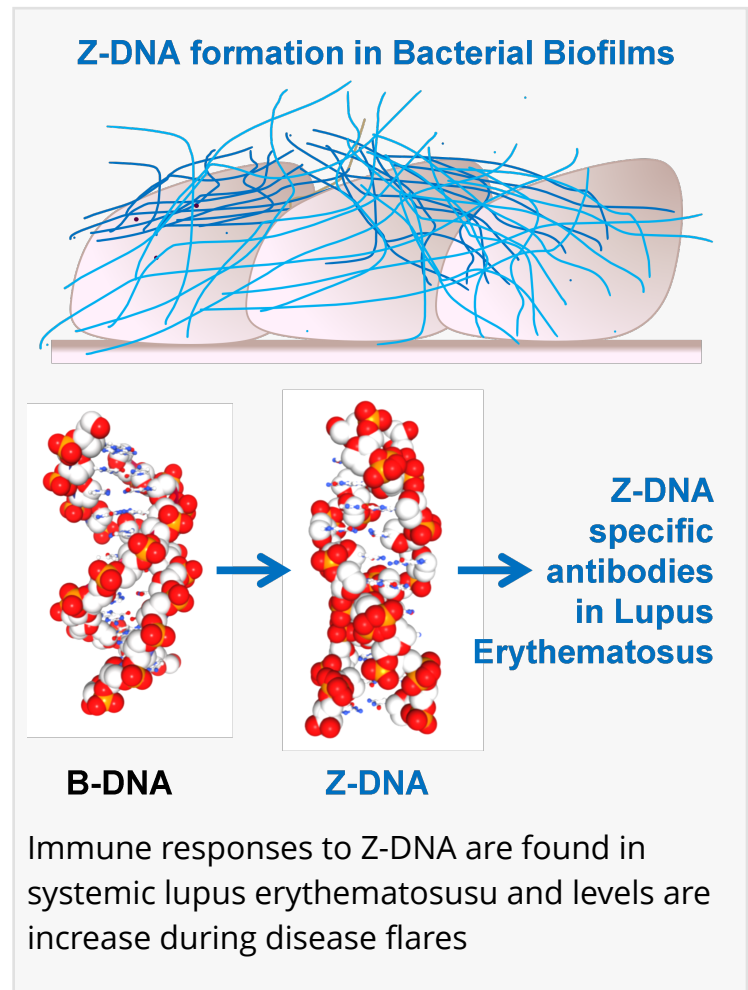


An update on the link between bacteria and autoimmune disease

An update on the growing connection between our bacterial microbiome and chronic autoimmune disease

CHARLESTOWN, MA, UNITED STATES, May 16, 2024 /EINPresswire.com/ -- From the time of its discovery, people have been intrigued about the unusual form of DNA that is called [Z-DNA](#). Unlike the right-handed Watson-Crick helix everyone hears about at school, Z-DNA is a left-handed helix. There were many questions about why is Z-DNA important in human health and disease, if at all. Intriguingly, the first clue of a biological role came from patients with an autoimmune disease called systemic lupus erythematosus (SLE). In this autoimmune disease where damage to many organs can occur, patients develop antibodies to Z-DNA that tract with disease activity. In an article just published in the [Annals of the Rheumatic Diseases](#), Dr. Pisetsky from Duke University and Alan Herbert from InsideOutBio have just published an update that explains the origins of anti-Z-DNA antibodies and shows the important of unusual DNA conformations in human diseases.

Many roles are now known for Z-DNA in the regulation of gene expression and control of cell death in human cells. These events occur dynamically within cells and involve genomic sequences called flipons that dynamically change conformation. What is unusual about the findings in SLE is that the left-handed Z-DNA is found in outside cells in the external milieu. Even more surprising is that in many cases, the Z-DNA is formed by bacteria as part of the [biofilm](#) they use to defend themselves against host responses. The Z-DNA acts as an exoskeleton to protect the bacteria against agents that damage their cell membranes and would otherwise cause them to swell until their membrane ruptures. Biofilms are, for example, one cause of antibiotic resistance. In the context of a bacterial infection, the Z-DNA formed is quite stable. Its persistence can trigger immune responses that lead to the formation of anti-Z_DNA antibodies.





The findings underscore how a person's microbiome can play an important role in chronic diseases."

Alan Herbert

Complexes that form between Z-DNA and those antibodies can be trapped in the fine vessels of the skin and kidneys to cause damage to the organs of affected individuals during disease flares. As the disease progresses, the initial immune reaction against Z-DNA can then trigger antibody responses against a range of normal tissues, exacerbating this form of autoimmune disease.

Targeting biofilm formation by bacteria to prevent the Z-DNA formation therefore offers a new opportunity to help patients with SLE.

About InsideOutBio: InsideOutBio is a start-up focused on developing a novel class of proprietary therapeutics to 'light' up tumors for the immune system to kill by reprogramming self/nonself pathways within cancer cells. Dr. Herbert leads discovery at InsideOutBio and contributed to the discovery of flipons. These statements about InsideOutBio comply with Safe-Harbor laws. They are forward-looking and involve known and unknown risks and uncertainties. They are not guarantees of future performance and undue reliance should not be placed on them.

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