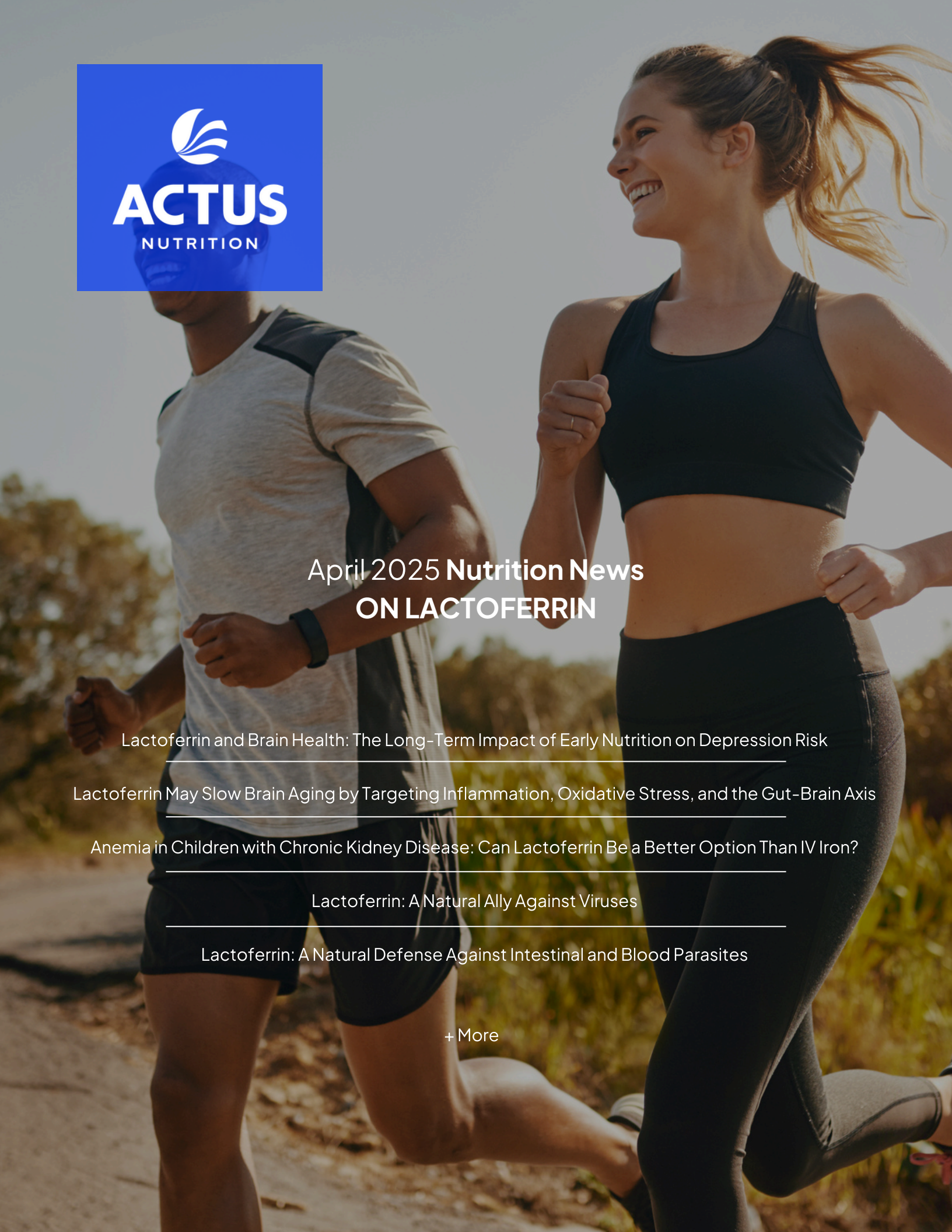

ACTUS NUTRITION

April 2025 **Nutrition News**
ON LACTOFERRIN

Lactoferrin and Brain Health: The Long-Term Impact of Early Nutrition on Depression Risk

Lactoferrin May Slow Brain Aging by Targeting Inflammation, Oxidative Stress, and the Gut-Brain Axis

Anemia in Children with Chronic Kidney Disease: Can Lactoferrin Be a Better Option Than IV Iron?

Lactoferrin: A Natural Ally Against Viruses

Lactoferrin: A Natural Defense Against Intestinal and Blood Parasites

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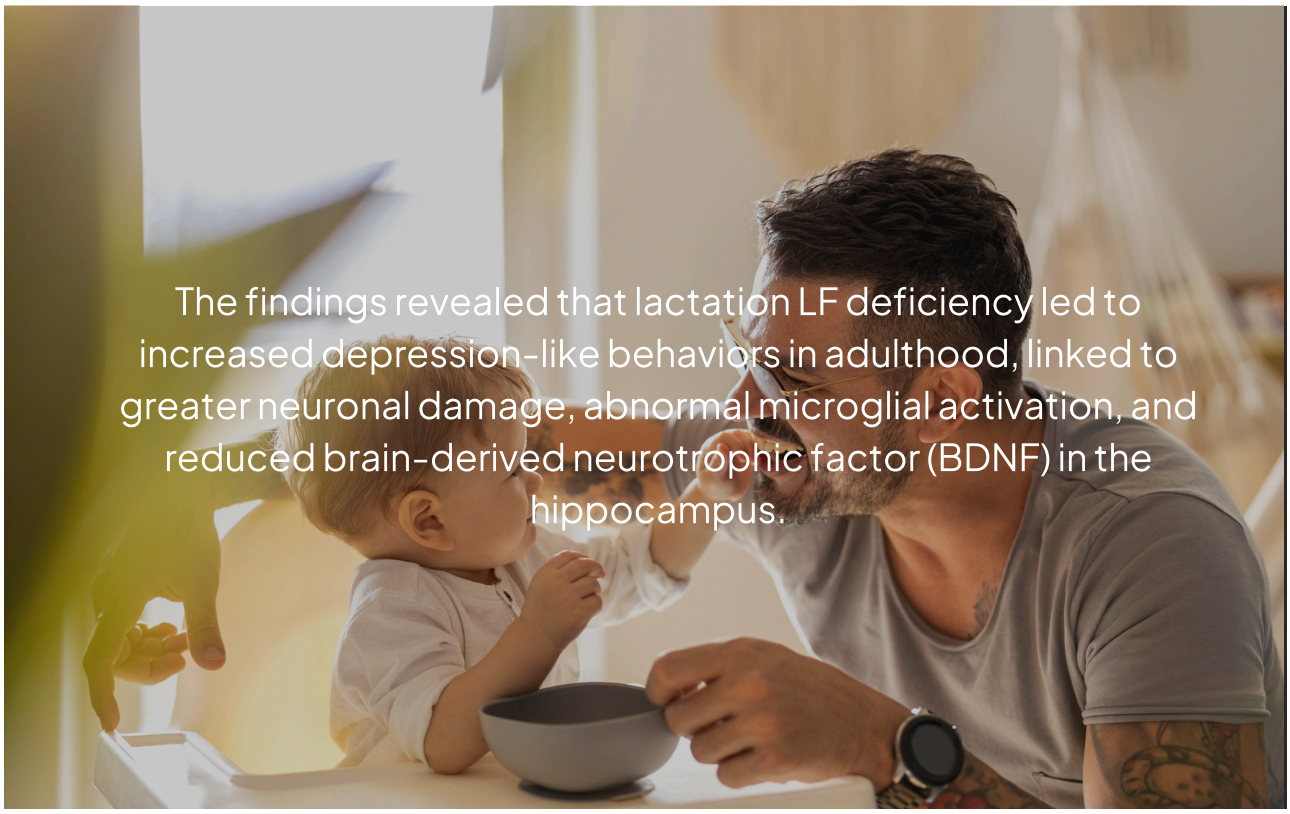
Lactoferrin and Brain Health: The Long-Term Impact of Early Nutrition on Depression Risk

Lactation is a critical period for brain development, with early-life nutrition playing a key role in long-term mental health. A recent study explored the impact of lactoferrin (LF) deficiency during lactation on the risk of depression in adulthood. Researchers used a mouse model where LF-deficient mothers nursed wild-type pups, then subjected the offspring to stress challenges in later life. The findings revealed that lactation LF deficiency led to increased depression-like behaviors in adulthood, linked to greater neuronal damage, abnormal microglial activation, and reduced brain-derived neurotrophic factor (BDNF) in the hippocampus. However, supplementation with recombinant human lactoferrin supported neuronal growth and reduced inflammation by modulating key cellular pathways. These results suggest that adequate lactoferrin intake during lactation may protect against long-term neurological and mood disorders by supporting healthy brain development.
Wang et al. Mol Med. 2025 Feb 7;31(1):50.



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Lactoferrin May Slow Brain Aging by Targeting Inflammation, Oxidative Stress, and the Gut-Brain Axis

Lactoferrin (LF), a natural protein with antioxidant and anti-inflammatory properties, is showing promise in the fight against brain aging. While it's already known for its role in reducing oxidative stress and inflammation in the body, this study explored whether LF could also protect the brain from age-related decline.

Researchers tested low, medium, and high doses of LF in a mouse model of brain aging caused by D-galactose. Mice receiving medium (500 mg/kg) and high (2000 mg/kg) doses of LF showed improved body weight, mobility, and memory performance. They also had reduced damage in both the brain's hippocampus—a key area for memory—and the intestinal lining.

LF boosted the brain and blood levels of key antioxidant enzymes and reduced inflammation markers in both the colon and bloodstream. It also helped restore cellular recycling systems (autophagy) by influencing the PI3K/Akt/mTOR pathway, which plays a major role in aging and brain health.

Interestingly, LF also had positive effects on gut health, improving the balance of gut bacteria and increasing beneficial short-chain fatty acids—important compounds that help maintain a healthy gut-brain connection.

Overall, the highest dose had the most noticeable anti-aging effects, but the medium dose (500 mg/kg/day) appeared to offer a balance between effectiveness and cost. These findings suggest that lactoferrin could support brain health during aging by reducing inflammation, improving gut health, and enhancing the body's natural cellular repair systems.

Wang et al. Int J Biol Macromol. 2025 Apr 12;309(Pt 4):143033.

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Anemia in Children with Chronic Kidney Disease: Can Lactoferrin Be a Better Option Than IV Iron?

Anemia is common in children with chronic kidney disease (CKD) and can make the condition worse, reducing quality of life. Treatments often involve injectable iron, which can have unwanted side effects. This study looked at whether an oral supplement, lactoferrin, could work just as well—or better—than standard intravenous (IV) iron therapy.

Sixty children with anemia due to CKD were split into two groups. One group took 100 mg of lactoferrin by mouth each day for 3 months. The other group received 50 mg of IV iron dextran three times a week over the same period.

Both groups showed improvements in their anemia. However, the children who took oral lactoferrin had more notable improvements in several blood health markers, including hemoglobin levels, red blood cell counts, iron levels, and inflammation markers like IL-6. The IV iron group also showed benefits, especially in kidney function and some inflammation markers, but fewer blood markers changed overall.

After 3 months, there were no major differences between the two groups in terms of overall outcomes. Still, the results suggest that oral lactoferrin may be a more effective and potentially easier alternative to IV iron for treating CKD-related anemia in children.
Hegazy et al. Sci Rep. 2025 Feb 5;15(1):4380.

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Lactoferrin: A Natural Ally Against Viruses

Lactoferrin is a natural milk protein with powerful antiviral and antibacterial properties. It's found in many parts of the body and plays a key role in the immune system, especially at mucosal surfaces—the body's first line of defense.

A recent comprehensive review of studies highlighted that lactoferrin can help protect against a variety of viruses, including those that cause COVID-19, the flu, herpes, hepatitis, and HIV. One of its standout features is its ability to bind to both viruses and the cells they try to infect, essentially blocking the virus from entering and spreading. This makes lactoferrin a critical part of our natural defense against infections.

Beyond simply blocking viruses, lactoferrin also supports immune health by balancing inflammation and boosting the body's early immune responses. It even helps regulate iron levels in the body, which can play a role in controlling infections caused by bacteria, fungi, and viruses.

Altogether, this natural protein offers a multi-layered approach to immune protection. As interest grows in food-based approaches to health, lactoferrin stands out as a promising candidate for supporting the body's defenses against viral infections.

Shafqat et al. Life Sci. 2025 Jan 15;361:123340.

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Lactoferrin: A Natural Ally in Cancer Support and Treatment ?

Cancer research continues to push the boundaries of science, and alongside conventional treatments, natural compounds are drawing increased attention for their potential benefits. One such compound is lactoferrin, a naturally occurring protein known for its wide range of health-supporting properties.

Lactoferrin has been studied for its antimicrobial, antioxidant, and anti-inflammatory effects—but its anticancer potential is particularly exciting. Research suggests that it may not only help fight cancer directly but also work in synergy with standard cancer treatments, potentially making them more effective and reducing common side effects.

This dual-action makes lactoferrin especially promising: it supports the body's defense systems while also targeting cancer cells. Scientists are continuing to explore exactly how it works—especially how it interacts with other molecules and targets specific receptors involved in tumor growth.

As we learn more, lactoferrin may become a key part of more personalized, natural strategies for cancer care—offering a gentler, holistic complement to existing therapies.

León-Flores et al. Biometals. 2025 Apr;38(2):465-484.

Targeted Astaxanthin Delivery with Lactoferrin: A Novel Approach for Enhancing IBD Treatment

Oral therapy is the preferred method for treating inflammatory bowel disease (IBD), but damage to the intestinal lining and frequent diarrhea reduce drug retention at inflammation sites, limiting effectiveness. To overcome this, researchers developed a novel oral formulation of astaxanthin (Ast) that selectively anchors to inflamed regions using a lactoferrin (LF)-responsive delivery system. This approach enhances astaxanthin's solubility and ensures safe consumption. In animal models, the formulation significantly improved IBD outcomes, including increased colon length and a 100% survival rate. The therapeutic benefits were linked to enhanced immune regulation, improved epithelial repair, and restoration of gut microbiota balance. This innovative inflammation-responsive delivery system offers a promising strategy for more precise and effective IBD treatments.

Yang et al. Adv Healthc Mater. 2025 Feb;14(4):e2402731

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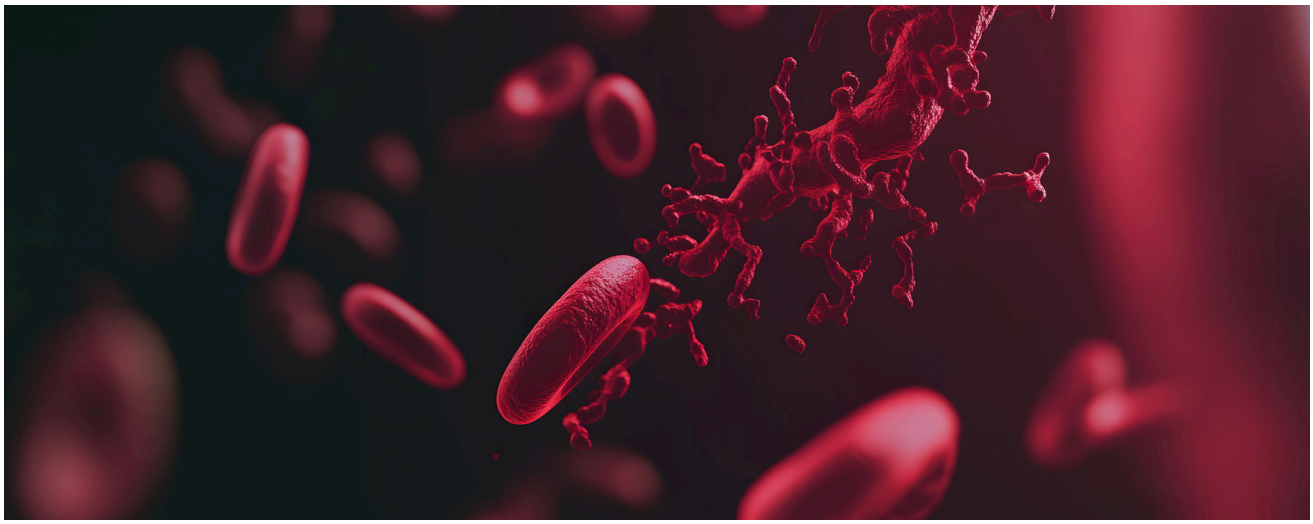
Lactoferrin: A Natural Defense Against Intestinal and Blood Parasites



Lactoferrin is a natural milk protein known for its ability to bind iron and support immune function. Recent research highlights its potential to combat a wide range of parasites that affect the digestive tract and bloodstream—many of which are becoming increasingly resistant to conventional treatments.

Parasites need iron to grow and survive, often stealing it from their host. Lactoferrin works by capturing this iron first, effectively starving the parasites and disrupting their life cycle. In addition to removing iron, lactoferrin can trigger the production of harmful molecules inside infected cells—such as reactive oxygen and nitrogen species—that help destroy the parasites from within.

Studies over the past 40 years have explored how lactoferrin works in different forms: as a complete protein, as smaller protein fragments (called peptides), and even as part of tiny delivery systems designed to target infections more precisely. These studies show promising effects against a variety of intestinal parasites like Giardia and Entamoeba, as well as blood-borne parasites like those that cause malaria, leishmaniasis, and toxoplasmosis.

As drug resistance continues to rise, natural alternatives that are gentle on human cells but tough on parasites are more important than ever. Lactoferrin's unique ability to block parasite nutrition and activate immune defenses makes it a compelling candidate for future antiparasitic strategies.

Anand. Front Parasitol. 2024 Feb 28;2:1330398.

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