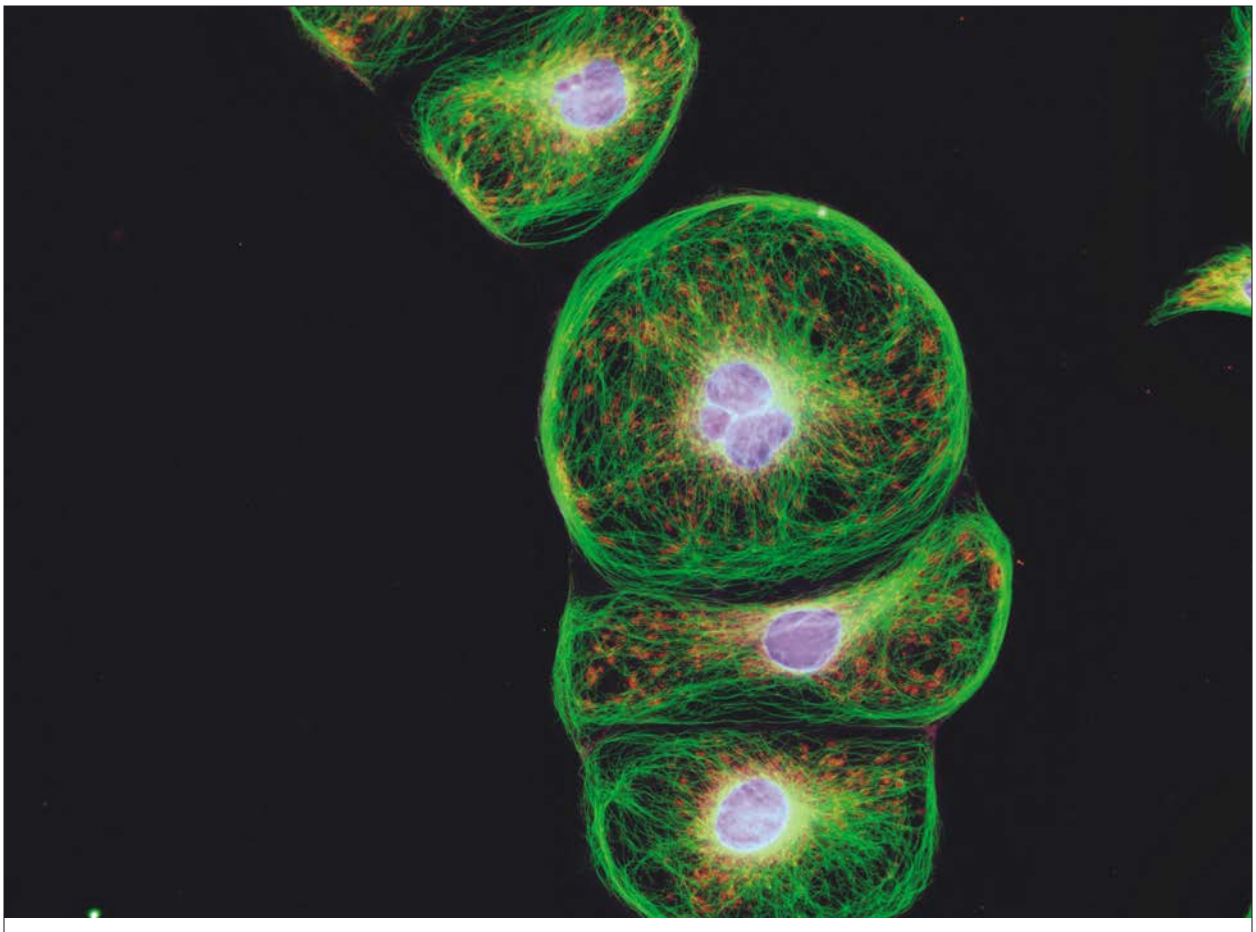

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Potential Chink in Armor of African Sleeping Sickness Parasite: It's Social

Long considered a freewheeling loner, the Trypanosoma brucei parasite responsible for African sleeping sickness has revealed a totally unexpected social side, opening a potential chink in the behavioral armor of this and other supposedly solitary human parasites, according to research presented at the American Society for Cell Biology's 50th Annual Meeting in Philadelphia.

"The concept of bacteria acting as groups of cells communicating and cooperating with one another has had a major impact on our understanding of bacterial physiology and pathogenesis, but this paradigm has not been applied to parasitic protozoa," said Kent Hill, Ph.D., of University of California, Los Angeles, who presented the findings. "Social motility offers many potential advantages, such as facilitating colonization and navigation through host tissues."

The unexpected discovery that at the right time and on the right surface, *T. brucei* are extremely social reveals "a level of complexity and cooperatively to trypanosome behavior that was not previously recognized," said Hill.

It also suggests a whole repertoire of behavior for other "loner" parasites that are responsible for malaria and epidemic diarrhea.

These supposedly solitary protozoa were better known for their propeller-like flagella and for cycling between tsetse fly and human hosts. But seeded onto a semisolid surface, *T. brucei* during their tsetse fly stage collect into large multi-cellular communities whose members sense their environment, exchange messages, and coordinate their movements in response to external signals.

T. brucei's flagellum provided the clue about the parasite's social behavior, said Hill. While examining the proteins exposed on the outside of the trypanosome flagellum, he and his colleagues identified a family of surface-exposed receptors and downstream signaling cascades involved in cyclic adenosine monophosphate (cAMP) intracellular signal transduction.

Using genetics to block gene expression and drugs to block protein activity, the researchers found that their flagella possessed sensing and signaling systems that equipped trypanosomes for social behavior.

Story Source: The above story is reprinted from materials provided by American Society for Cell Biology, via EurekAlert!, a service of AAAS.