

Johns Hopkins University

Department of Biology Seminar Series

Thursdays, 4:00pm

For more information go to: <https://bio.jhu.edu/events>

Zoom link: <https://zoom.us/j/97925356454?pwd=bjNuTlY1dU9BcXcrRFdleis2TVNadz09>

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Host: Bob Johnston

“Cooperation among tumor cells is a cancer vulnerability”

Tumor evolution is shaped by competition and cooperation. For example, cell biologists have known for decades that cells struggle to grow from low density cultures. In ecology, this population density effect is known as the Allee effect, and it is considered an irrefutable sign of cooperation. Still, while competition in cancer is widely studied, the role and mechanisms of cell cooperation remain unclear. Since cooperation requires individuals to interact, cooperative populations are inherently vulnerable and risk extinction when their density drops below a tipping point. To exploit this vulnerability in cancer, we sought to identify conditions that make tumors more reliant on cooperation. Our results show that under amino acid starvation tumor cells must cooperate to collectively digest extracellular oligopeptides. The hydrolysis of these peptides is catalyzed by secreted aminopeptidases that create a shared pool of free amino acids. We identified CNDP2 as the key secreted aminopeptidase and its downregulation inhibits cell cooperation and tumor growth in vivo. Our data show that cell cooperation is a critical adaptation to the tumor microenvironment, and it represents a cancer vulnerability.