Study: Sugar helps control cell division

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Johns Hopkins scientists in Baltimore say they've discovered a deceptively simple sugar is really a critical regulator of cells' natural life cycle.

Their research reveals that, when disturbed, the process could contribute to cancer or other diseases by failing to properly control cell division, the researchers say.

The sugar, known as O-GlcNAc, is used inside cells to modify proteins, thereby helping or preventing their interactions with other proteins and regulating their destruction. The sugar's effect on proteins seems to be important controllers of cell division, say the researchers.

"The dogma for decades has been that the cycle of cell division is controlled by the appearance and disappearance of certain proteins called cyclins. But experiments have shown that you can knock out any of these and still get perfectly normal cell division," says the study's first author, Chad Slawson, a postdoctoral fellow in biological chemistry. "In contrast, our experiments show that by increasing or decreasing the amount of sugar attached to proteins, the cell cycle is disrupted and isn't salvageable unless O-GlcNAc levels are fixed."

The study is detailed in the Sept. 23 issue of the Journal of Biological Chemistry, available online now.