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By Meredith Fraser
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MEDICAL RESEARCHER'S DISCOVERY MAY EXPLAIN HOW CERTAIN CANCERS DEVELOP

TALLAHASSEE, Fla.— A Florida State University College of Medicine researcher has discovered a new interaction between a cell signaling system and a specific gene that may be the cause of B-cell lymphoma. The finding suggests a similar interaction could be occurring during the development of other types of cancer, leading to further understanding of how cancer works — and how it might be stopped.

Yoichi Kato, an assistant professor in the Department of Biomedical Sciences, and his lab team found that the gene — known in scientific shorthand as BCL6 — can inhibit one of the pathways cells use to transmit signals to other cells. Called the Notch signaling pathway, it's an important mechanism for cells to control gene regulation.

“There are very few molecules that we know directly inhibit Notch signaling,” Kato said. “So that is why the interaction, and our finding, is very interesting to people in many areas — cancer specialists, neuroscientists, and many others.”

Kato's team produced [a paper outlining the findings](#) that was published in the journal *Developmental Cell*, and Kato recently presented the paper at an international conference in Cold Spring Harbor, N.Y., for scientists studying early development of vertebrates.

Kato and his researchers have focused on the Notch signaling pathway's role in vertebrate early development. In their study, they found that when BCL6 inhibits the Notch signaling pathway during the early stages of embryo development, the alignment of the embryo's internal organs is affected, which can lead to a congenital disorder.

However, the Notch signaling pathway, which creates the equivalent of a molecular highway across a cell's membrane, is involved in many types of cell-to-cell interaction, including neuron development, stem cell differentiation and apoptosis (programmed cell death).

The fact that BCL6 regulates the Notch signaling pathway could be important for any cellular process where Notch plays a role, including the formation of many cancers. BCL6 is a gene that, when mutated in certain ways, can lead to several types of B-cell lymphoma. B-cell lymphomas, including both Hodgkin's and non-Hodgkin's lymphomas, occur when B-cells, which produce antibodies to fight infections, mutate and become cancerous.

With more study of the interaction between the Notch signaling pathway and the BCL6 gene, scientists may be able to better understand how these cancers form. Kato and his lab plan to

further investigate the interaction's role in neural development, as well as how the interaction could affect stem cell formation.

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