

# Transcription factor Lyl-1 critical in producing early T-cell progenitors

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A transcription factor called Lyl-1 is necessary for production of the earliest cells that can become T-cells, critical cells born in the thymus that coordinate the immune response to cancer or infections, said a consortium of researchers led by those from Baylor College of Medicine in a report in the journal *Nature Immunology*.

These earliest progenitors (called early T lineage [progenitor cells](#)) are the first cells that can be identified as being on the road to becoming T-cells, said Dr. Margaret Goodell, director of the [Stem Cells](#) and Regenerative Medicine Center of Baylor College of Medicine. Without Lyl-1, only a few of these early T lineage progenitor cells get made.

"This finding gives us insight into the biology of these progenitor cells," said Goodell, a professor of pediatrics at BCM and a member of the Center for Cell and Gene Therapy at BCM, Texas Children's Hospital and The Methodist Hospital.

Dr. Fabian Zohren, a post-doctoral student in Goodell's laboratory, found that mice lacking the gene for this factor had a T-cell deficiency and in particular, too few of these early progenitor cells.

"It showed that those early T lineage progenitor cells are really dependent on Lyl-1 for their generation," said Goodell, who is also corresponding author of the report. "We think that Lyl-1 controls a program that allows survival and expansion of these critical progenitors."

The finding may have particular import in understanding a form of leukemia known as T-cell [acute lymphoblastic leukemia](#). The researchers found that the forms of the disease that have the worst prognosis are those in which the [cancer cells](#) resemble these early T lineage progenitor cells. These cells also have high levels of Lyl-1.

One possibility is the T-cell progenitors in patients with this type of T-cell leukemia continue to express Lyl-1, so continue to be programmed to expand. The excess Lyl-1 prevents the early T lineage progenitor cells from differentiating into active T-cells. Goodell said a recent grant from the Alex's Lemonade Stand Foundation will help test that hypothesis.

Provided by Baylor College of Medicine

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