St. Anna Kinderkrebsforschung
CHILDREN'S CANCER RESEARCH INSTITUTE

Press Release

When Acute Lymphoblastic Leukemia Transforms

(Vienna, 02.04.2024) **Acute lymphoblastic leukemia (ALL) is indeed highly treatable. However, for new treatment methods in personalized medicine, subtypes of this leukemia must be studied more thoroughly. A team of researchers from St. Anna Children's Cancer Research Institute and the University of Padua has now made another step forward in this important work. Their paper has recently been published in the journal *Blood*.**

Acute lymphoblastic leukemia (ALL), a malignant disease of blood-forming cells, primarily occurs in preschool-aged children. It is now highly treatable because chemotherapy and stem cell transplantation provide the best chances for long-term survival of affected individuals. However, in order to further increase cure rates with personalized medicine, the various subtypes of this leukemia must be better understood: A team led by St. Anna Children's Cancer Research Institute and the University of Padua recently achieved an important step in the discovery and improved characterization of one of these subtypes. The work was published in the prestigious journal *Blood*.

There are two fundamentally distinct forms of acute lymphoblastic leukemia (ALL): those affecting B cells of the immune system, and those affecting T cells. B-ALL is more common in younger children, while T-ALL is rarer and mainly affects older children and adolescents. The challenge lies in the fact that even the now highly curable B-ALL has several subgroups that need to be identified in order to better understand them and further increase cure rates.

The surface molecule

A team from St. Anna Children's Cancer Research Institute and the University of Padua has focused on a subtype of B-ALL that arises from altered B lymphocytes and exhibits a specific marker on the cell surface: the surface molecule CD371, which is also found on normal blood cells. According to Michael N. Dworzak, Principal Investigator at St. Anna Children's Cancer Research Institute and last author of the study, the surface molecule can be detected using a technique called flow cytometry.

He believes that such analysis should only be performed in reference laboratories: "This standardizes analyses and studies." In Austria, there is only one reference laboratory for these studies - at St. Anna CCRI. "All bone marrow samples from children and adolescents with newly diagnosed leukemia from all over Austria are sent here." That's 80-100 samples per year.

The researchers have observed that the leukemia cells of this subtype of B-ALL transform into another, mature type of blood cell called monocytes during early therapy, which is crucial for an accurate assessment of minimal residual disease (MRD). Precise measurement of MRD allows doctors to assess the effectiveness of treatment and make adjustments if necessary to ensure that all diseased cells are successfully eliminated. Although this particular form of B-ALL is associated with a poorer early response to therapy, complete recovery can usually still be achieved through MRD-based therapy.

Publication:
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Doi: 10.1182/blood.2023021952