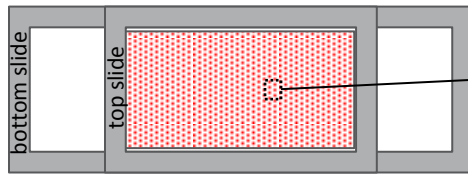


A first step in diagnosing LGL leukemia: The blood smear

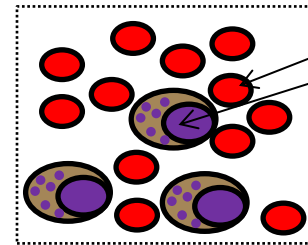
Introduction

- LGLL is a cancer that is defined as the clonal expansion of either cytotoxic T-cells or NK-cells. This means that at one point in time a T-cell or NK-cell survived too long and subsequently copied itself over and over again. We can consider the T-cell and NK-cell forms as subtypes of the same disease. If you read on to *“How do protein markers on the surface of T-cells and NK-cells help with diagnosis of LGL leukemia?”* you can learn more about T- and NK-cells.
- LGLL can sometimes be mild with few or no symptoms in some people. Because of this, it is probably underdiagnosed. The first indication that someone may have LGLL comes from the blood smear. A patient may be having a routine complete blood count (CBC) laboratory test and find an abnormal result. This abnormal result prompts further testing. On the next page, you can see a diagram with explanations about how this is often the first indication of LGLL.

Microscope slide with a blood smear



Zoomed in view of blood cell smear



Red blood cell

LGL: the large purple circle is the nucleus and the small purple circles are the granules containing proteins that can kill other cells.

- A blood smear is created on a microscope slide when a drop of blood is put onto the bottom slide, then the top slide is used to smear the blood along the bottom slide.
- This smear allows the cells to be spread out so their morphology (what they look like) and abundance can be evaluated.
- An automated counter determines how many of each blood cell is present, then produces a readout.
- Blood cells that may trigger an abnormal count would be: decreased numbers of red blood cells or neutrophils, or increased number of lymphocytes.
- Patients with LGLL will have an increased number of **LGL cells** that will be **larger than normal lymphocytes**. A normal lymphocyte is approximately the size of a red blood cell, however LGLs are twice that size.
- If increased LGLs is the only abnormal parameter, patients may not have symptoms. Patients with decreased red blood cells and neutrophils may already have symptoms.
- Any abnormal counts will alert the medical laboratory technicians so that a manual count can be performed.

- The CBC result may show a high lymphocyte count and low neutrophil count or both. Let's define two terms that are often used to describe LGLL:
 - **Neutropenia** – fewer than the normal amount of neutrophils
 - **Lymphocytosis** – an increase in lymphocytes; usually an increase of T- or NK-cells (white blood cells). This can be part of a normal immune response, but in a healthy individual, the lymphocytes decrease back to baseline levels after the immune response is done.
- If neutropenia and/or lymphocytosis are observed and persist, further tests are needed to confirm an LGLL diagnosis.
- Another phenomenon, called the inverted CD4/CD8 ratio is a hallmark of LGLL and will be discussed in future content.

