

How do protein markers on the surface of T-cells and NK-cells help with diagnosis of LGL leukemia?

Introduction

- An LGLL diagnosis must meet two parameters:
 1. Increased number LGLs
 2. Clonality of the LGLs.

In other words, it must be established that there is an abnormally high number of LGLs that are copies of each other.
- Increased LGLs can be established by both the blood smear (see “*A First Step in Diagnosing LGL Leukemia: The Blood Smear*”) and flow cytometry. The clonality is established by the TCR rearrangement test.
- In order to understand the flow cytometry and TCR rearrangement diagnostic tests, we will now discuss protein markers on T- and NK-cells.

This diagram shows simplified pictures of a T-cell and an NK-cell. The job of some proteins is to be present on the surface of the cell where they interact with proteins on the surface of other cells.

- These surface proteins can be called markers since they help identify a cell type. A type of surface marker we will focus on is called **CD** (which stands for **cluster of differentiation**).
- In this diagram, you can see 6 different CD markers: CD3, CD8, CD16, CD56, CD57, and CD94. The CDs are all the same type of protein, but have some difference in their amino acid sequence making them able to perform different functions.
- In T-LGLL, CD3, CD8, and CD57 are typical markers for the T-LGL cells. In NK-LGLL, CD16, CD56, and CD94 are typical markers for NK-LGL cells. This will become more clear in the flow cytometry analogy. Other CD markers are present on these cell types, but for the purpose of simplicity, we will describe the ones most commonly used to identify T or NK cells.
- Furthermore, there are other types of T-cells present in the body. The T-helper cell has a CD4 marker, but not CD8 (it also has other markers besides CD4). The CD4 helps distinguish that the cell has a certain function. Another example of different markers on lymphocytes can be found in *“What is the difference between LGL leukemia and chronic lymphocytic leukemia (CLL)?”*
- Another marker that is only on T-cells is the T-cell receptor (TCR). The TCR can identify antigens (foreign substances in the body) to start an immune response. The TCR will be explained in depth in subsequent content.

