

# Manual of the WebTool PLAIT

---

## Manual of the WebTool PLAIT

### Introduction

[What is PLAIT?](#)

[How does the process look?](#)

[What should be considered?](#)

### Website PLAIT

[How is the medical condition predicted?](#)

[How and what results are produced?](#)

[How does one use PLAIT?](#)

[Registration](#)

[Login](#)

[Platform](#)

## Introduction

---

In this user manual, you will find all the information regarding the usage of Phenotyping Lymphomas with an Artificial Intelligence Toolbox (PLAIT).

### What is PLAIT?

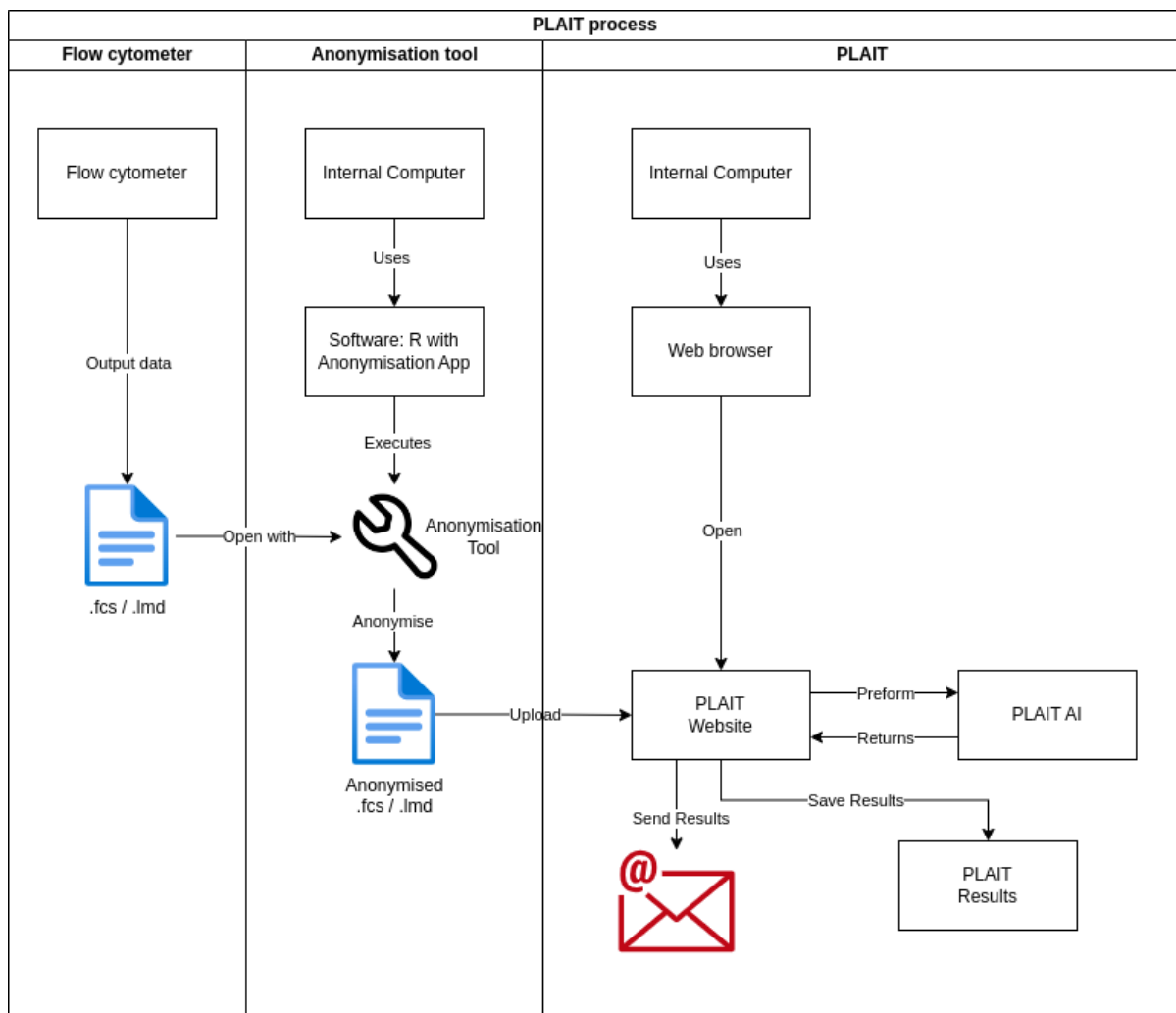
---

The web tool PLAIT classifies hematologically abnormal samples into mature B-cell lymphoma categories. An estimate about the disease category is made solely based on the uploaded flow cytometric data in the form of `.fcs` files or `.lmd` files. A diagnosis is provided by the treating physicians when uploading the data and it undergoes a fully automated review through Artificial Intelligence. Hence, the name Phenotyping Lymphoma with an Artificial Intelligence Toolbox (PLAIT).

### How does the process look?

---

First and foremost, a flow cytometric assay must be performed. The obtained data, depending on the flow cytometer model, is output in either `.fcs` file or `.lmd` file format. Only then is the file uploaded to the PLAIT web portal, transferred to the project's computing infrastructure. Once uploaded, the file is analysed by an algorithm, and the result is sent via email and is also accessible in the portal.



## What should be considered?

When using PLAIT, three essential points must be considered:

1. PLAIT is a **university-based, non-commercial research project** that provides an estimated classification based on the data. A legally binding medical **diagnosis** is therefore **excluded**.
2. For data protection reasons, all data must be anonymized before the upload, i.e. before handing it over to the PLAIT server. **No personally identifiable data according to Art. 4 Nr. 1 GDPR may be uploaded.**
3. The results of the analysis and the anonymized data are **stored** for future research and development purposes. As mentioned in point 2, these do not contain any personally identifiable data according to Art 4 Nr. 1 GDPR.

## Website PLAIT

The PLAIT website generates an estimated classification regarding the medical condition of patients based on the previously anonymized data. A legally binding medical diagnosis is not provided.

The project website is available in both German and English. All relevant content for usage is accessible in both languages. To switch languages, simply click on the flag icon.

## How is the medical condition predicted?

---

PLAIT is a data-driven classifier for classifying leukemia. The anonymized data from the flow cytometer are analyzed using data-bionic methods. Through a multitude of test datasets, the artificial intelligence (AI) recognizes self-learned patterns in the data and can automatically assign these patterns to a diagnosis.

Specifically, PLAIT utilizes the property of self-organization and emergence of data. Patterns in the data emerge and are classified using Emergent Self-Organizing Maps (ESOM). For further reference, see Ultsch, Alfred. "Maps for the visualization of high-dimensional data spaces." Proceedings of the Workshop on Self-organizing Maps. 2003.

## How and what results are produced?

---

The result, along with the corresponding ticket number, is sent via email as soon as it is available. Additionally, the result can be viewed on the PLAIT website. The results include a classification indicating whether the patient sample shows a normal or abnormal phenotype, and a probability indicating how likely it is that the result is correct.

If the provided preliminary diagnosis does not significantly align with the result from PLAIT, more advanced pathological examination methods could be employed as a third instance to establish a final diagnosis.

## How does one use PLAIT?

---

### Registration

- You need to register before using PLAIT. We will activate your user account as soon as possible. Only after successful activation, you can log in. Activation requires a university or college email address. The activation is done manually and may take up to 24 hours.
- After clicking on 'Register', you will be redirected to a page where you need to enter your details.

### Login

- Sign in using the link <http://137.248.121.81:9797/login/> with your login credentials. You will then be redirected to the PLAIT platform, or you can click on 'Login'.
- Afterwards, you can log in.
- Note: If you have forgotten your password, you can reset it here.

### Platform

- After logging in, you will be directed to the page for file upload. Simply enter a 'Ticket ID' of your choice for personal identification.
- Next, click on 'Choose file' and select your `.fcs` or `.lmd` file in the window.
- Then, click on 'Submit A New Ticket' and wait for the file to be uploaded. Depending on the size, this may take some time.
- Afterward, you will see a ticket overview with your uploaded files. Now, you just need to wait for your result, which will be sent to you via email. Typically, this should not take longer than 30 minutes.

- You can also update your profile information by clicking on 'Profile'.