



Autoinflammatory disease treatment recommendation using unsupervised learning

Actual situation and difficulties

The autoinflammatory disease is a group of rare diseases (less than 1 in 2'000 people) characterized by recurrent flares of fever accompanied with other symptoms (articular, cutaneous, gastrointestinal, cardiac, ...). There is actually about 20 defined diagnosis, but there are still a lot of patients who do not correspond to any defined diagnosis. Diagnosis are usually defined when a common genetic mutation is found in multiple patients.

A broad range of treatments (biological treatments) can stop the flares, but there is no clear definition of which treatment will work for which patient. It is even more difficult to find the right treatment for patients who do not fit in one specific diagnosis.

Hypothesis

With the help of unsupervised learning, we can cluster all the autoinflammatory patients based on their clinical symptoms and laboratory values. These clusters can then help the physician to choose the best treatment for specific patient groups.

Global project

The JIRcohort is a network of more than 70 centers from 8 countries collecting observational data on autoinflammatory patients. Since 2016 the data of more than 900 patients have been included.

1st step

Based on clinical and laboratory data from the first at diagnosis definition, group patients in different clusters

2nd step

Evaluate treatment efficacy for each cluster and define treatment recommendations

3rd step

Implement a clinical tool for the doctors which will give them treatment recommendations.

Master thesis

Evaluate the available data on the JIRcohort and use unsupervised learning to find new patient clusters. Give recommendations to perform the project described above.