

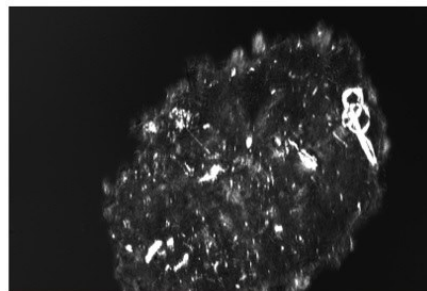
Assignments: Raman identification of pathological particles (BSc. or Internship)

Background

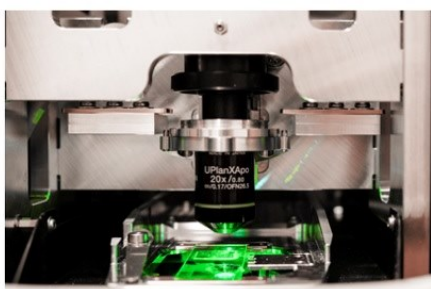
Crystallopathies are a class of diseases caused by presentation of crystals, microplastics or nanoparticles in the human body. In rheumatology, presence of urate or calcium crystals can cause severe arthritis and even lead to joint destruction. In a partnership project between the University of Twente, ReumaNederland and the VieCuri Medical Centre, an effort is made to improve diagnostics of these diseases with the application of Raman spectroscopy.



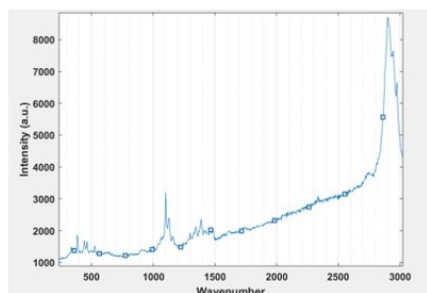
1. Place specimen on microscope slide



2. Select objects in polarization microscopy image



3. Scan selection with laser (10-60 seconds/object)



4. Analyse Raman spectra with visual examination

Possible assignments

We are looking for BMT or BME students to work on several assignments related to this project. We currently have two projects in mind, but we are open for creative ideas.

Project 1: Towards an automatic measurement procedure

As a student working on this assignment, you will work towards a fully automatic measurement procedure. This assignment includes the design and testing of several predefined procedures with this goal in mind. An affinity with (MATLAB) programming is required.

Project 2: Collecting clinical data

This is a very clinical-oriented assignment. You will perform synovial fluid analysis with Raman spectroscopy of patients with a variety of joint diseases, including gout, pseudogout, osteoarthritis, rheumatoid arthritis, and rotator cuff degeneration. You will work together with clinicians to retrieve samples and analyze the data.

Contact

The main contact for this assignment is PhD-candidate Tom Niessink. You can reach him at t.niessink@utwente.nl