In order to achieve the ultimate strength in fibers, it is mandatory to achieve the highest possible alignment of the constituent polymers. However, the achievement of high Herman’s orientation parameter can be hampered by many reasons, e.g. working against the polymeric conformational entropy (entropy spring) needing efficient post stretching and “conformational locking”. Occasionally the unfavourable entanglements in the constituents may hamper efficient stretching. Particularly in cellulosics, it would be highly interesting to explore fibers if the chains would be (almost) fully aligned and stretched, which is highly challenging. To overcome the challenges, in this work we pose the hypothesis whether supramolecularly modified sugar chains would allow high alignment in liquid crystalline spinning, resulting in good mechanical properties.

Your work would be to study liquid crystals with polarized optical microscope and to measure mechanical properties of the possible fibers. You don’t have to have expertise of the said measurements, but experience in laboratory work and scientific measurements are favourable. Good communication skills in Finnish or in English is required. It may be possible to include the work in your B.Sc. or M.Sc. thesis, depending on your situation.

For more information of the project, don’t hesitate to contact teemu.myllymaki@aalto.fi

*Don’t be afraid of the abbreviations in the figure, everything will be explained to you when you start in the lab.