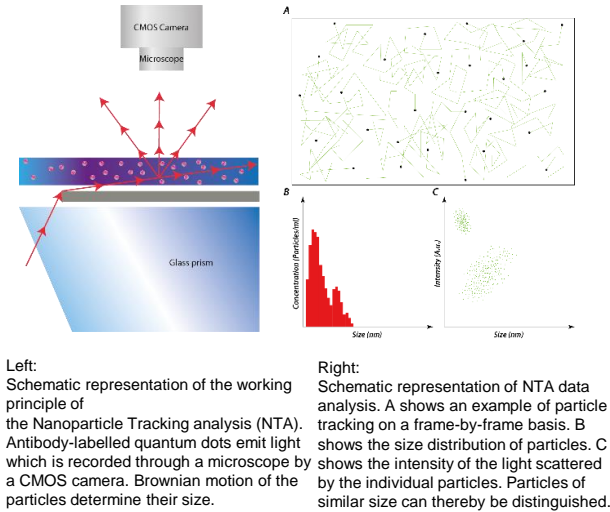


## Improving the Value of New Biomarkers in Companion Diagnostics

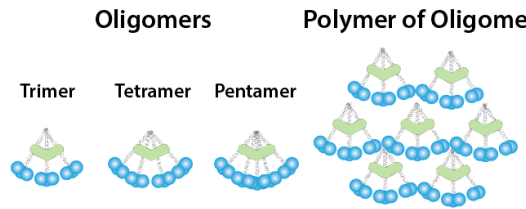
### Value Proposition and Field of Application

Biomarkers for diagnosis of autoimmune diseases are often low in specificity, sensitivity, or both and are therefore usually included in matrices of several biomarkers that give an overall assessment of disease status. These matrices consist of many biomarkers quantified using similar techniques, because of this, new biomarkers are often correlated with already established ones and the added value of the new biomarkers are therefore often low. We propose here a completely different assessment of biomarkers not only based on the concentration of proteins but also on size and structure. This adds significant new value to existing and new biomarkers within autoimmune diseases. The size and structure of immune proteins can change their potency by a factor greater than  $10^6$ .

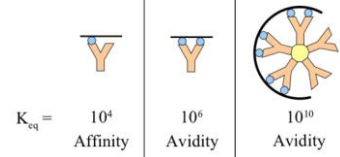
#### How to Determine Protein size?



#### Oligomerization of Proteins Determine Potency



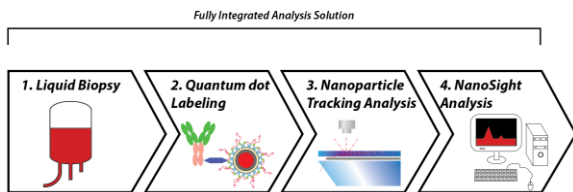
Several proteins in plasma have so-called oligomeric structure. This oligomerization greatly affects the potency of these proteins to bind their ligand. If a protein oligomerizes the absolute concentration can be unaffected while the activity is multiplied by many factors. NIP-Q can detect this change in oligomerization and give a better image of the activity of the proteins.



### Technology Description

Our setup can be divided into four steps:

- 1: Obtain a liquid biopsy from the patient e.g. blood plasma.
- 2: Label specific antibodies against the desired protein.
- 3: Run NTA to determine concentration, size, and shape of the immune complexes
- 4: Analyze results using NanoSight to determine the size-region of interest.



Priority application filed November 2019.

### Team



PhD-Student  
Kristian Juul-Madsen  
Application of Technique



Professor  
Thomas Vorup-Jensen  
Development of Technique



Post-Doc  
Anne Margrethe Trolborg  
Collection of Patient Samples

The Inventors are a mixed of three different groups with leading competences within nanoscience of proteins, autoimmune diseases and clinical practice of biomarker analysis.



Chief Physician  
Kristian Steengaard-Pedersen  
Collection of Patient Samples



Department Chair of Clinical Medicine  
Holger Jon Møller  
Development of Technique

All senior inventors have previous experience with commercialization of patented research.

### Current State

NIP-Q has been validated for improving the value of one biomarker for diagnosis of SLE in a cohort consisting of 39 patients and 14 controls. Currently, NIP-Q is being evaluated for the use of improving other biomarkers in rheumatoid arthritis.

### Call to action

We are looking for an experienced partner within treatment of autoimmune diseases to expand the validation of our technology and in the long term implement NIP-Q as a key tool for companion diagnostics in the clinic.

