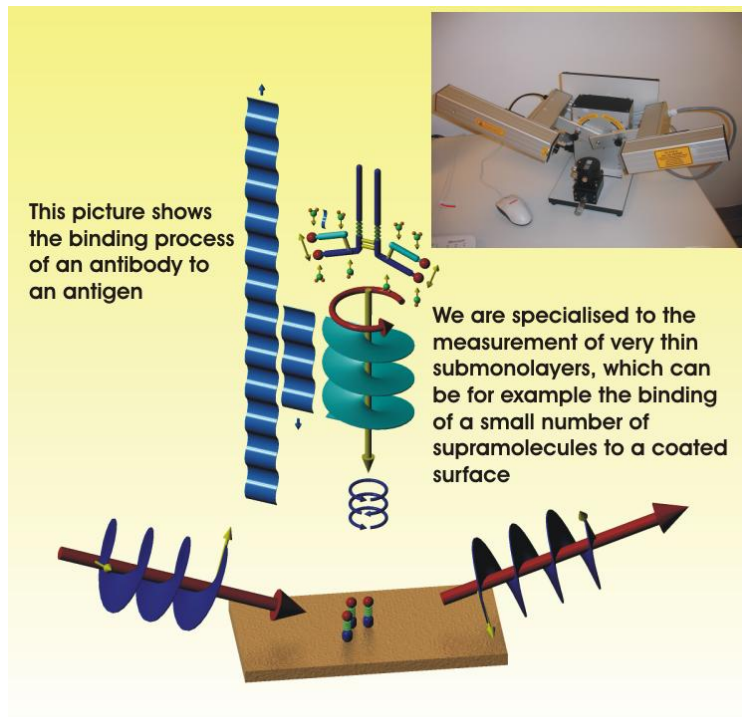


## Theory of long Distance Interaction between Antibodies and Antigens

The theory is published in European Biophysics Journal (DOI: 10.1007\_s00249-011-0718-z)

<http://www.springerlink.com/content/bp51256171800570>

According to our theory antibody have an electrodynamic detection system for antigens, a steering unit based of technical mechanics and a drive.



Measuring the kinetics of antibody antigen interactions we found that there is a long distance attraction of antibodies to antigens. For high concentration of antigens on a surface this long distance can have a reach of 2 mm or more.

The EL X-02 BIII ellipsometer is optimized to such antibody antigen measurements.

The following effects are proves of the theory:

1. Alexandre Rothen found in 1946 that buried antigens are attracting antibodies
2. Ellipsometric measurements with recombinant antigens and human antibodies showed a straight line at the beginning of kinetics which is caused by the long distance effect
3. Ellipsometric measurements with bound antibodies and marked anti-antibodies showed no straight line of kinetics
4. Antibodies are binding to a 8 nm membrane even if there is no direct contact possible between antibodies and antigens
5. If Antibodies have same binding sites for light chain and heavy chain, this increases affinity 10 fold
6. If both binding sites are similar, affinity is increases by a factor of 10
7. Single-Chain antibodies developed from full size antibodies work only with a definite linker
8. Structures taken from phage display can only be used for scFV single chain antibodies if the linker has a definite length and elasticity (flexibility)
9. Three binding loop Structures taken from phage display can only be used for scFV single chain antibodies if the linker has a definite length and elasticity (flexibility)