Detection of human Immunoglobulin E(hIgE) using surface plasmon resonance

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Allergy is a common disease suffering 10-20% of the general population worldwide and caused by exposure of the skin to a chemical, the respiratory system to dust or pollen or the digestion system to a food. In 1960s immunoglobulin E (IgE) has been identified as being closely associated in mediating hypersensitivity. On the surface membrane of basophiles and mast cells in all individuals IgE make these cells highly sensitive to stimulation by IgE antibody-allergen interaction. This reaction is the key to IgE-mediated allergy. Therefore total IgE serum level is widely reported as a marker of atopic disease. High level of total Immunoglobulin E in a human serum reflects the presence of allergic conditions. Human Immunoglobulin E is detected by the Immunoglobulin E aptamer, which is oligonucleotide (DNA or RNA) that can bind with high affinity and specificity to a wide range of target molecules. On the Surface Plasmon Resonance (SPR) chip, self assembled monolayer of ethylene glycol and modified synthetic aptamers make bio-chemical interface by biotin streptavidin interaction. A high affinity aptamer could detect below 1ng/ml IgE through the SPR instrument.