Researchers mimic body's own healing potential to create personalised therapies for inflammation

April 4 2011

Scientists at Barts and The London School of Medicine and Dentistry and Harvard Medical School, Boston have found a way of mimicking the body's natural mechanism of fighting inflammation. During inflammation cells release very small particles termed 'microparticles' that retain features of their parent cell. The scientists discovered that certain microparticles were beneficial to health, and that these microparticles contained anti-inflammatory lipids, which help terminate inflammation and return the body to its normal balance.

The discovery, featured online in the current edition of the Journal of Immunology, paves the way for new personalized treatments to target uncontrolled inflammation that need not rely on synthetic biomaterials, therefore reducing potential toxicity.

Inflammation of joints and muscles is implicated in many human diseases including cardiovascular disease, arthritis and temporomandibular disorders and its treatment remains an unmet medical need.

Led by Dr Lucy V Norling (a Foundation Fellow of the Arthritis Research UK), researchers from the William Harvey Research Institute at Barts and The London School of Medicine and Dentistry and Harvard Medical School (laboratory of Professor CN Serhan) investigated the properties of microparticles during inflammatory episodes showing them

to contain beneficial lipids (fat molecules) that are precursors for compounds that stimulate the resolution of an inflammatory episode. The researchers then mimicked this natural communication process to make a new personalized delivery system for anti-inflammatory therapeutics based on natural human microparticles instead of synthetic biomaterials, which bring adverse immunotoxic effects.

The many benefits of these humanized particles, coined 'nano-proresolving medicines' are that they can be loaded with anti-inflammatories (e.g. resolvins or other small molecules) to enhance their protective bioactions.

Dr Norling said: "These results uncover a novel way of targeting anti-inflammatories therapeutics to the site of inflammation using a natural delivery system. I think this new mode of delivery could have application for numerous inflammatory diseases including those of the joint such as arthritis and temporomandibular disorders. "

Provided by Queen Mary, University of London