

Peptides conjugated to gold nanoparticles induce macrophage activation

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Macrophages that react against pathogenic organisms can also be activated with artificial nanometric units consisting of gold nanoparticles (Au NPs) with a peptide coating. Using bone marrow-derived macrophages, here we show that these cells have the capacity to recognize Au NPs once conjugated to two biomedically relevant peptides, the amyloid growth inhibitory peptide (AGIP) and the sweet arrow peptide (SAP), while they do not recognize peptides or NPs alone. The recognition of these conjugates by macrophages is mediated by a pattern recognition receptor, the TLR-4. Consequently, pro-inflammatory cytokines such as TNF- α , IL-1 β and IL-6, as well as nitric oxide synthase were induced and macrophage proliferation was stopped when exposed to the peptide-conjugated Au NPs. Contamination by lipopolysaccharide in our experimental system was excluded. Furthermore, macrophage activation appeared to be independent of peptide length and polarity. As a result of macrophage activation, conjugated