

## Abstract

Nanoparticles represent a promising material for nanomedicine applications. However, they must meet certain requirements to be eligible for clinical trials. Despite optimization of the ADME profile which determines biodistribution in organs, the exact control of the circulation period in the bloodstream and removing them from the body after they perform their function remains problematic. In order to address this issue, we have applied *click* reaction to control elimination of nanoparticles from the bloodstream and/or from the organs. A library of clearing probes (BCN) was created and the impact of *click* reaction on both the internalization of PLGA polymer nanoparticles in microglia cells and the possibility of controlling their biodistribution and elimination from the body was investigated in mouse. Obtained data indicate that BCN probes are reactive reagents for *click* reaction for diverse azide-functionalized chemical targets and differentially affect internalization of Cy5.5 PLGA nanoparticles carrying azide group. *In vivo* experiments although not conclusive provided preliminary data for further development of this technology. The *click* reaction could become an excellent tool to control the biodistribution of nanoparticles in a living organism, which could be a breakthrough in the use of nanomaterials in medicine.

**Keywords:** *click* chemistry, nanoparticles, BCN, ADME profile, cellular uptake