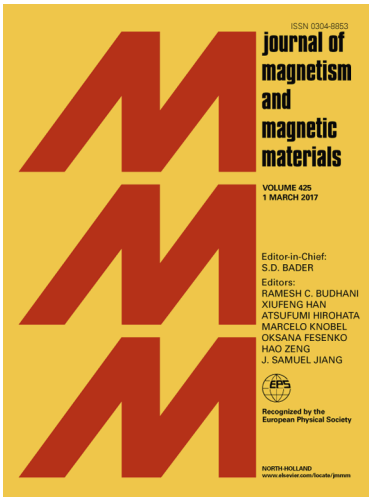

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PII: S0304-8853(18)31813-4
DOI: https://doi.org/10.1016/j.jmmm.2018.10.022
Reference: MAGMA 64433

To appear in: *Journal of Magnetism and Magnetic Materials*

Received Date: 21 June 2018
Revised Date: 4 October 2018
Accepted Date: 4 October 2018

Please cite this article as: M. Mühlberger, C. Janko, H. Unterweger, E. Schreiber, J. Band, C. Lehmann, D. Dudziak, G. Lee, C. Alexiou, R. Tietze, Functionalization of T lymphocytes for magnetically controlled immune therapy: selection of suitable superparamagnetic iron oxide nanoparticles, *Journal of Magnetism and Magnetic Materials* (2018), doi: https://doi.org/10.1016/j.jmmm.2018.10.022

Functionalization of T lymphocytes for magnetically controlled immune therapy: selection of suitable superparamagnetic iron oxide nanoparticles

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Word count abstract: **288**
Number of figures: **7 (+ supplementary data 4)**
Number of references: **25**

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Abstract

According to the World Health Organization, cancer is the second most important cause of death in Europe. Due to its manifold manifestations, it is not possible to treat all patients according to a uniform scheme. However, all solid tumors have one thing in common: independent of the tumor`s molecular subgroup and the treatment protocol, the immune status of the tumor, especially the amount of tumor infiltrating lymphocytes (TILs), is important for the patient`s clinical outcome - the higher the number of TILs, the better the outcome. For this reason it seems desirable to increase the number of TILs.

One way to accumulate T cells in the tumor area is to make them magnetizable and attract them with an external magnetic field. Magnetization can be achieved by superparamagnetic iron oxide nanoparticles (SPIONs) which can be bound to the cells' surface or internalized into the cells.

For this study, SPIONs with different coatings were synthesized and incubated with immortalized mouse T lymphocytes. SPIONs only stabilized with lauric acid (LA) coated *in situ* or afterwards