Sorting $CD4^+$ T cells in blood by using magnetic nanoparticles coated with anti-CD4 antibody

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Abstract: We used Fe_3O_4 magnetic nanoparticles (MNPs) which are coated with antiCD4 monoclonal antibody to bind selectively onto membranes of $CD4^+$ T cells (hereafter antiCD4-MNPs). The antiCD4-MNPs were prepared through direct covalent interaction between the carboxyl group of the antiCD4 antibody and the amino group of amino-modified MNPs. The antiCD4-MNPs were mixed with human blood cells, followed by bursting the red blood cells with hypotonie buffer; then, the antiCD4-MNPs coated cells were separated by using a magnet. We observed the number of cells bound with magnetite clusters and particles. When fluorescence isothiocyanate labeled antiCD4-MNPs was used to observe the $CD4^+$ T cells, the fluorescent intensity was improved by about two times compared to that when cells were labeled with the antiCD4 antibody only. This is a potential method to sort helper $CD4^+$ T cells for observation under conventional microscopes.

Author Keywords: AntiCD4 antibody; $CD4^+$ T cell; Fluorescence; Magnetic nanoparticles

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