Cancer Application Using Magnetosomes

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The magnetosomes are specific organelles of the Magnetospirillum magneticum(Magnetotactic bacteria), representing intracellular chain of magnetite(iron oxide) particles. The magnetotactic bacteria use the property of the magnetosomes to guide itself through the geomagnetic field and it can be found in the OATZ(oxic anoxic tranzition zone) The main porpouse of our project is to use the magnetosomes's magnetic properties and an external magnetic field to generate enough heat(Over 42°C) by the principle of magnetocaloric effect to induce the ablation of cancer cells. In other words we want to create a new efficient hyperthermia method. First process was the extraction the magnetosomes from the magnetic bacteria by destroying the cell membrane using ethanol and then the separation of the magnetosomes by moving them to another vial using a permanent magnet. Second experiment was the usage of an external magnetic field to increase the temperature of the magnetosomes from the vial, resulting in a significant increase of temperature.

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