Project Title:	*Evaluation of experimental conditions for the use of nucleic acid enzymes combined to magnetic particles for the detection of food-borne pathogens*
Project Short description	Nucleic acid enzymes are composed of single strands of DNA or RNA that are capable of catalyzing several types of reactions, such as cleavage, ligation, phosphorylation, and deglycosylation of RNA or DNA. Those reactions can take place in presence of a target analyte that produces a change in the conformation of the nucleic acid strand. Several strategies based on the use of this nucleic acid enzymes have been developed in the literature in order to perform rapid detection of pathogens, which have a high impact in the food industry, public health and economy. However, there are still many experimental variables that affect the behavior of these nucleic acid enzymes that need to be explored in order to get the maximum benefits. Thus, in this project, the master student will evaluate and study the experimental parameters affecting the response of nucleic acid enzymes in order to increase their enzymatic activity as much as possible, and will apply the results to the detection of food-borne pathogens in food samples. The student will get experience working with magnetic nanoparticles (used as transductors for the detection with a magneto-resistive platform), DNA extraction from bacteria and sample preparation.
Expected Start/end date	January 2015-June 2015
Required degree and Background knowledge of students, minimum gradepoint average, etc…	Master students eligible for this project will have a degree in Chemistry, Biology, Biochemistry, Biotechnology or Nanotechnology. Applicants with any other degree will be asked to send a justification of the reasons why he/she are good candidates to work in this project. It is also desirable that the students have coursed master subjects related to nanotechnology, food or biotechnology. Students should have an English level equivalent to the level B1 of the common European reference for languages.

Supervisor at INL

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