



Research Project Proposal
Academic year 2021-2022
Máster en Investigación Biomédica

Project Nº 40		
Title: Role of denitrification in <i>Brucella</i> pathogenesis		
Department/ Laboratory Laboratory where the project will be carried out indicating Department of Microbiology and Parasitology		
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<p>The members of the genus <i>Brucella</i> are α-2 Proteobacteria that cause brucellosis, an important disease affecting livestock and wild life as well as human beings. These bacteria follow a stealthy behavior that allows them to reach sheltered intracellular niches. To reach this intracellular niche, <i>Brucella</i> copes with different intracellular stresses such as oxidative and nitrosative stress. Once it reaches the intracellular niche, <i>Brucella</i> multiplies extensively in an ER- derived compartment. Among the adaptations that intracellular pathogens have to make in order to multiply inside vacuoles, the ability to obtain energy under conditions of low oxygen tension stands out. <i>Brucella</i> has been described as a facultative anaerobic genus capable of respiring nitrate. Although <i>Brucella</i> has the genetic capacity to carry out complete denitrification ($\text{NO}_3^- \rightarrow \text{N}_2$), it is not clear whether it carries out this type of respiration and it has been postulated that genes involved in the last steps of the process ($\text{NO} \rightarrow \text{N}_2$) may be involved in coping with nitrosative stress.</p> <p>The goals of this project are:</p> <ol style="list-style-type: none"> 1) To study the nitrate respiration of <i>Brucella</i>. 2) To study <i>Brucella</i> strategies to deal with nitrosative stress. 3) To connect the results obtained in 1 and 2 with <i>Brucella</i> virulence. <p>To achieve these objectives, we propose to construct mutants in the genes of interest and to analyze the phenotype of the mutants in different <i>in vitro</i> and <i>in vivo</i> conditions.</p>		
yes	<input checked="" type="checkbox"/>	Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?
no	<input type="checkbox"/>	