Influence of food matrix composition upon foodborne *Listeria monocytogenes* infection
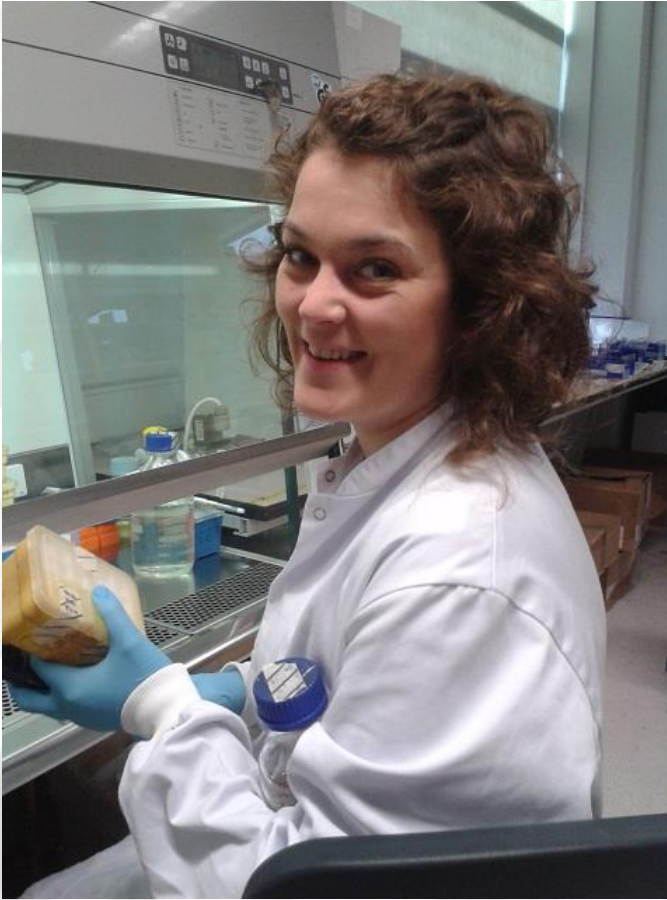

Undergraduate projects:

qPCR optimization for forensic proposes (DNA amplification technique)

Bioprocessing: single cell analysis and population dynamics during biological production of compound of value

My name is Vanessa Las Heras and I am 23 years old. I am from south of Portugal, where I also studied my bachelor in Biotechnology, in Algarve University. In the last year of bachelor I integrated the ERASMUS program and went to Lund University, in Sweden, where I also made my Master degree in Biotechnology engineering.

I am currently working as a PhD student at University College of Cork, in Ireland. My topic of research is the influence of food matrix composition upon foodborne *Listeria monocytogenes* infection. My project will allow understanding how food components, such as fat, carnitine and glutamate, influence the pathogen adaptation during infection in the gastrointestinal tract.

Why am I doing it?

Listeria monocytogenes is a dangerous food born pathogen, representing a treat to humans and a huge cost for medical treatment and for food industry. For this reason it is necessary understand the biology of this organism and focus on the virulence aspects and how they are influenced by the host's diet. Carnitine is a compound that is present in processed meat foods (such as sausage and pates), and has been proven to interact with the virulence factors of *Listeria* acting as an osmo protectant, allowing adaptation during infection in the small intestine. For this reason carnitine will be my focus in this study. Furthermore due to the alimentary changes in the current society it is of relevance to consider the impact of a high fat diet on the pathogen infection, since it has been proven that this diet increases cellular permeability.

What am I doing?

My project will allow understanding, in an *in vivo* model, how the virulence is affected by the different environments and the presence of other microorganisms inside the gastrointestinal tract. Furthermore I will also focus on the effect of diet in the microbiota and in the expression of the virulence factors of *Listeria* monocytogenes. Having this in mind I will be able to correlate how *Listeria* interacts with the surrounding microbiota, which environments are more favourable and how food components allow adaptation to unsuitable conditions (such as low pH and high osmolarity).

How am I doing it?

For this project I will feed mice with a high fat and a high carnitine diet and compare, with the normal diet, how virulence is affected and which organisms are present in the microbiota by studying the mice liver, spleen, lymph nodes and faeces.
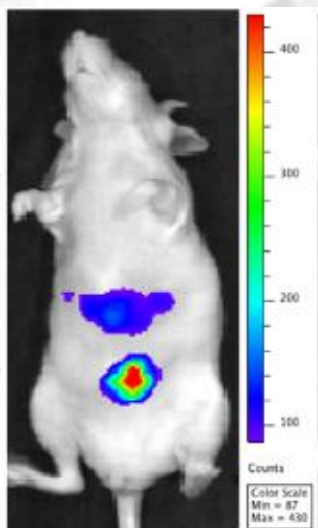
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