ImmunoTools *special* Award 2018

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Immune response characterization of a pharmaceutical product

Introduction:

Acinetobacter baumannii is a bacterial pathogen that has emerged in the last decades as one of the biggest nosocomial preoccupations. Nowadays, the World Health Organization considers the hospital infections provoked by this bacterium as “critical”.

The concerning about *A. baumannii* rises from the capacity of the bacteria to develop resistances against antibiotics. Some strains even are considered pan resistant, which means that are resistant against all kind of antibiotics.

Therefore, alternative treatments must be discovered to cure or to avoid the nosocomial infections provoked by *A. baumannii*. The project in which I am involved has arisen to develop a vaccine as a prophylactic treatment of this kind of infections.

Project:

The product consists of *A. baumannii* whole bacteria strain that lacks the lipopolysaccharide that covers the cell. This deficiency allows the immune response to be directed against membrane proteins that are more conserved in the genome of the bacteria than the lipopolysaccharide. Also, an adjuvant has been added to improve the efficacy of the product.

The vaccine has proved efficacy in a sepsis murine model in which produced complete protection of the animals against *A. baumannii* infection compared with non-treated group of animals in which died the 90% of the individuals.

Furthermore, we have characterized this product with *in-vitro* assays and we are developing all the assays required to measure the quality of the product and the batches that will be produced in the future.

Use of ImmunoTools award:

The next step is to study the immune response to this vaccine formula in a mouse model. Specifically, we want to compare the response in mice infected with *A.*

baumannii that were previously vaccinated with the final formulation, the vaccine without adjuvant and a group of non-treated animals to the untreated and non-infected animals. Samples from non-infected animals without previous vaccination will be used as control group. From these animals we will obtain the spleen and the lymph nodes proximal to the injection site to analyze the immune response induced by each vaccine formulation.

We will use flow cytometry that uses of fluorescently labeled monoclonal antibodies to characterize the phenotype of responding immune cells. Therefore, we would use the following antibodies:

APC labeled: CD3ε, isotype
PE labeled: CD4, CD8α, NK cells, TCRαβ, CD45R, CD45, CD44, CD49d, isotype
FITC labeled: CD8α, CD25, CD62L, CD40L, Gr-1, TCRγδ, CD19, CD80, CD90, isotype

We will also analyze the cytokine secretion profile of these cells to identify the T effector cell populations involved in the immune response. We would like to measure IL-17 using the mouse ELISA-set mouse IL-17A.

Conclusions

To sum up, we want to participate in this contest to use different kind of ImmunoTools products to characterize the immune response produced by the vaccine develop in this project.

After the pre-clinical phase in which we are working, the vaccine will enter a clinical test phase. By then we are hoping to have achieved a deeper understanding on how the different components of the product interact with immune system.

ImmunoTools *special* AWARD for **Carlos Berrio**

includes 25 reagents

FITC - conjugated anti-mouse CD8α, CD25, CD62L, CD40L, Gr-1, TCRγδ, CD19, CD80, CD90, Control IgG1

PE - conjugated anti-mouse CD4, CD8α, NK cells, TCRαβ, CD44, CD45, CD45R, CD49d, Control IgG2a, Control IgG2b

APC - conjugated anti-mouse CD3ε

mouse ELISA-set (for one 96 plate): mouse IL-17A

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