ImmunoTools IT-Box-139 Award 2013

Catarina Mota

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Towards the therapeutic use of Regulatory T Cells for the treatment of Autoimmune Diseases

Regulatory T cells (Treg) constitutively expressing the transcription factor Foxp3 are central regulators of peripheral immune responses. Manipulation of the Treg compartment in humans, either by increasing their thymic output or by adoptive transfer, is a quite promising therapeutic approach in several clinical settings. Particularly in autoimmune diseases (AID), animal models suggest that an increase in Treg cell number is likely to be therapeutic. The main purpose of my PhD Project is to establish efficient protocols for human Treg expansion and *in vitro* differentiation of conventional T cells into Treg to facilitate Treg-based immunotherapy in AID settings. With this purpose, we will assess the role of distinct signaling pathways in the expansion and *in vitro* differentiation of human peripheral Treg. To assess the role of the selected signaling pathways in human Treg expansion and *in vitro* conversion, we will sort-purify Treg and non-regulatory T cells based on a combination of expressed cell-surface markers such as CD4, CD25, CD127 and CD45RA and we will culture the previous populations in conditions described as favoring FOXP3 expression/ induction, activating simultaneously the selected signaling pathway. We will look for the expansion of Treg pool and the differentiation of non-regulatory T cells into FOXP3-expressing cells, monitored by FACS, along with the expression of other Treg-associated markers, such as CD25, CD39 and CTLA-4.

To validate the *in vitro* efficacy of the expansion and induction protocols obtained in a relevant AID setting, we will purify non-regulatory CD4 T cells as well as Treg from the peripheral blood of systemic lupus erythematosus patients and age-matched healthy donors and we will then stimulate each population under the optimized conditions established before.

The ImmunoTools Award would be a valuable and important contribution to the development of my PhD Project, considering the extensive cell sorting and flow cytometry acquisition protocols required. The ImmunoTools Award would therefore be instrumental to our purpose of establishing efficient protocols for human Treg expansion and *in vitro* differentiation for future use in adoptive immunotherapy of AID.

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ImmunoTools *IT-Box-139.2* for **Catarina Mota** includes 100 antibodies

FITC - conjugated anti-human CD1a, CD3, CD4, CD5, CD6, CD7, CD8, CD14, CD15, CD16, CD19, CD21, CD25, CD29, CD35, CD36, CD41a, CD42b, CD45, CD45RA, CD45RB, CD45RO, CD49d, CD53, CD57, CD61, CD63, CD80, CD86, HLA-DR, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE - conjugated anti-human CD3, CD4, CD8, CD11b, CD15, CD14, CD18, CD19, CD20, CD21, CD22, CD31, CD33, CD38, CD40, CD45, CD45RB, CD50, CD52, CD56, CD58, CD62p, CD72, CD95, CD105, CD147, CD177, CD235a, HLA-ABC, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE/Dy647 -tandem conjugated anti-human CD3, CD4, CD8, CD14, CD19, CD20, CD25, CD54

APC -conjugated anti-human CD2, CD3, CD4, CD8, CD10, CD11a, CD11c, CD14, CD16, CD27, CD37, CD42b, CD44, CD45, CD59, CD62L, CD69, CD71, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

DETAILS