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# Abstract B85: Quantification of sprouting angiogenesis under the effect of different growth factors involved in the tumor microenvironment

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DOI: 10.1158/2326-6074.TUMIMM16-B85 Published March 2017

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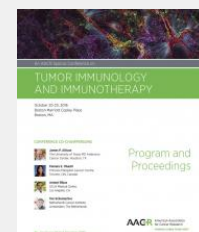
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Abstracts: AACR Special Conference on Tumor Immunology and Immunotherapy; October 20-23, 2016; Boston, MA

## Abstract

One of the most important problems in tumor control is the management of metastatic process. Angiogenesis or the formation of new blood vessels from preexisting ones plays a crucial role in the expansion of the tumor by providing oxygen, nutrition and conduits for cancer



March 2017  
Volume 5, Issue 3 Supplement  
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cells to invade and metastasize new tissues<sup>1</sup>. Abnormalities of growth factors (GFs) released such as PDGFs (Platelet Derived Growth Factor) could be involved in malignant human diseases<sup>2,3</sup>. Inflammation and cancer present similar mechanisms of development including angiogenesis or cell proliferation<sup>4</sup>. In order to know the effect on sprouting promotion of GFs existent in the tumor environment such as VEGF (Vascular Endothelial Growth Factor), PDGF, BMP2 (Bone Morphogenetic Protein 2) or TGF- $\beta$  (Transforming Growth Factor- $\beta$ ), we have developed a microfluidic-based test based on devices designed by Farahat et al. (2012)<sup>5</sup>, which allows to the user the quantification of sprouting formation under the effect of these GFs. TGF- $\beta$  pathway involved in tumor progression in multiple human cancers, instigates phenotypical changes affecting to the cell growth, differentiation and migration<sup>6</sup>. Knowing the overexpression of GFs such as VEGF or BMP2 in tumors<sup>7,8</sup>, we aimed to compare its effect on endothelial cells in angiogenesis. Analyzing the promotion of sprout in normal conditions under GFs addition would be possible to determine which of these molecules could decrease or promote the advance of the endothelial cells. The results obtained in this work indicated that VEGF is the most important factor to enhance the angiogenic process while non-specific factors such as BMP2 or TGF- $\beta$  show a low effectiveness. In the case of PDGF, the negative effect of this molecule observed in our assays could be explained by the non-optimal balance of concentration. Furthermore, we are currently working to quantify the effect of fluid flow on the sprouting promotion.

**Acknowledgments:** This research was supported by the European Research Council (ERC) through project ERC-2012-StG 306751, the Spanish Ministry of Economy and Competitiveness (DPI2015-64221-C2-1-

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**Citation Format:** Cristina Del Amo Mateos, Carlos Borau Zamora, Jesús Asín Lafuente, José Manuel García Aznar. Quantification of sprouting angiogenesis under the effect of different growth factors involved in the tumor microenvironment. [abstract]. In: Proceedings of the AACR Special Conference on Tumor Immunology and Immunotherapy; 2016 Oct 20-23; Boston, MA. Philadelphia (PA): AACR; *Cancer Immunol Res* 2017;5(3 Suppl):Abstract nr B85.

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