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Hepatic non-parenchymal cells: Accomplices to the liver colonization during metastatic progression

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The liver represents the main target for metastatic colorectal carcinoma cells and the second more commonly invaded organ after the lymph nodes. The complex network of vessels and microcapilaries, known as liver sinusoids makes this organ the perfect target for circulating cells released from the primary lesion. Along with CRC, gastric cancers metastasize mainly to the liver. However, although less common, circulating cells from other primary malignancies such as melanoma, breast or neuroendocrine tumors also adhere, establish and develop in the liver, giving rise to metastases.

The metastatic progression, one of the key factors limiting the survival rate and one of the most complex scenario medicine has to cope with, is a highly complex cascade of events influenced by a wide variety of mediators. Among the leading actors participating in this process, adhesion molecules expressed both on cancer cells and on target organ cells play a crucial role, generating the first cell-cell contacts that will end up with cancer cell extravasation and organ colonization. Additionally, these proteins may also act as signaling molecules able to modulate the local microenvironment to a prometastatic one, and trigger an angiogenic and a desmoplastic response by means of a reciprocal dialogue between the tumor cells and those ones residing in the organ to be colonized. In this scenery, the relevance of multiple cancer cell accomplices in the target organ remains poorly characterized, bearing in mind that, as postulated by the “seed and soil” theory, host organ-specific adhesion molecules are required for the switch towards the disease progression. This lecture will mainly focus on some of the various events taking place in the metastatic cascade driving to the colonization of the liver by circulating tumor cells and how he dialogue kept with hepatic non parenchymal cells modulates the liver microenvironment turning this organ into a welcoming target to metastasize.

Short biography

Prof. Beatriz Arteta

Current Post. **Associate Professor**
December 2012 – ongoing

Employer **University of Basque Country**
School of Medicine and Nursing -
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Previous Posts

Position Held	Institution	Dates
Postgraduate student	University of Basque Country - Spain	1994-1996
Postgraduate Erasus fellow	University of Tromso - Norway	1-1997/9-1997
Research assistant	University of Tromso - Norway	9-1997/6-2001
Research staff	University of Basque Country - Spain	12-2001/2-2002
Research assistant	University of Tromso - Norway	3-2002/8-2002
Research staff	University of Basque Country - Spain	9-2002/12-2003
Research assistant	University of Tromso - Norway	1-2003/9-2003
Research assistant	University of Tromso - Norway	4-2003/9-2003
Postdoctoral fellow	University of Basque Country - Spain	9-2003/9-2005
Research staff	University of Basque Country - Spain	2005/2010
Temporary assistant professor	University of Basque Country - Spain	2010/2012

Educational qualifications

Degree type	University	Year
Graduate in Biological Sciences	School of Science and Technology – University of Basque Country	1991
Doctor in Biological Sciences	School of Science and Technology – University of Basque Country	2001

Past and present membership of professional societies:

- American Association for Cancer Research (AACR).
- International Society for Cells of the Hepatic Sinusoids (ISCHS).
- Spanish Association of Gastroenterology (AEGASTRO)
- European Association for Cancer Research (EACR).
- Spanish Association for Histology and Tissue Engineering (SEHIT)

Student supervision:

Ph.D. Students:

- Completed: Aitor Benedicto (2014).
- Current students: Alba Herrero (Year 2), Iera Hernandez (Year 2).

Master students:

- Iris Aja (2014), Katrin Pietsch (2015), Alba Herrero (2015), Miriam Gonzalez (2016).

Undergraduate students:

- Mercedes Gonzalez (BSc. Bq Sci - 2015), Andoni Pineda (BSc Med Sci - 2016).

Relevant publications:

Submitted:

- Benedicto A, Romayor I, Arteta B. Liver ICAM-1: From loyal friend to metastasis ally. Submitted to Int J Cancer.(Dec 2016)
- Aitor Benedicto, Joana Marquez, Alba Herrero, Elvira Olaso, Elzbieta Kolaczkowska, Beatriz Arteta*. Decreased Expression of the ß2 Integrin on Tumor Cells Is Associated with a Reduction in Liver Metastasis of Colorectal Cancer in Mice. Submittedto BMC Cancer. (Dec 2016)

In Press:

- Beatriz Arteta*, Antonia Alvarez, Joana Marquez, Aitor Benedicto and Enrique Hilario. Frontiers in Stem Cell and Regenerative Medicine Research, 2017, Vol. 4, 3-29. (In Press).
- Hernandez-Unzueta Iera, Benedicto Aitor, Olaso Elvira, Sanz Eduardo, Viera Cristina, Arteta Beatriz* and Márquez Joana*. Oncology Letters (In press).

Accepted Research Articles:

- Elvira Olaso, Joana Marquez, Aitor Benedicto, Iker Badiola, Beatriz Arteta. Discoidin Domain Receptors in Liver Fibrosis. In “Discoidin Domain Receptors in Health and Disease. Editors: Rafael Fridman, Paul H. Huang. (2016): 293-313. ISBN: 978-1-4939-6381-2
- Márquez J, Mena J, Hernandez-Unzueta I, Benedicto A, Sanz E, Arteta B, Olaso E. Ocoxin® oral solution slows down tumor growth in an experimental model of colorectal cancer metastasis to the liver in Balb/c mice. Oncol Rep. 2016 Mar;35(3):1265-72. doi: 10.3892/or.2015.4486.

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- Ramirez-Garcia A, Arteta B, Abad-Diaz-de-Cerio A, Pellon A, Antoran A, Marquez J, Rementeria A, Hernando FL. Candida albicans increases tumor cell adhesion to endothelial cells in vitro: intraspecific differences and importance of the mannose receptor. PLoS One. 2013;8(1):e53584. doi: 10.1371/journal.pone.0053584.
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- Pérez-Garay M, Arteta B, Pagès L, de Llorens R, de Bolòs C, Vidal-Vanaclocha F, Peracaula R. alpha2,3-sialyltransferase ST3Gal III modulates pancreatic cáncer cell motility and adhesion in vitro and enhances its metastatic potential in vivo. PLoS One. 2010 Sep 1;5(9). pii: e12524. doi: 10.1371/journal.pone.0012524.
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