



RESEARCH TOPIC MEM10

Epithelial-to-mesenchymal transition at the crossroad of inflammation and tumorigenesis Curriculum MEM

Laboratory name

Fibrosis and tumorigenesis, IRCCS Humanitas Research Hospital

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Abstract

Inflammatory Bowel Disease (IBD) represents a predisposing factor for the development of colitis-associated cancer (CAC).

Epithelial-to-mesenchymal transition (EMT), an embryonic cellular trans-differentiation program relaunched during fibrosis and cancer, has been observed in the inflamed mucosa and surrounding fibrotic areas in IBD biopsies and in animal models of experimental colitis. Whether EMT functionally contributes to the pathogenesis of IBD or promotes the development of precancerous changes in the injured intestinal epithelium that lead to the development of CAC is currently unknown. The overall objective of this proposal is to determine the functional consequences the activation of the EMT program has in terms of epithelial injury response, modulation of inflammation and oncogenic potential.

Main technical approaches

Cellular and molecular biology, use of in vivo preclinical models, histology, flow cytometry, confocal microscopy, image analysis.

Scientific references

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- 2) Lovisa S, Fletcher-Sananikone E, Sugimoto H, Hensel J, Lahiri S, Hertig A, Taduri G, Lawson E, Dewar R, Revuelta I, Kato N, Wu CJ, Bassett RL Jr, Putluri N, Zeisberg M, Zeisberg EM, LeBleu VS, Kalluri R. Endothelial-to-mesenchymal transition compromises vascular integrity to induce Myc-mediated metabolic reprogramming in kidney fibrosis. *Sci Signal.* 2020 Jun 9;13(635):eaaz2597. PMID: 32518142
- 3) Lovisa S, Genovese G, Danese S. Role of Epithelial-to-Mesenchymal Transition in Inflammatory Bowel Disease. *J Crohns Colitis.* 2019 Apr 26;13(5):659-668. PMID: 30520951.



4) Lovisa S, LeBleu VS, Tampe B, Sugimoto H, Vadnagara K, Carstens JL, Wu CC, Hagos Y, Burckhardt BC, Pentcheva-Hoang T, Nischal H, Allison JP, Zeisberg M, Kalluri R. Epithelial-to-mesenchymal transition induces cell cycle arrest and parenchymal damage in renal fibrosis. *Nat Med.* 2015 Sep;21(9):998-1009. PMID: 26236991

Type of contract

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