

Inflammation and Cancer: Organ-specific Regulation of Cancer Development

Lisa M. Coussens

Department of Pathology, Comprehensive Cancer Center, University of California, San Francisco, 2340 Sutter St., San Francisco, CA 94143 USA; Phone: 001-415-502-6378
e-mail: coussens@cc.ucsf.edu

The concept that leukocytes are components of malignant tumors is not new; however, their functional involvement as promoting forces for tumor progression has only recently been appreciated. We are interested in understanding the molecular mechanisms that regulate leukocyte recruitment into neoplastic tissue and subsequent regulation those leukocytes exert on evolving cancer cells. By studying transgenic mouse models of skin¹, lung² and breast cancer³ development, we have recently appreciated that adaptive leukocytes differentially regulate myeloid cell recruitment⁴, activation, and behavior, by organ-dependent mechanisms. Thus, whereas chronic inflammation of premalignant skin neoplasms is B cell-dependent, during mammary carcinogenesis, T cells appear to play more of a dominant role in regulating pro-tumor and pro-metastatic properties of myeloid cells. To be presented will be recent insights into organ and tissue-specific regulation of epithelial cancer development by adaptive and innate immune cells, and thoughts on how these properties can be harnessed for effective anticancer therapeutics.

1. Coussens, L.M., Hanahan, D. & Arbeit, J.M. Genetic predisposition and parameters of malignant progression in K14- HPV16 transgenic mice. *Am J Path* **149**, 1899-1917 (1996).
2. Magdaleno, S.M., *et al.* Cyclin-dependent kinase inhibitor expression in pulmonary Clara cells transformed with SV40 large T antigen in transgenic mice. *Cell Growth & Differentiation* **8**, 145-155 (1997).
3. Guy, C.T., Cardiff, R.D. & Muller, W.J. Induction of mammary tumors by expression of polyomavirus middle T oncogene: a transgenic mouse model for metastatic disease. *Mol Cell Biol* **12**, 954-961 (1992).
4. de Visser, K.E., Korets, L.V. & Coussens, L.M. De novo carcinogenesis promoted by chronic inflammation is B lymphocyte dependent. *Cancer Cell* **7**, 411-423 (2005).