Updated 9/12/11

CAMB 701-301
Course Syllabus
Fall 2011
Thursday 12-2pm, BRB 301
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I. Stroma (Weeks 1-4)

- 9/8: Intro to course/overview/expectations
  - 1st hour: **Ellen Pure Overview Lecture**

- 9/15 Tumor/stromal interactions
  - 1st hour: NF1 paper (Yang et al. 2008 – Wade Clapp lab as main paper; (Zhu et al., 2002, Luis Parada lab, secondary paper). Basil Bakir

- 9/22 Fibroblasts/pericytes
  - 1st 40 min: Bhowmick NA et al., TGF-beta signaling in fibroblasts modulates the oncogenic potential of adjacent epithelia, Science 2004 (Hal Moses lab). Jaijun Zhu
  - 2nd 40 min: Greenberg et al., A role for VEGF as a negative regulator of pericytye function and vessel maturation, Nature 2008 (David Cheresh lab). Bridget Sackey
  - 3rd 40 min: Trimboli et al., Pten in stromal fibroblasts suppresses mammary epithelial tumours. Nature 2009 (Gustave Leone lab). Will Cho

- 9/29 Extracellular matrix/proteases
  - 1st hour: Grugan et al., Fibroblast-secreted hepatocyte growth factor plays a functional role in esophageal squamous cell carcinoma invasion. PNAS, 2010 (Anil Rustgi lab). Nicole Aiello
  - 2nd hour: Ahn GO and Brown JM. Matrix Metalloproteinase-9 Is Required for Tumor Vasculogenesis but Not for Angiogenesis: Role of Bone Marrow-Derived Myelomonocytic Cells (Martin Brown lab) Albert Lo

- 10/6 Regulation of Metastasis:
  - 1st hour: Kaplan et al., VEGFR1-positive haematopoietic bone marrow progenitors initiate the pre-metastatic niche. Nature 2005. (David Lyden, Shahin Rafii lab) Bo Qiu
  - 2nd hour: Padua et al., TGFb primes breast tumors for lung metastasis seeding thorugh angiopoietin-like 4. Cell 2008. (Joan Massague lab). Rachel Lynn

II. Angiogenesis (Weeks 5-7)

- 10/13 Hypoxia
  - 1st 40 min: **Celeste Simon Overview Lecture**

- 2nd 40 min: Mazzone et al. Heterozygous deficiency of PHD2 restores tumor oxygenation and inhibits metastasis via endothelial normalization. Cell 2009 (Peter Carmeliet lab). Michael Nakazawa

- 3rd 40 min: Arany et al., HIF-independent regulation of VEGF and angiogenesis by the transcriptional coactivator PGC-1. Nature 2008 (Bruce Spiegelman lab). Sara Small

- 10/20 Angiogenesis regulators
  - 1st hour: Ding BS, et al., Inductive angiocrine signals from sinusoidal endothelium are required for liver regeneration. Nature 2010 (Shahin Rafii lab). Rebecca Evans

  - 2nd hour: Liu Z., et al. Notch1 loss of heterozygosity causes vascular tumors and lethal hemorrhage in mice. J. Clinical Investigation 2011 (Raphael Kopan lab). Nikolaos Svoronos

- 10/27 Endothelial cell biology
  - 1st hour: Wang et al., Glioblastoma stem-like cells give rise to tumour endothelium. Nature 2010 (Vivian Taber lab) – 2 papers back to back in Nature on this topic; 2nd paper: Ricci-Vitaiani et al., Tumour vascularization via endothelial differentiation of glioblastoma stem-like cells. Nature 2010 (Ruggero De Maria lab). Omkar Kawalekar

  - 2nd hour: Wang et al., Ephrin-B2 controls VEGF induced angiogenesis and lymphangiogenesis Nature 2010 (Ralf Adams lab) - 2 papers back to back in Nature on this topic: (2nd paper: Sawamiphak S et al. Ephrin-B2 regulates VEGFR2 function in developmental and tumour angiogenesis). Bridget

III. Immune Surveillance (Weeks 8-12)

- 11/ 3 Innate immunity
  - 1st 40 min: **Ellen Pure Overview Lecture**

  - 2nd 40 min: Koebel et al, Adaptive immunity maintains occult cancer in an equilibrium state. Nature 2007 (Schreiber Lab). Rebecca Evans

  - 3rd 40 min: Fridlender et al., Polarization of tumor-associated neutrophil phenotype by TGF-beta: "N1" versus "N2" TAN. Cancer Cell, 2009. (Steve Albelda lab). Basil

- 11/10 Adaptive immunity
  - 1st hour: Dougan et al., A dual role for the immune response in a mouse model of inflammation-associated lung cancer. JCI, 2011 (Glen Dranoff lab). Will

  - 2nd hour: Kortylewski, et al., Regulation of the IL-23 and IL-12 balance by Stat3 signaling in the tumor microenvironment. Cancer Cell, 2009. Michael

- 11/17 Innate immunity
  - 1st hour: Chen et al., CCL18 from tumor-associated macrophages promotes breast cancer metastasis via PITPNM3. Cancer Cell, 2011. Jaijun

  - 2nd hour: Granot et al., Tumor Entrained Neutrophils Inhibit Seeding in the Premetastatic Lung. Cancer Cell 2011 (Robert Benezra lab). Albert

- 12/1 Organ-specific microenvironments
  - 1st hour: Kraman et al., Suppression of antitumor immunity by stromal cells expressing fibroblast activation protein-alpha. Science 2010. Bo
  - 2nd hour: Sethi N, et al. Tumor-derived JAGGED1 promotes osteolytic bone metastasis of breast cancer by engaging notch signaling in bone cells. Cancer Cell 2011. (Yibin Kang lab). Sara

IV. Therapeutic targets in the microenvironment (Weeks 12)

- 12/8 Therapeutic targets
  - 1st 40 min: **Robert Vonderheide Overview Lecture**
  - 2nd 40 min: Olive et al., Inhibition of Hedgehog signaling enhances delivery of chemotherapy in a mouse model of pancreatic cancer. Science 2009 (David Tuveson lab). Nicole
  - 3rd 40 min: Batchelor TT, et al., AZD2171, a pan-VEGF receptor tyrosine kinase inhibitor, normalizes tumor vasculature and alleviates edema in glioblastoma patients. Cancer Cell 2007 (Rakesh Jain lab). Nikolaos

12/15 Therapeutic targets

- 1st hour: Porter et al., Chimeric antigen receptor modified T cells in chronic lymphoid leukemia. New England Journal of Medicinen 2011 (Carl June lab). Rachel
- 2nd hour : Paez-Ribes, et al. Antiangiogenic therapy elicits malignant progression of tumors to increased local invasion and distant metastasis. Cancer Cell 2009 (Doug Hanahan lab). Omkar