Stanford

Eugene Butcher

Klaus Bensch Professor in Pathology

CONTACT INFORMATION

- **Alternate Contact**

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Bio

ACADEMIC APPOINTMENTS

- Professor, Pathology
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Stanford Cancer Institute
- Member, Wu Tsai Neurosciences Institute

LINKS

- Butcher Lab Home Page: http://butcherlab.stanford.edu/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

We study the trafficking of white blood cells (lymphocytes, dendritic cells, monocytes, etc.), including their interactions with the endothelial lining of blood vessels at sites of leukocyte extravasation, and their chemotactic responses in tissues. These events regulate immune responses by controlling the access of leukocytes to sites of inflammatory or immune reaction in the body. We identified an array of adhesion molecules or "homing receptors" that lymphocytes use to recognize organ (and/or inflammation)-specific vascular ligands or "addressins". The vascular addressins and adhesion receptors control immune cell recruitment, and thus local immune and inflammatory responses. We showed that adhesion receptors act coordinately with G protein-linked chemoattractant receptors in a multi-step process that controls the specificity and provides combinatorial diversity in leukocyte trafficking.

A major focus of the group is on understanding the programming of targeted immune cell trafficking in homeostasis, in the immune response and in disease models (colitis, psoriasis, EAE, cancer). Genetic, antibody and small molecule-based approaches allow us to discover and define the mechanisms involved. Since blood cell interactions with the vasculature control recruitment, we are applying state-of-the art single cell (transcriptomic and mass cytometric) profiling of endothelial cells as well as immune cells to uncover the origin (stem or progenitor cells) and differentiation of leukocyte-recruiting endothelium, and the mechanisms of vascular and immune cell ‘imprinting’. The studies have fundamental implications for the therapeutic regulation of immune responses.

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Romain Ballet, Kevin Brulois, Theresa Dinh, Sofia Nordling, Borja Ocón Moreno, Menglan Xiang, Yu Zhu

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Cancer Biology (Phd Program)
- Cardiovascular Medicine (Fellowship Program)
- Immunology (Phd Program)
- Microbiology and Immunology (Phd Program)

Publications

PUBLICATIONS

- **Endothelial HIF-2alpha is Required for the Maintenance of Airway Microvasculature.** *Circulation*
  Jiang, X., Tian, W., Tu, A. B., Pasupneti, S., Shuffle, E., Dahms, P., Zhang, P., Cai, H., Dinh, T. T., Liu, B., Cain, C., Giaccia, A. J., Butcher, et al
  2018
- **Gut-Selective Integrin-Targeted Therapies for Inflammatory Bowel Disease** *JOURNAL OF CROHNS & COLITIS*
  Lamb, C. A., O'Byrne, S., Keir, M. E., Butcher, E. C.
  2018; 12: S653–S668
- **A Chimeric Antibody against ACKR3/CXCR7 in Combination with TMZ Activates Immune Responses and Extends Survival in Mouse GBM Models** *MOLECULAR THERAPY*
  Salazar, N., Carlson, J. C., Huang, K., Zheng, Y., Oderup, C., Gross, J., Jang, A. D., Burke, T. M., Lewen, S., Scholz, A., Huang, S., Nease, L., Kosek, et al
  2018; 26 (5): 1354–65
- **Neutrophils recruited through high endothelial venules of the lymph nodes via PNAd intercept disseminating Staphylococcus aureus** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Bogoslowski, A., Butcher, E. C., Kubes, P.
  2018; 115 (10): 2449–54
- **Single-cell analysis of early progenitor cells that build coronary arteries.** *Nature*
  Su, T., Stanley, G., Sinha, R., D'Amato, G., Das, S., Rhee, S., Chang, A. H., Poduri, A., Raftrey, B., Dinh, T. T., Roper, W. A., Li, G., Quinn, et al
  2018

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