Stanford

Laura Peterson

Instructor, Pediatrics - Neonatal and Developmental Medicine

Curriculum Vitae available Online

Bio

BIO

I am a passionate physician scientist working in the Neonatal Intensive Care Unit and studying the neonatal immune system and the immunologic adaptations of pregnancy.

Born in Colorado, I have lived all over the country. I came to Stanford for fellowship in Neonatal-Perinatal Medicine after completing Pediatric Residency at the University of Michigan, and I stayed on as faculty after completing fellowship. I received my M.D. from Vanderbilt University School of Medicine and my Bachelor of Science from Brown University.

ACADEMIC APPOINTMENTS

- Instructor, Pediatrics - Neonatal and Developmental Medicine

LINKS

- Gaudilliere lab website: https://gaudillierelab.stanford.edu/
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Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

I am a Neonatal Intensive Care physician scientist interested in the neonatal immune system, particularly the immune system of premature infants, and how it impacts the short and longterm health of this vulnerable population.

Dysregulated inflammation is at the heart of so many of the diseases suffered by our patients in the NICU. Diseases such as sepsis and necrotizing enterocolitis often afflict our babies in the first few weeks of life, while other inflammatory diseases, such as bronchopulmonary dysplasia and retinopathy of prematurity, affect patients for life. It is also likely that a dysregulated immune system is a major factor in the pathogenesis of the long-term neurodevelopmental impairment suffered by patients who were born premature.

In my current work, I use mass cytometry (CyTOF) to study the immune system and its behavior of premature infants. By using CyTOF, in combination with machine learning and other advanced statistical techniques, I am able to describe the neonatal immune system in great detail. I am particularly interested in how the profile of the neonatal immune system changes with gestational age, how it evolves over the course of the infant's first days and weeks of life, and how it relates to establishment of the gut microbiome.

Another area of focus is on immunology of human pregnancy. Pregnancy requires unique and remarkable immune adaptations in order to allow the mother to tolerate her semi-allogeneic fetus up until the time of delivery. Derangements in these immune adaptations are implicated in prematurity as well as diseases of pregnancy such as preeclampsia and intrauterine growth restriction, which are major indications for preterm delivery.

Publications

PUBLICATIONS

- **Multi-Omic, Longitudinal Profile of Third-Trimester Pregnancies Identifies a Molecular Switch That Predicts the Onset of Labor.**
  Stelzer, I., Ghaemi, M., Han, X., Ando, K., Peterson, L., Contrepois, K., Ganio, E., Tsai, A., Tsai, E., Rumer, K., Stanley, N., Fallazadeh, R., Becker, et al
  SPRINGER HEIDELBERG.2020: 89A

- **Outcomes and Resource Use Among Overweight and Obese Children With Sepsis in the Pediatric Intensive Care Unit.** *Journal of intensive care medicine*
  Peterson, L. S., Gállego Suárez, C., Segaloff, H. E., Griffin, C., Martin, E. T., Odetola, F. O., Singer, K.
  2020; 35 (5): 472–77

- **VoPo leverages cellular heterogeneity for predictive modeling of single-cell data.** *Nature communications*
  Stanley, N., Stelzer, I. A., Tsai, A. S., Fallahzadeh, R., Ganio, E., Becker, M., Phongpreecha, T., Nassar, H., Ghaemi, S., Maric, I., Culos, A., Chang, A. L., Xenochristou, et al
  2020; 11 (1): 3738

- **Multiomic immune clockworks of pregnancy.** *Seminars in immunopathology*
  Peterson, L. S., Stelzer, I. A., Tsai, A. S., Ghaemi, M. S., Han, X., Ando, K., Winn, V. D., Martinez, N. R., Contrepois, K., Moufarrej, M. N., Quake, S., Relman, D. A., Snyder, et al
  2020

- **Differential Dynamics of the Maternal Immune System in Healthy Pregnancy and Preeclampsia** *FRONTIERS IN IMMUNOLOGY*
  Han, X., Ghaemi, M. S., Ando, K., Peterson, L. S., Ganio, E. A., Tsai, A. S., Gaudilliere, D. K., Stelzer, I. A., Einhaus, J., Bertrand, B., Stanley, N., Culos, A., Tanada, et al
  2019; 10

- **Fibroblast-specific plasminogen activator inhibitor-1 depletion ameliorates renal interstitial fibrosis after unilateral ureteral obstruction.** *Nephrology, dialysis, transplantation : official publication of the European Dialysis and Transplant Association - European Renal Association*
  Yao, L., Wright, M. F., Farmer, B. C., Peterson, L. S., Khan, A. M., Zhong, J., Gewin, L., Hao, C. M., Yang, H. C., Fogo, A. B.
  2019; 34 (12): 2042–50

- **Human metapneumovirus small hydrophobic (SH) protein downregulates type I IFN pathway signaling by affecting STAT1 expression and phosphorylation.** *Virology*
  Hastings, A. K., Amato, K. R., Wen, S. C., Peterson, L. S., Williams, J. V.
  2016; 494: 248–56

- **Effectiveness of a School-Based Deworming Campaign in Rural Kenya** *JOURNAL OF TROPICAL PEDIATRICS*
  Peterson, L. S., Ondiek, M., Oludhe, D. O., Naul, B. A., Vermund, S. H.
  2011; 57 (6): 461-463