

March 2023

## Thymic Stromal Lymphopoietin Participates in the Host Response to Intra-Amniotic Inflammation Leading to Preterm Labor and Birth

Tomi Kanninen

*Wayne State University School of Medicine, Department of Obstetrics and Gynecology; Perinatology Research Branch, Division of Obstetrics and Maternal-Fetal Medicine, Division of Intramural Research, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, U.S. Department of Health and Human Services (NICHD/NIH/DHHS)*

Li Tao

*Wayne State University School of Medicine, Department of Obstetrics and Gynecology; Perinatology Research Branch, Division of Obstetrics and Maternal-Fetal Medicine, Division of Intramural Research, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, U.S. Department of Health and Human Services (NICHD/NIH/DHHS)*

Roberto Romero

*Perinatology Research Branch, Division of Obstetrics and Maternal-Fetal Medicine, Division of Intramural Research, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, U.S. Department of Health and Human Services (NICHD/NIH/DHHS); Bethesda, Maryland, 20892 and Detroit, Michigan, 48201, USA; Department of Obstetrics and Gynecology, University of Michigan, Ann Arbor, Michigan, 48109, USA; Detroit Medical Center, Detroit, Michigan, 48201, USA*

Yi Xu


*Wayne State University School of Medicine, Department of Obstetrics and Gynecology; Perinatology Research Branch, Division of Obstetrics and Maternal-Fetal Medicine, Division of Intramural Research, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, U.S. Department of Health and Human Services (NICHD/NIH/DHHS)*

Marcia Arenas-Hernandez

*Wayne State University School of Medicine, Department of Obstetrics and Gynecology; Perinatology Research Branch, Division of Obstetrics and Maternal-Fetal Medicine, Division of Intramural Research, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, U.S. Department of Health and Human Services (NICHD/NIH/DHHS)*

See next page for additional authors

Follow this and additional works at: [https://digitalcommons.wayne.edu/som\\_srs](https://digitalcommons.wayne.edu/som_srs)

 Part of the [Biology Commons](#), [Cell and Developmental Biology Commons](#), [Cellular and Molecular Physiology Commons](#), [Laboratory and Basic Science Research Commons](#), [Microbiology Commons](#), and the [Translational Medical Research Commons](#)

---

### Recommended Citation

Kanninen, Tomi; Tao, Li; Romero, Roberto; Xu, Yi; Arenas-Hernandez, Marcia; Galaz, Jose; Liu, Zhenjie; Miller, Derek; Levenson, Dustyn; Greenberg, Jonathan M.; Panzer, Jonathan; Padron, Justin; Theis, Kevin; and Gomez-Lopez, Nardhy PhD, "Thymic Stromal Lymphopoietin Participates in the Host Response to Intra-Amniotic Inflammation Leading to Preterm Labor and Birth" (2023). *Medical Student Research Symposium*. 256.

[https://digitalcommons.wayne.edu/som\\_srs/256](https://digitalcommons.wayne.edu/som_srs/256)

This Research Abstract is brought to you for free and open access by the School of Medicine at DigitalCommons@WayneState. It has been accepted for inclusion in Medical Student Research Symposium by an authorized administrator of DigitalCommons@WayneState.

---

**Authors**

Tomi Kanninen, Li Tao, Roberto Romero, Yi Xu, Marcia Arenas-Hernandez, Jose Galaz, Zhenjie Liu, Derek Miller, Dustyn Levenson, Jonathan M. Greenberg, Jonathan Panzer, Justin Padron, Kevin Theis, and Nardhy Gomez-Lopez PhD

***Thymic Stromal Lymphopoietin Participates in the Host Response to Intra-Amniotic Inflammation Leading to Preterm Labor and Birth***

Li Tao<sup>1,2,\*</sup>, Roberto Romero<sup>1,3-6</sup>, Yi Xu<sup>1,2</sup>, Marcia Arenas-Hernandez<sup>1,2</sup>, Jose Galaz<sup>1,2,7</sup>, Zhenjie Liu<sup>1,2</sup>, Derek Miller<sup>1,2</sup>, Dustyn Levenson<sup>8</sup>, Jonathan M. Greenberg<sup>1,2</sup>, Jonathan Panzer<sup>1,2</sup>, Justin Padron<sup>8</sup>, Kevin R. Theis<sup>1,2,9</sup>, Nardhy Gomez-Lopez<sup>1,2,9</sup>

**ABSTRACT**

**Objective:** To determine if bacteria (*Ureaplasma parvum* and *Sneathia* spp.) associated with intra-amniotic infection can trigger the induction of cytokine Thymic stromal lymphopoietin (TSLP) in human amnion epithelial cells (hAECs) in vitro.

**Material or subjects:** Amniotic fluid and chorioamniotic membrane (CAM) were collected from women with sPTL who delivered at term (n=30) or preterm without intra-amniotic inflammation (n=34), with sterile intra-amniotic inflammation (SIAI, n=27), or with intra-amniotic infection (IAI, n=17). Amnion epithelial cells (AECs), *Ureaplasma parvum*, and *Sneathia* spp. were also utilized.

**Methods:** The expression of TSLP, TSLPR, and IL-7R $\alpha$  was evaluated in amniotic fluid or CAM by RT-qPCR and/or immunoassays. AECs co-cultured with *Ureaplasma parvum* or *Sneathia* spp. were evaluated for TSLP expression by immunofluorescence and/or RT-qPCR.

**Results:** TSLP was elevated in amniotic fluid of women with SIAI or IAI and expressed by the CAM. TSLPR and IL-7R $\alpha$  had detectable gene and protein expression in the CAM; yet, *CRLF2* was specifically elevated with IAI. While TSLP localized to all layers of the CAM and increased with SIAI or IAI, TSLPR and IL-7R $\alpha$  were minimal and became most apparent with IAI. Co-culture experiments indicated that *Ureaplasma parvum* and *Sneathia amnii* upregulated *TSLP* expression in AECs.

**Conclusions:** *Ureaplasma parvum* and *Sneathia* spp. triggers induction of TSLP, a central component of the intra-amniotic host response during sPTL.