1128-92-91 **Tilmann Glimm*** (glimmt@wwu.edu), Dept. of Mathematics, Western Washington University, 516 High Street, Bellingham, WA 98225. *Modeling the role of synchronized Hes1 oscillations in the developing chick limb skeleton.*

In avian embryonic limbs, mesenchymal cells aggregate to form chondrogenic condensations, which later turn into cartilage, then bone. It has been experimentally established that their characteristic size and spacing is mediated by a regulatory network consisting of two glycan-binding proteins: CG(chicken galectin)-1A, CG-8 and their counterreceptors.

Based on a mathematical model of this regulatory network (Glimm, Bhat and Newman, 2014), we address the role of spatially synchronized temporal oscillations of Hes1, a transcription factor that plays an important role in the Notch signaling pathway. Recent experiments show that damping these oscillations through a Notch inhibitor results in irregularly sized and fused condensations.

We incorporate Hes1 into the model and show through numerical and analytic results how the interaction of the skeletogenic galectin circuit with Hes1 is able to regularize the pattern of condensations.

Mathematically, the model consists of a system of PDEs containing a nonlocal term to represent cell-cell adhesion. Temporal oscillations lead to explicitly time-dependent parameters.

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