developing joints, *smad6* is located in the perichondrium and *smad1* is expressed in the developing tendons.

doi:10.1016/j.ydbio.2007.03.241

Program/Abstract # 181
Elevated levels of Gli3R alter anterior–posterior patterning in the chick limb

Joseph J. Lancman [1], Yina Li [2], Chin Chiang [3], John F. Fallon [1]
[1] *University of Wisconsin-Madison, Madison, WI, USA*
[2] *Vanderbilt University Medical Center, Nashville, TN, USA*

Gli3 is the primary transcriptional effector of Sonic Hedgehog (Shh) signaling in the developing limb and exists in two forms: Gli3 activator (Gli3A) and Gli3 repressor (Gli3R). Processing of Gli3A to Gli3R is Shh-dependent; in cells receiving Shh signal, Gli3A is maintained while those receiving little or no Shh signal, Gli3A is converted to Gli3R. SHH diffusion from the Zone of Polarizing Activity (ZPA), across the anterior–posterior (AP) axis, forms a gradient. Cells expressing Gli3 near the ZPA receive high Shh signal and translate this into a high ratio of Gli3A:Gli3R. Cells further from the ZPA receive less Shh signal and produce lower Gli3A:Gli3R. In the most anterior limb mesoderm, almost all Gli3 exists as Gli3R. The inverse relationship between Shh signal and processing of Gli3A to Gli3R creates a gradient of Gli3 transcriptional activity across the AP axis. We hypothesized that by over-expressing Gli3R throughout the limb, we would effectively reduce the endogenous Gli3A:Gli3R ratios and cells would change their fate according to their new Gli3A:Gli3R ratio. These cells would interpret the elevated levels of Gli3R equivalent to cells located in the anterior limb mesoderm. Effects of Gli3R over-expression were determined by changes in gene expression patterns and the final phenotype of the skeletal elements. We show that raising the level of Gli3R produces changes in both gene expressions and the final skeletal phenotype consistent with anteriorization of the developing limb. The effects of elevated Gli3R were most dramatic in the autopod.

doi:10.1016/j.ydbio.2007.03.242

Program/Abstract # 182
Molecular characterization of a nonsyndromic polydactylous chicken

Cortney M. Bouldin, Brian D. Harfe
Department of Mol. Gen. and Microbiol., Univ. of Florida, Gainesville, FL, USA

One of the most common congenital malformations in humans is extra digits, or polydactyly. Our understanding of the etiology of this condition has been increased by studies using model animals exhibiting polydactyly. In this study, we have analyzed a previously uncharacterized, spontaneous mutant in the model system *Gallus gallus*. This spontaneous chicken mutant, known as "*Dorking*", exhibits autosomal dominant, preaxial polydactyly. Unlike the well-characterized talpid mutants, which are embryonic lethal, *Dorking* chickens are viable and their polydactyly is nonsyndromic. In situ hybridization using *Dorking* embryos revealed that these embryos do not ectopically express Sonic Hedgehog or 5′ Hox genes. However, ectopic expression of *Gli1* and *Ptc1*, components of Hedgehog signaling, and Fibroblast Growth Factors is evident in *Dorking* embryos. In addition, cell death in the anterior necrotic zone is decreased, and the limb field is increased in size, which may also be contributing factors to the formation of an extra digit. We are currently using more sensitive techniques to search for a ligand, which could be activating the ectopic Hedgehog signaling.

doi:10.1016/j.ydbio.2007.03.243

Program/Abstract # 183
Zebrafish (*Danio rerio*) androgen receptor: cDNA fragment cloning and messenger RNA levels during embryonic development

Christopher S. Lassiter, Liên-Thành C. Kratzke
Department of Biol., Roanoke College, Salem, VA, USA

Steroid hormones regulate gene expression in organisms by binding to receptor proteins. One group of steroid hormones is androgens, which signal through androgen receptors (AR). Endocrine disrupters (EDCs) are chemicals in the environment that adversely affect organisms by binding to nuclear receptors, including ARs. In order to better understand the harms of EDCs, further research on androgen receptors and other hormone signaling pathways is necessary. In this study, fragments of the zebrafish (*Danio rerio*) AR were cloned. Analysis of the zebrafish AR genomic and amino acid structures revealed that the AR has been highly conserved among vertebrates and is homologous to the human AR. Zebrafish AR messenger RNA (mRNA) levels were measured from 0 to 72 hours post fertilization (hpf), and AR mRNA signals increased noticeably between 24 hpf and 48 hpf. The increase in mRNA suggests that the AR is first being used in developing embryos during this timeframe. Further studies of the AR will provide a broader understanding of how the hormone-signaling pathway works and how it is affected by environmental chemicals.

doi:10.1016/j.ydbio.2007.03.244

Program/Abstract # 184
Presence of the androgen receptor in the development of the neural tube

Rodrigo Núñez Vidales, Carmen Méndez, Carmen Mondragón, Esteban Cruz, Alejandro Aragón, Verónica Rodríguez, K. Pedernera
Departamento de Embriología, Facultad de Medicina, UNAM, Mexico