

portray scientific knowledge as nothing more than personal preferences that don't matter. However, other varieties view science as a value-laden social practice, but recognize that scientific methods can provide useful ways for coping with nature; especially when they take into account multiple perspectives. It is this latter view that offers insight into how the animal science profession can address policy issues in morally responsible ways. Currently, the animal science community advocates the modern view that public policy should be based only on sound sci-

ence. This view conceives the animal science community as one that is segregated from and holds authority over a greater human community. A perspective which seems more compatible with addressing the diverse interests of a greater community is one which views animal scientists as part of such a community, and who provide only some of the perspectives that should be considered when addressing policy issues.

Key Words: Ethics, Policy, Philosophy of Science

Mechanisms of Hormonal Signal Transduction

737 Progesterone regulates reproductive function through two functionally distinct receptor isoforms. OM Conneely^{*1}, B Mulac-Jericevic¹, and F DeMayo¹, ¹*Baylor College of Medicine.*

Progesterone regulates reproductive function by interaction with two intracellular receptors, PR-A and PR-B, that arise from a single gene. To establish the selective physiological roles of PR isoforms in vivo, we have selectively ablated PR-A (PRAKO) or PR-B (PRBKO) expression in mice. Ablation of PR-A results in severe abnormalities in ovarian and uterine function but does not affect responses of the mammary gland or thymus to progesterone. Analysis of uterine function of PRAKO mice reveals an unexpected progesterone-dependent proliferative activity of PR-B in the epithelium and provides evidence that the tissue specific functions of this isoform are due to specificity of target gene transactivation rather than differences in spatiotemporal expression relative to PR A. Contrary to PRAKO mice, PRBKO mice are fertile and have successful pregnancies that result in normal litter sizes. Histological studies of uteri isolated from PRBKO mice revealed normal sensitivity to estrogen and progesterone. Specifically, progesterone acting through PR-A alone antagonizes estrogen-induced proliferation of the uterine epithelium in PRBKO mice. Progesterone receptors are critical for mammary gland development and morphogenesis. We have analyzed mammary glands response to estrogen and progesterone in PRBKO animals ovariectomized at 6 or 10 weeks of age. Whole mounts analysis of mammary glands obtained from ovariectomized 6 week old PRBKO mice treated with estrogen and progesterone for 3 weeks showed significantly reduced side branching when compared to wild type and PRAKO mice. Interestingly this phenotype is reverted in 10 week old PRBKO mice treated under identical hormonal regime. These results further demonstrate tissue specific functions of progesterone receptor isoforms.

Key Words: progesterone receptor isoforms, female reproduction

738 Role of Neurotrophic Factors in Ovarian Development. S.R. Ojeda*, G.A. Dissen, C. Romero, and A. Paredes, *Oregon Regional Primate Research Center/Oregon Health Sciences University, Beaverton, OR.*

The neurotrophins nerve growth factor (NGF), neurotrophin-4/5 (NT-4/5), and brain derived neurotrophic factor (BDNF), and their high-affinity tyrosine kinase membrane-anchored receptors (trkA for NGF and trkB for NT-4/5 and BDNF) are expressed in the mammalian ovary before the initiation of follicular assembly. Mice carrying a null mutation of the NGF gene had a reduced number of primary follicles and a normal population of primordial follicles, suggesting that NGF is not required for follicular formation, but is necessary for the initiation of follicular growth. The fewer primary follicles seen in NGF KO mice appear to result from a deficiency in somatic ovarian cell proliferation. After formation of primary follicles, NGF facilitates early follicle growth by inducing the synthesis of biologically active FSH receptors. Concomitant

deletion of the NT-4 and BDNF genes, or deletion of the gene encoding their trkB receptor, resulted in reduced granulosa cell proliferation and decreased formation of secondary follicles at the onset of follicular growth. Thus, activation of trkA receptors during early follicle development appears to sustain the conversion of primordial into primary follicles, whereas activation of trkB receptors facilitates the acquisition of additional layers of granulosa cells by the primary follicles. Thecal cells of antral follicles continue to express NGF and respond to the neurotrophin with proliferation and prostaglandin release. While an increase in thecal trkA expression occurs at the time of the preovulatory surge of gonadotropins, blockade of trkA receptors inhibits ovulation, suggesting a role for NGF in ovulatory rupture. Thus, neurotrophins contribute to regulating two key phases of ovarian development: the initiation of follicular growth, and follicular rupture at ovulation. Together, these results identify a novel function for the neurotrophins in the development of a nonneural organ, and demonstrate that they act in the ovary to facilitate the proliferation and differentiation of specific cellular subsets involved in follicular growth. (Supported by NIH grants HD-24870, RR-00163 and U54-HD18185)

Key Words: Ovarian Development, Neurotrophic Factors, Follicular Growth

739 Growth hormone signaling to the nucleus. Jessica Schwartz* and Graciela Piwien-Pilipuk, *Dept. Physiology, University of Michigan.*

Effective use of growth hormone (GH) depends on understanding its mechanism of action. The diverse actions of GH are mediated by multiple signaling mechanisms. When GH binds, the GH receptor associates with the tyrosine kinase JAK2, initiating multiple signaling events. Analysis of GH-regulated gene expression indicates that multiple signaling cascades triggered by GH regulate the function of multiple transcription factors. The proto-oncogene c-fos is a target for several GH-initiated signaling pathways. One pathway, mediated by GH-promoted tyrosine phosphorylation of Signal Transducers and Activators of Transcription (STATs), regulates the *Sis-Inducible Element*. Transcriptional activation mediated by the Serum Response Element in response to GH depends on the phosphorylation and activation of the transcription factor Elk-1 by MAP kinases. The dephosphorylation of the transcription factor C/EBP beta promoted by GH appears to reflect inhibition of Glycogen Synthase Kinase 3 (GSK3) via GH-stimulated PI-3 kinase/Akt, leading to changes in the binding and function of C/EBP beta. It is likely that signaling networks involving multiple pathways initiated by GH-GH receptor-JAK2 interactions contribute to the coordinated regulation of gene expression in response to GH. Such changes in gene expression underlie the physiological actions of GH.

Key Words: Gene expression, GH signal transduction, Transcription factors

Profitable Meat Goat Production: The Interaction of Genotype and Management

740 Rheological characteristics of uncooked goat meat. Eric Risch* and Jackson M. Dzakuma, *Prairie View A&M University, Prairie View, TX. USA.*

After weaning, 48 kids of Spanish (SP) and Tennessee Stiff-Legged (TS) breeds were individually penned and fed an 18% CP and 65% TDN ration for six months during which time their weights were taken on a bi-weekly basis. These breeds represent goats with small (TS) and intermediate (SP) mature sizes. They were slaughtered at six months of age. Four replicates of rectangular slabs (approximately 2.54 cm x 2.54

cm x 1.77 cm) of samples were taken from the fore-quarter, hind-quarter and breast regions of the carcasses. An Instron Universal Testing Machine (Model 4201) was used to apply 80 % compression deformation at a strain rate of 2.54 cm/min to each sample in the axial direction. The strength or ultimate stress (as determined by the ultimate load applied to the sample till failure), the elastic modulus (as determined by the ratio of ultimate stress over strain) and the toughness of the sample (derived from the area under the force-deformation curve and giving an indication of the energy required to propagate failure) were determined