

DR. LARRY COGBURN

B.S., Poultry Science, North Carolina State University

M.S. Physiology, North Carolina State University

Ph.D., Environmental Physiology/Endocrinology, University of Illinois

Post-doctoral research fellow in Immunobiology at Mississippi State University

Sabbatical research fellow in Molecular Endocrinology at Station de Recherches Avicoles, Institut National de La Recherche Agronomique, Nouzilly, France, of two divergently selected broiler chickens

Professor Emeritus of Functional Genomics and Systems Biology at the University of Delaware

Skilled in Systems Biology, Avian Biology, Bioinformatics, Animal Sciences, Functional Genomics, and Genetics

Experienced Professor of Functional Genomics and Molecular Endocrinology with a Demonstrated History of Working in Higher Education, Skilled in Systems Biology, Avian Biology, Bioinformatics, Animal Sciences, Functional Genomics, and Genetics.

Research

Research directed at application of biotechnology for improvement of growth efficiency and/or body mass of broiler chickens.

Cogburn Laboratory conducted a functional genomics consortium project to examine global patterns of gene expression in tissue of broiler chickens divergently selected for either growth rate or body composition. Research in Dr. Cogburn's laboratory has focused on the somatotropic and thyrotropic axes and their roles in endocrine regulation of growth and development in the broiler chicken. Earlier work was directed at application of biotechnology for improvement of growth efficiency and/or body composition, which led to the discovery of novel endocrine manipulations which increase lean body mass of broiler chickens. Research group discovered unique truncated transcripts of the prolactin receptor gene in the testes of sexually mature chickens that could be important for normal maturation and reproductive competence. The group also identified molecular defects in the chicken growth hormone receptor gene which causes sex-linked dwarfism.

Research into molecular biology of the chicken growth hormone receptor and prolactin receptor genes and their respective importance in normal growth and reproductive development

Research group discovery of unique truncated transcripts of the prolactin receptor genes in roosters

Research about the functional genomics of the broiler chicken that identified genes or gene clusters in key metabolic and regulatory pathways

Research to identify candidate genes and quantitative trait loci that can be used in genetic marker assisted selection programs to breed healthier, fast-growing broiler chickens

Research Projects

Characterization and Function of the GHR Gene

Discovery of Avian Leptin

Dissertation Research Project in Environmental Physiology, University of Illinois: The Effect of Pinealectomy on Metabolism and Somatic Growth of Immature Chickens

Endocrine Regulation of Growth and Body Composition in Broiler Chickens

Identification of Genes Involved in Formation of the Egg Shell and Its Membranes in Chickens

Master of Science Thesis Project NCSU: *Physiological Effects of Mercury in the Domestic Chicken*

Post-doctoral Research Project – Immunobiology - Mississippi State University: Functional Lymphocytes in the Chicken Pineal Gland and Lymphopoiesis in the Chicken Pineal

USDA IFAFS Functional Genomics of the Chicken Project

USDA-NRI-funded Characterization of Truncated Prolactin Receptor Transcripts in Testes of Sexually Mature Chickens

USDA-NRI-funded Gene Networks Controlling Feed Intake and Metabolism

Publications (Some publications performed jointly with other researchers; 132 publications are credited to Dr. Cogburn, with some of them being addendums to the list below).

Avian Apolipoprotein A-V Binds to LDL Receptor Gene Family Members

Characterization of Unique Truncated Prolactin Receptor Transcripts, Corresponding to the Intracellular Domain, in the Testis of the Sexually Mature Chicken 1

Chicken Genomics Resource: Sequencing and Annotation of 35,407 ESTs from Single and Multiple Tissue cDNA Libraries and CAP3 Assembly of Chicken Gene Index

Chronic Intravenous Infusion of Chicken Growth Hormone Increases Body Fat Content of Young Boiler Chickens

Comparison of Gene Expression in Normal and Growth Hormone Receptor-Deficient Dwarf Chickens Reveals a Novel Growth Hormone-Regulated Gene

A Comprehensive Analysis of QTL for Abdominal Fat and Breast Muscle Weights on Chicken Chromosome 5 Using a Multivariate Approach

Correction: Detection of a Cis eQTL Controlling BMCO1 Gene Expression Leads to the Identification of a QTG for Chicken Breast Meat Color

Correction: Mapping of Leptin and Its Systemic Genes to Chicken Chromosome 1p

Cryptic Peptides of Prepro-TRH Antagonize TRH-induced GH secretion in Chickens at Extrapituitary Sites

Detection of a Cis eQTL Controlling BMCO1 Gene Expression Leads to the Identification of a QTG for Chicken Breast Meat Color (2 articles)

Differential Gene Expression in the Hypothalamus of Neonatal Chicks During Feeding and Fasting

Discovery and Characterization of the First Genuine Avian Leptin Gene in the Rock Dove (Columba livia)

Discovery of the Elusive Leptin in Birds: Identification of Several 'Missing Links' in the Evolution of Leptin and its Receptor

Duplicated Spot 14 Genes in the Chicken: Characterization and Identification of Polymorphisms Associated with Abdominal Fat Traits

Dysfunctional Growth Hormone Receptor in a Strain of Sex-linked Dwarf Chicken: Evidence for a Mutation in the Intracellular Domain

Effects of BDNF, T-3, and Corticosterone on Expression of the Hypothalamic Obesity Gene Network in Vivo and in Vitro

Endocrinology: Discovery and Characterization of the First Genuine Avian Leptin Gene in the Rock Dove (Columba livia)

Fatness QTL on Chicken Chromosome 5 and Interaction with Sex (2 articles)

Functional Annotation of Genomic Data with Metabolic Inference

Functional Genomics in Chickens: Development of Integrated Systems Microarrays for Transcriptional Profiling and Discovery of Regulatory Pathways

Functional Genomics of the Chicken – A Model Organism

Functional Mapping of Gene Networks Controlling Growth and Metabolism

Gallus gallus NADH Dehydrogenase B14.5b Chain (NDUFC2) mRNA, Complete CDS

Gallus gallus THRSP-like Protein mRNA, Complete CDS

Gallus gallus Thyroid Hormone Responsive Spot 14 Alpha 1 (THRSP) mRNA, Complete CDS

Gallus gallus Thyroid Hormone Responsive Spot 14 Alpha 2 (THRSP) mRNA, Complete CDS

Gallus gallus Thyroid Hormone Responsive Spot 14 Beta 1 (THRSP) mRNA, Complete CDS (2 articles)

Gallus gallus Thyroid Hormone Responsive Spot 14 Beta 2 (THRSP) mRNA, Complete CDS

Gene Expression Profiling During Cellular Differentiation in the Embryonic Pituitary Gland Using cDNA Microarrays

Gene Expression Profiling to Identify Eggshell Proteins Involved in Physical Defense of the Chicken Egg

Genome-wide Interval Mapping Using SNPs Identifies new QTL for Growth, Body Composition, and Several Physiological Variables in an F2 Intercross Between Fat and Lean Chicken Lines

Genome-wide Interval Mapping Using SNP Identifies New QTL for Growth, Body Composition, Meat Quality, and Several Physiological Parameters in an F2 Intercross Between Fat and Lean Chicken Lines

Glucocorticoid-induced Changes in Gene Expression in Embryonic Anterior Pituitary Cells

Growth Hormone Down-regulates Growth Hormone Receptor mRNA in Chickens but Developmental Increases in Growth Hormone Receptor mRNA Occur Independently of Growth Hormone Action

Hypothalamic BDNF Gene Expression is Modulated by Thyroid Hormones in Vivo

Identification of QTL Controlling Meat Quality Traits in an F2 Cross Between Two Chicken Lines Selected for Either Low or High Growth Rate

Identifying specific proteins Involved in Eggshell membranes Formation Using Gene Expression Analysis and Bioinformatics

Insulin Immuno-neutralization in Chicken: Effects on Insulin Signaling and Gene Expression in Liver and Muscle

Insulin Immuno-neutralization in Fed Chickens: Effects on Liver and Muscle Transcriptome

Insulin-like Growth Factors and Body Growth in Chickens Divergently Selected for High or Low Growth Rate

Manipulation of Thyroid Status and/or GH Infection Alters Hepatic gene Expression in the Juvenile Chicken

Mapping of Leptin and Its Syntenic Genes to Chicken Chromosome 1p

Mapping of Main, Epistatic and Sex-Specific QTL for Body Composition in a Chicken Population Divergently Selected for Low or High Growth Rate

Mapping QTL for Growth and Shank Traits in Chickens Divergently Selected for High or Low Body Weight

Mapping Quantitative Trait Loci Affecting Fatness and Breast Muscle Weight in Meat-type Chicken Lines Divergently Selected on Abdominal Fatness

Metabolic Responses of the Turkey Hen (Meleagris gallopavo) to an Intravenous Injection of Chicken or Porcine Glucagon

Microarray Analysis of Gene Expression Patterns in the Anterior Pituitary of Chickens Genetically Selected for High and Low Body Weight

Molecular Cloning and Sequence Analysis of Chicken Type 1 Delodinase cDNA: Expression in Normal and Dwarf Broiler Chickens

Ontogeny of Growth Hormone Receptor Gene Expression in Tissue of Growth-selected Strains of Broiler Chickens

Physiology of Growth and Development

QTL for Several Metabolic Traits Map to Local Controlling Growth and Body Composition in an F-2 Intercross Between High and Low Growth Chicken Lines

RNA-Seq Analysis of Abdominal Fat in Genetically Fat and Lean Chickens Highlights a Divergence in Expression of Genes Controlling Adiposity, Hemostasis, and Lipid Metabolism

Regulation of ANKRD9 Expression by Lipid Metabolic Perturbations

Systems-wide Chicken DNA Microarrays, Gene Expression Profiling, and Discovery of Functional Genes

Transcriptional Analysis of Abdominal Fat in Chickens Divergently Selected on Bodyweight at Two Ages Reveals Novel Mechanisms Controlling Adiposity: Validating Visceral Adipose Tissue as a Dynamic Endocrine and Metabolic Organ

Transcriptional Analysis of Abdominal Fat in Genetically Fat and Lean Chickens Reveals Adipokines, Lipogenic Genes, and a Link Between Hemostasis and Leanness

Transcriptional and Pathway Analysis in Hypothalamus of Newly Hatched Chicks During Fasting and Delayed Feeding

Transcriptional Profiling and Pathway Analysis Reveal Differences in Pituitary Gland Function, Morphology, and Vascularization of Chickens Genetically Selected for High or Low Body Weight

Transcriptional Profiling in Tissue of Divergently Selected Broiler Chickens

Transcriptional Profiling of Hypothalamus During Development of Adiposity in Genetically Selected Fat and Lean Chickens

*Transcriptional Profiling of Liver During the Critical Embryo-to-hatchling Transition Period in the Chicken (*Gallus gallus*)*

Transcriptional Profiling of Liver in Riboflavin-deficient Chicken Embryos Explains Impaired Lipid Utilization, Energy Depletion, Massive Hemorrhaging, and Delayed Feathering

Transcriptome Analyses of Liver in Newly-hatched Chicks During the Metabolic Perturbation of Fasting and Re-feeding Reveals THPSA as the Key Lipogenic Transcription Factor

Utilisation de SNP Pour la Cartographie de QTL de Croissance, Composition de la Carcasse et Qualite de la Viande dans un Croisement F2 de Ligees de Poulet et Maigre

Patents

Endocrine Manipulation to Improve Body Composition of Poultry (518012)

Endocrine Manipulation to Improve Body Compositions of Poultry (5162302)

Endocrine Manipulation to Improve Body Composition of Poultry ((4929600)

Identification of Fat and Lean Phenotypes in Chickens Using Molecular Markers (20100261173)

Identification of Fat and Lean Phenotypes in Chickens Using Molecular Markers (7666590)

Identification of Fat and Lean Phenotypes in Chickens Using Molecular Markers (20090246778)

Identification of Fat and Lean Phenotypes in Chickens Using Molecular Markers (20050214814)

Methods for predicting fat and Lean Phenotypes in Chickens (20120183958)

Molecular Markers for Identification of Fat and Lean Phenotypes in Chickens (20110124852)

Molecular Markers for Identification of Fat and Lean Phenotypes in Chickens (20070092909)

Molecular Markers for Identifying of Fat and Lean Phenotypes in Chickens (20030186299)