

Poultry Benefits From Basic Research

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Most of us associate chicken with a source of food. But, in reality, the chicken serves many purposes, including that of experimental model.

Historically, avian embryos represent the classical developmental biology model system. Avian embryos develop in a rapid fashion reminiscent of most vertebrate animals including humans. And, due to their unique packaging system, chick embryos can be easily monitored and observed throughout the course of gestation.

In the mid 1950s, two leading scientists documented the morphological changes that occur during the course of avian development. To this day, the develop-

mental atlas chronicled by Drs. Hamburger and Hamilton serves as a universal handbook for comparative staging of avian embryos. They were one of the first groups to note that the chick heart performs rhythmic contractions within the first three days of incubation, eye coloration occurs after five-day, and rudimentary feathers are present after nine days. Through their recorded observations of avian development, our understanding of the processes of fetal development in humans has been greatly enhanced.

In vertebrates, regions of cells respond to their surrounding environment in an instructive fashion, thus becoming committed to a specific cell fate. With regard to cardiogenesis (heart formation), the inductive signal to become a cardiocyte (heart cell) is received within the first 18 hours. After ex-

pansion of the cardioblast population, the cells cease replication and begin to synthesize the proteins necessary for contraction. The cells align to form a tube structure that ultimately loops and fuses to form the four-chambered heart.

One of the ongoing projects in our lab is to discern the mechanistic basis for early heart formation, specifically, what tells a cell to become a cardiocyte. Through explant experiments and tissue grafting, several small proteins have been identified as candidate-inducing agents.

By characterizing the factors that elicit a response in normally non-cardiogenic cells, we can determine the functional role of certain growth factors and determine the means by which they promote heart formation.

One of the recently discovered factors that promotes cardiogenesis is a protein called bone morphogenic protein (BMP2). BMP2 is one of several growth factors which also is intricately involved in regulating formation of the skeleton.

Interestingly, ectopic delivery of BMP2 to cells normally not fated to become cardiocytes induces expression of genes characteristic of cardiocytes. This would suggest that one means of promoting heart formation is through localized production of BMP2. The ability of BMP2 to act on two dis-

New Asian Market For Pennsylvania Poultry

FREDERICKSBURG (Lebanon County) — Agriculture Secretary Samuel E. Hayes Jr. on Thursday visited the Farmer's Pride plant here to announce the shipment to Japan of more than 100,000 pounds of Bell & Evans chicken — an agreement reached as a result of Gov. Tom Ridge's trade mission to Asia last year.

"Gov. Ridge's trade mission opened the door of Pennsylvania agricultural products to move into Japan," Hayes said. "The relationships we established during the mission have been invaluable in helping companies such as Bell & Evans to expand their marketing opportunities."

"Demand for poultry in Japan is high, and Japanese consumers value high-quality, all-natural meats. Pennsylvania food products are well-known in Japan, and we believe there can be significant trade expansion there."

tinctly different systems further demonstrates the complexity of embryonic development.

In summary, the avian embryo provides us with a remarkable tool which can provide insight into many developmental questions. By taking advantage of the avian model, key issues regarding human disease can be addressed.

Hayes and Scott Sechler, president of Bell & Evans, signed a product certificate verifying that the poultry is "Pennsylvania raised and processed." Each shipment will carry a certificate. Bell & Evans chickens are totally grain fed in environmentally controlled houses.

Processed by Farmer's Pride, the Bell & Evans chicken is being shipped from Fredericksburg to Nissho Iawo Corp. in Tokyo for distribution to upscale food markets and restaurants throughout Japan.

Sechler said the poultry will be freezer-packed and trucked to Seattle, then transported by ship to Japan.

Sechler followed up on contacts made by Hayes in Japan, and several Japanese food-industry representatives have visited the Fredericksburg plant and placed orders.

Established in 1939, Farmer's Pride has nearly 600 employees and processes 130,000 chickens daily, marketing in 22 states throughout the Eastern United States.

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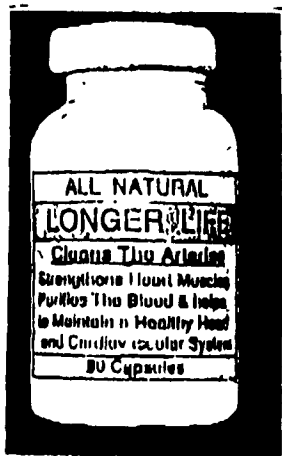
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