

Franklin West (left) and Steven Stice are members of a group that's produced chicken stem cells, which are pictured in the background, that will allow for efficient vaccine production.



ANDREW TUCKER

RBC engineers stem cells for faster vaccine production

Research teams working with the Regenerative Bioscience Center (RBC) at UGA are hoping to develop an efficient use of avian stem cells for commercial vaccine production. The research follows earlier funding from the Bill and Melinda Gates Foundation.

In 2011, the foundation awarded nearly \$1.6 million to the RBC for developing chickens made resistant to Newcastle virus through chicken stem cells. As a spinoff of this, induced pluripotent chicken cell lines, or stem cells produced from adult cells, were developed for vaccine production. Today, most vaccines are produced in disease-free chicken eggs. In developing countries, importing these eggs for vaccine production, tailored

to specific needs, is expensive and not always available. New stem cell technologies could offer a sustainable, regional solution.

Franklin West, College of Agricultural and Environmental Sciences assistant professor, along with Claudio L. Afonso at the U.S. Department of Agriculture Agricultural Research Service's Southeast Poultry Research Laboratory and Steven Stice, a Georgia Research Alliance Eminent Scholar and CAES D.W. Brooks Distinguished Professor, have engineered cost-effective, versatile chicken stem cells and adapted them to simple conditions needed for efficient vaccine production.

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STEVEN STICE

The new findings, reported in the Journal of Biological Standardization, provide an innovative solution to overcoming bottlenecks and time constraints during current methods of vaccine production.

"What sets this cell-based production system apart from the others is that it's quick, easy to use and versatile in that it can be applied to multiple vaccine types; for example, Newcastle and, potentially, influenza vaccines, and both animal and human vaccines," said Stice, director of the RBC.

The use of cell lines for the manufacture of viral vaccines offers additional advantages in the event of a human flu pandemic. Currently, fertilized chicken eggs are used to host the flu virus. This more-

than-60-year-old process is not only time consuming, but in the event of a pandemic, it could also place egg inventory in short supply. Beyond this process, additional time is needed for the Centers for Disease Control and Prevention to create a reference strain. With chicken cell-based production technology, demand quotas are achieved much faster with greater process control.

The team hopes to soon revolutionize the poultry vaccine industry for developing countries, where virus containment is needed the most.

"The best way to keep the avian flu from reaching the U.S. is to first prevent its spread across the world," Stice said.

■ Charlene Betourney

