



Ihuoma Chizaram  
Okwuonu  
**2015 AWARD Fellow**

“I hope to excel through the AWARD Fellowship. I want to give it my best, knowing that this will help me achieve my goals”

Position	Senior Research Scientist
Institution	National Root Crops Research Institute (NRCRI)
Country	Nigeria
MSc	Applied Microbiology and Plant Pathology, University of Jos, 2004
Mentor	Dr. Joseph Onyeka, Assistant Director Farming Systems Research Programme, NRCRI
Research Area	Application of biotechnology approaches to improve root and tuber crops for enhanced agricultural productivity and economic empowerment of rural farmers.

Ihuoma Chizaram Okwuonu was raised in an urbanized environment in Umuahia in southeastern Nigeria. Observing her parents influenced her—her father was a lawyer while her mother was a teacher. “We are career-minded people, keen on passing along information,” she says. “My desire was to build an enterprise that provides a commodity for the people.” This led Okwuonu to pursue a career in agriculture; she developed her scientific skills through studying microbiology and biotechnology at the university. While pursuing her doctorate degree, Okwuonu got a job as a research scientist in the NRCRI biotechnology program. Here, she was mentored by her first supervisor, who encouraged her to venture into genetic modification. Okwuonu is in the process of completing her PhD in Environmental Microbiology and Biotechnology at the Michael Okpara University of Agriculture.

Between January 2009 and February 2014, Okwuonu was a visiting research scholar at the Donald Danforth Plant Science Center in St. Louis Missouri, U.S.A., where she was trained in genetic engineering, transformation, and biosafety. “My specific desire is to use biotechnology tools to improve disease resistance in crops,” she says. The scientist is keen to contribute to research to address constraints such as plant diseases that result in reduced yields of tuber crops like cassava, which are the staple food for many resource-poor smallholder farmers. “Women are the main stakeholders in the cultivation and commercialization of these products,” notes Okwuonu. “Cassava lacks some essential nutrients like proteins, vitamins, and minerals,” she continues, adding that improving the crop will empower farmers through increased incomes and better nutrition.

Okwuonu’s research interests include establishing a genetic transformation protocol for the improvement of farmer-preferred

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**AWARD is a career-development program that equips top women agricultural scientists across sub-Saharan Africa to accelerate agricultural gains by strengthening their research and leadership skills through tailored fellowships. AWARD is a catalyst for innovations with high potential to contribute to the prosperity and well-being of African smallholder farmers, most of whom are women.**

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cassava cultivars and other root and tuber crops such as yam and sweet potato. This work has a capacity-building component geared toward training young African scientists to acquire innovative technologies such as in vitro techniques, genetic engineering, transformation, and molecular analysis skills. “Transgenic technology provides an effective means of modifying cassava, as it offers tools that overcome many of the limitations of conventional breeding used in cassava improvement,” she explains. These benefits include halving the time required to develop new traits, reducing the population size for selection of improved varieties, overcoming heterozygosity and inbreeding depression—all of which are associated with conventional breeding. She is also involved in a project geared towards eliminating disease and multiplying clean planting materials for the orange-fleshed sweet potato (OFSP). This entails producing and multiplying virus-free OFSP vines for distribution to farmers.

Okwuonu notes that there is a lot of misunderstanding and confusion surrounding biotechnology products. To remedy this, she plans to educate rural smallholder farmers, especially women. “I want to educate women on biotechnology products and the effect they can have on their lives,” she says. “I believe in using biotechnology tools like tissue cultures, which you can use to breed and multiply quality planting materials to benefit farmers. Not all biotechnology products are GMOs,” says Okwuonu, highlighting the fact that crop improvement through tissue culture does not involve genetic modification. “Now, there are new technologies that do not use transgenic methods, but instead use gene editing methods,” she explains.

“I hope to acquire a new skill in genome editing so I can enhance the technology I already have,” says Okwuonu. She hopes to benefit from AWARD leadership courses to improve her communications skills. “I have always been a lab person and I believe the leadership training will enhance my capabilities in this area,” she says. As the head of tissue culture and genetic transformation at NRCRI, Okwuonu supervises colleagues and students. Through AWARD, she hopes to build her confidence, tolerance, and ability to deal with difficult people. “Through mentoring, I will be able to learn a lot that will help me in fulfilling my duties.” She also hopes to expand her networks via collaboration with social scientists to reach smallholder farmers.

Okwuonu derives satisfaction from meeting deadlines and solving problems, particularly by developing technologies. “When I was able to transform cassava with a marker gene, I was really happy,” she says. She hopes to excel through the AWARD Fellowship. “I want to give it my best, knowing that this will help me achieve my goals.”