

NOBLE NEWS & VIEWS



RESEARCH

Noble Microscopes: Inspiring the Next Generation of Ag Scientists

Jin Nakashima, Ph.D., cellular imaging core facility manager, interacts with students as part of the 2014 Oklahoma Ugly Bug Contest award ceremonies at Central High Elementary School in Marlow, Oklahoma. During the contest, each participating school submits an “ugly bug” specimen, which is imaged by Oklahoma Microscopy Society members. After voting on the “ugliest bugs,” members travel to the winning schools to award them new microscopes and to lead them in fun, educational activities.



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Noble Research Institute scientists seek to better understand how plants grow and how they respond to various environmental stresses such as drought, low nutrients, hot and cold temperatures, and microbial pathogens. We expect the knowledge gained from such research could eventually be applied toward assisting farmers and ranchers in navigating the challenges they often face when growing crops in the harsh environments of the Southern Great Plains. The microscope is an important component of a scientist’s tool kit. Modern high-powered and advanced microscopes enable scientists to see into the secret lives of plants down to the cellular and molecular levels. Intricate details about plants uncovered by these microscopes provide blueprints



Oklahoma Microscopy Society member Ben Smith, Ph.D., talks about gadgets and gizmos to students from Oak Hall Episcopal School in Ardmore, Oklahoma, during Kids Night with a Microscope, which is hosted at the Noble Research Institute.

to guide Noble scientists in developing new crop cultivars more adapted to life in the Southern Great Plains.

THE MOST BEAUTIFUL UGLY BUGS

In addition to research, microscopes have become an integral component of youth education programs within the Noble Research Institute and throughout Oklahoma. As members of the Oklahoma Microscopy Society (OMS), we have been actively involved in efforts to inspire Oklahoma students to consider pursuing careers in the science, technology, engineering and mathematics (STEM) fields. There are two OMS youth outreach programs worth highlighting in this article.

First is the Oklahoma Ugly Bug Contest that was started by the OMS in 1997 to generate interest in the science of microscopy, particularly in Oklahoma students from kindergarten to sixth grade. In this contest, students from participating schools collect native Oklahoma insects and mail one specimen they consider the “ugliest bug” to microscopy labs of OMS members located at the University of Oklahoma and Oklahoma State University. The mailed insects are processed by OMS members for imaging with a scanning electron microscope (SEM), a type of microscope that enables scientists to examine surface details of a sample. Images of the most beautiful “ugly bugs” are judged by OMS members online or through one of their biannual meetings.

For simply mailing an insect specimen, the winning schools are awarded a brand new stereomicroscope for use in their science classes. As OMS members, we travel to the winning Oklahoma schools for the award ceremonies. We bring the new stereomicroscope prize along with posters of all the winning bugs for distribution, and we organize other fun activities with various microscopes and scientific gadgets. Each year, about eight to 10 Oklahoma schools are awarded from more than 70 entries statewide. For more than 20 years, OMS (through the Ugly Bug Contest) has inspired students from more than 600 Oklahoma schools and distributed more than 100 new stereomicroscopes in an effort to spark interest in science education among Oklahoma youth.

AN EVENING WITH MICROSCOPES

We are also involved in the annual “Kids Night with a Microscope” event. This event is typically held the night before the OMS spring workshop. During the event, we host local elementary or middle school students and their parents for an evening of fun activities with a

wide variety of microscopes. In 2012 and 2014, this event was held at the Noble Research Institute. Local students got the chance to operate tabletop SEMs, instruments similar to those used for the ugly bug contest. While rotating through different workstations, students experienced how a laser from a confocal microscope is used to reconstruct a three dimensional (3D) image of a plant and how specific parts of a plant cell move. At other workstations, students used a microscope with a powerful laser to carve their names and draw on the surface of special slide glasses.

We hope our continued efforts to expose Oklahoma students to state-of-the-art research tools through these events will encourage some of them to become our state’s next generation of agricultural scientists. 🐞

MORE INFORMATION

For more information about ongoing OMS youth programs, visit: www.uglybug.org