A Research Treasure Trove

The next generation of cutting-edge NC State solutions in forensic science, cancer treatment, solar energy and more may come from a decidedly old-school source: dye.

The Eastman Chemical Company has donated its Max A. Weaver Dye Library — more than 100,000 dye and fabric samples in all — to NC State.

“This priceless collection could contain the dyes for the next generation of solar panels, the next generation of photodynamic cancer therapies, the next generation of environmentally responsible textile dyes,” explains David Hinks, interim dean of the College of Textiles. The dye collection will be a “treasure trove” for NC State’s innovative, interdisciplinary research in a range of fields, he adds.

Medical researchers and dye chemists such as Ciba Professor of Dyestuff Chemistry Harold Freeman use dyes to develop targeted cancer treatments. “The dyes are designed to dye cancer cells and not healthy cells,” Hinks says. “That allows doctors to identify the cancer but also, by focusing a tunable laser onto that area, the dye will absorb the energy of the laser and ultimately kill the cancer cell. So this is a form of targeted chemotherapy.”

David Muddiman’s research group in chemistry is developing state-of-the-art analytical techniques for forensic analysis of dyed fibers. Frank Hunte’s group in materials science and engineering is interested in developing new dye applications with improved infrared absorption signatures that can prevent military personnel from being detected by night-vision scopes.

The next generation of analytical chemists and forensic scientists will build skills as student researchers who contribute to the forensic science database, Hinks notes. Textiles scientists and engineers will study it for ways to create environmentally responsible dyes that can be applied to textiles, paper, packaging, cosmetics, hair coloring and a host of other products and applications.

Chemists around the world will be able to use data such as 3-D crystallographic models of the chemical structures that the late Max Weaver, longtime dye research leader for Eastman, drew by hand on glass vials. NC State will digitize and post the structures along with key cheminformatics data using ChemSpider, a free online resource maintained by partners at the Royal Society of Chemistry.

The donation builds on NC State’s existing partnership with Eastman. Under a 2012 agreement, NC State became an Eastman Chemical Center of Excellence and the recipient of $10 million over six years.