

Preserving Library of Congress' treasures is goal of FSU researcher

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The Library of Congress has no shortage of reading materials with more than 134 million items in its collection. This summer, a Florida State University chemist will use his knowledge of cellulose, a key component of paper, to help the world's largest library find ways of preserving its vast treasure trove of books, manuscripts, maps, newspapers and pamphlets, many of which are irreplaceable.

André Striegel, an assistant professor of chemistry and biochemistry at FSU, has been invited to serve as the first Preservation Research and Testing Professor in Residence at the Library of Congress' Preservation Research & Testing Division. While in Washington, D.C., for two months this summer, he will investigate the degradation of cellulose-based materials over time — and work on ways to mitigate the problem.

“It is an honor to be the first person asked by the Library of Congress to serve in this capacity,” Striegel said. “I can only hope the research I perform while there helps us to understand how cellulose, the basic ingredient of paper and cloth-type documents, degrades and how this, in turn, leads to corrective or preventive actions to help preserve the books, documents, artwork and other materials that have served to transmit information and values across cultures through the centuries.”

Striegel explained that cellulose used for commercial purposes comes primarily from cotton. It is processed to make paper or other types of sheet material, such as cellophane; to produce fibers such as rayon; and to create textile materials. However, during processing, cellulose

molecules are subjected to a variety of stresses that can damage them. This, in turn, can affect the end-use properties of the material — paper in books and documents, for example, or cloth in paintings and parchments.

“If we better understand the stresses that cellulose polymers undergo during processing, we might be able to refine the production process to create more-durable materials,” Striegel said. “We also might be able to identify better ways of preserving existing materials such as the many one-of-a-kind treasures housed in the Library of Congress.”

While at the Library of Congress, Striegel will make use of a process known as ultrasonication to degrade cellulose-based materials under controlled conditions. He then will use an analytical technique known as multidetector size-exclusion chromatography to study the results — and hopefully reach some conclusions about ways of producing cellulose-based materials with much longer shelf lives.

“At FSU, my research group has extensive experience in polymer chromatography, ultrasonic polymer degradation, and the characterization of polysaccharides including cellulose,” Striegel said. “Because so many materials in the Library of Congress’ collection are cellulose-based, this project seemed like a natural fit between my group’s interests and theirs.”

In addition to his cellulose research, Striegel will consult on other projects during his time at the Library of Congress, including one that focuses on the degradation of magnetic audio tapes. He also will give a series of lectures.

Source: Florida State University

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