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Student Researchers Share Project Results at April 8 Poster Show

Quick Facts

- Twenty-three students presented their research at the April 8 poster show in Sims Science Building.
- Topics ranged from High Mobility Group A1 Proteins, fungal spores, design/synthesis of Sphingosine Kinase Inhibitors and more.



Senior chemistry major Laquitta Massingill (Sumter, S.C.) studied the Capsaicin levels and Scoville heat values of hybrid peppers produced by Rock Hill's PuckerButt Pepper Company.



Clover, S.C., native Kevin Mays, a rising senior double major in chemistry and biology, worked to develop and synthesize Sphingosine Kinase Inhibitors that will target cancer cells.

ROCK HILL, S.C. - For a student who loves spicy food as much as senior chemistry major **Laquitta Massingill**, working with hot peppers seemed a natural fit.

"I've always liked spicy food, so this project sparked my interest," said **Massingill**. The Sumter, S.C., native used Rock Hill-based PuckerButt Pepper Company hybrid peppers in her research. She presented her project, "Capsaicin Concentrations and Scoville Heat Values for Hybrid Peppers," at the **April 8 chemistry poster show in Sims Science Building**. **Massingill** was one of 23 students who presented posters on their research projects, which ranged from the design and synthesis of Sphingosine Kinase Inhibitors to aid in cancer treatment to the study of High Mobility Group A1 Proteins and how they convert healthy cells to cancerous cells.

Massingill, mentored by Cliff Calloway, professor of chemistry, studied the

Scoville heat values – as well as the Capsaicin concentrations – in the pepper company's hybrid peppers. The amount of Capsaicin present determines the spiciness of the peppers, a one-of-a-kind hybrid created by the company. The as-yet-unnamed pepper may be one of the hottest ever created, **Massingill** determined; in fact, the peppers burned her skin several times.

Despite her appreciation of spicy flavors, **Massingill** admits that she's a bit nervous about trying one

of the company's peppers. "I haven't worked up the nerve yet," she said.

Another student researcher, Clover, S.C., native **Kevin Mays**, selected a project that focused on designing and synthesizing Sphingosine Kinase Inhibitors – a "giant subject" in the research world, according to Mays. The rising senior double major in biology and chemistry explained that there are high levels of Sphingosine-1-Phosphate – made by the enzyme Sphingosine Kinase (I/II) – in nearly every type of cancer. In his research project, "Design and Synthesis of Novel Zone 4 Modified Sphingosine Kinase Inhibitors," **Mays** worked toward the creation of Sphingosine Kinase Inhibitors that will preferentially eliminate cancer cells. The research appealed to him, he said, because it could lead to the creation of a drug line that could treat cancer more efficiently.

"The Sphingosine Kinase Inhibitors are highly selective; they will only attack cancer cells," said **Mays**, who worked with associate professor of chemistry Christian Grattan.

Other students who presented at the **April 8 poster show** included:

Abby Bradner, Charlotte, N.C., (Robin Lammi) – "Unmasking Preferred Structures and Structural Dynamics in Dimers of Amyloid- β Peptide"

Chelsea Brennan, Swiftwater, Pa., (James Hanna) – "Synthesis of 3,3',4,4'-Tetrahydroxyphenyl and its Evaluation as a Potential Amyloid-B Aggregation Inhibitor"

Felicia Boulware, Fort Lawn, S.C., (Scott Werts) – "Design of Soil Temperature Sensor for Monitoring and Experiments During Fire Events"

Ashton Brock, Columbia, S.C., (Takita Sumter) – "Transcriptional Activation of the HMGA1 Promoter Through the Wnt/B-Catenin Pathway"

Jaelyn Cika, Fort Mill, S.C., (Grattan) – "Synthesis of Sphingosine Kinase 1 Inhibitors by Manipulation of Zone 2"

Tyler Couch, Fort Mill; Zach Curry, Waxhaw, N.C.; Harrison Toney, Bethune, S.C.; Elizabeth Bales, Elgin, S.C., (Jason Hurlbert) – "Expression and Purification of Bacterial Xylanases Ca-Q97TI2 and Cp-C7IMC9"

Megan D'Angelo, Florence, S.C., (Hanna) – "A New Synthesis of 3-Alkylpyrazolo[3,4-b]pyridines"

J. Amy Deng, Rock Hill, (Sumter) – "Cloning and Functional Characterization of Novel R25 Variants of High Mobility Group A1 (HMGA1)"

Will Lominac, Hickory, N.C., (Hanna) – "Cyclization of 3-Benzoylpyridine N-oxide Tosylhydrazide: Optimization of the Electrophile"

Jeff Myers, Lexington, S.C., (Hanna) – "The Synthesis of Benzisoxalo[2,3-a]pyridinium Tetrafluoroborates"

Ray Olang, Fort Mill, (Grattan) – "Design and Synthesis of Novel Sphingosine Kinase Inhibitor Derivatives"

Carol Perkins, Florence, (Sumter) – "Bioinformatic Investigation of the Regulatory Networks of the High Mobility Group A (HMGA) Proteins"

J. Kennon Smith, Rock Hill, (Hurlbert) – "Generation of Homology Models Suitable for Phasing of X-ray Crystallographic Data"

Craig Stevens, Rock Hill, (Hanna and Robin Lammi) – "Synthesis and Evaluation of Potential Amyloid-B Aggregation Inhibitors"

Amber Wallace, Deland, Fla., (Grattan) – "Synthesis of Zone 1 and 2 Sphingosine Kinase 1 Inhibitors"

T. Cameron Waller, Lancaster, S.C., (Hurlbert) – "Structural Determinants of Bacillus subtilis Xylanase C Specificity to 4-O-Methyl-D-Glucuronoxylan"

Nicole Wesselschmidt, Lancaster, (Werts) – "Carbon and Nitrogen Trends in Bulk Peat in Holocene Deposits and Modern Sedge from Congaree National Park"

H. Mark White, Rock Hill, (Werts) – "Isolation and Analysis of Endomycorrhizal Fungal Spores from Semi-Arid Arizona Soils"

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