

Dr. Martin Karp, Member

SUBJECT: REQUEST FOR APPROVAL OF RESOLUTION NO. 08-A2 OF THE SCHOOL BOARD OF MIAMI-DADE COUNTY, FLORIDA, RECOGNIZING SHANE MACKEY FOR BEING NAMED A SEMIFINALIST IN THE SIEMENS COMPETITION IN MATH, SCIENCE & TECHNOLOGY RESEARCH COMPETITION

COMMITTEE: INSTRUCTIONAL EXCELLENCE AND COMMUNITY ENGAGEMENT

LINK TO DISTRICT STRATEGIC PLAN: DEVELOP OUR STUDENTS SO THEY ARE ABLE TO SUCCESSFULLY COMPETE IN THE GLOBAL ECONOMY

Shane Mackey, a 12th grader at Dr. Michael M. Krop Senior High School, was named a semifinalist in the Siemens Competition in Math, Science & Technology Research Competition. He is the only winner from Miami-Dade County. The Siemens Competition recognizes remarkable talent, fostering individual growth for high school students who are willing to challenge themselves through science research. Through this competition, students have an opportunity to achieve national recognition for science research projects that they complete in high school. By supporting outstanding students today, and recognizing the teachers and schools that inspire their excellence, the Foundation helps nurture tomorrow's scientists and engineers.

Shane conducted his research on "Lens Refilling for the Restoration of Accommodation and Near-Vision in Human and Other Primate Lenses." His work specifically focused on Presbyopia, which affects 1.3 billion people worldwide and over a third of the American population. Presbyopia is as common a part of aging as wrinkles and gray hair, and can begin to manifest as early as the age of forty.

The project details our loss of accommodative ability, which begins the moment we are born, and our range of accommodation, which shrinks almost exponentially. By age twenty, our amplitude of focus has shrunk to half of what it was at age ten, and by age sixty it is almost non-existent. This loss of accommodation is most likely the result of accumulation of advanced glycation end-products in the crystalline lens that cause the lens to lose its flexibility over time thereby making accommodation more difficult.

By removing the hardened contents of the lens of a presbyopic eye and replacing them with a polymeric gel that has the same optical properties as a young, healthy lens, the presbyopia can be cured and accommodation returned to the lens. Several advantages exist to the lens refilling procedure that cannot be found in any of the existing treatments for Presbyopia.

Shane is interested in pursuing a career in the bioengineering field. In 8th grade, he began reading independently about such topics as biotechnology and artificial intelligence. His focus on technologies of the future led him to gain a greater interest in conducting research in emerging fields including anti-aging medicine and nanotechnology. Through the honors and executive internship program, he was able to work with Drs. Parel and Manns at the Bascom Palmer Eye Institute. While the experimentation was already underway, an evaluation of the work had not begun. Shane was able to conduct an independent analysis of their experiments working both at home and at the lab.

Technology will increase exponentially becoming more complex. The first commercial products on bioengineering will be coming out in the near future and within 10 years, some real applications for this and other similar projects will exist with a gradual move into actual procedures. Shane looks forward to being a part of this exciting progress.

Under the guidance of his high school science teacher Dr. David Buncher at Dr. Michael M. Krop Senior High School, Shane has been able to pursue his work and conduct research. He has been recognized for numerous other accomplishments. Last year, he earned first place in the Medicine and Health category at the Florida State Science Fair and had previously received second place at this Fair. At the county level, he received the top award in the Biological field at the Science Fair. He has participated at the International Science Fair for three consecutive years since he was a ninth grade student. He received the Outstanding Science Student award at his high school. Shane was also a first place winner in the Florida Virtual Science Fair, a member of the first place SECME Brain Bowl team, a recipient of the Miami-Dade County Science Teachers Award, and a recipient of the Show Board Award for the best use of a science board.

Other recognitions include the Advanced Placement Scholar of Distinction award, the National Merit Semifinalist honor, a National Council of Teachers of English essay award, a Spot Success award, the F. Craig Sturgeon community service award, and an MIT Book award.

**ACTION PROPOSED BY
DR. MARTIN KARP:**

That The School Board of Miami-Dade County, approve Resolution No. 08-A2, recognizing Shane Mackey for being named a semifinalist in the Siemens Competition in Math, Science & Technology Research Competition.

**RESOLUTION NO. 08-A2
OF THE SCHOOL BOARD OF MIAMI-DADE COUNTY
FLORIDA, RECOGNIZING SHANE MACKEY FOR BEING NAMED A SEMI-
FINALIST IN THE SIEMENS COMPETITION IN MATH, SCIENCE &
TECHNOLOGY RESEARCH COMPETITION**

WHEREAS, Shane Mackey, a 12th grader at Dr. Michael M. Krop Senior High School, was named a "semi-finalist" in the Siemens Competition in Math, Science & Technology Research Competition, which recognizes remarkable talent early on, fostering individual growth for high school students who are willing to challenge themselves through science research; and

WHEREAS, Shane conducted his research on "Lens Refilling for the Restoration of Accommodation and Near-Vision in Human and Other Primate Lenses" specifically focusing on Presbyopia, which affects 1.3 billion people worldwide and over a third of the American population; and

WHEREAS, Through the honors and executive internship program, he was able to work with Drs. Parel and Manns at the Bascom Palmer Eye Institute and conduct an independent analysis of their experiments working both at home and at the lab; and,

WHEREAS, Shane's project is the only winner from Miami-Dade County.

NOW, THEREFORE, BE IT RESOLVED THAT:

The School Board of Miami-Dade County, Florida approve Resolution No. 08-A2 of The School Board of Miami-Dade County, Florida, recognizing Shane Mackey for being named a semi-finalist in the Siemens Competition in Math, Science & Technology Research Competition.

Presented this eighteenth day of November, A.D. 2008

THE SCHOOL BOARD OF MIAMI-DADE COUNTY, FLORIDA

CHAIR

ATTEST:

Secretary