

**Davidson Fellow**  
**Raja Selvakumar**  
\$10,000 Scholarship Recipient



**Personal Info**

Age: 16  
Alpharetta, Georgia

**School, College and Career Plans**

Raja is a rising junior at Milton High School. He plans to attend Stanford or MIT, where he will pursue biomedical engineering or nanotechnology.

**Davidson Fellows Submission: Science**

In his project, "The Implementation of a Gastro Microbial Fuel Cell in Capsular Nanorobotics," Raja developed the Gastro Microbial Fuel Cell (GMFC). Based on the microbial fuel cell, the GMFC generates electricity using gastrobacteria, to be used to power capsular nanobots. Current lithium ion batteries in biomedical capsular nanobots are not able to sustain power for long periods of time; the GMFC has the potential to solve this problem. The GMFC-powered capsular nanobot can play an important role in treating gastrointestinal diseases through intracellular diagnosis and surgery.

**Biography**

While a student at Fulton Science Academy Middle School, Raja had the opportunity to pursue various different scientific and mathematical avenues, such as Science Olympiad and Math Olympiad. These experiences carried over to high school where he continued to participate in as many math and science activities as he could. These experiences have inspired Raja with a passion to innovate and bring about a new era of ideas.

Raja initially had difficulty conducting his experiment in a proper laboratory due to a lack of lab space. He persevered and was able to conduct his research at Emory University and his mentor and teacher provided him with a workspace and proper equipment to start his experiment. Raja prepared for his experiments by studying numerous university papers and theses to learn new concepts and keep track of the latest scientific studies.

Outside of scientific research, Raja enjoys reading, spending time with friends and playing the trumpet. He is President of his school's Robotics Club, founder of the Chess Club and also participates in the Math Team, Debate Team and Academic Bowl team. He also enjoys playing basketball and soccer, especially with friends.

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**Davidson Fellow**  
**Raja Selvakumar**  
(cont.)

- 2011 Davidson Fellow
- 2011 Intel International Science and Engineering Fair, Fourth Place, Category Award Winner- Biochemistry
- 2011 ISWEEEP International Sustainable World, Energy, Engineering, and Environment Project Olympiad, Second Place, Category Award Winner- Energy
- 2011 Sanofi-Aventis National BioGENEius Challenge, Finalist
- 2011 INEPO International Environment Project Olympiad Turkey, Second Place
- 2011,2010,2009 Georgia Science and Engineering Fair, First Place
- 2011,2010 Georgia BEST and FIRST Robotics, Finalist
- 2011,2010 Georgia ARML American Regional Mathematics League, Member
- 2011 Boy Scout Star Rank
- 2010 GFCA State Debate Tournament, Quarter Finalist

**Community Activities**

Raja is a Star Scout and is working toward his Eagle Project to give back to his temple. He volunteers with the North South Foundation to promote math, spelling, vocabulary, and other competitions for K-8 graders to donate scholarship money for underprivileged children in India. He has conducted math and spelling workshops for that purpose, and also helped the Robotics team's first summer camp for middle school students.