



**Davidson Fellow Laureate**  
**Sikandar Porter-Gill**  
(\$50,000 Scholarship Recipient)



**Personal Info**

Sikandar Porter-Gill  
Age: 17  
Gaithersburg, Maryland

**School, College and Career Plans**

A rising senior at Gaithersburg High School, Sikandar will be applying to colleges this fall, including Penn State, Harvard, University of Maryland, and the University of California-San Diego for his undergraduate education, where he plans to major in environmental, naval or chemical engineering.

**Davidson Fellows Submission** (*Science*)

In his project, "The Production of Methane in a Two-Chamber Bio-Catalyzed Microbial Fuel Cell Utilizing *Methanosarcina barkeri*," Sikandar developed a novel process to clean wastewater and produce methane for use as an alternative form of energy. He engineered bio-catalyzed microbial fuel cells in a two-chamber design, connected with a proton conducting membrane, to degrade organic material in wastewater and produce methane, the principal component of natural gas. Sikandar's research is a promising step toward pursuing a cost-effective and environmentally-friendly energy source.

**Biography**

As a high school senior, Sikandar will be taking four Advanced Placement (AP) classes along with two classes at Montgomery College. He serves as the student president for the Academy of Science and Technology at his school.

With a desire to be part of the research in the area of alternative fuels, Sikandar's interest in microbial fuel cells (MFC) began about four years ago. He spent time understanding how a wastewater treatment plant (WWTP) functions, and engineering these MFC on a mini scale in hopes that they can be transposed into realization in a modern day WWTP. He hopes that the work he has completed in researching microbial fuel cells (MFC) and methanogenesis will be a positive contribution to society as a renewable biofuel technology. Using microbial fuel cells is important to current efforts being made in the field of alternative fuels.

In addition to an interest in microbial fuel cells, Sikandar is interested in space science. Besides holding several awards for his science projects, Sikandar is a member of the National Honors Society and French Honors Society.

*Please see next page.*



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(Cont.)

**Honors/Awards**

- 2008 Davidson Fellow Laureate
- 2008 International Sustainable World (Energy, Engineering, & Environment) Project Olympiad (I-SWEEEP), Second Place Energy Category
- 2008 Montgomery Area Science Fair, Five Specialty Awards, Category First Place, *Production of Methane in a Two-Chamber Bio-Catalyzed Microbial Fuel Cell Utilizing Methanosarcina Barkeri*
- 2008 Rachel Carson Scholar, Honorable Mention
- 2008 AP Environmental Sciences, outstanding performance award
- 2007 Intel Science & Engineering Fair (ISEF) – fourth place, Energy and Transportation Category
- 2007 BioGENEius Regional Competition – Maryland State winner
- 2007 Montgomery Area Science Fair, Five Specialty Awards, Category First Place, Over-all Winner-*Improvement of a Single-Chamber Microbial Fuel Cell Utilizing a Novel Concept for a Hydrophobic Coating at the Cathode and the Incorporation of Graphite Granules at the Anode Electrode*
- 2006 ISEF– Air Force Government Award
- 2006 Montgomery Area Science Fair, Five Specialty Awards, Category First Place, Over-all Winner-*Harvesting Energy from Wastewater in a 2-Chamber Microbial Fuel Cell*
- 2006 London Designing Automata Competition, second place, secondary category, England
- 2005 Montgomery Area Science Fair, Three Specialty Awards

**Community Activities**

Sikandar has volunteered hundreds of hours with the youth program at Montgomery College. He also heads a small group of students at his high school interested in energy conservation, called Gaithersburg Going Green.

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