



Davidson Fellow
Prithwis Mukhopadhyay
($\$10,000$ Scholarship Recipient)



Personal Info

Age: 16
Woodbury, Minnesota

School, College and Career Plans

This fall, Prithwis is a junior at Woodbury Senior High School. He is considering both Harvard and the Massachusetts Institute of Technology as college options, and plans to study medical science, computer science and/or nanotechnology.

Davidson Fellows Submission (*Science*)

In his project, "A Common Food Additive Induces Cell Migration and Neoplastic Phenotype by Decreasing ASB Activity," Prithwis researched the molecular mechanism by which carrageenan may induce premalignant cell transformation. Carrageenan is a FDA-approved food additive found in dairy products, processed meats, dog food, infant formula and cosmetics. Using mammary epithelial cells, he found carrageenan reduced Arylsulfatase B (ASB) activity and increased sulfated glycosaminoglycans (sGAG), especially chondroitin sulfate, which induced cell migration and premalignant transformation. Prithwis' work shows how carrageenan influences breast cancer cell proliferation and migration.

Biography

Prithwis was born in Calcutta, India, and his family moved to the United States when he was six months old, settling in Woodbury, Minn. when he was seven years old.

Science and mathematics have always been his favorite subjects. By eighth grade, Prithwis had completed high school math courses, and started taking college-level calculus courses through the University of Minnesota's Talented Youth Mathematics Program. He completed honors level college courses on vector analysis and Linear Algebra during his sophomore year as well as high school senior level physics.

One of the biggest challenges Prithwis faced in pursuing his Davidson Fellows project was the lack of proximity to the research facility in Chicago. To overcome this, Prithwis planned his research activities well in advance and communicated regularly with his mentor via email and phone.

Prithwis serves on his school's student council and participates in Quiz Bowl, the Science Olympiad and is on the Math League team. He loves to travel, visiting his friends and relatives in India every year. In his free time, Prithwis enjoys watching movies and cartoons, playing strategy games and tinkering with electronic devices.

Please see next page.



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(Cont.)

Honors/Awards

- 2009 Davidson Fellow
- 2005 – Present University of Minnesota Talented Youth Mathematics Program
- 2009 Intel International Science and Engineering Fair Finalist
- 2009, 2008 Minnesota Scholar of Distinction in Science
- 2009, 2008 Minnesota Scholar of Distinction in Mathematics
- 2009 3M Corporate Sponsorship Award, First Place
- 2009 Institute of Food Technologists Award, First Place
- 2008 Intel International Science and Engineering Fair Finalist
- 2008 U.S. Army Award
- 2008, 2007 Science Olympiad Finalist and Team Member
- 2008, 2007, 2006 Math League Finalist and Team Member
- 2007 Named one of the top 40 young scientists in the nation and a Discovery Channel Young Scientist Challenge Finalist
- 2007 MIT Excellence award, minor planet (23834) Mukhopadhyay named in his honor
- 2007 Intel International Science and Engineering Fair Alumni Award
- 2007 Midwest Academic Talent Search Honor
- 2007 Quiz Bowl Finalist
- 2007 – Present Member of National Honor Society

Community Activities

As a voluntary online tutor, Prithwis helps high school and college students in mathematics. He assists members of the local Indian community with various cultural and religious events, and volunteers at the VA Hospital in Chicago, Ill. during summer vacations.

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