

Davidson Fellow
Shalini Ramanan

\$10,000 Scholarship Recipient



Personal Info

Age: 17

Richland, Washington

School, College and Career Plans

Shalini recently graduated from Hanford High School. She will attend Brown University and major in Computer Science. She has plans for a career in Artificial Intelligence, focusing on understanding how cognition, comprehension and decision making happen in the human mind.

Davidson Fellows Submission: Science

In her project, "Inhibition of Vascular Cell Migration by Bisdemethoxycurcumin: A Bioinformatics Based Approach to Identify Target Genes," Shalini worked with Bisdemethoxycurcumin (BC), a natural dietary component of the spice turmeric, to test its effectiveness in treating cardiovascular diseases. Through cell migration assays and western blot techniques, she found that BC inhibited platelet-derived growth factor (PDGF)-induced vascular smooth muscle cell migration and signaling. Using bioinformatics, she identified target genes connected with signaling pathways. PDGF-stimulated cell-migration and proliferation are key pathological events in a variety of disease including atherosclerosis and cancer. Her studies may help design and characterize novel drug molecules with clinical applications.

Biography

In high school, Shalini took AP or advanced classes such as Calculus 3, AP Calculus BC, AP Statistics, AP Chemistry, AP Biology, AP World History, AP Psychology, and AP English Language and Composition. The summer before her senior year, she was accepted into the Young Women in Science Program and was able to work at the Pacific Northwest National Laboratory as an intern in the Biological Sciences & Mass Spectrometry department. Through Hanford High School's work-based learning program, she was also able to work part-time at Energy Northwest.

Shalini first became interested in her project when she learned about the beneficial effects of the spice turmeric, which her mother would prepare into an herbal medicine when Shalini was sick. Over time, she became curious to see what effect Bisdemethoxycurcumin, a natural nontoxic dietary component of turmeric, might have on cardiovascular diseases.

Shalini has many interests outside of science. Just a sampling includes piano, violin, classical dance, swimming, tennis, chess, creative writing, reading, drawing, painting, traveling and watching movies.

Please see next page.



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(cont.)

- 2011 Davidson Fellow
- 2011 Local ELKS Scholarship Winner
- 2011 Richland Rotary Club Scholarship Winner
- 2011 Richland Kiwanis Club High School Top Seniors Award
- 2011 INTEL Student Talent Search Semifinalist
- 2010 INTEL International Science and Engineering Fair Medical and Health Science Third Place
- 2010 Mid-Columbia Regional Science and Engineering Fair Grand Prize Winner
- 2010 Yale Science and Engineering Association Award Certificate and Medallion
- 2010 Intel Excellence in Computer Science Award Certificate
- 2010 Washington State Science and Engineering Fair- First Place, Senior Division
- 2010 Advanced Placement Scholar
- 2009 Mid-Columbia Regional Science and Engineering Fair Second Place
- 2007 Mid-Columbia Regional Science and Engineering Fair Third Place

Community Activities

Shalini participates in many community service clubs such as Interact Club (a branch of the Rotary Club), Key Club, Link Crew, Buddy Club and National Honor Society. As president of Interact Club, she led an effort to raise more than \$1,000 and, through matching processes, donated \$14,000 to an orphanage in India. She has also learned Bharatanatyam, an Indian classical dance, and has performed at local festivals, cultural associations and for senior citizens at a local retirement residence.