



**Davidson Fellow Laureate
Alexandra Courtis**

(\$50,000 Scholarship Recipient)



Personal Info

Alexandra Courtis

Age: 17

Davis, California

School, College and Career Plans

Alexandra is a recent graduate of Davis Senior High School and will attend Harvard University where she hopes to major in a joint M.D./Ph.D. program and pursue a career in medical research and work with the World Health Organization.

Davidson Fellows Submission (Science)

In her project, "Bright Luminescent Silicon Nanoparticles for Biological Applications," Alexandra developed a new method of creating luminescent silicon nanorods and quantum dots, used in biomedical imaging and cancer treatments to track biological processes. While traditional production methods of quantum dots are very costly, Alexandra used sodium silicide and ammonium bromide to produce highly luminescent particles, making the synthesis of silicon nanoparticles commercially viable on a large scale. Her research is considered a major advancement in the imaging of cancerous tumors at the cellular level and directed tumor targeting.

Biography

By age 12, Alexandra was taking Advanced Placement Calculus and at 14, was the youngest student to take Vector Analysis at the University of California, Davis. Soon after, she was accepted to the Accelerated College Entrance Program at California State University, Sacramento while also keeping up a full high school schedule.

Alexandra became involved in inorganic chemistry as a 14-year-old sophomore assigned to shadow a science laboratory for her AP Chemistry class, and she knew immediately that she wanted to continue in order to make her own contributions to the field of nanoscience. One of the biggest challenges Alexandra faced was balancing nearly 20 hours a week in the lab and the demands of schoolwork. The pursuit of the scientific process has given her a strong sense of direction and accomplishment.

Alexandra works extensively with the United Nations Association of the USA. She is the elected Chair of Education for the Northern California Division and the Founder and Director of UNA Youth Council of Northern California. Alexandra is also the Founder and President of the UNA-USA Student Alliance Group of Davis and was the student organizer for two UNA-USA Davis UNICEF Fundraising Drives.

In her free time, Alexandra enjoys playing tennis, reading Christopher Moore and taking care of her dog and cat.

Please see next page.

The Davidson Institute for Talent Development

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(Cont.)

Honors/Awards

- 2007 Davidson Fellow Laureate
- 2007 Finalist Intel Science Talent Search
- 2007 Patricia Beckman Project of the Year Award, California State Science Fair
- 2007 U.S. Air Force Scholarship, Intel International Science and Engineering Fair
- 2007 Selected Presenter, Richard Larock Undergraduate Research Conference, University California, Davis
- 2007 Selected Scholarship Participant, Taiwan International Science Fair 2008
- 2007 Second Place, Chemistry Category, International Science and Engineering Fair
- 2007 First Place, Chemistry Category, California State Science Fair
- 2007 Selected Participant and Scholarship Awardee, Dr. Bessie F. Lawrence International Summer Science Institute at the Weizmann Institute of Science
- 2007 Third Place, United Nations Association of the United States National High School Essay Contest
- 2007 National Collegiate Inventors and Innovators Alliance/Lemelson Foundation Scholarship Recipient
- 2004-Ongoing Research Group Member, Lab of Professor Kauzlarich, UC Davis Dept. of Chemistry
- 2006 Rensselaer Medalist in Math and Science
- 2006 Winner of STAR Award, American Association of Teachers of French
- 2006 Author and Presenter, American Chemical Society 232nd National Meeting and Exposition

Community Activities

Alexandra has served as the captain of her school's Model United Nations Team and President of the Amnesty International student chapter. She spearheaded her high school's first-ever UNICEF drive and with Amnesty International, developed a community-wide awareness campaign on the plight of child soldiers in Uganda. Alexandra has also been elected to represent the more than 4,200 students in her school district as the only student representative on the Davis City Council's Human Relations Commission.

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