

Young scientists compete in talent search

Forty high school seniors became finalists this week in the 53rd Westinghouse Science Talent Search. More than 1,600 students from 682 schools entered the search, a competition for scholarships as well as for recognition of scientific potential. The contest is sponsored by Westinghouse Electric Corp. in partnership with Science Service, Inc. in Washington, D.C.

The 16 female and 24 male finalists will come to Washington for the Science Talent Institute, held March 9 to March 14, to meet prominent scientists, visit research centers, and display their projects at the National Academy of Sciences. Each finalist will be interviewed by a panel of eight researchers. The top three finalists will win scholarships of \$40,000, \$30,000, and \$20,000, respectively, distributed over four years. Seven more finalists will earn scholarships, three for \$15,000 and four for \$10,000 each. The remaining 30 finalists will get \$1,000 apiece.

"There is no other national resource with more potential to improve the future of our technology, our economy, and the quality of our lives than America's promising young science students," says Alfred S. McLaren, president of Science Service.

This year's finalists, age 16 to 18:

- Alabama: William Benton Venable, Tallassee H.S., Tallassee.
- California: Eric Chunchieh Wang, La Jolla H.S., La Jolla.
- Colorado: Rajen Arun Sheth, Cherry Creek H.S., Englewood.
- Delaware: Catherine Kailyn Huang, Tower Hill School, Wilmington.
- Florida: Kimberly Anne Hanisak, Vero Beach Senior H.S., Vero Beach.
- Maryland: Jennifer Melissa Kalish, Bryn Mawr School, Baltimore.
- Massachusetts: Margaret Chalmers Bothner, Falmouth H.S., Falmouth; Jessica Hammer, Maimonides School, Brookline; Yvonne Ou, Lexington H.S., Lexington; Janos Zahajszky, Canton H.S., Canton.
- Michigan: Darius Dewitt Hollings, Cass Technical H.S., Detroit.
- Minnesota: Steven Daniel Sherman, Winona Senior H.S., Winona; Princessa Victoria VanBuren, St. Cloud Technical H.S., St. Cloud.
- Missouri: Jason Patrick Talley, Joplin H.S., Joplin.
- Montana: Forrest Newell Anderson, Helena H.S., Helena.
- Nebraska: Michael Thomas Jones, Cambridge Public School, Cambridge.
- New Hampshire: William Whitney Burke-White, Phillips Exeter Academy, Exeter.

- New York: Johnson Chen, Stuyvesant H.S., New York; Won Choi, Flora Tarkovsky, and Grace Yang, Bronx H.S. of Science, New York; Todd Eldad Hod and Job Thomas Rijssenbeek, Ward Melville H.S., Setauket; Jennifer Yu-Fe Lin, Hunter College H.S., New York; Alexis Zeiff Martin, La Guardia H.S. of Music and Art, New York; Mariya Minkova, Midwood H.S. at Brooklyn College, New York; Tamas Muller, Edward R. Murrow H.S., New York; Jamel Lamonté Oeser-Sweet, Martin Luther King Jr. H.S., New York; Alex Olegovich Sinelnikov, James Madison H.S., New York; John Francois Staropoli, Waldorf School, Garden City; Shimin Zheng, Townsend Harris H.S./Queens College, New York.
- Ohio: Rakhi Chaudhuri, Maumee Valley Country Day School, Toledo.
- Pennsylvania: Peng-Chu Benjamin Tu, State College Area H.S., State College.
- South Dakota: John Laurence Staub, Sisseton H.S., Sisseton.
- Texas: Katherine Leigh Schaudt, James E. Taylor H.S., Katy.
- Utah: David Ian Crowley, Viewmont H.S., Bountiful; David L. Farmer, Orem H.S., Orem.
- Virginia: Diego Francisco Figueroa, Thomas A. Edison H.S., Alexandria; Robert Christopher Sarvis, Thomas Jefferson H.S. for Science & Technology, Alexandria.
- Wisconsin: Raechal Elizabeth Sager, Nicolet H.S., Glendale. —R. Lipkin

Growth factors boost heart's blood flow

Genetically engineered growth factors can improve the heart's blood supply in dogs and pigs, researchers say. They believe such drugs may one day provide humans with a treatment to counter clogged coronary arteries, the main vessels that supply the heart with blood.

People with disease-narrowed coronary arteries experience repeated bouts of myocardial ischemia, a dangerous decline in the volume of blood flowing to heart muscle. Cardiologists know that everyone has so-called collateral vessels that bring small amounts of blood to the heart. These collateral vessels enlarge when the coronary arteries are blocked, thus bypassing the obstruction. In most cases, however, collateral circulation can't make up the shortfall in blood volume, so patients may still experience crushing chest pain.

National Heart, Lung, and Blood Institute researchers Stephen E. Epstein and Ellis F. Unger wanted to find out if they could improve upon nature's own method of providing alternate routes for the heart's blood supply. They focused on two growth factors, vascular endothelial growth factor (VEGF) and fibroblast growth factor (FGF). Both are short proteins thought to play a role in the body's normal production of new

blood vessels.

In one investigation, the researchers relied on dogs and a device that gradually narrows the left coronary artery. That experimental process mimics what happens to humans when the coronary arteries become choked with fatty plaque, Epstein says. Next, the team injected VEGF, FGF, or an inactive placebo directly into the arteries of the dogs in the study. After four weeks, each growth factor boosted collateral circulation by an average of 40 percent, Epstein said last week at the American Heart Association's annual science writers' seminar, held in Clearwater Beach, Fla.

The duo also wanted to see if a very short course of growth factor could spark more collateral blood flow. They repeated their experiment with dogs but this time gave just FGF for a period of seven days. Even brief treatment with FGF provoked a substantial increase in collateral blood flow.

If people with coronary artery disease obtained such a boost in their collateral circulation, they might avoid the sometimes painful ischemic episodes, which can leave regions of the heart with dead or damaged tissue, Epstein says. More important, such treatment might help patients avoid angioplasty

or bypass surgery, comments Michael Simons of Beth Israel Hospital in Boston, whose research with pigs also shows FGF helps boost collateral blood supply.

Are such growth factors safe? Nobody really knows. Scientists believe that growth factors encourage the proliferation of smooth muscle cells that help make up artery walls. Epstein wonders whether such treatment could actually narrow the already diseased arteries even further. To test that worrisome possibility, Epstein and Unger injured the leg arteries of dogs and exposed those vessels to FGF. The growth factor triggered no abnormal growth of artery cells — at least in this preliminary experiment. "So far, we're encouraged," Epstein says.

Another concern revolves around the speculation that growth factors could rev up indolent tumors. Many people harbor such tumors, which may not cause problems for years, Epstein points out. Yet long-term exposure to growth factors might help transform slow-growing tumors into aggressive cancers.

Simons doesn't believe cancer is a likely side effect, especially if treatment is brief. His group plans a safety trial of growth factors given to humans with severe coronary artery disease.

—K.A. Fackelmann