PRESS RELEASE

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The American Society of Human Genetics Hosts Fourth Annual DNA Day Essay Contest, Supports Genetics Education Efforts

ASHG Announces High School Student Essay Contest Winners in Celebration of National DNA Day on April 24, 2009

BETHESDA, MD – April 24, 2009 – In celebration of National DNA Day, the American Society of Human Genetics (ASHG) and the Genetics Society of America (GSA) have joined with corporate sponsor Life Technologies Corporation (NASDAQ:LIFE) through its Life Technologies™ Foundation, to educate students and teachers about important concepts in genetic science by hosting the fourth annual National DNA Day Essay Contest.

Celebrated annually on April 25, National DNA Day commemorates the discovery of DNA's double helix and the completion of the Human Genome Project in April 2003. The essay contest is just one of the many DNA Day activities designed to excite students about human genetics and help them gain a better understanding of the underlying scientific principles and research methods.

“ASHG’s National DNA Day Essay Contest is an educational initiative that brings students and their teachers together with some of the best geneticists in the world,” said Joann Boughman, Ph.D., executive vice president of ASHG. “Our organization coordinates the essay contest and other educational activities because, as the largest society for genetics professionals, we feel that it is important for us to raise awareness about the value of genetics education and research. ASHG is also committed to sharing a broader understanding of human genetics by reaching out to students in science classrooms around the world, in an effort to increase their excitement about and interest in the field.”

ASHG’s annual DNA Day Essay Contest challenges science students in grades 9-12 to question and reflect on key concepts of human genetics by writing an original essay that provides a substantive, well-reasoned argument about the genetic basis of various traits, including those related to health and disease. This year, ASHG received a total of 300 essay submissions from high school students in the U.S., Canada, and other countries, such as China, Bangladesh, Pakistan and Ghana. More than 150 geneticists from ASHG and GSA volunteered to judge the students’ essays on the basis of critical thinking, scientific accuracy, creativity and organization.

“Most genetics units in high school contain little or no information about complex traits – which are those influenced by many different genes and the environment,” said Michael Dougherty, Ph.D., Director of Education for ASHG. “This year’s essay questions gave teachers a reason to talk about common diseases, such as heart disease, diabetes, cancer and schizophrenia, which are the subject of much current research in genomics.”

Today, in celebration of National DNA Day, ASHG and corporate sponsor Life Technologies Foundation announced the winners of the fourth annual DNA Day Essay Contest during the live online DNA Day 2009 Chatroom sponsored by the National Human Genome Research Institute (NHGRI/NIH). The students who submitted the top responses for each of the two essay contest questions were awarded $400; second place winners were awarded $250; and third place winners, $150. Teachers of the students who won first place prizes will each receive $2,000 to purchase new laboratory equipment for their science classrooms.

2009 NATIONAL DNA DAY ESSAY CONTEST WINNERS:

High school students in grades 9-12 were invited to submit written essays on one of the following two questions. The first essay question asked students to explain the relationship between *genes* and *traits*. More specifically, students had to explain whether all inherited traits come in only two distinct varieties, or whether some traits have a more complex pattern of inheritance.

For the first essay question, ASHG and GSA judges awarded first place to **Mehera Emrich**, a senior from *Acalanes High School* in *Lafayette, Calif*. Emrich's essay explained the relationship between genes and traits, and she impressed the geneticist judges by contrasting modern scientific understanding with John Locke's philosophical construct that humans are born as a 'tabula rasa' or 'blank slate' that is 'filled in' by each person's environment. In her essay, Emrich acknowledged the importance of both heredity and environment when she wrote, "Mendel greatly underestimated genetic complexity, while Locke grossly overestimated the impact of environmental influences on human development." She concluded her essay by stating that, "Perhaps it would be more correct to say that genes, by creating a living organism, provide a slate that has already been written on. With the passage of time the environment edits this writing, modifying the wording but maintaining the essence of the original document."

ASHG and GSA also named second and third place winners for the first essay question. **Laura Molina**, a sophomore from *Viera High School* in *Viera, Fla*., won second place for her careful description of a variety of inheritance patterns that go beyond the 'either/or' types studied by Mendel. In her essay, Molina noted that, "Not all traits come in just two varieties. Modes of inheritance like co-dominance, incomplete dominance, and epistasis involve intricate interactions between the expression of multiple alleles and/or genes that often result in the existence of three or more varieties of traits, such as human blood markers and flower color." Molina concluded her essay by affirming that, "Future investigation will probably uncover even more complex modes of inheritance and relationships between genes and traits that will improve our [current] understanding of genetics."

Likewise, the third place winner for this question also provided an adept description of the relationship between genes and traits. In his prize-winning essay, **Stephen Wang**, a junior at the *Charter School of Wilmington* in *Wilmington, Del*., explained that, "Geneticists have discovered phenomena…showing that more than two variations are possible for any one given trait." Wang concluded his essay by noting that, "Therefore, not all traits for all species come in only two varieties. Often, these traits can come in 3 or 4, [or] maybe more variations, each the result of a complex genetic combination."

For the second of the two essay contest questions, students were asked to explain and provide examples of the genetic and environmental factors that influence human health and disease. The ASHG and GSA judges awarded first place to **Michael Kovacs**, a senior from *Winston Churchill High School* in *Potomac, Md.*, for his response to this question. In his essay, Kovacs wrote about obesity, using this health condition as an example to illustrate the complexity of the genetic and environmental interactions that can contribute to disease. In his own words, "Obesity, like so many other health risks, is the sum of a variety of conditions that add up to a life-threatening illness." Kovacs then described some of these 'conditions' that can cause disease. He concluded his essay with the following astute observation, stating that, "We cannot take the reductionist approach to health and disease by assigning just a single cause to a single problem. Genetics, infections, and the environment play some role in most diseases, and by understanding how they all work together to create so serious a problem as obesity, we can potentially provide better methods of treatment, prevention, and control of these diseases."

Jennifer Li, a junior at *Enloe High School* in *Raleigh, N.C.*, won second place for her response to this question. In her cleverly titled essay, "The Intricacy of Human Diseases: From the Pea to Phenylketonuria," Li adeptly illustrated her understanding of how certain environmental factors can influence human health and disease. She did so by describing the surprising complexity of phenylketonuria (or PKU), which is a rare, inherited single-gene disorder that affects a person's ability to properly metabolize the amino acid phenylalanine and, if left untreated,

can cause problems with brain development that could lead to mental retardation. In her essay, Li gave a perceptive description of the complex nature of human disease when she explained that, “In general, human diseases are the result of manifold and intertwining factors.” Li concluded her essay with the observation that, “[An] intricate web of multiple genetic and environmental factors all play a role in disease development.”

Sharon Hartzell, a junior from *Chenango Forks High School* in *Binghamton, N.Y.*, won third place for her response to the second essay question. In her essay, Hartzell explained the delicate balance between genes and environment to convey an accurate understanding of the causes of human health and disease. In her own words, Hartzell described that, “Human disease is influenced in its transmission and in its manifestation by both our internal and external environments...Both heritable and infectious diseases are strongly influenced by both genetics and the external environment, and an understanding of this relationship is crucial to human health.” Hartzell concluded her essay with the following recommendation that, “Those at risk for heritable diseases strongly influenced by environmental factors, such as cancer and heart disease, can cultivate healthy habits to prevent the onset of disease.”

A number of students who were finalists in the 2009 DNA Day Essay Contest also received Honorable Mention accolades, including one international student in Bangladesh who wrote an insightful and creative essay on genetics and infectious disease.

For more information about the National DNA Day Essay Contest, please visit the education section of ASHG’s Web site at http://www.ashg.org/education.

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About National DNA Day

National DNA Day occurs annually on April 25 to mark the 50th anniversary of the discovery of DNA's double helix, and to commemorate the completion of the Human Genome Project in April 2003. Genetics researchers, clinicians, hospitals, professional organizations, private companies, advocates, academicians and schools across the U.S. host various activities and events on National DNA Day in a coordinated effort to engage and inform students about genomics, and inspire the next generation of scientists who will use genetics research to benefit personal and public health.

National DNA Day is part of a collaborative public outreach initiative sponsored by the American Society of Human Genetics, the Genetics Society of America, the National Human Genome Research Institute, the American College of Medical Genetics, the National Society of Genetic Counselors, the International Society of Nurses in Genetics, the Genetic Alliance, and other regional partners. For more information about National DNA Day, please visit http://www.ashg.org/education.

About The American Society of Human Genetics

Founded in 1948, the American Society of Human Genetics (ASHG) is the primary professional membership organization for human genetics specialists worldwide. The nearly 8,000 members of ASHG include researchers, academicians, clinicians, laboratory practice professionals, genetic counselors, nurses and others involved in or with a special interest in human genetics. The Society’s mission is to serve research scientists, health professionals and the public by providing forums to: (1) share research results through the Society’s Annual Meeting and in the *American Journal of Human Genetics* (*AJHG*); (2) advance genetic research by advocating for research support; (3) educate current and future genetics professionals, health care providers, advocates, policymakers, educators, students and the general public about all aspects of human genetics; and (4) promote genetic services and support responsible social and scientific policies. For more information about ASHG, please visit http://www.ashg.org.

About The Genetics Society of America

Founded in 1931, The Genetics Society of America (GSA) includes over 4,000 scientists and educators interested in the field of genetics. The Society promotes the communication of advances in genetics through publication of the journal *GENETICS*, and by sponsoring scientific meetings focused on key organisms widely used in genetic research. The GSA supports genetic science education for students of all ages and advocates for genetic science research funding via the Joint Steering Committee, an organization of several scientific societies that informs Congress about the importance of scientific research. For more information, please visit http://www.genetics-gsa.org.

About Life Technologies

Life Technologies Corporation (NASDAQ:LIFE) is a global biotechnology tools company dedicated to improving the human condition. Our systems, consumables and services enable researchers to accelerate scientific exploration, driving to discoveries and developments that make life even better. Life Technologies customers do their work across the biological spectrum, working to advance personalized medicine, regenerative science, molecular diagnostics, agricultural and environmental research, and 21st century forensics. Life Technologies had sales of more than $3 billion in 2008, employs approximately 9,500 people, has a presence in more than 100 countries, and possesses a rapidly growing intellectual property estate of approximately 3,600 patents and exclusive licenses. Life Technologies was created by the combination of Invitrogen Corporation and Applied Biosystems Inc. For more information on how we are making a difference please visit our website: http://www.lifetechnologies.com.