The remarkable contribution of vaccination programs to public health cannot be contested. The success of Jonas Salk’s polio vaccine in mass human trials, the fiftieth anniversary of which was celebrated on April 12, 2005, was one of the most important feats in the history of medicine. As a result of this prevention strategy, the devastating epidemics that plagued the country in the twentieth century have not since occurred, and the World Health Organization declared the US polio-free in 1994. With this announcement, polio was added to the list of diseases that have been stamped out through successful, widespread vaccination programs: the global elimination of smallpox was declared in 1979, and in 2000, measles was pronounced no longer endemic in the US.

Rubella (also known as German measles) followed suit on March 21, 2005, when the Centers for Disease Control (CDC) declared it eliminated in the US. The rubella virus was once a grave health threat to infants and a major cause of serious birth defects and miscarriages. The CDC embarked on a rubella elimination program in 1989, and in the following decade, only 117 cases were reported. In 2001, for the first time, fewer than 100 US cases were reported, and in 2004, fewer than 10 cases surfaced, all of which were likely acquired in other countries and imported into the US.

Despite extraordinary progress in relegating vaccine-preventable diseases, such diseases endure, predominantly in developing countries. Vaccinations against rubella will continue vigilantly in the US because international travel to areas without steadfast vaccine programs makes it possible for surreptitious cases to enter the country and transmit the disease to vulnerable individuals. The Pan-American Health Organization has set a goal to eliminate rubella from all of North and South America by 2010.

Stacie Bloom

Belgian scientists awarded top honors

The Health Prize of the Interbrew-Baillet Latour Fund, worth nearly $200,000, is the most prestigious international scientific prize awarded in Belgium. On May 12, 2005, Désiré Collen of the Flanders Interuniversity Institute for Biotechnology and Peter Carmeliet of the University of Leuven will be honored with this award for their pioneering work in genetics and cardiovascular disease. The JCI spoke with the scientists about the prize and the work leading up to it.

JCI: How were you selected for this prize?

Carmeliet: An international jury of renowned scientists selected the laureates among 21 candidates from 13 different countries.

JCI: What aspect of your work directly contributed to your winning this prize?

Collen: I started my scientific career studying the molecular mechanisms of blood clot dissolution. These studies ultimately resulted in the isolation and characterization of tissue-type plasminogen activator (tPA), which digests blood clots. This led to the development, with Genentech Inc., of recombinant tPA for the treatment of acute myocardial infarction.

Carmeliet: In the early 90s, I teamed up with Désiré Collen to study cardiovascular diseases using gene targeting and focused on the molecular basis of angiogenesis in health and disease. These studies elucidated the role of angiogenic factors, in particular of vascular endothelial growth factor (VEGF) and placental growth factor (PlGF), and tested novel strategies to treat cancer, inflammation, and ischemic tissue disease. Recently, our team provided evidence for the therapeutic potential of VEGF for the neurodegenerative disorder amyotrophic lateral sclerosis (ALS).

JCI: What are the most direct clinical consequences of your work?

Collen: The discovery of tPA and its development as a novel thrombolytic drug has saved the lives of a few percent of the more than 5 million treated patients with myocardial ischemia worldwide.

Carmeliet: Mice deficient in a single VEGF allele revealed the key role of VEGF in angiogenesis. Further studies demonstrated

Infant with “blueberry muffin” skin lesions indicative of rubella, a major cause of serious birth defects, which has been eliminated in the US. Photo courtesy of the Centers for Disease Control.
that PlGF, a homolog of VEGF, affects angiogenesis in disease but not in health. The implication of these findings is that blocking PlGF might combine efficacy in inhibiting tumor growth with safety of only affecting tumor but not quiescent vessels. Conversely, delivery of PlGF stimulated revascularization of ischemic tissues. Our studies also showed that low levels of VEGF cause motor neuron degeneration, reminiscent of ALS. We have now demonstrated that VEGF prolongs survival in ALS rodent models. Clinical trials are underway.

JCI: What is the biggest challenge you face?
Collen: To secure a steady flow of funding and talented researchers to compete at the front line of basic research and to efficiently transfer technology for potential medical applications to interested industrial partners.

Carmeliet: Understanding the molecular basis of angiogenesis and lymphangiogenesis, using mouse, zebrafish, and frog genetic models. Our focus is evolving from identifying mechanisms governing cardiovascular and nervous system function, and the development of mechanism-based novel treatments for life-threatening cardiovascular and neurological diseases.

In the debate of sex and science, Summers, Hopkins, and the X chromosome battle it out

While speaking at an academic conference on January 14, 2005, Lawrence Summers, the president of Harvard University, suggested that innate biological differences between men and women might be one reason for the paucity of women math and science professors. Nancy Hopkins, a biology professor at the Massachusetts Institute of Technology (MIT), walked out upon hearing this remark. Both Summers’ comments and Hopkins’ reaction have received significant publicity and undergone much scrutiny.

Hopkins herself married young, but was divorced by 30 and decided not to have children. Early on, Hopkins repeatedly observed men and women equally accomplishing...