Thomas D. Pollard ‘64

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I was fortunate to study at Pomona at the time when chemistry and physics were energizing biology. Forty years later, this revolution in molecular biology has given us a clear view of the history of life on earth and all of the tools required to understand human physiology and disease.

The blue print for each living organism is recorded in DNA molecules. The DNA sequence encodes genes, which specify all of the molecules that make up an organism. The simplest bacteria have but 600 genes. Bakers yeast cells have about 6000 genes. You have about 30,000 genes, not many more than a fruit fly.

Rapid sequencing of DNA has produced a huge database of genome sequences from diverse organisms. In addition to providing a catalogue of the molecules of life, these DNA sequences record the history of life on earth. Analysis of DNA sequences proves that all living things on earth evolved from a common ancestor -- single cells that lived about 3.5 billion years ago. That is billion with a “B”, not thousands for even millions of years – a very long time ago.

Since that time and continuing today, some genes sustain chemical changes that are passed succeeding generations. Many of the changes reduce the fitness of the organism, but some improve fitness. Over the long term, competition between sister organisms with random differences in their genes determines which survive in various environments. As a result of this process your genes differ by about 1 part in 10,000 from the person sitting next to you (unless they are your identical twin). This process of evolution by natural selection is the most important and one of the best established principles in biology.

A major goal is to understand how cells work at the molecular level. In the near future we will be able to explain, for example, how the genetic differences that separate each of us account for our particular predispositions to disease. This, for example, will allow us to predict which of us is likely to have a heart attack or develop cancer. If individuals and society can deal with the ethical and personal issues raised by these insights, it will be possible to take more proactive approaches to health care, rather than simply reacting to disease as we do now.

Society must decide how soon that it wants these insights. Research in biology is limited only by resources. Increasing the investment will bring answers sooner rather than later. Pomona has invested wisely in new buildings and staff. Regrettably the federal government, the major benefactor of scientific research, is withdrawing support. You should let your elected officials know that you want your tax dollars invested in scientific research that will benefit the health and well-being of all of us.

About Thomas D. Pollard ‘64

Thomas Dean Pollard, M.D., Pomona Class of 1964, is a professor of molecular biophysics and biochemistry at Yale University. Pollard, who is chair of Yale’s Department of Molecular, Cellular and Developmental Biology, previously served as president of the prestigious Salk

Institute for Biological Studies (1996–2000) and as a professor at the Johns Hopkins School of Medicine (1976–1996). Pollard's research focuses on the molecular mechanisms that make cells move. In 2004, he received the E.B. Wilson Medal, the highest scientific honor of the American Society for Cell Biology. The award was given in recognition of "the pioneering studies of his laboratory on cellular motility including the discovery of the Arp2/3 complex… The discovery of this fundamental system has immense implications in human health from fetal development to cancer biology." Among his numerous publications, Pollard is the co-author of the textbook Cell Biology (second ed., 2004). He earned his M.D. from Harvard Medical School.