

DNA ENGINEER PAYS IT FORWARD (AND BACK)

By Melea Reicks Licht

IF YOU VISIT THE SCIENCE BOUND WEB PAGE AT Iowa State University you'll see that under "results," in addition to 56 graduates, the program for recruiting ethnically diverse students in math and science lists a number of masters graduates and "a Ph.D. in biology from Cornell University."

That Ph.D. is Charles Stewart Jr.

"Science bound was one major thing that opened my eyes to science and the impact it can have on the world," Stewart says.

Stewart ('00 agricultural biochemistry) is a research associate at the Salk Institute for Biological Studies in San Diego, Calif. The institute uses molecular biology and genetics, neurosciences and plant biology to understand and develop new treatments for a range of human diseases and improve the quality and quantity of the world's food supply.

As a postdoc in the chemical biology lab he works on discovering the structures and functions of enzymes.



Charles Stewart was the college's commencement speaker in 2000. He's now a postdoctoral research associate at the Salk Institute for Biological Studies in San Diego.

So, how exactly does he do that?

Stewart starts out at the lab bench where he places proteins in a solution that makes them crystallize over time. Then he takes a picture of the arrangement of atoms in the crystals using x-rays made by accelerating electrons in a large underground machine. He takes the pictures back to the lab where he runs software programs to visualize the proteins' structure.

"Once we understand an enzyme's three-dimensional structure and how it relates to its function we can engineer the enzyme to make products," he says. "In one project we're working with ISU researchers to create enzymes from plant sources to replace those from oil sources."



Charles Stewart talks with high school students about how he grows protein crystals to determine enzymes' 3-D structure.

He explains all this to San Diego area high school students during Salk's annual high school visit day and with Des Moines area high schoolers during his visits home to see family. His story, as well as the possible impact of his research, is inspiring.

Stewart says the other major thing that drew him to science was a summer internship program in the College of Agriculture and Life Sciences for high school minority students – now known as the George Washington Carver Internship Program.

His internship mentor Sande McNabbe in forestry and plant pathology helped Stewart follow his interests to biochemistry where he worked as an undergraduate research assistant throughout his degree work.

"That internship program immersed me in agriculture and biochemistry and taught me how they intersect," he says.

Besides working in the lab, while at ISU Stewart served as national president of Minorities in Agriculture and Natural Resource Related Sciences, worked as a resident assistant and was selected by college administration to address his fellow graduates at commencement.

"In my speech I encouraged students to always try to seize the day and excel at all you do. Don't feel like you need to follow a traditional path. It's the little side trail that you wander off on that could lead you to the most interesting things."

Stewart is certainly glad he did. From his beginnings in agricultural research at Iowa State to Cornell to his volunteer work in Ghana, Stewart continues to make his own path. 

STORIES ONLINE EXTRA:

Learn more about the George Washington Carver Internship Program and Science Bound at www.ag.iastate.edu/stories.