

Joachim Messing: Feeding the World

Microbiologist helped crack the genetic code that revolutionized medicine and agriculture.

BY ROBIN LALLY

Ending hunger, conserving the environment, and advancing medicine were more important goals to Rutgers professor Joachim Messing than earning lots of cash.

So when he discovered a way to crack the genetic code of humans and plants like rice, corn, and wheat, Messing did not patent his work. Instead, he gave away the tools he invented—for free—to his fellow scientists around the world because he believed it was

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vital for future research. His decision enabled his colleagues to further decipher the genetic blueprint of living cells, which revolutionized medicine and agriculture.

"I thought it was important to be generous and make this freely available without restrictions so biotechnological innovations could move forward," says Messing, the Selman A. Waksman Chair in Molecular Genetics at Rutgers University–New Brunswick.

Messing, who is also the director of the Waksman Institute of Microbiology, has become famous for a genetic engineering technique used in laboratories to create plants that have produced disease-resistant crops considered crucial to feeding the world's population and drugs like erythropoietin (EPO) used to treat cancer patients.

Messing's technique has resulted in the creation of new lines of drought-tolerant plants more resistant to insects, herbicides, and other environmental stresses and enabled biofuels to be extracted for energy from plants like corn and sorghum, a drought-tolerant African grass that can be grown in regions where corn and other grains do not thrive.

"When I look at the products that have been made today, it is clear they were dependent on the tools that were conceived more than 40 years ago and developed thereafter," says Messing, the son of working-class parents who grew up in postwar Germany where he was a pharmacy student and doctoral candidate in biochemistry before coming to the United States.

The results of the work, Messing says, are a tribute to his life's research.

"After watching these crops grow over the last 20 years, you can see the positive impact that these techniques have had on their outcome," he says.



Joachim Messing gave information away for free that helped scientists crack the genetic code of humans and plants, revolutionizing medicine and agriculture.

Finding innovative methods to develop more nutritious crops that can be grown without additional irrigation and on the same amount of land as current crops has always been a priority for Messing, who came to Rutgers in 1985 to oversee research in the life sciences and at the Waksman Institute.

“Since I was born, the world’s population has tripled,” says Messing, whose published research became the most frequently cited in all of science during the 1980s, according to *The Scientist*, a national magazine covering life sciences and innovations. “This means we need more nutrients on less land with less water.”

Messing has been honored for his contribution to humanity and received international recognition for his accomplishments in genetic engineering, which enabled the deciphering of the genetic code of crop plants. In 2013 he was recognized by the Wolf Foundation of Israel when he won the Wolf Prize in Agriculture, which honors scientists and artists whose “achievements are in the interest of mankind

and friendly relations among peoples.” Messing then gave the \$50,000 prize to Rutgers as seed money for founding a new endowed chair at the Waksman Institute.

Considered to be one of the world’s top experts in molecular genetics, Messing is a member of both the National Academy of Sciences of the United States and the National Academy of Sciences of Germany, still teaches undergraduates, and mentors students in his laboratory. Those who have worked with him say that Messing has a contagious enthusiasm that spreads throughout his laboratory and creates positive synergy among the team.

“He has the mentality that whatever you are doing can be done,” says Marja Timmermans, who worked with Messing as a lab technician and a graduate student from 1987 to 1996 and is now a Humboldt Professor at the University of Tübingen in Germany. “He’s happy and enthusiastic and that excitement rubs off and creates a really positive, creative environment.”