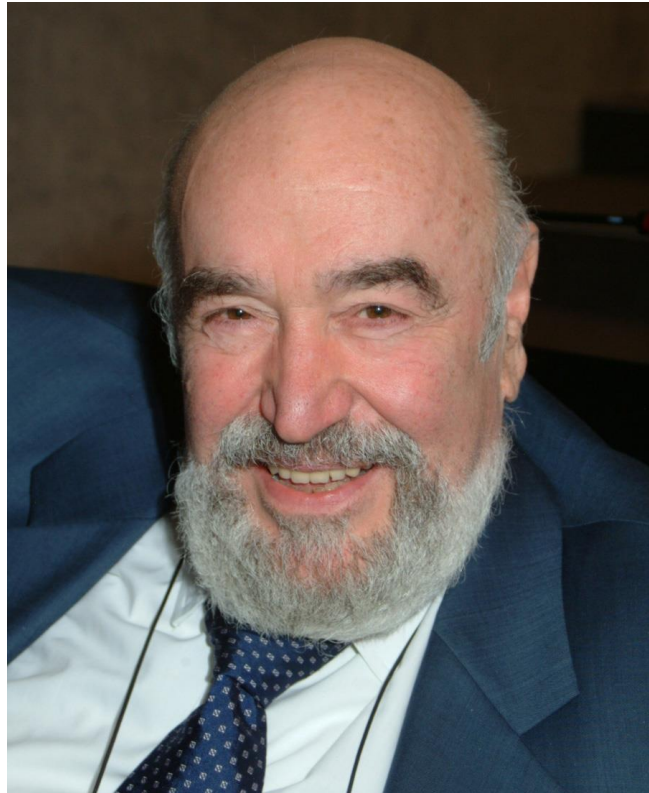


Plant breeding innovation and health: Dr. Vincenzo Costigliola

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The technology has changed very significantly over the last 40 years as we have learned to understand more of the processes by which genetic material is stored, altered and transmitted between microorganisms, plants and animals says Dr. Vincenzo Costigliola, President of the European Medical Association.

There has been a rapid development in gene editing technologies in the last five years, and the announcement in April 2015 of genome editing embryos using CRISPR-Cas9 demonstrated that human gene modification has moved out of the realm of the theoretical, and clinical applications are becoming feasible.

But let's make a step back. Why is plant breeding innovation related to human health?

It is a scientifically proven fact that our food choices affect our health and that we are what we eat. Take for instance cow milk, changes in DNA have occurred in human populations as evolutionary responses to changes in diets and behaviours ever since. For example, a change in a single gene 10,000 years ago allowed a group of northern Europeans to become lactose-tolerant and continue to consume milk products into adulthood.

We know that agriculture is strictly related to health, therefore, the biotechnologies that are important for the development of agriculture are also important for health.

Do you think that biotechnologies are important for patients?

They surely are. The medical field is very interested in biotechnologies for a large set of applications, from biomarkers to site-directed mutagenesis.

Beyond healthcare, there is a plethora of applications. CRISPR-Cas9 can be used to eliminate pests, and microbes can be engineered to produce biofuels more efficiently. In agriculture, the technology can accelerate crop engineering by enabling us to modify genes in plant seeds more quickly and precisely. For example, CRISPR-Cas9 can be used to produce grapes that are freeze resistant so that they aren't damaged by cold storage.

What do you think would be the role of biotechnologies in reformulating existing therapies and delivering better drugs?

On one hand biotechnologies are helping us improve the structure of drugs and on the other hand, they allow us to personalize treatments. Some hospitals already carry out pharmacogenetic tests to help physicians target treatment and medications to patient's genetics. Some long-term applications are also extremely exciting, such as in the field of regenerative medicine.

Could you give me a few concrete examples of treatments that could be improved with the help of biotechnologies?

When we use the word biotechnologies, we could consider both the diagnostic sphere and the therapeutic one. In any case, there are hundreds of possible applications. Consider that certain diseases are based on mutations in single genes as is the case with, say, cystic fibrosis or Huntington's chorea. As scientists have learned more about the human genome, they have found that many medical conditions, including cancer and type II diabetes, are the result of an interaction between a number of genes and their environment.

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Dr. Vincenzo Costigliola, Founder & President of European Medical Association

Dr. Vincenzo Costigliola has more than 40 years of medical practice and a post-degree specialization in Anesthesiology and Intensive Care. He is a Founder & President of European Medical Association. He has also co-founded and is President of the European Association for Preventive, Predictive and Personalized Medicine.

What is plant breeding?

Plant breeding is the art and science of changing the traits of plants in order to produce desired characteristics to improve the overall function of various plants and crop systems.

With the predicted growth in the global population and the effects of climate change, varieties with increased yields and resistance to drought and disease are critical if we are to provide enough food for future generations. Plant breeding is one of the tools that will help us achieve sustainable crop production in the long term.

About the NBT Platform

The NBT Platform is a coalition of SMEs, large industry representatives and members of prominent academic and research institutes. Its aim is to provide policy makers and stakeholders with clear and precise information on NBTs and to generate awareness about their benefits for the European economy and society.

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