

## Nota de prensa



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### CBGP Professor Luis Rubio receives Grant to Develop Nitrogen-Fixing Cereals

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The research program under the NFIX acronym has a \$3 million funding for a period of 52 months from the Bill & Melinda Gates Foundation.

Dr. Luis Rubio of the Center for Plant Biotechnology and Genomics (CBGP) at the Technical University of Madrid has been awarded a grant from the Bill & Melinda Gates Foundation to develop nitrogen-fixing cereals. The research program under the NFIX acronym has a \$3 million funding for a period of 52 months. Guided by the belief that every life has equal value, the foundation focuses on improving people's health and giving them the chance to lift themselves out of hunger and extreme poverty.

NFIX charitable purpose is to introduce biological nitrogen fixation in cereals to increase productivity of Sub-Saharan Africa and South Asia small farmers while preserving the environment.

Crop productivity heavily depends on nitrogen availability to the plant.

In some crops, such as legumes, symbiotic biological nitrogen fixation acts as natural fertilizer by providing nitrogen needed for plant growth.

On the other hand, because major cereal crops are unable to form symbioses with nitrogen-fixing bacteria, their field yields are generally increased by addition of chemically synthesized nitrogen fertilizers. The extensive use of commercial nitrogen fertilizers in developed countries poses enormous environmental threats that must be addressed. In contrast, the cost of chemical fertilizers is prohibitive for poor farmers, and they are scarcely used in most of Africa resulting in poverty and hunger derived from very low crop yields.

Dr. Rubio, who has also been awarded the prestigious European Research Council Starting Grant for his studies on nitrogen fixation biochemistry, has now the opportunity of applying the basic science developed in his laboratory. The long-term goal of his research is to increase cereal crop productivity by engineering plants to fix their own nitrogen. "The knowledge gained in our nitrogenase biosynthesis studies immediately brings back the traditional challenge of transferring active nitrogenase enzyme to higher organisms and, specifically, to crop plants. At this point, our understanding of nitrogenase biosynthesis and our analytical capability are deep enough as to carefully control this transfer and interpret and respond to the challenges that will be found during the process of the engineering cereals to fix nitrogen", Rubio said.

Gates Foundation endorsement of research carried out at the laboratory of Prof. Rubio is supportive of CBGP strategies. CBGP is a research center with a label of excellence devoted to the study of plants and associated microorganisms; its mission is to carry out the most advanced research aimed at understanding plant function and contributing to fulfill the needs of the economic agents within the agriculture, forestry, and environment productive sectors. CBGP seeks to attract and nurture frontier research programs.

CBGP hosts other scientists long involved in nitrogen fixation research, such as Professors Juan Imperial and Tomás Ruiz Argüeso. "One frequently hears that everything is known about nitrogen fixation from the application point of view. It is said that since it was discovered in 1888, this subject has been sufficiently studied to take advantage of its potential in agriculture. It could be the truth in the case of legumes and the

use of selected inocula, but there are many other aspects to be considered in view of new knowledge. We can then ask ¿is there a future for nitrogen fixation research? We can reply yes, and we must continue with its study based on the necessity of a) increasing food security due to the evolution of the population and the change of food habits; b) diminishing the use of nitrogen fertilizers due to their economic and environment cost; and c) maintaining natural ecosystems”, Ruiz Argüeso explained.

It is important to note that the annual cost of nitrogen fertilizers in the farming system worldwide reaches \$80 billion plus the costs associated to negative environmental impacts. “In comparison to current agricultural practices that make heavy use of nitrogen fertilization, obtaining nitrogen-fixing cereals would lower the environmental impact of intensive agricultural practices moving them towards more sustainable practices”, added Prof. Juan Imperial, CBGP’s Deputy Director and expert in nitrogen fixation.

### **Documentos adjuntos**

- Dr. Luis Rubio