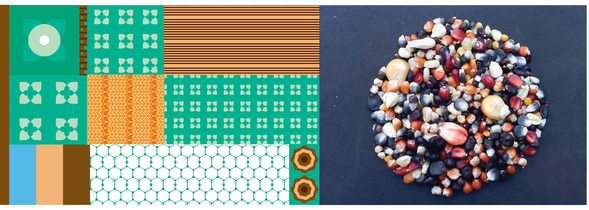
THE FASCINATING PLANT DEVELOPMENT

...or «sitting at Star War's bar next to a Ficus benjamina»

The plant kingdom is an amazing catalogue of genetic variability, and being in a green house is a bit like sitting at the Star War's bar.

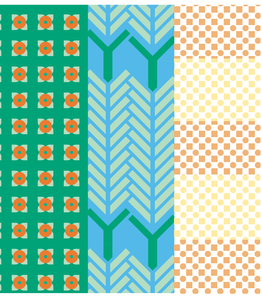
This incredible variability is million of years old (the picture shows the variety of forms and colors of maize's seeds, still surviving in our days)

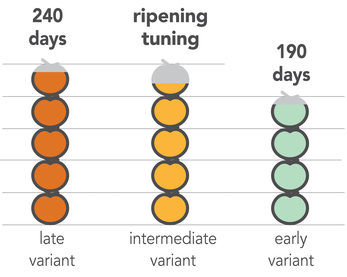


The very first farmers, in the fertile crescent, realized that the seeds of some weeds were not dispersed, but kept on the plants. Just few years ago we have been able to understand that this is caused by a **DNA mutation**, something very very tiny, but with huge consequences: the agriculture was born! Now we understand much more about how a plant develops, even at the **molecular level**. In some cases we have been able to use the molecular knowledge to obtain plants more suitable for the agricultural environment where they live.

Let's make an example: development includes ripening of the fruit. In our lab we elucidated the molecular basis for **peach** ripening and we now know that it is possible to modulate the maturation date using variants of one specific gene.

It would be nice to have on the shelves ripe and, at the same time, tasty fruits, and for a longer period during the year!





The control of plant architecture is a way to improve the yield.

During the '40-'60 the Green Revolution allowed to increase wheat yield in an unprecedented way, mostly as a consequence of mutations of genes controlling plant height . The resulting plants were shorter and thus more resistant to lodging. In our lab we work with cereals showing variability in ear's development and alteration of the number of plants produced by a single seed (a phenomenon known as tillering).

Today we know the molecular mechanisms underlying these phenomena, and we can design breeding programs to achieve the second Green Revolution: more productive ears, and plants resistant to environmental stresses, just to mention two of our goals.

Plant development also means yield. This is our drive in studying the molecular and genomics basis of the hybrid vigor. We are also interested in understanding the capacity to produce "better" seeds, for example by improving the plant's capacity to fill them (you can see it in the upper picture, where the maize ear has both perfect and deformed seeds). In the lower picture you can see how the hybrid (center) obtained from the cross of two pure lines (sides) is much more "beautiful" than the parents. We are investigating the molecular basis of this and we aim at using those "strong" genes to improve the main crops.

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