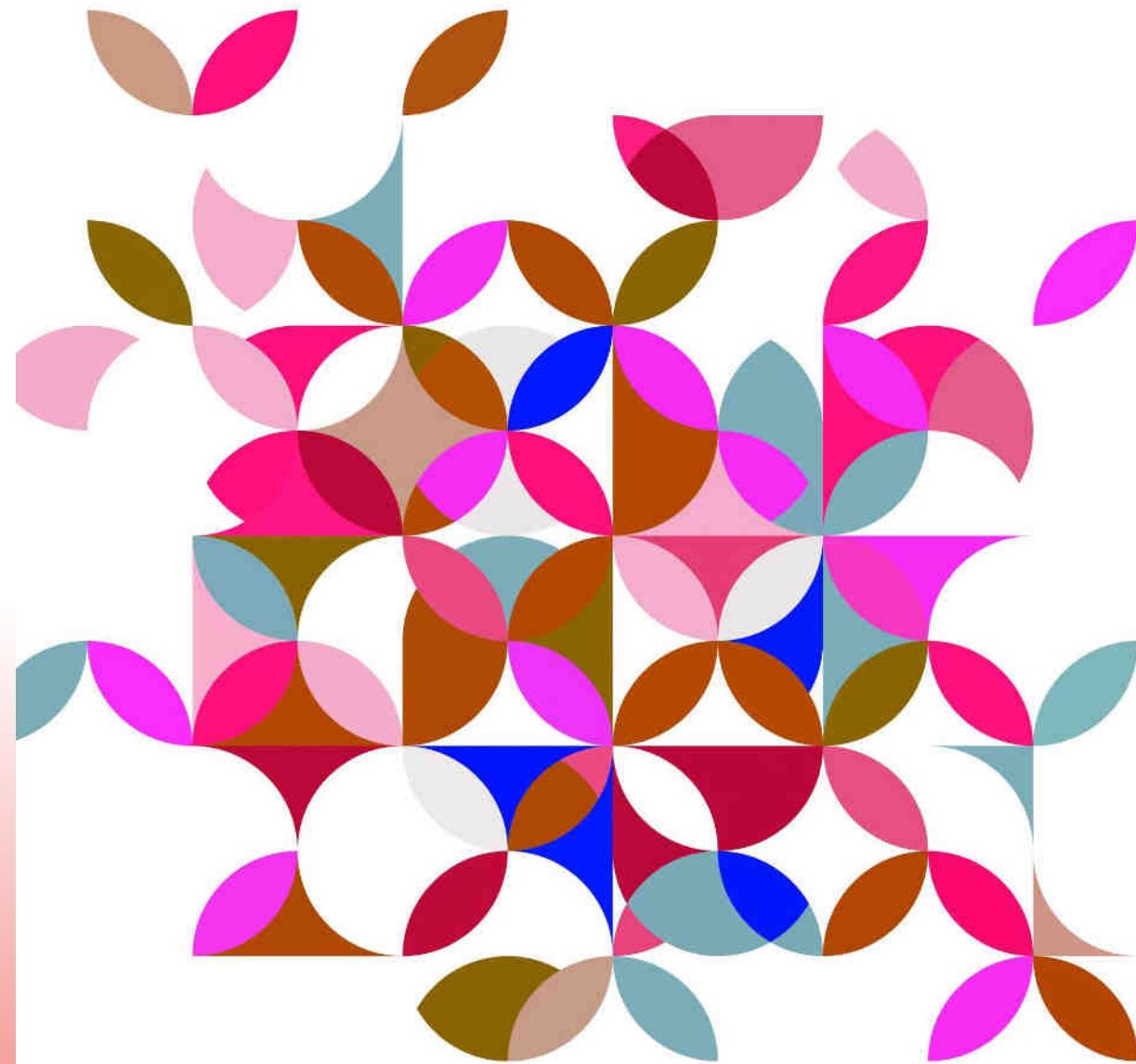


GENOMA 20+2

FAPESP -2022

J FERNANDO PEREZ



BUILDING BLOCKS OF A HISTORY OF SUCCESS (1)

- BACKGROUND
- MAY 1st, 1997 Fernando Reinach's idea: network, organism of relevance to agriculture
- Meeting with leading scientists conducting research in genetics: *Xylella Fastidiosa* enters, nobody knows how to grow its culture
- International Consultants: André Goffeau & Steve Oliver
- Criteria para choice of organismo: size, scientific and social/economic relevance
- Bioinformatics: João Setubal e João Meidanis
- Lunch with Ricardo Brentani: enter Andrew Simpson & Joaquim Machado
- Choice of organism: *Thyobacillus ferrooxidans*

BUILDING BLOCKS OF A HISTORY OF SUCCESS (2)

- Enter: FUNDECITRUS – ADEMerval GARCIA – Joseph Bové
- ONSA: THE VIRTUAL GENOMICS INSTITUTE
 - Structure: DNA Coordinator Andrew Simpson
 - Training Centers: Fernando Reinach & Paulo Arruda
 - Bioinformatic Center: João Setubal & João Meidanis
 - Sequencing Centers
- Call for proposals: 34 CENTERS SELECTED
- Collaboration with Bordeaux
- Reaction of the Community: support and criticism

CONSEQUENCES

- Partnership with Ludwig Institute for Cancer Research: Cancer Genome Project

Expressed genes in tumor cells

At some stage Brazil was the second country in number of human EST in public data bank

- Genome of *Xanthomonas Citri*, responsible for Citrus Canker
- USDA commissions the genome sequencing of the strain of *Xylella Fastidiosa* responsible for Pierce's Disease threatening vineyards in California.
- Genome Sequencing of Expressed genes of Sugar Cane, Eucalyptus, Bovine Genome all in partnership with the industry.

THE ECONOMIST JUL 20TH 2000

- Fruits of co-operation
- SAMBA, football and... genomics. The list of things for which Brazil is renowned has suddenly got longer. Only a few days after publishing, on July 13th, the first-ever sequence of the genome of a plant pathogen, scientists at Sao Paulo's state research agency, Fapesp, were due to announce, on July 21st, another success—the composition of 279,000 human expressed-sequence tags, small pieces of DNA that allow genes to be located along chromosomes. Only in America and Britain have more than that number of human ESTs been identified.

THE NEW YORK TIMES

- *Model for Research Rises in a Third World City*

- April 24, 2001
- SÃO PAULO, Brazil — It has no laboratories or research teams of its own, only a modest administrative staff working out of a nondescript building in a residential neighborhood here. But through canny management and careful choices, the Research Support Foundation of the State of São Paulo is rapidly becoming a powerhouse in genomics and a model for scientific investigation in the third world.
- Last July, a Brazilian consortium organized and financed by the foundation became the first anywhere to decode the genome of a plant pathogen, *Xylella fastidiosa*, an insect-borne bacterium that infests oranges. A few months later, the foundation, known as Fapesp, announced that the consortium had completed the genetic sequence of a second pest that plagues this country's thriving fruit export industry, *Xanthomonas citri*, or citrus canker.
- "From the moment we began, our objective has always been the same: to work on the frontiers of science while addressing issues of social and economic relevance," Dr. José Fernando Pérez, the foundation's scientific director, said in an interview here. "The genome project has served that purpose and created an image of leadership for us."
- "What they are doing is science of the highest quality, comparable to anything that is being done at the largest sequencing centers in the United States or Europe," Dr. Claire Fraser, president of the Institute for

THE NEW YORK TIMES (2)

- "What they are doing is science of the highest quality, comparable to anything that is being done at the largest sequencing centers in the United States or Europe," Dr. Claire Fraser, president of the Institute for Genomic Research in Rockville, Md., said in a telephone interview. "As a result, they have really become recognized as an important player in the field, making a major contribution to the international genome effort."
- Increasingly, Fapesp's accomplishments are also making it the standard for scientific research in the third world. In an editorial last year, the magazine Nature called the genome work here "a political as well as a scientific achievement" that refutes the "common misconception that only advanced industrialized nations have the wherewithal and skilled human resources needed to achieve cutting edge science."

LE FIGARO

- Le Brésil parmi les grands: Les mécanismes de la virulence dévoilés
 - L'annonce du décryptage complet du génome de la bactérie *Xylella fastidiosa* constitue un double événement. Non seulement, c'est la première fois qu'un micro-organisme pathogène pour les végétaux est séquencé, mais, surtout, ce travail remarquable, publié aujourd'hui dans la revue Nature, est l'œuvre d'un consortium de laboratoires brésiliens. Le fait que ce pays émergent dans le domaine de la biologie se soit impliqué dans ce projet, avec le soutien de l'Institut national de la recherche agronomique, ne doit rien au hasard: la bactérie séquencée est un redoutable ravageur des agrumes et le Brésil, qui produit le tiers des oranges vendues dans le monde, compte bien utiliser ces connaissances pour maîtriser ce fléau.

GENOME 10 NATURE 15 JULY 2010

BRAZIL'S BIOTECH BOOM

- Ten years ago, Brazilian bioscience was transformed by a bold initiative. Scientists and the government must develop and extend the progress that has resulted. In May 1997, a pair of Brazilian scientists spent a weekend in the country discussing a bold idea. José Fernando Perez, the science director at the São Paulo Research Foundation (FAPESP), a state-funded agency and one of Brazil's leading research sponsors, had been looking for game-changing research initiatives. Biologist Fernando Reinach, one of his advisers, had a sufficiently adventurous plan: kick-start biotechnology research throughout Brazil by sequencing a genome. For many risk-averse scientists in the old guard, who were acutely aware of how far the country lagged behind the rest of the world in biotechnology, this plan seemed overly ambitious. But the duo pushed ahead to build the capacity for genomics and bioinformatics that Brazil lacked, quickly organizing a team to conduct the project and then settling on a bacterium to sequence. FAPESP invested the equivalent of US\$12 million, largely dedicated to sequencers, computers and reagents, while the team brought together and trained researchers from a range of fields to develop a broad and long-lasting set of skills and knowledge. On 13 July 2000 that effort paid off when the team, by then comprising more than 100 researchers in 35 Brazilian labs, published the genetic code for the citrus pathogen *Xylella fastidiosa* in an article featured on the cover of *Nature* (A. J. G. Simpson et al. *Nature* 406, 151–157; 2000). Ten years later, the fruits of that project keep coming. Before its *Xylella* paper had even come out, for example, the network was busy sequencing another citrus pathogen while taking its first stab at the complex sugarcane genome and contributing to the international Human Cancer Genome Project. The same tools and expertise were repackaged for sugarcane research in Brazil's first major agricultural biotechnology enterprises: Allelyx (*Xylella* in reverse), which focused on genomics, and CanaVialis, which made innovations in conventional sugarcane breeding. **Perhaps more than anything, *Xylella* demonstrates the benefits of aiming high. Scientists undertook a major project, executed it with precision and published the results in English in a major international journal. The results were broadcast by mainstream media outlets worldwide, and Perez believes that this singular — and unexpected — outcome even helped to change Brazilian science's relationship with the Brazilian media. *Xylella* helped to change Brazil's perception of itself, its own capabilities and its place in the world of science.**

THANK YOU

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