

# Brazilian Clone Collection Center (BCCCenter): A Sequencing Facility and a Repository Center for Biotechnological Applications

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BCCCenter

## About the Center:

- The Brazilian Clone Collection Center (BCCCenter) was built initially to store and distribute the clones of the Sugarcane EST project, which was supported by FAPESP (The State of São Paulo Research Foundation) and COPERSUCAR (Cooperative of the Sugarcane, Sugar and Alcohol Producers from São Paulo State)
- Having the capacity to produce and distribute genomic and cDNA (ESTs) libraries clones, soon it became a Repository Center for Storage & Distribution of Cosmids, ESTs and Shotgun clones for several genome projects developed in Brazil.
- Besides the capability to produce, store and distribute DNA libraries clones, the Center, through robotic colony manipulator, provide services of colony picking, large scale plate replication, clones re-array from existing plates and gridding of large libraries onto nylon macro-arrays (colony or plasmid DNA).
- The Center can now provide sequencing services as well, both for distribution of certified clones or for genome sequencing projects.

## Clones Produced for Academic Sequencing Projects

Organism	Genome Project	Plates (96 wells)	Clones Produced
<i>Xylella fastidiosa</i> (orange disease)	FAPESP	50	4,800
<i>Xylella fastidiosa</i> (grape disease)	FAPESP/USDA	35	3,360
<i>Xanthomonas anoxopodis</i> pv citri	FAPESP	580	55,680
<i>Xanthomonas campestris</i> pv campestris	FAPESP	485	46,560
<i>Chromobacterium violacium</i>	CNPq National Genome Project	1.120	107,520
<i>Glucanacetobacter diazotrophicus</i>	CNPq – Rio Genome	909	87,264
<i>Litopenaeus vannamei</i> (shrimp)	CNPq	1,270*	60,960
<i>Corynebacterium pseudotuberculosis</i>	CNPq – Minas Gerais	350	33,600
<i>Leptospira interrogans</i> serovar Copenhageni	FAPESP	1,884	180,864
<i>Eucaliptus grandis</i>	FAPESP	6,270*	300,960
<i>Coffea robusta</i>	FAPESP	2,218*	106,464
<i>Bos indicus</i>	FAPESP	2,324*	111,552
<i>Boophilus microplus</i>	FAPESP	380	36,480
	<b>TOTAL</b>	<b>17,875</b>	<b>1,136,064</b>

\* Including master and replica plates

## Clones Produced for Research Institute and Companies

Customer	Plates (96 wells)	Clones Produced
Research Institute (Applied Project)	1.184	113.664
Biotech Company	1.541	147.936
	<b>2.725</b>	<b>261.600</b>

## Sugarcane ESTs Distributed \*

Customer	Clones Distributed
Inside Brazil	1,569
Outside BraZil (only plasmid DNA), including CropDesign (BASF) - FAPESP agreement (935)	1,005
	<b>2,674</b>

**\* Total Sugarcane ESTs stored: 270,912 (~ 43.141 genes)**

## Macro-Arraying (Gridding)

Project	Genes Gridded onto Nylon Membrane	Institution
Master Thesis	Sugarcane	UNESP
Master Thesis	Sugarcane	UNESP
Master Thesis	Sugarcane	UNESP
Master Thesis	Sugarcane	UNESP
Master Thesis	Sugarcane	USP
PhD Thesis	<i>Xanthomonas citri</i>	UNESP/USP
PhD Thesis	Sugarcane	UNESP
PhD Thesis	Sugarcane	UNESP
PhD Thesis	Sugarcane	UNESP
PhD Thesis	Sugarcane	UNICAMP/USP
Applied Research	Medicinal plants	UNAERP

- Around 20 papers were already published in International Journals
- One patent application (GENES ASSOCIATED TO SUCROSE CONTENT – USP/FAPESP)

## Structures and equipments

### Storage & Distribution and Services on Libraries and Membrane Gridding (colonies or DNA):

1. A large capacity for clones storage: 16 ultra-low temperature ( $-86^{\circ}\text{C}$ ) freezers allocated in controlled-temperature rooms ( $18^{\circ}\text{C}$ ). Alarm and backup power generation systems have been installed in order to prevent damage in the event of electric power failure. One freezer is maintained empty as a backup.



Can be used for public and private institutions (companies)

FAPESP; MCT/FINEP

## 2. A Robotic device (Robot Q-Bot; Genetix) that can be used to:

- colony picking
- library plate replication
- re-arraying libraries and plates (96/384 well plates)
- macro-arraying (Gridding)
- Libraries construction ( shotgun, cDNA, cosmids, fosmids and BAC libraries)



**Can be used for public and private institutions (companies)**

**FAPESP**

### 3. Installations certified by CTNBio for GMOs manipulation



# DNA Sequencing

## 1. A new building for sequencing and bioinformatics



**First Building: Storage and Distribution  
FAPESP**



**Second Building: Sequencing and  
Bioinformatics – UNESP/FINEP**



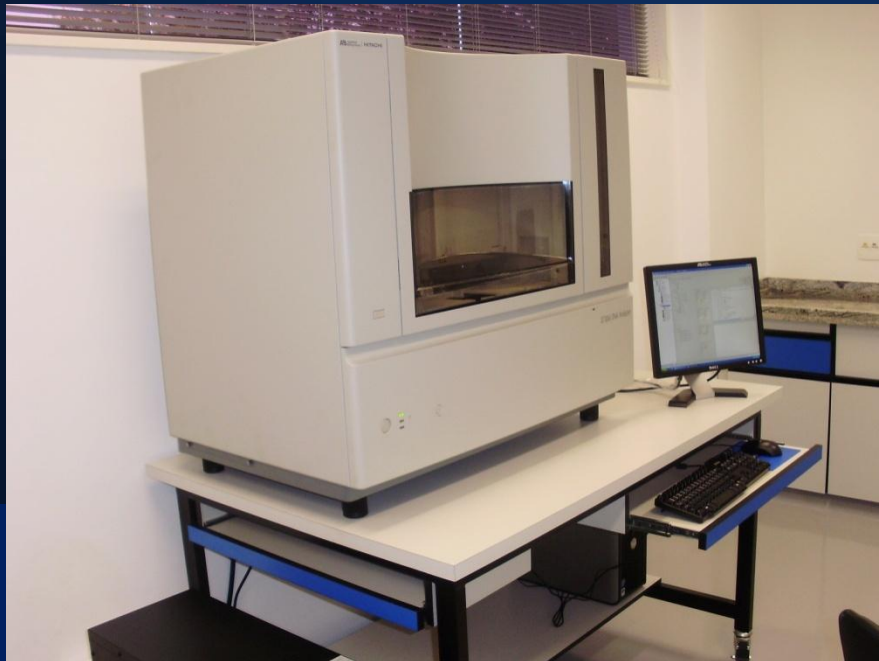
**The two buildings are connected**

**2.** A capillary DNA sequencer (ABI 3730 XL) was just installed and is already running (FINEP).

- DNA sequencing services can be done using DNA from plasmids, ESTs, cosmids, BACs and PCR products.
- This enable the Center to provide certified clones using sequencing and bioinformatic tools.
- For **de novo** sequencing or re-sequencing of whole genome in high-throughput and large scale and for functional genomic analysis, the Center will have second generation sequencer provided by FAPESP (Multiuser Project just approved – Sequencing and Functional Genomic Facility)
- **It will become Institutional (qualified people will be hired)**

**To attend the scientific community; public and private institutions (companies)**

## Sequencing Lab



**ABI 3730 XL Sequencer**



**Bioinformtics**

## **Next Steps:**

➤ **Integrate all the information in the SiCol System (Collections of Biotechnological Interest) – LNCC will be involved**

**- A new web site is under construction**

**[www.bcccenter.fcav.unesp.br](http://www.bcccenter.fcav.unesp.br)**

**- Contact: +55-16-32032772**

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➤ **Certified and accredited at national and international level**

## **Aims:**

- The Center intend to become a Bioresource and Repository facility that can provide high quality biological materials for biotechnological applications.
- It has the capacity and the aim to produce and store several types of libraries such as shotgun, cDNA (EST), cosmids fosmids and BAC libraries (including metagenomic libraries), specially from organisms that are strategic for biotechnological applications to humans, animals and agriculture attending requests from the scientific and industrial communities.
- It will also act strategically by producing cosmid or BAC libraries from organisms that are strategic for for the preservation of Brazilian biodiversity
- These libraries clones can have their ends sequenced for genomic projects and/or can be gridded onto nylon membranes.
- The sequencing facility is expected to be used by public and private institutions for biotechnological purposes → **USE THE TIME TO ANALYSE THE DATA, NOT TO GENERATE THE DATA**

**Thanks for your attention**