CENTRAL INSTRUMENTATION FACILITY (CIF)

The **Central Instrumentation Facility** of **JJ College of Arts & Science, Pudukkottai** was established in the year 1998 and houses a wide range of high-end instruments for pushing the boundaries of research in Science and Technology to higher level. These instruments and facilities help the faculties, research scholars and students to carry out globally competitive research in basic and applied sciences. The CIF of JJC is equipped with sophisticated instruments to carry out research in all the arenas of Biotechnology.

TECHNE™ **Thermocycler** can process up to 40% more samples per hour than a traditional 96-well instrument. Suitable for both single labs and core facilities, the thermal cycler's fast cycling enables several experiments per day. A specially designed thermal block delivers a unique heating and cooling system that provides accurate ±0.1°C temperature control and quickly cycles from one temperature to the next.

Lark™ **Innovative Gel Documentation System** provides an excellent reproduction of Molecular Studies. The system is an excellent optics coupled to a high quality camera, the LUMINAX Gel Documentation System, is a high and reliable fluorescent and colorimetric bio-imaging system. Featuring a 18 megapixel digital camera, the camera connects to a PC through a USB and can be controlled from the PC. The light-tight cabinet has a UV safety switch and a roll-out transilluminator. A choice of illumination options with UV trans/epi lighting, wavelength specific LEDs and more, adds to the versatility of the system.

GENESYS™ UV-I Spectrophotometer performs high throughput quantitative UV-Vis measurements where a double beam is required as a reference cell position. Optimized for usability and performance, this platform features a high-resolution color touchscreen, optional Wi-Fi networking, and a rugged design built for repetitive, heavy use environments. Regarded worldwide for reliability, accuracy and reproducibility, GENESYS spectrophotometers meet today's expectations for advanced technology in a compact, robust package.

The offers observation that exceeds conventional imaging tools. With advanced measurement capabilities, this system enables a variety of analyses. Expanded

memory capacity allows for storage of millions of images. It is easy to use and can be used effectively by expert and novice users. The system is equipped with all of the features needed to enhance the analysis.

Epifluorescent – Nikon[TM] **microscope** is a versatile high resolution microscope. The machine is **inverted** fluorescence/bright-field wide-field microscope built on a Nikon Eclipse Ti body. It is fitted with a Nikon DS-Qi1Mc monochrome camera, an ultra high-quality monochrome, cooled digital microscope camera geared for high-speed, high - sensitivity applications' (low-noise electronics + high-quantum efficiency detector, ideal for fluorescence imaging). The microscope is suited for fluorescence and bright-field imaging (including DIC) of live cells in flasks, dishes or glass-bottomed MatTek dishes.

BTX [TM] **- ECM-630 Electroporator** delivers a maximum of 6000A in low-voltage model and provides excellent control of the time constant. It features BTX Power Platform technology, digital user interface, built-in monitoring of voltage and pulse length, automatic charge and pulse sequence, single rotary encoder, programming options, online menu, and protocol storage. The system duplicates over 200 ECM 600 protocols; the additional ECM 630 resistor selection NONE allows researchers to reproduce protocols from competitive systems lacking resistor settings or reporting unlimited resistance. The tool is ideal for bacterial, yeast, fungal, and other microorganism transformation in HV mode; optimized for a broad range of mammalian cell lines such as ES cells, fibroblasts, and epithelial cells in the LV mode. Its novel applications include transdermal drug/gene delivery and intact plant gene delivery.

Pulsed-Field Gel Electrophoresis - CHEF [TM] **DR-II -** unit is a highly discriminative molecular typing technique that is used in epidemiological studies worldwide. PFGE is based upon the variable migration of large DNA restriction fragments in an electrical field of alternating polarity. By comparing the fingerprints of any two isolates, one can investigate if they belong to the same strain (i.e. the two isolates are clonal) or if they are genetically unrelated.

Apart from these instruments, our facility is home to various other sophisticated scientific tools like **Elisa Reader** (BIO-RAD[TM] – 550, USA), **Fluorometer** (BIO-RAD[TM]- Versa Fluor, USA), **Sonicator** (Toyoden[TM]:US -50), **Ultra Cooling Centrifuge** (REMI[TM]- R:24), **Laminar Air Flow** (Atlantis[TM]), **Gel Dryer** (BIO-RAD[TM], USA), **Incubator** (Tempo[TM]), etc.

We provide these **facilities** and related resources for **the students and academicians** to achieve academic excellence in learning, teaching and research through this first class facility because…..

"We Power Ideas…

We Create Champions…."

Sl. No.	Name of instrument	Company and Model	Purpose of the instrument
1.	**UV-Vis Spectrophotometer**	Genesys™ – UV-I (England)	• For the detection of impurities, structure elucidation of organic compounds, quantitative determination of some compounds, etc.
2.	**Digital microscope**		• Uses a built-in camera with a magnifying lens, instead of eyepieces, and displays the live image on a monitor • Used to study biological organisms and their vital processes.
3.	**Gel-documentation system**	Lark™ innovative (India)	• For the imaging and documentation of nucleic acid and protein suspended within polyacrylamide or agarose gels.
4.	**Epifluorescent –Nikon microscope**	Nikon™ –E-400 (Japan)	• For the identification of structures in fixed and live biological samples.
5.	**Electroporator**	BTX™ - ECM-630 (USA)	• Used for applying electrical field to cells in order to increase the permeability of the cell membrane, allowing chemicals, drugs, or DNA to be introduced into the cell (also called electrotransfer).
6.	**Pulsed Field Gel Electrophoresis**	BIO-RAD™ - CHEF- DR-II (USA)	• For epidemiological studies and gene mapping in microbes and mammalian cells; also motivated development of large-insert cloning system such as bacterial and yeast artificial chromosomes.
7.	**ELISA reader**	BIO-RAD™ - 550 (USA)	• For protein and enzyme assays, and also used for HIV detection and quantitation of nucleic acids.
8.	**Fluorometer**	BIO-RAD™ - Versa Fluor (USA)	• For precise quantitation of biological molecules including nucleic acids and proteins in microliter (µl) samples.
9.	**Sonicator**	Toyoden™: US -50	• For fast, reproducible sample preparation to extract viruses from tissue and cell culture prior to downstream

			analyzation of proteins, nucleic acids, etc.
10.	**Ultra cooling centrifuge**	REMI™- R:24 (India)	• For pelleting fine particulate fractions, such as cellular organelles (mitochondria, microsomes, ribosomes) and viruses.
11.	**Autoclave**	Inlab – Vertical™ (India)	• For the sterilization of surgical equipment, laboratory instruments, pharmaceutical items, and other materials. • Can sterilize solids, liquids, hollows, and instruments of various shapes and sizes.
12.	**Laminar air flow chamber**	Atlantis™ (India)	• To prevent contamination of semiconductor wafers, biological samples, or any particle sensitive materials and provide a contamination free environment.
13.	**Incubator**	Tempo™ (India)	• To grow and maintain biological cultures and samples by providing optimum temperature and conditions.
14.	**Orbital shaker**	Tempo™ (India)	• For culturing microbes, washing blots, and general mixing needs. • Ideal for culturing microbes and samples that are temperature sensitive through development.
15.	**Tissue Culture rack**	-	• Useful for various types of tissue culture plants and other tissue culture work in tissue culture room. • Used in areas of tissue culturing of plants is Ideal for Agricultural Research Labs.
16.	**Gel dryer**	BIO-RAD™ (USA)	• To dry the agarose or polyacrylamide gel medium used in gel electrophoresis to separate macromolecules DNA, RNA and proteins.
17.	**Thermal Cycler**	TECHNE™	• To amplify DNA and RNA samples by polymerase chain reaction.