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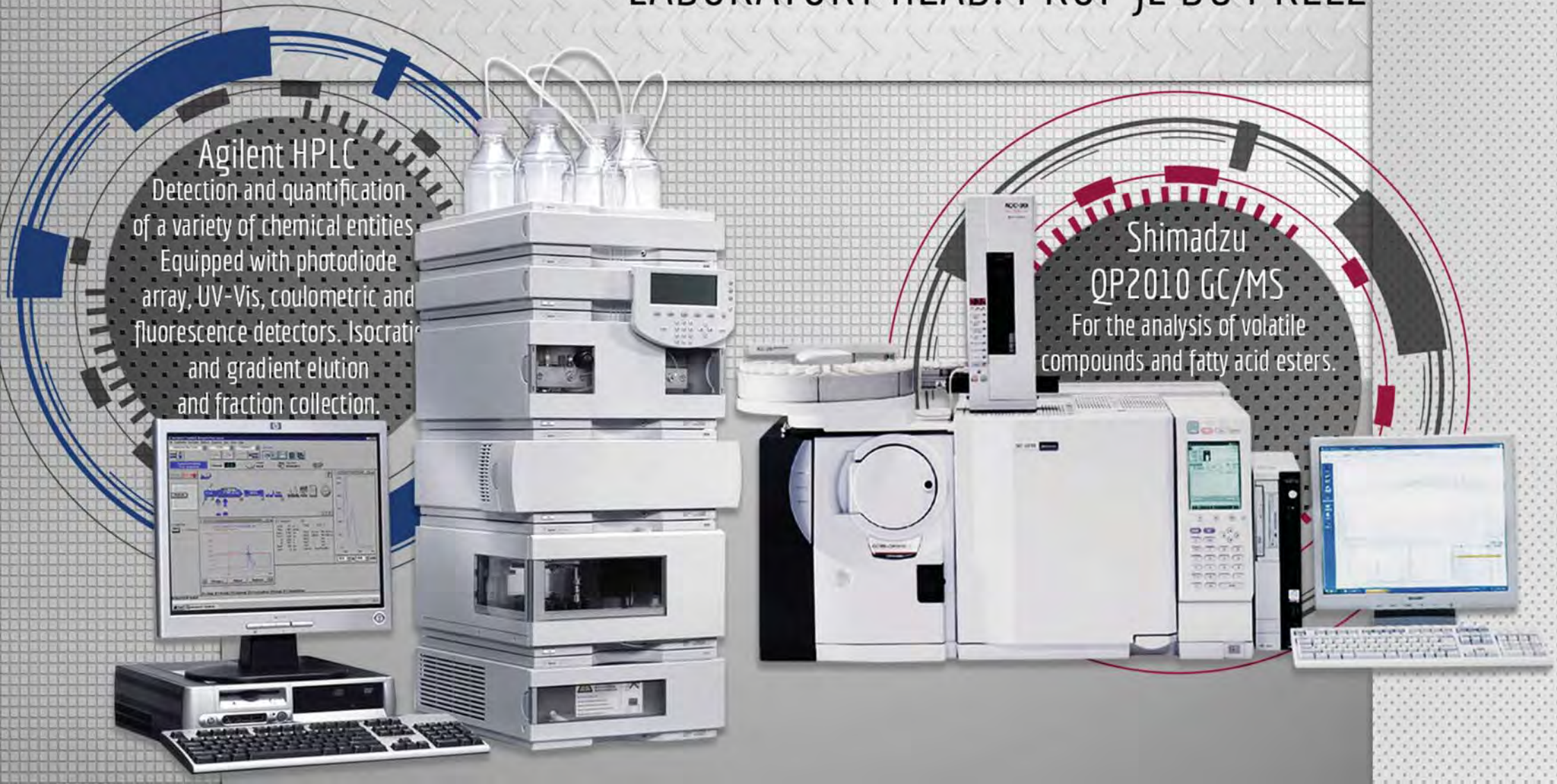
PhaRxmaCen™

ANALYTICAL TECHNOLOGY LABORATORY

LABORATORY HEAD: PROF JL DU PREEZ

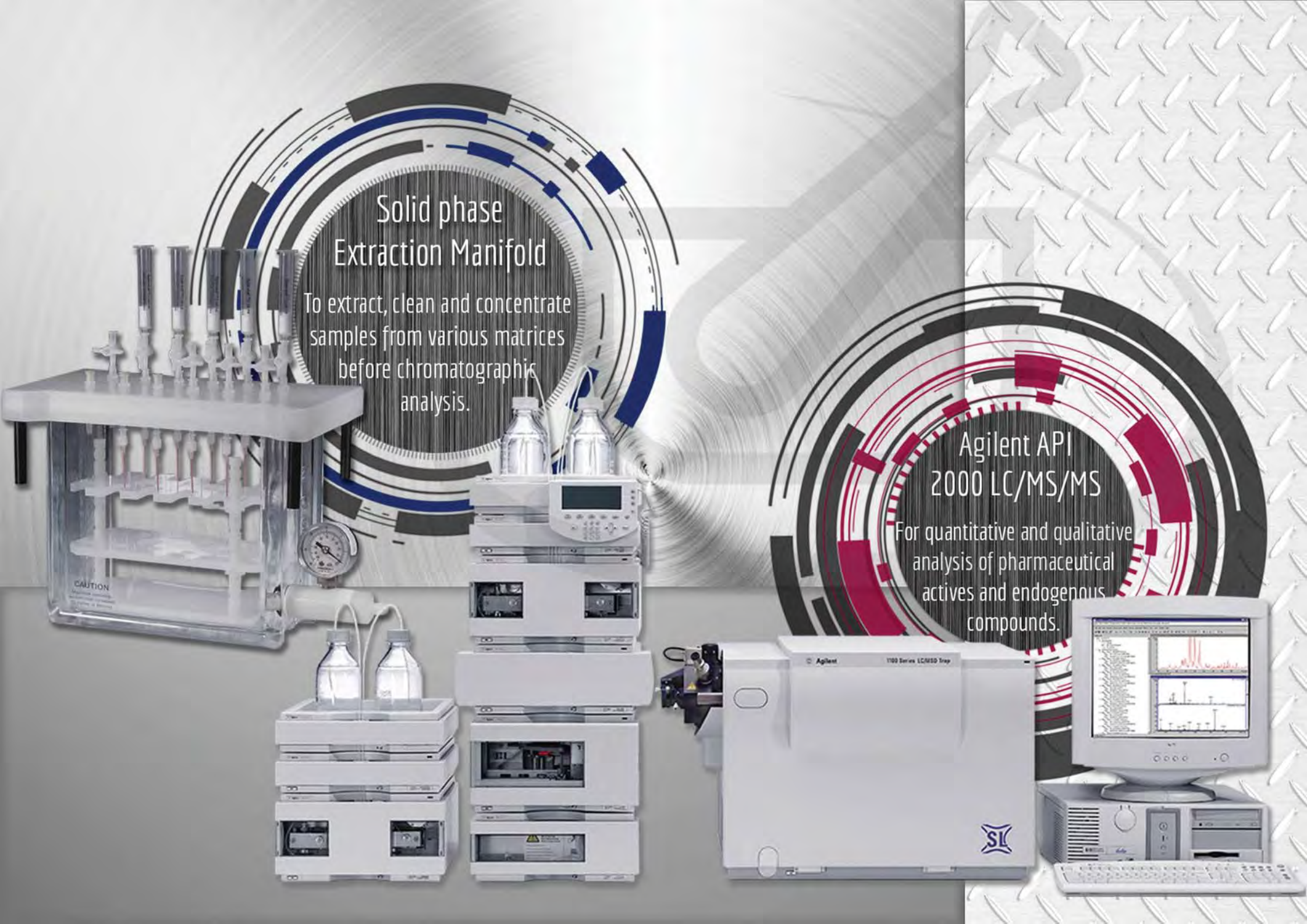


Solid phase Extraction Manifold

To extract, clean and concentrate samples from various matrices before chromatographic analysis.

Agilent API 2000 LC/MS/MS

For quantitative and qualitative analysis of pharmaceutical actives and endogenous compounds.



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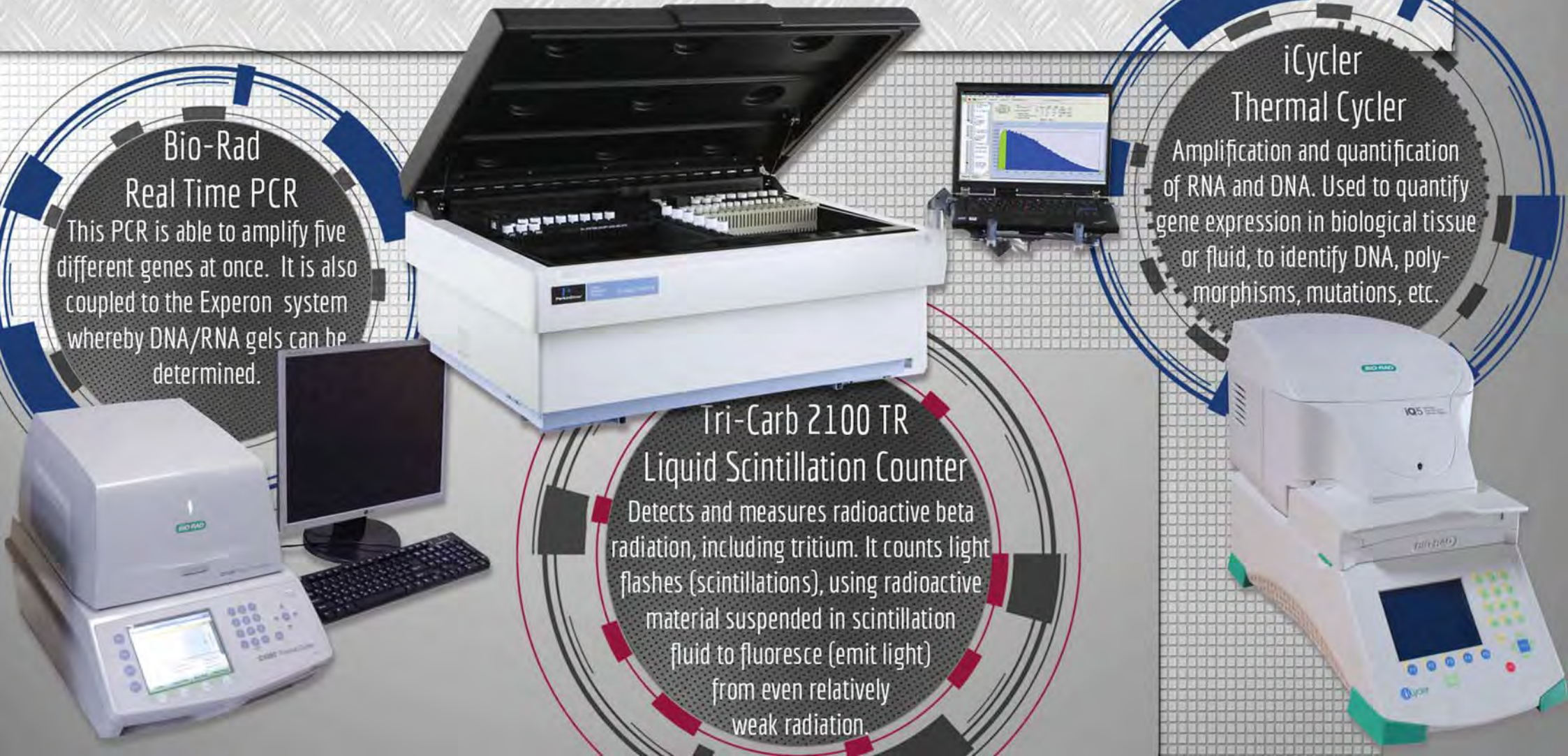
LABORATORY FOR APPLIED MOLECULAR BIOLOGY

Laboratory Head: Dr Chrisna Gouws



Bio-Rad Real Time PCR

This PCR is able to amplify five different genes at once. It is also coupled to the Experon system whereby DNA/RNA gels can be determined.

Tri-Carb 2100 TR Liquid Scintillation Counter

Detects and measures radioactive beta radiation, including tritium. It counts light flashes (scintillations), using radioactive material suspended in scintillation fluid to fluoresce (emit light) from even relatively weak radiation.

iCycler Thermal Cycler

Amplification and quantification of RNA and DNA. Used to quantify gene expression in biological tissue or fluid, to identify DNA, polymorphisms, mutations, etc.

Beckman Optima L-100XP

A super high speed ultra-centrifuge for the preparation of crude or purified membranes from tissue, homogenates and separation of organelles from whole cells.

BD FACSVerse

The Flow Cytometer is a sophisticated cell analyzer, which is expandable in future applications, and can analyze up to 10 parameters simultaneously.

FACScalibur™

Equipped with a 488 Argon laser. Quantification and analysis of fluorescent labelled cell and particles using flow cytometery. Four channel colour detection linked to CellQuest Pro software makes sorting of cells and particles possible.

Bio-Rad

Gel Documentation System

Used for the imaging of nucleic acid and protein polyacrylamide or agarose gels, typically stained with ethidium bromide or other fluorophores such as SYBR Green. Possesses an ultraviolet light trans-illuminator, a hood to shield external light and a camera for image capturing with long exposure times. Typically used for relative quantification of Western blot bands.

Spectramax Paradigm

P4E Microplate Reader

It is a user upgradable microplate detector and can detect in a number of modes eg fluorescence, absorbance, time-resolved fluorescence, luminescence and homogenous time-resolved fluorescence. It's very effective in the analysis of small sample volumes, which makes it extremely beneficial if analyses are performed on the tissue of small rodents and cell cultures.

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CELL CULTURE LABORATORY

Laboratory Head: Dr C Gouws

Nikon Type 120

An upright microscope system offering superior optical performance to observe growth and health of cultured cells.

Invitrogen Countess®

This automated cell counter is a benchtop cell assay platform equipped with state of the art optics and image analysis software for rapid assessment of cells in suspension.

These 3 incubators provide truly uniform conditions from top to bottom and side to side and offer fast temperature recovery, gas exchange and humidity, to ensure cells grow in a well controlled, healthy environment.

FORMA steri-cycle
CO2 Incubator

Galaxy
170R
CO2 Incubator

Esco Cell Culture
CO2 Incubator

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PHARMATEC LABORATORY:

BIOPHARMACEUTICS AND DRUG DELIVERY SYSTEMS

Laboratory Head: Prof JH Hamman

Easy Mount Diffusion System

This apparatus is used for in vitro drug absorption studies on excised animal tissue or cell culture monolayers.

Erweka DT6R

Dissolution system

This system is used to conduct dissolution studies on dosage forms to determine the rate and extend of drug release.

Caleva
Laboratory Screen Extruder and Multi Bowl Spheronizer

This apparatus is used for the production of beads as multiple-unit solid oral dosage forms. The bead making process consists of 2 steps namely, extrusion of the wetted powder mass through a screen and then spheronisation of the extrudate to form spherical beads containing the active pharmaceutical ingredient. The beads can then be filled into hard gelatin capsules or compressed into tablets.

Caleva
Mini Coater Dryer

This apparatus is used for film coating of small batches of solid oral dosage forms such as tablets and beads. The coating is applied to the dosage forms in order to obtain controlled drug release or region specific drug release in the gastrointestinal tract. Furthermore, coating is used to protect the drug within the dosage form against degradation by chemicals and enzymes in the gastrointestinal tract or to taste mask in the case of very bitter tasting drugs.

Malvern
Mastersizer

Particle size distribution using a solid blue laser and dynamic light scattering analysis.

Malvern
Zetasizer 2000

Measures Zeta potential incolloidal systems.

VirTis Scientific
Freeze Dryer

Biological materials must be dried in order to stabilize them for storage or to achieve a porous and malleable structure.

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PHARMATEC LABORATORY:

SOLID-STATE PHARMACEUTICAL INNOVATION & NANOTECHNOLOGY

Laboratory Head: Prof W Liebenberg

Shimadzu IR Prestige-21

Fourier Transform Infrared Spectrophotometer

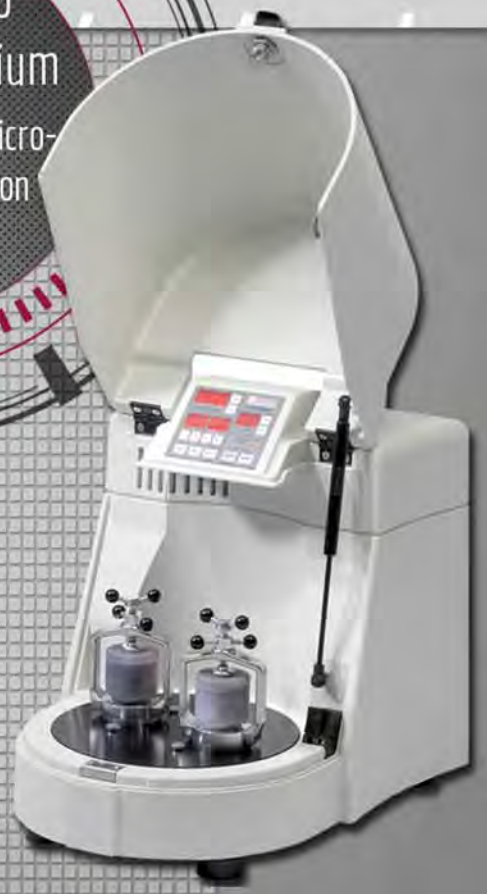
IR is complementary to other physical characterization techniques. IR is typically used as an identification assay. A peak-by-peak correlation of the IR spectra is excellent evidence for identity.

Shimadzu DTG-60 Differential Thermo Gravimetric Analyser

Determine weight loss associated with solvents or water incorporated in the crystal lattice.

Fritch Micro Mill P7-Premium

For the creation of micro- and nano powders on laboratory scale.



Nikon Eclipse E400
Thermal Microscope

TM gives visual confirmation of thermal events like melting, dehydration, desolvation, recrystallization or decomposition of a compound. DSC can sometimes be ambiguous about the exact nature of a recorded thermal event. TM is then necessary to observe its nature.

VTI-SA
Gravimetric Sorption Analyser

The Vapour sorption analyzer is a continuous vapour flow sorption instrument for obtaining water and organic vapour isotherms at temperatures ranging from 25°C to 90°C at ambient pressure. Vapour sorption analysis is an established technique for determining the effect on materials of exposure to controlled conditions of humidity and temperature.

Shimadzu
DSC-60A Differential Scanning Calorimeter

Determine melting points and solid-state transitions. An excellent tool in identifying different polymorphic forms.

TAM III Calorimeter
Thermal Activity Monitor

Solution calorimetry is a thermal technique which directly measures the heat change caused by dissolution of a crystalline powder. This analytical technique is highly sophisticated and can measure solid-state properties such as amorphous content, crystallinity and polymorphism.

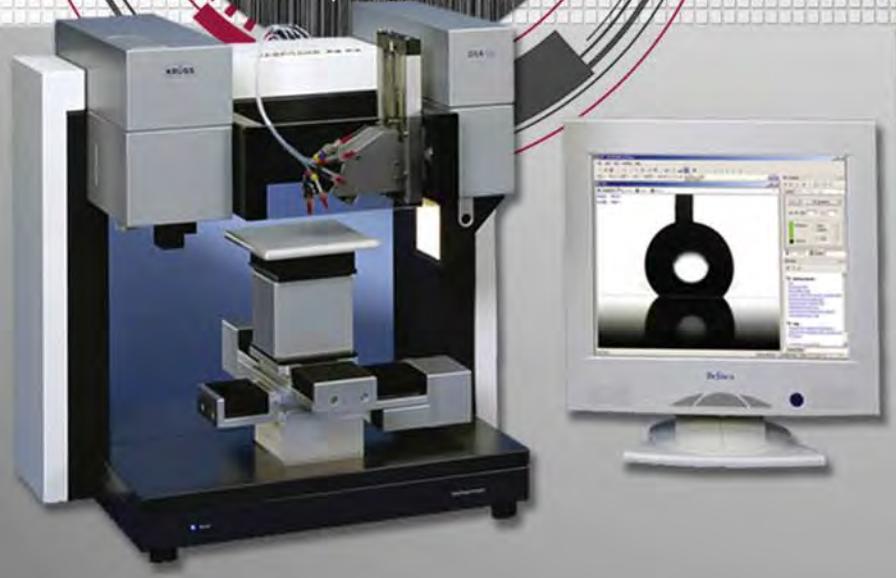
PANalytical Empyrean XRPD

This technique is used on a routine basis for characterisation of different polymorphic forms. XRPD is the predominant tool for the study of poly-crystalline materials and is eminently suited for both the routine characterisation of polymorphs and solvates, as well as advanced research. The degree of crystallinity within a sample can also be measured using x-ray powder diffraction. Variable temperature X-ray powder diffractometry (VTXRPD) is a fast method to characterise and measure the transformation between two polymorphic forms, and mixtures thereof.

Kruss DSA100

Drop Shape Analysis System

Measurement of static and dynamic contact angles.
Testing of wetting properties of solids.



Shimadzu

HPLC System

Detection and quantification of a variety of chemical entities.
Equipped with column switching, photodiode array, refractive- and fluorescence detectors.

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PHARMACEUTICAL CHEMISTRY LABORATORY

Laboratory Head: Prof A Petzer

VirTis
Benchtop Freeze Dryer

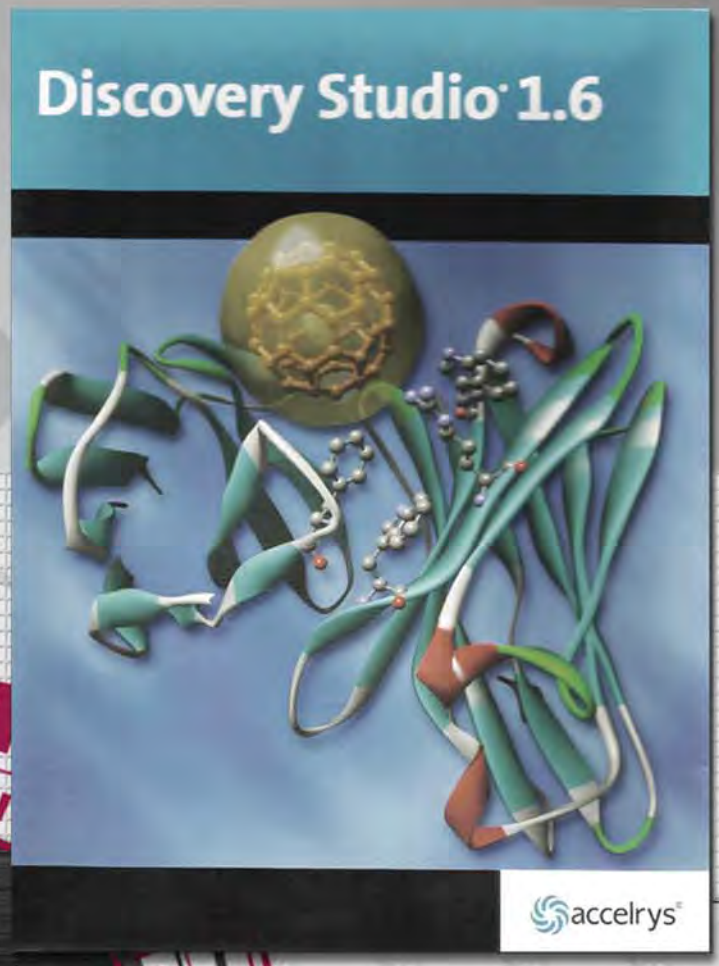
The Virtis freeze dryer are used for the lyophilisation of compounds.

Bruker
Alpha IR with ATR

IR spectroscopy is a widespread and powerful tool for the identification and characterization of a diverse range of materials. Molecular structures and components are identified via their typical infrared absorption bands. IR spectroscopy can be applied for the qualitative characterization of materials, as well as for their quantification.

Dionex ASE 350
Accelerated Solvent Extractor

A patented system for the extraction of solid and semisolid samples using common solvents at elevated temperatures and pressures.



Accelrys Discovery Studio

Modelling and simulation software.

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MICRODIALYSIS LABORATORY

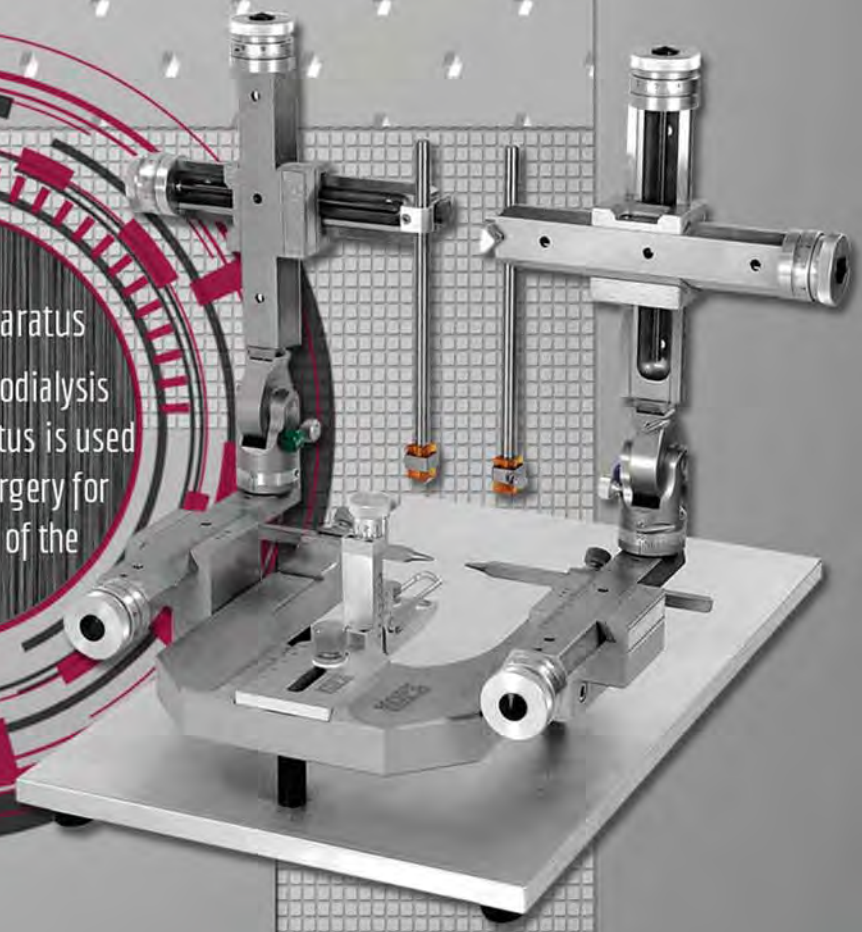
Laboratory Head: Prof BH Harvey

TSE
Microdialysis Apparatus

Microdialysis procedures: Following implantation of a probe in a specified brain area in live, freely moving rats, subsequent withdrawal of samples is facilitated by this apparatus, preceeding theanalysis of the specified neurochemicals in the samples.

Kopf
Stereotactic Apparatus

Preceeding the microdialysis procedure, this apparatus is used in the stereotaxic surgery for correct placement of the probe.



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TRANSDERMAL LABORATORY

Laboratory Head: Prof M Gerber

DT1200

Acoustic & ElectroAcoustic Spectrometer

The DT-1200 uses an acoustic sensor for measuring particle size distribution in concentrated dispersions and emulsions. It applies the same sensor for measuring bulk viscosity and longitudinal viscosity in Newtonian and non-Newtonian liquids. In addition the DT-1200 contains a sensor for zeta potential measurement, as well as numerous options, such as titration with two burettes, conductivity (aqueous and non-aqueous solutions), pH and temperature measurements, etc.

Diffusion Apparatus System

Consist of diffusion water baths, vertical Franz diffusion cells, Franz cell stands & Variomag magnetic stirrer plates

Diffusion apparatus system is used to perform in vitro skin diffusion studies in a temperature-controlled environment.