Modern laboratory equipment in the College of Pharmacy

The faculty established different laboratories to enhance and to support the pharmaceutical research, they are currently equipped with many instruments that needed for students. Maintenance and regular inspection guidelines are followed within each laboratory to be sure the working conditions are meet the standards.

The laboratories included in the college and the equipment equipped with it

Cell and Molecular Pharmacology Research Laboratory

- Safety Cabinet Laminar Flow
- CO_2 Incubator
- Inverted Trinocular Phase Contrast Microscope
- Semi-Micro Balance
- Compact Digital Microplate Shaker
- Centrifuge
- P-Vac Portable Vacuum System
- Digital Water Bath
- Vortex Mixer
- Digital Tube Roller
- Orbit^{tm}LS Low Speed Laboratory Shaker
- Digital Dry Bath
- Electrophoresis Instruments
- Precision Balance 0.01g
- C-Digit Chemiluminescent Western Blot Scanner
- Hot Plate Stirrer
- P-Vac Portable Vacuum System
- Vortex Mixer
- Prism^{tm} Mini-Centrifuge
- Freezer (-20 ^{0} C) and Fridge (2-8 ^{0} C)

Ibn sina Laboratory for Pharmacological Sciences

- Drying Oven
- Homogenizer
- FTIR (Shimadzu)
- Ultrasonic Water bath
- UV Spectrophotometer
- PH Meter
- HPLC
- Sonicator
- Balance
- Centrifuge (5000 rpm)
- Centrifuge (12000 rpm)
- Melting-Points Apparatus
- Gas Chromatograph- Mass Spectrometry
- IR spectroscopy
- Microplate Spectrophotometer
- Dissolution System

Ibn Al-Bitar Laboratory for Pharmaceutical Chemistry

- Drying Oven
- Incubator
- Diffusion Cell Apparatus
- Hotplate
- Refrigerator
- Bio-Safety Cabinet
- Water Bath
- Thermo-Circulator
- Digital Temperature Controller
- Electronic Analytical Balance
- BandelinSonorexDigitec

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Al-Razi Technology Laboratory

- Drying Oven
- Water Bath oscillator
- Incubator
- Reverse Transcriptase PCR machine
- Universal Cold Centrifuge
- Centrifuge (NF 815)
- Centrifuge (LaboFuge 200)
- Autoclave
- UV Spectrophotometer
- Microscope
- Vortex Mixer
- Microplate Reader (Elizer)
- Magnetic Heated Stirrer
- Colony Counter
- The OxoidAnaerobic Jar

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A detailed description of some of the modern devices in the college

Ultra-high-performance liquid chromatograph with Diode array (UltiMate® 3000 basic):

The sensitivity of ECD-3000RS Detector is capable of detecting analytes in the Picomole (10-12 M) range and exceeds in isocratic mode for neurochemical measurements in brain research and in pharmaceutical applications, easily expand to multiple (up to four) independent sensors, simultaneously measures both low and high levels of analytes without losing data to peak with Auto-Ranging feature.

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Gas Chromatograph-Mass Spectrometer (SHIMADZU):

(GC/MS) is a single quadrupole powerful technique, comprising a gas chromatograph (GC) coupled to a mass spectrometer (MS) by which complex mixtures of chemicals may be separated, identified and quantified sample. Routine analyses are fully automated using a range of sample introduction techniques, including large-volume and temperature-programmable injections can reach to 300˚c, high vapor pressure and direct insertion probe. Furthermore, Ecology mode reduces costs associated with power and carrier gas consumption when the instrument is in standby.

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Stereotaxic Apparatus:

This device is much précised that used to manipulate the brain of living animals. Stereotaxic surgery is a versatile approach that can be used to generate lesions, manipulate gene expression, or deliver experimental agents to the brain. This technique allows researchers to accurately target deep structures within the brain through the use of a stereotaxic atlas, which provides the 3D coordinates (x, y, and z) of each area. In addition, associated equipment and accessories for stereotaxic surgery include anesthesia setups, micro-syringe and micro-drills which helps detect and measure neuronal activity of the brain.

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Multiskan™ Microplate Photometer (Thermo Fisher):

The UV-visible spectrophotometer is used to measure absorbance in a variety of research and clinical applications with the easy-to-use. This photometer provides proven performance and reliable results through this Features; wide wavelength ranges of 340 to 850nm, fast reading of both 96- and 384-well plates, Shaking and incubation up to 50°C for temperature critical assays. As well as the ability study of the pharmacokinetics of the drug and polymer. This photometer is also useful for qualitative and quantitative ELISA applications in clinical laboratories.

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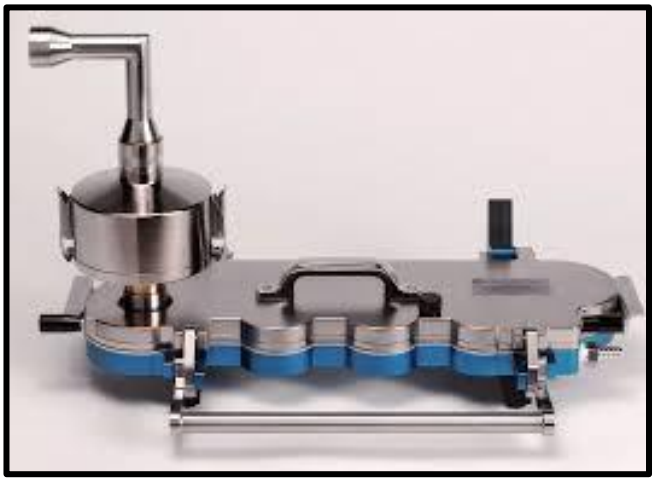

Next Generation Impactor (Copley Scientific):

The Next Generation Impactor (NGI) is a high-performance, precision, particle classifying cascade impactor, designed specifically for the pharmaceutical industry for testing metered-dose inhalers (MDI), dry-powder inhalers (DPI), nebulizers and nasal sprays. In addition, there are eight nozzle pieces in the NGI, corresponding to seven size-fractionation stages, a micro-orifice collector that takes the place of a final filter and apply multiple flow rates (15 L/min, 30 L/min, and 90L/min).

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Fourier-transform infrared spectroscopy (FTIR):

FTIR is a technique used to obtain an infrared spectrum of absorption or emission of a solid, liquid, and plastic with spectral range from 350 cm^{-1} to 8300 cm^{-1}. Optimal results are obtained by Identifying contaminants and impurities in products which is useful in safety studies. It is also useful in rapidly screening ID and quality of raw materials, intermediates and formulated products.

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Dissolution Apparatus:

Drug release behavior of pre-formulations is made possible by dissolution testing, which simulates the behavior of capsule, bead, and enteric coated tablets in vitro. This is useful in dissolution studies of extended release products.

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Ultraviolet – visible spectroscopy (UV-Vis):

Absorption spectroscopy or reflectance spectroscopy in the ultraviolet spectral region.

UV-Vis spectroscopy is routinely used in analytical chemistry for the quantitative determination of different analytes, such as: highly conjugated organic compounds and biological macromolecules. Spectroscopy analysis is commonly carried out in solutions.

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Centrifuge:

A Centrifuge is a piece of equipment that puts an object in rotation around a fixed axis (spins it in a circle), applying a potentially strong forces perpendicular to the axis of spin (outward). Very high speed centrifuges and ultracentrifuges able to provide very high accelerations can separate fine particles down to the nano-scale, and molecules different masses.

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Rotary evaporator:

A rotary evaporator is a device used in chemical laboratories for the efficient and gentle removal of solvents from samples by evaporation. Rotary evaporators are also used in molecular cooking for the preparation of distillates and extracts.

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PCR Machines:

The thermal cycler (also known as a thermocycler, PCR machine or DNA amplifier) is a laboratory apparatus most commonly used to amplify segments of DNA via the polymeras chain reaction(PCR). Thermal cyclers may also be used in laboratories to facilitate other temperature-sensitive reactions, including restriction enzyme digestion or rapid diagnostics. The device has a thermal block with holes where tubes holding the reaction mixtures can be inserted. The cycler then raises and lowers the temperature of the block in discrete, pre-programmed steps.

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Compact Digital Microplate Shaker:

This shaker is used in continuous shaking or timer mode up to 99 hrs 59 min. It features stable and accurate microplate shaking with standard and enlarged platform that can shake maximum of six microplates at one run.

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Digital Dry Bath, dual position:

Digital Dry Baths provide accurate digital temperature selection, eliminating the need for external thermometers and repetitive "fine tuning" of a temperature control knob. The Dry Bath provides accurate temperature with real time monitoring that continuously maintains the selected temperature within ±0.2°C.

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LI-COR C-DiGitChemiluminescentWestern Blot Scanner:

A high-performance, highly affordable chemiluminescence imager that is used to detect targetproteins on Western blot membranes (nitrocellulose and PVDF). The membrane is previously incubated with the proper primary antibody (related to the protein target), then incubated with the chemiluminescent HRP-conjugated secondary antibody. The camera of the chemiluminescent C-DiGit detects the chemiluminescence emanating from the membrane, transforming the signal into a digital image for rapid analysis with software provided with the detection machine.

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Inverted Trinocular Phase Contrast Microscope:

In the cell culture lab., cells can be viewed and observed by the “inverted microscope”. This type of microscope is one of the light microscopes as the light is used as energy source. Light rays pass through a specimen to be magnified by objective lenses and visualized by the ocular lenses. It is called inverted microscope because the light source and the condenser are found on the top of the stage unlike the usual light compound microscope. The role of condenser lens is to concentrate the light on the specimen which is placed on a stage.

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Electrophoresis apparatus:

This apparatus is used for electrophoresis process in which mixtures of proteins (protein lysates) are separated based on their molecular weights through the electrophoresis gel SDS. Proteins are denaturalized before being loaded to the gel to convert their structures from secondary to primary and have a negative charge. Then, the gel is placed in the electrophoresis tank, covered with running buffer then connected to the power supply to allow proteins to move toward the positive electrode when a voltage is applied, causing separation.