

Spectra Max Gemini Microplate Spectrofluorometer

Introduction and Instrument Specifications

The Spectra Max Gemini Dual-Scanning Microplate Spectrofluorometer can perform a variety of fluorescent, time-resolved fluorescent, and luminescent assays. The Spectra Max Gemini uses two holographic diffraction grating monochromators, which allow for individual optimization of wavelengths for both excitation and emission. The dual-scanning capability can also be used to determine excitation and emission settings for new fluorescent probes. Mirrored optics focus the light into the sample volume and cutoff filters are used to reduce stray light and minimize background interference. The light source is a high-powered Xenon flash lamp.

Microplates having 6,12,24,48,96, and 384 wells can be used in the Spectra Max Gemini. Fluorescent or luminescent detection is achieved from the top down through the entire depth of sample in the microplate well. Detection of species collected on membrane plates is also possible. The dynamic range of detection is from 10^{-6} to 10^{-11} molar fluorescein. Variations in measured fluorescence values are virtually eliminated by internal compensation for detector sensitivity, photomultiplier tube voltage and sensitivity, as well as excitation intensity.

Temperature in the microplate chamber is isothermal, both at ambient and when the incubator is turned on. When the incubator is on, the temperature may be controlled from 1°C above ambient to 45°C. The contents of the wells in a microplate can be mixed automatically by shaking before each read cycle, which make it possible to perform kinetic analysis of solid-phase, enzyme-mediated reactions such as a kinetic ELISA.

The Spectra Max Gemini is controlled by an external computer running Softmax Pro software, which provides integrated instrument control, data display, and statistical data analysis. The Spectra Max Gemini cannot be operated without the computer and Softmax Pro software.

Spectra Max Gemini Microplate Spectrofluorometer Operation and Guidelines

Policy

Projects:

All new users should meet with Johnafel Crowe (Office: 404.894-2212, johnafel.crowe@ibb.gatech.edu) to discuss their project **BEFORE** they use the instrument. An abstract or brief description of each user's project involving fluorescence or luminescence should be discussed in person or forwarded to johnafel.crowe@ibb.gatech.edu. At that time objectives and goals of the user can be discussed as well as the best means of achieving these objectives. **Important note:** If projects involve potential biohazards, the user must inform Johnafel and supply protocols for decontamination at this time.

Instrument Use:

The Spectra Max Gemini is a very expensive and sensitive piece of equipment. We expect all users to be properly trained before they use this instrument. This is done after project consultation described above. Visit ibb.gatech.edu/~avesper/confocal/ to schedule a training session. Basic training sessions are administered upon request. These sessions usually last about 1 hrs. Basic training session topics include but are not limited to operation of the system, how to acquire, save, transfer data, and shut down the instrument.

Spectra Max Gemini Sessions:

All users will read and have available the condensed equipment instructions for the Spectra Max Gemini. Equipment will be left as clean or cleaner than the user originally encountered it. Each user is required to sign a log before and after each session. Users are required to report any instrument problems encountered during each session to Johnafel Crowe. This action will help to keep the Spectra Max Gemini up and running properly. Each user can save data on the User data drive in a folder to temporarily store their statistical data. The User data drive connected to the computer has a limited amount of disk space. **Therefore, users are required to bring blank storage media** (e.g. blank Zip disks, blank CDs, MO disks, or hard drives via the GT network) **to each session** and transfer their images to some form of storage media **BEFORE** each session is complete. **The core laboratory is not responsible for the backup of user folders and files.**

Instrument Modifications:

No modifications are to be made to the Spectra Max Gemini Microplate Reader or the attached computer. Only certified Molecular Devices representatives may make hardware and software modifications to the system.

Reserving Time for Spectra Max Gemini Sessions:

Equipment reservations can be made by visiting <http://www.ibb.gatech.edu/~avesper/confocal/> and following the instructions provided.

IF YOU REQUIRE OPERATOR ASSISTANCE, YOU SHOULD NOTIFY JOHNAFEL AND RESERVE A TIME NO LATER THAN THE DAY BEFORE YOUR APPOINTMENT. In the event of a cancellation or an error when scheduling a time, please notify Johnafel at 404-894-2212; johnafel.crowe@ibb.gatech.edu as soon as possible and he will make the necessary corrections to the schedule. If the core laboratory has to cancel an appointment, then the user will be notified in a timely manner.

After Hours Use:

Please see Johnafel if you are a trained user and require access. To gain access to the Spectra Max Gemini after hours when you come to your session, remember to bring your buzz card it will give you programmed slide key access to the lab.

Safety

Emergency procedures:

In case of an emergency, please contact:

Johnafel Crowe Office: 404-894-2212, Home: 770-210-9145

Steven Woodard Office: 404-894-5891, Cell: 404-725-0023, Home: 770-322-0187

Kay Kinard Office: 404-894-8896, Home: 770-944-0519

In the event we cannot be reached and the matter requires immediate attention, call Georgia Tech Police 404-894-2500. These numbers will be posted near the instrument and on the outside of Room 1328.

Biohazardous Materials:

Please notify Johnafel of any potentially biohazardous samples that are scanned using the Spectra Max Gemini. Any sample or specimen that is either human, or primate in nature is considered a potential biohazard. Therefore it is the user's responsibility to perform their image acquisition in such a way as to not contaminate the instrument. Furthermore, it is the user's responsibility to provide the facility with decontamination protocols. In the event that the instrument becomes contaminated by the sample or specimen (e.g. blood, sputum or waste products), it is the user's responsibility to notify Johnafel Crowe immediately. All biohazardous waste will be disposed of in red biohazardous bags and placed in a designated waste area. Regular waste pick-ups will be scheduled with the Department of Environmental Health and Safety.

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