

Abstract Submitted  
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**The application of time-gated fluorescence spectroscopy to the real-time monitoring of biological metabolism**<sup>1</sup> ZACHARY LONG, PAUL URAYAMA, Miami University — A time-gated fluorescence spectroscopy system capable of nanosecond gating and picosecond control of gate delays is presented. Used in conjunction with pulsed excitation, the system is capable of tracking the temporal evolution of the fluorescence spectrum from solution samples. The system uses a nitrogen discharge laser as the excitation source and a time-gated intensified CCD detector coupled to a spectrograph. Precise synchronization between the laser pulse and ICCD gate is achieved using a constant-fraction optical discriminator. System characterizations are presented, for example, the ability to both spectrally and temporally resolve the content of fluorophore mixtures is confirmed. Biotechnological applications are highlighted, including gated spectroscopy for the real time monitoring of metabolic activity via measurement of endogenous cellular fluorescence.

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