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## September 2017

Spotlight Summary by Emmi Kantola

### Multiphoton in vivo imaging with a femtosecond semiconductor disk laser

Multiphoton microscopy is an important tool for developmental biology and neuroscience, but the cost of such microscopes—particularly the cost of an ultrafast laser source—hinder their wider use in laboratories. An ideal ultrafast laser source should be able to excite a variety of fluorophores, generate femtosecond range pulses, and be small, reliable, and cost-effective. In this work, the authors present an ultrafast semiconductor disk laser (SDL) passively mode-locked with a semiconductor saturable absorber mirror capable of generating 170-fs pulses at around 1027 nm with a repetition rate of 1.63 GHz. They performed several multiphoton imaging experiments and showed that the ultrafast SDL produced equally good imaging results as a commonly used Ti:Sapphire laser with similar operation parameters. Ultrafast SDLs can also be designed to emit wavelengths from the UV to the mid-IR through bandgap engineering, and with the added bonus of a small and simple footprint, reliable operation, and low cost, an array of SDLs operating at different wavelengths could potentially replace the costly Ti:Sapphire lasers in multiphoton microscopy.

### Article Reference

#### Multiphoton in vivo imaging with a femtosecond semiconductor disk laser

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