The **Wang Lab** (BME) has pioneered photoacoustic microscopy – a novel imaging modality for early-cancer detection. In a typical experiment, laser pulses are used to deliver energy into biological tissues. Some of energy will be absorbed and converted into heat, leading to transient thermoelastic expansion that generates ultrasonic waves. The waves can be further detected by an ultrasonic transducer and integrated to form photoacoustic images. It is known that optical absorption is closely associated with physiological properties, such as hemoglobin concentration and oxygen saturation. As a result, photoacoustic imaging provides a vehicle to perform *in vivo* physiology measurements. Furthermore, it is safe and applicable to animals as well as humans. Recently, the Wang and Xia labs have demonstrated that gold nanocages can be applied to photoacoustic imaging to substantially enhance the contrast between the blood vessels and the surrounding tissues (see Figure). This collaboration has demonstrated that imaging modalities combined with nanomaterials can formulate a powerful technology platform for *in vivo* molecular and therapeutic imaging in nanomedicine.

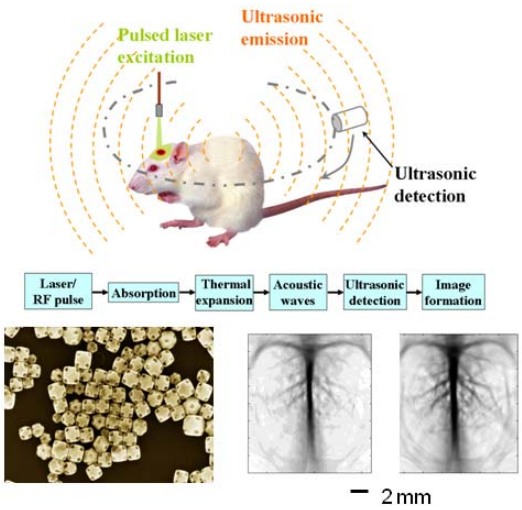

Figure 5. An illustration of photoacoustic microscopy and the use of gold nanocages as a new class of contrast agents (the right image was taken with nanocages).

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Wang Lab: http://labs.seas.wustl.edu/bme/Wang/