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Biomedical Engineering (BME)

## A smart fiber optic sensor system for quantitative tissue optical spectroscopy

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Smart fiber optic sensors, systems, and methods for performing quantitative optical spectroscopy are disclosed. In one embodiment, smart fiber optic sensor can include a sensing channel, a calibration channel, and a pressure sensing channel. External force or pressure can be calculated at pressure sensing channel for monitoring and controlling pressure at a sensor-specimen interface thereby ensuring more accurate specimen spectral data is collected. Contact pressure can be adjusted to remain within a specified range. A calibration light of the calibration channel and an illumination light of the sensing channel can be generated simultaneously from a shared light source. Pressure sensing channel can transmit light from a second light source and collect pressure spectral data.

