spectrum and match well with the water absorption spectrum suggesting that this is the limiting factor in the bandwidth of our system. Higher performance can be obtained by using waveguiding fluids whose absorption spectrum are better matched to the wavelength range of interest. For example, at 1550 nm, heavy water would be preferable as a waveguiding fluid for lower optical absorption [30].

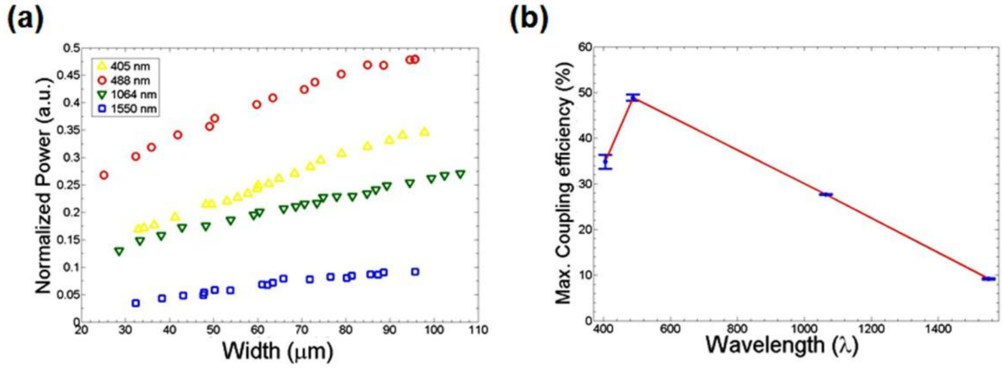

Fig. 6. (a) Coupled power into the output waveguide as a function of core width for 4 different slaser wavelengths. (b) Maximum coupling efficiency for all wavelengths tested here. The error bars represents standard error of the mean.

4. Conclusions

We present here a new approach to reconfigurable photonics which couples the physical adaptability of microfluidic waveguides to fiber-in and fiber-out optical systems. Our efforts focused on the development of two components that could form the basis of a more complex reconfigurable photonic system: a signal attenuator and a 1x2 optical switch. By integrating liquid- and solid-state photonic modalities onto a single chip, we have demonstrated high coupling efficiency (3.1 dB), low cross-talk (less than 20 dB), and demonstrated good performance over a broad range of wavelengths from visible and telecommunication.

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