We present a method for making polymer chips with a narrow-band near-infrared absorber layer that enables light-induced local heating of liquids inside fluidic micro- and nanochannels fabricated by thermal imprint in polymethyl methacrylate. We have characterized the resulting liquid temperature profiles in microchannels using the temperature dependent fluorescence of the complex $[\text{Ru(bpy)}_3]^{2+}$. We demonstrate thermophoretic manipulation of individual YOYO-1 stained T4 DNA molecules inside micro- and nanochannels.