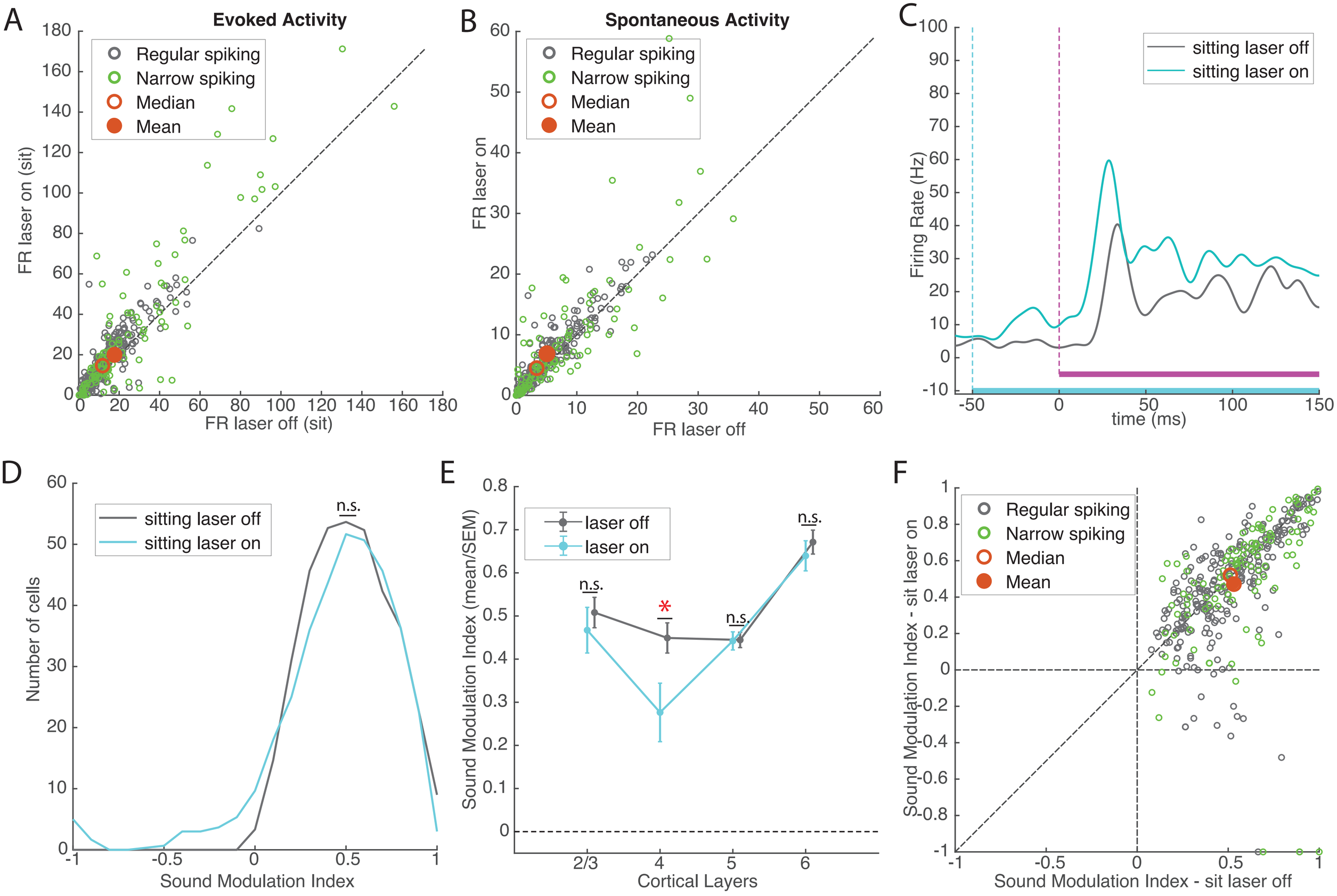

Figure 3. Effects of VIP activation on auditory cortical activity. Similarly to running, VIP activation increases spontaneous firing rate, but this change does not reduce sound evoked modulation of auditory cortical neurons. **A.** Onset response firing rate of recorded neurons (n = 372) to a white noise stimulus (0 -100 ms post stimulus onset) during laser on and laser off trials. Narrow spiking neurons are plotted in green (n = 105), regular spiking neurons are plotted in grey (n = 267). Population mean and median are indicated in red filled and unfilled circle respectively (Laser Off FR (Mean/SEM) = 17.48/0.98, Laser On FR (Mean/SEM) = 21.30/1.24, signrank p = 2.69e-17). **B.** Spontaneous firing rate of recorded neurons (n = 372) during laser off and laser on trials. Narrow spiking neurons are plotted in blue (n = 205), regular spiking neurons are plotted in grey (n = 267). Population mean and median are indicated in red filled and unfilled circle respectively (Laser Off FR (Mean/SEM) = 5.38/0.30, Laser On FR (Mean/SEM) = 6.31/0.36, signrank p = 2.39e-11). **C.** Mean response of an example neuron to a white noise stimulus during laser on (grey) and laser on (cyan) trials. White noise is depicted in magenta (dashed line is an onset), LED light is depicted in cyan (dashed line is an onset). **D.** Two distributions of sound modulation indices during sitting laser off trials (grey) and sitting laser on trials (cyan), Laser Off MI Mean/SEM = 0.52/0.01, Laser On MI Mean/SEM = 0.47/0.02, signrank p = 0.1243, N = 372. **E.** Means and SEM of sound modulation indices during laser on and laser off trials across cortical layers in sitting condition (Laser Off MI (Mean/SEM) = 0.51/0.04, 0.45/0.04, 0.45/0.02, 0.67/0.03; Laser On (Mean/SEM) = 0.47/0.05, 0.28/0.07, 0.44/0.02, 0.64/0.04; n = 20, 30, 102, 41; signrank p = 0.9870, 0.0011, 0.1558, 0.5997; layers 2/3, 4, 5, 6 respectively). **F.** Sound modulation indices in sitting laser off condition plotted against sound modulation index in sitting laser on condition (n = 372). Mean and median are plotted in red filled and unfilled circles, respectively.