Reactive oxygen and nitrogen species (RONS) have been shown to play important roles in various fields, including medical treatment (e.g. cancer and chronic wounds), food preservation, and water purification. It is well established that atmospheric pressure plasmas generate a wide variety of RONS in air near room temperature, including $O_2^*$, $O_3$, $OH$, O, and NO. Those highly reactive species are hard to generate by other means. Therefore, the plasma-generated RONS have significant potential to realize radical-enhanced processes. A challenge, however, is to control the plasma chemistry and mass transportation to treated samples. In this study, we employed surface-micro discharge [1] and investigated the time and spatial distributions of those reactive species in gas-phase and aqueous-phase. In gas-phase, we measured the concentration of ozone using UV absorption at 254 nm. Our measurements demonstrate that gas phase air plasma chemistry can show surprising complexities. In aqueous phase, nitrites and nitrates were measured by UV spectrometer at 200-400 nm. The concentration of hydrogen peroxide was measured using electrochemical probe. Dissolved ozone was also quantified by indigo method. Three different modes of species distributions in aqueous-phase were identified: ozone-mode, nitrate-mode, and nitrite-mode. Our experimental observation indicates that power density from SMD, external gas flow, and the residence time of the species are key parameters to control the distributions of plasma-generated RONS. The antibacterial efficacy of plasma-treated liquid significantly depends on those parameters. In the presentation, we will also discuss possible effects of UV photons to modulate the plasma chemistry in gas-phase and aqueous-phase.