Cellular and molecular responses of a filamentous fungus *Neurospora crassa* to plasma

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Although plasma is an efficient means of microbial sterilization, mechanism of plasma effect on microorganisms still needs to be clarified. In addition, a limited number of studies are available on eukaryotic microorganisms such as yeast and fungi in relation to plasma application [1][2]. Thus, we investigated cellular and molecular aspects of plasma effects on a filamentous fungus, *Neurospora crassa* by making use of argon plasma jet at atmospheric pressure [3]. The viability and cell morphology of *N. crassa* spores exposed to plasma were both significantly reduced depending on the exposure time when treated in water. The intracellular genomic DNA content was dramatically reduced in fungal tissues treated in water with plasma. Dramatic reduction in pH of water after plasma exposure was observed and this might produce detrimental effect on fungal spores. However, direct plasma treatment resulted in more severe effect on fungal spores than plasma treated and acidic water, indicating that factors directly from plasma could affect fungal viability and other responses. Interestingly, we discovered that the transcription factor *tah-3* gene was involved in generating fungal tolerance to a harsh plasma environment.

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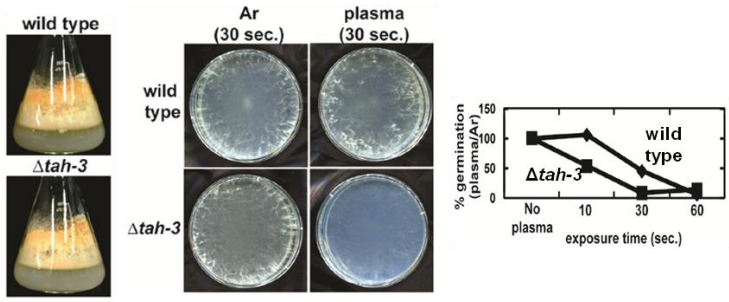

Figure 1: Responses of the *tah-3* deletion mutant to plasma. Growth in normal condition (Left panel), Growth on Vogel's Minimal media (middle panel), and spore germination rate (Right panel)

References

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