## Homeopathic medicines influence fungal adhesion and cellular oxygen metabolism of MDCK and MA104 cell lines

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Background: Fungal and viral infections constitute a serious public health problem, because morbidity and mortality rates of these diseases have been increasing in the last decades [1,2]. The resistance to antifungal and antiviral agents [3,4] currently available in the pharmaceutical market motivates the development of new therapies, including complementary and alternative health practices [5,6]. In this context, our research group has deepened the knowledge about the therapeutic potential of homeopathy using different models [7-9]. Homeopathic medicines undergo a process of serial dilution whereby the final remedy contains extremely low amounts of the active substance, with pharmacological action, and, consequently, cannot be considered merely placebos [10]. Aims: In the present study, we evaluated the potential of two different homeopathic medicines, named Influenzinum RC (compounded with influenza A virus) and Candida albicans RC (compounded with *Candida albicans* yeasts), which are prepared according to Brazilian homeopathic procedures [11]. Methodology: The biotherapics (12x, 30x) were prepared from Candida albicans yeasts [7, 11] and from influenza virus A H3N2 [6,11]. The cellular parameters evaluated after biotherapic treatments were: cytotoxicity by MTT assay; PFK-1 activity; and maximum respiratory capacity. Results: Our results showed that Influenzinum RC did not cause cytotoxic effects but induced morphological alterations, increased (p < (0.05) mitochondrial activity, and significantly modified (p < 0.05) PFK-1 activity of MDCK cells. Additionally, using high-resolution respirometry we could detect a maximum respiratory capacity when these cells were treated with Influenzinum RC, despite a well-preserved ultrastructure of their mitochondrial organelles. In contrast, when MA104 cells were treated with Candida albicans RC, a significant decrease in cellular respiratory capacity as well as in yeasts adhesion rate was detected. Conclusions: These results indicate that homeopathic medicines modify important cellular and metabolic aspects of mammalian cells and these alterations should be responsible for the therapeutic potential of these drugs.

Keywords: Candida albicans, influenza A virus, homeopathy, in vitro models.

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