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Reactive oxygen species involved in the inflammation and wound healing

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Immune cells are involved in virtually every aspect of the physiology process that may participate in hemostasis and work to prevent infection while scar formation or pathogen infected. Evidence supporting a central role for T lymphocytes in the regulation of immune system is provided by studies which examine the in vivo effects of alternate forms of T cell manipulation on various parameters and neutrophils also as important to the infection process as they help to prevent the pathogen, however they also release harmful enzymes which damage healthy tissue surrounding the wound site. While in the wound or infected process, the one of the most important materials released is the ROS and recent researches also indicated that the reactive oxygen species (ROS) are essential messengers that may act as inflammation activator. ROS consist of many molecular species, including H2O2, O2−, and OH− that act as signaling molecules. It was reported that ROS may affect the cell migration for hepatic pro-fibrogenic cells and peripheral blood monocytes. In this inflammation process, cooperation among cells and mediators occurs, and a wide range of factors are involved in the classical immune response. Macrophage is critical for the uptake and degradation of infectious agents and senescent cells, as it also plays important roles in tissue growth, tissue remodeling, and inflammation by producing oxidants, proteinases, and antimicrobial peptide. Activated inflammatory cells serve as sources of ROS and reactive nitrogen intermediates (RNI) that are capable of initiating changes in cell function to include cell signaling pathways, transcription factor activation, mediator release, apoptosis, and compensatory cell proliferation but it is not clear whether ROS and RNI produced and released by neutrophils or macrophages are sufficient to diffuse through the extracellular matrix, enter epithelial cells, cross their cytoplasm even the physiological role of ROS and RNI involved in the cellular response. In our recent research, we major in the function of ROS role in the macrophage or other physiology responses in the microenvironment full of ROS production. We proposed that immune cells interacts with oxidative stress, which promotes cellular messenger to affect permeability of the calcium ion channel to increase intracellular Ca2+ concentration to the cellular migration mechanism.

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Multidrug-resistant *Acinetobacter baumannii* infection in intensive care unit patients in a hospital with building construction: Is there an association?

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Background: *Acinetobacter baumannii* (*A. baumannii*) has emerged globally as a significant pathogen in hospitals. It is also present in soil and water. In a previous study, it was discovered that the *A. baumannii* class 2 integron occurred most frequently. Here, whether the *A. baumannii* class 2 integron is in the soil around the hospital, and if the soil is the cause for increasing numbers of *A. baumannii* infections in the intensive care unit (ICU) patients were determined.

Methods: This cross-sectional prospective study was conducted in two ICUs at Loghman-Hakim Hospital, Tehran, Iran, from November 2012 to March 2013. Patient, soil, and hospital environment samples were collected. All isolates were identified using standard bacteriologic and biochemical methods. The phenotypes and genotypes were characterized. The standard disc diffusion method was utilized to test antimicrobial susceptibility. Integron identification was performed by multiplex polymerase chain reaction.

Results: A total of 42 *A. baumannii* clinical strains were isolated, all from patient samples; 65% of the isolated species were classified as class 2 integrons. The strains were 100% resistant to piperacillin, piperacillin-tazobactam, ceftazidime, ceftriaxone, cotrimoxazole, cefepime, ceropenem, and cefotaxime. However, all of the strains were sensitive to polymyxin B. *A. baumannii* was detected around the lip of one patient.

Conclusions: Further research is necessary to establish a relationship between *A. baumannii* and soil, (especially in regards to its bioremediation), as well as to determine its importance in nosocomial infections and outbreaks in the ICU.

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