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Innovative Biomedical Equipment for Diagnosis and Treatment

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Editor's Note

The Journal of Bioengineering and Biomedical Science is a peer reviewed, open access journal that includes a variety of articles that contributes to the advancement of research in the biomedical sciences.

The current issue includes 9 articles that address cutting edge research in biomedical sciences. These include antiviral drug discovery, diagnosis of breast cancer assessment, tissue engineering, epilepsy diagnosis, ovarian cancer disorder, and bimolecular computing. The contributors to this issue come from Canada, Italy, Iran, Israel, Mexico, Pakistan, Tunisia, and the United States.

In their paper, Rusnati et al. presents the use of heparan sulfate proteoglycans (HSPGs) as a novel approach in antiviral drug discovery. The mutation rate of many viruses is very high in comparison to bacteria and the drugs of choices for the treatment are limited. Many viruses (including HIV-1, HSV, HPV and RSV) exploit HSPGs as attachment receptors. A majority of eukaryotic cell types have HSPGs on their cell surface. It is postulated that HSPGs could be used in the development of a new tool against virus [1].

Majid Shokoufi et al. claims that a Periodic Dynamic Thermography (PDT), in conjunction with image processing and analysis, to be an easy to use procedure that involves capturing thermal images of the breast. The authors have proposed a proof-of-concept study for subjects to overcome the limitations of mammography at the adolescence stage. Using phantom breast tissue, the authors evaluated this technology. The authors propose a PDT as an interesting and acceptable diagnostic tool in breast cancer screening [2].

Jarquín-Yáñez et al. evaluated gelatin-hyaluronic acid scaffolds for use in tissue engineering. By using different concentrations of 1-ethy-3(3-dymethylaminopropyl) carbodiimide hydrochloride (EDC), the physical and biological characteristics of theses scaffolds can be altered. This could lead to the manufacture of tissues for application in regenerative medicine and tissue engineering [3].

Epilepsy is a neurological disorder marked by sudden recurrent episodes of sensory disturbance, loss of conscience, convulsions, associated with abnormal electrical activity in the brain. Mechmeche et al. proposed a dynamic approach to evaluating a data set. Matlab simulation illustrates that by comparing two classifiers, the high-dimensionality is reduced to one relevant feature, showed as classification metrics of 100%. This algorithm shows promise in assisting physicians in diagnoses by limiting the need for scanning EEG signals [4].

Worldwide, ovarian cancer is one of the most common cancers observed in women. Therefore, early diagnosis is a priority to minimize the burden of this disease that can affect over 50% of the world's population. Mahmoodian et al. evaluated dual-model imaging that combines ultrasound and acoustic imaging in an effort to develop a better tool for the early diagnosis of this ovarian cancer. Such a tool would minimize side effects and be economically viable. The authors utilized ultrasound, integrated with photo acoustic technique, resulting in minimal cost, energy and use of lasers [5].

Measuring vital signs of patients, such as pulse, blood pressure, temperature, and respiratory rate are important at the bedside or wherever the patient is. Mansy discusses the concept of enabling a better stethoscope - a smart stethoscope' stethoscope. Advances in digital signal processing, data storage, and artificial intelligence can provide better diagnostic tools. Such tools can only enable better healthcare [6].

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