Reda Abdelbaset

Date of birth: 26/02/1990 | **Nationality:** Egyptian | **Gender:** Male |

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About me:
Reference (Abstract of a journal paper in title: Detection of Hepatocellular carcinoma in clinical specimens using Dielectrophoresis based ElectroKinetic Platform):
Liver malignant growth incorporates hepatocellular carcinoma (HCC) involving 75 %–85 % of liver patients respectively which is attributed mainly to the lack of early biomarker/s and poor accesses to affordable, simple diagnostic techniques, which is not available in the conventional techniques of HCC diagnosis. Consequently, there is an urgent need to develop an alternative simple, rapid HCC diagnostic system. One side of this development is the use of a lab on a chip, which facilitates the detection of cancer cells quickly and efficiently at a lower cost. Dielectrophoresis (DEP) phenomenon is the motion of neutral particles under the effect of the non-uniform electric field. DEP phenomenon is a widely used technique for manipulation and separation of biological cells. The proposed electro-kinetic platform is designed based on travelling wave dielectrophoresis (twDEP) configuration, which is implemented using a printed circuit board (PCB) technology. Herein, we have developed an electro-kinetic platform based on PCB technology to characterize, identify, and detect human liver cancer cells from clinical samples, compared to human normal liver cells. Also, rat's normal muscle cells as a different organism has been tested. The experimental results proved the ability of the developed electro-kinetic platform to differentiate efficiently between HCC and normal liver cells from real clinical samples, and Rat's normal muscle cells, with high specificity, accuracy and sensitivity.

WORK EXPERIENCE

01/10/2020 – CURRENT – Egypt
LECTURER – HELWAN UNIVERSITY

- Teaching Modeling and simulation course
- Teaching Random processes
- Teaching Bio-equipment
- Teaching Bio-electronics
- Teaching Stress Analysis
- Teaching lab on a chip

01/09/2014 – CURRENT – Egypt
RESEARCH ASSISTANT – CENTRE OF NANO-ELECTRONICS AND DEVICES AT ZEWAIL CITY, AND AMERICAN UNIVERSITY IN CAIRO (AUC).

- Modeling and simulation of the physical phenomenon using COMSOL multiphysics.
- Image processing and classification using MATLAB
- PCB Designer Using ALTIUM Designer
- CMOS Designer using Cadence Virtuoso (SKILL Scripting) and P-spice.
- bio-systems tester using many biological particles (E.g, biological cells (HCCs, normal liver cells, muscle cells, and stem cells), serum of virus-C, DNA fragments of virus-C, and E. Coli bacteria).
-Cleanroom specialist

01/03/2016 – 01/01/2018 – Egypt

TEACHING ASSISTANT – MISR UNIVERSITY FOR SCIENCES AND TECHNOLOGY (MUST)

Teaching:
Bio- Mechanics
Bio- Electronics
Ultrasound

01/03/2017 – 01/01/2018 – Egypt
RESEARCH AND DEVELOPMENT ENGINEER – BIO-BUSINESS COMPANY

- Signal processing (NIBP (Non-Invasive Blood Pressure) module).
- Estimation of Blood pressures (Systolic, Diastolic, and mean) by:
1- Amplitude based (ratio).
2- Shape based (Fuzzy logic, and neural network).

01/03/2014 – 01/08/2014 – Egypt
TECHNICAL SUPPORT – PAXERA COMPANY

Image processing (DICOM for CAD (computer Aid Diagnostic system)).

01/11/2012 – 01/12/2013
CLINICAL ENGINEER – ELHELMIA MILITARY HOSPITAL

EDUCATION AND TRAINING

01/09/2016 – 04/10/2020 – cairo, Egypt
PHD – Helwan university

Field(s) of study
- Biomedical Engineering (electronics)

Thesis: A fully automated CMOS based Bio-chip for Biological Cells characterization and identification

01/09/2012 – 06/08/2016 – Egypt
MASTER – Helwan university

Field(s) of study
- Biomedical Engineering, Electronics

Thesis: A Microfluidic Platform for Liver Cancer Cells Detection

01/09/2007 – 01/08/2012
BACHELOR BIOMEDICAL ENGINEERING – Helwan University

CREATIVE WORKS

2016 – CURRENT

Citations

Citations: 101
H-index: 4
I10-index: 2
Reda Abdelbaset - Google Scholar
https://scholar.google.com.eg/citations?hl=en&user=sBXynJsAAAAJ&view_op=list_works&gmla=AJsN-F4NRYhkzAQOSqz0RseiVzJuMtSucMv5sXKm3rvs6mw9fP7UiW8E1QtEdGGiM9QqPqbretftAGhyImeTp0YaK-pGuDGkuzA4ihBehF0EopnssurI0c0

PUBLICATIONS

Detection of Hepatocellular carcinoma in clinical specimens using Dielectrophoresis based ElectroKinetic Platform

https://doi.org/10.1016/j.sna.2020.112402

Adipose stem cells display higher regenerative capacities and more adaptable electro-kinetic properties compared to bone marrow-derived mesenchymal stromal cells

https://www.nature.com/articles/srep37801

Detection of foodborne pathogens using novel vertical capacitive sensors

https://doi.org/10.1016/j.aej.2021.09.016

An electro-kinetic platform based on printed circuit Board technology for identification and characterization of biological cells.

https://doi.org/10.1016/j.mee.2019.02.001

A novel method to design an electro-kinetic platform based on complementary metal-oxide semiconductor technology using SKILL scripting of cadence

https://doi.org/10.1016/j.bbe.2018.11.011

The effect of heart pulsatile on the measurement of artery bioimpedance

https://doi.org/10.5617/jeb.4677

Micro-electrodes based on CMOS Technology for Charactrization of Biological Cells

10.1109/ISSPIT47144.2019.9001744

Planar Micro-electrodes versus Cone Plate for Biological Cell Trapping and Charcterization

10.1109/ISSPIT47144.2019.9001740

Dielectrophoretic based Microfluidic for nanoparticles “viruses” separation

10.1109/NILES53778.2021.9600490

Optimization of micro-electrodes for DNA fragments labelled to microbeads manipulation and characterization

10.1109/ICM48031.2019.9021935

A novel microfluidic system using a reservoir and flow control system for single-cell release, migration, separation, and characterization

10.1109/ICM48031.2019.9021278

Mathematical Modelling for Bone Cement MMA Free Radical Polymerization Process

10.1109/CIBEC.2018.8641796

A 3-D biomechanical model for enhancing the performance of artificial hand

10.1109/MECBME.2018.8402403

A Model of Electrokinetic Platform for Separation of Different Sizes of Biological Particles

https://doi.org/10.1007/978-3-319-64861-3_11

A 130 nm CMOS integrated Lab-On-a-Chip based on DeFET sensor for biomedical analysis

10.1109/MWSCAS.2016.7870138

A 3D model of quadrupole dielectrophoresis levitation

10.1109/MWSCAS.2016.7870021

A 2D model of different electrode shapes for traveling wave dielectrophoresis

10.1109/ICM.2016.7847864

A 2D model of traveling wave Dielectrophoresis microelectrode array based on printed circuit board technology for manipulation and characterization of malignant and normal liver cells

10.1109/JEC-ECC.2016.7518975

PROJECTS

01/01/2022 – 01/01/2023

PRP2021.R31.12 - Ring Oscillator Based Capacitive Sensor Array for High-Speed Flow Cytometry

Information Technology Industry Development Agency [ITIDA], Cairo (Egypt)

01/09/2020 – 01/02/2021

Detection of Covid-19 using Dielectrophoresis platform

Ajman University , United Arab Emirates

01/11/2019 – 01/09/2020

A novel vertical array of capacitive sensors for tracking of levitated cells

Ajman University , United Arab Emirates

01/03/2018 – 01/03/2019

An Electrokinetic Based Microfluidic Platform for DNA Detection, Identification and Sorting

Information Technology Industry Development Agency [ITIDA], Cairo (Egypt)

01/05/2015 – 01/10/2016

Electro-kinetic platform and a combine between electro-kinetic platform and DeFET sensor based on CMOS technology for manipulation and characterization of biological cells

Academy of Scientific Research and Technology (ASRT), Cairo (Egypt)

01/09/2014 – 01/10/2015

Electro-kinetic platform based on printed circuit board PCB technology for manipulation and characterization of biological cells

Information Technology Industry Development Agency [ITIDA], Cairo (Egypt)

HONOURS AND AWARDS

01/04/2021

PhD Research Excellence Award 2019 – Helwan University

Excellence for international publishing 2019

01/08/2012

"Young Innovators Award program". – Nahdet El Mahrousa

best Undergraduate Graduation Project " Automatic fibrillator" Award

VOLUNTEERING

Reviewer at IEEE Transactions on Biomedical Circuits and Systems journal

I reviewed an article

Reviewer at Journal of the Brazilian Society of Mechanical Sciences and Engineering

I reviewed an article

Reviewer at The IEEE International Midwest Symposium on Circuits and Systems (MWSCAS) 2016 conference

Arab united emirates
I reviewed two articles within the conference

Reviewer at Advances in Science, Technology and Engineering Systems Journal (ASTESJ)

I reviewed an article

CONFERENCES AND SEMINARS

12/2019
31st International Conference on Microelectronics (ICM 2019)

03/2018
the 4th IEEE Middle East Conference on Biomedical Engineering (MECBME 2018) at Gammarth – Tunis (Tunisia)

09/2017
The 3rd International Conference on Advanced Intelligent Systems and Informatics (AISI2017), Egypt

10/2016
The 28th International Conference on Microelectronics 2016 (ICM 2016), Egypt

06/2016
The Fourth International Japan-Egypt Conference on Electronics, Communications and Computers (JEC-ECC 2016), Egypt

RECOMMENDATIONS

Yehea ismail – Supervisor – y.ismail@aucegypt.edu – (+20) 01005649656

Yehea Ismail is the director of the nanoelectronics and devices center at The American University in Cairo and Zewail City.

Walid Al-Atabany – PhD Thesis Examiner – walid.al-atabany@h-eng.helwan.edu.eg – (+20) 01090266026

Associate Professor at information technology and computer science El-Nile University

Mohamed Tarek Elwakad – Supervisor – mtwakad@yahoo.com – (+20) 01005387323

Vice dean at Future University, Cairo, Egypt.
Supervisor:
B.sc project
Master thesis
PhD thesis

DIGITAL SKILLS

Microsoft Office | Zoom | Programmin language PYTHON | Data Science Data Analytics | EEG signal processing | Electrochemical Impedance Spectroscopy (EIS) | Programmin language MATLAB | Cadence Virtuoso XL | COMSOL Multiphysics (Advanced) | Scientific Paper Writing

LANGUAGE SKILLS

Mother tongue(s): **ARABIC**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	B2	C2	B2	B2	C2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DRIVING LICENCE

Driving Licence: B