CURRÍCULUM VÍTAE NORMALIZADO

Khaled Moustafa

Generated from: Editor CVN de FECYT

Date of document: 24/01/2019

v 1.4.0

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Summary of CV

This section describes briefly a summary of your career in science, academic and research; the main scientific and technological achievements and goals in your line of research in the medium -and long- term. It also includes other important aspects or peculiarities.

I am Khaled Moustafa, an Egyptian Ph.D., my scientific career was mainly focused on Molecular and Cellular Biology in Plant cells (Mainly, Arabidopsis seedling, cell culture, suspension cell culture, synchronization). Throughout my PhD (Doctorate in Cellular Biology, Universidad Complutense de Madrid, Spain, 12/2014), the main objectives were to understand the genetics/molecular signaling pathway of the plant cell response to microgravity alterations as an unmarked environmental cue on plant (Arabidopsis thaliana) cell developmental processes such as cell proliferation (cell cycle checkpoints and regulation), cell growth (nucleolar activity and ribosome biogenesis), epigenetic modifications, gene regulations and chromatin remodeling using recent Biochemistry, genomic, proteomic, transcriptomic, cytology and cellular biology tools. My current experience and knowledge on signaling pathway “Molecular and cellular biology” have been strengthened by the conceptual and practical autonomy that I could acquire in research during my Master and Ph.D. studies at the Plant Cell Nucleolus, Proliferation & Microgravity Lab in Centro de Investigaciones Biológicas, CSIC, Madrid, Spain. My proteomic and molecular interest was reinforced through my Plant Pathology/Proteomics post-doctoral experience within Dr. Christian Mazars at LRSV-CNRS-Toulouse, France investigating Programmed Plant cell death project to identify new proteomic aspects/pathways (Sphingolipid signaling/Pathway activation) related to the Role of the Ca+2-dependent protein kinase CPK3 and nuclear calcium in Fumonisin B1-induced programmed cell death. Currently, I contracted as a junior researcher in Palacky university in Olomouc to investigate the recent genome editing for drought tolerance in barley using CRISPR/Cas9 Knockouts and recent polymorphisms for drought tolerance by the mean of Bioinfromatics tools.

During my scientific formation, in addition to cell biology approaches such as flow cytometry, Immunofluorescences and microscopy approaches that include optical, fluorescent, confocal, in vivo and electron microscopy, I gained a strong experience in data collection, and management through the rearrangement of large data sets using statistics programs such as SPSS, Sigma Plot, MSTAT and bioinformatic programming to detect Protein-protein interaction and define different genes networks. During my Ph.D. training and currently in the frame of the post-doctoral internship, I have also performed usual molecular biology approaches related to gene expression (PCR, Rt-qPCR, and microarray), transcriptomics profiling analysis using different bioinformatics tools and basic proteomic approaches (Protein purification- SDS-PAGE - western blot, IPs, Nuclei purifications, phosphorylation and dephosphorylation, and Radioactivity reaction).

These diversified set of skills, my personal, language (Arabic, English, Spanish, French), my ease of adaptation to different environments as highlighted by my various internships in multi European teams including groups from the Czech republic, Netherlands, Germany, France, USA. All funded by the European Space Agency and NASA and my commitment and my

attractiveness for research should allow me to be quickly effective on the project that you propose.
Yours sincerely,
Khaled Y. Kamal

General quality indicators of scientific research

This section describes briefly the main quality indicators of scientific production (periods of research activity, experience in supervising doctoral theses, total citations, articles in journals of the first quartile, H index...). It also includes other important aspects or peculiarities.

I am Khaled Y. Kamal (ORCID: 0000-0002-6909-8056). My career experience was focused on three main concepts
1- Plant Space Biology and Human space exploration
2- Plant biology and environmental cues (Biotic and abiotic)
3- Crop physiology and genetics improvements

My scientific formation was maintained over Molecular and Cellular Biology in Plant cells (Mainly, Arabidopsis seedling, cell culture, suspension cell culture, synchronization). Throughout my PhD (Doctorate in Cellular Biology, Universidad Complutense de Madrid, Spain, 12/2014), My proteomic and molecular interest was reinforced through my Plant Pathology/Proteomics post-doctoral experience within Dr. Christian Mazars at LRSV-CNRS-Toulouse, France investigating Programmed Plant cell death project to identify new proteomic aspects/pathways (Sphingolipid signaling/Pathway activation) related to the Role of the Ca+2-dependent protein kinase CPK3 and nuclear calcium in Fumonisin B1-induced programmed cell death. Recently, I experienced my Lecturer position at Crop Science Department, Faculty of Agriculture, Zagazig University investigating the physiological response of crop science to different environmental cues and climate change as a part of the crop science project investigating the Morpho-physiological and Yield characters in sunflower under drought environment conditions. Recently, I have employed as a junior researcher at Palacky University in Olomouc to perform research work on Genome editing for drought tolerance in cereals mainly in Barley using recent Genomics and bioinformatics tools.

The outcomes of this technique I learned, allow us to obtain results of importance enough to be published in high-impact journals (such..., Plant, Cell / Environment, Scientific reports, Genomics, Plant Science) (9 publications and 10 conferences).

These diversified set of skills, my personal, language (Arabic, English, Spanish, French), my ease of adaptation to different environments (International activities) as highlighted by my various internships in multi European teams including groups from the Netherlands, Germany, France, USA, Czech Republic and Egypt showing my highly international activities.

Yours sincerely,
Khaled Y. Kamal

Khaled Moustafa

Surname(s): **Moustafa**
Name: **Khaled**
ORCID: **0000-0002-6909-8056**
ScopusID: **56641034700**
ResearcherID: **A-6242-2015**
Google Scholar: **Khaled Y. Kamal**
Personal web page: **https://fr.linkedin.com/in/khaledykamal**

Current professional situation

Employing entity: Palacky University in Olomouc
Type of entity: University
Department: Faculty of Science
Professional category: Junior researcher
Educational Management (Yes/No): Yes
City employing entity: Olomouc, Czech Republic
Start date: 01/11/2018
Type of contract: Temporary employment contract
Dedication regime: Full time
Primary (UNESCO code): 240401 - Biostatistics; 241714 - Plant genetics; 241715 - Plant growth; 241793 - Plant genetic resources
Performed tasks: Project (Genome editing for drought tolerance in cereals) Objective I: Functional polymorphism in genes involved in the perception and metabolism of phytohormones with a link to higher drought tolerance Objective II: Targeted knock-out of genes linked to yield parameters in barley Objective: III Targeted knock-out of genes influencing tolerance to drought in barley Objective IV: Initiation and proliferation of barley crown roots Objective V: Role of MAP kinases in adaptation and tolerance to drought stress Objective VI: The role of unknown groups of aldehyde dehydrogenases in monocotyledon plant species
Field of management activity: University

Previous positions and activities

	Employing entity	Professional category	Start date
1	Université Toulouse III - Paul Sabatier, Toulouse, France	Postodctoral fellow	03/10/2016
2	Zagazig University - Faculty of Agriculture, Agronomy Department	Lecturer	15/01/2015
3	Centro de Investigaciones Biológicas	PhD student	01/10/2010
4	Zagazig university - Faculty of Agriculture - Agronomy Department	Post Graduate Student (Teaching Assistance)	13/11/2007

1 **Employing entity:** Université Toulouse III - Paul Sabatier, Toulouse, France
Type of entity: University
Department: Biological department, LRSV, UPS, CNRS

City employing entity: Toulouse, France
Professional category: Postodctoral fellow
Educational Management (Yes/No): Yes
Start-End date: 03/10/2016 - 29/07/2018
Duration: 1 year - 10 months
Type of contract: Grant-assisted student (pre or post-doctoral, others)
Performed tasks: 1- Full-time postdoctoral research to investigate (Role of the calcium-dependent protein kinase CPK3 and nuclear calcium in Fumonisin B1-induced programmed cell death) using Arabidopsis thaliana plants based on recently advanced proteomics platform. 2- The current project aims at confirming that Arabidopsis cells with a mycotoxin that modulates the sphingolipid metabolism and induces PCD (Fumonisin B1) it has been shown that CPK3 is cleaved. Preliminary data also indicates that CPK3 (full length or cleaved form) migrates into the nucleus through microscopy approaches and to evaluate the importance of nuclear calcium in the activation of the nuclear form of CPK3. For this purpose, a comparative phosphoproteomic study will be conducted on nuclear proteins extracted from various plant lines (WT and cpk3 knock-out lines) treated or not with calcium inhibitors and Fumonisin B1. 3. Different proteomic, cellular biology, Genomics protocols will be developed and enhanced for the first time in the LRSV lab using. 4- Maintains some new Microscopical protocols (In vivo fluorescence microscope). 5- Update new bioinformatics tools for deeply genomics data analysis. searching for the new gene to gene network controlling the signaling pathway for the PCD response. 5- Manage own scientific project, experimental design, Seminar presentations and prepare the Manuscripts for the future publications of the results.
Field of management activity: University
Applicability in teaching and/or research: Research activity only ¨Full-time postdoctoral research to investigate (Role of the calcium-dependent protein kinase CPK3 and nuclear calcium in Fumonisin B1-induced programmed cell death) using Arabidopsis thaliana plants based on recently advanced proteomics platform¨..

2 **Employing entity:** Zagazig University - Faculty of Agriculture, Agronomy Department
Type of entity: University
Department: Agronomy Department, Faculty of Agriculture, Zagazig University
City employing entity: Zagazig, Egypt
Professional category: Lecturer
Educational Management (Yes/No): Yes
Start-End date: 15/01/2015 - 30/09/2016
Duration: 1 year - 7 months - 15 days
Type of contract: Grant-assisted student (pre or post-doctoral, others)
Dedication regime: Full time
Primary (UNESCO code): 240902 - Genetic engineering; 240991 - Genetic Development; 240992 - Molecular genetics of plants; 241711 - Plant anatomy; 241713 - Plant ecology; 241715 - Plant growth; 241793 - Plant genetic resources; 310301 - Crop breeding; 310302 - Crop hybridisation; 310306 - Field crops
Performed tasks: My responsibility as a Lecturer at Agronomy department, faculty of Agriculture, Zagazig University was divided into three main tasks: 1- Teaching responsibility of undergraduate, Graduate (Supervisor of Master and Ph.D. student), Teaching at Master and Ph.D. programmes. 2- Research and Development: Co-PI of the Plant breeding and genetics projects (Characterization of sunflower genotypes for drought tolerance). 3- Teaching, education and Research Quality insurance by the Egyptian National Authority to ensure the quality of education and accreditation.
Field of management activity: University
Applicability in teaching and/or research: 1- Lecturer of undergraduate students courses (Plant Breeding and Genetics, Advanced of Genetics and Epigenetics, Applied Biotechnology, Experimental statistics, Crop physiology and improvements). For academic years 2015/2016. 2- Lecturer of Graduate students (Master and Ph.D.) courses (Principles of Plant Breeding and Genetics, Current trends in molecular biology, Genetics and environmental stresses, Statistics). 3- Lecturer of Erasmus Master Studies TEMPS (Master of Sustainable Agriculture), Academic year 2015/2016. 4- Lecturer of Erasmus Master Studies TEMPS (Master of Biotechnology and Bioinformatics), Academic year 2015/2016. 5- Lecturer of Responsible Conduct of Research program entitled (Developing Capacities for Teaching Responsible Science in Zagazig University during 2017 semester). Teaching the following courses: (Responsible conduct of research, Research misconduct; Plagiarism, Fabrication,

Falsification., Dual use research., Mentor-trainee relationships and responsibilities., and Responsible authorship.

3 **Employing entity:** Centro de Investigaciones Biológicas **Type of entity:** State agency

Department: Centro de Investigaciones Biologicas, CSIC

Professional category: PhD student **Educational Management (Yes/No):** No

Start-End date: 01/10/2010 - 05/01/2015 **Duration:** 4 years - 3 months

Type of contract: Grant-assisted student (pre or post-doctoral, others)

Primary (UNESCO code): 240701 - Cell culture; 240702 - Cell genetics; 240705 - Tissue culture; 241713 - Plant ecology; 241715 - Plant growth; 241793 - Plant genetic resources; 251200 - Space Sciences

Performed tasks: My Ph.D. work aims to evaluate the effects of altered gravity, as provided by different devices based on Earth, on Arabidopsis thaliana cell culture ¨Cell suspension and callus ¨ and, when possible, to compare the results with those obtained with real microgravity, in space. We need to know the physiological processes occur in the space environment especially, studying the nucleolus as an excellent indicator of functional changes in the cell which related to cell proliferation, the cell growth, and Epigenetics. This Project research is to understand the physical and biological effects of the absence of gravity which necessary to conduct operations on space environments especially the ¨The effect of simulated microgravity and hypergravity on Arabidopsis thaliana cell proliferation and cell growth¨. I have experience for using several ground-based facilities (GBF). As part of a multicenter ESA joint-project. I have already performed a lot of experiments using LDC and RPM in The European Space Research and Technology Centre (ESTEC) and also using the Pipette clinostat in DLR German Aerospace Center. And even using the magnetic levitation in High Field Magnet Laboratory - Radboud University, Netherland. All the collected samples compared with the control condition and utilized different recent methodology to obtain our aim and research purpose such as for cell proliferation (Flow cytometry sorter, Microscope electrons, and M.confocal), for the genomics studies (RT-qPCR and Microarrays), and for Proteomic studies (Western plot and Dimensional electrophoresis. In addition to studying the chromatin structure and Adaptation future for the space biology research

Field of management activity: Public Research Body

4 **Employing entity:** Zagazig university - Faculty of Agriculture - Agronomy Department

Professional category: Post Graduate Student (Teaching Assistance)

Start-End date: 13/11/2007 - 30/09/2010 **Duration:** 2 years - 10 months

Performed tasks: Work as Demonstrator on Agronomy Department, Faculty of Agriculture, Zagazig University. Our field of science interested in Crops Breeding, Genetics, Plant Physiology, and Abiotic stress. 2 Years of research work as a part of my master thesis on the title of " Evaluation some sunflower genotypes for drought tolerance." (2008-2010) The combined data of this experimental research will be calculated and analyzed to compute the following parameters based on physiological characters and PCR-technology : 1. Mean performance of sunflower genotypes for various aspects of drought environment. 2. Correlation between physiological traits and drought sensitivity tolerance. 3. Stability parameters for yield according to Eberhart and Russell (1966). 4. Gene action and heritability through diallel cross analysis according to Hyman (1954).

Education

University education

1st and 2nd cycle studies and pre-Bologna degrees

1 **University degree:** Master Degree
Name of qualification: Master en Genética y Biologéa Cellular (0688)
City degree awarding entity: Madrid, Spain
Degree awarding entity: Universidad Complutense de Madrid **Type of entity:** University
Date of qualification: 17/07/2012
Average mark: Good
Prize: End of degree award

2 **University degree:** Bachelor's degree
Name of qualification: Bachelor's degree in Agriculture
City degree awarding entity: Zagazig, Egypt
Degree awarding entity: Zagazig University **Type of entity:** University
Date of qualification: 01/07/2007
Average mark: Excellent
Prize: End of degree award
Standardised degree: Yes **Date of homologation:** 12/2010
Foreign qualification: Bachelor in Agriculture (Agronomy)

Doctorates

Doctorate programme: Programa Oficial de Doctorado en Biología
Degree awarding entity: Universidad Complutense de Madrid **Type of entity:** University
City degree awarding entity: Madrid, Spain
Date of degree: 17/12/2014
Thesis title: Alteraciones inducidas por cambios gravitatorios en células proliferantes en cultivo de Arabidopsis thaliana
Thesis director: F. Javier Medina
Thesis co-director: Raul Herranz Barranco
Obtained qualification: Sobresaliente (CUM LAUDE)

Attended advanced, improvement and innovative teacher training and new technology courses and seminars focused on improving teaching

1 **Title of course/seminar:** TWAS-ARO Roundtable on Responsible Science
Goals of the course/seminar: The event aims at bringing together eminent scientists, policy makers along with young Arab scientists to discuss pressing topics related to responsible scientific research and the means to develop a mechanism ensuring integrity in the research process. The Roundtable will also present to Arab scientists the importance of conducting ethical research that follows the international standards through having in depth discussions and group work.
Organising entity: TWAS Arab Regional Office (TWAS-ARO) **Type of entity:** Associations and Groups
Faculty, institute or centre: the Bibliotheca Alexandrina (BA)
Duration in hours: 15 hours
Start-End date: 28/11/2017 - 29/11/2017

2 **Title of course/seminar:** DIES-TRAINING COURSE MANAGEMENT OF INTERNATIONALISATION EGYPT-SUDAN
Goals of the course/seminar: Qualify university staff to manage processes and tasks of internationalization in the area of higher education
Organising entity: The German Academic Exchange Service or DAAD **Type of entity:** Foundation
Duration in hours: 60 hours
Start-End date: 18/02/2017 - 22/02/2017

3 **Title of course/seminar:** Dealing with Change: Higher Education Network
Organising entity: The German Academic Exchange Service or DAAD **Type of entity:** Foundation
Duration in hours: 25 hours
Start-End date: 12/03/2016 - 15/03/2016

4 **Title of course/seminar:** Professionalism in science: Conducting research responsibly
Goals of the course/seminar: • Understand the professionalism in science and how to conduct research responsibly through the understanding of misconduct of research.
Organising entity: Zagazig University **Type of entity:** University
Faculty, institute or centre: Faculty of Agriculture
Duration in hours: 10 hours
Start-End date: 20/02/2016 - 23/02/2016

5 **Title of course/seminar:** 2nd Egyptian Educational Institute on Responsible Science
Goals of the course/seminar: help implement teaching of responsible science using the way of the Active Learninig
Organising entity: US national Academies of Science **Type of entity:** Foundation
Duration in hours: 40 hours
Start-End date: 07/2015 - 07/2015

6 **Title of course/seminar:** Strategic Planning for Higher Educational Institutes
Goals of the course/seminar: Improve Faculty staff for a proper Strategic Planning for Higher Educational Institutes
Organising entity: Egyptian National Authority for Quality Assurance and Accreditation of Education **Type of entity:** State agency

Duration in hours: 10 hours
Start-End date: 04/05/2015 - 05/04/2015

7 **Title of course/seminar:** Self Evaluation for Higher Educational Institutes
Goals of the course/seminar: Improve Faculty staff for Self Evaluation for Higher Educational Institutes
Organising entity: Egyptian National Authority for Quality Assurance and Accreditation of Education
Type of entity: State agency
Duration in hours: 15 hours
Start-End date: 21/03/2015 - 23/03/2015

Language skills

Language	Listening skills	Reading skills	Spoken interaction	Speaking skills	Writing skills
French	B1	B2	B1	B2	B2
Spanish	C1	C2	C1	C1	C2
Arabic	C2	C2	C2	C2	C2
English	C2	C2	C2	C2	C2

Teaching experience

General teaching experience

1 **Name of the course:** Biostatistics
University degree: Master (Erasmus Program)
Start date: 09/2015
End date: 01/2016
End date: 01/2016
Entity: Zagazig University
Type of entity: University
Faculty, institute or centre: Faculty of Agriculture, Agronomy Department

2 **Name of the course:** Epigenetcs
University degree: Bachelor
Start date: 09/2015
End date: 01/2016
End date: 01/2016
Entity: Zagazig University
Type of entity: University
Faculty, institute or centre: faculty of Agriculture, Agronomy department

3 **Name of the course:** Genetics and Plant Improvements
University degree: Bachelor
Start date: 02/2015
End date: 06/2015
End date: 06/2015
Entity: Zagazig University
Type of entity: University
Faculty, institute or centre: faculty of Agriculture, Agronomy department

4 **Name of the course:** Biostatistics
University degree: Bachelor
Start date: 02/2016
End date: 06/2016

Entity: Zagazig University **Type of entity:** University
Faculty, institute or centre: faculty of Agriculture, Agronomy department

5 **Name of the course:** Advanced Molecular Plant Breeding
University degree: Doctorate
End date: 06/2016
Entity: Zagazig University **Type of entity:** University
Faculty, institute or centre: faculty of Agriculture, Agronomy department

6 **Name of the course:** Mutants and Epiegentcs
University degree: Doctorate
End date: 06/2016
Entity: Zagazig University **Type of entity:** University
Faculty, institute or centre: faculty of Agriculture, Agronomy department

7 **Name of the course:** Scientific English (Agriculture)
University degree: Bachelor
End date: 06/2016
Entity: Zagazig University **Type of entity:** University
Faculty, institute or centre: faculty of Agriculture, Agronomy department

Experience supervising doctoral thesis and/or final year projects

1 **Project title:** Genetic analysis of heat stress tolerance in bread wheat (Master)
Type of project: Minor thesis
Co-director of thesis: Khaled Youssef Kamal; Mohamed Abdel Hamid Ali; Abdel Hamid Hassan Salem
Entity: Faculty of Agriculture, Zagazig University **Type of entity:** University
City of entity: Zagazig, Egypt
Student: Eman Abdullah Elsboky
Obtained qualification: Excellent with Honor
Identify key words: Plant genetics; Wheat; Plant breeding
Date of reading: 07/08/2016

2 **Project title:** Genetic characterization of aluminum tolerance in whaet
Type of project: End of course project
Entity: Faculty of Agriculure, Zagazig University **Type of entity:** University
City of entity: Zagazig, Egypt
Student: Wesam Elsayed Abdel Majead
Obtained qualification: Excellent (91%)
Date of reading: 12/04/2016

3 **Project title:** Identification and fine-mapping of a new resistance gene in Arabidopsis for different abiotic stress
Type of project: End of course project
Co-director of thesis: 1
Entity: Faculty of Agriculture, Zagazig University **Type of entity:** University
City of entity: Zagazig, Egypt
Student: Amany Ahmed Mohamed Ghoneam
Obtained qualification: Excellent (98%)
Date of reading: 12/04/2016

Awards received for innovation in the field teaching

Name of the prize: Responsible Conduct of Research (RCR) Award
Awarding entity: The U.S. National Academies of Sciences (NAS) **Type of entity:** Foundation
City awarding entity: Zagazig, Egypt
Proposed by: Teaching Award
Conferral date: 11/12/2015

Scientific and technological experience

Scientific or technological activities

R&D projects funded through competitive calls of public or private entities

1 **Name of the project:** Genome editing for drought tolerance in cereals
Entity where project took place: Palacky University in Olomouc
City of entity: Olomouc, Czech Republic
Name principal investigator (PI, Co-PI....): Petr Galuszka; Veronique Bergougnoux; Tomáš Werner; Khaled Moustafa
Nº of researchers: 8
Start-End date: 01/11/2018 - 30/09/2021
Total amount: 15.000.000 €

2 **Name of the project:** Initial assessment of the nutritional quality of the Brassica Species Microgreens under altered Gravity as a component of Space Life Support Systems
Entity where project took place: ESTEC-ESA
City of entity: Leiden, Holland
Name principal investigator (PI, Co-PI....): Khaled Moustafa; Raul Herranz; Amr Abdelmotagaly
Nº of researchers: 3
Start-End date: 01/01/2018 - 22/01/2019
Total amount: 160.000 €

3 **Name of the project:** Climate change & salt tolerant agricultural practices & reforestation of arid areas for CO2 sequestration
Entity where project took place: Zagazig University **Type of entity:** University
City of entity: Zagazig, Egypt
Name principal investigator (PI, Co-PI....): Mohamed Saeed Abuhashim; Mohamed ALi Saad Eldin
Nº of researchers: 11
Funding entity or bodies:
The EXCEED (MENA Region) **Type of entity:** Foundation

Start-End date: 01/2016 - 12/2018
Total amount: 750.000 €

4 **Name of the project:** Role of the calcium-dependent protein kinase CPK3 and nuclear calcium in Fumonisin B1-induced programmed cell death
Entity where project took place: LRS-CNRS-Université Toulouse III (Paul Sabatier) **Type of entity:** University
City of entity: Toulouse, Midi-Pyrénées, France
Name principal investigator (PI, Co-PI....): Khaled Youssef Kamal
Nº of researchers: 3
Funding entity or bodies:
Institut francais d'Egypte (IFE) + Science & Technology Development Fund in Egypt (STDF)

Start-End date: 10/2016 - 07/2017
Total amount: 36.000 €

5 **Name of the project:** Professionalism in science: Conducting research responsibly
Entity where project took place: Zagazig University **Type of entity:** University
City of entity: Zagazig, Egypt
Name principal investigator (PI, Co-PI....): Khaled Y. Kamal; Mahmoud Setuhy; Mohamed Ali Saad Eldin
Nº of researchers: 8
Funding entity or bodies:
The U.S. National Academies of Sciences (NAS) **Type of entity:** Foundation
City funding entity: Washington, United States of America

Start-End date: 11/2015 - 09/2016
Total amount: 25.000 €

6 **Name of the project:** Cellular and Molecular genetics aspects to the Climate change
Entity where project took place: Zagazig University **Type of entity:** University
City of entity: Zagazig, Egypt
Name principal investigator (PI, Co-PI....): Khaled Y. Kamal
Nº of researchers: 7
Funding entity or bodies:
STDF:: Science & Technology Development Fund in Egypt **Type of entity:** Foundation
City funding entity: Cairo, Egypt

Start-End date: 02/2015 - 08/2016
Total amount: 50.000 €

7 **Name of the project:** Functional alteration on plants caused by the microgravity in the space and on Earth as a part of European multi-laboratories. AYA2009-07952
Entity where project took place: Centro de Investigaciones Biológicas **Type of entity:** State agency
City of entity: madrid, Spain
Name principal investigator (PI, Co-PI....): F. Javier Medina
Nº of researchers: 5
Funding entity or bodies:
Ministerio de Ciencia y Tecnología. Programa Nacional del Espacio en Espana.
City funding entity: Madrid, Spain

Start-End date: 05/2010 - 12/2014
Total amount: 150.000 €

8 **Name of the project:** "GIA: From GBF to ISS with A. thaliana" (Ref. CORA-GBF-2011-009)
Entity where project took place: Centro de Investigaciones Biológicas **Type of entity:** State agency
City of entity: Madrid, Spain
Name principal investigator (PI, Co-PI....): Raul Herranz
Nº of researchers: 15
Funding entity or bodies:
European Space Agencey **Type of entity:** State agency

Start-End date: 03/2012 - 09/2014
Total amount: 47.000 €

9 **Name of the project:** Participación española en un nuevo proyecto ESA-NASA sobre Biología de Plantas en la Estación Espacial Internacional (Acción Complementaria) (Ref. AYA2010-11834-E)
Entity where project took place: Centro de Investigaciones Biológicas **Type of entity:** State agency
City of entity: Madrid, Spain
Name principal investigator (PI, Co-PI....): F. Javier Medina
Nº of researchers: 5
Funding entity or bodies:
Ministerio de Ciencia e Innovación. Investigación **Type of entity:** Ministerio
City funding entity: Madrid, Community of Madrid, Spain

Start-End date: 01/2011 - 12/2013
Total amount: 70.000 €

Scientific and technological activities

Scientific production

Publications, scientific and technical documents

1 Khaled Y. Kamal; Jack J. W. A. van Loon; F. Javier Medina; Raul Herranz. Differential transcriptional profile through cell cycle progression in Arabidopsis cultures under simulated microgravity. Genomics. Elsevier, 11/01/2019. Available on-line at: <https://www.sciencedirect.com/science/article/pii/S0888754318305366>. ISSN 0888-7543
DOI: 10.1016/j.ygeno.2019.01.007
Type of production: Scientific paper **Format:** Journal
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 4 **Corresponding author:** No
Impact source: SCOPUS **Category:** Plant Science

Relevant results: Plant cell cycle meets the absence of gravity vector; a fundamental process during plant development is disrupted by microgravity conditions; however, each cell cycle phase response in the early exposure to microgravity has not been described at the transcriptomic level . To investigate the contribution of each cell cycle phase contribution in the early cell response to simulated microgravity, an immobilized synchronous (in S phase due to aphidicolin treatment) suspension culture was exposed to simulated microgravity using a Random Positioning Machine for some hours until a synchronized subpopulation of cells at G2/M and G1 phases were obtained. An asynchronous culture was also exposed to simulated microgravity and included in the transcriptomic analysis. Our results reveal a differential cell cycle subpopulation effect in gene ontology groups associated with cellular response, stress and unknown biological processes. The global transcriptional

expression shows a general depression profile in all the conditions in response to simulated microgravity. Despite that, the effects accumulate at the G2/M phase and change dramatically at G1 consistently with a differential cell adaptation to microgravity in any of the phases. These changes are also found in the activation of differential gene ontology groups in any of the phases and particularly in a complex stress response that changes from G2/M to G1. Collectively, these results suggest that simulated microgravity produces an intense disruption of cell cycle regulation through stress mechanisms to cope with the reduced gravity evolutionary novel environment potentially usable in future space agronomy and sustainable agriculture goals.

2 Mélanie Ormancey; Patrice Thuleau; Renier van der Hoorn; Sabine Grat; Ambroise Testard; Khaled Kamal; Marie Boudsocq; Valérie Cotelle; Christian Mazars. Sphingolipid-induced cell death in Arabidopsis is negatively regulated by the papain-like cysteine protease RD21. Plant Science. 280, pp. 12 - 17. Elsevier, 13/11/2018. Available on-line at: <https://www.sciencedirect.com/science/article/pii/S0168945218312159>. ISSN 0168-9452

DOI: 10.1016/j.plantsci.2018.10.028

Type of production: Scientific paper **Format:** Journal

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Total no. authors: 9 **Corresponding author:** No

Relevant results: It is now well established that sphingoid Long Chain Bases (LCBs) are crucial mediators of programmed cell death. In plants, the mycotoxin fumonisin B1 (FB1) produced by the necrotrophic fungus Fusarium moniliforme disrupts the sphingolipid biosynthesis pathway by inhibiting the ceramide synthase leading to an increase in the amount of phytosphingosine (PHS) and dihydrosphingosine (DHS), the two major LCBs in Arabidopsis thaliana. To date, the signaling pathway involved in FB1-induced cell death remains largely uncharacterized. It is also well acknowledged that plant proteases such as papain-like cysteine protease are largely involved in plant immunity. Here, we show that the papain-like cysteine protease RD21 (responsive-to-desiccation-21) is activated in response to PHS and FB1 in Arabidopsis cultured cells and leaves, respectively. Using two allelic null mutants of RD21, and two different PCD bioassays, we demonstrate that the protein acts as a negative regulator of FB1-induced cell death in Arabidopsis.

3 khaled Y. Kamal Kamal; Raul Herranz Herranz; Jack J. W. A. van Loon Van Loon; F. Javier Medina Medina. Cell cycle acceleration and changes in essential nuclear functions induced by simulated microgravity in a synchronized Arabidopsis cell culture. Plant,Cell & Environment. 42 - 2, pp. 480 - 494. Wiley Online Library, 14/08/2018.

Type of production: Scientific paper **Format:** Journal

Corresponding author: No

Relevant results: Zero gravity is an environmental challenge unknown to organisms throughout evolution on Earth. Nevertheless, plants are sensitive to altered gravity, as exemplified by changes in meristematic cell proliferation and growth. We found that synchronized Arabidopsis-cultured cells exposed to simulated microgravity showed a shortened cell cycle, caused by a shorter G2/M phase and a slightly longer G1 phase. The analysis of selected marker genes and proteins by quantitative polymerase chain reaction and flow cytometry in synchronic G1 and G2 subpopulations indicated changes in gene expression of core cell cycle regulators and chromatin-modifying factors, confirming that microgravity induced misregulation of G2/M and G1/S checkpoints and chromatin remodelling. Changes in chromatin-based regulation included higher DNA methylation and lower histone acetylation, increased chromatin condensation, and overall depletion of nuclear transcription. Estimation of ribosome biogenesis rate using nucleolar parameters and selected nucleolar genes and proteins indicated reduced nucleolar activity under simulated microgravity, especially at G2/M. These results expand our knowledge of how meristematic cells are affected by real and simulated microgravity. Counteracting this cellular stress is necessary for plant culture in space exploration.

4 khaled Y. Kamal; Raul Herranz; Jack J. W. A. van Loon; F. Javier Medina. Simulated microgravity, Mars gravity, and 2g hypergravity affect cell cycle regulation, ribosome biogenesis, and epigenetics in Arabidopsis cell cultures. Scientific Reports. Nature, 23/04/2018. Available on-line at: <https://www.nature.com/articles/s41598-018-24942-7>. ISSN 2045-2322

DOI: 10.1038/s41598-018-24942-7

Type of production: Scientific paper **Format:** Journal

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Total no. authors: 4 **Corresponding author:** Yes

Relevant results: Gravity is the only component of Earth environment that remained constant throughout the entire process of biological evolution. However, it is still unclear how gravity affects plant growth and development. In this study, an in vitro cell culture of Arabidopsis thaliana was exposed to different altered gravity conditions, namely simulated reduced gravity (simulated microgravity, simulated Mars gravity) and hypergravity (2g), to study changes in cell proliferation, cell growth, and epigenetics. The effects after 3, 14, and 24-hours of exposure were evaluated. The most relevant alterations were found in the 24-hour treatment, being more significant for simulated reduced gravity than hypergravity. Cell proliferation and growth were uncoupled under simulated reduced gravity, similarly, as found in meristematic cells from seedlings grown in real or simulated microgravity. The distribution of cell cycle phases was changed, as well as the levels and gene transcription of the tested cell cycle regulators. Ribosome biogenesis was decreased, according to levels and gene transcription of nucleolar proteins and the number of inactive nucleoli. Furthermore, we found alterations in the epigenetic modifications of chromatin. These results show that altered gravity effects include a serious disturbance of cell proliferation and growth, which are cellular functions essential for normal plant development.

5 Khaled Y. Kamal; Jack J. W. A. van Loon; F. Javier Medina; Raul Herranz. Embedding Arabidopsis Plant Cell Suspensions in Low-Melting Agarose Facilitates Altered Gravity Studies. Microgravity Science and Technology. 29 - 2, pp. 115 - 119. Springer, 31/01/2017. Available on-line at: <https://link.springer.com/article/10.1007/s12217-016-9531-8#aboutcontent>. ISSN 0938-0108

DOI: 10.1007/s12217-016-9531-8

Type of production: Scientific paper **Format:** Journal

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Total no. authors: 4 **Corresponding author:** No

Relevant results: Gravity plays a role in modulating plant growth and development and its alteration induces changes in these processes. Microgravity research has recently been extended to the use of in vitro plant cell cultures which are considered as an ideal model system to study cell proliferation and growth. In general, among the ground-based facilities available for microgravity simulation, the 2D pipette clinostat had been previously considered a suitable facility to be used for unicellular biological models although studies using single plant cell cultures raised some concerns. The incompatibility comes from the standard requirement of shaking a suspension culture for assuring its viability and active proliferation status in the control samples. Moreover, a related issue applies to the use of the random positioning machine (RPM) for cell suspension experiments. Here, we demonstrate an alternative culture method based on the immobilization of the culture before the altered gravity treatment occurs, such that it behaves as a solid object. Our immobilization procedure preserved plant cell culture viability without compromising basic cell properties as viability, morphology, cell cycle phases distribution, or chromatin organization, when compared with a standard cell suspension under shaking as a control. This approach should allow the space biology community to improve the quantity and quality of plant cell results in future simulated microgravity experiments or spaceflight opportunities.

6 Abdel-Hamid Salem; Hassan Awaad; Mohammed Ali; Khaled Y. Kamal. Expression of Heterosis, Gene Action and Relationship among Morpho-physiological and Yield Characters in Sunflower under Different Levels of Water Supply. Journal of plant production. 7 - 12, pp. 1523 - 1534. 2016.

Type of production: Scientific paper **Format:** Journal

Corresponding author: Yes

Relevant results: In order to monitor heterosis, inheritance and interrelationship among morpho-physiological and yield characters in sunflower, half diallel crosses among seven genetically divergent inbred lines were evaluated under adequate water supply, moderate and severe stress. Drought sensitivity index indicated that the parental sunflower genotypes L38 and L990 and the F1 crosses L38 x L990 and L350 x L460 were more tolerant to water stress, whereas L11 and L235 and the F1 cross L11 x L990 classified as sensitive one. Cross combination L38 x L350 scored desired and significant heterosis for leaf chlorophyll content at moderate stress; transpiration rate at severe stress; achene yield/plant and achene oil content at adequate water supply and moderate stress. Additive gene action had a great role in controlling transpiration rate, plant height and achene oil content, while dominance was important in controlling achene yield/plant under the three levels of water regimes. The environmental variance had significant effect on gene expression of physiological and yield characters in most cases. Narrow sense heritability was high (>50%) for transpiration rate and low (< 30%) for achene yield/plant under the three levels of water regimes. Significant positive correlations were registered between achene yield/plant and each of leaf water content, transpiration rate, plant height, head diameter and 100-achene weight across three environments. The maximum direct effect on achene yield/plant was accounted for transpiration rate and plant

height with values of 12.941% and 12.219%, respectively. The highest indirect effects on achene yield/plant variation were observed for transpiration rate via plant height followed by transpiration rate via 100-achene weight; leaf water content via 100-achene weight with values of 8.442%, 5.530% and 4.579%, respectively across three environments.

7 Khaled Y. Kamal; Raul Herranz; Jack J. W. A. van Loon; Peter C. M. Christianen; F. Javier Medina. Evaluation of Simulated Microgravity Environments Induced by Diamagnetic Levitation of Plant Cell Suspension Cultures. Microgravity Science and Technology. 28 - 3, pp. 309 - 317. Springer, 20/11/2015. Available on-line at: <https://link.springer.com/article/10.1007/s12217-015-9472-7#Abs1>. ISSN 0938-0108

DOI: 10.1007/s12217-015-9472-7

Type of production: Scientific paper **Format:** Journal

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Total no. authors: 5 **Corresponding author:** No

Relevant results: Ground-Based Facilities (GBF) are essetial tools to understand the physical and biological effects of the absence of gravity and they are necessary to prepare and complement space experiments. It has been shown previously that a real microgravity environment induces the dissociation of cell proliferation from cell growth in seedling root meristems, which are limited populations of proliferating cells. Plant cell cultures are large and homogeneous populations of proliferating cells, so that they are a convenient model to study the effects of altered gravity on cellular mechanisms regulating cell proliferation and associated cell growth. Cell suspension cultures of the Arabidopsis thaliana cell line MM2d were exposed to four altered gravity and magnetic field environments in a magnetic levitation facility for 3 hours, including two simulated microgravity and Mars-like gravity levels obtained with different magnetic field intensities. Samples were processed either by quick freezing, to be used in flow cytometry for cell cycle studies, or by chemical fixation for microscopy techniques to measure parameters of the nucleolus. Although the trend of the results was the same as those obtained in real microgravity on meristems (increased cell proliferation and decreased cell growth), we provide a technical discussion in the context of validation of proper conditions to achieve true cell levitation inside a levitating droplet. We conclude that the use of magnetic levitation as a simulated microgravity GBF for cell suspension cultures is not recommended.

8 Khaled Y Kamal; Ruth Hemmersbach; F Javier Medina; Raul Herranz. Proper selection of 1g controls in simulated microgravity research as illustrated with clinorotated plant cell suspension cultures. Life sciences in space research. 5, pp. 47 - 52. Elsevier, 18/04/2015. Available on-line at: <https://www.sciencedirect.com/science/article/abs/pii/S2214552415000218?via%3Dihub>. ISSN 2214-5524

DOI: 10.1016/j.lssr.2015.04.004

Type of production: Scientific paper **Format:** Journal

Corresponding author: No

Relevant results: Understanding the physical and biological effects of the absence of gravity is necessary to conduct operations on space environments. It has been previously shown that the microgravity environment induces the dissociation of cell proliferation from cell growth in young seedling root meristems, but this source material is limited to few cells in each row of meristematic layers. Plant cell cultures, composed by a large and homogeneous population of proliferating cells, are an ideal model to study the effects of altered gravity on cellular mechanisms regulating cell proliferation and associated cell growth. Cell suspension cultures of Arabidopsis thaliana cell line (MM2d) were exposed to 2D-clinorotation in a pipette clinostat for 3.5 or 14 hours, respectively, and were then processed either by quick freezing, to be used in flow cytometry, or by chemical fixation, for microscopy techniques. After long-term clinorotation, the proportion of cells in G1 phase was increased and the nucleolus area, as revealed by immunofluorescence staining with anti-nucleolin, was decreased. Despite the compatibility of these results with those obtained in real microgravity on seedling meristems, we provide a technical discussion in the context of clinorotation and proper 1g controls with respect to suspension cultures. Standard 1g procedure of sustaining the cell suspension is achieved by continuously shaking. Thus, we compare the mechanical forces acting on cells in clinorotated samples, in a control static sample and in the standard 1g conditions of suspension cultures in order to define the conditions of a complete and reliable experiment in simulated microgravity with corresponding 1g controls.

9 Khaled Y. Kamal; Hassan A. Awaad; Mohammed A. Ali Ali; Abdel Rahman E. Omar Omar; A. H. Salem Salem. Some Stability Parameters in Sunflower (Helianthus annuus L.) Genotypes at Various Environments. Egyptian Journal of Applied Science. 2012.

Type of production: Scientific paper **Format:** Journal

Corresponding author: No

Relevant results: YIELD stability is one of the most important needs in sustainable agriculture. The ideal sunflower (Helianthus annuus L.) genotype would produce high yields when water supply is abundant and should have only small reduction in yields under water stress condition. The use of methods that integrate yield performance and stability to select superior genotypes becomes prerequisite. Phenotypic, genotypic and AMMI stability parameters were computed for seed yield and oil content of twelve sunflower genotypes under six diverse applications (the combination between three water regimes and two seasons). Phenotypic stability parameters indicated that the most desired and stable sunflower genotypes were L20, L235 and L460 for seed yield/fed as well as L20, L350, Giza 102 and Sakha 53 for seed oil content (%). Genotypic stability estimates revealed that the most average stable genotypes were L20 for seed yield (t/fed) and L350, L770, Giza 102 and Sakha 53 for seed oil content (%). According, to AMMI stability, the most stable sunflower genotype was L20, L235 and L460 for seed yield (t/fed) as well as L235, L350 and Giza 102 for seed oil content. Strong agreement was found between Eberhart and Russell, Tai and AMMI statistics for measuring stability parameters for seed yield (t/fed) and seed oil content (%) in almost sunflower genotypes.

10 Raul Herranz; Miguel A Valbuena; Aranzazu Manzano; Khaled Y Kamal; F Javier Medina. Use of microgravity simulators for plant biological studies.Methods in molecular biology (Clifton, N.J.). 1309, pp. 239 - 54. Springer, 2015. Available on-line at: <https://link.springer.com/protocol/10.1007%2F978-1-4939-2697-8_18#aboutcontent>. ISSN 4939-2697

DOI: 10.1007/978-1-4939-2697-8_18

Type of production: Book chapter **Format:** Journal

Corresponding author: No

Relevant results: Simulated microgravity and partial gravity research on Earth is highly convenient for every space biology researcher due to limitations of access to spaceflight. However, the use of ground-based facilities for microgravity simulation is far from simple. Microgravity simulation usually results in the need to consider additional environmental parameters which appear as secondary effects in the generation of altered gravity. These secondary effects may interfere with gravity alteration in the changes observed in the biological processes under study. Furthermore, ground-based facilities are also capable of generating hypergravity or fractional gravity conditions, which are worth being tested and compared with the results of microgravity exposure. Multiple technologies (2D clinorotation, random positioning machines, magnetic levitators or centrifuges), experimental hardware (proper use of containers and substrates for the seedlings or cell cultures), and experimental requirements (some life support/environmental parameters are more difficult to provide in certain facilities) should be collectively considered in defining the optimal experimental design that will allow us to anticipate, modify, or redefine the findings provided by the scarce spacefl ight opportunities that have been (and will be) available.

11 Raul Herranz; Miguel A Valbuena; Khaled Youssef; F. Javier Medina. Mechanisms of disruption of meristematic competence by microgravity in Arabidopsis seedlings.Plant Signaling & Behavior. 9 - 3, Taylor and Francis Online, 10/03/2014. Available on-line at: <https://www.tandfonline.com/doi/full/10.4161/psb.28289>. ISSN 1559-2324

DOI: 10.4161/psb.28289

Type of production: Review **Format:** Journal

Corresponding author: No

Relevant results: Experiments performed in actively proliferating plant cells both in space and simulated microgravity have evidenced a common effect: cell proliferation appears enhanced whereas cell growth is depleted. Coordination of cell growth and proliferation is a major feature of meristematic cells and is called meristematic competence. Therefore, disruption of meristematic competence may lead to important alterations in the developmental pattern of the plant. Auxin is known to be a mediator of the transduction of the gravitropic signal and a regulator of the rates of growth and proliferation in meristematic cells, but our experiments in simulated microgravity, using both mechanical and magnetic levitation technologies, have revealed that the interdependence between gravity sensing, gravitropism, auxin levels and meristematic competence is neither strict nor univocal and may include additional factors and mechanisms. Available data indicate that the effects of altered gravity on cell growth and proliferation are not only the consequence of the transduction of the gravitropic signal perceived by columella cells in the root tip, but they may also be achieved with independence of the statolith displacement, using additional mechanisms of gravity sensing, and of the auxin polar transport, using additional transduction mediators.

Works submitted to national or international conferences

1 **Title of the work:** Initial assessment of Brassica Species Microgreens: A Functional crop that can diversify Food systems
Name of the conference: EXCEED ¨Water - Energy - Food - NEXUS in MENA Region
Corresponding author: Yes
City of event: Äswan, Egypt
Date of event: 11/11/2018
End date: 17/11/2018
Organising entity: DAAD ¨Germany
City organizing entity: Munich, Germany
Khaled Kamal; Amr Abdel Motagaly; Raul Herranze.

2 **Title of the work:** Alterations in cell cycle regulation induced by simulated microgravity in a plant cell culture.
Name of the conference: ESA/ISGP/CNES joint life sciences meeting
Corresponding author: Yes
City of event: Toulouse, Midi-Pyrénées, France
Date of event: 07/2016
Organising entity: CNES-France
City organizing entity: Toulouse, France
Khaled Youssef Kamal; Jack; Raul; Francisco Javier Medina.

3 **Title of the work:** EndNote as a tool for Advanced Research publish
Name of the conference: National Conference for Scientific Research in Egypt
Corresponding author: Yes
City of event: Zagazig, Egypt
Date of event: 05/2016
Organising entity: Faculty of Agriculture, Zagazig University
Type of entity: University Centres and Structures and Associated Bodies
City organizing entity: Zagazig, Egypt
Khaled Youssef Kamal.

4 **Title of the work:** Effect of short-term heat stress on growth, physiology and heat stress responsive system in wheat seedlings.
Name of the conference: 35th International Conference of Advanced Agronomist practices in Egypt
Corresponding author: Yes
City of event: Alexanderia, Egypt
Date of event: 12/2015
Organising entity: Alexanderia University
Type of entity: University
Khaled Youssef Kamal; Eman; Abdel Hamid Hassan Salem.

5 **Title of the work:** Microgravity causes changes in Arabidopsis cell developmental processes; cell growth, chromatin organizations, and cell proliferation
Name of the conference: CONFERENCE for YOUNG SCIENTISTS 2015
Corresponding author: Yes
City of event: Kyiv, Ukraine
Date of event: 09/2015
Type of entity: State agency

Organising entity: National Academy of Science of Ukraine
City organizing entity: Kyiv, Ukraine
khaled Youssef Kamal; Jack; Raul; Francisco Javier Medina.

6 **Title of the work:** Space Biology (Growing Plants in Space)
Name of the conference: Conference of Young Egyptian Researchers
Corresponding author: Yes
City of event: Zagazig, Egypt
Date of event: 04/2015
Organising entity: Zagazig University **Type of entity:** University
City organizing entity: Zagazig, Egypt

7 **Title of the work:** Meristematic competence is disrupted by microgravity, real or simulated, in seedlings and cultures cells of Arabidopsis.
Name of the conference: COSPAR
Corresponding author: No
City of event: Mosco, Russia
Date of event: 08/2014
Organising entity: COSPAR **Type of entity:** State agency
City organizing entity: Mosco, Russia
Francisco Javier Medina; Miguel; Khaled Youssef Kamal; John; Jack; Raul.

8 **Title of the work:** Disruption of Cell Growth and Proliferation Induced by Simulated Microgravity on Synchronic Plant Cell Cultures.
Name of the conference: ASGSR
Corresponding author: Yes
City of event: orlando, United States of America
Date of event: 11/2013
Organising entity: NASA **Type of entity:** State agency
khaled youssef kamal; jack; raul; francisco javier medina.

9 **Title of the work:** Altered gravity induces changes in the plant cell cycle: Growth a synchronic cell culture in a random positioning machine.
Name of the conference: ELGRA
Corresponding author: Yes
City of event: Rome, Italy
Date of event: 09/2013
Organising entity: ELGRA
khaled youssef kamal; jack; raul; francisco javier medina.

10 **Title of the work:** Plant cell cycle is altered by microgravity, real or simulated, in root meristematic and cultures cells.
Name of the conference: ELGRA
Corresponding author: No
City of event: Rome, Italy
Date of event: 09/2013
Organising entity: ELGRA
Ana; Khaled Youssef kamal; Miguel; John; Jack; Raul.

11 **Title of the work:** Ground-based facilities simulated microgravity affects cell proliferation and cell growth in plant cell cultures".
Name of the conference: CIB journadas
Corresponding author: Yes
City of event: Madrid, Spain
Date of event: 03/2011
Organising entity: Centro de Investigaciones Biológicas
Type of entity: State agency
City organizing entity: madrid, Spain
khaled youssef kamal; raul; francisco javier medina.

R&D management and participation in scientific committees

Organization of R&D activities

1 **Title of the activity:** 1st Workshop on Responsible Science [Responsible conduct of Research: RCR]
Type of activity: Managment - Organisation - Talk and seminars
Geographical area: Regional
Convening entity: Zagazig University
Type of entity: University
City convening entity: Zagazig, Egypt
Start-End date: 20/02/2016 - 23/02/2016
Duration: 4 days

2 **Title of the activity:** 2nd Egyptian Educational Institute on Responsible Science
Type of activity: Organization - Talk a seminar
Geographical area: Non EU International
Convening entity: The U.S. National Academy of Sciences in cooperation with Ain Shams University
Type of entity: Foundation
City convening entity: Ain Soukhna, Egypt
Start-End date: 21/07/2015 - 26/07/2015
Duration: 7 days

R&D management

Name of the activity: Authority to ensure the quality of education and accreditation Team
Type of management: Programme management
Performed tasks: Responsible for the (Post graduate and Scientific Research sector - Faculty file submitted) for the quality Insurance visit by the The Egyptian National Authority to ensure the quality of education and accreditation.
Entity: Zagazig university
Type of entity: University
Start date: 05/2015
Duration: 1 year - 4 months

Other achievements

Stays in public or private R&D centres

1 **Entity:** University of Toulouse III - Paul Sabatier **Type of entity:** University
Faculty, institute or centre: LRSV - CNRS - UPS
City of entity: Toulouse, Midi-Pyrénées, France
Start-End date: 10/2016 - 07/2017 **Duration:** 9 months
Goals of the stay: Post-doctoral
Provable tasks: Identify the Role of the calcium-dependent protein kinase CPK3 and nuclear calcium in Fumonisin B1-induced programmed cell death.

2 **Entity:** Zagazig University **Type of entity:** University
Faculty, institute or centre: Faculty of Agriculture
City of entity: Zagazig, Egypt
Start-End date: 01/2015 - 09/2016 **Duration:** 1 year - 9 months
Goals of the stay: Contracted
Provable tasks: Plant Breeding and Genetics Teaching (Lecturer/PhD)

3 **Entity:** Centro de Investigaciones Biológicas **Type of entity:** State agency
City of entity: Madrid, Spain
Start-End date: 10/2010 - 01/2015 **Duration:** 4 years - 3 months
Goals of the stay: Doctorate
Provable tasks: Master and PhD formation in Molecular and Cellular Biology (Environmental Biology)

4 **Entity:** Florida University **Type of entity:** University
Faculty, institute or centre: Space Biology Laboratory
City of entity: Gainsville - Florida, United States of America
Start-End date: 10/2014 - 11/2014 **Duration:** 1 month
Goals of the stay: Guest
Provable tasks: Supporting and increasing my experience in using in vitro cell cultures on the Space Biology research

5 **Entity:** European Space Agency **Type of entity:** Technological Centre
City of entity: Noordwijk, Holland
Start-End date: 02/2013 - 04/2013 **Duration:** 2 months
Goals of the stay: Guest
Provable tasks: Using ground based facilities to study the impact of microgravity on plant cell biology.

6 **Entity:** German Aerospace Center (DLR) **Type of entity:** Technological Centre
City of entity: Koln, Germany
Start-End date: 11/2011 - 08/2012 **Duration:** 32 days
Goals of the stay: Guest
Provable tasks: Using Pipette clinostat to study the impact of microgravity and Diamagnetic levitation on plant cell biology.

7 **Entity:** Radboud University **Type of entity:** University
Faculty, institute or centre: High Magnetic Field Laboratory
City of entity: Nijmegen, Holland
Start-End date: 02/2011 - 03/2012 **Duration:** 21 days
Goals of the stay: Guest
Provable tasks: Using Magnetic levitation to study the impact of microgravity and Diamagnetic levitation on plant cell biology.

8 **Entity:** Zagazig University **Type of entity:** University
Faculty, institute or centre: Faculty of Agriculturte
City of entity: Zagazig, Egypt
Start-End date: 11/2007 - 09/2010 **Duration:** 2 years - 10 months
Goals of the stay: Contracted
Provable tasks: Teaching Assistance

9 **Entity:** SMHI-SIDA **Type of entity:** Foundation
City of entity: Norrkoping, Sweden
Start-End date: 04/2009 - 06/2009 **Duration:** 2 months
Goals of the stay: Training Fellowship
Provable tasks: The advanced international training program on Climate Change - Mitigation and Adaptation for community planners and decision makers in developing countries

10 **Entity:** Agência Paulista de Tecnologia dos Agronegócios: APTA **Type of entity:** University Research Institute
Faculty, institute or centre: Instituto Agronômico - IAC, de Campinas
City of entity: São Paulo, Brazil
Start-End date: 07/2008 - 12/2008 **Duration:** 6 months
Goals of the stay: Guest
Provable tasks: Learn New advanced technique for plant breeding and Genetics for different environmental stresses

Obtained grants and scholarships

1 **Name of the grant:** Postdoctoral Fellowship
City awarding entity: Toulouse, France
Aims: Post-doctoral
Awarding entity: IFE - STDF **Type of entity:** Foundation
Amount of the grant: 25.000 €
Conferral date: 10/2016 **Duration:** 9 months
End date: 06/2017
Entity where activity was carried out: University of Toulouse III - Paul Sabatier
Faculty, institute or centre: LRSV - CNRS - UPS

2 **Name of the grant:** Lecturer fellowship
City awarding entity: Zagazig, Egypt
Aims: Post-doctoral
Awarding entity: Zagazig University **Type of entity:** University
Amount of the grant: 42.000 €
Conferral date: 15/01/2015
End date: 30/09/2016

Entity where activity was carried out: Zagazig University
Faculty, institute or centre: Faculty of Agricultutre

3 **Name of the grant:** JAE-preDoc
City awarding entity: Madrid, Spain
Aims: Pre-doctoral
Awarding entity: Consejo Superior de Investigaciones Científicas **Type of entity:** State agency
Amount of the grant: 72.800 €
Conferral date: 10/2010 **Duration:** 4 years
End date: 30/09/2014
Entity where activity was carried out: Centro de Investigaciones Biológicas

4 **Name of the grant:** Short Stay fellowship
City awarding entity: Leiden, Holland
Aims: Pre-doctoral
Awarding entity: European Space Agency **Type of entity:** Foundation
Amount of the grant: 4.500 €
Conferral date: 02/2014 **Duration:** 2 months
End date: 04/2014
Entity where activity was carried out: ESTEC - ESA

5 **Name of the grant:** SMHI-SIDA Training program on Climate Change
City awarding entity: Norrkoping, Sweden
Aims: Training Courses
Awarding entity: SMHI-SIDA
Amount of the grant: 7.000 €
Conferral date: 04/2009 **Duration:** 2 months
End date: 06/2009
Entity where activity was carried out: Norrkoping

6 **Name of the grant:** FAPESP short Stay fellowship
City awarding entity: Sao Paulo, Brazil
Aims: Pre-doctoral
Awarding entity: São Paulo Research Foundation **Type of entity:** Foundation
Amount of the grant: 8.000 €
Conferral date: 07/2008 **Duration:** 6 months
End date: 12/2008
Entity where activity was carried out: Agência Paulista de Tecnologia dos Agronegócios: APTA

7 **Name of the grant:** Undergraduate sholarship
City awarding entity: Zagazig, Egypt
Aims: Undergraduate
Awarding entity: Egyptian Ministry of Higher Education
Amount of the grant: 10.000 €
Conferral date: 09/2003 **Duration:** 4 years
End date: 05/2007
Entity where activity was carried out: Zagazig University
Faculty, institute or centre: Faculty of Agriculture

8 **Name of the grant:** Junior Researcher
Aims: Post-doctoral
Awarding entity: palacky university in olomouc **Type of entity:** University
Conferral date: 01/11/2018
Entity where activity was carried out: Czech Republic

9 **Name of the grant:** Travel Grant
City awarding entity: Orlando, United States of America
Aims: Conference
Awarding entity: NASA (ASGSR)
Amount of the grant: 590 €
Conferral date: 11/2013
Entity where activity was carried out: Centro de Investigaciones Biológicas

10 **Name of the grant:** Travel grant (Conference)
City awarding entity: Rome, Italy
Aims: Conference
Awarding entity: European Space Agency **Type of entity:** Foundation
Amount of the grant: 1.150 €
Conferral date: 09/2013
Entity where activity was carried out: Centro de Investigaciones Biológicas