



LES ACTES DU PREMIER SÉMINAIRE COMMUN SUR LA RECHERCHE USJ/AUB

PROCEEDINGS OF THE FIRST JOINT USJ/AUB RESEARCH WORKSHOP

Sciences biomédicales et Sciences de l'ingénieur



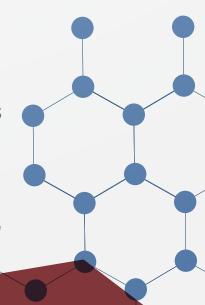
Biomedical Sciences and Engineering

Vendredi 19 janvier 2018

Université Saint-Joseph de Beyrouth
Campus de l'innovation et du sport, rue de Damas
Auditorium François S. Bassil

Friday January 19, 2018

Saint-Joseph University of Beirut
Campus of Innovation and Sports, Damascus road
Auditorium François S. Bassil



OPENING CEREMONY

9h-9h30

- Pr Dolla Karam Sarkis, Vice-recteur à la recherche de l'USJ
- Dr Saad Andary, Vice-gouverneur de la Banque du Liban
- Pr Salim Daccache, Recteur de l'Université Saint-Joseph de Beyrouth
- Pr Fadlo Khuri, President of the American University of Beirut

9h30-10h

• Keynote speaker: **Pr Jacques Belghiti,** Counselor of the Ministry of Health in France - Conseiller du Ministère de la santé en France Innovation in Surgery: from a new idea to the market access Innovation en chirurgie: de la nouvelle idée à l'accès au marché

10h-10h30 Coffee break

10h30-13h Session I

Chairs: Pr Hala Mohtasseb - Pr Roland Tomb - Pr Fadi Geara

• Pr Dolla Karam Sarkis (USJ):

Research overview at USJ

La recherche à l'USJ : vue d'ensemble

• Pr Roland Tomb (USJ):

Research overview at the Faculty of Medicine Les axes de recherche à la Faculté de médecine

• Pr Pierre Khoueiry (AUB):

Mining the regulatory genome: role and applications in cancer genomics – Exploration du génome régulateur Rôles et applications dans le génomique du Cancer

• Pr Lydia Khabbaz (USJ):

Research in Neuropsychopharmacology : the Reward Circuit Recherche en Neuropsychopharmacologie : circuit de récompense

• Pr Jason Amatouri (AUB):

Modeling the upper airway for obstructive sleep apnea

Modélisation des voies respiratoires supérieures dans l'apnée du sommeil obstructive

• Pr Ismat Ghanem (USJ):

Biomechanics of the musculoskeletal system: From numbers to function Biomécanique du système musculo-squelettique : des chiffres à la fonction

• Pr Ahmed Fawzi El-Yazbi (AUB):

Targeting adipose inflammation as an early intervention with diabetic cardiovascular complications: New horizons for old drugs

L'inflammation du tissu adipeux dans les complications cardiovasculaires chez les diabétiques : Nouvels horizons pour des anciens médicaments

• Pr Nassim Fares (USJ):

Heart and renal remodeling under stress: From animal models to functional aspects

Le remodelage cardiaque et renal en conditions de stress: Du modèle animal aux aspects fonctionnels

13h-14h Lunch break

14h-17h Session II

Chairs: Pr Dolla Karam Sarkis - Pr Ali Bazarbachi - Pr Zaher Dawy

• Pr Marianne Abi Fadel (USJ):

The adventure of PCSK9: From genetic discovery to a new therapeutic class in familial hypercholesterolemia

L'aventure de PCSK9 : de la découverte génétique vers une nouvelle classe thérapeutique dans l'hypercholestérolémie familiale

Pr Assaad Eid (AUB):

Diabetes induced microvascular complications: Unveiling new friends and identifying hidden enemies

Complications microvasculaires induites par le diabète : Dévoiler de nouveaux amis et identifier des ennemis cachés

• Pr Richard Maroun (USJ):

Valorization of Food Byproducts: Natural antioxidants extraction and characterization

Valorisation des bio-produits alimentaires: extraction et caractérisation des antioxydants naturels

• Pr Arij Daou (AUB):

L'apprentissage rapide régule les propriétés intrinsèques des neuronnes corticaux

• Pr Hadi Kanaan (USJ):

Power electronics for power quality improvement in modern electric grids Amélioration de la qualité d'énergie dans les réseaux électriques modernes par voies de l'électronique de puissance

• Pr Noel Ghanem (AUB):

Cell cycle control by Rb and p53 during adult neurogenesis: implications on neurodegeneration in the adult brain

Contrôle du cycle cellulaire via Rb et p53 durant la neurogenèse : implication dans la neurodégénérescence du cerveau adulte

• Pr Georges Sakr (USJ):

Machine Learning: Advances in Cardio Vascular Medicine

Apprentissage automatique: les progrès dans la médecine cardiovasculaire

• Pr Massoud Khraiche (AUB):

High density multimodal point of care diagnostic platform for CTC Plate-forme de diagnostic haute densité pour la détection des cellules cancéreuses circulantes

• Pr Georges Hilal (USJ):

Impact of mutations location on p53 overexpression in epithelial ovarian carcinoma: ex vivo and in vitro studies

Effet de la localisation des mutations du gène p53 sur la surexpression de la protéine dans le cancer d'ovaire: études ex vivo et in vitro

Joint scientific committee

AUB

Pr Hala Mohtasseb Pr Ali Bazarbachi Pr Zaher Dawy

USJ

Pr Roland Tomb Pr Fadi Geara Pr Nassim Fares Pr Dolla Karam Sarkis

Opening speaches

Professor Dolla Karam Sarkis,

Vice-recteur à la recherche de l'Université Saint-Joseph de Beyrouth



حضرة رئيس الجامعة الأميركيّة في بيروت الدكتور فضلو خوري، حضرة رئيس جامعة القدّيس يوسف في بيروت الأب سليم دكّاش، حضرة أمين عام مجلس الوطني للبحوث العلميّة، البروفيسور معين حمزة حضرة نائب حاكم مصرف لبنان الدكتور سعد العنداري Monsieur le directeur du bureau du Moyen Orient de l'Auf Pr Hervé Sabourin

Notre conférencier d'aujourdh'hui, Pr Jacques Belghiti.

حضرة نواب الجامعة والأساتذة الباحثين،

أعزّائي الطلاّب،

إسمحوا لي أن أرحّب بكم شديد الترحيب في بدء لقائنا العلمي المشترك الذي يجمعنا اليوم في حرم الابتكار والرياضة في جامعة القدّيس يوسف

إنّي لمسرورة جدًّا اليوم إذ إنّ هذا اليوم العلمي هو أوّل نتاج لمعاهدة التعاون التي وُقّعَت بين جامعتَينا يوم الثلاثاء الفائت في الجامعة الأميركيّة. إنّها من دون شكِّ بداية ناجحة ومفيدة للطرفين.

صحيحٌ أن هذا التعاون هو نتيجة إرادة الرئيسين الدكتور فضلو والأب دكّاش، إنّما هي أيضًا إرادة جميع الأساتذة الذين انتظروا بحماس إشارة الانطلاق، فأعرب جميعُهم عن رغبتهم في التعاون من أجل القيام بمشاريع وندوات علميّة مشتركة.

سمعتُ الأب دكّاش يقول مؤخّرًا أن التعاونَ بدأ منذ زمن طويل. فالتعاون العلميّ الحديث بدأ أيضًا منذ زمن بشكلٍ غير رسميّ أو غير موتّق: إذ إنّ عددًا كبيرًا من الباحثين تعاونوا معًا في المجالات كافّة.

لا يتوقّف هدفُنا اليوم على التعاون بالمشاريع البحثيّة، فهذه أسهل الأمور! طموحُنا اليوم هو بناء مشاريع دكتوراه مشتركة (Co-tutelle)، وتبادل الطلاّب وتأسيس لمنح شهادات مشتركة. وكباحثة أرى أيضًا أهميّة إنشاء تطبيق (Plateforme) مشترك لما يوفّر من مال وجهد لكلا الطرفين.

أتوجّه أخيرًا بشكر من القلب للحاضرين والمشاركين، أشكر بنوع خاص الدكتور فضلو والأب دكّاش لثقتهما بعملنا وتشجيعنا الدائم. Je remercie Pr Belghiti qui a fait Paris-Beyrouth pour nous parler de l'innovation médicale أشكر الدكتور سعد العنداري لتشجيعه الدائم لنا ولحثّنا على التعاون

لا بدّ من أن أوجّه شكرًا كبيرًا لفريق الجامعة الأميركيّة: البروفيسور علي بزرباشي، والبروفيسور هلا محتسب والبروفيسور زاهر ضاوى.

ولفريق الجامعة اليسوعية البروفيسور رولان طنب والبروفيسور نسيم فارس والبروفييسور فادي جعارة.

أرجو أن يكون نهارنا بداية ناجحة وحجر أساس لتعاون وثيق وأنا على ثقة أنّ لقاءنا التالي الذي سنحدّد موعده قريبًا سيكون لعرض نتائج أبحاثنا المشتركة والأبحاث الني يعمل عليها طلّابُنا.

Je vous souhaite une bonne journée et une bonne conférence

Doctor Saad Andary,

Vice-gouverneur de la Banque du Liban



Mr. Presidents Pere Salim Daccache and Dr Fadlo Khoury,

Ladies and gentlemen

I wish to thank the organizers of the "First Joint USJ/AUB Research Workshop" for inviting me to your opening ceremony. I am delighted to see the cooperation between these two prominent academic institutions gaining force thanks to the vision and the will of their two leaders. I have come to understand that their vision is intended to take these institutions beyond the confines of academic learning. Their vision is to see academia serving the needs of society at large.

We at the central bank have supported and intend to continue to support academic institutions and higher education in general. Our support has taken the shape, at one point, of student loans, and it has also been in the form of stimulus low priced medium term loans of which both USJ and AUB have benefited. These include construction of premises, parking lots, equipment and environmentally-friendly inexpensive loans. These loans have helped expand the capacity of their facilities including their medical centers.

On behalf of the Central bank's Governor Salamé I wish to reiterate our commitment to continue to serve both your institutions and academia at large and to make a symbolic contribution to this event. This research workshop falls within the confines of our joint vision for the medical services industry in Lebanon.

As part of the vision of BDL with circular 331 and other incentive schemes, we are encouraging medical research leading to commercialization of ideas, to help create job opportunities. We commend your joint collaboration with us in this initiative. We hope this will develop soon and spread to other universities.

Ladies and gentlemen,

The gospels of Mathew and Luke command, and I quote,

"So I say to you, ask & it will be given to you; seek, & you will find; knock, & the door will be opened to you." unquote

Ask and express, seek with your minds, and knock to move forward.

Let us all ask, seek, and knock together for a better future in Lebanon....Thank you

Professor Salim Daccache s.j.,

Recteur de l'Université Saint-Joseph de Beyrouth



It is with great pleasure and pride that I welcome you today to the Campus of innovation and sport for this scientific day of prominent researchers from both AUB and USJ, an event that reflects one of our deepest aspirations: an inter-university dialogue, between our teachers-researchers, addressing biomedical and engineering subjects. When I say dialogue, I don't merely mean a series of conferences, because it is through dialogue, exchange of knowledge and interaction that we can build a strong scientific culture and lead joint scientific research projects.

On Tuesday, earlier this week, President Dr. Fadlo Khuri and I signed a memorandum of understanding. President Khuri said that we should not let this agreement become a decorative and lifeless document, therefore it is up to you, ladies and gentlemen, professors, teachers-researchers to translate it into action. In fact, it is known that agreements between universities remain unfulfilled if teachers from both sides do not work together to turn words into action. This seminar reflects this desire to work and create together for the good of both our universities as well as our societies.

Dear friends,

Since its establishment, our institution has been continuously devoted to scientific research in its various fields, like history, religion, philosophy, kalam, fauna and flora, Arabic and French literature, biology, physics, archeology, paleontology and many other disciplines. This work was carried out thanks to the efforts of teams of teachers - researchers, administrative and technical staff, and students with different backgrounds and aspirations, who all have a common passion for sharing and enriching their knowledge and skills. Along this path, the Jesuit fathers were always present, with, as living proof, a wide series of books published throughout one hundred years and even more. Today, even though the scientific presence of the Jesuits is much more modest than before, they will certainly remain for us a source of inspiration for many years to come.

Dear friends

Over the past years, and despite our limited means, we've been devoting, with the "Hôtel Dieu de France", more time, energy and human resources to enhance research which is a key element in our academic educational project. A health and technology division was in fact created on this particular campus in order to promote various researches in many disciplines. This furtherance of research is like a risky challenge we all carry together. With other researchers from different universities, especially in France, and today with our AUB colleagues, it is becoming increasingly possible to succeed in this challenge and reap its fruits. The complexity approaches that you are going to debate today, over health, environment, food products, chronic diseases, concern us in many ways: as researchers, as instructors and as citizens.

This seminar is a crucial and significant first step and I am sure that it will be a great success for those who have prepared it and, also, for those who will host it. This success will pave the way for more collaborative research work and a wide range of disciplinary and interdisciplinary approaches. We shall work together and, together, we shall succeed.

Professor Fadlo Khuri,

President of the American University of Beirut



My friend and brother Pere Salim Daccache, Vice Governor of BDL Saad Andary, Director of CNRS Saad Andary, Vice Rector of USJ Dolla Sarkis, Esteemed colleagues of Lebanon's two greatest universities,

It is a pleasure to be here at the First AUB-USJ Joint Biomedical Research Conference. It has taken a little while, but now, as you have heard, our journey together has begun in earnest. If we are truly to succeed in the challenging environment in which we exist today in Lebanon and the Middle East, I believe strongly that the great universities which Lebanon is blessed with must work together as a team—a body whose sum is greater than

its component parts—to produce new knowledge and provide new opportunities for all of our extraordinary and ambitious graduates. The two oldest and most outstanding institutions are without doubt the American University of Beirut (AUB) and the Saint Joseph University (USJ), and thus we must lead by example. Our alliance, which we consecrated with the signing of an MOU in front of our Boards this last Tuesday, January 16, 2018, is the cornerstone of what we hope will be the beginning of a new Golden Age for accountability, creativity and collaboration in Lebanon.

Both Universities have a shared focus on world-class student experience and high-quality research. We have both pioneered medical education in this region and continue to produce outstanding doctors and to care for our patients to world-class standards. It is fair to say that together USJ and AUB have cornered the market in educating the great names and history makers that this country has produced—as I said at a joint gathering on Tuesday, USJ may outnumber us on Presidents of the Republic, we have the edge on Prime Ministers of Lebanon and the Arab World (4 in Lebanon, 9 in Jordan alone), and Palestinian revolutionaries. We both have our roots in the Christian tradition, but have both opened our doors students of every religion, or of no religion at all.

Both institutions have been here long enough that they have undergone the kind of inculturation that was so hauntingly shown in Martin Scorsese's magical film Silence, describing the gradual development of Japanese roots by 17th century Portuguese Jesuits. AUB and USJ have long since grown deep roots in Lebanon and the Levant.

As a result of the long-term negotiations between the two institutions in which clear strands of partnership activities have been identified, we signed a historic memorandum of understanding on January 16, 2018. The MOU sets out opportunities for collaboration, cooperation and interaction as well as positive academic engagement between the AUB and the USJ. This agreement is between the two universities, rather than between schools, faculties or departments, but it will surely lead to collaborations at many different levels that will be mutually beneficial for both institutions.

The MOU is designed to facilitate and develop a genuine and mutually beneficial discussion process aimed at developing the identified relationships between AUB and USJ. It allows both institutions to explore future potential cooperation which may include: 1) new or existing academic programs like joint masters or PhD programs), 2) joint research activities in the form of conferences, workshops and seminars), 3) pursuing joint submissions of grants, 4) student exchange, 5) staff exchanges, and 6) exchange of information related to publications or teaching materials, among others. Through this strategic partnership, we hope to deepen our relationship with USJ, and

enhance the quality of our engagement with this historic institution in order to provide the best possible educational experiences for our students.

Ralph Waldo Emerson, the great American transcendentalist once said: "There is no limit to what can be accomplished if it doesn't matter who gets the credit." In this era of higher education, nobody can or should ever corner the market on excellence. And building higher and higher walls against the outside world is not only unwise; it is a surefire policy for ultimate irrelevance in my view. Nor do we seek partnerships with our partner universities, in Lebanon and all around the world, as a defensive measure, to cover one another's weaknesses. It is genuinely a path to synergy in areas in which each side is outstanding, be it health, the humanities, the arts, science, business or engineering.

As some of you know, shortly after my arrival, I agreeed to give an interview, in my limited French, to the excellent Patricia Khodr in L'Orient Le Jour. She writes: "Face aux critiques, Fadlo R. Khuri ne se laisse pas faire. Tenace, il se défend. Ne lâche pas ses idées, respecte à la lettre la réglementation de l'université.

« Si tout le monde aime ce que vous faites, cela veut dire que vous ne faites rien. Mais il faut qu'ils comprennent ce que vous faites et cela même s'ils ne sont pas d'accord avec vous. C'est pour cela qu'il faut communiquer et être transparent », explique-t-il.»

But some credit is certainly due. I would like to close by thanking the architects of this accord, and the leaders of this symposium, in particular my thanks go to Hala Muhtasib from AUB and Dolla Sarkis from USJ, and all of their colleagues who have worked tirelessly to make this day, and this accord happen. And of course, I thank my friend and brother, Pere Dr. Salim Daccache for his friendship, his determination, and his commitment that future generations of scholars and students may one day see in this partnership the stirrings of hope for a brighter future for Lebanon and the Arab World. Thank you, and congratulations to all.



Professor Jacques BELGHITI

Was the Chairman of the Department of HPB Surgery and Transplantation in Hospital Clichy.

Honorary member of the American College of Surgeons and of the American and Surgical Association.

Was president of the International Liver Transplantation Society and of the European Hepato-Biliary Association.

President and organizer of the World congress of the International Hepato-Biliary Association and of the International Liver Transplant Society in Paris.

Member of the delegation of innovation in the French ministry of health and advisor for innovative medical devices of the Lebanese government.



COMMENT FACILITER L'INNOVATION EN MÉDECINE ?

Les innovations en santé sont à l'origine de l'amélioration considérable de la durée de vie du siècle dernier et ma vie de chirurgien a été marquée par le développement de dispositifs médicaux (DM) qui ont améliorés l'état clinique des opérés. Certains dispositifs médicaux tels que les stimulateurs cardiaques, les stents ou les prothèses orthopédiques ont bouleversés des pronostics. Mais la préoccupation première reste de définir les risques que peuvent faire courir ces dispositifs pour la personne malade et son entourage. C'est la vocation du « marquage CE », obtenu auprès d'un organisme notifié en Europe ou le « FDA approval » aux USA que de vérifier les normes de fabrication pour offrir l'assurance d'une sécurité technique.

Pour autant cette assurance technique ne dit rien, ni de l'efficacité, ni de l'efficience, ni du suivi en vie réelle de ces dispositifs. Elle n'est donc pas considérée en France comme suffisante pour une prise en charge par l'assurance maladie. Le remboursement d'une innovation est un impératif de santé publique lorsqu'il considéré comme utile. Il nécessite donc une évaluation qui est réalisée en France par la Haute Autorité de santé (HAS) qui intègre les paramètres techniques du DM, l'expertise d'utilisation des opérateurs, les données des études cliniques comparatives issues de la littérature médicale référencée et les recommandations de sociétés savantes.

Pour les dispositifs considérés comme innovants, la procédure générale ne peut pas s'appliquer, du fait principalement de l'absence de comparateur similaire et donc d'études cliniques comparatives. Pour autant leur diffusion peut mériter d'être facilitée. D'abord pour ne pas priver les personnes malades d'un possible bénéfice clinique, bénéfice qui suppose de pouvoir impliquer les professionnels de santé concernés dans une recherche clinique et créer les conditions d'une formation nouvelle par l'acquisition de la technique d'implantation.

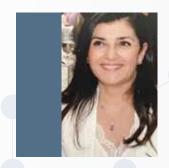
Dans pratiquement tous les pays industrialisés il existe des mesures dérogatoires pour faciliter l'utilisation puis le développement de ces innovations. L'idéal étant de conditionner une prise en charge à la réalisation d'une étude complémentaire destinée à recueillir les données manquantes pour envisager dans un délai de 3 à 5 ans un remboursement de règle générale.

La tendance nouvelle est de conditionner un remboursement dérogatoire à un certain nombre d'exigences qui incluent : (a) des données publiées augurant d'une efficacité cliniques ; (b) une certaine assurance concernant sa sécurité (avec le marquage CE ou FDA) ; (c) un suivi, si possible exhaustif, des malades ayant eu le DM et enfin (d) le caractère transitoire de cette dérogation permettant à tout moment d'interrompre sa mise sur le marché.

Cette démarche innovante où l'on accepte un risque ne se conçoit que si le suivi en vie réelle est efficace avec un retour d'expérience, facilité par les moyens informatiques pour recueillir des données hospitalières, assurancielles et bientôt des malades eux mêmes.

Professor Dolla KARAM SARKIS

Vice-recteur à la recherche de l'Université Saint-Joseph de Beyrouth Professor of Microbiology, Faculty of Pharmacy, Saint Joseph University of Beirut



OVER VIEW OF THE RESEARCH AT USJ: FOCUS ON MEDICAL AND BIOMEDICAL ENGINEERING

The aim of this presentation is to have an overview of the research at Saint-Joseph University and identify the potential fields of collaboration between our two institutions.

After a Strategic Screening, the Priorities of the University Research and development are:

- 1. Health and Quality of life
- 2. Agriculture and Food Technology
- 3. Renewable energies
- 4. Natural resource management
- 5. Information Technology
- 6. Economic, social and cultural development
- 7. Conflict and violence

Our focus in this workshop goes to the health, sciences and engineering fields. During the day, the deans and speakers of Medicine, Pharmacy, Engineering and Sciences Faculties will be developing their research activities.

I will be presenting an overview of the main research activities in these fields.

I- Faculty of medicine:

Research departments:

- 1. Medical Genetics Unit: Fr. Michel Scheuer, sj
- 2. Cancer and metabolism: Mr. Georges Hilal
- 3. Biomechanics and medical imaging: Dr. Ismat Ghanem
- 4. Neurosciences: Dr. Joseph Maarrawi
- 5. Physiology and Pathophysiology: Mr. Nassim Farès
- 6. Regenerative medicine and inflammation
- 7. Surgical sciences: Dr. Victor Jebara

II- Faculty of pharmacy: five research departments: Biochemistry, Microbiology, Nutrition, Pharmacology, and Toxicology.

- 1- Department of Biochemistry and Molecular Therapeutic: Mr. Marianne Abi Fadel.
- 1.1- Biochemical, Molecular and Genetic studies of cardiovascular and metabolic diseases:
- 1.2- Discoveries of new therapeutic targets: ex PCSK9 and anti-PCSK9 in familial hypercholesterolemia, from genes to new therapies.

2- Department of nutrition: Mr. Khalil Helou:

- 2.1- Study of determining factors of obesity and metabolic syndrome in a Lebanese population
- 2.2- Levels of PCB, OCPs, dioxins, furans, in fetal blood, maternal
- 2.3- Fatty Liver

3- Department of Toxicology: Ms. Hayat Azouri:

- 3.1- Physiopathology of drug hypersensitivity: example of antibiotics and hypouricemic agents. Ms. Hayat Azouri.
- 3.2- Effects of allergenic metals on dendritic cells and human macrophages in skin allergies. Ms. Diane Antonios
- 3.2- The study of co-operation between dendritic cells and T cells in chemical and drug allergies": doctorat en cotutelle avec Paris XI. Ms. Hayat Azouri (Rami Bechara, 2017)

4- Department of Microbiology: Ms. Dolla Karam Sarkis.

4-1: Microbiota:

- Epidemiological study of the oral and intestinal microbiota in the Lebanese general population: Pr. Rafic Baddoura, Ms. Dolla Karam Sarkis
- Infantile Colic, Inflammatory Bowel Disease and microbiota: Pr. Adib Moukarzel
- Impact of maternal nutrition and Dietary Components on the Breast milk microbiome. Dr. Bassam Eid
- Necrotizing Enterocolitis: Mr. Tarek Itani
- Neuropsychiatric Disorders: Autism Spectrum Disorder, Depression: doctorate: Ms. Rouba el Khatib
- Study of the correlation between alterations in gut microbiota, Intestinal inflammation, GVHD and the outcomes of allogeneic Bone Marrow Transplantation: Ms. Dolla Karam Sarkis & Mr. Ali Bazarbachi; doctorate: Ms. Christelle Hajjar
- Implementation of preventive strategies: Fecal Microbiota Transplantation

4-2 : Clinical and Environmental Microbial Resistance:

- Cationic Anti Microbial Peptides: as an alternative to antibiotics and their efficacy against: Multi Drug Resistant pathogens: Ms. Regina Geitani (FP-Pasteur)
- Assessment of colistin-carbapenem activity against Acinetobacter spp into the Lebanese population. Ms. Micheline Hajjar (FP- Balamand)
- Prevalence of antibiotic resistance genes and bacterial community composition in the Lebanese Rivers and Soil. Ms. Wadad Hobeika (FP- Limoges)
- Detection and transmission of antibiotic resistant bacteria among animals (Poultry and Cattle) and between animals and humans. Ms. Myriam Mikhael (FP-INRA)

4-3 : Food quality control and microbiology:

 Differentiation between fresh and thawed poultry meat by bacterial count and dosage of HADH activity. Ms. Désirée Hajj (FP- IRI).

5- Department of pharmacology: Ms. Lydia Khabbaz

- 5.1: Pharmacology and clinical pharmacy
- 5.2: Physico-chemical analysis
- 5.3: Pharmacogenetics

III- Faculty of sciences:

Three Research Units

- Technologies and Agri-Food Valorization: Mr. Nicolas Louka
- Environment, Genomics and Proteomics: Mr. Maher Abboud
- Mathematics and Modeling: Mr. Toni Sayah

Topics for potential collaborations with medical and engineering fields:

- 1. Characterization of bioactive molecules: Mr. Richard Maroun
- 2. Intensification of agro-industrial processes: Mr. Nicolas Louka
- 3. Mycology and food safety: Mr. André El Khoury
- 4. Characterization of the biological medium by optical methods: Ms. Marie Abboud Mehanna
- 5. Kinetic study in a heterogeneous medium: Mr. Roger Lteif
- 6. Study of the authenticity of foods: Mr. Toufic Rizk, Mr. Jospeh Bejjani
- 7. Hybrid materials and applications: Mr. Maher Abboud
- 8. Atmospheric emissions, measurements and modeling: Mr. Charbel Afif
- 9. Air quality study: Mr. Wehbeh Farah
- 10. Waste treatment: Mr. Dominique Salameh
- 11. HIV-1 integrase inhibitors: Ms. Zeina Hobaika
- 12. Drosophila genetics and host-pathogen interactions: Ms. Laure El Chamy
- 13. Genomic characterization of plants: Ms. Magda Bou Dagher Kharrat
- 14. Genetics and microbial virulence: Ms. Mireille Kallasy Awad
- 15. Structural mechanics: Ms. Joanna Bodgi
- 16. Fluid mechanics: Mr. Tony Sayah
- 17. Monte Carlo methods: Mr. Rami El Hadadd
- 18. Numerical modeling and applications in radiophysics: Mr. Georges Fares and Mr. Ziad Francis

IV- Faculty of Engineering - ESIB:

Four Research Centers:

- 1. Lebanese Center for Studies et Research in Construction (CLERC): Mr. Fouad Kaddah
- 2. Computer, Modeling and Information Technology Center: Mr. Marc Ibrahim
- 3. Center for Electrical Industries and Telecommunications: Mr. Elias Rachid
- 4. Regional Center for Water and Environment: Mr. Wajdi Najem

Research Topics and Themes at ESIB:

- 1. Renewable energy integration in conventional electric power systems: Mr. Hadi Y. Kanaan
- 2. Power electronics for power quality enhancement in disturbed power grids: Mr. Hadi Y. Kanaan
- 3. Predictive control of electrical systems: Ms. Flavia Khatounian El-Rajji
- 4. Energy efficiency in electrical systems: Mr. Ragi Ghosn
- 5. Energy optimization in industrial processes: Ms. Chantal Maatouk Riachi
- 6. Energy efficiency in buildings: Ms. Chantal Maatouk Riachi
- 7. Antennas and propagation: Mr. Elias Rachid
- 8. Wireless and mobile networks: Mr. Marc Ibrahim
- 9. Internet of Things (IoT): Mr. Marc Ibrahim
- 10. Network and information security: Mr. Maroun Chamoun
- 11. Data integration: Mr. Dany Mezher and Mr. Maroun Chamoun
- 12. Artificial intelligence and machine learning: Mr. Georges Sakr

Professor Roland R. TOMB

Dean of Faculty of Medicine, Université Saint-Joseph de Beyrouth Chairman and Professor, Dermatology Department Chairman and Professor, Department of Bioethics



RESEARCH OVERVIEW AT THE FACULTY OF MEDICINE

8 laboratories

6 labs at the "Pôle Technologie Santé", Innovation and Sport Campus

Medical Genetics Unit; Cancer and metabolism; Biomechanics and medical imaging; Neurosciences; Physiology and Pathophysiology; Regenerative medicine and inflammation

2 labs at the Medical Sciences Campus

Surgical sciences; Public Health

Several research axis

Neurosciences Dr. Joseph Maarrawi and Ms. Sandra Kobaiter-Maarrawi

- Research axis: Neural circuitry of pain: Modulation and Mechanisms on animal models
- 2 PhD students and master students

Cancer and metabolism Mr. ass Georges Hilal

- Research axe: Signaling pathways interactions in cancer, telomerase and inflammation.
- 4 PhD students and master students

Surgical sciences Dr. Victor Jebara, Dr. Riad Sarkis, Dr. ass Aline Khazzaka

- Learning and training in microsurgery and laparoscopy, and Research
- Physicians and postgraduated medical students

Regenerative medicine and inflammation

- Adipose tissue stem cells: implications in inflammatory diseases
- 3 PhD students and master students

Public Health ISSP founded within the Faculty of medicine in September 2016

• Interdisciplinary research interests: Health services research, Environment and health, E-health, Vulnerability and public health, Real-world data, Interprofessional collaboration and education

The Medical Genetics Unit (UGM)

22 full timers, 3 MD, 3 PhD

Human Genetics fundamental axes: Clinical Genetics; Cytogenetics; Molecular Genetics; Biochemical Genetics: Functional Genetics

Goals:

- Provide families with clinical and molecular diagnoses
- Guide families to a therapeutic solution when it exists
- Raise awareness on the importance of genetics among medical professionals
- Disseminate genetic knowledge to students from different countries
- Research on the molecular basis of rare genetic disorders

Since 1994, more than 300 articles have been published

Gene identification: 30 novel genes

Technologies at UGM: Standard Karyotyping (1970), Sanger Sequencing (2001), FISH technique (2005), Linkage analysis (1998), Molecular karyotyping (2010), Gene expression (2008), **Next Generation Sequencing analysis (2014)**

Exome sequencing at UGM

- Also known as whole exome sequencing (WES), it is a genomic technique for sequencing all of the protein-coding regions in a genome (genes exons)
- A bioinformatics platform was established in 2014: ≈ 350 exomes were analyzed
- First Lebanese exome database (publication in progress)

Genetic basis of Primary Immuno-deficiencies (PIDs)

Heterogeneous group of inherited disorders affecting the development and/or function of the immune system (Collaboration with Boston Children's Hospital, Harvard Medical School)

Functional genetics Lab: Functional assays on patient cells and on cell lines to validate the involvement of a mutation in a disease

Assessment of protein expression by Western blot and/or by flow cytometry, TLR screening, In vitro proliferation of T cells, In vitro migration assays, Nuclear translocation assays, Other assays depending on the case.

Professor Pierre KHOUEIRY

Professor of Bioinformatics, American University of Beirut, Lebanon Member, International Society for computational Biology (ISCB)



MINING THE REGULATORY GENOME: ROLE AND APPLICATIONS IN CANCER GENOMICS

The non-coding DNA, including regulatory elements, constitute 98% of the human genome. This previously coined "junk DNA" is source of evolutionary novelty and has been shown lately to be implicated in several diseases. Additionally, regulatory elements are believed to play a major role in conferring robustness to biological systems.

My research work focuses on understanding the role, evolution and dynamics of DNA regulatory regions in development and disease, two biological mechanisms where the regulatory genome is subject to profound conformational and activity changes.

My lab has long expertise in diverse experimental and computational approaches that we constantly combine to lead multidisciplinary research projects.

On the experimental side, we use several molecular techniques and Next Generation Sequencing (NGS) applications including RNA-seq, exome sequencing and ChIP-seq to annotate and identify regulatory regions and DNA variation in development and disease contexts. Computationally, we develop pipelines and workflows for the analysis of NGS including quality check and a panoply of bioinformatics resources including sequence analysis, comparative genomics, differential and functional analysis.

During my talk, I will discuss how we used an integrative approach by combining data from RNA-seq, ChIP-seq and other NGS assays in order to decipher the implication of thousands of regulatory regions in resistance and sensitivity of cancer cells. I will emphasize on the role of a very particular family of protein and enhancers that has been shown lately to alter cell sensitivity to drugs.

I will finish my talk by giving a glance on several collaborative projects that my lab is leading in the field of cancer genomics.

Professor Lydia RABBAA KHABBAZ

Professeur titulaire en pharmacologie et pharmacie clinique, Faculté de pharmacie, Directrice de l'école doctorale Sciences et Santé, Université Saint-Joseph de Beyrouth

RESEARCH IN
NEUROPSYCHOPHARMACOLOGY
LABORATOIRE DE
PHARMACOLOGIE, PHARMACIE
CLINIQUE ET CONTRÔLE DE
QUALITÉ DES MÉDICAMENTS
(LPCQM)



LPCQM is a research lab but we also perform assays and analysis on routine basis.

The lab is officially recognized by the Lebanese MOPH as a reference lab for drug quality control.

Routine analysis: drug quality control, cotinine assay (smoking marker), therapeutic levels of neuroleptics (serum), analysis of polymorphisms impacting the activity and side effects of drugs (anticancer for example).

Ongoing research projects in 2018: 22.

17 International publications in 2016-2017.

Funds: CNRS-L (3), USJ research council (6), grants for PhD: CNRS-L (1) and USJ research council (1)

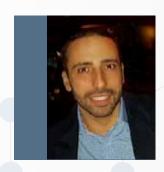
Out of the 4 PhD theses, 2 are in collaboration (cotutelle): with « Laboratoire de Neurosciences expérimentales et cliniques-INSERM UMR-S1084, Université de Poitiers » and with the Lebanese University.

PHYSICO-CHEMICAL ANALYSIS



Professor Jason AMATOURI

Assistant professor of biomedical engineering, AUB



MODELING THE UPPER AIRWAY FOR OBSTRUCTIVE SLEEP APNEA

Obstructive sleep apnea (OSA) is a highly prevalent sleep-related breathing disorder that can have serious health consequences, including cardiovascular disease and neurocognitive impairment. OSA is characterized by recurrent episodes of upper airway narrowing or closure during sleep that impede breathing. Approximately 50% of OSA patients remain untreated due to non-adherence or non-response to currently available therapies. A



major part of the issue is that the mechanisms underlying upper airway collapse remain unclear, and moreover vary between individuals. This is namely due to the complex and interactive nature of a number of anatomical, physiological and biomechanical factors that govern upper airway behavior. Accordingly, our research adopts a multi-model, multi-disciplinary approach to better understand why the upper airway collapses and to develop enhanced therapeutic options to keep it open during sleep. This includes computational finite element modeling, physical models, detailed physiological experiments using animal and human models, as well as biomedical imaging studies. One focus of our group is to apply these models in determining the role of the hyoid bone (a mobile bone at the base of the tongue) in maintaining an open airway, as well as in the therapeutic efficacy of certain OSA treatment options (e.g. mandibular advancement, hypoglossal nerve stimulation). We also utilize our multi-model approach to investigate snoring, and how its associated tissue vibrations may independently lead to adverse health consequences, such as carotid artery damage, atherosclerosis and eventual ischemic stroke. We believe that using this multi-model approach will collectively lead to improved understanding and treatment of sleep-related breathing disorders, and thus avoidance of their associated health consequences.

Professor Ismat GHANEM

Professor of Orthopaedic Surgery, Université Saint-Joseph de Beyrouth Head of Laboratory of biomechanics and medical imaging (LBIM), Faculty of Medicine, Saint Joseph University of Beirut.



BIOMECHANICS OF THE MUSCULOSKELETAL SYSTEM: FROM PHYSICS TO FUNCTION

Musculoskeletal Biomechanics is the science of the human body that focuses on the mechanics of the skeletal segments, joints, ligaments and muscles. The laboratory of biomechanics and medical imaging has been launched in 2011 at the Faculty of Medicine at the University of Saint-Joseph. Its main fields of research are human movement and 3D subject-specific



musculoskeletal modeling. It is equipped with a motion capture system and the EOS® low-dose biplanar x-ray system, the first to be installed in the Middle East and North Africa region. The motion capture is mainly used to do gait analysis exams for patients with motor disabilities. It allows the calculation of 3D angles and moments in the joints during walking as well as the acquisition of muscular activities. The EOS® allows the 3D reconstructions of the spine, pelvis and lower limbs using only one frontal and one lateral simultaneous x-rays at low dose of radiation in standing position, from which 3D radiological angles are calculated on the skeletal segments. Examinations are performed for patients with orthopedic and neurological disorders such as cerebral palsy, scoliosis, adult spinal deformity, Parkinson, low back pain, abnormalities in the lower limbs, etc. Main researches are focused on these specific pathologies. The team consists of specialists in biomechanics, engineers, physical therapists, orthopedic surgeons, residents, interns, PhD and master students. Till the beginning of 2018, 17 articles were published in peerreviewed journals and indexed in PudMed. The team has more than 50 abstracts presented in international conferences with 3 best papers awards. The main collaborations are with the Institut de Biomécanique Humaine Georges Charpak at Arts et Métiers ParisTech in Paris and the spine division at the Hospital for Special Surgery in New York.

Professor Ahmed F. EL-YAZBI

Professor of Clinical Pharmacy and a Board-Certified Pharmacotherapy Specialist



TARGETING ADIPOSE INFLAMMATION AS AN EARLY INTERVENTION WITH DIABETIC VASCULAR

COMPLICATIONS: NEW HORIZONS FOR OLD DRUGS

Diabetes remains a main risk factor for cardiovascular disorders. The vascular impact of diabetes is typically related to poor glycemic



control. Yet, a significant proportion of diabetic patients present with microvascular complications at initial diagnosis, implicating a vascular insult early in the course of metabolic dysfunction. On the other hand, recent evidence suggests that some anti-diabetic drugs might have a positive impact on diabetic cardiovascular complications apart from their hypoglycemic effect. The mechanism of the early insult occurring in the context of diabetes development is not well-defined. Furthermore, the potential corrective mechanism of anti-diabetic drugs was not properly investigated in these circumstances. To address these questions, we developed a high calorie diet (HC)-fed rat model with delayed development of hyperglycemia. Twelve weeks of feeding were not associated with an increase in neither body weight, blood pressure, blood glucose level, nor plasma insulin levels. Yet, HC-fed rats showed an increased sensitivity to the pressor effect of phenylephrine together with an increased vascular contractile response evident in aortic segments and mesenteric microvessels.

This increased contractility was resistant to calcium-free physiological solutions implicating a potential upregulation of calcium sensitization mechanisms. This observation was supported functionally whereby the isolated vessel segments showed an increased dependence on Rhoassociated kinase (ROCK) for the induced contraction. While there was no detected increase in ROCK expression, western blotting for phosphorylated MYPT1 showed an increased basal activity in vessels from HC-fed rats. This was associated with an elevated level of reactive oxygen

species as detected by DHE staining. We believe that these abnormalities are brought around by increased TGF- β expression as a consequence of peri-vascular adipose tissue inflammation. TGF- β and Smad3 staining were increased in vascular tissue from HC fed rats.

This was also coupled with a reduction and an elevation of AMPK and Erk1/2 phosphorylation, respectively. Furthermore, TGF- β and IL-1 β mRNA levels were elevated, together with observed areas of macrophage infiltration, in the peri-vascular adipose tissue dissected from these vessel segments. A detrimental systemic response to HC feeding was ruled out, since there was no increase in neither serum TGF- β , advanced glycated end products, nor increased cytokine expression in systemic adipose pools. Oral treatment with metformin or pioglitazone for the last two weeks of feeding; or switching to normal diet for the same duration were associated with a decrease in markers of adipose inflammation and a reversal of all functional and molecular abnormalities observed in HC-fed rats. As such, it is likely that early vascular dysfunction in the course of diabetes results as a consequence of peri-vascular adipose inflammation and could potentially be modified at the early stage by anti-diabetic drugs with known anti-inflammatory potential. Supported by AUB MPP fund #320148.

Professor Nassim Farès

Professor of Physiology at the Faculty of Medicine of Saint Joseph University of Beirut Head Director of the Research Laboratory of Physiology and Pathophysiology at the Faculty of Medicine, Saint Joseph University of Beirut



HEART AND RENAL REMODELING UNDER STRESS: FROM ANIMAL MODELS TO FUNCTIONAL ASPECTS

Heart diseases remains the predominant cause of mortality in the world, and one in six adults over 25 years of age has some degree of chronic kidney diseases, with incidence increasing with age. Cardiac and Renal diseases are closely

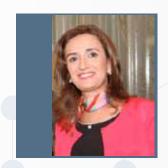


associated with morphological and functional remodeling. These remodeling processes constitute the main research axis of my lab. We focus on the study of molecular signaling pathways and calcium homeostasis implicated in cardiac and renal fibrosis as well as their hemodynamic and metabolic disorders. Altogether, to better understand the underlying pathophysiological mechanisms and to define novel therapeutic strategies. In this context, numerous animal models are used (mice, rats) e.g. Knock out TRPC3 mice; Unilateral Ureteral Obstruction model; Abdominal Aortic Banding model; L-NAME model; Streptozotocine model; Polyphenols and vitamin D enriched diet; Two kidney-one clip model. Technics used: Intracellular calcium imaging; Cell patch clamp; Western Blot; Cell isolation and culture (Cardiomyocytes, Fibroblasts, Islet of Langerhans, Nephron); ELISA; Echocardiography; Blood pressure measurement; Langendorff apparatus; Immunohistology; Histopathology.

Key words: Heart; Kidney; Functional remodeling; Calcium; Disease; Rodents.

Professor Marianne ABI FADEL

Dean of the School of Pharmacy, Saint Joseph University of Beirut Head of the Biochemistry and Molecular Therapeutics laboratory (LBTM), Saint Joseph University of Beirut



THE ADVENTURE OF PCSK9: FROM GENETIC DISCOVERY TO A NEW THERAPEUTIC CLASS IN FAMILIAL HYPERCHOLESTEROLEMIA

Thirteen years after our ground-breaking discovery linking PCSK9 to familial hypercholesterolemia, a new class of lipid lowering drugs has emerged: the anti-PCSK9 antibodies. Indeed in 2003, we identified



PCSK9 as the third gene implicated in autosomal dominant hypercholesterolemia after LDLR and APOB (Abifadel et al. Nature Genetics 2003). This major breakthrough rapidly became the center of interest of researchers worldwide as a new therapeutic target to lower LDL-cholesterol. Preclinical and clinical studies launched by pharmaceutical companies led to the first three anti-PCSK9 antibodies, two of which (evolocumab and alirocumab) reduce LDL cholesterol levels by 50-60% and received FDA and European Medicines Agency approvals in 2015 on top of statin therapy. Recently, results of the Further Cardiovascular Outcomes Research With PCSK9 Inhibition in Subjects With Elevated Risk (FOURIER) trial, the outcome trial of evolocumab over 2.2 years, showed a reduction of 15-20% in the risk of major cardiovascular outcomes in high-risk patients receiving statin therapy. Results of ODYSSEY OUTCOMES trial, evaluating the effect of alirocumab in 18,000 patients with established CVD are also eagerly awaited in 2018. The evolution of research on PCSK9, starting from the discovery of the first set of mutations in PCSK9 in FH in 2003, is an amazing example of successful translational research. It shows how rigorous and powered genetic analysis can lead to the discovery of a new class of lipid-lowering drugs that give hope in fighting high cholesterol levels and their cardiovascular complications. My presentation in the joint USJ-AUB meeting focused on the history of the discovery of PCSK9 in Familial hypercholesterolemia, the major role of our team in this discovery but also in the study of the molecular basis of familial hypercholesterolemia in Lebanon, known by its very high frequency, as well as dyslipidemia and cardiovascular diseases.

Professor Assaad EID

Associate Professor, Faculty of Medicine, Department of Anatomy Cell Biology and Physiological Sciences, American University of Beirut



DIABETES INDUCED MICROVASCULAR COMPLICATIONS: UNVEILING NEW FRIENDS AND IDENTIFYING HIDDEN ENEMIES

Diabetes, a major public health problem, is associated with a number of metabolic risk factors that contribute to a high rate of microand macrovascular events. The mechanisms that contribute to the onset and development of these complications are poorly defined.



specifically nephropathy and neuropathy are the most common complications of diabetes worldwide, affecting up to 40 and 50% of all diabetic patients respectively.

Diabetic nephropathy (DN) is a major chronic diabetic complication that arises from persistent hyperglycemia. It is characterized by a gradual loss of glomerular filtration surface area and capillary volume as well as expansion of mesangial matrix due to the excessive production and deposition of extracellular matrix proteins.

Diabetic Peripheral Neuropathy (DPN), the most common type of diabetic neuropathy is associated with structural changes and functional injuries affecting the peripheral nerves. The myelination of axons is a complex process carried out by Schwann cells (SCs) in the peripheral nervous system (PNS). However, the mechanism leading to nerve demyelination in diabetes is not well characterized. Peripheral myelin genes MPZ and PMP22 expression is tightly regulated in SCs. A slight change in PMP22 or MPZ expression has a deep impact on the development and preservation of nerve fibers and their myelin sheaths.

The importance of glucose in the pathogenesis of DN and DPN has been described. However, the cellular and molecular pathways involved in DN and DPN are still unknown.

Our data highlight the role of reactive oxygen species in the pathogenesis of DN and DPN. We show that NADPH-induced ROS production is at the heart of DN and DPN injuries. These enzymes signal through the AMPK/mTOR pathways and induce microvascular complications.

More importantly, we show that targeting these enzymes has a protective effect and can reverse renal and nervous injuries. Taken together our results suggest a novel therapeutic model to treat microvascular injury induced in diabetes.



Professor Richard G. MAROUN

Dean of the Faculty of sciences, Saint Joseph University of Beirut. Professor of Biochemistry, Saint Joseph University of Beirut. Head of the research team "Characterization of Bioactive Molecules"



VALORIZATION OF FOOD BYPRODUCTS: NATURAL ANTIOXIDANTS EXTRACTION AND CHARACTERIZATION

Food byproducts valorization practices have gained much attention lately as a means of sustainable management, which can increase the profit for local economies. So far, these materials constitute an underexploited source for the recovery and production of natural



compounds for food and other multiple industrial applications. The annual production of large waste quantities by the food processing industries creates serious problems as a consequence of the absence of efficient policies regarding their disposal. When considering their high production volumes and their nutritional content, these byproducts become an important subject for valorization. The value of food byproducts is associated with their content in dietary fibers and several bioactive molecules which can be capitalized in the food, pharmaceutical, cosmetic and nutraceutical industries. In our laboratory several conventional and emerging methods are being used in order to valorize different industrial food byproducts such as in grapes, oranges and olives. The main molecules extracted and purified are phenolic compounds. We demonstrated that these molecules have important bioactive effects such as antimicrobial, anticancer and DNA protective properties, they could be used as well to positively modulate gut microbiota and decelerate cardiovascular aging. Our state-of-the-art technology and expertise could be properly applied on several food byproducts, especially that tons of these byproducts are annually produced.

Professor Arij DAOU

Assistant Professor, Faculty of Engineering and Architecture, Biomedical Engineering
Program, American University of Beirut



LEARNING RAPIDLY REGULATES INTRINSIC PROPERTIES OF CORTICAL NEURONS

Whereas memories are widely thought to be implemented by plasticity in synaptic strength mediated via activity-dependent changes, nonsynaptic forms of plasticity have also been implicated. The type and magnitude of ionic currents that a neuron expresses contribute to the number, timing, and patterns of action potentials generated in response to a given input, hence the neuron's contribution to network dynamics. Plasticity of these intrinsic



properties includes homeostatic and other forms of regulation, suggesting the potential for widespread contribution to brain plasticity. Neuronal intrinsic properties have been manipulated in vitro and in vivo, by numerous experimental approaches but also including behavioral conditioning, may involve one or more ionic currents, and can be limited to segments of dendrites, or the somatic or axon hillock compartments. Changes in the latter compartments should modulate currents that arise from all processes of spatiotemporal summation in the neuron's dendrites. In spite of this extensive work, how such potentially widespread and powerful plastic mechanisms may be integrated at the network level, and are expressed in complex learned behaviors, remains largely unexplored.

Birdsong learning is a well-established model for complex vocal learning. A hallmark of juvenile song development is its regulation by auditory feedback, a process that extends into adult song maintenance. The song system component of the basal ganglia pathway and the HVC_v neurons that project to that pathway are posited as sites that might be rapidly modified by auditory feedback-induced changes in singing, yet HVC_x extracellular recordings in birds exposed to distorted auditory feedback (noise) to date have failed to identify such signals. Instead, here we examined intracellular properties of HVC_x neurons and challenged birds with a potent stimulus for inducing changes in song syntax, delayed auditory feedback. Using an adult zebra finch brain slice preparation we show that within a single bird all intracellularly recorded basal ganglia-projecting song system "HVC_v" neurons share similar spike waveform shapes and bursting properties, which vary from bird to bird. Modeling and physiological studies indicated that the shared properties arise from similar magnitudes of at least five somatic ionic currents. Neurons from different adults were characterized by different combinations of current magnitudes, and this was related to acoustic features of the birds' songs. Sibling pairs had precisely overlapping values, and in birds exposed to abnormal (delayed) auditory feedback, the uniformity of intrinsic properties rapidly degraded with singing. Variability in neuronal intrinsic properties was also observed in juvenile birds learning to sing. The results suggest that developmental learning normalizes HVC, intrinsic properties to efficiently transmit to the basal ganglia presynaptic activity in HVC_x reflecting the state of the premotor network driving singing that regulates the neural sequence generated. We hypothesize that stability in neuronal networks involves regularization of intrinsic properties across populations of functionally homologous neurons, an enduring memory mechanistically distinct from that at synapses.

Professor Hadi KANAAN

Professor and Head of the Electrical and Mechanical Department at Ecole Supérieure d'Ingénieurs de Beyrouth (ESIB) of Saint-Joseph University of Beirut



POWER ELECTRONICS FOR POWER QUALITY IMPROVEMENT IN MODERN ELECTRIC GRIDS

Modern power systems are highly distributed due to the variety of power generators that are geographically connected at different points of the grid. In order to integrate and adapt these new sources to the grid requirements, and to control the electric energy transfer to the load, the use of power electronics becomes mandatory. However, the massive integration of these devices combined with the proliferation of nonlinear loads causes a major power quality problem within the grid known as harmonic distortion, which has a severe impact on the grid performance on both technical and economical levels. For these reasons, international standards aimed to limit the harmonic content in the grid have been developed, and regulations for grid-connectivity have been imposed.

In order to increase the power quality of the grid in presence of polluting devices, and therefore comply with the standards and grid regulations, several power electronics based solutions are studied, analyzed, implemented and tested. These controllable devices overcome the drawbacks of the conventionally used passive filters. This presentation is aimed, first, to introduce the audience to the impacts of low power quality in distributed power systems, and then to present briefly the devices that can be used for power quality improvement and that were developed in the Faculty of Engineering at Saint-Joseph University of Beirut with the help of its collaborators in France and Canada. On the load side, different types of power factor correction circuits are presented for single-phase applications: the Boost, SEPIC and Sheppard-Taylor based converters. For three-phase systems, advanced current-injection and three-switch/level topologies are shown and discussed. On the distribution system level, active power filters are exposed, with an emphasis on the hybrid filters that combine the benefits of the active and passive filters and, hence, represent a trade-off between these two technologies. At the source level, advance multilevel and matrix converters are employed and illustrated; the Z-source matrix topologies and the multilevel modular converters have taken a special attention due to their promising features. The performance of all presented power electronics configurations is demonstrated through simulations and experimental implementations and testing. It has been evaluated in terms of Total Harmonic Distortion (THD), power factor, dynamics, robustness to load and/or source variations, source and/or load unbalance, and power efficiency. The results of these studies are already published in more than 30 journal papers and 140 conference proceedings.

Finally, it should be noted that all these research works were financially supported by the Agence Universitaire de la Francophonie (AUF), le Lebanese National Council for Scientific Research (CNRS-L), CEDRE Project, the research council of Saint-Joseph University of Beirut, and Canada Research Chair in Power Electronics and Energy Conversion.

Professor Noël D. GHANEM

Associate Professor of Biology, American University of Beirut, Lebanon



CELL CYCLE CONTROL BY RB DURING ADULT NEUROGENESIS: IMPLICATIONS ON NEURONAL REGENERATION AND DEGENERATION INSIDE THE ADULT MAMMALIAN BRAIN

Adult neurogenesis (AN) is an ongoing developmental process that generates newborn



neurons from neural stem and progenitor cells (NSPCs) in the mammalian brain throughout life. AN is spatially restricted to the subventricular zone (SVZ) and the subgranular zone (SGZ), and, significantly contributes to brain plasticity in the olfactory bulb (OB) and the hippocampus (Hi). Adult NSPCs are, however, limited in number and fate which hinders their potential contribution to the regenerative process inside the rest of the brain following neuronal loss or injury. In this context, cell cycle proteins play distinct and critical roles that extend beyond cell cycle control and constitute key regulatory mechanisms involved in neuronal differentiation, maturation and survival. I present here an overview of AN and the various cycling and non-cycling functions attributed to key cell cycle regulators, primarily the Retinoblastoma protein, Rb, and, highlight recent studies from my laboratory identifying a critical requirement for Rb in the control of progenitor cell proliferation and long-term neuronal survival in the OB (Scientific Reports, 6:20230 IDOI: 10.1038/ srep20230), the Hi (Hippocampus, 2016 Nov;26(11):1379-1392. doi: 10.1002/hipo.22613) and the olfactory system (Front Mol Neurosci. 2016 Sep 9;9:81). As a direct implication from the above studies, I suggest the presence of a novel and irreversible link between aberrant cell cycle control in adult-born neurons e.g. loss of cell cycle suppression and neurodegeneration, where the OB could be a suitable model to study in the future the degenerative process that normally occurs following aging (Omais S, Jaafar C and Ghanem N, submitted to Front Neurosci. 2018). Successful identification and manipulation of the molecular mechanisms that control AN will allow us to enhance the regenerative capacity and neuronal survival inside the adult brain, and may provide a novel approach to the modeling of neurodegenerative diseases such as Alzheimer's disease and Parkinson's disease from early detection to progression and treatment as well.

Professor Georges SAKR

Assistant professor at the faculty of engineering (ESIB) at Saint-Joseph University of Beirut



Machine Learning: Advances in Cardiovascular Medicine

First Joint USJ/AUB Research Workshop

George E. Sakr

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Abstract
Machine learning is a subfield of artificial intelligence that teaches the computer to perform tasks from examples. In our collaboration with AUB and AUBMC, we apply machine learning algorithms to predict cardiovascular diseases. The result of our work focuses on reducing the financial and time cost on the patient.

Improved Accuracy Of Anticoagulant Dose Prediction Using A Pharmacogenetic And Artificial Neural Network Based Method European Journal of Clinical Pharmacology (IF=2.966)

The unpredictability of Acenocoumarol dose needed to achieve The unpredictability of Acenocoumanol dose needed to achieve target blood thinning level remains a challenge. In this research we aim to provide a machine learning based software that pro-vides more accurate Acenocoumanol dosage prediction with less trial and error iterations. The examples used to teach the com-puter are composed of the following items:

- Use demographic and physiological features (age, gender, BMI, BSA)
- Add to it some lifestyle habits (Alcohol, Smoking) • Mix them with genotyping results for CYP2C9 and VKORC1
- Use of Artificial Neural Networks (ANN) and compare the
- results with linear regression (LR).

Results

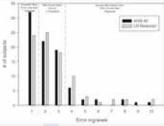


Figure 1 gives the following three observations

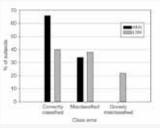
- Highly accurate is 89 for ANN and 78 for LR
- . Mis-dosed is 66 for ANN and 71 for LR
- Grossly mis-dosed is 19 for ANN and 25 for LR.

Artificial neural network modeling using clinical and knowledge independent variables predicts salt intake reduction behavior Cardiovascular Diagnosis and Therapy

High dietary salt intake is directly linked to hypertension and cardiovascular diseases. Predicting behaviors regarding salt intake habits is vital to guide interventions and increase their effectiveness. The goal of this research is to:

- . Design a questionnaire that test Knowledge, Attitude and Be-
- From the behavior question compute a score
- Design a predictive model that uses the smallest number of questions to predict behavior.
- · Behavior is divided into 3 classes: Favorable, slightly favorable and unfavorable.

. Train an ANN model on a dataset in which we included If an Arts induced on a dataset in wind we included it 5 high risk adult patients, from both genders, with a his-tory of acute presentation of Hypertension, coronary artery disease (CAD), congestive heart failure, and/or history of Stroke/Transient Ischemic Attack admitted to the Cardiac



Artificial neural network modeling enhances risk stratification and can reduce downstream testing for patients with suspected acute coronary syndromes, negative cardiac biomarkers, and normal ECGs. The International Journal of Cardiovascular Imaging (EF: 1.896)

Despite uncertain yield, guidelines endorse routine stress my-ocardial perfusion imaging (MPI) for patients with suspected acute coronary syndromes, unremarkable serial electrocardio-grams, and negative troponin measurements. This study therefore investigated the use of artificial neural net-works (ANN) to improve risk stratification and prediction of

MPI and angiographic results.

ANN was trained on a dataset formed by:

- \bullet Patients were risk stratified according to thrombolysis in myocardial infarction (TIMI) scores, ischemia was defined as $\xi5$
- · Obstructive coronary artery disease was defined as ¿50 % angiographic obstruction.
- The observed features were Age, Diabetes, Hypertension, Hyperlipidemia, Family History, Current Smoker, Known CAD Sever Chest Pain, Aspirin (Yes/No)

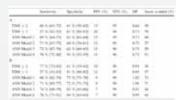


Table 1 shows 4 different ANN models each with different sen sitivity and specificity. The ANN models have higher discrimi-

natory power than TIMI score for ischemia prediction and also for obstructive CAD.

Artificial neural network-based model enhances risk stratification and reduces non-invasive cardiac stress imaging compared to DiamondForrester and Morise risk assessment models: A prospective study Journal of Nuclear Cardiology (IF: 3.930)

In this research we aim to enhance risk stratification of individuals who are sent for stress testing. In our study, we prospectively recruited 486 patients who were 19 years of age or older, and who were being evaluated for coronary artery disease with exercise radionuclide testing or echocardiographic stress testing Patients that were included were patient who showed symptoms suggestive of stable angina, and patients with features of unstable angina but had normal ECGs and at least two negative serial troonin test.

Patient excluded from the study were patients who presented with non-ST elevation Myocardial Infarction (NSTEMI), ST elevation Myocardial Infarction (STEMI), and those who pre sented with unstable angina with any ST changes on ECG.



Figure 3: Web based software for predicting ischemia

Results

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Table 2 shows a comparison between the design ANN model and the traditionally used scores Morise and Diamond-Forrester. It shows that ANN has a higher discriminatory power that both traditional methods.

Conclusions

This summarizes the history of collaboration between AUBMC and ESIB from 2013 onwards. It shows the effectiveness of using machine learning algorithms to predict cardiovascular diseases. The research shows that ANN outperforms standard procedures in all the above applications.

Forthcoming Research

The research team formed by Imad H. Elhajj (AUB), Hussain Ismaeel (AUBMC), Daniel Asmar (AUB), Elie Chammass (AUB and yours truly (ESIB-US) wil be working on an innovative new project entitled: Echo Video Based Right Ventricle (RV) Function Assessment using Deep Learning in which we want to assess the RV function using echo videos and bypass the need for MRI which is the current baseline using deep Learning (same technique used in self-diving cars). technique used in self-driving cars)

Professor Massoud L. KHRAICHE

Assistant Professor, Biomedical Engineering Program. American University of Beirut, Lebanon.



NEURALENGINEERING AND NANOBIOSENSORS GROUP

Circulating tumor cells (CTCs) are cells that detach from primary or metastatic lesions and enter into circulation. These cells carry significant information on cancer progression and metastasis. Isolating, enumerating and characterizing CTCs from the bloodstream (typically, peripheral blood) has shown



potential for early detection and monitoring of cancer progression throughout disease, treatment and relapse. Current methods for enumerating CTCs in blood utilize labor-intensive florescence imaging requiring expensive microscopes, image analysis or manual identification of target cells. In addition, imaging relies on fluorescent tagging CTC via protein expression that can be suppressed on target cells depending on disease state or cell environment. Our group is developing a novel platform for high-sensitivity capture and enumeration of viable CTCs in the blood stream using electronic means of cell detection that do not require imaging microscopes and enables real-time monitoring of CTC adhesion and enrichment post capture. The core technology used for detecting cells is a unique design utilizing high performance Thin Film Transistor (TFT) integrated into a high density and low cost electronic chip for quick capture and enumeration of CTCs. The specificity of the platform is further enhanced with the functionalization of CTC specific antibody markers on the sensing surface. Finally, the captured cells remain viable and can be retained for further analysis or cell culture.

Professor Georges HILAL

Associate Professor of Biochemistry, Faculty of Medicine, Saint-Joseph University of Beirut
Head, Cancer and Metabolism Laboratory, Faculty of Medicine, Saint-Joseph University of Beirut



TP53 GENE MUTATIONS DIFFERENTLY REGULATE OVARIAN CANCER METABOLISM: EX VIVO AND IN VITRO STUDIES

Background: Even in the presence of oxygen, cancer cells tend to metabolize glucose into lactate instead of undergoing oxidative phosphorylation. Knowing that glucose is crucial for tumor's proliferation, new patient's treatment strategies tend to combine chemotherapy to hypoglycemic drugs. p53 is a tumor suppressor and key regulator of glycolysis in cancer cells, however highly mutated in tumors. In ovarian cancer, the majority of studies concerning p53 mutations focus on the DNA binding domain since the majority of hotspot mutations affects this region of the gene. However, mutations affecting other regions such as the proline rich domain linked directly to apoptosis may also affect the protein's expression and activity. The aim of this study is to investigate the effect of various positions of mutations in TP53 gene on glycolysis, apoptosis and transcription of p53 target genes.

Material and Methods: this study was divided into two parts. The in vitro study was done using 3 ovarian cancer cell lines SKOV-3 (p53 null), Igrov-1 (WT p53) and Ovcar-3 (DNA domain mutant p53), along with the transfection of SKOV-3 cells by three different vectors: WTp53, P72R p53 and R249S p53. The ex vivo part was performed on 30 ovarian cancer biopsies. The biopsies were subjected to Tp53 immunohistochemistry and sequencing to study the mutations and their effect on p53 expression. The effect of Tp53 mutations on glucose metabolism was assayed by glucose consumption measurements, lactate production and mRNA expression of various glycolytic enzymes. To study the effect of mutations on the transcriptional activity of p53, p21 and MDM2 expression was quantified in these cells. Annexin V assay was performed on transfected SKOV-3 to study the apoptotic activity of WT and mutant p53.

Results: DNA binding domain mutant cells (Ovcar-3 and R249S SKOV-3) presented a 30% increase in glucose consumption and lactate production when compared to IGROV-1 and WT SKOV-3. P72R SKOV-3 exhibited the same pattern as WTp53 cells. The increase in the mRNA expression of glucose transporters GLUT-1 and 3 and of the glycolytic enzymes PK, PFK, G6PDH and aldolase in cells with DNA binding domain mutations varied from 20 to 30%, whereas the levels of PDHa and TIGAR decreased significantly (40%). The transcriptional activity of DNA binding domain mutant cells showed a 50% decrease in comparison to WT and P72R mutant cells. The apoptotic activity of p53 was unaltered in P72R transfected SKOV-3 cells. The ex vivo results revealed a high frequency of the P72R variant in the ovarian biopsies (69%), associated with an overexpression of the p53 protein. The glycolytic and transcriptional patterns of cells extracted from these biopsies were similar to those obtained in transfected cells.

Conclusion: Though both DNA-binding and proline-rich domains mutations lead to p53 overexpression, only the first type promotes Warburg effect and could have the worst patient's prognosis.

Media article



يوم بحثي مشترك بين الأميركيّة والقدّيس يوسف لدفع البحث العلميّ ولتبادل المعرفة

في خطوة أولى بعد اتفاق التعاون والشراكة بين الجامعتين الأميركيّة والقدّيس يوسف، افتتح في جامعة القدّيس يوسف في بيروت أوّل مؤتمر بحثيّ مشترك، لتبادل الخبرات والمعرفة في مجالات علميّة عدّة أبرزها العلوم الطبيّة والهندسيّة والهندسيّة وكلّ ما يتعلّق بها.

وهدف هذا التعاون لرفع شأن المستوى العلمي الجامعي ومستوى الأبحاث ودعمها، لينبثق عنها أقطاب نخبوية تعود بالمنفعة العامّة على المجتمع لخلق شبكة من الباحثين، ذوي المستوى والخبرة في المجالات كافّة للرفع من شأن العلم وتطبيقاته وما يعود به من النفع على المجتمع وعلى الاقتصاد في لبنان.

وقد أثار هذا المؤتمر اهتمامًا وحماسًا ملحوظين في صفوف الأساتذة والباحثين من كلتَي الجامعتَين محاضرين كانوا أم مشاركين.

وافتتحت المؤتمر نائب رئيس الجامعة لشؤون البحث العلميّ البروفسورة دولا كرم سركيس متحدّثة عن أهميّة هذه الشراكة بين إحدى أكبر جامعات لبنان، خصوصًا أنّها أضاءت على تعاون موجود أصلاً بين الجامعتين من خلال باحثين من خلال باحثين من خلال توقيع إتفاقية تفاهم.

وقالت: «سبق افتتاح المؤتمر البحثيّ الأوّل توقيع إتفاقيّة بين الجامعتين فيما يخصّ البحث العلميّ وتبادل الخبرات والهيكليّات والأدوات البحثيّة، إلى تبادل الطلاّب والباحثين، ونأمل أن تتبعها إتفاقيّات مع جامعات لبنانيّة أخرى». حاولنا







أن نغطي في هذا المؤتمر الأوَّل بعضًا من الحقول البحثيّة الأساسيّة لنظهر نقاط قوة كلّ جامعة ما يسهّل التعاون ويجعل نتائجه سريعة ومفيدة، فالعلوم التطبيقيّة تشكّل أرضيّة جيّدة جدًا للانطلاق منها نحو ميادين بحثيّة أخرى لا سيّما السريريّة منها والأكاديميّة. وغني عن الإشارة إلى أننا اعتمدنا في المؤتمر على التوازن في توزيع المحاضرات لتتمكن كل جامعة من تبيان ما عندها من خبرات كنموذج فقط، إذ هناك العديد من الباحثين الذين أرادوا المشاركة، ولا شك أن المؤتمرات المقبلة ستتيح لهم المجال لذلك». وأكّدت نائب الرئيس لشؤون البحث العلميّ بأنّ هذا التحالف سيضمُّ إختصاصات الماستر والدكتوراه وتبادل الطلاّب في كلّ المجالات والبرامج المشتركة وهذا كفيل بتأمين إستمراريّة هذه الشراكة بين الجامعتين.

واعتبر رئيس الجامعة البروفسور سليم دكّاش أنّ «هذا الحدث يشهد على ما دأبنا عليه منذ فترة طويلة أن نطلق عليه تسمية حوار قائم بين الجامعات عبر الأساتذة الباحثين عن موضوع يتناول هذه المرة المسائل الطبيّة والحيويّة والهندسيّة. أقول حوار ولا أعني مجرد سلسلة من المحاضرات لأنّنا من خلال الحوار وتبادل الكلمات والإصغاء يمكننا بناء ثقافة علميّة رائعة ومشاريع بحث علميّة مشتركة». وأعتبر أنّ هذه الندوة «تعكس الرغبة في العمل معًا والانتاج معًا من أجل خير جامعتينا وخير مجتمعاتنا.» مشدّدًا على دور الجامعة والأباء اليسوعيّين الذين كانوا حاضرين بقوة في مجال الأبحاث والعديد من الأعمال الصادرة على مدى ١٠٠ سنة وأكثر.

وكان المؤتمر المشترك قد إستضاف كلاً من نائب حاكم مصرف لبنان الدكتور سعد عنداري، الذي أكّد على التزام مصرف لبنان بتسهيل الحصول على قروض للباحثين. واختتم رئيس الجامعة الأميركيّة البروفسور فضلو خوري الجلسة الإفتتاحيّة قائلاً: «لقد بدأنا رحلتنا فعليًّا ومن أجل النجاح في هذه الأيّام الصعبة التي تمرُّ على لبنان والشرق الأوسط، يترتّبُ علينا أن نعملَ معًا، وبنوع خاص كأكبر جامعتين في لبنان، من أجل إنتاج المعرفة وتأمين فرص عمل أكثر للشباب

اللبناني ذو المهارات العالية. يجب أن يكون تحالُفُنا قدوة لسائر الجامعات.» وقد شدّد البروفسور خوري على أهميّة الانفتاح في الجامعتين إذ قال أنّ «جذور جامعتينا مسيحيّة طبعًا إنّما شرّعنا أبوابنا لكافّة الديانات.» كما أنّه ذكّر بخرّجي الجامعتين «فخرّجتُ كلتا الجامعتين رؤساء جمهوريّة ورؤساء مجلس الوزراء في لبنان والعالم العربي. هدف الشراكة بيننا هو التعاون في كافّة المجالات الأكاديميّة والبحثيّة.» وأهميّة هذه الشراكة بحسب ما ورد في كلمة فضلو أنّها «تمنحنا تآزرًا يقودنا نحو التفوّق في مجال الصحّة والعلوم الإنسانيّة والإجتماعيّة والهندسيّة.»

واستهلّ المحاضرات العلميّة البروفسورُ جاك بلغيتي، ضيف المؤتمر ومندوب الهيئة العليا للصحّة في فرنسا إذ تحدّث في كلمته عن الابتكارات الجديدة في عالم الطبّ عامّة والجراحة خاصّة، وتطويرها في كافّة المجالات البحثيّة التطبيقيّة منها والسريريّة، كما عرض مجموعة من الاقتراحات عن طرق تحسين العلاج وإطالة الحياة في بعض الحالات المرضيّة المزمنة.

أمّا المحاضرون فتطرّقوا إلى أبحاث عملوا عليها ضمن فرق ذات خبرات عالميّة. وأكدوا من خلال محاضرتهم على أهميّة التعاون بين الأطباء والباحثين والمهندسين الطبيّين للتوصّل إلى حلول مفيدة عبر استعمال الذكاء الإصطناعي في متابعة بعض الأمراض، والتكنولوجيات المبتكرة لاكتشاف مبكر لأنواع جديدة من السرطان، وعلاجات محتملة لأمراض منتشرة بكثرة كالسكّري، وفي علم الوراثة والفيزيولوجيا وسرطان الثدي ومواضيع بحثيّة أخرى ممّا يبعث فينا الأمل لإيجاد حلول لمشاكل صحيّة خطيرة ومميتة.

لا تنحصر أهميّة هذا المؤتمر في الأحداث الآنيّة فقط، إنّما تتوسّع لتشمل ما سينتج عنه من نشاطات مشتركة بين الجامعتين وجمع القدرات وتوحيد الجهود على النطاق الإنسانيّ والتكنولوجيّ ضمن إطار الأبحاث المفيدة على مستوى المجتمع عامة.

جريدة النهار، شباط ٢٠١٨



Memorandum Of Understanding

AUB-USJ

January 16, 2018

For the first time in Lebanon, the two oldest universities of Beirut: the American University of Beirut (AUB) and the Saint-Joseph University (USJ) signed the «Memorandum of understanding» on the 16th of January 2018 in the presence of Ministre Marwan Hamadé (Minister of Education and Higher Education) representing the President of the Lebanese Republic, General Michel Aoun.

The speeches of Pr. Salim Daccahe, Rector of the USJ and Pr. Fadlu Khuri, President of the AUB, pronounced on this occasion.

Pour la première fois au Liban, les deux plus vieilles universités du pays, l'Université Américaine de Beyrouth et l'Université Saint-Joseph de Beyrouth, ont signé le 16 janvier 2018 un accord de collaboration, en présence de son excellence monsieur Marwan Hamadé, ministre de l'éducation et de l'enseignement supérieur, représentant le président de la république, le général Michel Aoun.

Les discours du Pr Salim Daccahe, recteur de l'USJ et du Pr Fadlu Khuri, président de l'AUB, prononcés à cette occasion.

كلمة البروفسور سليم دكاش اليسوعي،

رئيس جامعة القديس يوسف في بيروت

عند توقيع «مذكّرة تفاهم» بين الجامعة الأميركيّة في بيروت وجامعة القدّيس يوسف في بيروت، يوم الثلاثاء الواقع فيه ١٦ كانون الثاني (يناير) ٢٠١٨، في الساعة السادسة والنصف مساءً، في «ماركاند هاوس» في الجامعة الأميركيّة.

فخامة رئيس الجمهوريّة ممثّلاً بمعالي وزير التربية والتعليم العالي الأستاذ مروان حماده،

حضرة رئيس مجلس أمناء الجامعة الأميركيّة وأعضاء المجلس،

حضرة رئيس الجامعة الأميركيّة في بيروت،

حضرة أعضاء المجلس الاستراتيجي لجامعة القديس يوسف في بيروت،

حضرات نوّاب الرئيسين، والعمداء، والمدراء، والأساتذة،

أيّها الأصدقاء، سيّداتي سادتي،

خلال الحرب العالمية الأولى، ولمئة سنة خلت، قال الرئيس المؤسس للجامعة الأميركية في بيروت: «من كان يحلم ولو للحظة أن يكون بيننا هذه المجموعة من الآباء اليسوعيين، خصوصًا الفرنسيين منهم بيننا يقطنون في «البوست هاوس»؟ وكان ذلك إشارة إلى التهجير القسري لأهل الجامعة اليسوعية آنذاك وقد وجدوا ملجأ في حَرَم الجامعة الأميركية بعد سنوات طويلة من الصراع بين الكاثوليك والإنجيليين. وأقول اليوم من كان يحلم بأن نجتمع ها هنا في قلب الجامعة الأميركية، وفي «الماركند هاوس» بالذات، أي في بيت رئيس الجامعة للتوقيع سوية على «مذكّرة التفاهم» هذه التي هي أكثر وأبلغ من مذكّرة والتي تفتح الباب لعمل عظيم بين الجامعة الأميركية في بيروت والجامعة اليسوعية البيروتية الأصل والمكان.

أيّها الأصدقاء،

لا يمرُّ أسبوع في عملنا الجامعي إلا ونوقع إتفاقًا من هنا ومن هنالك، فنعتز بأن سجّل جامعتنا مليء بالاتفاقات مع الجامعات الأخرى وأن لمؤسّساتنا بُعدًا دوليًّا فريدًا من نوعه يدخل ما نسمّيه عولمة التعليم العالي وقدرته على أن يستقبل طلابًا وأساتذة من الأقاصي وأن يمنح الشهادات ذات الجودة والقيمة العالية والعالميّة والتي تؤهّل من يحملها أن يعمل على المساحة الكونيّة من دون إشكال. إلا أنّ هذه المذكّرة اليوم، وقد تحدّث الرئيس فضلو عن تفاصيل محتواها ومحدوديّة مساحتها، لها نكهتها الخاصّة لأنّ فيها بعض الخصوصيّة والجماليّة المستحبّة.

فهذه المعاهدة وإن طال انتظارها إنّما تأتي من تاريخ طويل، هو تاريخ حملناه معًا، حتى ولو لم نصنعه سويّة ضمن شراكة مجدّدة، إلاّ أنّ الواقع يقول إنّ المتخرّجين من جامعتينا، أولئك الذين حصلوا على المهارات والكفاءات من مقاعد الدراسة، إنّما عملوا على إنماء هذه البلاد وغيرها من البلدان بروح من العطاء وبذل الذات وتجاوز المصاعب والعقبات. هذا التاريخ الطويل لا أريد أن أراه صراعًا بين مؤسّستين أو بين نهجين تربويّين مختلفي الطرق والأساليب واللّغة، بل إنّنا نرى فيه شيئًا من التكامل الذي عاد بالفائدة على المؤسّستين بالذات وكذلك على المجتمع اللبنانيّ والعربيّ والشرقيّ، لأنّ الخير الذي أتى على يد الجامعتين إنّما تجاوز حدود بيروت ليصل إلى مختلف بقاع الشرق وتجاوز حدودها كذلك. وهذا التاريخ بالذات، الموسوم بذكرى المئة والخمسين سنة لتأسيس الجامعة الأميركيّة والمئة والثلاثة وأربعين عامًا للجامعة اليسوعيّة، هو الذي ينادينا اليوم، بما فيه من إنجازات وربّما من إخفاقات، لمزيد من الوعي لمسؤوليّاتنا حيال التعليم الجامعيّ العام في لبنان ليكون حاملاً رسالة هي رسالة المجودة والتربية المتكاملة، والإنسانيّة والمواطنيّة والمهنيّة فيستمرّ هذا التعليم عاملاً على صقل رأسمال لبنان والعالم العربيّ، الذي لا بعده رأسمال ألا وهو رأسمال الموارد البشريّة الكفوءة القادرة على تطوير صناعة المعرفة واقتصاد المعرفة، ووضع هذه المعرفة في خدمة نموّ الشعوب والمجتمعات.

وهذه النكهة الخاصة في توقيع هذه المذكّرة لا بل الآتية من المذكّرة بالذات، تأتي منك مباشرة حضرة الرئيس فضلو خوري، الأخ والصديق، لأنّك أردت أن توثّق العلاقات بين الجامعتين لا من عاطفة معيّنة أو مصلحة آنيّة بل ضمن رؤية متكاملة تحدّثنا فيها أكثر من مرّة خلال لقاءاتنا. فلا يجوز، كما تقول، أن نكون أسرى واقع جديد صار فيه تأسيس الجامعات في لبنان خاضعًا لمنطق النظام الإقتصاديّ الليبراليّ، بل إنّه من الضروري أن تكون للمؤسّسات الجامعيّة التي تراكمت لديها خبرات الماضي وقيم الرسالة التربويّة أن يكون لديها الجرأة في تسلّم زمام المبادرة للعمل معًا، من ضمن روحيّة التضامن والمعاهدة والتحالف، من أجل أن يبقى وجه التعليم الجامعيّ في لبنان، وهو وجه المؤسّسات التعليميّة الجامعيّة التي لا تبغي ربحًا، وجه المؤسّسة العاملة على نجاح الطالب والتي لا همّ لها سوى أنّ الشهادة التي تمنحها هي موسومة بالجودة والامتياز والتي لا هدف لها إلاّ تكوين شخصيّة الطالب والمواطن المنفتح على صَنُوه وعلى المختلف عنه دينًا أو ثقافة أو لونًا.

إنّها المؤسّسات التي لا وجهة لها سوى إعلاء شأن البحث العلميّ الأساسيّ والعمليّ الضروريّ للتعليم فيلعب لبنان ومؤسّساتنا الجامعيّة الدور الرياديّ في تقوية عالم المعرفة واقتصادها، وأودّ أن أضيف أنّ روحيّة هذا التحالف لا تقتصر على جامعتينا بل إنّها مفتوحة على أولئك الذين يريدون الإسهام في تقوية جسم التعليم الجامعيّ على قواعد العطاء والجديّة واحترام الأمانة والشرعة التربويّة اللبنانيّة، والتي تميّز بين العمل والمجاهدة في سبيل الحقّ والحقوق وبين التكفير والهمجيّة والبربريّة في النظرة إلى الأخر. في هذا المضمار لا بدّ أن نعمل للموازنة بين البحث العلميّ في مجال العلوم الطبيّة والبيولوجيّة والتكنولوجيّة وبين البحث العلميّ في مجال العلوم الطبيّة والبيولوجيّة والتكنولوجيّة وبين البحث العلميّ في مجال الأداب والعلوم الإنسانيّة وهو كان ولا يزال من اختصاص رسالة جامعتينا، وكم نحن بحاجة إلى تعزيز هذا البحث في وقت نسأل ذواتنا عن أي إنسان نريد أن نكون وأن نربّي وعن أي مجتمع نريد أن نشكّل ولماذا هذا العنف كلّه في مجتمعاتنا، وفي وقت أصبحت فيه العصبيّة التي فينا أخطر بكثير من الأميّة الهجائيّة، وهي عصبيّة رأيناها ونراها تقضي على الأخضر واليابس وعلى الهويّات المنفتحة والأوطان القائمة على التعدّديّة في تكوينها، وهذه مجالات لا بدّ أن نكون جريئين في طرق أبوابها والسعى إلى فتح آفاق جديدة للإجابة عن الأسئلة التي تهدّد الواقع والمصير.

سيّداتي سادتي،

عندما نصل إلى القلم لتوقيع معاهدة وعلى وجه الخصوص هذه المذكّرة التي تجمع بين مؤسّستينا، وبين قلوب تخفق أمام هذا الحدث الهام، فإنّما ننظر شاكرين إلى أولئك الذين عملوا واللواتي عملن جاهدين في مراجعة النصّ والتدقيق فيه ليكون له الشكل المثالي الذي نحن بحاجة إليه. فشكري يتوجّه إلى البروفسور محمّد حراجلي والبروفسور هلا مُحتسب من الجامعة الأميركية، وإلى البروفسور دولا سركيس من جامعتنا وكذلك إلى البروفسور لارا كرم بستاني لمراجعتها القانونيّة لهذا النصّ وكذلك إلى البرقسود المخفيّين والجنديّات المخفيّات الذين أعدّوا لهذا الاحتفال، ولهذه الساعة، من أهل الإدارة والإعلام والتواصل، ممتنّين لفخامة رئيس الجمهوريّة أنّه كلّف معالي الوزير مروان حماده، صديق الجامعتين وحتى وإن كان من قدامى الحقوق في اليسوعيّة، أن يمثّله في هذا الاحتفال.

وإن أردت الختام، فإنّما أذكر معكم وأمامكم هذه الكلمة للأب جان دوكرييه الذي أرسى قواعد الإدارة الحديثة لجامعتنا في السنة ١٩٧٥: إنّ ما أسّس لعمل الجامعة الأكاديميّ ولنجاحها في هذا المضمار هو تلك الحريّة التي تتميّز بها منذ انطلاقتها. فلا بدّ أن نحافظ عليها أمام الغلواء أكانت طائفيّة أم قوميّة أو رأسماليّة. ولقد قال دانييل بلس كلامًا مشابهًا لهذا التصريح مباني عند تأسيس الجامعة في رأس بيروت في السنة ١٨٨٠. فهذه الحريّة تبقى اليوم أساسًا لعملنا وكلّ ما بين أيدينا من قوّة وموارد وكلّ علاقاتنا وحتى هذه المعاهدة اليوم إنّما تدفعنا إلى تربية الأجيال على حريّة الفكر والكلمة بحيث إنّ إبداع العالم الجديد في لبنان والعالم العربيّ هو أمانة بين أيدينا وهو في صلب رسالتنا. لقد أصبحت المذكّرة واقعًا، فالكرة أصبحت اليوم بين أيدي اللاعبين الباحثين بين الأساتذة في جامعتينا لتتحوّل النوايا إلى أفعال وإلى تراكم معرفة ومحبّة وثقة تؤسّس لتاريخ جديد ينضم إلى تاريخ سابق. فلنبن معًا هذا التاريخ من أجل أن نجدد شباب خدمتنا ورسالتنا.

President Dr. Fadlo R. Khuri Speech at MOU between AUB and USJ

January 16, 2018

Esteemed colleagues of Lebanon's two greatest universities,

The German man of letters Johann Wolfgang von Goethe wrote in his masterpiece Faust: "There are but two roads that lead to an important goal and to the doing of great things: strength and perseverance. Strength is the lot of but a few privileged men; but austere perseverance, harsh and continuous, may be employed by the smallest of us and rarely fails of its purpose, for its silent power grows irresistibly greater with time.

As I said in my inaugural address as AUB president two years ago, for far too long AUB, the oldest university in Lebanon, has neglected to acknowledge or work together with its exceptional siblings in this country. The two and one half years that I have spent as AUB president may have been among the most intense and exhilarating of my life, but that time has done nothing to change my viewpoint that Lebanon's higher education sector must align itself more in order to reinforce our common goals, needs, and purpose. If we are going to succeed in this challenging environment, I believe strongly that we must work together as a team—a body whose sum is greater than its component parts—to produce new knowledge and provide new opportunities for all of our extraordinary and ambitious graduates.

While Lebanon has seven or eight universities of note, it is no leap of faith to say that l'Université SaintJoseph is by some distance our closest sibling. Our ages are similar: AUB turned 150 two years ago, and USJ turns 150 in 2025, I believe. We have both pioneered medical education in this region and continue to produce outstanding doctors and to care for our patients to worldclass standards. It is fair to say that together USJ and AUB have cornered the market in educating the great names and history makers that this country has produced—USJ may outnumber us on presidents of the republic and others in Lebanon's high political echelons, while I think we have the edge on prime ministers, and Palestinian revolutionaries. I do not believe either institution can boast a Nobel laureate or an Oscar winner... yet! But I have no doubt that several of those must be in the pipeline. We both have our roots in the Christian tradition, although AUB went from Protestant to emphatically secular in the early 20th century, and Saint Joseph has kept its affiliation to Catholicism, while both have opened up access to students of every religion, or of no religion at all. Perhaps the most striking difference between us is the use of the medium of the French language at USJ and our use of English as the language of tuition at AUB. But no doubt both our student bodies will routinely use not just two but three languages rolled into one! Maître! El fetoura, please!

Seriously, it defies logic that USJ and AUB have had so little to do with each other over our long and illustrious histories. Why has there been no Lebanese equivalent of Oxbridge until now, or the United States' Big Three? Of course the answer is complex, just as the makeup and history of Lebanon is complex. But that is also why today is such an important, even historic, moment in the

history of our country—as Lebanon's two premier seats of higher learning come together in a spirit of sincere partnership and sign this memorandum of understanding linking our two universities.

Returning to Faust, Goethe wrote (and this time I have the original German): Was heute nicht geschieht, ist Morgen nicht getan... let me revert to the Irish poet John Anster's translation:

Are you in earnest? Seize this very minute - What you can do, or dream you can, begin it,

Boldness has genius, power, and magic in it, Only engage, and then the mind grows heated - Begin it, and the work will be completed.

Yes, our work is bold, and self-confident, and ambitious, and all-encompassing. In this era of higher education, nobody can or should ever corner the market on excellence. And building higher and higher walls against the outside world is not only unwise; it is a surefire policy for ultimate irrelevance in my view. Nor do we seek partnerships with our partner universities, in Lebanon and all around the world, as a defensive measure, to cover one another's weaknesses. It is genuinely a path to synergy in areas in which each side is outstanding, be it health, the humanities, the arts, science, business or engineering. This partnership between l'Université Saint-Joseph and the American University of Beirut will impact our students and our faculty and staff; it will impact our region; it will impact our research, teaching and service missions; and it is no exaggeration to say that it can impact the world. Indeed as we come together as a band of academic brethren and sisters, we are creating real value for our societies and a viable path forward towards a real, participatory democracy where the ultimate goal is a meritocracy, a society of enlightened peers.

I would like to thank the AUB team who have helped bring this MOU to fruition and for the hard work we are going to do on our side to ensure this partnership fulfils our expectations and its full potential. And I would especially like to thank my friend and brother, Pere Professor Salim Daccache, his outstanding leadership team, and the faculty, staff and students of USJ, for their engagement in this partnership which is so important to this country and this region.

Thank you, and congratulations to all. The best of these two great universities, and the best of and for Lebanon, is surely yet to come!

Media Coverage

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aub-أفسام-أخرى/تربية-شباب/حماده-يخ-توقيع-إتفاقية-بين-الaub-أفسام-أخرى/تربية-شباب/حماده-ين-الجامعتين-جعل-من-لبنان-ما-هو-عليه-اليوم