Curriculum Vitae

KARAM Layal

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I. Personal information

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+961 04 406 426
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lkaram@ndu.edu.lb

II. Education

2009-2013: PhD in Food Science and Technology, Engineering of Biological Functions Department, ProBioGEM and UMET laboratories, Doctoral School for Science of Matter, Radiation and Environment, Lille 1 University - Science and Technology, France

Qualifications from the Ministry of Higher Education and Research in France:
- Section 31 - Theoretical chemistry, physics, analytics
- Section 33 - Chemistry of materials
- Section 64 - Biochemistry and molecular biology
- Section 68 - Biology of organisms

2004-2005: Master II of Science in Quality Control & Management, “Agrofood” sector (Diplôme d’Etudes Approfondies (DEA) awarded and decreed under the seal of “Institut National Agronomique Paris-Grignon” (INA P-G) and “Institut National de la Recherche Agronomique (INRA-France) in collaboration with Saint-Joseph University, Saint-Esprit de Kaslik University and Lebanese University

2003-2004: Master I of Science in Chemistry, Major: General Chemistry, Faculty of Sciences - Lebanese University

III. Experience

December 2014 – June 2015: Project Development coordinator at arcenciel (Beirut, Lebanon)
- Evaluation of needs and proposition of tailor-made R&D projects for the agriculture program
- Communications and presentations to develop collaboration projects with the academic and industrial fields
- Technical support and follow-up activities for the dairy processing plant in Taanayel

July 2013 – April 2014: Postdoctoral researcher at Ecole Nationale Supérieure de Chimie de Lille (ENSCL) (Lille, France)
Management of 2 research projects in agrofood and in surface treatments
Setting up collaboration projects between academic partners, industrials and the European Union

September 2009 – July 2013: PhD candidate at ProBioGEM and UMET laboratories (Lille, France)

Setting up antimicrobial surfaces and innovative active food packaging to improve the safety, quality and shelf-life of packaged foods

Funding: Scholarship funded by the European Union (Erasmus)

The globalization of food trade and changes in lifestyles present new major challenges for food safety. Setting up active packaging, via antimicrobial peptides adsorption on materials, is an innovative and proactive approach to improve the safety, quality and shelf-life of packaged foods. Such improved antimicrobial strategies might also benefit the biomedical industry where the bacterial infection and implants can cause life-threatening illnesses. The development of those processes requires a multidisciplinary approach and expertise in the fields of chemistry, microbiology, physics and materials sciences. Peptides adsorption on surfaces and the antimicrobial activity of the functionalized materials depend mainly on surface properties, on surface treatments allowing the modification of such properties and on the peptides-materials-bacteria interactions. In this thesis, nisin, an antilisterial bacteriocin, produced by Lactococcus lactis subsp. lactis was used as the antimicrobial agent. The selected packaging was the low density polyethylene, a commonly used packaging in the food and biomedical sectors. Different cold plasma processes were optimized to develop surfaces with various characteristics and specific functionalities needed for the adsorption studies. Physicochemical surface characterization techniques permitted from one side, to confirm the surface functionalization by surface treatments and by nisin and from another side, to study the surface interactions. The antimicrobial study was undertaken to compare and confirm the antimicrobial activity of the different treated packaging. This work was also carried out against some food pathogens and at refrigeration temperature in order to assess possible future food packaging applications.

Finally, the multidisciplinary aspect of this work entailed the collaboration between different partners: laboratoire Procédés Biologiques, Génie Enzymatique et Microbien (EA 1026), Unité Matériaux et Transformations (UMR-CNRS 8207), Unité de Chimie et de Catalyse du Solide (UMR-CNRS 8181), laboratoire Procédés d’Elaboration Revêtements Fonctionnels (UMR-CNRS 8008) at Lille 1 University - Science and Technology, in addition to laboratoire Biopolymères Interactions Assemblages (BIA, INRA) at Nantes, laboratoire Chimie des Surfaces et Interfaces du CEA at Saclay and the Innovation Department, Antimicrobial Applications of DuPont – Danisco, Nutrition and Health in England.

Food Safety Project (Phase II) - for the implementation of food safety systems, Good Manufacturing Practices, HACCP plans, ISO 22000… for industries especially in the field of meat and dairy sectors

January 2006 – August 2009: Manager of a Pilot Plant for research & development - ASAIL project - ACDI/VOCA (Beirut, Lebanon)
This project was designed and implemented by ACDI/VOCA under the USAID-financed “Expanding Economic Opportunities” in Lebanon in collaboration with Vitech Consulting s.a.l. and the Chambers of Commerce, Industry & Agriculture in Tripoli, Saida & Zahle.

Brief description of job experience:
Over the course of ASAIL project, I worked in following through the details of the establishment and spin of the pilot plant in Tripoli. The major highlights of this period had been researching for new technologies & equipments specifications, procuring suitable equipments, ensuring the proper installation and establishment of the pilot plant to meet international standards and requirements, establishing contact with SMEs “Small & Medium Enterprises”, Cooperatives and producers, developing technical skills in improving targeted products, attending local and international exhibitions, working with local & international experts, identifying international market potential, working on packaging specifications, attending tailor made extensive trainings, implementing ISO 9001 system for the pilot plant and finally acquiring the skills to work on improving & developing new products in the food sector among them: distillates, honey, pomegranate concentrate and essential oil.

The Pilot Plant services included research & development projects, consultancy on technologies and equipments for plants, technical assistance and training (for small & medium enterprises and women cooperatives on GMP, GHP, food safety and product improvement…), taste panels and sensory evaluation for products in the food sector, working with local and international consultants, cooperation with local and international institutions, nutrition facts labels for food products…

April – September 2005: Internship at Institut de Recherches Agronomiques Libanais. Dissertation title: «Valorisation agronomique des eaux de végétation des olives (margines)» -

May – July 2004: Master thesis project at Faculty of Sciences, Lebanese University. Dissertation title: «Physique des réacteurs nucléaires - Notions Générales» -

IV. Professional and capacity building trainings

2014: Professional training “Characterization and formulation of pharmaceuticals”, 16-20 June 2014, École Thématique CNRS, Val Joly, France

2006-2009: Attending 34 workshops and tailor-made trainings in the field of: Traceability, Food Safety & Good Manufacturing Practices, Quality Improvement Tools, Value Chain training, Packaging & Labeling, Hazards Analysis and

V. Teaching activities

➢ Notre Dame University - Louaize (NDU) - Faculty of Nursing & Health Sciences, Lebanon

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<thead>
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<th>Type</th>
<th>Year</th>
<th>Degree</th>
<th>Course</th>
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<td>Bachelor</td>
<td>Food Quality Management</td>
<td>45 h</td>
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<td>Teaching courses</td>
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<td>Master</td>
<td>Advanced Food Quality Management</td>
<td>45 h</td>
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<td>Teaching courses</td>
<td>2017-Current</td>
<td>Master</td>
<td>Advanced New Food Product Development</td>
<td>45 h</td>
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<tr>
<td>Projects</td>
<td>2017-Current</td>
<td>Bachelor</td>
<td>Project in Food Safety &amp; Quality Management</td>
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➢ American University of Beirut (AUB) - Faculty of Agricultural & Food Sciences, Department of Nutrition & Food Sciences - Lebanon

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<th>Year</th>
<th>Degree</th>
<th>Course</th>
<th>Number of hours</th>
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<tr>
<td>Teaching courses</td>
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<td>Bachelor</td>
<td>Food Chemistry</td>
<td>45 h</td>
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<tr>
<td>Teaching courses</td>
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<td>Bachelor</td>
<td>Food Microbiology</td>
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<tr>
<td>Practical laboratory</td>
<td>2015-2017</td>
<td>Bachelor</td>
<td>Food Microbiology</td>
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➢ Université Saint Joseph (USJ) - Faculté d’ingénierie - Ecole Supérieure d'Ingénieurs Agroalimentaires (ESIA) - Lebanon

➢ Université Saint Joseph (USJ) - Faculté de Pharmacie - Lebanon

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<th>Number of hours</th>
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<td>Master</td>
<td>Food additives</td>
<td>21 h</td>
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<tr>
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<td>2015-2017</td>
<td>Master</td>
<td>Food Inspection</td>
<td>21 h</td>
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- **University of Balamand (UOB) - Professional Master courses, Lebanon**

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<th>Course</th>
<th>Number of hours</th>
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<tbody>
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<td>Master</td>
<td>Food science and technology</td>
<td>45 h</td>
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<tr>
<td>Teaching courses + Practical work</td>
<td>2014-2016</td>
<td>Master</td>
<td>Food Analysis</td>
<td>45 h</td>
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<tr>
<td>Teaching courses</td>
<td>2015-2016</td>
<td>Master</td>
<td>Food Microbiology</td>
<td>45 h</td>
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- **American University of Technology (AUT) - Lebanon**

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<th>Number of hours</th>
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<td>Bachelor</td>
<td>Nutrition</td>
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<td>Teaching courses</td>
<td>2014</td>
<td>Bachelor</td>
<td>Biology</td>
<td>45 h</td>
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<tr>
<td>Teaching courses</td>
<td>2015</td>
<td>Bachelor</td>
<td>Food processing</td>
<td>45 h</td>
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<tr>
<td>Teaching courses</td>
<td>2015</td>
<td>Bachelor</td>
<td>Food Microbiology &amp; Safety</td>
<td>45 h</td>
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- **Lille 1 University - Science and Technology**, University Institute of Technology ‘Sécurité et Qualité en Alimentation’, France

- **Lille 1 University - Science and Technology**, Polytech ‘Génie Industriel Alimentaire’, France

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<th>Year</th>
<th>Degree</th>
<th>Course</th>
<th>Number of hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching courses</td>
<td>2013</td>
<td>Bachelor</td>
<td>Food safety and quality</td>
<td>21 h</td>
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<tr>
<td>Practical work</td>
<td>2014</td>
<td>Master</td>
<td>Process engineering</td>
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VI. Publications and scientific communications

**Publications : Papers in international peer-reviewed scientific journals**


**Communications in national & international conferences**

**Oral presentations**


- Seminar “**Current food safety & quality challenges - Role of active & intelligent packaging**” - Department of Food Science and Technology - Aristotle University of Thessaloniki, Greece, 1 December 2016.

- Invited lecturer “**Erasmus + International Credit Mobility Programme**” - Department of Food Science and Technology - Aristotle University of Thessaloniki, Greece, 21 November - 3 December 2016.


Congress « Journées Franco-Libanaises, Physique et Interfaces », organized by Lille 1 University and Lebanese University, Villeneuve d’Ascq – France, 18 – 21 October 2011.

Poster presentations

Conference « Nutrition and Food Research Conference Trends and Challenges in the Middle East », organized by Lebanese American University (LAU), 12 April 2016.


VII. Skills and expertise

Methods, processes and analytical tools

- Treatments and processes:
  - Different processes in the food industry (dairy products, meat & poultry, ready to eat meals…)
  - Surface treatments for setting up packaging materials (cold plasma, covalent grafting of polymer films on surfaces…)
  - Setting up of antimicrobial surfaces
  - Essential oils extraction methods: hydro-distillation, steam distillation, vacuum distillation, solvent extraction…
- **Physico-chemical techniques:** XPS, ToF-SIMS, AFM, SEM, FTIR, HPLC, colorimetric methods, surface energy and contact angle measurements, Zêta potential and routine tests for food quality control...
- **Microbiological techniques:** qualitative and quantitative tests for measuring the antimicrobial activity, Microbiological examination and testing of foods
- **Other analytical methods:** optimization by experimental designs and statistical methods

**Communication**

- Coordination and follow-up of collaborations inter-laboratories and inter-industrials
- Presentations in international (5) and national conferences (3)
- Preparation and delivery of tailor-made trainings for industrials and academics (4)
- Organization of stands in international exhibitions and trade shows (6)

**Management of R&D projects - processes**

- Improvement of existing products and development of new products from the concept idea to commercialization
- Expertise in microbiology chemistry, materials and applied food sciences
- Monitoring and review of scientific, technological and regulatory development
- Planning of production and budget control
- Staff management and trainings (students, operators and engineers)
- Reporting, data analysis and synthesis

**Quality control and management**

- Implementation and review of quality management systems: ISO 9001, ISO 22000, HACCP
- Quality assurance: definition and preparation of technical specifications, conformity and validation…
- Development and validation of analytical testing methods

**Language and computer skills**

- **Computer skills:** Word, Excel, PowerPoint, Access, statistical software (SAS, SPSS, Minitab, Stat graphics, Modde), Nutrition Facts Software…
- **Trilingual:** English (TOEFL : 100/120), Arabic, French – Fluent

**VIII. Research activities & Supervision of students and trainees**

- **Research theme:** Safety assessment of meat and chicken in the Lebanese Retail Market
  Master II thesis project: University of Balamand
  **2016-2017 (6 months), Jina Yammine**
- Research theme: Natural preservation and shelf-life of ready-to-eat Hummus
  Master II thesis project: University of Balamand
  2016-2017 (6 months), Patricia Dahdah

- Research theme: Characterization of the microbiological, physicochemical and sensorial properties of Labneh
  Master II thesis project: University of Balamand
  2016-2017 (6 months), Ralph Almaarrawi

- Research theme: Effect of essential oils and packaging on the quality and shelf-life of fresh chicken Taouk and fresh beef Shawarma
  Master II thesis project: collaboration project between University of Balamand and American University of Beirut
  2016 (6 months), Rayane Roustom
  2016-2017 (6 months), Rayane Chehab

- Research theme: Development of new innovative packaging to improve the safety and quality of nuts
  Master II thesis project in collaboration with University of Balamand (Lebanon) and Kazzi nuts
  2015 (6 months), Ronza Saade

- Research theme: Study of interactions between nisin and the polyethylene for setting up active packaging against Listeria spp.
  In collaboration with ProBioGEM and UMÉT laboratories, Lille 1 University (France)
  2012 (6 months), Samir Boukla
  Master II thesis project, ProBioGEM laboratory, Lille 1 University

  2012 (6 months), Érica Christ Petterle
  Master II thesis project, UMÉT laboratory, Lille 1 University

  2011 (2 months), Joanna Sakellariou
  Internship exchange program, Department of Food Technology, Technological Educational Institute of Athens (Greece)

  2010 (3 months), Marie Crombet
  Internship project for second year engineering students, Ecole Nationale Supérieure de Chimie de Lille, Lille 1 University

  2009-2010 (4 months), Maud Millet & Mélanie Mora
  Internship project for third year engineering students, Ecole Nationale Supérieure de Chimie de Lille, Lille 1 University

  2009 (6 months), Illona Dagdalianidou
  Master II thesis project, Aristotle University of Thessaloniki (Greece)

- Research theme: Study of rose water extraction (Rosa x damascena Miller) - Optimization of the traditional method -
In collaboration with Saint - Joseph University (Lebanon)

2008 - 2009 (6 months), Hicham Mohammad
Master II thesis project in industrial technology, Faculty of Sciences, Saint - Joseph University

2007 - 2008 (6 months), Roman Achkar
Master II thesis project in food chemistry, Faculty of Sciences, Saint - Joseph University

- Research theme: Study of the quality of pomegranate concentrate obtained by different procedures
  In collaboration with Lebanese University

2008 – 2009 (6 months), Yasmine Jabali
Master II thesis project, Faculty of Sciences II, Lebanese University

- Research theme: Carob bean gum extraction from two varieties Kheshabi and Sandali and technological contribution to the separation of the carob seed components
  In collaboration with Lebanese University

2009 (6 months), Yves Chartouni
Final thesis project for Agricultural engineer diploma, Faculty of Agronomy, Lebanese University

2008 (6 months), Antoine El Hachem
Final thesis project for Agricultural engineer diploma, Faculty of Agronomy, Lebanese University

IX. Awards & Certificates

Communication award for presenting an innovative project, Forum « Doctoriales franco-belge 2011 » (Marcq-en-Barœul, France, 22-27 May)

25 certificates in the field of food safety, GMP, HACCP, ISO 22000, quality control & management and food related processes (Certificates available upon request)

X. Collective responsibilities

Representative of PhD students in the hygiene and security committee of ProBioGEM laboratory (2010-2011)

XI. Other experience

Vice-president of the Lebanese students’ association in Lille (2010-2011), presenter and volunteer organizer of cultural activities