

## PhD Thesis proposal

| General Information           |  |   |
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| PhD Thesis Title              | <b><i>Assessment of the Magnitude for Overweight and Obesity, and its Determinants: Development of Preventive Strategy, Health and Nutritional Education Program for Children in Lebanon</i></b> |   |
| School                        | <b><i>Faculty of Agricultural and Food Sciences</i></b>  |   |
| Research Unit                 | NA   |   |
| Laboratory                    | NA   |   |
| Axis                          | <b>Public Health</b>   |   |
| PhD Supervisor                | Name & Title : Dr. Sophie Julien<br>Associate Prof<br>Email:<br>sophejuliensukarieh@usek.edu.lb  | University Address: Faculty of Agricultural and Food Sciences, Department of Human Nutrition and Dietetics - USEK |
| Co-supervisor (if applicable) | Name & Title: Dr. Nathalie Estephan<br>Associate Professor<br>Email nathaliestephan@usek.edu.lb  | University Address: Faculty of Sciences Holy Spirit University of Kaslik- USEK                                    |
| Location (s)                  | Location 1: USEK   | Work shift calendar /per year (%):  |
|                               | Location 2: (if applicable)  | Work shift calendar /per year (%):  |
| Funding and scholarship       |  |   |

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| Applicant Profile and/or Special Requirements | <p><b>Profile:</b> Dieticians with a master's degree in Public Health</p> <p><b>Special Requirements:</b></p> <ul style="list-style-type: none"> <li>- Contact details of 3 referees (academic and/or professional)</li> <li>- Applicants with particular interest in empirical research in survey, statistical analysis skills and chemistry</li> <li>- Full-time (3/4 free time) applicant is highly recommended</li> </ul> |
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| Subject's national or worldwide Context, Objectives & Research lines  |
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| <p><b>Word count limit: 300 words</b></p> <p><b>Background:</b> Childhood obesity rates has dramatically increased worldwide and has been observed becoming epidemic in Lebanon, increasing the prevalence of hypertension and/or diabetes among children. Glucosuria is often tied to diabetes but it is still unclear whether it can be associated with hypertension. <b>Objective:</b> This doctoral research project aims mainly at identifying predisposition factors of childhood overweight, and fostering the development of preventive strategy in order to enable early diagnostic of hypertension in overweight children.</p> <p><b>Specific aims:</b> The research objectives will be accomplished by focusing on four specific aims:</p> |

1) Address the prevalence of overweight in young children with their biological, environmental and behavioral contributors. 2) Evaluate and/or determine the association of overweight and hypertension with urinary biomarkers and/or glucosuria. 3) Correlate the systematic presence of urinary biomarkers with overweight and/or hypertension to develop a non-invasive early screening of risk factors for diabetes and/or obesity. 4) Develop and validate a nutrition program to promote wellness and good lifestyle habits for children in Lebanon. **Study design:** First, six to twelve year-old participants will be recruited in schools upon parent’s consent. The combination of anthropometric and cross-sectional studies will assess the prevalence of hypertension, diabetes in overweight or obese children, and its determinants through a thorough diet monitoring. Second, metabolomics will aid to identify urinary biomarkers to develop potential screening tools in the diagnostic of hypertension in overweight children. All together, these results will help in deciphering the yet unclear relationship between risk factors and glucosuria in childhood. **Impact:** This research will provide an innovative approach to assess the nutritional status associated with overweight and /or hypertension in young children in Lebanon. The proposed experiments may unveil new urinary biomarkers for the early detection of hypertension associated with diabetes and/or obesity relevant as a primary preventive strategy to reduce obesity and diabetes in young Lebanese.

| Outcomes (OCs) : What do we wish to achieve? |   |
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| OC1:   | Determine the prevalence of overweight, obesity associated with hypertension and/or glycosuria in children aged 6 to 11 in Lebanon  |
| OC2:   | Identify and compare urinary biomarkers between overweight or obese children with normal-body weight children for association of glucosuria with hypertension using metabolomics. |
| OC3 :  | Validate glycosuria as a screening tool for diabetes, obesity and/or hypertension   |
| OC4 :  | Develop preventive strategy and nutritional education programs  |

| References (R) ( 5 most recent peer-reviewed publications) |  |
|--|--|
| R1:  | Nasreddine L, Naja F, Chamieh MC, Adra N, Sibai AM, Hwalla N. Trends in overweight and obesity in Lebanon: evidence from two national cross-sectional surveys (1997 and 2009). BMC Public Health. 2012 Sep 17;12:798. doi: 10.1186/1471-2458-12-798.                               |
| R2:  | Zhao H, Liu Y, Li Z, Song Y, Cai X, Liu Y, Zhang T, Yang L, Li L, Gao S, Li Y, Yu C. Identification of essential hypertension biomarkers in human urine by non-targeted metabolomics based on UPLC-Q-TOF/MS. Clin Chim Acta. 2018 Nov;486:192-198. doi: 10.1016/j.cca.2018.08.006. |
| R3 :   | Harpole M, Davis J, Espina V. Current state of the art for enhancing urine biomarker discovery. Expert Rev Proteomics. 2016 Jun;13(6):609-26. doi:10.1080/14789450.2016.1190651. Review.   |
| R4 :   | Lee EY, Yoon KH. Epidemic obesity in children and adolescents: risk factors and prevention. Front Med. 2018 Dec;12(6):658-666. doi:10.1007/s11684-018-0640-1.  |
| R5 :   | Urakami T, Yoda M, Yoshida K, Mine Y, Aoki M, Suzuki J. Renal glucosuria in school children: Clinical characteristics. Pediatr Int. 2018 Jan;60(1):35-40. doi:10.1111/ped.13456.   |