



UNIVERSITAT DE  
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## Dietary intake and biomarkers of acrylamide exposure and risk of endometrial and ovarian cancer

A molecular epidemiologic study in the European  
Prospective Investigation into Cancer and Nutrition

Mireia Obón Santacana



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**ANNEX**





## 9. ANNEX

### 9.1 Publication 3: Supplemental table

**Table 12.** Supplemental table 1: Baseline characteristics of the 801 non-smoking postmenopausal women

| Variables                                   | Mean     | SD     | P5       | P25      | Median   | P75      | P95      |
|---|----------|--------|----------|----------|----------|----------|----------|
| <b><i>Lifestyle variables</i></b>           |          |        |          |          |          |          |          |
| Age at recruitment (y)                      | 58.79    | 6.30   | 49.29    | 54.33    | 58.83    | 63.06    | 69.44    |
| Body Mass Index (kg/m <sup>2</sup> )        | 26.73    | 4.90   | 20.07    | 23.21    | 25.96    | 29.41    | 36.07    |
| Alcohol at recruitment (g/d)                | 6.04     | 8.63   | 0.00     | 0.18     | 2.13     | 8.87     | 24.26    |
| <b><i>Dietary variables (g/day)</i></b>     |          |        |          |          |          |          |          |
| Total dietary fiber                         | 22.45    | 7.02   | 12.28    | 17.76    | 21.73    | 26.28    | 34.70    |
| Total proteins                              | 83.02    | 25.34  | 45.70    | 65.42    | 81.00    | 97.23    | 128.04   |
| Meat and meat products                      | 90.88    | 48.77  | 21.05    | 56.34    | 84.03    | 121.54   | 175.53   |
| Potatoes and other tubers                   | 78.00    | 58.92  | 7.09     | 32.90    | 67.11    | 114.85   | 178.94   |
| Vegetables                                  | 215.85   | 139.33 | 56.35    | 114.68   | 183.18   | 292.20   | 472.48   |
| Olives                                      | 1.30     | 4.44   | 0.00     | 0.00     | 0.00     | 0.03     | 8.57     |
| Fruits, nuts, seeds                         | 289.73   | 179.12 | 69.58    | 161.15   | 259.53   | 376.37   | 628.21   |
| Flour, flakes, starches, semolina           | 0.56     | 2.13   | 0.00     | 0.00     | 0.00     | 0.16     | 2.54     |
| Pasta, rice, other grains                   | 58.64    | 56.09  | 3.36     | 20.03    | 41.86    | 80.12    | 176.62   |
| Cereal and cereal products                  | 198.09   | 93.95  | 79.97    | 135.42   | 182.42   | 241.91   | 375.86   |
| Bread, crisp bread, rusks                   | 116.16   | 65.97  | 28.80    | 69.50    | 104.77   | 152.00   | 234.88   |
| Breakfast cereals                           | 17.25    | 45.85  | 0.00     | 0.00     | 0.00     | 11.17    | 115.10   |
| Salty biscuits, aperitif biscuits, crackers | 2.14     | 5.10   | 0.00     | 0.00     | 0.22     | 2.14     | 11.43    |
| Dry cakes, biscuits                         | 9.63     | 20.88  | 0.00     | 0.00     | 3.44     | 12.32    | 38.93    |
| Pastries                                    | 0.91     | 2.00   | 0.00     | 0.00     | 0.00     | 0.99     | 4.62     |
| Cakes and biscuits                          | 46.57    | 47.92  | 0.00     | 15.35    | 34.43    | 63.76    | 128.57   |
| Chocolate, candy bars, paste, confetti      | 6.26     | 11.21  | 0.00     | 0.00     | 2.00     | 8.04     | 25.00    |
| Confectionery non-chocolate, candied fruits | 2.57     | 7.10   | 0.00     | 0.00     | 0.13     | 1.67     | 12.90    |
| Snacks                                      | 2.29     | 9.26   | 0.00     | 0.00     | 0.00     | 0.21     | 10.01    |
| Olive oil                                   | 9.00     | 14.06  | 0.00     | 0.00     | 0.47     | 15.22    | 39.51    |
| Deep frying fats                            | 0.32     | 1.04   | 0.00     | 0.00     | 0.00     | 0.00     | 2.03     |
| Tea   | 220.49   | 318.36 | 0.00     | 0.00     | 41.42    | 375.00   | 855.00   |
| Coffee                                      | 282.75   | 262.19 | 0.00     | 70.00    | 191.90   | 475.00   | 750.00   |
| Decaffeinated coffee                        | 38.39    | 110.55 | 0.00     | 0.00     | 0.00     | 3.57     | 250.00   |
| Energy intake (kcal/day)                    | 1,913.10 | 550.34 | 1,132.44 | 1,529.36 | 1,842.57 | 2,214.45 | 2,861.80 |

SD, Standard deviation; P5, 5<sup>th</sup> percentile, P25, 25<sup>th</sup> percentile; P75, 75<sup>th</sup> percentile; P95, 95<sup>th</sup> percentile

## 9.2 Ethical Approvals

### International Agency for Research on Cancer



World Health  
Organization

150 cours Albert Thomas  
69372 Lyon cedex 08, France

IARC Ethics Committee (IEC)

Tel.: +33 4 72 73 85 43

Fax: +33 4 72 73 85 64

E-mail: [iec@iarc.fr](mailto:iec@iarc.fr)

<http://ethics.iarc.fr>

Dr E. Duell

Unit of Nutrition, Environment and Cancer

Cancer Epidemiology Research Program

Bellvitge Biomedical Research Institute (IDIBELL)

Catalan Institute of Oncology (ICO)

Avda Gran Via 199-203

08907 L'Hospitalet de Llobregat

Barcelona

Spain

Ref.: IEC 12-01

16<sup>th</sup> March 2012

Dear Dr Duell,

You submitted the following project for review by the IARC Ethics Committee (IEC):

***Project No. 12-01***

**Biomarkers of acrylamide exposure and risk of endometrial and ovarian cancer:  
a molecular epidemiologic study in EPIC**

This project was evaluated by the IEC during its meeting on Wednesday, 22<sup>nd</sup> February 2012.  
The members present were as follows:

E. Bayle (IARC)  
J.-P. Boissel (IEC Chair, external member)  
M. Guerrier (external member)  
Y. Ikdomi (external member)  
M. Plummer (IARC)  
A. Saxena (WHO)  
E. Seleiro (IARC)  
P.-J. Souquet (external member)  
B. Sylla (IARC)  
P. Vineis (IEC Vice-Chair, external member)  
S. Haver-Legros (Secretary to the IEC)

The decision of the IEC concerning the above project is as follows:

*Cleared after ethical review*

Yours sincerely,

A handwritten signature in black ink, appearing to read 'J. Boissel', written over a horizontal line.

Professor J.-P. Boissel  
Chair, IARC Ethics Committee

**INFORME DEL COMITÉ ÉTICO DE INVESTIGACIÓN CLÍNICA  
SOBRE PROYECTOS DE INVESTIGACIÓN**

El Comité Ético de Investigación Clínica del Hospital Universitari de Bellvitge, mediante su procedimiento de revisión rápido de la documentación contemplado en las Normas de Funcionamiento Interno del Comité, ha evaluado la documentación presentada para el proyecto de investigación con nuestra ref. **PR061/11**, titulado:

**“BIOMARKERS OF ACRYLAMIDE EXPOSURE AND RISK OF ENDOMETRIAL  
AND OVARIAN CANCER: A MOLECULAR EPIDEMIOLOGIC STUDY IN EPIC”**

Presentado por el Dr. Eric Duell del Programa de Investigación en Epidemiología del Cáncer, de la Unidad de Nutrición, Medio Ambiente y Cáncer del ICO – Fundació IDIBELL, como investigador principal, y vista la aprobación previa que consta en el Acta 07/11 de 7 de Abril de 2011, se ha acordado dar INFORME FAVORABLE al mencionado proyecto.



 **Bellvitge**  
Hospital  
Comité Ètic d'Investigació  
Clínica

Fdo. Dr. Eric Sospedra Martínez  
Secretario del CEIC

L'Hospitalet de Llobregat, 23 de Marzo de 2012



Hospital Universitari de Bellvitge  
Feixa Llarga s/n  
08907 L'Hospitalet de Llobregat  
Tel. 932 607 500  
www.bellvitgehospital.cat



## 9.3 Curriculum Vitae and publications

### PERSONAL INFORMATION:

- **Surname, name:** Obón Santacana, Mireia
- **Nationality:** Spanish
- **Date of birth:** 15<sup>th</sup> December 1988
- **E-mail:** [mireia.obon@gmail.com](mailto:mireia.obon@gmail.com)

### EDUCATION AND TRAINING:

| DATE      | INSTITUTION   | DEGREE   |
|-----------|---|--|
| 2006-2009 | Ramon Llull University – Health Sciences Faculty<br>Blanquerna<br>Award: Best academic expedient for years 2006 to 2009 | University title of Human Nutrition and Dietetics          |
| 2009-2010 | Ramon Llull University – Health Sciences Faculty<br>Blanquerna  | Superior university title of Human Nutrition and Dietetics |
| 2010-2012 | University of Barcelona (Pharmacy Faculty)- Rovira i Virgili University – University of Balearic Islands.               | Master's in Nutrition and Metabolism – Investigation Line  |
| 2012–2016 | University of Barcelona (Medicine Faculty) – Catalan Institute of Oncology  | PhD candidate in Medicine, Cancer and Human Genetics Line  |

### SPECIAL COURSES:

- **Name of the course:** 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> Nutrition Conference
- **Institution:** Catalan Nutritionist Association (ACDN)
- **Dates:** November 14<sup>th</sup> 2009, November 27<sup>th</sup> 2010, and November 12<sup>th</sup> 2011, Barcelona, Spain
  
- **Name of the course:** Epidemiologic Principles & Methods
- **Professors:** Dr. Kenneth Rothman y Dr. Elizabeth Hatch
- **Institution:** Medicine Faculty 'A.Gemelli'; Università Cattolica del Sacro Cuore
- **Date:** November 4<sup>th</sup> – 8<sup>th</sup> 2013, Rome, Italy
  
- **Name of the course:** Diet and cancer: from prevention to survival
- **Institution:** The Graduate School VLAG in co-operation with the Department of Human Nutrition of Wageningen University, and the Wereld Kanker Onderzoek Fonds (WCRF NL)
- **Date:** October 1<sup>st</sup>-3<sup>rd</sup> 2014, Wageningen, The Netherlands
  
- **Name of the course:** Micronutrients genomics project & Microgennet Workshop program
- **Institution:** Vereniging European Nutrigenomics Organisation (NuGO) with the University of Barcelona
- **Date:** September 10<sup>th</sup> 2015, Barcelona, Spain
  
- **Name of the course:** Update in Breast Cancer: from prevention to log survival
- **Institution:** Spanish Association Against Cancer (AECC), Health Department of the Catalan Government, Bellvitge Hospital, and Catalan Institute of Oncology (ICO)
- **Date:** October 16<sup>th</sup> 2015, Barcelona, Spain
  
- **Name of the course:** Analysis of Genetic Epidemiology Studies
- **Institution:** Institute of Predictive and Personalized Medicine of Cancer in co-operation with the Catalan Institute of Oncology (ICO)
- **Date:** February 26<sup>th</sup> 2016, Badalona, Spain

- **Name of the course:** XIV Advanced oncology course on translational investigation and digestive tumors
- **Institution:** The Institute for Health Science Research Germans Trias i Pujol (IGTP), the Catalan Institute of Oncology (ICO), and the 'Consell Català de Formació Continuada Professions Sanitàries'
- **Date:** May 12<sup>th</sup>-13<sup>th</sup> 2016, Badalona, Spain

**WORK EXPERIENCE:**

- **Position:** Clinical nutritionist
- **Date:** June 2010 – July 2011; January 2015 – July 2015
- **Institution:** Nutrition department, Vilafranca del Penedès Hospital, Barcelona, Spain
  
- **Position:** Nutritional epidemiologist (Pre-doctoral investigator)
- **Start date:** March 2012
- **End date:** January 2016
- **Institution:** Unit of Nutrition and Cancer, Cancer Epidemiology Research Program, Catalan institute of Oncology (ICO) - Bellvitge Biomedical Research Institute (IDIBELL), Barcelona, Spain
  
- **Position:** Nutritional epidemiologist
- **Start date:** January 2016
- **End date:** On going
- **Institution:** Institute of Predictive and Personalized Medicine of Cancer (IMPPC), Badalona, Spain

**TEACHING ACTIVITIES:**

- **Session:** "Nutrition and Health" workshop
- **Dates:** January 20<sup>th</sup>, 2010; January 27<sup>th</sup>, 2011; and January 12<sup>th</sup>, 2012
- **Institution:** Ramon Llull University – Health Sciences Faculty Blanquerna
  
- **Session:** "Professional work experience as a Nutritionist"
- **Dates:** May 14<sup>th</sup> 2013
- **Institution:** Ramon Llull University – Health Sciences Faculty Blanquerna
  
- **Work done:** Prepare and develop a master online teaching module on "Molecular basis of cancer and potential anticarcinogenic diet agents"
- **Dates:** July 2014 – September 2015
- **Institution:** Fundación Universitaria Iberoamericana

**POSTERS:**

- **Title:** Dietary intake of acrylamide and pancreatic cancer risk in the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort
- **Authors:** **Obón-Santacana M**; Lujan-Barroso L; Slimani N; Bueno-de-Mesquita HB\*; Duell EJ\*. \* Contributed equally
- **Congress:** IUNS 20<sup>th</sup> International Congress of Nutrition
- **Date:** September 2013, Granada, Spain

- **Title:** Dietary intake of acrylamide and risk for endometrial and epithelial ovarian cancer in the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort
- **Authors:** **Obón-Santacana M**; Kaaks R; Peeters PH; Duell EJ
- **Congress:** III World Congress of Public Health Nutrition
- **Date:** November 2014, Las Palmas de Gran Canaria, Spain
  
- **Title:** Acrylamide and glycidamide hemoglobin adduct levels and risk of endometrial and epithelial ovarian cancer in EPIC
- **Authors:** **Obón-Santacana M**; Lujan-Barroso L, Kaaks R; Peeters PH; Riboli; Duell EJ
- **Congress:** 12<sup>th</sup> European Nutrition Conference – FENS 2015
- **Date:** October 2015, Berlin, Germany
  
- **Title:** Nuts and seeds intake and pancreatic cancer risk in the EPIC cohort
- **Authors:** **Obón-Santacana M**; Friesling H; Jenab M; Riboli E; Bueno de Mesquita H.B; Duell EJ.
- **Congress:** 12<sup>th</sup> European Nutrition Conference – FENS 2015
- **Date:** October 2015, Berlin, Germany
  
- **Title:** GCAT|Genomes for Life: A prospective cohort study of the genomes of Catalonia
- **Authors:** **Obón-Santacana M**; Vilardell M; Carreras A; Duran X; Valeta G; Puig L; Perucho M; Moreno V\*; de Cid R\*. \* Contributed equally.
- **Congress:** 49<sup>th</sup> European Human Genetics Conference – ESHG/EMPAG 2016
- **Date:** May 2016, Barcelona, Spain

#### **ORAL PRESENTATIONS:**

- **Title:** Dietary intake of acrylamide and pancreatic cancer risk in the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort
- **Place:** CREAL (Center for Research in Environmental Epidemiology)
- **Date:** January 2013, Barcelona, Spain
  
- **Title:** Dietary intake of acrylamide and risk of endometrial and ovarian cancers in the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort
- **Place:** International Workshop: Ovarian and Endometrial, and Breast cancer EPIC working group meeting, Naples, Italy.
- **Date:** October 2013
  
- **Title:** Dietary intake and biomarkers of acrylamide exposure and risk of endometrial and ovarian cancer in the EPIC study
- **Place:** 1<sup>st</sup> IDIBELL PhD day, Hospitalet del Llobregat, Spain.
- **Date:** November 2015

#### **SCIENTIFIC PUBLICATIONS:**

1. Molina-Montes E, Sánchez M-J, Zamora-Ros R, Bueno-de-Mesquita HBA, Wark PA, **Obón-Santacana M**, Kühn T, Katzke V, Travis RC, Ye W, Sund M, Naccarati A, Mattiello A, Krogh V, Martorana C, Masala G, Amiano P, Huerta J-M, Barricarte A, Quirós J-R, Weiderpass E, Åsli LA, Skeie G, Ericson U, Sonestedt E, Peeters PH, Romieu I, Scalbert A, Overvad K, Clemens M, Boeing H, Trichopoulou A, Peppas E, Vidalis P, Khaw K-T, Wareham N, Olsen A, Tjønneland A, Boutron-Ruault M-C, Clavel-Chapelon F, Cross AJ, Lu Y, Riboli E, Duell EJ (2016) Flavonoid and lignan intake and pancreatic cancer risk in the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort. *Int J Cancer* doi:10.1002/ijc.30190.



2. Amiano P, Chamosa S, Etzezarreta N, Arriola L, Moreno-Iribas C, Huerta JM, Egües N, Guevara M, Navarro C, Chirlaque MD, Sánchez MJ, Molina-Montes E, Requena M, Quirós JR, **Obón-Santacana M**, Jakszyn P, González CA, Dorronsoro M (2016) No association between fish consumption and risk of stroke in the Spanish cohort of the European Prospective Investigation into Cancer and Nutrition (EPIC-Spain): a 13· 8-year follow-up study. *Public Health Nutr* 1–8. doi: 10.1017/S1368980015001792.
3. **Obón-Santacana M**, Lujan-Barroso L, Freisling H, Cadeau C, Fagherazzi G, Boutron-Ruault M-C, Kaaks R, Fortner RT, Boeing H, Ramón Quirós J, Molina-Montes E, Chamosa S, Castaño JMH, Ardanaz E, Khaw K-T, Wareham N, Key T, Trichopoulou A, Lagiou P, Naska A, Palli D, Grioni S, Tumino R, Vineis P, De Magistris MS, Bueno-de-Mesquita HB, Peeters PH, Wennberg M, Bergdahl IA, Vesper H, Riboli E, Duell EJ (2016b) Dietary and lifestyle determinants of acrylamide and glycidamide hemoglobin adducts in non-smoking postmenopausal women from the EPIC cohort. *Eur J Nutr* doi:10.1007/s00394-016-1165-5.
4. Merritt MA, Tzoulaki I, van den Brandt PA, Schouten LJ, Tsilidis KK, Weiderpass E, Patel CJ, Tjønneland A, Hansen L, Overvad K, His M, Dartois L, Boutron-Ruault M-C, Fortner RT, Kaaks R, Aleksandrova K, Boeing H, Trichopoulou A, Lagiou P, Bamia C, Palli D, Krogh V, Tumino R, Ricceri F, Mattiello A, Bueno-de-Mesquita HB, Onland-Moret NC, Peeters PH, Skeie G, Jareid M, Quirós JR, **Obón-Santacana M**, Sánchez M-J, Chamosa S, Huerta JM, Barricarte A, Dias JA, Sonestedt E, Idahl A, Lundin E, Wareham NJ, Khaw K-T, Travis RC, Ferrari P, Riboli E, Gunter MJ (2015) Nutrient-wide association study of 57 foods/nutrients and epithelial ovarian cancer in the European Prospective Investigation into Cancer and Nutrition study and the Netherlands Cohort Study. *Am J Clin Nutr* doi:10.3945/ajcn.115.118588.
5. **Obón-Santacana M**, Lujan-Barroso L, Travis RC, Freisling H, Ferrari P, Severi G, Baglietto L, Boutron-Ruault M-C, Fortner RT, Ose J, Boeing H, Menéndez V, Sanchez-Cantalejo E, Chamosa S, Huerta Castaño JM, Ardanaz E, Khaw K-T, Wareham N, Merritt MA, Gunter MJ, Trichopoulou A, Papatesta E-M, Klinaki E, Saieva C, Tagliabue G, Tumino R, Sacerdote C, Mattiello A, Bueno-de-Mesquita HB, Peeters PH, Onland-Moret NC, Idahl A, Lundin E, Weiderpass E, Vesper HW, Riboli E, Duell EJ (2015b) Acrylamide and glycidamide hemoglobin adducts and epithelial ovarian cancer: a nested case-control study in non-smoking postmenopausal women from the EPIC cohort. *Cancer Epidemiol Biomark Prev Publ Am Assoc Cancer Res Cosponsored Am Soc Prev Oncol* doi:10.1158/1055-9965.EPI-15-0822.
6. **Obón-Santacana M**, Freisling H, Peeters PH, Lujan-Barroso L, Ferrari P, Boutron-Ruault M-C, Mesrine S, Baglietto L, Turzanski-Fortner R, Katzke VA, Boeing H, Quirós JR, Molina-Portillo E, Larrañaga N, Chirlaque M-D, Barricarte A, Khaw K-T, Wareham N, Travis RC, Merritt MA, Gunter MJ, Trichopoulou A, Lagiou P, Naska A, Palli D, Sieri S, Tumino R, Fiano V, Galassom R, Bueno-de-Mesquita HB, Onland-Moret NC, Idahl A, Lundin E, Weiderpass E, Vesper H, Riboli E, Duell EJ (2015a) Acrylamide and glycidamide hemoglobin adduct levels and endometrial cancer risk: A nested case-control study in nonsmoking postmenopausal women from the EPIC cohort. *Int J Cancer* doi:10.1002/ijc.29853.
7. Hüsing A, Dossus L, Ferrari P, Tjønneland A, Hansen L, Fagherazzi G, Baglietto L, Schock H, Chang-Claude J, Boeing H, Steffen A, Trichopoulou A, Bamia C, Katsoulis M, Krogh V, Palli D, Panico S, Onland-Moret NC, Peeters PH, Bueno-de-Mesquita HB, Weiderpass E, Gram IT, Ardanaz E, **Obón-Santacana M**, Navarro C, Sánchez-Cantalejo E, Etzezarreta N, Allen NE, Khaw KT, Wareham N, Rinaldi S, Romieu I, Merritt MA, Gunter M, Riboli E, Kaaks R (2015) An epidemiological model for prediction of endometrial cancer risk in Europe. *Eur J Epidemiol* doi:10.1007/s10654-015-0030-9.
8. Ose J, Schock H, Tjønneland A, Hansen L, Overvad K, Dossus L, Clavel-Chapelon F, Baglietto L, Boeing H, Trichopoulou A, Benetou V, Lagiou P, Masala G, Tagliabue G, Tumino R, Sacerdote C, Mattiello A, Bueno-de-Mesquita HB, Peeters PH, Onland-Moret NC, Weiderpass E, Gram IT, Sánchez S, **Obón-Santacana M**, Sánchez-Pérez M-J, Larranaga N, Huerta Castaño JM, Ardanaz E,

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