

## PERSONAL INFORMATION

## Zerva Ioanna

 Leof. Knossou 44, Heraklion Crete, 71306, Greece

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 [ioann\\_zer@hotmail.com](mailto:ioann_zer@hotmail.com)

Date of Birth 11/05/1987 | Nationality Greek

## Education and Training

Nov 2012- Jan 2016

## PhD diploma work (A)

Department of Biology, University of Crete, Immunology laboratory

Title: Personalized implantable vaccines with antigen preactivated macrophages

Supervisor: Professor I. Athanassakis

Sep 2010- Sep 2012

## Master of Science diploma work, (9.4/10)

Department of Biology, University of Crete, Immunology laboratory

"3-dimensional laser structured scaffolds improve macrophage adherence and antigen-specific response".

Supervisor: Professor I. Athanassakis

Sep 2005- Mar 2010

## Bachelor in Biology (6.45/10)

Department of Biology, University of Crete, Immunology laboratory

Ιουλ 2003

## DEL F 1 in French

Diplome D'études en langue française – 1er degree

Ιουν 2002

## First Certificate in English

University of Cambridge (Grade C)

Νοεμ 2001

## European Computer Driving Licence (ECDL)

RESEARCH AND TEACHING  
EXPERIENCE

## RESEARCH EXPERIENCE

Jun 2016-today

## Postdoc Research

Immunology Laboratory, Department of Biology, University of Crete

Nov 2012-Jan 2016

## PhD candidate

Immunology Laboratory, Department of Biology, University of Crete and Institute of Electronic Structure and Laser (IESL), Institute of Technical Education (ITE), (Supervisor professor Irene Athanassakis)



- in mouse '(2016)
9. Katerina Metoxianaki: "The role of ConA as a mitogen in immune response to HSA" (2016)
  10. Anastasios Kouimtzis: " *In vitro* immune response to 4T1 cell fragments"(2017)
  11. Nikoleta Kokkou: "Identification of human leukocyte culture conditions in silicon scaffolds" (2019)
  12. Vassilia Pateraki: "Identification of the development of immunity after application of the implantable vaccine against breast cancer" (2020)

PUBLICATIONS/ PRESENTATIONS  
IN CONFERENCES  
PUBLICATIONS

- 
1. **1. Zerva I.** Bakela A., Athanassakis I. Immunotherapy on chip against an experimental sepsis model, *Inflammation*, 2021, DOI: 10.21203/rs.3.rs-440862/v1
  2. **Zerva I,** Pateraki V, Athanassakis I. Implantable vaccines: a solution for immune system manipulation to any antigenic stimulus. *J Immunological Sci.* (2020); 4(4): 5-11
  3. **Zerva I,** Simitzi C, Stratakis E, Athanasakis I. Personalized Implantable Vaccines with Antigen Pre- Activated Macrophages. *Austin J Clin Immunol.* 2019; 6(1):1038.
  4. **I. Zerva** , E. Katsoni, Chara Simitzi, Emmanuel Stratakis, Irene Athanassakis. Laser micro-structured Si scaffold-implantable vaccines against Salmonella Typhimurium , <https://doi.org/10.1016/j.vaccine.2019.02.080>, 2019
  5. **I. Ζέρβα** , X. Lanara, E. Stratakis, I. Athanssakis. Personalized Implantable Vaccines with Antigen Pre- Activated Macrophages against cancer. *Immunity*; 14, 3: 49 – 52, 2018
  6. E. Gavgiotaki, G. Filippidis, **I. Zerva** , G. Kenanakis, E. Archontakis, S. Agelaki, V. Georgoulas, I. Athanassakis. Detection of the T cell activation state using non-linear optical microscopy. *Journal of Biofotonics*, <https://doi.org/10.1002/jbio.201800277>
  7. E. Gavgiotaki, G. Filippidis, **I. Zerva**, S. Agelaki, V. Georgoulas, I. Athanassakis. Nonlinear microscopy as diagnostic tool for the discrimination of activated T cells. *Proc. SPIE 10414, Advances in Microscopic Imaging*, 1041406-5 V.2 July, 2017

8. Christiana Kyvelidou, Dimitris Sotiriou, **Ioanna Zerva**, Irene Athanassakis. Protection Against Lipopolysaccharide-induced immunosuppression by IgG and IgM. Shock, in press, 2017

9. **Zerva Ioanna**, Simitzi Chara, Siakouli-Galanopoulou Alexandra, Ranella Anthi, Stratakis Emmanuel, Fotakis Costas, Athanassakis Irene (2013) Transplantable vaccines: In vitro antigen presentation enables in vivo immune,. Vaccine 13;33(27):3142-9. Epub 2015.

10. Lina Papadimitriou, **Ioanna Zerva**, Mirella Georgouli, Takis Makatounakis, Joseph Papamatheakis, Irene Athanassakis (2013) DO $\alpha$ - $\beta$ + expression in favor of HLA-DR engagement in exosomes, Immunobiology 218.1019– 1025.

11. **Ioanna Zerva**, C. Simitzi, A. Ranella, E. Stratakis, C. Fotakis, I. Athanassakis 3-Dimensional Laser Structured Scaffolds Improve Macrophage Adherence and Antigen-specific Response, Procedia Engineering, Volume 59, 2013, Pages 211–218, 3rd International Conference on Tissue Engineering, ICTE2013

12. M. Kalognomou, **I. Zerva**, S. Papadogiorgakis, I. Athanassakis. Trophoblast cells transcribe and release HLA-DR molecules in a free form and exosome-engaged structures:, Journal of Reproductive Immunology, Volume 81, Issue 2, p140, September 2009.

#### Patents

1. Personalized implantable vaccines with antigen preactivated monocytes, Greek patent office (# 12254). Athanassakis I., **Zerva, I.**, Simitzi, C., Ranella, A., Stratakis E., OBI 201401003300, 27 May 2014.

2. Immunomodulation technology against autologous cancer cells and tissues: Individual implant vaccinations against cancer. I. Zerva, E. Stratakis, I. Athanassakis, OBI 20190100297, 2021

#### Diplomatic tasks/ comprehensive Reports

Ioanna Zerva (2016) : Personalized implantable vaccines with antigen preactivated macrophages, **doctoral thesis**  
Department of Biology, University of Crete, Immunology laboratory  
Supervisor: Professor I. Athanassakis

Ioanna Zerva (2012): 3-dimensional laser structured scaffolds improve macrophage adherence and antigen-specific response, **master thesis**.  
Department of Biology, University of Crete, Immunology laboratory  
Supervisor: Professor I. Athanassakis

Ioanna Zerva (2011) : Identification of the Frem3 protein in the uterus muscle  
**3 months practical training-extensive reference**

Department of Biology, University of Crete, Histology laboratory

Supervisor: Professor G. Chalepakis

Ioanna Zerva (2010): The exosome's role on the regulation of negative HLA-DR expression in cancer cell lines. **BSc diploma work.**

Department of Biology, University of Crete. Immunology laboratory

Supervisor: Professor I. Athanassakis

## Seminars

1. 1. November 2017: Seminar on teaching in Natural Sciences "Modern Teaching Approaches", Heraklion, Crete.
2. July 2014: Summer School, Biofotonics and Molecular Imaging-BIMI, University of Crete, Greece.
3. May 2014: IP course Care and use of laboratory animals, University of Crete, Greece.
4. January 2014: IMBB Safety Seminar, IMBB-FORTH, Crete, Greece.

## Participations in Conferences Oral presentations

1. 7<sup>th</sup> European Society For Reproductive Immunology, Marathon, Greece. "Trophoblast cells transcribe and release HLA-DR molecules in a free form and exosome-engaged structures" , M. Kalognomou, **I. Zerva**, S. Papadogiorgakis, I. Athanassakis, 2009
2. International Conference on Tissue Engineering- ICTE 2013, Leiria, Portugal. "3-dimensional laser structured scaffolds improve macrophage adherence and antigen-specific response", **Ioanna Zerva**, C. Simitzi, A. Ranella, E. Stratakis, C. Fotakis, I. Athanassakis, 2013
3. Termis-eu 2013, Instabul, Turkey. "3-dimensional laser structured scaffolds improve macrophage adherence and antigen-specific response", **Ioanna Zerva**, C. Simitzi, A. Ranella, E. Stratakis, C. Fotakis, I. Athanassakis, 2013
4. E-MRS 2013, Warsaw University of Technology "3-dimensional laser structured scaffolds improve macrophage adherence and antigen-specific response", **Ioanna Zerva**, C. Simitzi, A. Ranella, E. Stratakis, C. Fotakis, I. Athanassakis, 2013

5. ECBO 2017- European Conference on Biomedical Optics, Munich, Germany. Nonlinear microscopy as diagnostic tool for the discrimination of activated T cells. E.Gavgiotaki, G.Filippidis, **I.Zerva**, S.Agelaki, V.Georgoulas, I.Athanassakis, 2017
6. 10<sup>th</sup> Frontiers in immunology research international conference, Chania, Greece. Differential behavior of laser micro-structured Si scaffolds according to the biological stimulant. **I.Zerva**, E. Katsoni, C.Simitzi, A.Ranella, E.Stratakis, I.Athanassakis, 2017
7. Congress of Clinical and Translational Oncology, Heraklion, Greece. "Personalized Implantable Vaccines for Breast Cancer". I. Zerva, I.Athanassakis, 2017
8. 11<sup>th</sup> Congress of Immunology, Athens, Greece. Personalized Implantable Vaccines for Cancer. V. Pateraki, I. Zerva, X. Lanara, E. Stratakis, I. Athanassakis. 2019
9. 14th global summit on immunology and cell biology, webinar. Immunotherapy-on-chip against an experimental sepsis model. I.Zerva, K.Bakela, I. Athanassakis.2021.
10. 6<sup>th</sup> European Congress of Immunology, virtual ECI, "Immunotherapy on chip against an experimental sepsis model", I.Zerva, K.Bakela, I.Athanassakis, 2021

#### Poster Presentations

1. 2<sup>nd</sup> European Congress of Immunology, Berlin, Germany. "Trophoblast cells transcribe and release HLA-DR molecules in a free form and exosome-engaged structures",M. Kalognomou, **I. Zerva**, S. Papadogiorgakis, I. Athanassakis, 2009
2. 3rd European Congress of Immunology – ECI 2012, Glasgow, Scotland.  
"3-dimensional laser structured scaffolds improve macrophage adherence and antigen-specific response", **Ioanna Zerva**, C. Simitzi, A. Ranella, E. Stratakis, C. Fotakis, I. Athanassakis, 2012
3. 15<sup>th</sup> International Congress of Immunology- ICI 2013, Milan, Italy.

"3-dimensional laser structured scaffolds improve macrophage adherence and antigen-specific response", **Ioanna Zerva**, C. Simitzi, A. Ranella, E. Stratakis, C. Fotakis, I. Athanassakis, 2013

4. 4th European Congress of Immunology-ECI 2015, Vienna, Austria.

Transplantable immune modulation in response to autologous cancer cells", **Ioanna Zerva**, C. Simitzi, A. Ranella, E. Stratakis, I. Athanassakis, 2015

5. 4th European Congress of Immunology-ECI 2015, Vienna, Austria.

"Controllable mitogenic response by peptidoglycane activated macrophages loaded on laser micro-structured Si scaffolds", Katsoni Eleni, **Zerva Ioanna**, Simitzi Chara, Ranella Anthi, Stratakis Emmanuel, Athanassakis Irene, 2015

6. 5th European Congress of Immunology-ECI 2018, Άμστερνταμ, Ολλανδία. «Implantable, pre-activated microconed-Si scaffold vaccines for cancer therapy». I. Zerva, A.Kouimtzis, V.Pateraki, C. Lanara, E. Stratakis, I. Athanassakis, 2018

#### Conference moderator

1. 10<sup>th</sup> Frontiers in immunology research international conference, Chania, Greece. 2017.

### Summary of Doctoral thesis

The role of the immune system is to recognize antigens, respond by humoral or cellular reactions, eliminate the foreign stimuli and develop specific memory. The development of immune response against an antigenic stimulus has been exploited in the context of vaccines that are being developed to prevent or ameliorate the effects of future pathogen infections. In order to avoid virulence, second generation vaccines consisting of defined antigenic peptides or recombinant protein sub-units, need the simultaneous administration of adjuvants to enhance immune responsiveness. However, adjuvants are responsible for several side-effects. In addition, because of the extended polymorphism of histocompatibility antigens, the selection of specific noninfectious antigenic epitopes might not be effectively presented by all individuals. To overcome these problems, a system allowing natural antigen loading and presentation *in vitro* and further activation of the immune response *in vivo*, was developed.

Such technology leads to personalized implantable vaccines. Thus, pre-activated macrophages naturally seeded with the antigen will be absorbed on implantable surfaces able to stimulate the development of immune response. Such approach eliminates side effects due to the non-specific stimulation of adjuvants, while leaving the natural selection mechanism of antigen loading in antigen presenting cells to choose the right antigenic epitope for each individual. The implantable surfaces to be used herein consist of 3D micro-textured Si scaffolds fabricated by ultrafast lasers. The application of such technology to humans will be of great importance opening novel areas of research and treatment.

Scholarships / Awards

1. European Federation of Immunological Societies (EFIS) travel grant, European Congress of Immunology (ECI), Glasgow 2012.
2. Federation of Immunological Societies (EFIS) travel grant, European Congress of Immunology (ECI), Vienna 2015.
3. Funding of the doctoral thesis by the Special Research Account of the University of Crete.
4. Federation of Immunological Societies (EFIS) travel grant, European Congress of Immunology (ECI), Amsterdam 2018.
5. Funding for postdoctoral research, NSRF programs for young researchers.2020-2021.
6. Federation of Immunological Societies(EFIS) grant, European Congress of Immunology (ECI) 2021.

PERSONAL SKILLS

NATIVE LANGUAGE Greek

OTHER LANGUAGES

COMPREHENSION		SPEAKING		WHRITTING
ORAL	READING	COMMUNICATION	ORAL EXPRESSION	



English	B2	B2	B2	B2	B2
First Certificate in English, Cambridge University					
French	A1	A1	A1	A1	A1
Diplome D' Etudes En Langue Francaise (A1, A2, A3, A4)					

Levels: A1 / A2: Basic user - B1 / B2: Independent user - C1 / C2: Proficient user.  
Common European Framework for Languages.

DIGITAL SKILLS

SELF EVALUATION				
DATA PROCESSING	COMMUNICATION	CONTENT CREATION	SECURITY	PROBLEM SOLVING
EXPERIENCED USER	EXPERIENCED USER	EXPERIENCED USER	INDEPENDENT USER	INDEPENDENT USER

Levels: Basic user - Independent user - Experienced user

Digital skills - self-evaluation Table

**IT Diploma: ECDL (2001)**

- Units: 1. Using the computer and managing files (windows)  
 2. Word processing (word)  
 3. Spreadsheets (excel)  
 4. Databases (access)  
 5. Presentations (power point)  
 6. Information and Communication (internet)  
 7. Basic Concepts of Information Technology (IT)

**Additional Computer Skills:**

- experience of blast nucleotide,
- FCS Express V3,
- Photoshop,
- Image J,
- Adobe.

ADDITIONAL INFORMATION

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Nov 2015

**Laboratory Assistant**

Fertility Centre of Crete, Heraklion

- Semen analysis
- Preparation of nutrient media
- preparation procedure for insemination

Jun 2010- Mar 2012

**Customer Service & Sales**

OTE company, Heraklion Crete

- Sales of voice packs and internet
- Customer Services