

Personal Information

Family/First Name: Mpakali Anastasia

Gender: Female

Place, date of birth: Athens, 10 May 1980

Marital status: Married with one child

Mail: ampakali@gmail.com, ampakali@ipta.demokritos.gr

Telephone number: 2106503827, 6936008185

Nationality: Greek

Education

Ph.D. (2012) National and Kapodistrian University of Athens, Medical School & BSRC Alexander Fleming, *"Exploring the role of RNA helicase Ddx5/p68 at the molecular mechanism of generation of genomic methylation patterns during the differentiation of mouse embryonic stem cells"*

M.Sc. (2008) National and Kapodistrian University of Athens, Medical School, *"Exploring the role of RNA helicase Ddx5/p68 at the molecular mechanism of generation of genomic methylation patterns during the differentiation of mouse embryonic stem cells"*

B.Sc. (2005) National and Kapodistrian University of Athens, Faculty of Biology.

Positions

December 2012-today

Research Associate, Laboratory of Protein Chemistry (Supervisor: Stratikos E.), National Center for Scientific Research NCSR "Demokritos"

December 2008-November 2012

Ph.D Research entitled "Exploring the role of RNA helicase Ddx5/p68 at the molecular mechanism of generation of genomic methylation patterns during the differentiation of mouse embryonic stem cells", at Laboratory of Epigenetics and Genomics, Institute of Molecular Biology and Genetics, BSRC Alexander Fleming (Supervisors: Agalioti Th., Thanos D., Papavassileiou A.) Grade: 7/7

January 2007-June 2008

Master Thesis entitled "Exploring the role of RNA helicase Ddx5/p68 at the molecular mechanism of generation of genomic methylation patterns during the differentiation of mouse embryonic stem cells", at Laboratory of Epigenetics and Genomics, Institute of Molecular Biology and Genetics, BSRC Alexander Fleming (Supervisors: Agalioti Th., Thanos D., Papavassileiou A.), Grade: 10/10

July 2006-December 2006

2nd rotation of the Master Program "Molecular Medicine" at Laboratory of Epigenetics and Genomics at Institute of Molecular Biology and Genetics, BSRC Alexander Fleming (Supervisor: Agalioti Theodora), Grade: 10/10

September 2006-November 2006

Co-assistance at students' practice and correction of exercises, Medical School, National and Kapodistrian University of Athens

January 2006-May 2006

1st rotation of the Master Program "Molecular Medicine" at Center of Immunology and Transplantation, Biomedical Research Foundation, Academy of Athens (Supervisor: Sideras P.), Grade: 10/10

October 2005-December 2005

Practical exercise at Biomedical Institute "Marianthi Simou" of Evangelismos Hospital, Athens

September 2004-June 2005

Honor Thesis for the Bachelor entitled "Immunohistochemical study of vascular endothelial growth factor receptor VEGFR-3 (or Flt-4) in invasive breast carcinoma and correlation with other biological markers", Pathological Anatomy of School of Medicine and Department of Cell Biology and Biophysics, National and Kapodistrian University of Athens (Supervisors: Nakopoulou L, Kousoulakos S), Grade: 10/10

Fellowships-Awards

- **ELIDEK Grant** (10/2018 – 9/2021) Individual postdoctoral research grant "ARIA: Atomic Resolution Insight into the Antigen processing machinery", grant No. 303 (GSRT, Principal Researcher A. Papakyriakou, Institute of Biosciences & Applications)
- **Bodosakis Award** for the poster entitled "P68/Ddx5 RNA Helicase is a key regulator of de novo DNA methyltransferases in mouse embryonic stem cells." **A. Mpakali**, A. Kotini and T. Agalioti (33rd FEBS Congress & 11th IUBMB Conference 28 June - 4 July 2008, Athens, Greece)
- **Scholarship** for the academic year 2006-2007 from the MSc Program "Molecular Medicine", School of Medicine, National and Kapodistrian University of Athens.

Techniques

- Molecular Biology Techniques (cloning, DNA & RNA isolation and purification, mutagenesis, sequencing, PCR, RT-PCR and qPCR, ChIP, Immunoprecipitation Assays, Bisulfite Sequencing, Methylation Assays, Southern Blotting)
- Cell culture (mammalian and insect cells), cell transfection, siRNA technology
- Protein Expression in bacteria, insect cells and mammalian cells (EGFP, His, GST, Baculovirus systems, stable cell lines, etc)
- Protein Purification, Western Blot, SDS-PAGE, Protein-protein Interaction Assays
- Enzymatic Assays, Isolation of peptides (HPLC), Gel filtration
- Immunohistochemical staining
- Crystallography (set and analysis)
- Animal models (mice manipulation)

Publications

1. *A systematic re-examination of processing of MHCI-bound antigenic peptide precursors by ER aminopeptidase 1.*
Mavridis G., Arya R., Domnick A., Zoidakis J., Makridakis M., Vlahou A., **Mpakali A.**, Lelis A., Georgiadis D., Tampé R., Papakyriakou A., Stern L.J., Stratikos E.
J Biol Chem. **2020** Mar 17. pii: jbc.RA120.012976. doi: 10.1074/jbc.RA120.012976
2. *Mechanism for antigenic peptide selection by endoplasmic reticulum aminopeptidase 1.*
Giastas P*, **Mpakali A***, Papakyriakou A., Lelis A., Kokkala P., Neu M., Rowland P., Liddle J., Georgiadis D., Stratikos E.
Proc Nat Acad Sci USA. **2019** Dec 16. pii: 201912070. doi: 10.1073/pnas.1912070116.
(* these authors contributed equally to this work)
3. *Editing the immunopeptidome of melanoma cells using a potent inhibitor of endoplasmic reticulum aminopeptidase 1 (ERAP1).*
Koumantou D., Barnea E., Martin-Esteban A., Maben Z., Papakyriakou A., **Mpakali A.**, Kokkala P., Pratsinis H., Georgiadis D., Stern L.J., Admon A., Stratikos E.
Cancer Immunol Immunother. **2019** Aug;68(8):1245-1261. doi: 10.1007/s00262-019-02358-0.
4. *Endoplasmic reticulum aminopeptidase 1 polymorphism Ile276Met is associated with atopic dermatitis and affects the generation of an HLA-C associated antigenic epitope in vitro.*
Niepiekło-Miniewska W*, **Mpakali A***, Stratikos E., Matusiak Ł., Narbutt J., Lesiak A., Kuna P., Wilczyńska K., Nowak I., Wiśniewski A., Zwolińska K., Ponińska J., Płoski R., Szepietowski J.C., Kuśnierczyk P.
J Eur Acad Dermatol Venereol. **2019** May;33(5):906-911. doi: 10.1111/jdv.15449.
(* these authors contributed equally to this work)
5. *Molecular pathways for antigenic peptide generation by ER aminopeptidase 1.*
Mpakali A., Maben Z., Stern L.J., Stratikos E.
Mol Immunol. **2019** Sep;113:50-57. doi: 10.1016/j.molimm.2018.03.026, Review.
6. *Inhibitors of ER Aminopeptidase 1 and 2: From Design to Clinical Application.*
Georgiadis D., **Mpakali A.**, Koumantou D., Stratikos E., *Curr Med Chem.* **2019**;26(15):2715-2729. doi: 10.2174/0929867325666180214111849. Review.
7. *Crystal Structures of ER Aminopeptidase 2 in Complex with Inhibitors Reveal Pharmacophore Requirements for Optimizing Inhibitor Potency.*
Mpakali A., Giastas P., Deprez-Poulain R., Papakyriakou A., Koumantou D., Gealageas R., Tsoukalidou S., Vourloumis D., Mavridis I.M., Stratikos E. and Saridakis E., *ACS Med Chem Lett.* **2017** Feb 21;8(3):333-337
8. *Ligand-induced conformational change of Insulin-regulated aminopeptidase: insights on catalytic mechanism and active site plasticity.*
Mpakali A., Saridakis E., Harlos K., Zhao Y., Kokkala P., Georgiadis D., Giastas P., Papakyriakou A., Stratikos E.
J Med Chem. **2017** Apr 13;60(7):2963-2972. doi: 10.1021/acs.jmedchem.6b01890

9. Critical Role of Interdomain Interactions in the Conformational Change and Catalytic Mechanism of Endoplasmic Reticulum Aminopeptidase 1.
Stamogiannos A., Maben Z., Papakyriakou A., **Mpakali A.**, Kokkala P., Georgiadis D., Stern L.J., Stratikos E.
Biochemistry. **2017** Mar 14;56(10):1546-1558. doi: 10.1021/acs.biochem.6b01170.
10. Optimization and Structure-Activity Relationships of Phosphinic Pseudotriptide Inhibitors of Aminopeptidases That Generate Antigenic Peptides.
Kokkala P, **Mpakali A**, Mauvais FX, Papakyriakou A, Daskalaki I, Petropoulou I, Kavvalou S, Papathanasopoulou M, Agrotis S, Fonsou TM, van Endert P, Stratikos E, Georgiadis D., J Med Chem. **2016** Oct 13;59(19):9107-9123.
11. Structural basis for antigenic peptide recognition and processing by ER aminopeptidase 2.
Mpakali A., Giastas P., Mathioudakis N., Mavridis I.M., Saridakis E., Stratikos E.
J Biol Chem. **2015** Sep 17. pii: jbc.M115.685909
12. Crystal Structure of Insulin-Regulated Aminopeptidase with Bound Substrate Analogue Provides Insight on Antigenic Epitope Precursor Recognition and Processing.
Mpakali A., Saridakis E., Harlos K., Zhao Y., Papakyriakou A., Kokkala P., Georgiadis D., Stratikos E.
J Immunol. **2015** Sep 15;195(6):2842-51. doi: 10.4049/jimmunol.1501103.
13. p68/Ddx5 RNA helicase interacts and co-localizes in vivo with the de novo DNA methyltransferases Dnmt3a1 and Dnmt3a2
Mpakali A., Kotini A.G., Spella M., Kouyialis M., Tserga A., Fragos-Livanios .L, Samiotaki M., Agalioti T.
Journal of Proteomics and Bioinformatics, OMICS Publishing Group, Volume 5(1): 007-014 (2012) – 007, <http://dx.doi.org/10.4172/jpb.1000207>
14. Dnmt3a1 Upregulates Transcription of Distinct Genes and Targets Chromosomal Gene Clusters for Epigenetic Silencing in Mouse Embryonic Stem Cells
Kotini A. G*, **Mpakali A.***, Agalioti T
Mol Cell Biol. **2011** Apr;31(7):1577-92. doi: 10.1128/MCB.01093-10
(* these authors contributed equally to this work)
15. Clinicopathological and prognostic significance of vascular endothelial growth factors (VEGF)-C and -D and VEGF receptor 3 in invasive breast carcinoma
E. Mylona, P. Alexandrou, **A. Mpakali**, I. Giannopoulou, G. Liapis, S. Markaki, A. Keramopoulos, L. Nakopoulou
European Journal of Surgical Oncology, 33: 3, pg 294 – 300, April **2007**

Works Presented in Scientific Meetings

1. **Mpakali A.**, Structural basis of inhibition of Insulin-regulated Aminopeptidase by a macrocyclic peptidic inhibitor, IRAP 2019 meeting, 27-30 August **2019**, Nafplion, Greece
2. **Mpakali A.**, Saridakis E., Harlos K., Zhao Y., Kokkala P., Georgiadis D., Giastas P., Papakyriakou A., Stratikos E., Ligand-induced conformational change of Insulin-regulated Aminopeptidase: insights on catalytic mechanism and active site plasticity, 68th Conference of Hellenic Society of Biochemistry and Molecular Biology, 10-12 November **2017**, Eugenides Foundation, Athens, Greece
3. **Mpakali A.**, Kokkala P., Mauvais F.X., Papakyriakou A., Daskalaki I., Petropoulou I., Kavvalou S., Papathanasopoulou M., Agrotis S., Fonsou T.M., van Ender P., Georgiadis D., Stratikos E. Selectivity Optimization of Phosphinic Pseudotripeptides as Inhibitors of Insulin Regulated Aminopeptidase 3rd International IRAP Symposium, 28-30 August **2017**, Paris, France
4. **Mpakali A.**, Exploring the Immune System with X-Ray Crystallography, 59th Summer School NCSR Demokritos, 3-14 July **2017**, Athens, Greece
5. **Mpakali A.**, Saridakis E., Harlos K., Zhao Y., Kokkala P., Georgiadis D and Stratikos E., Insulin-regulated Aminopeptidase: a long journey from protein to crystals, 1st Spring meeting Hellenic Crystallographic Association Young Researchers, 27-28 May **2017**, National Hellenic Research Foundation
6. **Mpakali**, E. Saridakis, K. Harlos, Y. Zhao, P.Kokkala, D. Georgiadis and E. Stratikos Ligand-induced conformational rearrangements of Insulin-regulated aminopeptidase: insights on catalytic mechanism and active site plasticity, 8th International Conference of the Hellenic Crystallographic Association & 11th Conference of the Hellenic Society for Computational Biology and Bioinformatics, 7-9 October **2016**, Agricultural University of Athens, Athens, Greece
7. **Mpakali A.**, Saridakis E., Giastas P., Zhao Y., Kokkala P., Mavridis I.M., Georgiadis D. and Stratikos E., Structural basis for antigenic epitope precursor recognition and processing by Endoplasmic Reticulum Aminopeptidase 2 and Insulin Regulated Aminopeptidase., 66^o Conference of Hellenic Society of Biochemistry and Molecular Biology, 11-13 December **2015**, Eugenides Foundation, Athens, Greece
8. Stamogiannos A., **Mpakali A.**, Papakyriakou A., Stratikos E. Elucidating the role of the conformational plasticity of ERAP1 in regulating its enzymatic activity
9. 66^o Conference of Hellenic Society of Biochemistry and Molecular Biology, 11-13 December **2015**, Eugenides Foundation, Athens, Greece
10. Giotopoulou G., Kati D., Katsikani K., **Mpakali A.**, Agalioti T. and Stathopoulos G.T A role for Ddx5 RNA helicase in promoting lung carcinogenesis, 66^o Conference of Hellenic Society of Biochemistry and Molecular Biology, 11-13 December **2015**, Eugenides Foundation, Athens, Greece
11. **Mpakali A.**, Saridakis E., Harlos K., Zhao Y., Papakyriakou A., Kokkala P., Georgiadis D., Stratikos E., Structural basis for antigenic peptide generation in cross-presentation, IRAP Conference, 14-18 September **2015**, Uppsala Sweden
12. Stamogiannos A., **Mpakali A.**, Koumantou D., Zervoudi E., Evnouchidou I. and Stratikos E., The substrate length selectivity of aminopeptidases that generate antigenic peptides, FEBS-EMBO 2014 Conference, 30 August – 4 September **2014**, Paris France
13. Kotini A., **Mpakali A.** and Agalioti T., Dnmt3a1 Upregulates Transcription of Distinct Genes and Targets Chromosomal Gene Clusters for Epigenetic Silencing in Mouse Embryonic Stem Cells.

- 61^o Conference of Hellenic Society of Biochemistry and Molecular Biology, 15-17 October **2010**, Alexandroupolis, Greece
14. Kotini A., **Mpakali A.** and Agalioti T., *Dnmt3a1 Upregulates Transcription of Distinct Genes and Targets Chromosomal Gene Clusters for Epigenetic Silencing in Mouse Embryonic Stem Cells.*, 9th EMBL Conference on Transcription and Chromatin, 28-31 August **2010**, Heidelberg
 15. **Mpakali A.**, Kotini A. and Agalioti T., *P68/Ddx5 RNA Helicase is a key regulator of de novo DNA methyltransferases in mouse embryonic stem cells.*, 33rd FEBS Congress & 11th IUBMB Conference, 28 June - 4 July **2008**, Athens, Greece
 16. **Mpakali A.**, Kotini A. and Agalioti T., *Ddx5/p68 RNA helicase plays a regulatory role in DNA methylation/demethylation cycles during cell differentiation.*, 59^o Conference of Hellenic Society of Biochemistry and Molecular Biology, 7-9 December **2007**, Athens, Greece
 17. **Mpakali A.**, Kotini A. and Agalioti T., *Ddx5/p68 RNA helicase role in the regulation of the de novo DNA methylation.*, 58^o Conference of Hellenic Society of Biochemistry and Molecular Biology, 9-11 November **2006**, Patras, Greece
 18. Mylona E., **Mpakali A.**, Markaki S., Nikolaou I., Mavrommatis J., Keramopoulos J., Nakopoulou L., *Study of the vascular endothelial growth factor receptor (VEGFR)-3 localization in invasive breast carcinomas in relation to their biological behavior and patients survival.*, The 6th Athens Congress on Women's Health and Disease, 23-25 September, **2005**, Athens, Greece

Membership in scientific societies

- Member of the Hellenic Crystallographic Association
- Member of the Hellenic Society of Biochemistry and Molecular Biology