

Curriculum Vitae

Emmanouil “Manolis” Maragkakis, PhD

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Education

- 2002 **BSc Biology** (1st year), National Kapodistrian University of Athens, Greece
- 2007 **BSc Physics**, National Kapodistrian University of Athens, Greece
Specialization: Electronics, Computer systems, Telecommunications and Automation.
Thesis: Computational simulation of signal transmission in neurons.
- 2011 **PhD Bioinformatics**, Martin Luther Universität Halle Wittenberg, Germany
Award: The highest distinction *summa cum laude*
Advisors: Artemis Hatzigeorgiou and Ivo Grosse
Dissertation: Bioinformatics approach for microRNA target prediction and functional analysis.

Current research position

- 2016- **Research Associate, University of Pennsylvania, USA** (PI: Zissimos Mourelatos)
Uncovered novel widespread mechanism of co-translational, ribosome-phased mRNA endonucleolytic decay of canonical mRNAs. First-author manuscript in press Nat. Struct. Mol. Biology.

Previous research positions

- 2007-2011 **PhD student, B.S.R.C. “Alexander Fleming”, Greece** (PI: Artemis Hatzigeorgiou)
Employed high throughput sequencing and machine learning for miRNA target prediction
Developed most accurate miRNA target prediction program DIANA-microT
Coupled miRNA function to disease and biological pathways
Developed suite for miRNA functional analysis, accessed by hundreds of researchers daily
Awarded B.S.R.C. “Alexander Fleming” scholarship and IKYDA travel award
- 01-03 2011 **Research Scholar, University of Pennsylvania, USA** (PI: Zissimos Mourelatos)
Developed computation tools for analysis and synthesis of large-scale datasets.
Uncovered pre-miRNA surveillance system in quality control of miRNA synthesis.
- 2011-2016 **Postdoctoral fellow, University of Pennsylvania, USA** (PI: Zissimos Mourelatos)
Revealed piRNA biogenesis mechanism in mice
Uncovered the key role of piRNAs in the germline for targeting and trapping mRNAs
Identified the effect of RNA binding proteins associated with ALS in neurons
Developed tools for complex analysis of sequencing data (RNA-Seq, CLIP-Seq, Ribo-Seq)
Awarded the Brody scholarship and selected and funded as an innovator from Penn I-Corps

Funding

- 2008 **Scholarship, Biomedical Science Research Center “Alexander Fleming”**
Role: Trainee, Duration: 3-year, Amount: €60,000
- 2010 **IKYDA research travel scholarship**
Role: Trainee, Duration: 2-year, Amount: €10,000
- 2013 **Fellowship in Incurable Diseases, Brody Family Medical Trust Fund**
Role: PI, Duration: 3-year, Amount: €210,000, <10% acceptance rate
- 2016 **Penn I-Corps fund for innovators (National Science Foundation)**
Role: Academic lead, Amount: \$2,500 for business model development

Publication metrics (from Google scholar)

Citations: 3469
Citations for 10 first author articles: 1230
h-index: 18

Publications (*: equal, \$: corresponding)

1. Maragkakis M, Reczko M, Simossis VA, Alexiou P, Papadopoulos GL, Dalamagas T, Giannopoulos G, Goumas G, Koukis E, Kourtis K, Vergoulis T, Koziris N, Sellis T, Tsanakas P, Hatzigeorgiou AG, DIANA-microT web server: elucidating miRNA functions through target prediction. **Nucleic Acids Res.** 37, W273–6 (2009).
2. Papadopoulos GL, Alexiou P, Maragkakis M, Reczko M, Hatzigeorgiou AG, DIANA-mirPath: Integrating human and mouse miRNAs in pathways. **Bioinformatics** 25, 1991–1993 (2009).
3. Maragkakis M, Alexiou P, Papadopoulos GL, Reczko M, Dalamagas T, Giannopoulos G, Goumas G, Koukis E, Kourtis K, Simossis VA, Sethupathy P, Vergoulis T, Koziris N, Sellis T, Tsanakas P, Hatzigeorgiou AG, Accurate miRNA target prediction correlates with protein repression levels. **BMC Bioinformatics** 10, 295 (2009).
4. Alexiou P, Maragkakis M, Papadopoulos GL, Reczko M, Hatzigeorgiou AG, Lost in translation: an assessment and perspective for computational miRNA target identification. **Bioinformatics** 25, 3049–3055 (2009).
5. Alexiou P, Maragkakis M, Papadopoulos GL, Simmosis VA, Zhang L, Hatzigeorgiou AG, The DIANA-mirExTra web server: from gene expression data to miRNA function. **PLoS One** 5, e9171 (2010).
6. Iizasa H, Wulff BE, Alla NR, Maragkakis M, Megraw M, Hatzigeorgiou A, Iwakiri D, Takada K, Wiedmer A, Showe L, Lieberman P, Nishikura K, Editing of Epstein-Barr virus-encoded BART6 miRNAs controls their dicer targeting and consequently affects viral latency. **J. Biol. Chem.** 285, 33358–33370 (2010).
7. Alexiou P, Maragkakis M, Hatzigeorgiou AG, Online resources for miRNA analysis. **J. Nucleic Acids Investig.** 2, 2–5 (2011).
8. Maragkakis M*, Vergoulis T*, Alexiou P, Reczko M, Plomaritou K, Gousis M, Kourtis K, Koziris N, Dalamagas T, Hatzigeorgiou AG, DIANA-microT Web server upgrade supports Fly and Worm miRNA target prediction and bibliographic miRNA to disease association. **Nucleic Acids Res.** 39, W145–8 (2011).

9. Reczko M*, Maragkakis M*, Alexiou P, Papadopoulos GL, Hatzigeorgiou AG, Accurate microRNA target prediction using detailed binding site accessibility and machine learning on proteomics data. **Front. Genet.** 2, 103 (2011).
10. Vergoulis T, Vlachos IS, Alexiou P, Georgakilas G, Maragkakis M, Reczko M, Gerangelos S, Koziris N, Dalamagas T, Hatzigeorgiou AG, TarBase 6.0: capturing the exponential growth of miRNA targets with experimental support. **Nucleic Acids Res.** 40, D222–9 (2012).
11. Reczko M*, Maragkakis M*, Alexiou P, Grosse I, Hatzigeorgiou AG, Functional microRNA targets in protein coding sequences. **Bioinformatics** 28, 771–776 (2012).
12. Vlachos IS, Kostoulas N, Vergoulis T, Georgakilas G, Reczko M, Maragkakis M, Paraskevopoulou MD, Prionidis K, Dalamagas T, Hatzigeorgiou AG, DIANA miRPath v2.0: investigating the combinatorial effect of microRNAs in pathways. **Nucleic Acids Res.** 40, W498–504 (2012).
13. Vourekas A, Zheng Q, Alexiou P*, Maragkakis M*, Kirino Y, Gregory BD, Mourelatos Z, Target RNA repertoire of Mili and Miwi reveals piRNA biogenesis and function of Miwi in spermiogenesis. **Nat. Struct. Mol. Biol.** 19, 773–781 (2012).
14. Paraskevopoulou MD, Georgakilas G, Kostoulas N, Reczko M, Maragkakis M, Dalamagas TM, Hatzigeorgiou AG, DIANA-LncBase: experimentally verified and computationally predicted microRNA targets on long non-coding RNAs. **Nucleic Acids Res.** 41, D239–45 (2013).
15. Ibrahim F, Maragkakis M*, Alexiou P*, Maronski AM, Dichter AM, Mourelatos Z, Identification of in vivo, conserved, TAF15 RNA binding sites reveals the impact of TAF15 on the neuronal transcriptome. **Cell Rep.** 3, 301–308 (2013).
16. Nakaya T, Alexiou P*, Maragkakis M*, Chang A, Mourelatos Z, FUS regulates genes coding for RNA binding proteins in neurons by binding to their highly conserved introns. **RNA** 19, 498–509 (2013).
17. Honda S, Kirino Y, Maragkakis M, Alexiou P, Ohtaki A, Murali R, Mourelatos Z, Kirino Y, Mitochondrial protein BmPAPI modulates the length of mature piRNAs. **RNA** 19, 1405–1418 (2013).
18. Liu X, Zheng Q, Vrettos N, Maragkakis M, Alexiou P, Gregory BD, Mourelatos Z, A MicroRNA precursor surveillance system in quality control of MicroRNA synthesis. **Mol. Cell** 55, 868–879 (2014).
19. Vourekas A*, Zheng K*, Fu Q*, Maragkakis M*, Alexiou P, Pillai RS, Mourelatos Z, Wang PJ, The RNA helicase MOV10L1 binds piRNA precursors to initiate piRNA processing. **Genes Dev.** 29, 617–629 (2015).
20. Maragkakis M*, Alexiou P*, Nakaya T, Mourelatos Z, CLIPSeqTools - A novel bioinformatics CLIP-Seq analysis suite. **RNA** 22, 1–9 (2016).
21. Vourekas A, Alexiou P, Vrettos N, Maragkakis M, Mourelatos Z, Sequence-dependent but not sequence-specific piRNA adhesion traps mRNAs to the germ plasm. **Nature** 531, 390–394 (2016).
22. Vrettos N*, Maragkakis M*, Alexiou P, Mourelatos Z, Kc167, a widely used Drosophila cell line, contains an active primary piRNA pathway. **RNA** 23, 108–118 (2016).
23. Kortschak RD, Snyder JB, Maragkakis M, Adelson DL, biogo: a simple high-performance bioinformatics toolkit for the Go language. **JOSS**, (2017)
24. Ibrahim F*, Maragkakis M*, Alexiou P, Mourelatos Z, Ribothrypsis, a novel process of canonical mRNA decay, mediates ribosome-phased mRNA endonucleolysis. **Nat. Struct. Mol. Biol.** doi: 10.1038/s41594-018-0042-8, (2018)

25. Tadashi N^{\$}, Maragkakis M^{\$}, Amyotrophic Lateral Sclerosis associated FUS mutation shortens mitochondria and induces neurotoxicity, (in revision)

Recent invited talks

- Ribothrypsis and co-translational mRNA decay, Hellenic Pasteur Institute
- The hidden life of mRNAs, Biomedical Science Research Center “Alexander Fleming”
- Discovering biology with informatics, Temple University
- Ribothrypsis mediates widespread, ribosome-phased, endonucleolytic decay of canonical mRNAs, RECOMB/ISCB 2017

Professional associations

- 2013 International Society of Computational Biology
2013 Hellenic Society of Computational Biology and Bioinformatics
2016 Penn I-Corps cohort of innovators (funded by National Science Foundation)

Ad-hoc reviewer

- Nature Protocols
- Nucleic Acids Research
- Bioinformatics
- BMC Bioinformatics
- BMC Genomics

Teaching

- 2010-2011 **Lecturer and TA**, National Kapodistrian University of Athens, Greece.
Graduate course: “Introduction to Bioinformatics”
Topics: Pattern discovery, data mining, dynamic programming
- 2010-2011 **TA**, University of Thessaly, Greece.
Bachelor of Science course: “Bioinformatics”
Topics: Introduction of biology, data mining, dynamic programming

Supervision of graduate students and research fellows

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| 2010-2011 | 3 MSc students | National Kapodistrian University of Athens, Greece |
| 2010-2011 | 2 BSc students | University of Thessaly, Greece |
| 2011-2013 | 1 PhD student | University of Pennsylvania, USA |

References

Zissimos Mourelatos

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