Mirko LEDDA

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My objective is to obtain a 3-month internship in Computational Biology as part of the requirements of the Designated Emphasis in Biotechnology graduate program. I am result oriented and thrives in multinational teams and inter-disciplinary research environments.

AREAS OF SPECIALIZATION

Genetics - Genomics - Computational Biology - Structural Biology - Molecular Biology
Bioinformatics - Statistics - Machine Learning - Software Development

EDUCATION

2014- **Ph.D. in Integrative Genetics and Genomics with Emphasis in Biotechnology (DEB)**
University of California at Davis, CA, USA — Expected graduation in Early 2019

2008 **B.Sc. in Life Sciences with Emphasis in Biotechnology**
University of Applied Sciences (HES-SO), Sion, Switzerland

PROFESSIONAL EXPERIENCE

2009-2014 **Research Assistant** — Nestlé Research Center, Lausanne, Switzerland
Activity manager for projects aimed at understanding taste perception physiology. My contributions included:

- Genome-wide association studies (GWAS) of human metabolism and taste perception; Discovered new biomarkers for the health-status of the gastrointestinal tract and new genetic drivers of bitter taste perception.
- Statistical methods development to analyze human taste phenotypic data;
- Set up of the single cell Ca^{2+}-imaging technique and development of computational tools for automated data analysis.
- Functionalization and *in vitro* validation of several human, feline and rat GPCRs/TRP channels in mammalian cells (HEK, Hela, CHO, Chem-1 and primary rat DRG neurons). Receptor-interaction studies using siRNAs and co-expression approaches.
- Method development for the expression and purification of water-insoluble proteins in *E. coli*.

2008-2014 **Soldier, specialist in biological weapons** — Swiss Army (Labor Spiez), Spiez, Switzerland
Development and validation of laboratory techniques for the identification of pathogenic Bacteria, Viruses and Toxins.

2008 **Diploma Thesis student** — University of Palermo, Palermo, Italy
Studies about a gene with unknown function, in the bacterial strain *Streptomyces coelicolor*. Work incorporated in the European project *ActinoGEN* aimed at "developing novel genomics-based approaches to exploit hitherto overlooked genetic resources for new antibiotics".

TEACHING EXPERIENCE

2018 **Quantitative Genetics and Selection Theory, UC Davis** — Guest Lecturer
1h30 lecture on fundamental concepts in Machine Learning.

2017 **Machine Learning Workshop for the Plant Sciences Dept., UC Davis** — Lecturer
4h lecture on fundamental concepts in Machine Learning for the Ross-Ibarra, Knapp and Runcie labs.

Topics in Biomedical Engineering: Computational Genomics, UC Davis — Guest Lecturer
Two 2h lectures on fundamental concepts in Machine Learning.

2016 **Quantitative Genetics and Selection Theory, UC Davis** — Teaching assistant

Teaching R programming and the mathematical bases of selection theory in lab sessions.

2015 **Quantitative Genetics and Selection Theory, UC Davis** Course development

Preparation of the teaching material for this newly proposed class.

AWARDS

2017 **Graduate Student Travel Award** UC Davis

Competitive award to cover the cost to attend, as a speaker, the *2017 [BC]2 Basel Computational Biology Conference* in Basel, Switzerland.

2016 **Registration Bursary** Wellcome Genome Campus Scientific Conferences

Competitive award to cover the cost to attend, as a speaker, the *2016 Computational RNA Biology Conference* in Cambridge, UK.

Summer Graduate Student Researcher Award UC Davis

3-months support for graduate research in engineering, computer science, and disciplines with engineering-related applications and methods.

MEMBERSHIP

2018 **The RNA Society** Student member

COMMUNITY SERVICE

2015- **Graduate Student Association (GSA)** UC Davis

Representative for the IGG graduate program.

2017 **IGG Annual Colloquium** UC Davis

Member of the organizing committee.

Teen Biotech Challenge 2017 DEB, UC Davis

Judge for System and Computational Biology websites.

Topics in Biomedical Engineering: Computational Genomics (BIM189C) UC Davis

Mentored three students for their final projects.

2016 **Teen Biotech Challenge 2016** DEB, UC Davis

Judge for System and Computational Biology websites.

2015 **Science in the Siskiyous** Dunsmuir High School, Dunsmuir, CA, USA

Presented biology research and taught basic genetic concepts to three 9^{th} to 12^{th} grade high-school classes.

Science vs Fiction Senior Center, Davis, CA, USA

Presented common scientific misconceptions followed by an open discussion with seniors.

IGG program UC Davis

Mentor for all incoming international IGG students and mentor for a 1^{st} year IGG student.

PUBLICATIONS (* INDICATES CO-AUTHORSHIP)

2018 Ledda M. and Aviran S., patteRNA: transcriptome-wide search for functional RNA elements via structural data signatures, *Genome Biology* in press

2016 Choudhary K., Shih N.P., Deng F., Ledda M., Li B. and Aviran S., Metrics for rapid quality control in RNA structure probing experiments, *Bioinformatics* 32(23): 2575-3583 [doi]

Deng F.*, Ledda M.*, Vaziri S. and Aviran S., Data-directed RNA secondary structure prediction

using probabilistic modeling, *RNA* 22(8): 1109-19 [doi]

Michlig González S., Meylan Merlini J., Beaumont M., Ledda M., Tavenard A., Mukherjee R., Camacho S and le Coutre J., Acute Effects of single ingestion of TRPV1, TRPA1 and TRPM8 agonists on the energetic metabolism and the autonomic activity in healthy subjects, *Scientific Reports* 6: 20795 [doi]

2014 Rueedi R.*, Ledda M.*, Nicholls A.W., Salek R.M., Marques-Vidal P., Morya E., Sameshima K., Montoliu I., Da Silva L., Collino S. et al., Genome-wide association study of metabolic traits reveals novel gene-metabolite-disease links, *PLoS Genetics* 10(2) [doi]

2013 Ledda M.*, Kutalik Z.*, Destito M.C.S., Souza M.M., Cirillo C. a., Zamboni A., Martin N., Morya E., Sameshima K., Beckmann J.S. et al., GWAS of human bitter taste perception identifies new loci and reveals additional complexity of bitter taste genetics, *Human Molecular Genetics* 23: 259-267 [doi]

Godinot N., Yasumatsu K., Barcos M.E., Pineau N., Ledda M., Viton F., Ninomiya Y., le Coutre J. and Damak S., Activation of tongue-expressed GPR40 and GPR120 by non caloric agonists is not sufficient to drive preference in mice, *Neuroscience* 250: 20-30 [doi]

Montoliu I.*, Genick U.*, Ledda M., Collino S., Martin F.P., Le Coutre J. and Rezzi S., Current status on genome-metabolome-wide associations: An opportunity in nutrition research, *Genes and Nutrition* 8: 19-27 [doi]

2011 Genick U.K., Kutalik Z., Ledda M., Souza Destito M.C., Souza M.M., Cirillo C. a., Godinot N., Martin N., Morya E., Sameshima K. et al., Sensitivity of genome-wide-association signals to phenotyping strategy: The PROP-TAS2R38 taste association as a benchmark, *PLoS One* 6(11) [doi]

PATENTS

2014 Genick U.K., Ledda M., Montoliu I., Le Coutre J., Rezzi S., Collino S., Martin F.P., Da Silva L., Genetic and urine-derived markers of human metabolic and gut microbial states - US Patent Office, *US Patent 20,150,160,191* (issued in 2015)

2012 Genick U.K., Ledda M., Montoliu I., Le Coutre J., Rezzi S., Collino S., Martin F.P., Da Silva L., Genetic and urine-derived markers of human metabolic and gut microbial states - European Patent Office, *EP2687845 A1* (issued in 2014)

TALKS AND POSTERS

2017 **[BC]2 Basel Computational Biology Conference** Congress Center, Basel, Switzerland
Ledda M. and Aviran S., patteRNA: Transcriptome-wide search for functional RNA elements via structural data signatures. *Speaker - 20min talk*

Genome Research Day 23andMe, Mountain View, CA
Ledda M. and Aviran S., Transcriptome-wide search for functional RNA elements via structural data signatures. *Poster*

2016 **Computational RNA Biology Conference** Wellcome Trust, Cambridge, UK
Ledda M., Deng F., Vaziri S., and Aviran S., Data-directed RNA secondary structure prediction using probabilistic modeling. *Speaker - 15min talk*

HOBBIES/INTERESTS

Soccer - Alpine Ski - Hiking - Taking (many) pictures - Building servers at home

References upon request