

Mirko LEDDA

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Nationality: Swiss and Italian

AREAS OF SPECIALIZATION

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

EDUCATION

2008 B.SC. IN LIFE SCIENCES - University of Applied Sciences (HES-SO), Sion, Switzerland

RESEARCH POSITIONS

- 2016- PH.D. CANDIDATE - Integrative Genetics and Genomics Graduate Group, UC Davis, USA
Designated Emphasis in Biotechnology (DEB) program, UC Davis, USA
- 2014-2016 PH.D. STUDENT - Integrative Genetics and Genomics Graduate Group, UC Davis, USA
Designated Emphasis in Biotechnology (DEB) program, UC Davis, USA
- 2009-2014 RESEARCH ASSISTANT - Nestlé Research Center, Lausanne, Switzerland

PUBLICATIONS (* INDICATES CO-AUTHORSHIP)

- 2017 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](#)]
- 2016 Deng F.*, Ledda M.*, Vaziri S. and Aviran S., **Data-directed RNA secondary structure prediction using probabilistic modeling**, *RNA* 22(8): 1109-19 [[doi](#)]
- 2016 Michlig Gonzlez 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](#)]
- 2013 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](#)]
- 2013 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 Ledda M. and Aviran S., **patteRNA: Transcriptome-wide search for functional RNA elements via structural data signatures**. [BC]2 Basel Computational Biology Conference (September 13-15th). Congress Center, Basel, Switzerland.
Speaker - 20min talk
- 2017 Ledda M. and Aviran S., **Transcriptome-wide search for functional RNA elements via structural data signatures**. Genome Research Day (June 1st). 23andMe, Mountain View, CA.
Poster
- 2016 Ledda M., Deng F., Vaziri S., and Aviran S., **Data-directed RNA secondary structure prediction using probabilistic modeling**. Computational RNA Biology (October 17-19th). Wellcome Genome Camps Conference Centre, Hinxton, Cambridge, UK.
Speaker - 15min talk

TEACHING EXPERIENCE

- W 2018 GUEST LECTURER - QUANTITATIVE GENETICS AND SELECTION THEORY (GRADUATE COURSE PLS298), UC DAVIS
1h30 lecture on fundamental concepts in Machine Learning.
- F 2017 LECTURER - MACHINE LEARNING WORKSHOP FOR THE PLANT SCIENCES DEPT., UC DAVIS
4h lecture on fundamental concepts in Machine Learning for the Ross-Ibarra, Knapp and Runcie labs.
- W 2017 GUEST LECTURER - TOPICS IN BIOMEDICAL ENGINEERING: COMPUTATIONAL GENOMICS (UPPER-LEVEL BIM189C), UC DAVIS
Two 2h lectures on fundamental concepts in Machine Learning.
- W 2016 TEACHING ASSISTANT - QUANTITATIVE GENETICS AND SELECTION THEORY (GRADUATE COURSE PLS298), UC DAVIS
Teaching R programming and the mathematical bases of selection theory in lab sessions.
- F 2015 COURSE DEVELOPMENT - QUANTITATIVE GENETICS AND SELECTION THEORY (GRADUATE COURSE PLS298), UC DAVIS
Preparation of the teaching material for this newly proposed class.

OUTREACH

- 2015- GRADUATE STUDENT ASSOCIATION (GSA) - UC DAVIS
Representative for the IGG graduate program.
- 2017 IGG ANNUAL COLLOQUIUM - UC DAVIS
Member of the organizing committee.
- 2017 TEEN BIOTECH CHALLENGE 2017 - DEB, UC DAVIS

Judge for System and Computational Biology websites.

2017 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 SISKIYOU - DUNSMUIR HIGH SCHOOL, DUNSMUIR, CA, USA
Presented biology research and taught basic genetic concepts to three 9th to 12th grade high-school classes.

2015 SCIENCE VS FICTION - SENIOR CENTER, DAVIS, CA, USA
Presented common scientific misconceptions followed by an open discussion with seniors.

2015 IGG PROGRAM - UC DAVIS
Mentor for all incoming international IGG students and mentor for a 1st year IGG student.

SCIENTIFIC AND PROFESSIONAL EXPERIENCE

- 2009-2014 RESEARCH ASSISTANT - NESTLÉ RESEARCH CENTER, LAUSANNE, SWITZERLAND
Activity manager for projects aimed at understanding taste perception physiology.
- 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; Identified key parameters driving taste sensitivity variations in humans and defined a mathematical model to estimate a novel parameter called overall taste sensitivity.
 - Set up of the single cell Ca²⁺-imaging technique and development of computational tools for automated data analysis in Matlab.
 - 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".

LANGUAGES

- French: Mother Tongue
- Italian: Mother Tongue
- English: Fluent

PROGRAMMING LANGUAGES

Python - R - Matlab - Perl - Bourne Shell

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.
- 2016 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.
- 2017 GOLDEN KEY INTERNATIONAL HONOUR SOCIETY - Nominated for membership.
- 2016 GOLDEN KEY INTERNATIONAL HONOUR SOCIETY - Nominated for membership.
- 2015 GOLDEN KEY INTERNATIONAL HONOUR SOCIETY - Nominated for membership.