

# Mirko LEDDA

Steven J. Knapp Lab  
Plant Sciences & Strawberry breeding program  
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## RELEVANT SKILLS

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| <b>Computing</b> | Programming  | <ul style="list-style-type: none"><li>• Python, R, Matlab (+ some C and Perl).</li><li>• Shell scripting and analysis on high-performance clusters.</li><li>• Algorithms and software development/maintenance/release.</li></ul> |
|                  | Data science   | <ul style="list-style-type: none"><li>• Statistics, algebra, calculus and probability theory.</li><li>• Machine learning (incl. Tensorflow, Keras and scikit-learn).</li><li>• Big data analysis and management.</li></ul>       |
| <b>Biology</b>   | Bioinformatics   | <ul style="list-style-type: none"><li>• Next-gen sequencing (incl. library prep).</li><li>• Genomics, transcriptomics, metabolomics and GWAS.</li><li>• Common bioinformatics tools/pipelines.</li></ul>                         |
|                  | Engineering  | <ul style="list-style-type: none"><li>• Receptors biochemistry.</li><li>• Molecular, structural and cell biology.</li><li>• Bioprocesses and bioreactors.</li></ul>  |
| <b>Business</b>  | Management   | <ul style="list-style-type: none"><li>• Project management and team building.</li><li>• Effective oral and written communication.</li><li>• Teaching, consulting and mentoring.</li></ul>  |
|                  | Processes  | <ul style="list-style-type: none"><li>• Intellectual properties.</li><li>• Biology wet-lab management.</li><li>• Safety and quality control (incl. MP, SOP and GLP).</li></ul>   |
| <b>Language</b>  | English: Fluent   French: Native   Italian: Native   German: Basic |  |

## EDUCATION

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**Ph.D. in Integrative Genetics and Genomics with Emphasis in Biotechnology (DEB)** June 2019  
University of California at Davis, CA, USA  
Thesis title: Hairpin in a haystack: structure-guided search for functional RNA elements

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

## RESEARCH EXPERIENCE

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**Postdoctoral scholar** - UC Davis, CA Apr 2019-current  
Supervisor: Prof. Steven J. Knapp  
Topic: Computational and statistical methods for genomic prediction during selective breeding, the *in silico* design of genotype markers in complex genomes, and genetic linkage and association studies with complex phenotypes.

**Ph.D. researcher** - UC Davis, CA Sep 2014-Apr 2019  
Supervisor: Prof. Sharon Aviran

Topic: Computational and statistical methods for the analysis of high-throughput RNA structure probing experiments and RNA secondary structure predictions.

**Research intern** - 23andMe, Mountain View, CA

Jul 2018-Sep 2018

Supervisor: Dr. Babak Alipanahi

Topic: Finemapping genetic association studies using deep learning.

## RESEARCH EXPERIENCE (CONTINUED)

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**Research Assistant** - Nestlé Research Center, Lausanne, Switzerland

Apr 2009-Apr 2014

Supervisor: Prof. Johannes le Coutre

Topic: Genetic bases of taste perception. Taste physiology and receptor pharmacology.

**Soldier specialist in biological weapons** - Swiss Army, Labor Spiez, Switzerland

Sep 2008-Sep 2014

Supervisor: Dr. Christian Beuret

(5 months, then part-time 3 weeks per year)

Topic: Lab methods for the rapid identification of pathogenic bacteria, viruses and toxins.

**Undergraduate researcher** - University of Palermo, Italy

Oct 2007-Apr 2008

Supervisor: Prof. Anna Maria Puglia

Topic: Strategies for the study of genes with unknown functions in *Streptomyces*.

## TEACHING EXPERIENCE

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**Reader** - Chemical Engineering Thermodynamics Laboratory, UC Davis

2019

IOR: Prof. Bruce Gates and Prof. Jiandi Wan, Level: Graduate

Duties: Graded laboratory reports.

**Teaching assistant** - Advanced Genetic Analysis (GGG201A), UC Davis

2018

IOR: Prof. Danika Bannash and Prof. David Segal, Level: Graduate

Duties: Support to student and led a discussion session.

**Guest Lecturer** - Quantitative Genetics and Selection Theory (PLS298), UC Davis

2018

IOR: Prof. Steve Knapp, Level: Graduate

Duties: 1h30 lecture on Machine Learning.

**Lecturer** - Machine Learning Workshop for the Plant Sciences Dept., UC Davis

2017

IOR: Mirko Ledda, Level: Undergraduate, Graduate and Professor

Duties: 4h workshop on Machine Learning.

**Guest Lecturer** - Topics in BME: Computational Genomics (BIM189C), UC Davis

2017

IOR: Prof. Sharon Aviran, Level: Upper level undergraduate

Duties: Two 2h lectures on Machine Learning.

**Teaching assistant** - Quantitative Genetics and Selection Theory (PLS298), UC Davis

2016

IOR: Prof. Steve Knapp, Level: Graduate

Duties: Taught R programming and the mathematical bases of selection and breeding theory in lab sessions.

**Course development** - Quantitative Genetics and Selection Theory (PLS298), UC Davis

2015

IOR: Prof. Steve Knapp, Level: Graduate

Duties: Preparation of the teaching material as it was a new class.

## AWARDS

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- UC Davis Graduate Student Travel Award** - UC Davis 2017  
Competitive award to cover the cost to attend, as a speaker, the *2017 [BC]2 Basel Computational Biology Conference* in Basel, Switzerland.
- Registration Bursary** - Wellcome Genome Campus Scientific Conferences 2016  
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 2016  
3-month support for graduate research in engineering, computer science, and disciplines with engineering-related applications and methods.

## MEMBERSHIPS / HONORS

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- Graduate Student member** - American Society for Horticultural Science (ASHS) 2019
- Student member** - The RNA Society 2018
- Nominated for membership** - Phi Kappa Phi ( $\Phi\Kappa\Phi$ ) Honor Society 2018
- Nominated for membership** - Golden Key International Honour Society 2015-2018

## COMMUNITY SERVICE

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- IGG representative for the Graduate Student Association (GSA)** - UC Davis 2015-2019
- Volunteer for "Skype a Scientist"** - AECl Charter High School, Bronx, NY, USA 2019
- eMentor for the Biotechnology Academy Program** - Sheldon High School, Sacramento, CA, USA 2019
- IGG Annual Colloquium organizer** - UC Davis 2017
- DEB volunteer judge for the Teen Biotech Challenge 2017** - DEB, UC Davis 2017
- Student mentor for Topics in BME: Computational Genomics (BIM189C)** - UC Davis 2017
- DEB volunteer judge for the Teen Biotech Challenge 2016** - DEB, UC Davis 2016
- Volunteer for "Science in the Siskiyou"** - Dunsmuir High School, Dunsmuir, CA, USA 2015
- Volunteer for "Science vs Fiction"** - Senior Center, Davis, CA, USA 2015
- Mentor for incoming international IGG students** - UC Davis 2015

## PRESENTATIONS AND POSTERS

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- 2019 ASHS Annual Conference** - Tropicana, Las Vegas, NV 2019  
**Ledda M.**, Cobo N., Lorant A., Hardigan M.A. and Knapp S.J., A Bioinformatic Platform for Identifying Target DNA Sequences for the Development of SubGenome Specific DNA Markers in Polyploid and Other Complex Genomes. *Poster*
- [BC]2 Basel Computational Biology Conference** - Congress Center, Basel, Switzerland 2017  
**Ledda M.** and Aviran S., patterRNA: Transcriptome-wide search for functional RNA elements via structural data signatures. *Speaker - 20min talk*
- Genome Research Day** - 23andMe, Mountain View, CA 2017  
**Ledda M.** and Aviran S., Transcriptome-wide search for functional RNA elements via structural data signatures. *Poster*

**Ledda M.**, Deng F., Vaziri S., and Aviran S., Data-directed RNA secondary structure prediction using probabilistic modeling. *Speaker - 15min talk*

## PUBLICATIONS ( \* INDICATES CO-AUTHORSHIP)

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Radecki P.\*, **Ledda M.\*** and Aviran S. (2018) Automated Recognition of RNA Structure Motifs by Their SHAPE Data Signatures, *Genes* 9(6) [\[doi\]](#)

**Ledda M.** and Aviran S. (2018) patteRNA: transcriptome-wide search for functional RNA elements via structural data signatures, *Genome Biology* 19(28) [\[doi\]](#)

Choudhary K., Shih N.P., Deng F., **Ledda M.**, Li B. and Aviran S. (2016) 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. (2016) 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. (2016) 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 [\[doi\]](#)

Rueedi R.\*, **Ledda M.\***, Nicholls A.W., Salek R.M., Marques-Vidal P., Morya E., Sameshima K., Montoliu I., Da Silva L., Collino S., Martin F-P., Rezzi S., Steinbeck C., Waterworth D.M., Waeber G., Vollenweider P., Beckmann J.S., le Coutre J., Mooser V., Bergmann S., Genick U.K., Kutalik Z. (2014) Genome-wide association study of metabolic traits reveals novel gene-metabolite-disease links, *PLoS Genetics* 10(2) [\[doi\]](#)

**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., le Coutre J., Bergmann S., Genick U.K. (2013) 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. (2013) 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.K.\*, **Ledda M.**, Collino S., Martin F.P., Le Coutre J. and Rezzi S. (2013) Current status on genome-metabolome-wide associations: An opportunity in nutrition research, *Genes and Nutrition* 8: 19-27 [\[doi\]](#)

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., Bergmann S., le Coutre J. (2011) Sensitivity of genome-wide-association signals to phenotyping strategy: The PROP-TAS2R38 taste association as a benchmark, *PLoS One* 6(11) [\[doi\]](#)

## PATENTS

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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)

US Patent Office *US Patent 20,150,160,191* (Issued in 2015)

## **HOBBIES/INTERESTS**

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Sports (Soccer, Alpine Ski, GoKart), Travels, Hiking, Gardening.

**References upon request**