Mirko LEDDA

Glaab Lab
Luxembourg Centre for Systems Biomedicine (LCSB)
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RELEVANT SKILLS

Computing	Programming	• Python, R, Matlab (+ some C, Perl, HTML, CSS and JavaScript). • Bourne shell and high-performance computing in Linux (incl. AWS). • Algorithms, software and web app development and distribution. • Code optimization, coverage and profiling analysis.
	Data science	• Statistics, algebra, calculus and probability theory. • Machine learning (incl. Tensorflow, Keras and scikit-learn). • Big data analysis and data visualization.
Biology	Bioinformatics	• Genomics, transcriptomics, metabolomics and GWAS. • Omics data integration and network analyses. • Structural biology (e.g. Molecular Dynamics).
	Engineering	• Receptors biochemistry. • Molecular, structural and cell biology. • Bioprocesses and bioreactors.
Business	Management	• Project management and team building. • Effective oral and written communication. • Teaching, consulting and mentoring.
	Processes	• Intellectual properties. • Biology wet-lab management. • Safety and quality control (incl. MP, SOP and GLP).
Language	English: Fluent | French: Native | Italian: Native | German: Basic	

EDUCATION

Ph.D. in Integrative Genetics and Genomics — Oct 2014-June 2019
University of California at Davis, CA, USA

B.Sc. in Life Sciences with Emphasis in Biotechnology — Sept 2004-Apr 2008
University of Applied Sciences (HES-SO), Sion, Switzerland

RESEARCH EXPERIENCE

Postdoctoral scholar - Univerity of Luxembourg — Sep 2020-present
Supervisor: Prof. Enrico Glaab
Topic: Interpretable network and machine learning approaches to integrate omics data, model neurodegenerative diseases and generate functional hypotheses for the development of novel therapeutics. Includes systems biology and structural biology.

RESEARCH EXPERIENCE (CONTINUED)

Postdoctoral scholar - UC Davis, CA Apr 2019-July 2020
Supervisor: Prof. Steven J. Knapp
Topic: Computational and statistical methods for genomic prediction, 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, Moutain View, CA Jul 2018-Sep 2018
Supervisor: Dr. Babak Alipanahi
Topic: Finemapping genetic association studies using deep learning.

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

Guest Lecturer - Quantitative Genetics and Selection Theory (PLS298), UC Davis 2020
IOR: Prof. Steve Knapp, Level: Graduate
Duties: Several lectures covering frequentist, bayesian and machine learning models for genomic and phenotypic predictions.

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 EXPERIENCE (CONTINUED)

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.

PUBLICATIONS (* INDICATES CO-AUTHORSHIP)

Picot D.A.*, **Ledda M.***, Feldmann M.J.*, Hardigan M.A., Poorten T.J., Heffelfinger C., Cole G.S., Acharya C.B., Dellaporta S., Knapp S.J. (2021) Social Network Analysis of the Genealogy of Strawberry: Retracing the Wild Roots of Heirloom and Modern Cultivars, *G3 Genes|Genomes|Genetics* 19(3) [doi]

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

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)

PRESENTATIONS AND POSTERS

2019 ASHS Annual Conference - Tropicana, Las Vegas, NV 2019
Ledda M., Cobo N., Lorant A., Hardigan M.A. and Knapp S.J., PolyOligo: A Bioinformatic Platform for Identifying Target DNA Sequences for the Development of Sub-Genome Specific DNA Markers in Polyploid/Complex Genomes. *Poster*

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

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

AWARDS

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.

COMMUNITY SERVICES

IGG representative for the Graduate Student Association (GSA) - UC Davis	2015-2019
Volunteer for "Skype a Scientist" - AECI 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 Siskiyous" - 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

HOBBIES/INTERESTS

Sports (Soccer, Alpine Ski, GoKart), Travels, Hiking, DIY enthusiast.

References upon request