

Lorenzo Ferrando

POSTDOCTORAL RESEARCHER · TRANSLATIONAL AND INTEGRATIVE GENOMICS RESEARCH LAB

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Publication track record

Number of peer reviewed papers: 42

Citations: 581

H index: 13 (Scopus)

Personal statement

I am a bioengineer with a PhD in Translational Medicine in Oncology and Ematology. I have a strong expertise in the implementation and application of mathematical and statistical models to analyze high-dimensional omics-data in cancer research. I am currently involved in projects aimed to develop novel non-invasive classifiers based on cutting-edge machine learning approaches in the context of personalized cancer medicine. I am in charge of the development of bioinformatics pipelines for the LiSComp Lab (led by Prof. Michele Piana) and the Department of Internal Medicine.

Education

Dept. of Internal Medicine and Medical Specialities, University of Genoa

Genoa, Italy

PHD TRANSLATIONAL MEDICINE IN ONCOLOGY AND EMATOLOGY

2017 - 2021

- **Title:** Genomic analysis of special types of invasive breast cancer
Brief description: Histologic special types of breast cancer (BC) account for ~20% of BCs. Large sequencing studies of metastatic BC have focused on invasive ductal carcinomas of no special type (IDC-NSTs). During the PhD, I sought to define the repertoire of somatic genetic alterations of metastatic histologic special types of BC, leveraging the largest dataset (MSK-IMPACT) of special types of BC.
Advisor: Prof. G. Zoppoli

Dept. of Informatics, Bioengineering, Robotics and Systems Engineering, University of Genoa

Genoa, Italy

MASTER DEGREE IN BIOENGINEERING

2013 - 2015

- **Title:** Assessment of genomic signatures associated with ageing: a pan cancer analysis
Brief description: The thesis focused on the determination of biological processes common to ageing and carcinogenesis, through the identification of genomic determinants. Machine learning approaches were used to leverage high-dimensional multi-omics datasets and identify specific genomic traits of elderly cancer patients.
Co-advisor(s): Prof. A. Barla, Prof. G. Zoppoli

University of Genoa

Genoa, Italy

BACHELOR DEGREE IN BIOMEDICAL ENGINEERING

2009 - 2013

- **Title:** Experimental study of vitreous body dynamic
Brief description: The study deals with experimental analysis of the vitreous body, or vitreous humor, exposed to different types of stress. Through image acquisition and exposition, turbulent flow was evaluated after stress exposition, providing information about the effects of collisions on collagen network.
Advisor: Prof. A. Stocchino

Research Experience

Biogem, Istituto di Ricerche Genetiche

Ariano Irpino, AV

VISITING POSTDOCTORAL FELLOW

2022

- **Advisor:** Prof. Michele Ceccarelli.
Specialized training on cfMeDip-Seq for the characterization of epigenetic traits of early breast cancer.

Memorial Sloan Kettering Cancer Center, Department of Pathology

New York City, NY

GRADUATE RESEARCH ASSISTANT

2018 - 2019

- **Advisor:** Dr. Jorge Reis-Filho.
Focused training on massive parallel sequencing analysis for the characterization of epigenetic and genomic traits of special histologic types of breast cancer and rare form of gynecological cancers.

Department of Internal Medicine and Medical Specialities, University of Genoa

Genoa, Italy

EXTERNAL COLLABORATOR

2017-2018

- **Co-Advisors:** Prof. A. Ballestrero, Prof. G. Zoppoli
Model assessment, development and optimization for the identification of genomic determinants in elderly patients in the context of personalized medicine in the geriatric oncology field.

Publications

In the following publications, I was in charge of data analyses and interpretations, as well as manuscript writing.

SELECTED PUBLICATIONS

- Ferrando, Lorenzo A et al. "ESR1 gene amplification and MAP3K mutations are selected during adjuvant endocrine therapies in relapsing Hormone Receptor-positive, HER2-negative breast cancer." *PLoS Genet.* 3;19 (2023). **Co-first author**
- Moukarzel, Lea A et al. "Impact of obesity and white adipose tissue inflammation on the omental microenvironment in endometrial cancer." *Cancer* vol. 128,18 (2022): 3297-3309. **Co-first author**
- Moukarzel, Lea A et al. "Hyperthermic intraperitoneal chemotherapy (HIPEC) with carboplatin induces distinct transcriptional changes in ovarian tumor and normal tissues." *Gynecologic oncology* vol. 165,2 (2022): 239-247. **Co-first author**
- Cirmena, Gabriella et al. "Plasma Cell-Free DNA Integrity Assessed by Automated Electrophoresis Predicts the Achievement of Pathologic Complete Response to Neoadjuvant Chemotherapy in Patients With Breast Cancer." *JCO precision oncology* vol. 6 (2022): e2100198. **Co-first author**
- Ravera, Francesco et al. "Development of a hoRizontal data intEgration classifier for NOn-invasive early diAgnosis of breast cancer: the RENOVATE study protocol." *BMJ open* vol. 11,12 e054256. 31 Dec. 2021. **Co-last author**
- Fancello, Laura et al. "TMBleR, a bioinformatic tool to optimize TMB estimation and predictive power." *Bioinformatics (Oxford, England)*, btab836. 20 Dec. 2021.
- Dameri, Martina et al. "Multi-Gene Testing Overview with a Clinical Perspective in Metastatic Triple-Negative Breast Cancer." *International journal of molecular sciences* vol. 22,13 7154. 1 Jul. 2021. **Co-first author**
- Moukarzel, Lea A et al. "The genetic landscape of metaplastic breast cancers and uterine carcinosarcomas." *Molecular oncology* vol. 15,4 (2021): 1024-1039. **Co-first author**
- Pareja, Fresia et al. "The genomic landscape of metastatic histologic special types of invasive breast cancer." *NPJ breast cancer* vol. 6 53. 14 Oct. 2020. **Co-first author**
- Arruabarrena-Aristorena, Amaia et al. "FOXA1 Mutations Reveal Distinct Chromatin Profiles and Influence Therapeutic Response in Breast Cancer." *Cancer cell* vol. 38,4 (2020): 534-550.e9.
- Caffa, Irene et al. "Fasting-mimicking diet and hormone therapy induce breast cancer regression." *Nature* vol. 583,7817 (2020).
- Giannotti, Chiara et al. "Development of a predictor of one-year mortality in older patients with cancer by geriatric and oncologic parameters." *Journal of geriatric oncology* vol. 11,4 (2020): 610-616. **Co-first author**
- Ferrando, Lorenzo et al. "Development of a long non-coding RNA signature for prediction of response to neoadjuvant chemoradiotherapy in locally advanced rectal adenocarcinoma." *PloS one* vol. 15,2 e0226595. 5 Feb. 2020.
- Xu, Guotai et al. "ARID1A determines luminal identity and therapeutic response in estrogen-receptor-positive breast cancer." *Nature genetics* vol. 52,2 (2020): 198-207

IN PREP.

Ferrando, Lorenzo et al. "Epigenetic master regulation of transcription factors induces mucinous carcinoma."

Positions and honors

IT Director for the Department of Internal Medicine (DiMI) at Univeristy of Genoa.

HEAD IT ENGINEER FOR THE PROPER USE, SECURITY AND INTEGRITY OF THE GENOMICS DATA.

Since 2021

The AURORA project, Data Analysis Committee.

REPRESENTATIVE OF THE DATA ANALYSIS COMMITTEE FOR THE AURORA PROJECT FOR IRCCS
OSPEDALE POLICLINICO SAN MARTINO. BIG AGAINST BREAST CANCER.

Since 2021

Alleanza contro il cancro

BIOINFORMATIC REPRESENTATIVE OF THE ACCORD (UNIC 1: ANGIOSARCOMA PROJECT) TRIAL FOR
UNIVERSITY OF GENOA AND IRCCS OSPEDALE POLICLINICO SAN MARTINO.

Since 2020

Invited talks

Summer 2018. *Prediction of response to neoadjuvant chemoradiotherapy in rectal adenocarcinoma by whole transcriptome analysis: a prospective retrospective, consecutive cohort study.* Invited talk: 118th National Congress of Italian Society of Internal Medicine, Rome, Italy.

Outreach & Professional Development

DEVELOPED SOFTWARE

TMBleR (2021).

Bioinformatics tool to measure the clinical impact of various strategies of panel-based TMB measurement.

METAGENUA (2019).

One-year mortality predictor in older patients with cancer with high specificity.

PATENT

METAGENUA - Metodo multi-dominio per la predizione di mortalità dopo un anno in pazienti senior affetti da tumore.

Author(s): A. Ballestrero, G. Zoppoli, A. Nencioni, L. Ferrando

PEER REVIEW

Journal of Translational Medicine - BMC Journal

Tumori Journal - SAGE Journals

PROFESSIONAL MEMBERSHIPS

GNCS - Gruppo Nazionale per il Calcolo Scientifico

SIMI - Società di Medicina Interna

ACC - Alleanza Contro il Cancro

AACR - American Association for Cancer Research

I hereby authorize to personal data treatment (D. LGS. 196/2003 art. 13).

