

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors. Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Carrer, Alessandro

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Principal Investigator (@ VIMM) & Associate Professor (@ UniPD)

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
University of Trieste, Trieste	MS	11/2004	Biotechnology
International Center for Genetic Engineering and Biotechnology, Trieste	PhD	04/2010	Molecular Medicine
IRCSS Burlo Garofalo Children Hospital, Trieste	Other training	10/2001	Intern: microbiology of childhood diseases
International Center for Genetic Engineering and Biotechnology, Trieste	Postdoctoral Fellow	12/2012	neo-vessel stabilization
University of Pennsylvania, Philadelphia, PA	Postdoctoral Fellow	12/2017	Cell metabolism / epigenetics
University of Pennsylvania, Philadelphia, PA	Resident	03/2019	Cell metabolism / epigenetics

A. Personal Statement

Both metabolism and epigenetic reprogramming are amenable to therapeutic targeting, and can be linked. Understanding their relationship and contribution to cellular pathophysiology is key to unlock novel vulnerabilities or to identify environment-gene interactions. I am interested in studying how metabolic perturbations influence epigenetic regulation and how those contribute to clinical manifestation of a wide spectrum of diseases. In particular, my lab focuses on signaling functions of acetyl-CoA and downstream metabolites in the mevalonate pathway. I have established a record of productive and innovative research in the field.

B. Positions and Honors**Positions and Employment**

2025 – Associate Professor

2022 – 2025 Assistant Professor (RTDb), Department of Biology, University of Padova, Padova

2020 – 2022 MSCA Fellow, University of Padova, Padova

2020 – Principal Investigator, Veneto Institute of Molecular Medicine (VIMM), Padua

2017 – 2019 Research Associate, University of Pennsylvania, Philadelphia, PA

2013 – 2017 Postdoctoral fellow, University of Pennsylvania, Philadelphia, PA

2010 – 2012 Postdoctoral fellow, International Center for Genetic Engineering and Biotechnology (ICGEB), Trieste

2005 – 2010 PhD Student, International Center for Genetic Engineering and Biotechnology (ICGEB), Trieste

2002 – 2004 Undergraduate, International Center for Genetic Engineering and Biotechnology (ICGEB), Trieste

Other Experience and Professional Memberships

2024 - 2025 President, International Society for Cancer Metabolism (ISCaM)

2022 - present Founder and board of directors, Italian Pancreatic Cancer Community (I-PCC)

2022 - Member, Italian Society of Biochemistry (SIB)

2019 - iCARE Fellow, AIRC - MSCA Fellowship Program

2019 - Member, Italian Society of Biophysics and Molecular Biology (SIBBM)

2006 – 2008 Fellow, Ataxia UK

Honors

2020 - 2022 2020, MSCA Fellow

2019 - 2021 iCARE-2 Fellowship Award , AIRC

2008 - 2010 “AtaxiaUK” long-term fellowship, Ataxia UK

2019 Seal of Excellence , EU – Horizon2020 Marie Skłodowska-Curie Actions

2018 Travel Award , International Society for Cancer Metabolism (ISCaM)

2018 INROAd Mobility Award, University of Pavia

2011 Scholar-In-Training Award, AACR

2009 Scholar-In-Training Award, AACR

C. Contribution to Science

1. I generated a conditional knock-out mouse model for ACLY, the enzyme largely responsible for the generation of nucleocytoplasmic acetyl-CoA. These mice (Aclyfl/fl) have been extensively characterized and we have been able to generate Aclyfl/fl MEFs cell lines (Zhao et al, Cell Rep, 2016), mice lacking ACLY in adipocytes (Zhao et al, Cell Rep, 2016), in hepatocytes (Zhao et al, Nature, in revision) and pancreatic epithelial cells (Carrer et al, Cancer Discovery, 2019). This model represents a valuable tool for the study of several biological processes.
2. I demonstrated that cell-intrinsic factors can provoke chromatin remodeling through manipulation of cellular metabolism. I first found that signaling through AKT and KRAS is able to augment acetyl-CoA availability in pancreatic cancer cells, resulting in elevated global histone acetylation (PMCID: PMC4721608; PMC4151270; PMC6643997).
3. I found that dietary interventions can significantly impact acetyl-CoA availability and histone acetylation in different organs. Mice fed with a fat-rich diet show significant down regulation of ACLY expression and acetyl-CoA abundance in liver, pancreas and adipose tissue (PMC5336165). In contrast, dietary fructose feeds hepatic acetyl-CoA via microbiota-generated acetate (PMC7416516).

Selected publications

List: (underscores denote my contribution, in **bold** first-authorships, * for senior authorship)

Carrer A, Lee JV, Shah S, Snyder NW, Wei S, Venneti S, Worth AJ, Yuan ZF, Lim HW, Liu S, Jackson E, Aiello NM, Haas NB, Rebbeck TR, Judkins A, Won KJ, Chodosh LA, Garcia BA, Stanger BZ, Feldman MD, Blair IA, Wellen KE, Akt-dependent metabolic reprogramming regulates tumor cell histone acetylation, **Cell Metabolism**, 2014

- >200 citations
- featured in multiple N&V highlights (Cancer Discovery, Molecular & Cellular Oncology, Molecules and Cells)

Carrer A, Wellen KE, Metabolism and epigenetics: a link cancer cells exploit, **Curr Opin Biotechnol**, 2014

Carrer A, Parris JLD, Trefely S, Henry RA, Montgomery D, Kuo Y-M, Blair IA, Meier JL, Andrews Aj, Snyder NW, and Wellen KE, *Impact of high fat diet on tissue acyl-CoA and histone acetylation levels*, **Journal of Biological Chemistry**, 2017

- "Highly downloaded" JBC paper for February 2017

McDonald O, Saunders T, Tryggvadottir R, Mentch S, Warmoes M, Word A, **Carrer A**, Salz T, Natsume S, Stauffer K, Makohon-Moore A, Zhong Y, Wu H, Wellen KE, Locasale JD, Iacobuzio-Donahue C, Li X, *Large-scale epigenomic reprogramming links anabolic glucose metabolism to distant metastasis during the evolution of pancreatic cancer progression*, **Nature Genetics**, 2017

- >200 citations
- Multiple N&V commentaries
- WoS Highly Cited Paper 2019, 2020

JV Lee, K Kim, CT Berry, P Sen, T Kim, **A Carrer**, S Trefely, S Zhao, LE Barney, AD Schwartz, S Fernandez, SR Peyton, NW Snyder, SL Berger, BD Freedman, KE Wellen, *Acetyl-CoA promotes glioblastoma cell adhesion and migration through Ca²⁺-NFAT signaling*, **Genes and Development**, 2018

- Highlighted article (Martinez & Chandel, G&D, 2018)

Carrer A, Parris JLD, Trefely S, Campbell SC, Norgard RJ, Egolf SS, Sidoli S, Trizzino M, Sivanand S, Sela Y, Blair IA, Garcia BA, Nathaniel W. Snyder, Stanger BZ and Kathryn E. Wellen, *acetyl-CoA metabolism supports multi-step pancreatic carcinogenesis*, **Cancer Discovery**, 2019

- N&V spotlight article (Halbrook & Lyssiotis, CD, 2019)
- Cover article
- F1000 Selection
- WoS Highly Cited Paper 2020

Zhao S, Jang C, Liu J, Uehara K, Gilbert M, Izzo L, Zeng X, Trefely S, Fernandez S, **Carrer A**, Miller KD, Schug ZT, Snyder NW, Gade TP, Titchenell PM, Rabinowitz JD, Wellen KE, *Dietary Fructose feeds hepatic lipogenesis via microbiota-derived acetate*, **Nature**, 2020

Paoli C & **Carrer A***, *Organotypic culture of acinar cells for the study of pancreatic carcinogenesis*, **Cancers**, 2020

Grisan F, Spacci M, Paoli C, Costamagna A, Fantuz M, Martini M, Lefkimmatis K, **Carrer A***, *Cholesterol activates Cyclic AMP signaling in metaplastic acinar cells*, **Metabolites**, 2021

Calciolari B, Scapinello G, Quotti Tubi L, Piazza F, **Carrer A***, *Metabolic control of epigenetic rearrangements in B cell pathophysiology*, **Open Biology**, 2022

R. Noè, N. Inglese, P. Romani, T. Serafini, M. Fantuz, A. Zamborlin, B. Calciolari, N.C. Surdo, C. Paoli, M. Spacci, M.L. Ermini, G. Di Benedetto, C. Santi, K. Lefkimmatis, S. Dupont, V. Voliani, L. Sancineto, **A. Carrer***, *Organic Selenium induces ferroptosis in pancreatic cancer cells*, **Redox Biol**, 2023

Noè R, Carrer A*, *Diet predisposes to pancreatic cancer through cellular nutrient sensing pathways*, **FEBS Lett.**, 2024

Milan G, Mareninova OA, Fantuz M, Spacci M, Paoli C, Pineda JA, Noè R, Calciolari B, Zoncu R, Gukovskaya AS, **Carrer A***, *Reprogramming of cholesterol sensing in epithelial cells supports pancreatic inflammation*, **Mol Metab**, 2025

Full list: <https://www.ncbi.nlm.nih.gov/myncbi/alessandro.carrer.1/bibliography/public/>

Bibliometric parameters:

Publications: 26 (7 first-author; 5 corresponding author; active IF: 97,215)

Citations (per WoS): 2536 (2486 without self citations); Papers with >100 citations: 7

H-index: 16

Funding (role: PI only)

- 2026-2029 Investigator Initiated Grant, World Cancer Research Fund (WCRF): *Interrogating the impact of fructose-to-acetate conversion for nucleolus organization and pancreatic cancer initiation* (Project ID#: 3844) – 572,000 €
- 2025-2029 Investigator Grant, Italian Association for Cancer Research (AIRC): *Interrogating metabolic-epigenetic connection in the malignant evolution of pancreatic neoplasia* (Project ID#: 30296) – 815,000 €
- 2023-2025 Research Grant – Multi-round Call (#2), Telethon Foundation: *Dissecting the role of cytoplasmic signaling metabolites in Niemann-Pick disease type C* (Project ID# GMR23T1060) – 160,000 € (ended)
- 2022-2023 Seed Grant, World Cancer Research Fund (WCRF): *Do sweetened beverages promote pancreatic cancer risk? Interrogating metabolic alterations induced by dietary fructose* (Project ID# 2021-1769) – 80,000 € (ended)
- 2021-2022 Transnational Access (TNA) Projects, H2020 Framework Programme: *Dissecting epigenetic and cellular memory of inflammation to improve pancreatic cancer prevention* (Project ID#: 15158) – 60,000 € (ended)
- 2020-2024 My First AIRC Grant, Italian Association for Cancer Research (AIRC): *Interrogating metabolic and epigenetic reprogramming in pancreatic cancer initiation* (Project ID#: 23029) – 500,000 € (ended)
- 2020-2022 R21, National Cancer Institute (NCI): *Mitochondria-to-nucleus communication in pancreatic cancer initiation* (Project ID#: 1R21CA244025) – 250,000 \$ (ended)
- 2020-2023 Research Grant, the WorldWide Cancer Research Foundation (WWCR): *Mitochondria-to-nucleus communication in pancreatic cancer* (Project ID#: 20-0188) – 275,000 £ (ended)