

# Curriculum Vitae

## 1. Personal information

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Family name, First name: Nicoli Francesco  
Date of Birth: August 27<sup>th</sup> 1985  
Place of Birth: Isola della Scala (VR), Italy  
Contact: +39-328 1539260, nclfnc1@unife.it

Current employment: Researcher at the Department of Chemical and Pharmaceutical and Agricultural Sciences, University of Ferrara, Italy

## 2. Experience, Training and Education

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May 2021- RTD in Microbiology and Clinical Microbiology, Department of Chemical, Pharmaceutical and Agricultural Sciences, University of Ferrara, Italy

November 2018 - PhD in Biomedical Sciences and Biotechnology (second PhD), University of Ferrara,. Supervisor: Prof. Peggy Marconi

September 2017 – August 2018 Post doc at University of Padua, Department of Molecular Medicine, Padua, Italy. Supervisor: Prof. Antonella Caputo

March 2015- August 2017 Post-doc at INSERM Unit 1135, Paris, France. Supervisor: Dr. Victor Appay

October 2103 – December 2014 Research assistant at the Department of Life Sciences and Biotechnology (SveB), University of Ferrara, Italy. Supervisor: Prof. Riccardo Gavioli

September 2010- September 2013 PhD in Medical research-International Health, Center of International Health – Ludwig Maximilians University – Munich – Germany. Thesis title: “Immunomodulatory properties of the HIV-1 Tat protein”. Supervisors: Prof. Thomas Brocker, Dr. Christof Geldmacher, Prof. Riccardo Gavioli

September 2009- September 2010 Fellow at the Department of Biochemistry and Molecular Biology, University of Ferrara, Italy. Supervisor: Prof. Riccardo Gavioli

July 2009 Specialistic 5-years degree in Pharmaceutical Chemistry and Technology at the University of Ferrara with 110/110 cum laude. Title of the thesis: “Pre-clinical studies on a Tat-based vaccine against HIV-AIDS”. Supervisor: Prof. Riccardo Gavioli

### 3. Research areas of interest

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- Immunopathogenesis of infectious diseases
  - Role of viral factors in HIV pathogenesis
  - Studies of mechanisms characterizing the higher susceptibility to infections in elderly populations
  - Characterization of CD8<sup>+</sup> T cell dysfunctions in ageing and viral infections
  - Immune restoration after DAA therapy in HCV-infected patients
- Immunosenescence
  - B and T cell responses in aged individual
  - Characterization of intrinsic properties of T cell subsets in elderly individuals
  - Immunometabolic properties of immune cells in elderly individuals
  - SARS-CoV2 specific primary responses in subjects of different age groups
- Vaccine development against tumours and infectious diseases
  - Preclinical studies on vaccines against HIV-AIDS, HSV-1 and HSV-2
  - Preclinical studies on the use of Tat as adjuvant in vaccination settings
  - Identification of new adjuvant to enhance the priming of CD8<sup>+</sup> T cells in against tumours and viral pathogens
  - Study of naïve CD8<sup>+</sup> and CD4<sup>+</sup> T cells features in physiological and pathological contexts: metabolism, functionality, capability to generate effector and memory responses
  - Identification of new adjuvants to be used for vaccination of elderly subjects
- Role of metabolism on immunopathogenesis and immune control of infectious diseases
  - Metabolic bases of immune response
  - Immunometabolic properties of T cells of elderly patients
  - Immunometabolic properties of T cells of HIV-infected patients

### 4. Professional Skills

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- Cell culture: growing mammalian cells *in vitro*, assessing cell proliferation, FACS analysis, generating CTL cultures, stimulating memory T cells.
- *In vitro* priming of naïve T cells
- Flow cytometry: surface, intracellular, intranuclear and phosphoflow staining
- Biochemistry and molecular biology techniques: Western-blot, protein purification, proteases assay, DNA and RNA extraction, PCR, qPCR, retrotranscription.
- Immunological assays: Detection of cytokine release (ELISpot, intracellular staining, Bioplex), evaluation of antibody titers (IgG, IgM, IgA ELISA assays), immunophenotyping and analysis of epitope-specific CD8<sup>+</sup> T cells.
- Assessment of cellular metabolism
- Animal Handling: mice immunization, necropsy, collection of sera and mucosal secretions.
- Designing independently *in vitro* and *in vivo* experimental protocols.

- Performing statistical analysis of results: groups comparison with parametrical and non-parametrical statistic test, linear regression.
- Other skills
 

Language	Italian (native), English (Proficient), French (Independent)
Software	Graphpad Prism, BD FACSDiva, FlowJo Software

## 5. Publications

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- 1) Guidelines for the use and interpretation of assays for monitoring autophagy (4th edition)  
Klionsky et al, (2021)  
Autophagy, 17:1-382
- 2) Age-related decline of de novo T-cell responsiveness as a cause of COVID-19 severity.  
**Nicoli F**, Soli-Soto MT, Paudel D, Marconi P, Gavioli R, Appay V, Caputo A (2020) Corresponding author  
GeroScience, 42:1015-1019
- 3) The TLR9 ligand CpG ODN 2006 is a poor adjuvant for the induction of de novo CD8<sup>+</sup> T-cell responses in vitro.  
Papagno L, Kuse N, Lissina A, Gostick E, Price DA, Appay V, **Nicoli F**. (2020) Corresponding author  
Sci Rep, 10:11620
- 4) The Tat protein of HIV-1 prevents the loss of HSV-specific memory adaptive responses and favors the control of viral reactivation.  
**Nicoli F**, Gallerani E, Sicurella M, Pacifico S, Cafaro A, Ensoli B, Marconi P, Caputo A, Gavioli R. (2020) Corresponding author  
Vaccines, 8:E274
- 5) Impact of IgA isoforms on their ability to activate dendritic cells and to prime T cells.  
Gayet R, Michaud E, **Nicoli F**, Chanut B, Paul M, Rochereau N, Guillon C, He Z, Papagno L, Bioley G, Corthesy B, Paul S. (2020)  
Eur J Immunol, online ahead of print
- 6) A new approach to UV protection by direct surface functionalization of TiO<sub>2</sub> with the antioxidant polyphenol dihydroxyphenyl benzimidazole carboxylic acid.  
Battistin M, Dissette V, Bonetto A, Durini E, Manfredini S, Marcomini A, Casagrande E, Brunetta A, Ziosi P, Molesini S, Gavioli R, **Nicoli F**, Vertuani S, Baldisserotto A. (2020)  
Nanomaterials, 10:231
- 7) HPV-specific systemic antibody responses and memory B cells are independently maintained up to 6 years and in a vaccine-specific manner following immunization with Cervarix and Gardasil in adolescent and young adult women in vaccination programs in Italy.  
**Nicoli F**, Mantelli B, Gallerani E, Telatin V, Bonazzi I, Marconi P, Gavioli R, Gabrielli L, Lazzarotto T, Barzon L, Palù G, Caputo A. (2020)  
Vaccines, 8:26

- 8) Relationship between vaccination and nutritional status in children: analysis of recent Demographic and Health Surveys.  
Solis-Soto MT, Paudel D, **Nicoli F.** (2020)  
Corresponding author  
Demographic Research, 42:1-14
- 9) Angry, hungry T-cells: how are T-cell responses induced in low nutrient conditions?  
**Nicoli F.** (2020)  
Corresponding author  
Immunometabolism, 2:e200004
- 10) Synthesis and characterization of new multifunctional self-boosted filters for UV protection: ZnO complex with dihydroxyphenyl benzimidazole carboxylic acid.  
Battistin M, Durini E, Dissette V, Bonetto A, Marcomini A, Casagrande E, Brunetta A, Ziosi P, Molesini A, Gavioli R, **Nicoli F.**, Manfredini S, Vertuani S, Baldisserotto A. (2019)  
Molecules, 24:4546
- 11) In chronic hepatitis C infection, myeloid-derived suppressor cell accumulation and T cell dysfunctions revert partially and late after successful direct-acting antiviral treatment.  
Telatin V\*, **Nicoli F\***, Frasson C, Menegotto N, Barbaro F, Castelli E, Erne E, Palu G, Caputo A. (2019)  
**\*Shared first authorship**  
Front Cell Infect Microbiol, 9:190
- 12) Synthesis and biological activity of peptide  $\alpha$ -ketoamide derivatives as proteasome inhibitors.  
Pacifico S, Ferretti V, Albanese V, Fantinati A, Gallerani E, **Nicoli F.**, Gavioli R, Zamberlan F, Preti D, Marastoni M. (2019)  
ACS Med Chem Lett, 10:1086-1092
- 13) The STING ligand cGAMP potentiates the efficacy of vaccine-induced CD8<sup>+</sup> T cells.  
Gutjahr A, Papagno L, **Nicoli F.**, Kanuma T, Kuse N, Cabral-Piccin MP, Rochereau N, Gostick E, Lioux T, Perouzel E, Price DA, Takiguchi M, Verrier B, Yamamoto T, Paul S, Appay V. (2019)  
JCI Insight, 4:e125107
- 14) Naïve CD8<sup>+</sup> T-cells engage a versatile metabolic program upon activation in humans and differ energetically from memory CD8<sup>+</sup> T-cells.  
**Nicoli F.**, Papagno L, Frere JJ, Cabral-Piccin MP, Clave E, Gostick E, Toubert A, Price DA, Caputo A, Appay V. (2018)  
Corresponding author  
Front Immunol, 9:2736
- 15) Harnessing the induction of CD8<sup>+</sup> T-cell responses through metabolic regulation by pathogen-recognition-receptor triggering in antigen presenting cells.  
**Nicoli F.**, Paul S, Appay V. (2018)  
Corresponding author

- 16) The HIV-1 Tat protein affects human CD4<sup>+</sup> T-cell programming and activation, and favors the differentiation of naïve CD4<sup>+</sup> T cells.  
**Nicoli F**, Gallerani E, Sforza F, Finessi V, Chachage M, Geldmacher C, Cafaro A, Ensoli B, Caputo A, Gavioli R. (2018)  
AIDS, 32:575-581
- 17) Donation programme of returned medicines: role of donors and point of view of beneficiaries.  
**Nicoli F**, Paudel D, Bresciani G, Rodi D, Siniscalchi A. (2018)  
Corresponding author  
Int Health, 10:133-136
- 18) Cutting edge: a dual TLR2 and TLR7 ligand induces highly potent humoral and cell-mediated immune responses.  
Gutjahr A, Papagno L, **Nicoli F**, Lamoureux A, Vernejoul F, Lioux T, Gostick E, Price DA, Tiraby G, Perouzel E, Appay V, Verrier B, Paul S. (2017)  
J Immunol, 98:4205-4209
- 19) Immunological considerations regarding parental concerns on pediatric immunizations.  
**Nicoli F**, Appay V. (2017)  
Corresponding author  
Vaccine, 35:3012-3019
- 20) Association between different anti-Tat antibody isotypes and HIV disease progression: data from an African cohort.  
**Nicoli F**, Chachage M, Podola L, Clowes P, Bauer A, Mgaya O, Kowour D, Ensoli B, Cafaro A, Maboko L, Hoelscher M, Gavioli R, Saathoff M, Geldmacher C. (2016)  
Corresponding author  
BMC Infect Dis, 16:344
- 21) Systemic immunodominant CD8 responses with an effector-like phenotype are induced by intravaginal immunization with attenuated HSV vectors expressing HIV Tat and mediate protection against HSV infection.  
**Nicoli F**, Gallerani E, Skarlis C, Sicurella M, Cafaro A, Ensoli B, Caputo A, Marconi PC, Gavioli R. (2016)  
Vaccine, 34:2216-24
- 22) Bystander hyperactivation of preimmune CD8<sup>+</sup> T cells in chronic HCV patients.  
Alanio C, **Nicoli F**, Sultanik P, Flecken T, Perot B, Duffy D, Bianchi E, Lim A, Clave E, Buuren MM, Schnuriger A, Johnsson K, Boussier J, Garbarg-Chenon A, Bousquet L, Mottez E, Schumacher TN, Toubert A, Appay V, Heshmati F, Thimme R, Pol S, Mallet V, Albert ML. (2015)  
Elife, 4:e07916
- 23) Effects of different routes of administration on the immunogenicity of the Tat protein and a Tat-derived peptide vaccine.

Finessi V\*, **Nicoli F\***, Gallerani E, Sforza F, Sicurella M, Cafaro A, Caputo A, Ensoli B, Gavioli R. (2015)  
**\*Shared first authorship.**

Hum Vaccin Immunother, 11:1489-93

- 24) Different expression of Blimp-1 in HIV infection may be used to monitor disease progression and provide a clue to reduce immune activation and viral reservoirs.  
**Nicoli F**, Sforza F, Gavioli R. (2015)  
AIDS, 29:133-4
- 25) An attenuated Herpes simplex virus type 1 (HSV1) encoding the HIV-1 Tat protein protects mice from a deadly mucosal HSV1 challenge.  
Sicurella M, **Nicoli F**, Volpi I, Berto E, Gallerani E, Finessi V, Destro F, Triulzi C, Ensoli B, Manservigi R, Caputo A, Gavioli R, Marconi P. (2014)  
PLoS One, 9:e100844
- 26) HIV-1 Tat affects the programming and functionality of human CD8<sup>+</sup> T cells by modulating the expression of T-box transcription factors.  
Sforza F\*, **Nicoli F\***, Gallerani G, Finessi V, Reali E, Cafaro A, Caputo A, Ensoli B, Gavioli R. (2014)  
**\*Shared first authorship**  
AIDS, 28:1729-38
- 27) The HIV-1 Tat protein induces the activation of CD8<sup>+</sup> T cells and affects in vivo the magnitude and kinetics of antiviral responses.  
**Nicoli F**, Finessi V, Sicurella M, Rizzotto L, Gallerani E, Destro F, Cafaro A, Marconi P, Caputo A, Ensoli B, Gavioli R. (2013)  
PLoS One, 8:e77746

## 6. International Experiences

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- Member of the Center of International Health – Ludwig Maximilians University – Munich – Germany (2013-present)
- Visiting Scientist at INSERM Unit 1135, Paris, France. Supervisor: Dr. Victor Appay (August 2019)
- Selected member of the Young Investigator Program: Elsevier and EJVC (2015-2017)
- Invited speaker at the symposium CIH-connect, at LMU, Munich (February 2016, February 2017 and January 2018)
- Co-chair at 10th Vaccine Congress, 4-7 September 2016, Amsterdam
- Post-doc at INSERM Unit 1135, Paris, France. Supervisor: Dr. Victor Appay (2015-2017)
- PhD in Medical research-International Health, Center of International Health – Ludwig Maximilians University– Munich – Germany (2010-2013)
- Research expedition at Mbeya Medical Research Center (MMRC), Mbeya, Tanzania. Aim: measure frequency and titers of anti-clade B and C Tat antibodies in HIV-chronically infected, therapy naïve, individuals and assess any potential relation between anti-Tat humoral response with progression to AIDS and HIV-related immune dysfunctions (2012).

- Member of the organizing committee of the international symposium: “Fighting the scourge of TB/HIV co-infection, are vaccines and novel diagnostics the solution?”, Munich (Germany), March 3<sup>rd</sup> 2012 (70 participants).
- Workshop “Infections and Immunity”, Mbeya Medical Research Center (MMRC), Mbeya, Tanzania (2011)

## 7. Project as Principal Investigator

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Title	Funding	Period
Identification of Causes, Reasons And Solutions for High COVID-19 mortality rate in AGEd populations (CRASH CAGE)	German Academic Exchange Service (DAAD) - Center of International Health - Ludwig Maximilian University (CIH-LMU) (Germany)	2021
Identification of Causes, Reasons And Solutions for High COVID-19 mortality rate in AGEd populations (CRASH CAGE)	German Academic Exchange Service (DAAD) - Center of International Health - Ludwig Maximilian University (CIH-LMU) (Germany)	2020
Understanding AIDS worldwide studying immunopathogenesis and correlates of protection in HIV infection caused by different subtypes (UAW)	German Academic Exchange Service (DAAD) - Center of International Health - Ludwig Maximilian University (CIH-LMU) (Germany)	2019
Premature accelerated Ageing in Young HIV-infected Individuals: Global research initiative (PLAY HIGH)	German Academic Exchange Service (DAAD) - Center of International Health - Ludwig Maximilian University (CIH-LMU) (Germany)	2018

## 8. Awards and memberships

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2019-present	Member of the Italian Society of Immunology (SIICA)
2019-present	Member della Italian Society of Virology(SIV-ISV)
2019	Scholarship from the Istituto Universitario di Studi Superiori IUSS-Ferrara 1391
2018	Travel scholarship, 6 <sup>th</sup> European seminar in virology (EUSEV)
2016-present	Member of the European academy of allergy & clinical immunology
2016-2017	Member of the French Society of Immunology (SFI)
2015-present	Selected for the Young Investigator Program, managed by the journal Vaccine (Elsevier) and by Edward Jenner Vaccine Society (EJVC).
2014-present	Member of the editorial board of Ad Astra, multidisciplinary journal , Universidad San Francisco Xavier de Chuquisaca, Bolivia.
2013	Immunotools special award
October 2012	Travel scholarship: Italian Centre of Biotechnology
September 2012	Travel scholarship: Spinner (project funded by Emilia Romagna Region and EU)
March-July 2012	Teaching and research assistantship: LMU University (Munich) and German Academic Exchange Service (DAAD)
July 2010	Travel scholarship: Italian Centre of Biotechnology