



# Federica Frasca

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## ● WORK EXPERIENCE

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01/02/2022 – CURRENT

**RESEARCH FELLOW** – SAPIENZA UNIVERSITY OF ROME, ITALY

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01/11/2018 – Rome, Italy

**PHD IN "LIFE SCIENCE"** – DEPARTMENT OF MOLECULAR MEDICINE, SAPIENZA UNIVERSITY OF ROME, ITALY.

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*Awaiting the final discussion*

**TEACHING ACTIVITIES** – SAPIENZA UNIVERSITY OF ROME, ITALY

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March-2020: **Elective Didactic Activity (ADE)**, Topic of the lecture: "*Human Immunodeficiency Virus (HIV): Storia clinica dell'infezione, terapia e gestione del paziente*" for Nursing Bachelor Degree (Isernia), Faculty: Farmacia e Medicina, Sapienza University of Rome.

2020-2021: **Tutoring assignment**, 40 hours of tutoring activities for Master Degree students of the Molecular Biology course - "Pharmaceutical Chemistry and Technology" – Department of Chimica e Tecnologie del Farmaco, Sapienza University of Rome, Italy. Activities of tutoring: review of the main topics of the course and learning test.

2020-2021: **Tutoring assignment**, Tutoring for Second level Master in Molecular Virology, Sapienza University of Rome, Italy. Main topics: *i) Tecniche di biologia molecolare applicate allo studio dei virus; ii) Tecniche di biologia cellulare applicate allo studio dei virus; iii) Citofluorimetria nelle infezioni virali.*

2019-2020: **Culture della Materia**, Assistant of the course "*Basi cellulari e molecolari della vita*" - Dental Hygiene Bachelor Degree (Cassino), Professor: Carolina Scagnolari. Sapienza University of Rome, Italy.

2018-2019: **Teaching assignment**, Second level Master in Molecular Virology, Department of Molecular Medicine, Sapienza University of Rome. Topic of the lecture: "*CRISPR/CAS9 per lo studio delle interazioni virus-ospite*"

2020

**EDITORIAL ACTIVITIES**

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From 2020 - **Reviewer** for Archives of Virology

07/2020 – Rome, Italy

**SCIENTIFIC SUPPORT** – ETHOS S.R.L. COMPANY

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Preparation of a report and prework material for virtual advisory board. Topic of the virtual advisory board: "*Unmet clinical needs in management and treatment of nephropathic cystinosis*"

Rome, Italy

**LABORATORY TRAINING** – SAPIENZA UNIVERSITY OF ROME, ITALY

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2016 - 2018: Training for experimental Master's Degree thesis at Immuno-Infectivology and Clinical Trials Research Area, Children's Hospital Bambino Gesù Research Institute of Rome, Italy. Title of thesis: "*Identific*"

azione e caratterizzazione di una nuova popolazione di linfociti T CD8+ regolatori nel Diabete mellito insulino - dipendente".

2015 - Training for experimental Bachelor's Degree thesis. Title of the thesis: "Variabilità del DNA mitocondriale nella popolazione Cimbra nella provincia di Verona".

## ● EDUCATION AND TRAINING

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2018 - rome, Italy

**MASTER'S DEGREE - "GENETICA E BIOLOGIA MOLECOLARE NELLA RICERCA DI BASE E BIOMEDICA" (110/110 E LODE)** - Sapienza University of Rome, Italy

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2015 - Rome, Italy

**BACHELOR'S DEGREE - "SCIENZE NATURALI" (108/110)** - Sapienza University of Rome, Italy

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2011 - Rome, Italy

**HIGH SCHOOL DIPLOMA** - Liceo Scientifico Sandro Pertini

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## ● LANGUAGE SKILLS

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Mother tongue(s): **ITALIANO**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
<b>INGLESE</b>	B2	B2	B1	B1	B1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

## ● DIGITAL SKILLS

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Microsoft Office | Microsoft Word | Microsoft Excel | Microsoft Powerpoint | Google Drive | Ottima conoscenza e capacità di utilizzo di programmi per il calcolo statistico (Graphpad). | Ottima conoscenza del pacchetto di analisi statistica IBM SPSS | Softwares di analisi citofluorimetriche come BD Diva, CytExpert, Attune NxT software, FlowJo10. | Ottima conoscenza del software LightCycler ® Application Software Version 1.1 | ChemiDoc Imaging Systems

## ● PUBLICATIONS

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Sorrentino L, Silvestri V, Oliveto G, Scordio M, Frasca F, Fracella M, Bitossi C, D'Auria A, Santinelli L, Gabriele L, Pierangeli A, Mastroianni CM, d'Ettorre G, Antonelli G, Caruz A, Ottini L, Scagnolari C. Distribution of Interferon Lambda 4 Single Nucleotide Polymorphism rs11322783 Genotypes in Patients with COVID-19. *Microorganisms*. 2022 Feb 4;10(2):363. doi: 10.3390/microorganisms10020363.

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2022

Prezioso C, Moens U, Oliveto G, Brazzini G, Piacentini F, Frasca F, Viscido A, Scordio M, Guerrizio G, Rodio DM, Pierangeli A, d'Ettorre G, Turriziani O, Antonelli G, Scagnolari C, Pietropaolo V. KI and WU Polyomavirus in Respiratory Samples of SARS-CoV-2 Infected Patients. *Microorganisms*. 2021 Jun 9;9(6):1259. doi: 10.3390/microorganisms9061259.

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2021

2. Santinelli L, De Girolamo G, Borrazzo C, Vassalini P, Pinacchio C, Cavallari EN, Statzu M, Frasca F, Scordio M, Bitossi C, Viscido A, Ceccarelli G, Mancone M, Mastroianni CM, Antonelli G, d'Ettorre G, Scagnolari C. Alteration of type I interferon response is associated with subclinical atherosclerosis in virologically suppressed HIV-1-infected male patients. *J Med Virol*. 2021 Apr 29. doi: 10.1002/jmv.27028. Epub ahead of print. PMID: 33913525.

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2021

Scagnolari C, Bitossi C, Viscido A, Frasca F, Oliveto G, Scordio M, Petrarca L, Mancino E, Nenna R, Riva E, De Vito C, Midulla F, Antonelli G, Pierangeli A. ACE2 expression is related to the interferon response in airway epithelial cells but is that functional for SARS-CoV-2 entry? *Cytokine*. 2021 Apr. 140:155430. <https://doi.org/10.1016/j.cyto.2021.155430>

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2021

Scagnolari C, Pierangeli A, Frasca F, Bitossi C, Viscido A, Oliveto G, Scordio M, Mazzuti L, Di Carlo D, Gentile M, Solimini A, Ceccarelli G, Pugliese F, Mastroianni CM, d'Ettorre G, Turriziani O, Antonelli G; Virology and Infectious Diseases COVID-19 Study Group of Sapienza University. Differential induction of type I and III interferon genes in the upper respiratory tract of patients with coronavirus disease 2019 (COVID-19). *Virus Res*. 2021 Jan 5:198283. doi: 10.1016/j.virusres.2020.198283.

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2021

Bitossi C, Frasca F, Viscido A, Oliveto G, Scordio M, Belloni L, Cimino G, Pietropaolo V, Gentile M, d'Ettorre G, Midulla F, Trancassini M, Antonelli G, Pierangeli A, Scagnolari C. SARS-CoV-2 Entry Genes Expression in Relation with Interferon Response in Cystic Fibrosis Patients. *Microorganisms*. 2021 Jan 3;9(1):E93. doi: 10.3390/microorganisms9010093.

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2021

Upasani V, Scagnolari C, Frasca F, Smith N, Bondet V, Vanderlinden A, Lay S, Auerswald H, Heng S, Laurent D, Ly S, Duong V, Antonelli G, Dussart P, Duffy D, Cantaert T. Decreased Type I Interferon Production by Plasmacytoid Dendritic Cells Contributes to Severe Dengue. *Front Immunol*. 2020 Dec 17;11:605087. doi:10.3389/fimmu.2020.605087.

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2020

Clementi N, Scagnolari C, D'Amore A, Palombi F, Criscuolo E, Frasca F, Pierangeli A, Mancini N, Antonelli G, Clementi M, Carpaneto A, Filippini A. Naringenin is a powerful inhibitor of SARS-CoV-2 infection in vitro. *Pharmacol Res*. 2020 Oct 20:105255. doi: 10.1016/j.phrs.2020.105255.

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2020

d'Ettorre G, Recchia G, Ridolfi M, Siccardi G, Pinacchio C, Innocenti GP, Santinelli L, Frasca F, Bitossi C, Ceccarelli G, Borrazzo C, Antonelli G, Scagnolari C, Mastroianni CM. Analysis of type I IFN response and T cell activation in severe COVID-19/HIV-1 coinfection: A case report. *Medicine (Baltimore)*. 2020 Sep 4;99(36):e21803. doi: 10.1097/MD.00000000000021803.

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2020

Scagnolari C, Bitossi C, Frasca F, Viscido A, Oliveto G, Scordio M, De Vito C, Trancassini M, Midulla F, Cimino G, Pierangeli A, Antonelli G. No detection of SARS-CoV-2 in cystic fibrosis patients at the Regional (Lazio) Reference Center for CF in Italy. *J Cyst Fibros*. 2020 Sep; 19(5):837-838. doi: 10.1016/j.jcf.2020.06.018. Epub 2020 Jun 23. PMID: 32593510; PMCID: PMC7309918.

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2020

Innocenti GP, Santinelli L, Laghi L, Borrazzo C, Pinacchio C, Fratino M, Celani L, Cavallari EN, Scagnolari C, Frasca F, Antonelli G, Mastroianni CM, d'Ettorre G, Ceccarelli G. Modulation of Phenylalanine and Tyrosine Metabolism in HIV-1 Infected Patients with Neurocognitive Impairment: Results from a Clinical Trial. *Metabolites*. 2020 Jul 3;10(7):274. doi: 10.3390/metabo10070274

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2020

Pinacchio C, Scagnolari C, Iebba V, Santinelli L, Innocenti GP, Frasca F, Bitossi C, Scordio M, Oliveto G, Ceccarelli G, Antonelli G, Mastroianni CM, d'Ettorre G. High abundance of genus *Prevotella* is associated with dysregulation of IFN-I and T cell response in HIV-1-infected patients. *AIDS*. 2020 Aug 1;34(10):1467-1473. doi: 10.1097/QAD.0000000000002574. PMID: 32675560.

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2020

Scagnolari C, Bitossi C, Frasca F, et al. Differential toll like receptor expression in cystic fibrosis patients' airways during rhinovirus infection [published online ahead of print, 2020 Jul 23]. *J Infect*. 2020;S0163-4453(20)30500-4. doi:10.1016/j.jinf.2020.07.021

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2020

Santinelli L, Ceccarelli G, Borrazzo C, Innocenti G.P, Frasca F, Cavallari E, Celani L, Nonne C, Mastroianni C.M, D'ettorre G. Sex-related differences in markers of immune activation in virologically suppressed HIV-infected patients. *Biology of Sex Differences*. Volume 11, Issue 1, 1 May 2020, Article number 23.

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2020

Schippa S, Frassanito A, Marazzato M, Nenna R, Petrarca L, Neroni B, Bonfiglio G, Guerrieri F, Frasca F, Oliveto G, Pierangeli A, Midulla F. Nasal Microbiota in RSV Bronchiolitis. *Microorganisms*. ISSN 2076-2607. - 8:5(2020), pp. 1-12.

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2020

Di Pietro M, Filardo S, Frasca F, Scagnolari C, Manera M, Sessa V, Antonelli G, Sessa R. Interferon- $\gamma$  Possesses Anti-Microbial and Immunomodulatory Activity on a *Chlamydia Trachomatis* Infection Model of Primary Human Synovial Fibroblasts. *Microorganisms*. 2020 Feb 10;8(2). pii: E235. doi: 10.3390/microorganisms8020235. PubMed PMID: 32050567.

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2020

Pierangeli A, Viscido A, Bitossi C, Frasca F, Gentile M, Oliveto G, Frassanito A, Nenna R, Midulla F, Scagnolari C. Differential interferon gene expression in bronchiolitis caused by respiratory syncytial virus-A genotype ON1. *Med Microbiol Immunol*. 2020 Feb;209(1):23-28. doi: 10.1007/s00430-019-00633-6. Epub 2019 Sep 4. PubMed PMID: 31485724.

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2020

Santinelli L, Statzu M, Pierangeli A, Frasca F, Bressan A, Pinacchio C, Nonne C, Turriziani O, Antonelli G, d'Ettorre G, Scagnolari C. Increased expression of IL-32 correlates with IFN- $\gamma$ , Th1 and Tc1 in virologically suppressed HIV-1-infected patients. *Cytokine*. 2019 Aug;120:273-281. doi: 10.1016/j.cyto.2019.01.012. Epub 2019 Mar 23. PubMed PMID: 30910260.

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2019

Pellegrino M, Bellacchio E, Dharmo R, Frasca F, Betterle C, Fierabracci A. A Novel Homozygous Mutation of the AIRE Gene in an APECED Patient From Pakistan: Case Report and Review of the Literature. *Front Immunol*. 2018 Aug 13;9:1835. doi: 10.3389/fimmu.2018.01835. eCollection 2018. Review. PubMed PMID: 30150985; PubMed Central PMCID: PMC6099424

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2018

Fierabracci A, Pellegrino M, Frasca F, Kilic SS, Betterle C. APECED in Turkey: A case report and insights on genetic and phenotypic variability. *Clin Immunol*. 2018 Sep;194:60-66. doi: 10.1016/j.clim.2018.06.012. Epub 2018 Jul 3. PubMed PMID: 30018023

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2018

## ● CONFERENCES AND SEMINARS

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**(Oral poster) – 13° Italian Conference on AIDS and Antiviral Research (ICAR) 2021 – BINDING AND NEUTRALIZING ANTIBODIES TO INTERFERON (IFN)  $\alpha/\beta$  AND DEFECTIVE IFN TRANSCRIPTIONAL PROFILE IN COVID-19 PATIENTS**

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**Federica Frasca**, Mirko Scordio, Giuseppe Oliveto, Leonardo Sorrentino, Agnese Viscido, Camilla Bitossi, Alessandra D'Auria, Ginevra Bugani, Alessandra Pierangeli, Luigi Celani, Giancarlo Ceccarelli, Claudia Pinacchio, Letizia Santinelli, Claudio Maria Mastroianni, Gabriella D' Ettore, Guido Antonelli, Carolina Scagnolari.

**Role: presenting author**

**(Oral Communication) 5TH National Congress of the Italian Society for Virology (SIV/ISV) - ANALYSIS OF ANTI-SPIKE- NEUTRALIZING ANTIBODIES TITERS AND LEVELS OF CIRCULATING BIOMARKERS IN COVID-19 PATIENTS.**

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**Federica Frasca**, Mirko Scordio, Giuseppe Oliveto, Agnese Viscido, Leonardo Sorrentino, Letizia Santinelli, Claudia Pinacchio, Giancarlo Ceccarelli, Elio Gentilini, Eugenio Nelson Cavallari, Aurelia Gaeta, Gabriella d'Ettorre, Alessandra Pierangeli, Guido Antonelli, Carolina Scagnolari.

**Role: presenting author**

**(Oral Communication) 12° Italian Conference on AIDS and Antiviral Research (ICAR) - Digital Edition 2020: Higher frequency of CD4+PD1+ T cells and Interferon-Stimulate Genes are associated to a decrease in CD4+ Treg levels in HIV-1 infected patients**

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**Federica Frasca**, Mirko Scordio, Letizia Santinelli, Giancarlo Ceccarelli, Claudio Mastroianni, Guido Antonelli, Ivano Mezzaroma, Gabriella d'Ettoire, Carolina Scagnolari.

**Role: presenting author**

**(Science Spotlight presentation) Virtual CROI 2021: IMPAIRMENT OF TYPE I/III IFN RESPONSE IN THE UPPER AIRWAYS OF SARS-COV-2 PATIENTS.**

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**Federica Frasca**, Mirko Scordio, Agnese Viscido, Giuseppe Oliveto, Camilla Bitossi, Carolina Scagnolari.

**Role: presenting author**

**(Oral Communication) 3° SIV-ISV, Società Italiana Virologi (2019): Lineage 1 and 2 West Nile Virus infection equally affect the IFN response and dendritic cells maturation**

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**Federica Frasca**, Maura Statzu, Alessandra Pierangeli, Letizia Santinelli, Mirko Scordio, Chiara Nonne, Agnese Sgrigna, Beniamino Caputo, Vitiello Laura, Massimo Gentile, Elisabetta Riva, Guido Antonelli, Carolina Scagnolari.

**Role: presenting author**

**(Oral poster) 48° National conference SIM, Società Italiana di Microbiologia (VIRTUAL SIM) (2020): DYSREGULATION OF INTERFERON STIMULATED GENE RESPONSE IN THE RESPIRATORY TRACT OF PATIENTS WITH CORONAVIRUS DISEASE 2019 (COVID-19)**

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**Federica Frasca**, Mirko Scordio, Agnese Viscido, Giuseppe Oliveto, Camilla Bitossi, Laura Mazzuti, Daniele Di Carlo, Massimo Gentile, Angelo Solimini, Giancarlo Ceccarelli, Claudio Maria Mastroianni, Gabriella D'ettoire, Ombretta Turriziani, Alessandra Pierangeli, Carolina Scagnolari, Guido Antonelli.

**Role: presenting author**

**(Poster) 30° European Congress of Clinical Microbiology and Infectious Diseases (2020): TOLL LIKE RECEPTORS, IFN-LAMBDA AND IFN-STIMULATED GENES EXPRESSION IN CYSTIC FIBROSIS PATIENTS WITH RHINOVIRUS INFECTION.**

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**Federica Frasca**, Camilla Bitossi, Agnese Viscido, Giuseppe Oliveto, Mirko Scordio, Maria Trancassini, Valeria Pietropaolo, Fabio Midulla, Giuseppe Cimino, Paolo Palange, Alessandra Pierangeli, Carolina Scagnolari, Guido Antonelli.

**(Poster) 47° National Conference SIM, Società Italiana di Microbiologia (2019): The impairment of IFN response and dendritic cells maturation is similar during lineage 1 and 2 WNV infection.**

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**Federica Frasca**, Maura Statzu, Alessandra Pierangeli, Mirko Scordio, Chiara Nonne, Agnese Sgrigna, Beniamino Caputo, Vitiello Laura, Massimo Gentile, Elisabetta Riva, Guido Antonelli, Carolina Scagnolari.

## ● PROJECTS

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### 2021 – Gilead, Fellowship Program.

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Title of the project: *Development of a new integrative approach for monitoring SARS-CoV-2 infection-induced versus vaccine-acquired innate and T cell immunity in HIV-1 infected patients.*

**Role: Component**

### 2020 Scientific Research – Research Projects Financing (Avvio alla Ricerca, tipo 1), Sapienza University of Rome, Italy.

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Title of the project: *Characterization of type I/III IFN gene signature, delineation of virus-induced inflammasome activity and analysis of Th1/Th2 phenotype in severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infected patients*

**Role: Principal Investigator**

### 2019 ACTIONS CONCERTÉES INTERPASTEURIENNES (ACIP), Pilot Project proposal, Pasteur Institute, Paris, France.

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Title of the project: *Dengue virus-mosquito-host interactions: assessing type I interferon mediated immune processes and immunological effects of mosquito salivary glands on Dengue infection.* ACIP project A-2019. Duration 2 years.

**Role: Component**

### 2019 Scientific Research - Research Projects Financing, Sapienza University of Rome, Italy.

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Title of the project: *Determination of Interferon stimulated genes inhibiting mouse papillomavirus replication in mouse keratinocytes and mediating in vivo anti papillomavirus response.*

**Role: Component**

## ● HONOURS AND AWARDS

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2021

### The 13rd edition of ICAR Awards: ICAR-CROI Awards 2021 for young Italian investigators

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*Impairment of type I/III IFN response in the upper airways of SARS-CoV-2 patients* presented as Science Spotlight to Virtual CROI 2021.

## ● COMMUNICATION AND INTERPERSONAL SKILLS

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### Interpersonal skills

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Good interpersonal skills acquired during laboratory training and as a PhD student during teaching activities to Master's Degree students

## ● **SCIENTIFIC SKILLS**

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### **Acquired skills as PhD student**

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Cell culture techniques; practicality in virus infection experiments and antiviral/virucidal assays (of natural and synthesized compounds); competence on bioassay for detection of natural neutralizing antibodies (NAB) against Interferon (IFN); ability in molecular techniques as standard PCR and gene expression measurements by Real-time quantitative PCR (qPCR) (e.g. evaluation of type I and III IFN response after *in vitro* virus infection or *ex vivo* IFN stimulation of clinical samples collected from patients suffering from different viral infectious diseases); knowledge of IFN response and TTV load in transplant patients with CMV activation; application of flow cytometry method; good ability of data analysis and use of computational software.

## ● **MAIN RESEARCH TOPICS**

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### **Scientific topics**

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Host-virus interaction; antiviral immunity with focused attention to IFN pathways and cell-mediated responses in acute and chronic viral infection; principal viruses investigated: respiratory viruses [e.g. respiratory syncytial virus (RSV), rhinovirus (HRV) and coronaviruses, including SARS-CoV-2]; human immunodeficiency virus (HIV-1); cytomegalovirus (CMV); Dengue virus; viruses resistance to natural or new antiviral synthesized compound; immunopathogenesis of cystic fibrosis disease.