Achille BROGGI, PhD

Group leader:
Innate Immunity at mucosal sites

Background

Dr Broggi obtained his PhD in Translational Medicine in 2012, in the lab of Francesca Granucci at the University of Milan Bicocca. There he studied peripheral T cell tolerance and the role of the transcription factor NFAT in phagocytes.
He then moved to Boston in 2015 and joined Ivan Zanoni's lab at Boston Children's hospital as a research fellow.
There, he uncovered a new immune-modulatory function of IFN-λ, which inhibits neutrophil activation and protects mucosal barriers during intestinal inflammation.
As an Instructor since 2018, he also studied the role of IFNs in the respiratory system where he described that IFN-λ can impair tissue repair after acute viral pneumonia. .
Achille joined CIML in 2021 and is now following his interest in interferon responses as key regulators of mucosal biology and, in particular, in the regulation of the intestinal mucosal barrier.

Contact

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Awards

2021 - 2024	A*Midex Chaire d'Excellence award
2021 - 2023	Fondation pour la Recherche Médicale – Amorçage de jeunes équipes
2022 - 2024	Agence Nationale de la Recherche – Young Investigator award (JCJC)
2018 - 2021	Crohn's and Colitis Foundation (CCFA) research fellowship award (RFA°

Membership

- SIICA Società Italiana di Immunologia, Immunologia Clinica e Allergologia - Member
- SFI Société Française d'Immunologie- Member.

Main achievements

I contributed to elucidate different roles of IFN-λ both as an immune−modulator, as well as a regulator of tissue repair after viral infections.

I was the first to describe that IFN-λ can down−modulate neutrophil degranulation and ROS production thus protecting the intestinal mucosa in IBD models.

In the lung, while IFN-λ capacity to protect the epithelial from viral infections is well characterized, less is known about the long−term effects of IFN-λ on epithelial repair during prolonged viral infections.

I showed that IFN-λ inhibits epithelial proliferation and tissue restitution during viral pneumonia predisposing the host to lethal bacterial superinfections.

Selected publications

1. Sposito B*, **Broggi A*§**, Pandolfi L, et al. The interferon landscape along the respiratory tract impacts the severity of COVID-19. Cell 2021;0. Available at: http://www.cell.com/article/S0092867421009909/abstract [Accessed August 19, 2021].

2. Broggi A, Tan Y, Granucci F, et al. IFN-λ suppresses intestinal inflammation by non-translational regulation of neutrophil function. Nat Immunol 2017;18:1084–1093. Available at: http://dx.doi.org/10.1038/ni.3821.

3. Broggi A, Ghosh S, Sposito B, et al. Type III interferons disrupt the lung epithelial barrier upon viral recognition. Science 2020;369:706–712. Available at: http://dx.doi.org/10.1126/science.abc3545.

4. Broggi A, Granucci F, Zanoni I. Type III interferons: Balancing tissue tolerance and resistance to pathogen invasion. J Exp Med 2020;217. Available at: http://dx.doi.org/10.1084/jem.20190295.

5. Sposito B, Broggi A, Pandolfi L, et al. Severity of SARS-CoV-2 infection as a function of the interferon landscape across the respiratory tract of COVID-19 patients. bioRxiv 2021:2021.03.30.437173. Available at: https://www.biorxiv.org/content/10.1101/2021.03.30.437173v1 [Accessed April 2, 2021].

6. Vitali C, Mingozzi F, Broggi A, et al. Migratory, and not lymphoid-resident, dendritic cells maintain peripheral self-tolerance and prevent autoimmunity via induction of iTreg cells. Blood 2012;120:1237–1245. Available at: http://dx.doi.org/10.1182/blood-2011-09-379776.