



VANDERBILT  
SCHOOL OF MEDICINE

Basic Sciences

# Manuel Ascano, PhD

Assistant Professor of Biochemistry

Assistant Professor of Pathology, Microbiology and Immunology

[manuel.ascano@vanderbilt.edu](mailto:manuel.ascano@vanderbilt.edu)

615-875-8714

<https://lab.vanderbilt.edu/ascano-lab>

## Biosketch

Manny was raised in New York City and Chicago and received his Bachelor's in Microbiology from the University of Illinois Urbana-Champaign. He received his Ph.D. in Biochemistry from the University of Cincinnati, focusing on a pathway important to cancers. Manny trained as a postdoctoral fellow at Rockefeller University in New York City where he gained expertise in RNA biochemistry and innate immunity. He joined Vanderbilt in 2014 as a faculty member of the Department of Biochemistry. Among his research contributions, he is also an inventor of a patent for a molecule that can activate the immune system, which has relevance to the development of immunotherapeutics for autoimmune disorders and cancers.

## Key Publications

"Small molecule inhibition of cGAS reduces interferon expression in primary macrophages from autoimmune mice," *Nature Communications*, Sep 29;8(1):750, 2017

"Cyclic [G(2',5')pA(3',5')p] is the Metazoan Second Messenger Produced by DNA-Activated Cyclic GMP-AMP Synthase, *Cell*, 153(5):1094-1107", 2013

"FMR1 targets distinct mRNA sequence elements to regulate protein expression," *Nature*, 492(7249):382-386, 2012

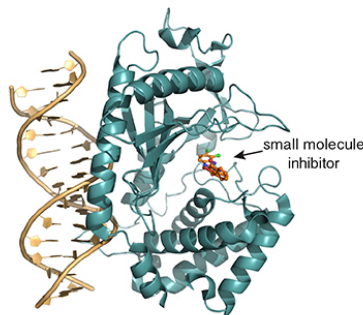
## "Understanding innate immunity to inspire new therapies for infectious disease, autoimmunity, and human cancers"

The Ascano lab integrates Biochemical and Chemical Biological approaches with High-throughput Transcriptomic and Proteomic technologies to **investigate the impact of RNA and DNA binding proteins in innate immunity, viral infection, and human disease**. Current research activities include:

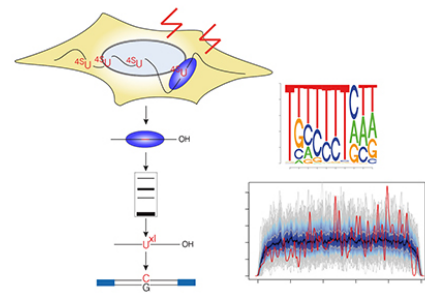
cGAS is a critical protein required for sensing foreign or damaged cellular DNA. Can we **understand the mechanism of cGAS enzyme activity** by designing small molecule activators and inhibitors, and can these compounds develop into novel drugs **for treatment of autoimmune disorders or cancers**?

RNA binding proteins play essential roles in regulating gene expression; without them, no protein can be made. **How do RNA binding proteins like ELAVL1 and IFIT1 regulate cellular and viral RNAs to promote cell survival during infection?**

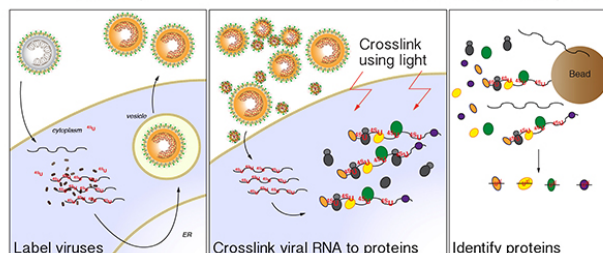
What human proteins make the first contacts with viral RNA during an infection? And **what role do these proteins play?** Anti- or pro-viral? Over 160 viruses that infect humans contain an RNA genome, and they include: **Influenza, HIV, SARS, and Ebola**.



The protein cGAS recognizes foreign DNA and triggers an inflammatory response. Small molecules can target its activity.



PAR-CLIP technology identifies all gene targets of RNA binding proteins like ELAVL1 and IFIT1 to determine which are important for immunity and cell survival.



VIR-CLASP technology captures the earliest events between viral genomes and human cells during infection. 73% of all viruses that cause human disease contain RNA genomes.