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In vitro differentiation of human macrophages with enhanced antimycobacterial activity

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Mycobacterium tuberculosis causes widespread, persistent infection, often residing in macrophages that neither sterilize the bacilli nor allows them to cause disease. How macrophages restrict growth of pathogens is one of many aspects of human phagocyte biology whose study relies largely on macrophages differentiated from monocytes in vitro. However, such cells fail to recapitulate the phenotype of tissue macrophages in key respects, including that they support early, extensive replication of M. tuberculosis and die in several days. Here we found that human macrophages could survive infection, kill Mycobacterium bovis BCG, and severely limit the replication of *M. tuberculosis* for several weeks if differentiated in 40% human plasma under 5%–10% (physiologic)oxygen in the presence of GM-CSF and/or TNF-α followed by IFN-γ. Control was lost with fetal bovine serum, 20% oxygen, M-CSF, higher concentrations of cytokines, or premature exposure to IFN-γ. We believe that the new culture method will enable inquiries into the antimicrobial mechanisms of human macrophages.

Biography

Guillaume Vogt was born in France. He received a Ph.D. degree from the University Paris René Descartes, Necker-Enfants Malades Medical School, and Paris, France. Then, he worked as postdoctoral associate with the Pr. Carl Nathan in New York, USA. Finally, he joined the Rockefeller University in New York, the St. Giles Laboratory of the Pr. Jean-Laurent Casanova. Among various distinctions, he received the distinguished Thermo Prize in Biotherapy, and the Prize of Pediatric Pathology. He is editor of different journals such as "Case Reports in Genetics". He is mainly interested in infectious disease and therapy, forensic and behavioral genetics.

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