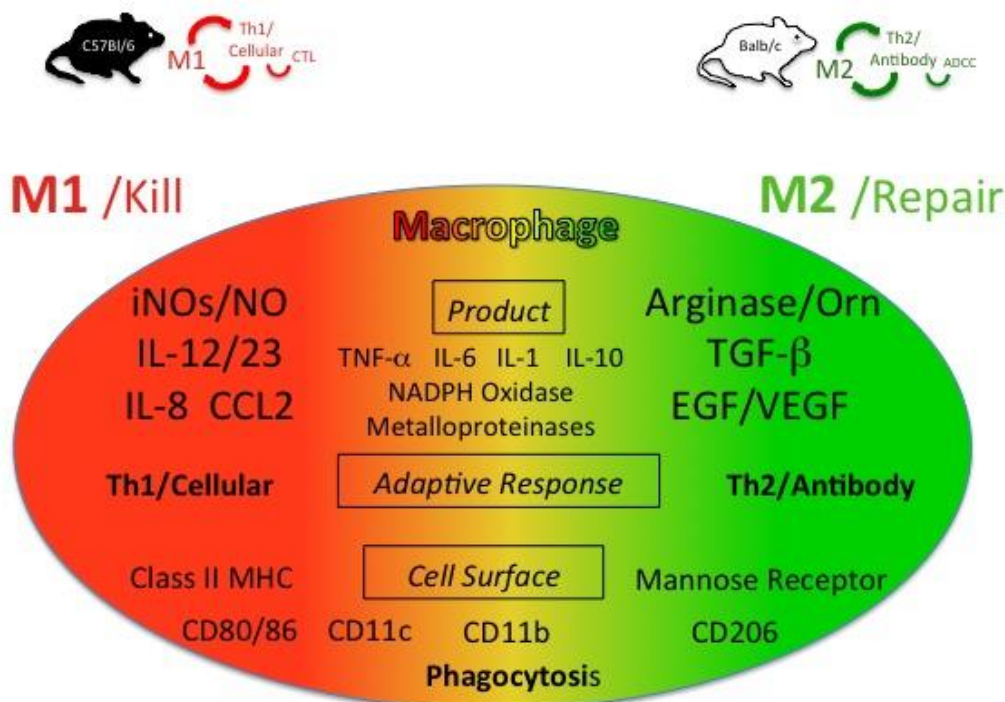


Dr. Charles Mills has been a Professor at Brown University and at the University of Minnesota Medical Schools. He discovered M1/Kill and M2/Repair-type macrophages that have revolutionized our knowledge of how immune systems operate. He specifically renamed macrophages M1 and M2 because he showed that macrophages/innate immunity directs T and B cells (adaptive immunity). Immunology has had it backward for over a one hundred years. The M1/M2 concept lights the way to developing new treatments for diseases such as cancer, autoimmunity and atherosclerosis. Most “modern” diseases do not display overt foreign antigens like pathogens. Instead, such chronic conditions mainly result from imbalances in macrophages/innate responses, like M1/Kill or M2/Repair. Even if foreign antigens are present (e.g., infections), M1 and M2-type macrophage responses direct other leukocytes, including stimulating T cells into Th1 or Th2-type specific responses.

Thus, macrophages are the “Chicken and the Egg” of immunity.



**From: 2014 AAI Timeline of Medical Discoveries.
2000: M1/M2 Macrophage Subtypes are Identified**

Reference: Mills CD, Ley K. M1 and M2 Macrophages: The Chicken and the Egg of Immunity. J. Innate Immun. (2014) 6:716-726.