

A Tale of Toes

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A 64-year-old male, with antineutrophil cytoplasmic antibody-associated vasculitis was being treated with methotrexate and low dose prednisone. He arrived at the clinic with bluish discoloration of the toes. Inflammatory markers and urine were normal. No history of chilblains or Raynaud's phenomena was noted. He recovered recently from mild coronavirus disease 2019 (COVID-19). A diagnosis of COVID toes (COVID digits) was made [Figure 1].

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Figure 1. Patient with COVID toes



Capsule

Parenteral BCG vaccine induces lung-resident memory macrophages and trained immunity via the gut–lung axis

Jeyanathan and colleagues showed that subcutaneous *Bacillus Calmette–Guérin* (BCG) vaccination can induce memory alveolar macrophages (AMs) and trained immunity in the lung. Although parenteral BCG vaccination trains bone marrow progenitors and circulating monocytes, induction of memory AMs is independent of circulating monocytes. Rather, parenteral BCG vaccination, via mycobacterial dissemination, causes a time-dependent alteration in the intestinal microbiome, barrier function and microbial

metabolites, and subsequent changes in circulating and lung metabolites, leading to the induction of memory macrophages and trained immunity in the lung. These data identify an intestinal microbiota-mediated pathway for innate immune memory development at distal mucosal tissues and have implications for the development of next-generation vaccine strategies against respiratory pathogens.

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