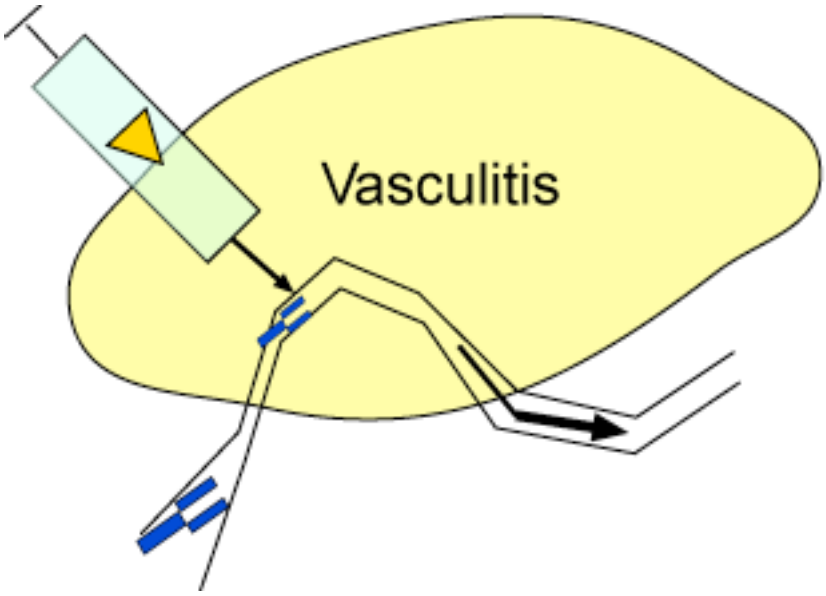
Arthus Reaction

Maurice Arthus (1862-1945) combines Koch's and Richet's discovery of the delayed hypersensitivity reaction. From Paris he travels to CH-Fribourg (chair of physiology for 4 years) to F-Lille to finally arrive in CH-Lausanne where he injects rabbits with horse serum containing anti-toxin antibodies. The cognate antigen, toxin, injected a few days later subcutanously will induce the now well known Arthus-phenomenon: the antigen attracts antibody to the site of injection leading to local formation of immune-complexes, which precipitate in vessel walls of the microcirculation thus inducing local inflammation. With the indirect Arthus-phenomenon used more frequently for experiments it is the antibody that becomes injected locally followed by systemic administration of antigen, but such procedure leads to identical tissue damage. Polymorphonuclear leukocytes bearing E-selectins (adhesion molecules) do not roll on endothelial cells anymore and infiltrate the tissue traversing endothelial cell gaps. Ensuing complement activation destroys the tissue. Important inflammatory mediators in Arthus reactions are: histamin, C5a, tumor necrosis factor, interleukins 1 and 8 as well as nitric oxide.



Inject antigen into the skin of an animal which already has made antibody upon prior antigen exposure: vasculitis is the consequence.