

Costas Tsiamis¹, Effie Poulakou-Rebelakou², Athanasios Diamandopoulos³

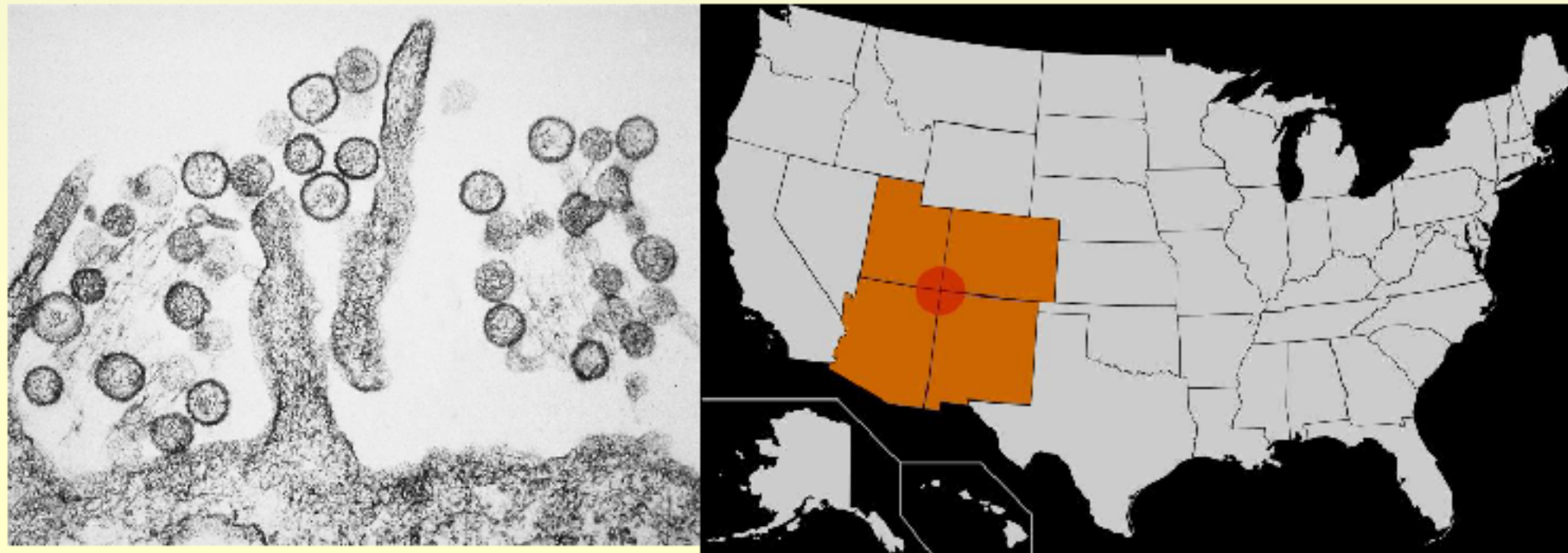
1. Department of Microbiology, Athens Medical School, National University of Athens, Greece
2. Department of History of Medicine, Athens Medical School, National University of Athens, Greece
3. N. and I. Louros Foundation for the History of Medicine, Athens, Greece

Introduction

A lot of microbes and parasites are involved in the pathogenesis of the nephritis. The microorganisms affected kidneys due to multiple virulence factors acting as superantigens. The study presents five historic discoveries of microorganisms related to diseases and syndromes with renal failure and nephritis: *Campylobacter spp.*, *Leptospira spp.*, *Trichinella spiralis*, *Polyomavirus* and *Hantavirus*. We omit some very well known micro-organisms such as streptococci.

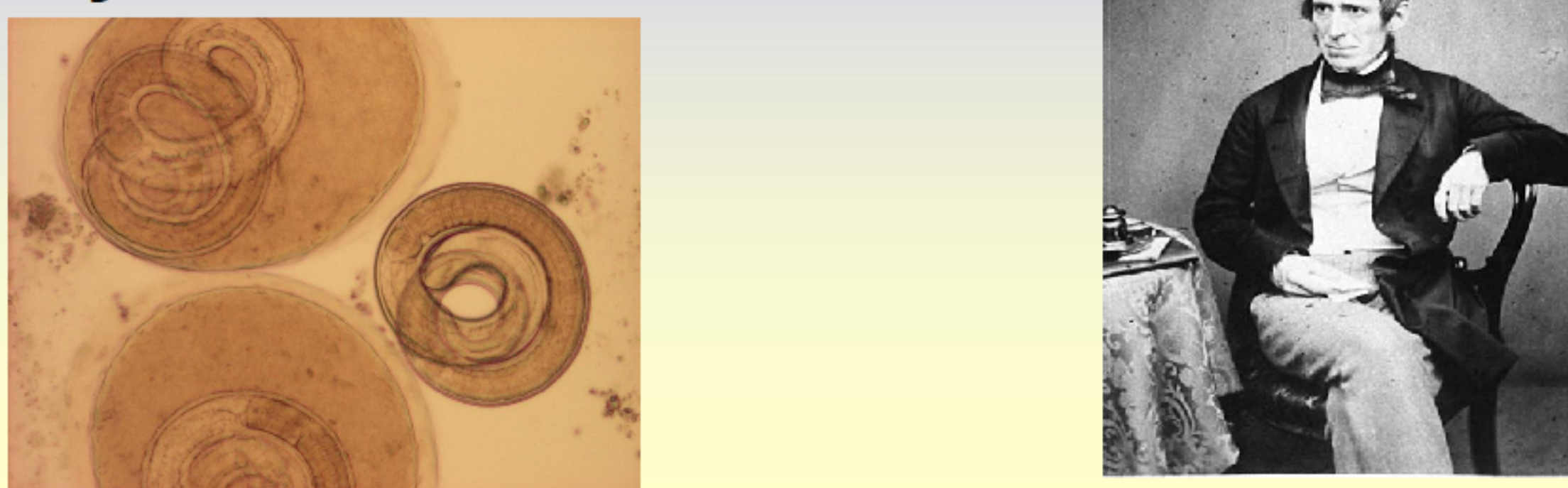
Hantavirus

Hantavirus, is a relatively newly discovered genus. Hemorrhagic fever with renal syndrome (HFRS) is a group of clinically similar illnesses caused by species of viruses from the family Bunyaviridae. It is also known as Korean hemorrhagic fever, and as epidemic nephropathy (Scandinavia and eastern European countries). In China, the Korean Peninsula and Russia, hemorrhagic fever with renal syndrome is caused by Hantaan, Puumala and Seoul viruses. The agents of these diseases are now established as a genus, *Hantavirus*. An epidemic of "trench nephritis" during World War I may in fact have been Hantavirus induced. Thousands of cases of this illness, considered an entirely new renal disease (*Kriegsnephritis* or *néphrite de guerre*), were noted in Allied and German troops in 1915-1916. An outbreak of Korean Hemorrhagic Fever among the soldiers of the United Nations Forces during the Korean War (1950–1953) was later found to be caused by a Hantaan virus infection. More than 3,000 soldiers became ill with symptoms that included renal failure, generalized hemorrhage, and shock, with 10% mortality rate. The virus was isolated in 1976 by Karl Johnson and Ho-Wang Lee. The disease was forgotten until the outbreak of Four Corners region (Arizona, Colorado, New Mexico and Utah) in 1993.



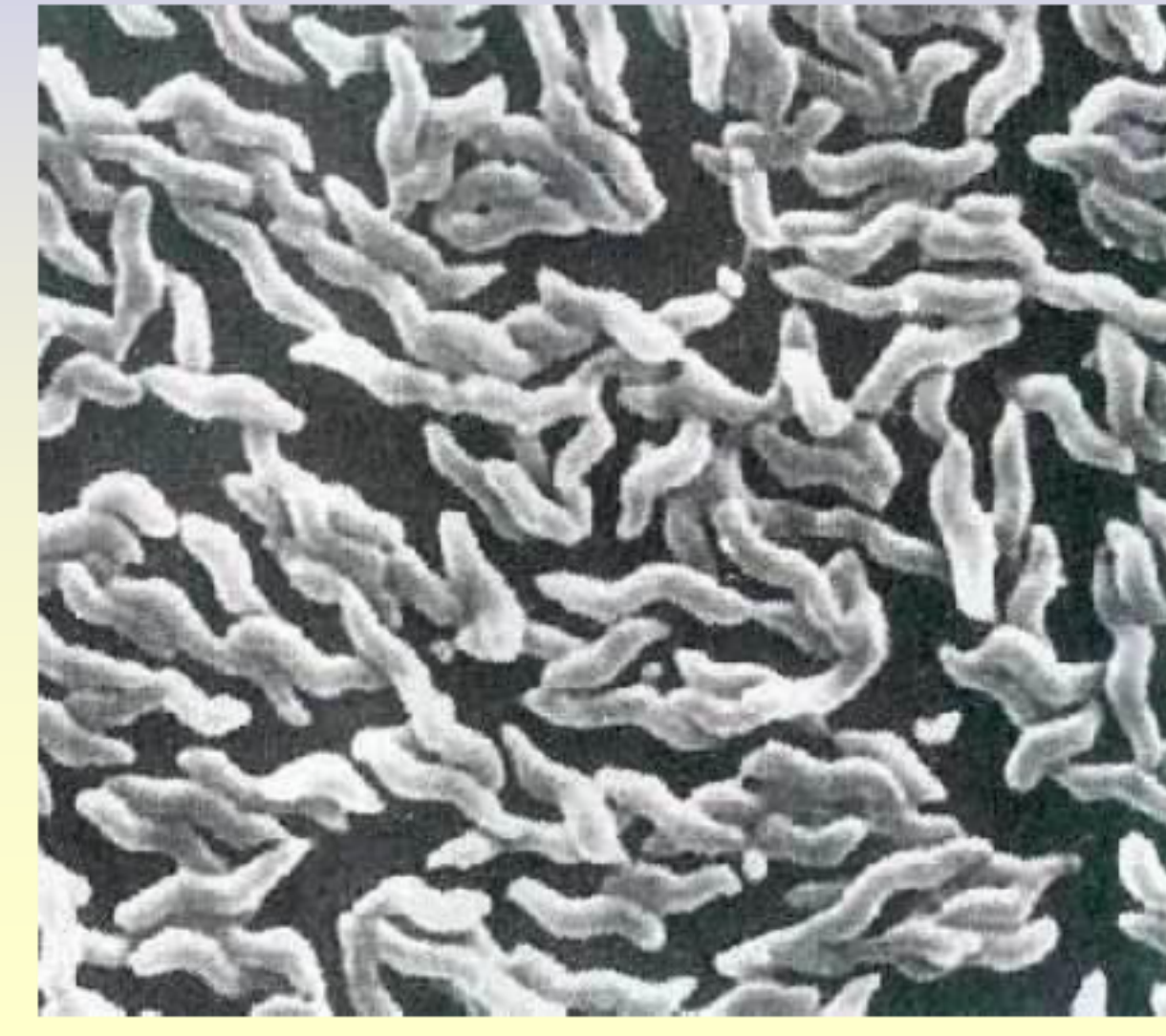
Trichinella spiralis

Trichinosis is a parasitic disease caused by eating raw or undercooked pork infected with the larvae of *Trichinella spiralis*. In 1835, James Paget, first observed the larvae of *Trichinella spiralis* in a specimen during an autopsy at St. Bartholomew's Hospital in London. Later on, Richard Owen is credited for the discovery of Trichinallis larval form.



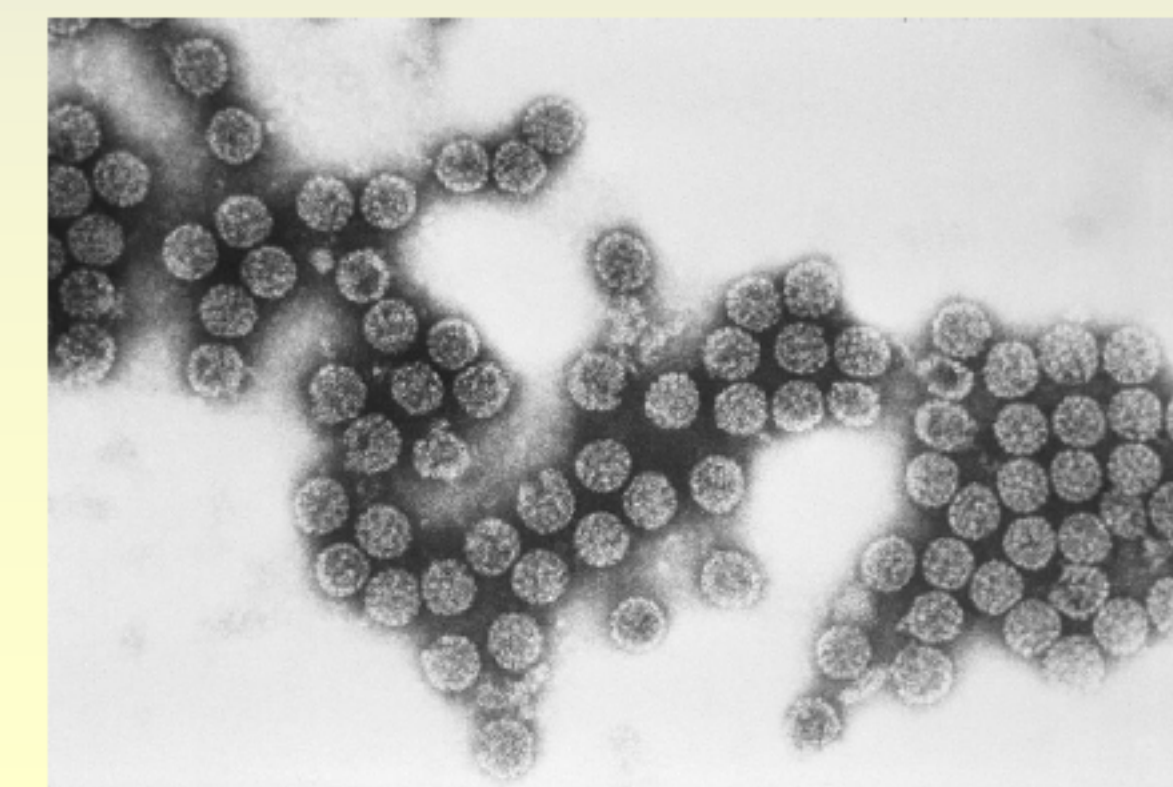
Campylobacter spp.

Most *Campylobacter* species are pathogenic and can infect humans and other animals. The symptoms of *Campylobacter* spp. infections (including nephritis) were described in 1886 in infants by an Austrian pediatrician in Graz, Theodore Escherich. He found the bacteria in stool specimens and large intestinal mucous associated with diarrhoea in neonates. These infections were named as *cholera infantum*. The genus was first described in 1963; however, the organism was not isolated until 1972.



Polyomaviruses

Polyomaviruses are DNA-based viruses and they are potentially oncogenic. Polyomaviruses contributed to diseases such as progressive multifocal leukoencephalopathy (JC virus), nephropathy (BK virus) and Merkel cell cancer (Merkel cell virus). BKV can be detected in the urine of individuals following bone marrow and renal transplantation as well as in the urine of healthy individuals. Murine polyomavirus was the first polyomavirus discovered by Ludwik Gross in 1953. Genome analysis has recently discovered seven additional human polyomaviruses. Based on the works of Gross, Sarah Stewart and Benice Eddy were the first to describe polyomavirus and demonstrated that it can cause tumor to be transmitted from animal to animal. BKV was isolated from a cell culture made from inoculations of urine from a patient into a human fetal kidney cell culture.



Leptospira

Leptospirosis is an infection caused by *Leptospira* and exhibits a variety of clinical manifestations, ranging from a mild self-limiting febrile illness to fatal disease with severe pulmonary haemorrhagic syndrome and renal failure. The disease was first described by Adolf Weil in 1886, after whom Weil's disease is named.

Conclusion

A lot of microorganisms are related to diseases and syndromes with renal failure and nephritis. It seems that a significant part of the historical evolution of nephritis is closely related to the history of the microbiologic discoveries during 19th and 20th century.

