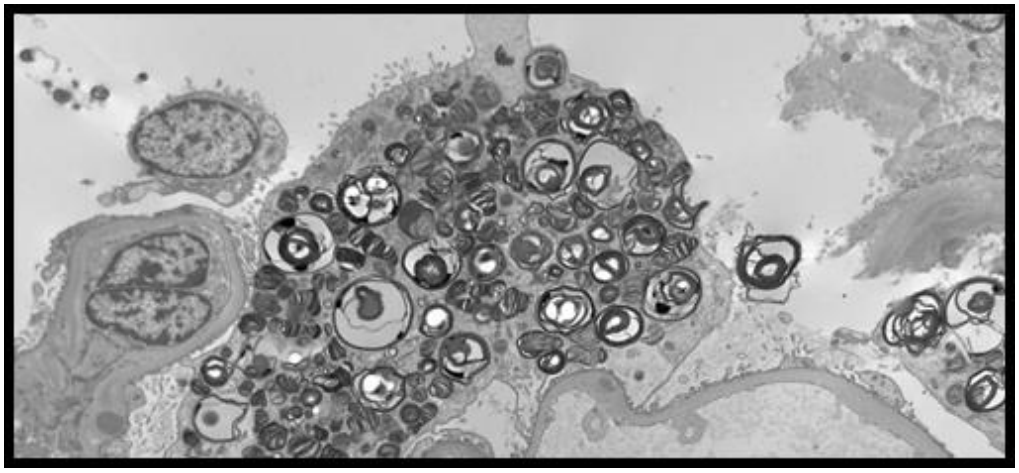
The Royal College of Pathologists
Pathology: the science behind the cure

Object 50: Electron microscope



What is it?
The electron microscope is a scientific instrument used to produce a magnified image of a specimen. Unlike the light microscope, which uses visible light, the electron microscope uses a beam of electrons to create an image. This allows it to magnify specimens many times more than a conventional microscope – up to 2 million times.

History
In 1931 German physicist Ernst Ruska and electrical engineer Max Knoll used electrons to produce a magnified image for the first time. They built a prototype electron microscope, capable of resolving to 50 nanometres. By 1960 electron microscopes had a resolution of 1 nanometre. Ruska received the Nobel Prize in 1986 for his work.

Pathology
Whereas the light microscope is suited to the examination of cells and tissues, the electron microscope is used to examine the structure of individual cells and their contents. Electron microscopy is used routinely in the examination of kidney biopsies, for example, allowing histopathologists to look at components of cells and any deposits in great detail to make a diagnosis and advise on treatment. Microbiologists also use electron microscopy in the diagnosis of infectious diseases.

Find out more
Visit the Nobel Prize website to find out more about the electron microscope.

See how accurate a 1665 drawing by scientist Robert Hooke was compared to a modern electron micrograph of a fly's foot on the John Innes Centre website.