

UNIVERSITI TEKNOLOGI MARA

**ULTRASTRUCTURAL FEATURES OF NORMAL
SPRAGUE DAWLEY'S KIDNEY UNDER
TRANSMISSION ELECTRON MICROSCOPE
(TEM)**

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Hopefully, this paper will become a useful reference and deliver significant contributions to future research that are related to this particular subject, so that there is continuous advancement in various related fields of study.

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ABSTRACT

The kidney is a complex organ that carries out a variety of functions responsible for physiological homeostasis. This present paper aims to provide reliable references for future studies involving ultrastructural features of the kidney. In this study, a pair of normal Sprague-Dawley's kidney was cut into thin slices and they were processed by routine electron microscopy procedures prior to examination of the ultrastructural features under transmission electron microscope. This present paper has discussed the morphological features of the ultrastructures of glomerulus, proximal tubule, Loop of Henle, distal tubule, and collecting duct and the physiological implications related to them. The glomerular capillary has filtration slits and numerous glomerular epithelial cells' foot processes which allow for efficient passage of substances filtered. The renal tubular cells generally have basal infoldings of the plasma membrane which provides a large surface area for their main functions of reabsorption and secretion. It is significantly found that the ultrastructural features of each of the structures examined have distinct, unique specialization that corresponds to their respective functions.

CHAPTER 1

INTRODUCTION

1.1 Background of study

The kidneys are organs of complex structures and are located just above the waist between the peritoneum and the posterior wall of the abdomen. They are said to be retroperitoneal organs due to their location (Tortora & Derrickson, 2008). The kidney is the major organ of the urinary system, while having numerous other functions in the human body. It is essentially responsible for the removal of excess water, salts and wastes of protein metabolism from blood and at the same time retaining nutrients and chemicals to the blood. Through these functions, the kidney plays a role in preservation of fluid, electrolyte, and acid-base balance, and regulation of blood pressure.

The kidney consists of two distinct regions; the superficial region known as the renal cortex and deep region called the renal medulla which houses the renal pyramids. The renal cortex and renal pyramids constitute the parenchyma of the kidney, which consists of microscopic structures called the nephrons. Each individual nephron can be divided into two parts, which are the renal corpuscle that is composed of glomerulus and the Bowman's capsule; and renal tubule, which is composed of proximal convoluted tubule, Loop of Henle, and distal convoluted tubule (Rhoades & Bell, 2012). There are three basic functions performed by the nephrons and collecting ducts, including glomerular filtration, tubular reabsorption,