INTRODUCTION AND REVIEW OF LITERATURE

The pancreas is a soft, lobulated, greyish pink and large retroperitoneal gland. It extends nearly transversely across the posterior abdominal wall, bheind the stomach from the duodenum to the spleen. Its right extremity is called the head which is the broadest part of the pancreas. It is moulded to the concavity of the duodenum. The head is attached to the main portion of the pancreas or body, by a slightly constricted neck extending forwards, upwards and to the left from the head and merges into the body (Last, 1978 and Williams and Warwick,1980).

The pancreas develops from the epithelial (endodermal) lining of the developing duodenum by dorsal and ventral budlike primordia, that arise on opposite sides of the duodenum. Either the dorsal or the ventral primordium may involute during development, so that in some species the pancreas has only one duct which is the development of either the dorsal or the ventral primordium, whereas in

other species, involution does not occur so that the pancreas has a double origin and two ducts (Arey,1946 and Nickel, Schammer, Schammer, Sciferle and Sac,1973).

The pancreas is separated from adjacent structures by only a poorly developed sheath of connective tissue. Indeed, it scarcely merits being called a capsule (Copenhaver, Bunge and Bunge,1971; Dellmann and Brown, 1976; Ham and Cormack,1979; Leeson and Leeson, 1981 and Cormack,1984). Unlike other abdominal organs, the pancreas lacks a well defined capsule. Instead, the outer limit on its ventral aspect is a thin layer of connective tissue and peritoneal mesothelium (Greep and Weiss,1973). However, in some species as the golden hamster the connective tissue extends to the surface of the pancreas and encapsulates the entire organ in varying degree of thickness (Jewell and Charipper,1951). As well, the sloth's pancreas is covered by a relatively thick connective tissue capsule rich in fibroblast, collagenous and reticular fibers. In such capsule, arteries, veins, lymphatics and thick

bundles of myelinated nerve fibers are described (Pinherio, Coutinho, Aguior, Passoa, Abrahamsohn, Pallot and Coutinho, 1981).

In sheep, the pancreas is invested by a well organised fibroelastic capsule of variable thickness. It is covered on its ventral surface by a serosa. The fibroelastic capsule is more dense in the outer part while deeply, the fibers are loosely arranged and housed more blood vessels. Its subserous layer is highly elastic showing a dense elastic network that joins the few elastic fibers in the capsule (Nada,1983).

Partitions of connective tissue extend in from the capsule to divide the pancres into lobules. These septa,like the acpsule, are very thin (Ham and Cormack,1979 and Leeson and Leeson,1981). Furthermore, separation commonly occurs along them when the pancreatic tissue is fixed, and in sections, lobules are ofen clearly indicated becuse they are separated by artifacts (Ham and Cormack,1979). In some lower

animals as, for instance, the cat, these lobules are well defined being completely separated from one another by connective tissue (Copenhaver et al.,1971).

It is well known since long time ago that, the pancreas is both an endocrine and an exocrine gland.

The exocrine portion of the pancreas is formed from acinar secretory end pieces as well as excretory ducts. The acini are packed together irregularly with only little reticular fibers containing capillaries between them (Malik and Brakash, 1972). The exocrine secretion is collected and delivered by a duct system composed of intercalated ducts, which penetrate partially into the acini forming the centroacinar cells, interlobular ducts located in the connective tissue septa and the main duct which opens in the duodenum (Ham,1978).

Although the septa are thin, considerable condensation of dense connective tissue is often

present around the main duct of the pancreas and its branches. This provides some internal support (Windle,1969).

The endocrine portion of the pancreas represented by the islets of Langerhans. The islets are incompletely delineated from the surrounding exocrine tissue by a trace of reticular fibers (Bloom and Fawcett, 1968; Malik and Brakash,1972; Bradbury, 1973; Ham and Cormack,1979 and Leeson and Leeson,1981). The internal support in the islet is provided by reticular fibers other than those associated with the capillaries. However they are not much, otherwise, the secretion of cells might have difficulty in gaining enterance to the capillaries (Bloom and Fawcett,1968; Bradbury,1973; Ham and Cormack, 1979 and Leeson and Leeson,1981).

In cattle, rabbits and rats, the capsule of Langerhans is thick and always complete (White and Harrop,1975).

In opossum, a thin layer of delicate connective

is brought about by clusters of fibrils leaving one bundle and joining another one. With the electron microscope, the collagenous fibrils seem to consist of finer microfibrils. These, so called unit fibrils, are about 0.04 micrometer thick. Each is composed of fundamental macromolecules, called tropocollagen.

Chemically, these fibers consist of an albuminoid, collagen, which gives them their name. Boiling dissolves the fibers into a colloidal solution of animal glue, this explains the namem collagen, which means glue production. Weak acids and alkalies cause fibers to swell markedly. They swell unevenly and become transparent giving the bamboo appearance. Strong acids and alkalies dissolve the fibers.

There is no specific stain for collagenous fibers, however, acid aniline dyes, stain them strongly and Mallory or Masson's trichrome stains give a good practical test for these fibers (Arey,1971).

Reticular fibers are closely related to collagenous fibers in that, they both consist of collagen

fibrils. However, the fibrils in reticular fibers are always of narrow diameter (about 20 nanometer). They do not form large bundles. In many locations, collagenous and reticular fibers blend and become continuous. Reticular fibers are displayed with special silver staining procedures. After silver treatment the fibers appear black and thus they are said to be argyrophilic. However, he same silver technique do not blacken collagen fibers. They merely tinge them yellow to brown. Reticular fibers are typically arranged in a network or a mesh-like pattern (Ross and Reith, 1985).

Reticular fibers are the first fibers to appear during development. They are still abundant in fetuses and the newborn. But,as the time goes on, many take on collagenous fibers characteristics. Some, however, remain permanently at the reticualr stage. Such fibers can be interpreted as immature, arrested collagenous fibers. In wound healing, reticular fibers are the first to appear then gradually increase in thickness and become collagenous fibers (Arey,1971, and Ross and Reith,1985).

Elastic fibers are solitary in loose connective tissue, never occurring in bundles. They branch and anastomose abundantly, thereby forming a network. A fiber tends t be much thinner (1 to 4 micrometer) than a collagenous fiber (1 to 20 micrometer). Elstic fibers can be selectively displayed with special dyes such as orcein or resorcin fuchsin (Arey,1971).

With the electron microscope the elastic fibers are seen to consist of a central amorphous component called elastin surrounded by fibrillar component. In young developing elastic material, the microfibrils predominate the amorphous component; however in adult elastic material, the amorphous component predominates (Ross and Reith,1985).

With adancing age the elastic fibers loose their resiliency as elastin degenerates into elacin (Arey, 1971).

All these fibers, collagenous, reticular, and elastic fibers, are embeded in a Jelly like mass

of mucopolysaccharides called the gound substance which is the most important non fibrous constituent of connective tissue (Domonkos, 1971).