

STUDY OF THE MOUSE PANCREATIC DUCTAL SYSTEM



FACULTAT DE VETERINÀRIA

Víctor Serra Artal



Universitat Autònoma de Barcelona

Universitat Autònoma de Barcelona, Veterinary Faculty, Dept. Animal Health and Anatomy, 08193, Bellaterra, Spain.

INTRODUCTION

The pancreatic ductal system consists of a network of different types of ducts that have an important role in the structure and function of the pancreas. The mouse is one of the most commonly animal species used in biomedical research due to its wide range of advantages. However, it is necessary to know it better and assess whether it is a good model in studies associated with pancreas pathologies.

OBJECTIVES

To focuss on the morphology of the mouse pancreatic ductal system and assess the main similarities and differences with the human pancreas. This objective should allow us to check the benefits of the mouse as an experimental model.

To increase knowledge about some of the main techniques used for the characterization of the pancreatic ductal system.

RESULTS

MATERIALS AND METHODS¹

n= 6 mice C57BL/6

Euthanasia with isoflurane. Midline laparotomy, locate and delimit the duct choledochus.

Mercox injection with 30G needle through the duct choledochus in a timeframe less than 3 minutes.

Dry at room temperature for some hours and place it in 60°C soap water for 24h.

Were corroded in 3% KOH for three days and washed in distilled water

The casts were mounted on stubs, sputtered with gold (5 minutes, 14-17 mA, 0,07 mbar)

Were observed in a EVO-LS15 scanning electron microscope at acceleration voltage from 5-15 kV.

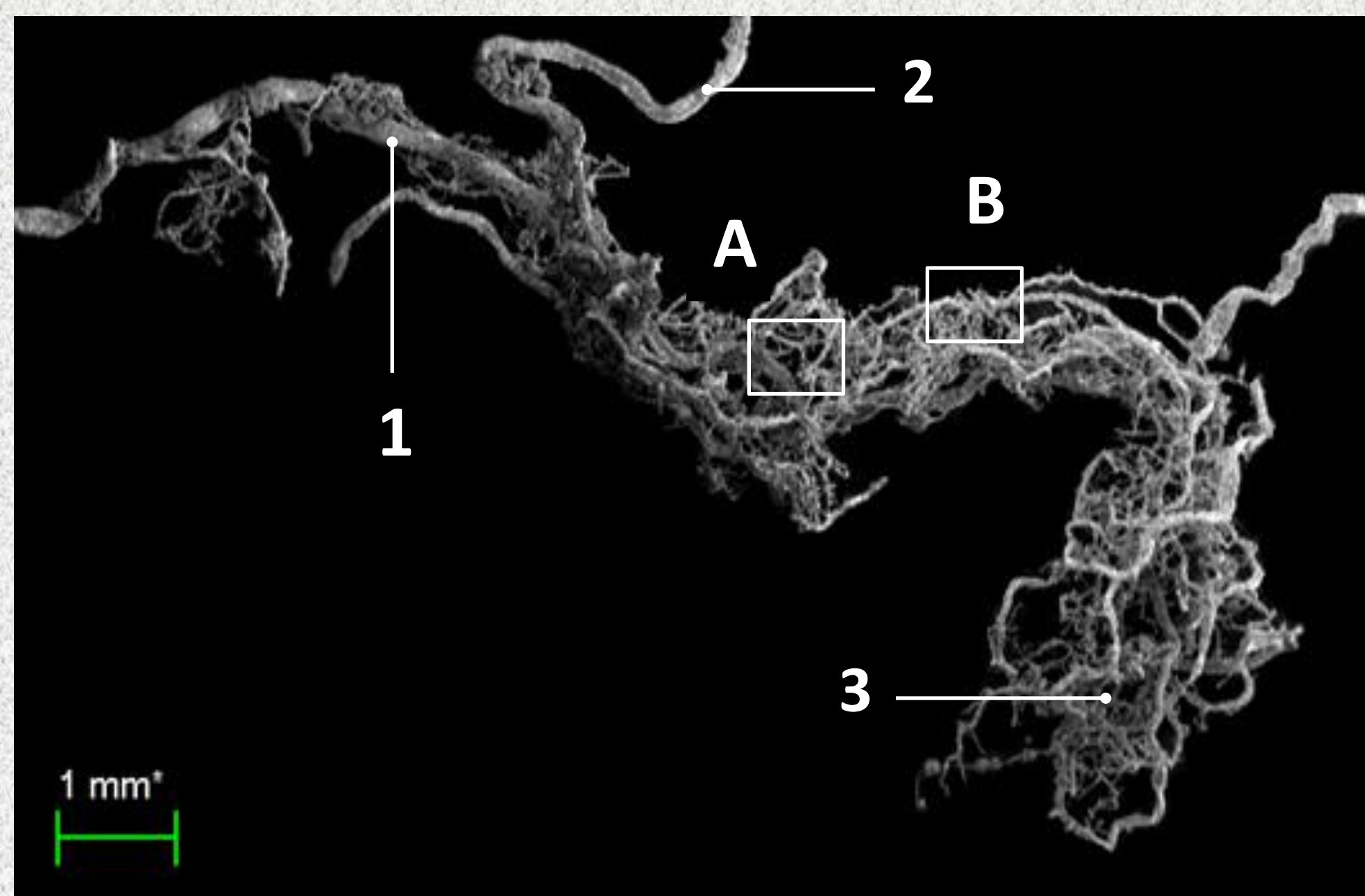


Figure 1. Overview of the pancreatic ductal system in a small lobe .

1. Interlobular duct (\varnothing 227 μ m).
2. Inter/Intralobular duct (\varnothing 181 μ m).
3. Network of diverse ducts and acini.

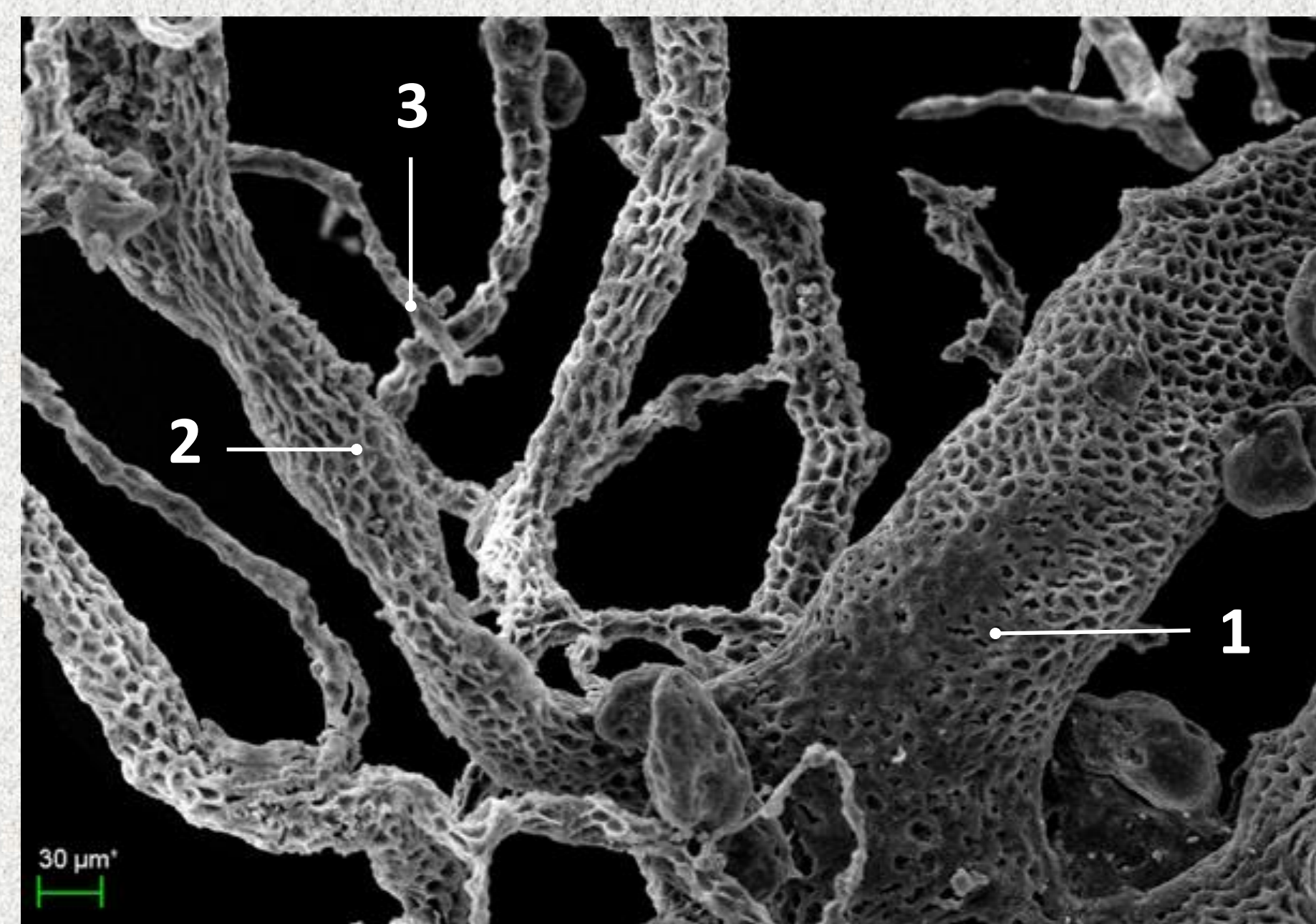


Figure 1.A. Detail of the ductal system in a small lobe.

1. Intra/Interlobular duct (\varnothing 127 μ m).
2. Intralobular duct (\varnothing 45 μ m).
3. Intercalated duct (\varnothing 7 μ m).

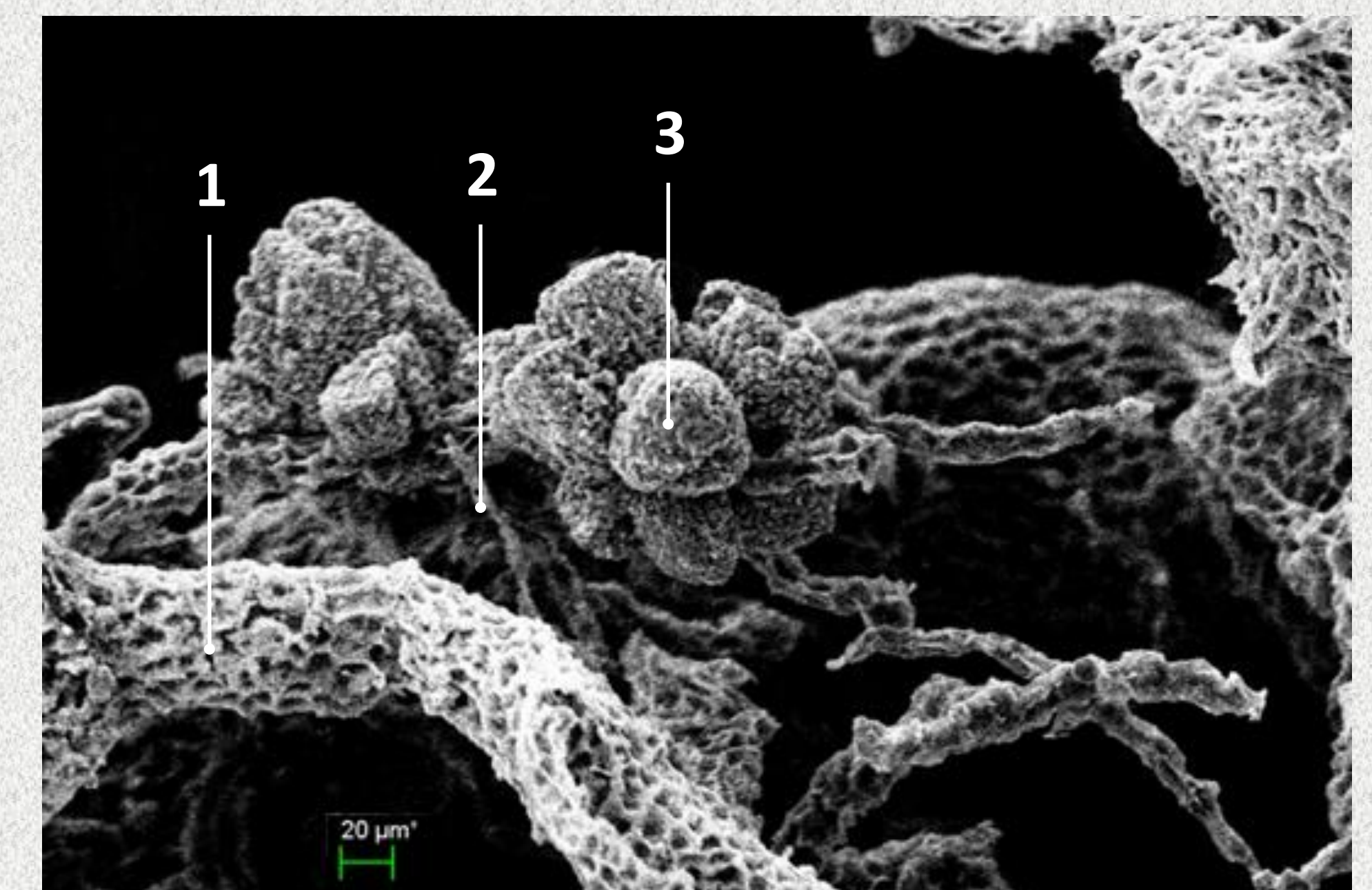


Figure 1.B. Pancreatic acinus.

1. Intralobular duct (\varnothing 61 μ m).
2. Intralobular duct (\varnothing 4,2 μ m).
3. Pancreatic acinus.

DISCUSSION

According to the direction in which pancreatic secretions progress and the gradual increase of the diameter, we classified the pancreatic ducts into four types: 1) Intercalated ducts, 2) Intralobular ducts, 3) Interlobular ducts and 4) Main ducts. After having observed a high level of diameters variability and considering the limited reliability of the manual measurement, it would be interesting to increase the number of samples and optimize the technology used with accurate measuring computer methods, enabling thus a better morphometric analysis and greater reliability.

CONCLUSIONS

- The technique of Mercox injection through the choledochus duct allows us to accurately reproduce the morphology of the mouse pancreatic ductal tree.
- The study of the duct casts obtained by scanning electron microscopy provides detailed information about the microanatomy of different types of pancreatic ducts.
- Despite the great potential of the technique used in this work, a detailed study of the global ductal system morphology should include the use of other complementary experimental techniques.

¹Carretero, A., Ditrich, H., Navarro, M., Splechtna, H., Ruberte, J. 1993. Technical improvements in corrosion casting of small specimens: a study on mesonephric tubules and vessels of chicken embryos. *Scanning Microscopy*, 7: 1333-1338.