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Teaching Method and Current Research Interest in Veterinary Anatomy with Special Reference to Bogor Agricultural University

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Teaching and learning methods in the field of Veterinary Anatomy in Indonesia are still using classic methods, such as lectures in class and continued with laboratory practices. To facilitate student centered learning, discussion using some teaching aid materials are used in the laboratory practices. The method continues to be improved from time to time to increase the student interest in the study of Veterinary Anatomy and to assist and facilitate student for a better understanding of the subject.

Although there may be some variations in each university, in general Veterinary Anatomy at universities in Indonesia is divided into three laboratories; the Laboratory of Anatomy, Laboratory of Histology, and Laboratory of Embryology. Based on Indonesia national veterinary curriculum, courses of Veterinary Anatomy in the DVM program are Veterinary Anatomy (6-8 credits), Veterinary Histology (4-5 credits), Topography of Anatomy (2-3 credits), Embryology and Developmental Genetic (2-3 credits). While the courses in the graduate program usually are Histomorphology, Comparative Anatomy, Embryology and Malformation, Cellular and Molecular Biology, Histological Technique, Histochemical Technique, Embryo Engineering, Embryonic Culture and Analysis, Antioxidant and Cellular Metabolism, Biology of Wild Animals, Anatomy and Histology of Primate, etc. The number of student body at DVM program at each of Faculty of Veterinary Medicine in Indonesia range from 60 to 250 students per year. Faculty of Veterinary Medicine, Bogor Agricultural University has average 220 student body/year. Because of this big number, the lectures and laboratory practices of Veterinary Anatomy are done by student grouping into three parallel classes.

Improvement on teaching and delivery method that we have done including: (1) Making college textbooks, practical guideline textbook, and Atlas of Anatomy¹. With these methods, students can learn the materials more better before attending class and laboratory practices; (2) Before starting the practical class, the students will have a quiz with the aim that students will always be ready to learn and understand the materials; (3) In macroanatomy, especially in the study of muscles and organs the specimens have been prepared properly by lecturers, so the practical time more efficiently and ease the students; (4) The formalin used for the preservation of anatomy practical specimens and cadavers have been decreased from 10 to 6 % levels; (5) The materials for study gross anatomy are sheep, dog, and horse cadavers; (6) Improvement in the practical study of histology and embryology includes the use of Dinoeye and two large monitors in the laboratory class to facilitate direct viewing of histological slides that are being observed under light microscope; (7) We also have student assistants as many as five students per laboratory practice class. The student assistants are recruited from the higher grade students based on their academic performance and good result in the interviews.

The current research in the field of Veterinary Anatomy is various from research in the field of gross anatomy, histology, and embryology. The studies that we have been doing can be classified in four types of research: (1) Research related to wildlife conservation and the use of its products. The study includes morphological exploration of all organ systems such as the digestive, reproductive organs, respiration and circulatory organs, nervous system, muscles, and bones. The

wild animals species are mouse deer, pangolin, porcupine, bats, swiftlet birds, rhinoceros, barking deer, and asian palm civet^{2,3}; (2) Basic research related to the reduction and treatment of degenerative diseases. Related research is the use of herbs such as *Mamordica charantia*, *Andrographis paniculata*, *Swietenia mahogany* seeds, *Malea azedarach*, *Eucheuma cottonii*, lotus seeds, and soybean tempe, in the prevention of degenerative diseases such as diabetes mellitus, hypercholesterolemia, osteoporosis, and oxidative stress involving the role of intracellular antioxidant^{4,5}. Utilization of stem cells in therapeutic efforts in the degenerative diseases such as diabetes mellitus was also performed; (3) Some research in the field of embryology are microfertilization and embryo engineering, cryopreservation of sperm, oocytes and embryos by vitrification methods, the development of stem cell therapy for degenerative diseases. Isolation and encapsulated Leydig cells, and also development conditioned medium (CM) for the development of stem cells in tissues culture⁶; and (4) Phylogenetic study of wild animals that can map the geographic presence of the species concerned⁷.

Most researches are done by collaboration with experts from human medicine, dentistry, biology, chemistry, biochemistry, pharmacology, animal husbandry, forestry, fisheries, food science and nutrition . This shows a very wide and important role of Veterinary Anatomy in supporting other sciences, to achieve a common goal in the animal and public health, one world health.

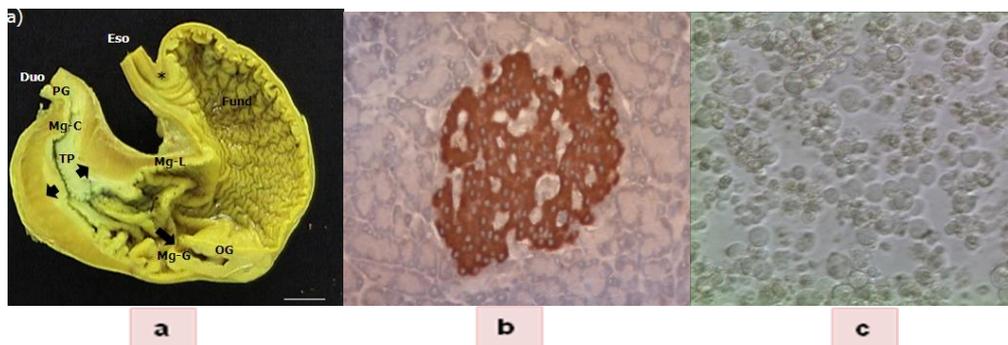


Figure 1. The stomach of pangolin (a), photomicrograph of beta cells of pancreatic rat (b), and tissue culture of Leydig cells (c).

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