## ABSTRACT

A neuroanatomical study on the agouti (*Dasyprocta leporina*), a neotropical rodent, investigating:

1. The morphology and morphometry of the skull,
2. The topography of brainstem nuclei associated with preganglionic parasympathetic innervation, and
3. The Central origin of gastric preganglionic parasympathetic fibres.

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The great advances of science and medicine over the past century would have been impossible were it not for the extensive use of animals in research. Of all the known mammalian species, approximately half belong to the order Rodentia. Of these, the laboratory rat and mouse constitute well over 80% of the animals utilized in medical and scientific inquiry.

The agouti has been cited by Baas et al as a probable research animal, however for any animal to enter the scientific arena as a human model, a detailed knowledge of its anatomical and physiological characteristics is prerequisite. Thus the aim of this research was to investigate the nervous system of the animal.

Using hot water maceration, neutral red staining and wheat germ agglutinase conjugated to horseradish peroxidase, the skull, normal histology of the medulla and innervation of the stomach of *dasyprocta leporina* was studied. The underlying hypothesis was that the neuroanatomical features of the agouti are closer to humans than that of other commonly used laboratory rodents.

What was discovered was that the morphometry and morphology of the skulll were similar to other hystricomorphic rodents. The gross anatomy and normal histology of the medulla was homologous to humans and that of commonly used laboratory rodents such as the guinea pig and rat. In addition, like all mammals studied, the preganglionic parasympathetic neurons of the stomach were derived from the dorsal motor nucleus of the vagus. However no labeling was seen in the nucleus ambiguus (NA) because of the area inoculated. Input from the NA remains to be investigated.

These observations constitute a significant addition to the fast growing database of the animal.

**Keywords**: Michelyn Carla Phillips; horseradish peroxidase; *dasyprocta leporina*; morphometry; hystricomorphic; stomach; preganglionic parasympathetic neurons; dorsal motor nucleus of the vagus; nucleus ambiguus.