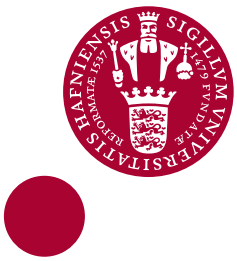

Comments on halothane gene carriers in pigs.

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Letters

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Dear Sir:

In the September 1992 issue of the *American Journal of Veterinary Research*, pp 1711-1714, Geers et al described a difference between halothane gene carrier pigs and normal pigs in the mean decrease of phosphocreatine (PCr) concentration and pH in biceps femoris muscle during halothane anesthesia. They found less decrease in the PCr concentration of heterozygote carriers than in normal pigs. This is surprising, considering that resting pH was lower and the decrease in pH was greater in the heterozygote carriers. One would have expected that the increase in the H^+ concentration in the heterozygotes would have led to a faster, not a slower, decrease in the PCr concentration in biceps femoris muscle in these animals. Similarly, one would have expected a faster increase in the concentration of inorganic phosphate (P_i) in biceps femoris muscle, leading to a marked increase in the ratio of inorganic P_i/PCr. We have recently conducted a similar experiment and have submitted the results for publication elsewhere.[1]

Three male and 5 female Danish Landrace pigs, age 8 to 11 weeks, weight 14 to 28 kg, were used. Their genotype, with respect to halothane sensitivity, was established on the basis of their pedigree and on the basis of genotypes of closely linked loci (the H blood group system and the PHI enzyme-type system[2]). All pigs were anesthetized for 1 to 1.5 hours with halothane/oxygen supplied via face mask, using 5% halothane initially and decreasing the concentration to 2 to 3% after a few minutes.

The ^{31}P-nuclear magnetic resonance (^{31}P-NMR) experiments were performed with a wide-bore (31 cm diameter) 4.7 Tesla Magnex magnet interfaced to an Otsuka Electronics Vivospec spectrometer. The NMR signals were collected from the lateral aspect of one biceps femoris muscle, by applying an inductively driven, two-turn surface coil (3.8 cm diameter) tuned to the resonance frequency of phosphorus, 81.02 MHz. Pulse width was 60 μseconds, corresponding to a 180° pulse in the center of the loaded coil. Each spectrum was the sum of 32 signals collected with an interpulse delay of 20 seconds, ensuring fully relaxed condition.

Surgical biopsy specimens were obtained from the contralateral biceps femoris muscle. The biopsies were freeze-clamped immediately, then kept in liquid nitrogen and later stored at −80 C until analyzed by standard biochemical methods.

Our measurements, which cover the interval described in the report by Geers et al, did not reveal any difference in the P_i/PCr ratio between the 2 halothane genotypes at rest during halothane anesthesia. On the other hand, the P_i/PCr ratio was higher in Nn-heterozygotes, compared with normals. We ascribe this difference to the unavoidable stimulation of the muscle tissue inflicted by a higher excitability of skeletal muscle of heterozygote animals. In summary, contrary to the findings of Geers et al, we were not able to identify the Nn-heterozygote animals by ^{31}P-NMR spectroscopy at rest during halothane anesthesia.

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