Less-invasive measurements using the small device, nano tag®, for locomotor activity, body temperature and gastrointestinal motility in cynomolgus monkeys or beagle dogs

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Evaluations of locomotor activity, body temperature and gastrointestinal motility in monkeys or dogs are useful to understand effects of candidate drugs on the central nervous and gastrointestinal systems. Here we describe less-invasive evaluation methods using the small device, nano tag® (15×14×7 mm).

Nano tag was subcutaneously implanted in cynomolgus monkeys. Gelatin capsule containing nano tag was orally administered in beagle dogs. Then body temperature and the amount of locomotor activity were simultaneously and continuously measured by nano tag and a telemetry system (PONEMAH system). The measured profiles obtained by nano tag approximately corresponded with those by the telemetry system, suggesting data obtained by nano tag are comparable to telemetry data. Moreover, nano tag could detect drug-induced changes of locomotor activity and body temperature in animals treated with caffeine, ketamine or thiopental. As to gastrointestinal motility, gastrointestinal residence time of nano tag was evaluated in dogs. The gastrointestinal residence time became shortened and extended by treatment with pilocarpine and loperamide, respectively. The proposed less-invasive methods using nano tag could help to evaluate effects of drugs on the central nervous and gastrointestinal systems in monkeys and dogs.