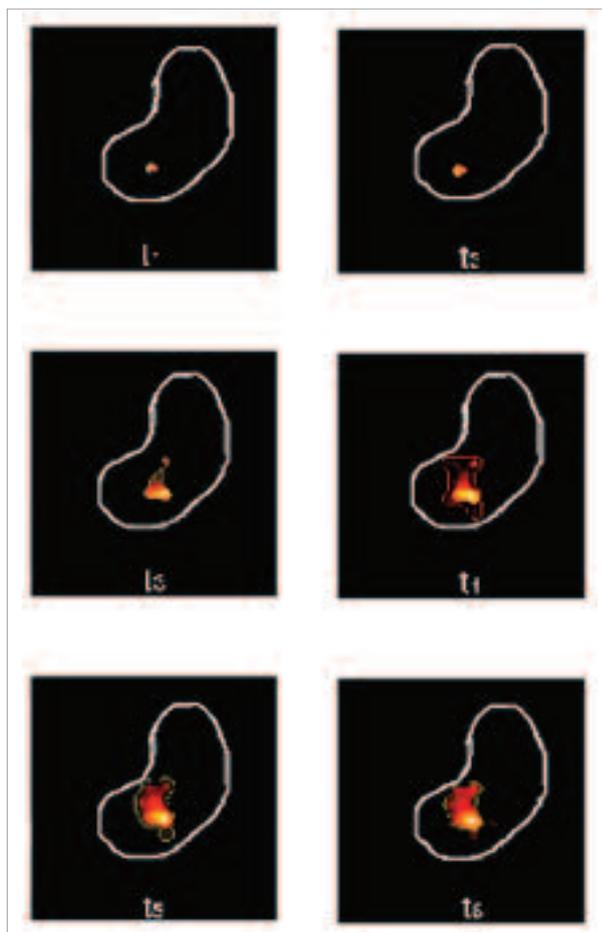


DEVELOPMENT AND IMPLANTATION OF NEW METHODS FOR STUDYING THE ACCOMMODATION AND CONTRACTIBILITY OF THE STOMACH. APPLICATIONS IN INVESTIGATIONS OF PHYSIOLOGY AND PHYSIOPATHOLOGY OF THE MOTILITY

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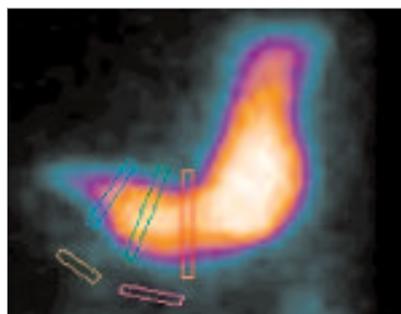
Magnetic images of the disintegration process of tablets in the human stomach by a biosusceptometry

The study of gastric motility has, for a long time, been carried out by means of invasive methods. More recently, non-invasive methods have been used, such as ultrasound, conventional scintigraphy, tomography by single photon emission and nuclear magnetic resonance. We are within a group active in the study of Digestive Motility, interest in the implantation of these methods, and the introduction of modifications which make them more efficient, as well as the development of other techniques, such as biomagnetic. It is planned, furthermore, to determine the effect of other variables of systemic nature, such as those related to volemic homeostasis, the relationships between the motor dysfunctions of the stomach, the control of appetite and the ingestion of foods, mediated by the liberation of neuropeptides, such as PYY, by endocrine cells existing in the distal part of the small intestine.

SUMMARY OF RESULTS TO DATE AND PERSPECTIVES

The project has provided vigorous support to the development and improvement of medical imaging techniques used for studies on gastrointestinal motility. Improvements of two previously described scintigraphic methods, for determining the time-course of gastric content distribution after meals, and for measurements of gastric contractility were made. The application of the improved techniques on patients with gastrointestinal motility disorders produced interesting results which were published.

A multidisciplinary team of researchers gathered within the project devised and developed a low cost, noninvasive biomagnetism-based imaging technique, which proved to be useful for a wide range of purposes: measurements of gastric emptying, intragastric meal distribution, contractility of the distal stomach, small bowel transit time, detection of "volume waves" in the proximal stomach, detection of disintegration of tablets in the gastrointestinal tract, and measurement of time-course of disintegration of tablets.



Scintigraphic image of stomach and regions of interest (ROIs) in the antrum

A couple of fruitful, medically-oriented lines of animal research, where experiments are performed on *in vivo* and *in vitro* models, are included in the project. The relaxing effects of Sildenafil (a vasodilator drug largely used for the treatment of male erectile dysfunction) on smooth muscle of rat stomach and duodenum was demonstrated. Involved mechanisms were described, the relationships of mucosal inflammations caused by NSAIDs and anti-cancer drugs, and their contemporaneous gastrointestinal motor dysfunctions have been clarified.

MAIN PUBLICATIONS

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