Porsolt has an extensive portfolio of services supporting drug discovery and development. We have extensive expertise and many years of experience in gastrointestinal safety pharmacology and efficacy. Porsolt remains committed to maintaining a recognized expertise in this area by continuing to develop and validate new models.

**EMESIS IN THE FERRET**

The assessment of emesis in ferrets is an established model that is used for the safety evaluation of compounds. It is also a valuable and commonly used model for evaluating efficacy against the emetic side effects of morphine-like treatments, cytotoxic agents or ionizing radiation.

- **Abdominal pressure recordings after cisplatin administration**
  - The ferret: a useful and valid model for pharmacological research on acute and delayed emesis. Whereas early emesis can be easily quantified in animal models by visual observation, the evaluation of delayed emesis requires alternative methods.

- **Acute and/or delayed phase of emesis induced by cisplatin in the telemetered ferret**
  - We have recently described an automated method using specifically adapted software for identifying abdominal pressure changes related to retches or vomiting (Goineau et al., 2013).

  - **Effect of aprepitant on the acute and delayed phase of emesis**
  - The automated method is reliable, valid and cost-effective for measuring emetic events over prolonged periods. This model creates new and important perspectives for the evaluation of combined therapies in cancer research and can facilitate the development of novel anti-emetic therapies (Goineau et al., 2014).

**GASTROINTESTINAL TRANSIT**

Gastrointestinal transit studies focus on the time of transit through the stomach, small intestine, caecum and colon. This is important for safety and efficacy evaluation of compounds and their effect on normal gastrointestinal motility.

- **Charcoal meal test**
  - The gastric emptying and the transit are measured by evaluation of the intestinal distribution of orally administered phenol red along the gastrointestinal tract.

- **Distribution pattern of phenol red within the stomach, small bowel, caecum and colon**
  - Gastric transit time in the small intestine, using the Charcoal Meal Test, focuses mainly on the measurement of small intestine transit time (the position of the charcoal front as a percentage of the total length of the small intestine) in rodents. A rough estimate of gastric emptying by measurement of the gastric contents can also be performed.

The gastric emptying and the transit are measured by evaluation of the intestinal distribution of orally administered phenol red along the gastrointestinal tract.
In the context of pre-clinical safety pharmacology, supplemental evaluations on gastrointestinal function are often limited to the assessment of gastrointestinal motility. Nevertheless, as new chemical entities may have diverse effects on the upper gastrointestinal system, additional and more specific measurements of gastric emptying are required.

**Phenol Red Test**

The phenol red test, considered as the historic gold standard, can detect both delayed and accelerated gastric emptying following test substance administration.

**Measurement of plasma acetaminophen levels**

Acetaminophen, which is poorly absorbed in the stomach, is rapidly and almost completely absorbed in the small intestine. Serum acetaminophen levels therefore correlate closely with gastric emptying rate.

Indirect determination of gastric emptying by measurement of the time course of plasma acetaminophen levels after its oral administration in a liquid meal.

**GASTROPARESIS**

Gastroparesis is a chronic stomach disorder manifested by delayed emptying of solids and liquids without evidence of mechanical obstruction of the gastroduodenal junction.

- **Clonidine-induced gastroparesis in the rat**
- **Gastric emptying in a rat model of Parkinson’s disease**

**Effect of loperamide and metoclopramide on gastric emptying in the rat**

Gastric emptying in a rat model of Parkinson’s disease.

**Effect of loperamide and metoclopramide on plasma acetaminophen levels in the rat**

**GASTRIC EMPTYING**

**POST-OPERATIVE ILEUS**

Post-operative ileus (POI) is the transient impairment of gastrointestinal function developing as a consequence of abdominal surgery. POI is induced by gentle manipulation of the small intestine using a rolling motion with two cotton-tipped applicators. Intestinal transit is then measured following test substance administration.

**Effect of mosapride on post-operative ileus (Phenol red distribution)**

**COLONIC MOTILITY**

Colonic motility is a critical process underlying the major functions of the large bowel, such as storage, absorption, propulsion, and defecation. Disorders of colonic motility typically present with constipation or diarrhea.

- **Colonic Transit in the rat**
- **Diarrheogenic/constipating activity in the rat**

Measurement of fecal output (mouse or rat) is valuable in evaluating potential constipating or diarrheogenic activity of a test substance. The number of fecal pellets evacuated and their consistency (hard, soft or liquid feces) are evaluated.