**Clues from milk**: a new formula for the treatment of necrotizing enterocolitis in the newborn.

Necrotizing enterocolitis (NEC) is a dreadful disease in neonates. The highest incidence is in (very) premature newborns. Approximately 15% of newborns born before 28 weeks of gestation are diagnosed with NEC, which makes it the most common intestinal emergency in preterm infants. It requires aggressive medical treatment, however25-50% of the patients still require multiple surgical interventions following pharmacotherapy. Thirty percent of all NEC patients die. NEC accounts for 20% of the costs of Neonatal Intensive Care Units annually.

The disease is characterized by a severe inflammatory process in the intestinal wall, leading to local tissue damage that may seriously affect the intestinal barrier function. A damaged intestinal barrier may allow toxic substances to cross the intestinal wall and reach the bloodstream, inducing a rapid deterioration of the clinical condition of the preterm child. The exact cause of NEC is unknown but disturbed intestinal perfusion (for instance due to circulatory problems), bacterial colonization and enteral feeding are important factors that play a role in the pathogenesis of NEC.

One of the most important preventive factors is breastmilk feeding. This might give a clue for the cause of this disease and also may provide an opening for prevention and/or improvement of therapy. The aim of this project is therefore to identify a key factor in breast milk that is able to prevent or ameliorate NEC. Following identification of such a key factor, the milk will be enriched with this compound. Treating high risk infants with this enriched milk might prevent or ameliorate the disease. In this research project the effectivity of the key factor will be first evaluated in vitro in cell cultures and subsequently in animal models for colitis. Our ultimate goal is to evaluate the effect of enriching milk with the key factor in clinical trials.The project is a collaboration between the Groningen Research Institute of Pharmacy (GRIP; prof. dr. K. Poelstra, dept. Pharmacokinetics, Toxicology & Targeting,) and the University Medical Center Groningen (UMCG; prof dr. J.B.F. Hulscher, dept. of Surgery, division Pediatric Surgery and prof. dr. A.F. Bos, dept of Pediatrics, division of Neonatology). We seek a PhD student with expertise in the area of medical biology and with specific affinity for cell culture techniques and experience in protein and fat purifications and the analysis of cells and tissues using histochemical -, PCR -, Western blot- and/or facs-techniques.

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