

## HB-EGF protects intestines from a variety of injuries, pair of studies suggests

August 20 2013

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It's not often that one treatment offers therapeutic potential for multiple conditions. However, after more than two decades of research, Gail Besner, MD, principal investigator for the Center for Perinatal Research and pediatric surgeon for the Department of Pediatric Surgery at Nationwide Children's Hospital, and her team have found that this may just be the case with HB-EGF, or heparin-binding EGF-like growth factor.

Having discovered the growth factor in 1990, Dr. Besner most recently conducted two studies in mice published in June in the *Journal of Pediatric Surgery* that reveal the potential of HB-EGF to protect the [intestines](#) from diverse types of injury. The first offers evidence that treatment with the growth factor may help the intestines protect themselves from damage after exposure to [radiation therapy](#).

"Many patients are treated with radiation therapy for pelvic and abdominal cancers each year, and over half suffer from injury to the intestines as a result, which may limit their ability to receive additional therapy," Dr. Besner says. "In the future, treatment with HB-EGF may protect the intestines from this injury, enabling patients to receive more therapy, or at least not suffer as much damage from the radiation."

HB-EGF is a protein that stimulates cells to grow and to move. Cell proliferation and migration are critical to wound healing, including the healing of intestinal [wounds](#). In addition, HB-EGF decreases the production of multiple substances that are formed upon intestinal injury

and that would normally act to worsen the injury. This allows the protein to protect the intestine from further harm.

To boost the potential protective potency of HB-EGF, Dr. Besner and her lab directed a second study involving stem cell administration, which is increasingly used to protect organs from injury. "We demonstrated that administration of HB-EGF protects the intestines from injury, and administration of [mesenchymal stem cells](#) protects the intestines from injury—but treatment with both therapies simultaneously acts synergistically to further protect the intestines from injury."

Together, the results of the two studies offer Dr. Besner encouragement for a healthier future for her tiny patients. Newborns, especially those born prematurely, are at particular risk of an injury to the intestines known as necrotizing enterocolitis, or NEC. Dr. Besner's research suggests HB-EGF may hold significant clinical potential for these babies.

"The mortality of NEC is too high, despite widespread research on it—if I operate on one of these babies, I have to tell the parents that their baby only has a 50 percent chance of living," Dr. Besner says. "Because of this, I am very motivated to find a cure. Mounting work from our laboratory shows that HB-EGF can protect the intestines from NEC. It is our hope that, in the future, we can administer HB-EGF to newborns most at risk of developing NEC in order to prevent them from developing this devastating disease."

Having studied the potential for therapeutic applications of HB-EGF for more than two decades, Dr. Besner is optimistic about the protein's potential. "We have some very exciting new lines of HB-EGF research going on in our laboratory at present, and we feel that the future for HB-EGF use in the treatment of human clinical disease remains bright."

**More information:** Matthews MA, Watkins D, Darbyshire A, Caron WE, Besner GE. Heparin-Binding EGF-like Growth Factor (HB-EGF) Protects the Intestines from Radiation Therapy-Induced Intestinal Injury. *Journal of Pediatric Surgery*. 2013 Jun, 48(6):1316-1322.

Watkins DJ, Yang J, Matthews MA, Besner GE. Synergistic Effects of HG-EGF and Mesenchymal Stem Cells in a Murine Model of Intestinal Ischemia/Reperfusion Injury. *Journal of Pediatric Surgery*. 2013 Jun, 48(6):1323-1329.

Provided by Nationwide Children's Hospital

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