

#ResearchAtHorizon: Helping patients' wounds heal faster

Some of the biggest discoveries in science come from studies that are simple and cost very little.

At Horizon's The Moncton Hospital (TMH), two researchers may be on the verge of just such a breakthrough in their research that asks the question:

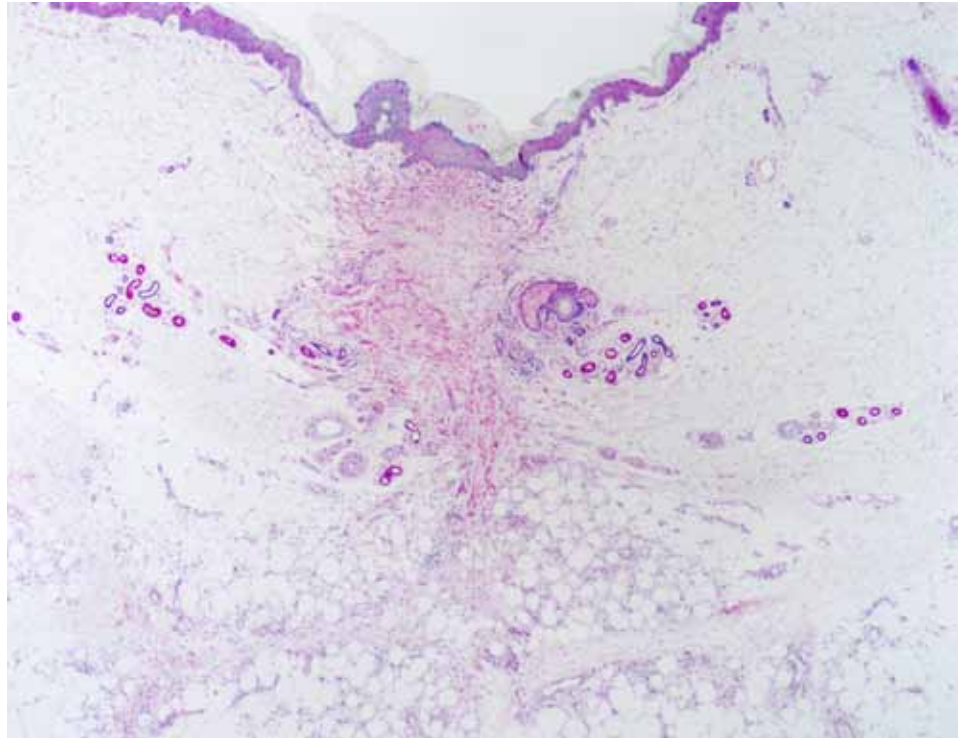
"How can we help patients' wounds heal faster?"

With chronic health conditions like diabetes, high blood pressure, or heart disease, damage to blood vessels can occur and lead to poor circulation. Poor circulation means it takes longer for our bodies to heal, and causes a great deal of suffering in the process while we wait for bandages to protect the skin while it heals. In more severe cases, surgery is needed to remove damaged tissue.

However, Drs. Emmanuel Maicas and Steve Griffiths have teamed up to study one possible way of improving treatment.

Heat shock proteins, or stress proteins, are released after injury to promote the growth of new tissue and blood vessels. Studies in animals have shown applying these proteins directly on wounds using a cream can speed up the healing process.

But, before they start testing a heat shock protein healing cream on patients, they need to first demonstrate humans release these



A photo of one of the skin wounds tested for heat shock protein in their study, taken with a microscope. Here, a 40-day-old scar was stained for one of the three heat shock proteins tested; the picture shows that the scar tissue in the center contains more protein (the magenta colour) than the surrounding dermis (the almost white area).

proteins when injured.

It was for this initial project that Drs. Maicas and Griffiths were awarded research funds

from the Friends of the Moncton Hospital's Community Health Research and Education Endowment (CHREE) 2018 funding competition.

Using existing tissue removed by surgeons over a decade ago from patients' scars or ulcers, the team will look at normal and abnormal tissue, and see if there is a difference in the amount of heat shock protein in each.

"Sometimes, important experiments are easy to perform, cost little but provide valuable clues about new treatments," said Dr. Maicas.

If it shows there is more protein in the abnormal tissue, this would be a positive indication humans do release these proteins when injured, and act as a springboard for a future clinical trial of heat shock protein cream at Horizon's TMH. At the time they started their research in early 2019, no one had published a similar study in humans.

"I was astonished and delighted to see how histology brought immediate clarity to a profoundly important health issue," said Dr. Griffiths.

To perform the analyses, the funding was used to purchase chemicals not regularly stocked in Horizon labs. However, the study is relatively quite low in cost, is conducted completely in the hospital laboratory and was also quite quick to complete (in less than six months).

Preliminary results indicate three different heat shock proteins are produced by the body during early wound healing.



Dr. Emmanuel Maicas, left, is a pathologist with the Department of Laboratory Medicine at Horizon's The Moncton Hospital, with a PhD in molecular genetics. Dr. Steve Griffiths, with a PhD in animal and human cellular biology, is the president and CEO of XOSOME (Exosome Precision Translational Biotechnology).