



Dartmouth neurologist James Bernat, M.D., gave the keynote lecture at the 2008 annual meeting of the Vlaamse Vereniging voor Neurologie, the Flemish Neurological Society, in Antwerp, Belgium.

A push for new knowledge about labor

No one fully understands the intricate dance of the hormones that trigger labor. Two DMS researchers thought they'd come close recently and submitted a paper detailing their findings to the *Journal of Clinical Investigation*. But the discovery—that a muscle relaxant triggers labor's forceful uterine contractions—was so surprising that the journal's reviewers asked the investigators to perform additional experiments to confirm the finding. They did so, and the paper was published a few months ago.

Trigger: The researchers—graduate student Kristina Fetalvero and vascular surgery researcher Kathleen Martin, Ph.D.—weren't surprised their discovery was controversial. It's long been known that prostacyclin, a fatty acid, is present in low levels in the uterus during pregnancy and spikes before labor starts. But until now no one suspected it might actually trigger labor.

Dartmouth ob-gyn Roger Young, M.D., Ph.D., recalls attending a meeting where Fetalvero and Martin presented their data—showing that prostacyclin both relaxes and enhances the contraction of smooth muscle cells in blood vessels and in the uterus. "I simply thought they were

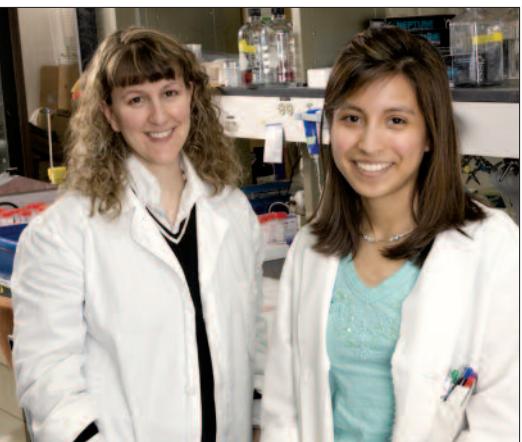
"I simply thought they were wrong," laughs ob-gyn Roger Young.

wrong," laughs Young. "I thought they were right in vascular, but that it would be a different result in uterine cells."

Soon the researchers made a believer out of him. Young, who is now at the University of Vermont, became a partner in the study. He provided tiny strips of uterine tissue, which he obtained from 21 volunteers about to undergo elective c-sections. The slices—two per patient—were attached to 400-milligram weights and suspended in test tubes. The weights helped the tissue maintain the ability to contract, which it would rapidly lose in a normal culture dish. One strip of each pair was treated with prostacyclin for 48 hours; the other was untreated. Then all the strips were stimulated with oxytocin, a muscle contractant present in labor. The treated samples underwent much stronger contractions than the untreated ones. The researchers determined that the prostacyclin had upregulated proteins that stimulate the contraction of smooth muscle cells.

Signals: The study has limitations, however, says Fetalvero, who's now a postdoctoral fellow at Novartis in Cambridge, Mass. Uterine tissue outside the body can't be stimulated by the signals that normally come from the fetus and hormones in the body. "All of these work together to trigger the labor phase," she says. But studying uterine tissue in the lab "is the next best thing to understanding human labor right now."

The study, which was funded by the National Institutes of Health, has implications for preventing preterm delivery, which has been increasing and now occurs in about 12% of pregnancies, says Young. "It makes it more incumbent on us to find at least one therapy that seems to work," he points out. "Right now we have none." —LAURA STEPHENSON CARTER



CHRIS MILLMAN

Martin, left, and Fetalvero studied labor's onset.

Back talk

Surgery trumps physical therapy, education, exercise, and medicine when it comes to relieving pain and improving physical function in people with a herniated lumbar disc. So reported James Weinstein, D.O., and his colleagues in the December 2008 issue of *Spine*. "The treatment effect for surgery was seen as early as six weeks, appeared to reach a maximum by six months, and persisted over four years," they wrote. The group of patients who didn't have surgery improved, too, the authors noted, just not as much as the group who had surgery.



Smoke alarm

DMS researchers found a possible link between maternal cigarette use and Sudden Infant Death Syndrome (SIDS). SIDS is a major cause of infant mortality in the U.S., but its mechanisms are still unknown. One possibility is laryngeal chemoreflex apnea, a condition in which liquid in the larynx may cause infants to stop breathing.

The DMS study showed that apnea lasted longer in rat pups whose mothers had been exposed to tobacco smoke than in rat pups from unexposed mothers. "This finding may be significant for the pathogenesis of SIDS in human infants," wrote Luxi Xia, M.D., and her coauthors in *Respiratory Physiology and Neurobiology*.

