

Baby Biology



What if someone told you the key to unlocking one of the mysteries of the human body might reside in your baby's poop? Would you be willing to save and store junior's fecal matter, in the family freezer no less, for the sake of important scientific research?

Luckily for HHMI investigator Patrick O. Brown at the Stanford University School of Medicine, several parents in the Silicon Valley area were willing to do just that, enabling Brown's team of researchers to make startling discoveries about the microbial ecosystem of the human intestine.

Chana Palmer, a former graduate student in Brown's lab, was the logistical mastermind behind what she and her colleagues referred to as the "poop project." She was also the lead author of the paper presenting their findings in *PLoS Biology* in July 2007.

The recruitment posters that Palmer distributed around the Stanford campus, she admits, "were a little vague about what was actually involved," focusing more on the end goal—an understanding of how bacteria colonize a newborn's digestive system—than on the actual dirty work involved.

Ultimately, Palmer was able to enlist 13 pregnant women—including one woman expecting twins—who were willing to collect their little ones' poop over a period of about a year. Palmer provided each mother with pre-labeled vials specifically designed for stool collection. "Like glass tubes you might find at a bead store," she explains, "but with a sterile spoon attached to the lid. We stressed that there was no need to scoop up the whole poop; just about one-fourth of a teaspoon. Sometimes the mothers gave us a bit too much."

Palmer also offered the families mini-freezers if they didn't feel comfortable storing the goods among their frozen vegetables and pizzas. One mother admitted to hiding the samples at the back of the freezer when her mother-in-law, sure to disapprove, came to visit.

Aside from some important discoveries that emerged from DNA microarray analyses of the stool samples (see "Baby's First Bacteria,"

page 48), Palmer enjoyed the human element of the research.

"We became close," she says of the mothers. "I wouldn't just pick up the poop and leave. I'd stay for a chat."

Indeed, Palmer participated in some of the families' most intimate moments. A few weeks before their due dates, the mothers were asked to provide vaginal swabs. "I met the moms immediately after their doctor's appointments," Palmer explains. "They'd hand off the swab and I'd walk across campus with it in a mini-ice-chest to the deep freezer." The mothers also called Palmer when they went into labor so she could bring to the hospital a small cooler for storing the baby's first poop. Called meconium, that first stool was, in Palmer's words, "a whole different beast." The thick, tarlike substance proved nearly impossible to work with, particularly on microscope slides.

Mothers provided samples of their own first postpartum stools, and also breast milk. Later, fathers were asked to make a contribution in the form of a stool sample. "Most, but not all, were cooperative," Palmer says of the fathers.

One of the more mundane eye-openers for Palmer, who has no children and was just recently married, "I hadn't realized just how many diapers a newborn baby goes through every day!" —*Lindsay Moran*



"We became close. I wouldn't just pick up the poop and leave. I'd stay for a chat."

CHANA PALMER