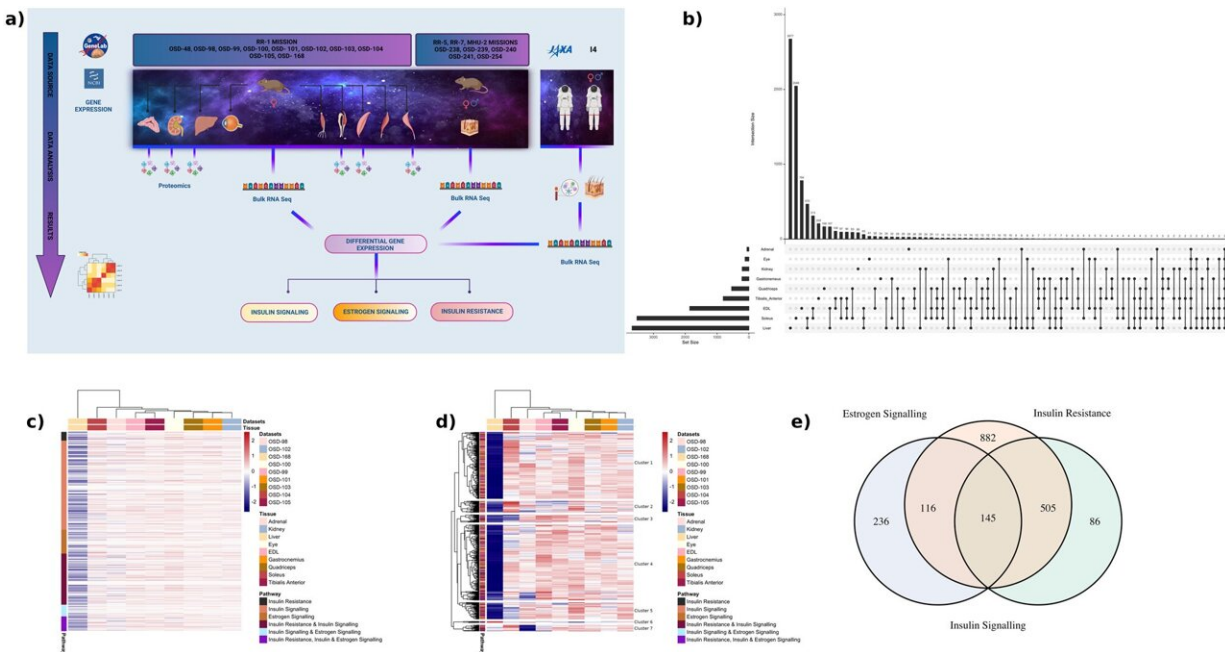


# OB-GYN studies how women's health is affected by space travel

June 12 2024, by Dave Scheiber



Unique differentially expressed genes across tissues in mice. Credit: *Communications Biology* (2024). <https://doi.org/10.1038/s42003-023-05213-2>

USF Health Morsani College of Medicine physician and assistant professor in the Department of Obstetrics and Gynecology in analyzing the effects of space travel on women's health. It is a place that has captivated her imagination since she was a child growing up in Istanbul, and now is the focus of Dr. Mathyk's wide-ranging studies at the University of South Florida.

"My interest is space biology and doing my best to advocate for [women's health](#) on Earth and beyond," she said.

Dr. Mathyk is an active member of NASA's GeneLab group, consisting of researchers in the field of space biology. They have published a space biology research package using data gathered from Inspiration 4, the world's first all-civilian, four-person mission to orbit—including two men and two women.

Dr. Mathyk served as first author on two papers published June 11 as part of a special [Nature Portfolio](#) package. The first is in *Communications Biology* journal titled, "[Spaceflight induces changes in gene expression profiles linked to insulin and estrogen.](#)" The second, in *npj Women's Health*, is titled "[Understanding how space travel affects the female reproductive system.](#)"

She is also a member of the NASA STAR course fellow program, receiving biosciences training, and in 2023 presented at the annual international space research conference held by the American Society for Gravitational and Space Research. As part of that, an illustration Dr. Mathyk conceived of and commissioned—depicting a female astronaut and an impressionistic uterus—won first prize in the conference's art competition.

Also this year, she presented on female reproductive health in space at NASA's annual GeneLab symposium.

"I feel like sometimes people are embarrassed to talk about women's health and certain things, but it's our nature, and it's been with us since the caveman days," she said.

Dr. Mathyk is among the very few physicians addressing the topic in an intensive way.

"I just say that this is my job on Earth and I'm not going to change that," she said. "There are space biology Ph.D. researchers working in this field, but I am the only female OB-GYN in the United States actively doing space research."

There are certain specific areas Dr. Mathyk has targeted to gain a greater understanding of [space travel](#) on women, such as menopause, menstrual irregularities, and the possible effects on fertility or infertility, as well as gynecological surgery and imaging.

"I don't want to focus on just one thing—when you say women's health, it's very broad," she explained. "I'm looking at whether women may have an increased risk for cancer, if they are they going to have irregular bleeding or could experience fertility problems. People also talk about pregnancy in space, but before that, we need to understand how we're going to maintain our health in a non-pregnant state. These are the areas I'm exploring."

While Dr. Mathyk's chief concern is ensuring the health of women space travelers, she also is motivated by a desire to keep future female crew members healthy and functioning effectively on a given mission.

"You want your team member when in an extreme, remote setting to be feeling good and working together with the team," she said. "It's all about health of the individual and health of the team."

She also feels a pressing need to learn more due to the increase in space travel, not just NASA-funded flights but private enterprise, and the likelihood that more everyday citizens will be paying their way into space in the coming years.

"What if I have a patient 10 years from now, and they ask me, 'Is it safe to fly into space?'" she said. "So from a physician's perspective, I started

looking at what I should know and how I am going to counsel those women. That was really how my interest in this developed."

It also has roots in Dr. Mathyk's days as a little girl in Turkey, where her mother worked as an anesthesiologist and father served in the military. She grew up with her mom, learning how she had finished first in her class in college and watching her work extremely hard at her job.

"I was always interested in space and always a curious kid, up to the point of getting myself in trouble," she recalled. "I was always wondering, 'Why does something happen?' and I'd do little experiments at home that didn't always work out. I always liked science—my husband says I have a brain wired for imagination and science. And I think I developed that out-of-the-box thinking as a kid."

In middle and high school, she developed another interest—swimming. Dr. Mathyk eventually became good enough to make Turkey's national team in the 200 fly, competing in the European Championships and winning her share of medals along the way. She also matched her mother's academic heights, eventually finishing as class valedictorian at Yeditepe University School of Medicine in Istanbul.

She could easily have had a successful OB-GYN career in Turkey after graduating in 2007. But her curious and adventurous spirit instilled a desire to expand her horizons. Her husband, Scott, then an English-language elementary school teacher from Canada, urged her to take the step.

"He said, 'You have great potential and you may one day benefit humankind, so I will support you,'" she said.

So off Mathyk boldly went: first to Boston for a post-doctoral fellowship at Harvard-MIT Health Sciences and Technologies; next as a visiting

scholar in reproductive endocrinology and infertility at the University of North Carolina—Chapel Hill; then back to Boston for her OB-GYN residency at Tufts University. Later, she completed an Aerospace Medicine Clerkship at NASA's Johnson Space Center in Houston.

Three years ago, Dr. Mathyk landed a position at HCA Florida Brandon Hospital. But last year, she heard USF Health's OB-GYN department was looking to hire new faculty members. Her husband had already found work at Moffitt Cancer Center, and the couple wanted to remain in the area, so she applied and was thrilled to be hired. She was excited to make a presentation to Charles J. Lockwood, MD, MHCM, executive vice president of USF Health and dean of the Morsani College of Medicine, about her space research.

Now, she is excited to begin a new chapter in her life with the [reproductive endocrinology](#) and infertility fellowship at USF, while continuing her work into women's health in space research.

**More information:** Mathyk, B.A., et al, Spaceflight induces changes in gene expression profiles linked to insulin and estrogen.

*Communications Biology* (2024). [doi.org/10.1038/s42003-023-05213-2](https://doi.org/10.1038/s42003-023-05213-2)

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[10.1038/s44294-024-00009-z](https://doi.org/10.1038/s44294-024-00009-z)

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