Speaker 1 ([00:03](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=3.1)):

The Missouri state journal, a weekly program, keeping you in touch with Missouri State University.

Nicki Donnelson ([00:08](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=8.25)):

As environmentally conscious as we are now, it still happens that as new technology and other products are developed, they may negatively impact the earth or human health long term. That's why scientists are constantly putting these items to the test and asking questions for the greater good.

New Speaker ([00:27](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=27.77)):

I'm Nicki Donnelson. Today on the Missouri State Journal, I have Dr. Paul Durham and Sarah Woodman as my guests. They're here to talk about a gas sensor project they're participating in at the center for biomedical and life sciences at the Jordan valley innovation center.

New Speaker ([00:43](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=43.05)):

When you have an accumulation of metals, Durham explains that acid rain can cause the metals to leach into the soil, then the seeps into the groundwater. Is it safe? Durham explains the study.

Dr. Paul Durham ([00:56](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=56.64)):

And so what we're doing is we're doing some in vitro studies, which means that we're growing cells and CA cultures, and then testing what heavy metals do, or if they cause toxicity, I should say. And then we're also have done something where we've actually put it into the drinking water of the animals to see what is the outcome, uh, or the impact on the offspring. Um, which is very novel.

New Speaker ([01:17](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=77.35)):

We, I mean, most times when people are studying environmental toxins, they're doing it more from the stand point of like adults. And a lot of times they're in actually injecting it, which is, you know, and they're using like really large amounts and stuff. So we decided to go the route of doing something that was more environmentally likely.

New Speaker ([01:33](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=93.82)):

So with all the different change in our climate and stuff and all the acid rain, it's crazy. The acid rain can actually cause leaching out of those heavy metals that are in all those electronic devices and those other appliances and things like that. And then that can get into the groundwater. And of course then animals, including ourselves, can actually be exposed to that. And so we're just asking the basic question: if the mother and the father are exposed to that, does that cause changes in the offspring?

Nicki Donnelson ([02:01](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=121.22)):

This study is in collaboration with the center for applied science and engineering or case in the Jordan valley innovation center, Woodman who is collecting tissue samples and is working on data analysis expands on some of the preliminary questions and early findings.

Sarah Woodman ([02:17](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=137.73)):

What results are we really seeing? Are we seeing impacts on various different organs? Are we seeing on the kidney, are we seeing impacts in the gut? Are we seeing impacts in the lungs and various other body systems? So at this point we're still somewhat early in the pro in the process of doing our analysis, but we are seeing some trends that we may see some effects as specifically in the gut, which is as we would expect. So if you're having ingestion of some of these metals, you would expect the gut would be one of the first places that you would see. And so in the future, it would be really cool to investigate if we give some other therapeutic types of substances, if we could reduce that stress to the gut. And if we could sort of fix that, um, balance and restore it, we're not seeing very much, very many effects in really any of the other body tissues, which make sense since we are giving this at moderate doses as compared to a lot of other studies where they're doing massive doses of some of these compounds and some of these metals, and then seeing of course effects because they're basically dumping in a ton of these metals and then it's causing, um, an effect, but it's higher than would be expected to be exposed to.

Nicki Donnelson ([03:36](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=216.5)):

Many of Durham's research interests, focus on pay pain pathologies. And he's also very interested in the gut brain access. He explains how this gas sensor project intersects with those research areas and what implications their findings might have on human health.

Dr. Paul Durham ([03:54](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=234.12)):

It looks like there's increased inflammation within the, uh, colon and within the last part of the digestive track. And then, but we're also seeing a huge change in the gut microbiome, which are the bacteria that actually reside in there. And there's been this whole push on the gut brain axis. So if you want to have a healthy brain, you have to have a healthy gut. So this has implications maybe that, you know, that could impact like cognitive function down the road. It basically could be to like IAL bowel disease and something like that, which is actually, you know, would be really bad later on in life. So those are gonna things that we're gonna kind of follow up on is whether or not this has long term implications being exposed at, you know, the beginning of life, so to speak.

Nicki Donnelson ([04:35](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=275.27)):

That was Dr. Paul Durham and Sarah Woodman from the Jordan valley innovation center. I'm Nicki Donnelson for the Missouri State Journal

Speaker 1 ([04:44](https://www.temi.com/editor/t/4moV6jQ85gqNbhJCV5gm4WftIsBBZ8prz8dDBVRtYSNCVZZGRu45PAtbAcg5v3At_oylLchxs5HZueaUM_j1dQzcI9g?loadFrom=DocumentDeeplink&ts=284.21)):

For more information contact the office of strategic communication at 4 1 7 8 3 6 6 3 9 7. The Missouri state journal is available online@ksmu.org.