# 'Undead' genes come alive days after death

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Credit: AI-generated image (disclaimer)

Researchers from the University of Washington, Seattle, have discovered that genes in animals remain 'turned on' days after death, possibly opening the door to new and better ways for preserving donated organs for transplantation and more accurate methods of determining when murder victims were killed.

Led by microbiologist Peter Noble, the research team wanted to test a

new method they had developed for calibrating gene activity measurements. Following research they had undertaken 2 years ago on the abundance of microbes in different human organs after death, they decided to apply their method to post-mortem samples. "It's an experiment of curiosity to see what happens when you die," Noble commented. The paper based on the outcomes of this research is currently being peer-reviewed for publication.

Noble and his colleagues extracted and measured messenger RNA (mRNA) levels in the tissue of recently deceased mice and zebrafish. As mRNA plays an important role in gene expression, higher levels of this molecule should indicate more genetic activity. The research team were able to describe over 1 000 genes that 'stayed alive' post-mortem. A total of 515 mice genes continued to operate for up to two days, whilst 548 zebrafish genes remained functional for an entire four days after death.

One of the most surprising findings was that hundreds of genes actually fired up - boosting their activity - within the first 24 hours after death. Noble suspects that many of them might have been suppressed or shut off by a network of other genes when their host was alive, and only after death were they free to 'reawaken".

The team also found that many of the genes that persisted post-mortem are typically active during embryonic development, which led them to theorise that, on a cellular level, newly developing lifeforms might share a lot in common with degenerating corpses. They also found that several genes that promote cancer became more active following death. This could explain why people who receive organ transplants from the recently deceased have a higher risk of cancer, although this has long been attributed to the immunosuppressive drugs transplant patients are typically prescribed.

In an accompanying paper, Noble and two of his colleagues

demonstrated another possible use for gene activity measurements, showing that they can provide accurate estimates on the actual time of death. Estimating the time of death is crucial for criminal investigations but this process is mostly done using non-biological factors (for example, the last SMS sent or call made on the victim's mobile phone). Following Noble and his colleagues' discoveries on gene activation after death, there is now the real possibility of being able to biologically affirm the actual time of death, which will greatly benefit forensic and criminal investigations.

"The headline of this study is that we can probably get a lot of information about life by studying death," Noble concluded.

It's no secret that feeling positive vibes from people you work with makes the job more enjoyable.

But a new University of Michigan study shows a leader's positive energy has a direct impact on productivity, absenteeism and commitment. People who work with positive energy leaders also do more work outside their official roles, and have more satisfying family lives.

Kim Cameron and Wayne Baker of U-M's Ross School of Business and colleagues Brad Owens of Brigham Young University and Dana Sumpter of California State University-Long Beach measured relational energy—the energy you get when you interact with people who make you feel good when you spend time with them. Through surveys and field studies they documented how this energy works and the effect it has on organizations.

They found that the more relational energy a leader exudes, the better employees on that team perform in terms of productivity, absenteeism, engagement and job retention.

Employees also are more likely to help each other and volunteer for tasks outside their job description.

"Managers spend so much time managing information and influence," said Cameron, the William Russell Kelly Professor of Management and Organizations. "But relational energy trumps both of those by a factor of four as an outcome determiner."

A related study by Cameron, Baker and their co-authors found that people who experience relational energy at work have better home lives as well.

"There's a spillover from relational energy at work to the home, said Baker, the Robert P. Thome Professor of Management and Organizations and professor of sociology. "When we interact with people, some buoy us up and others bring us down. When you're buoyed up you tend to bring that home."

Relational energy isn't to be confused with charisma or personality, say Cameron and Baker, who are both core faculty members for the Center for Positive Organizations at the Ross School. Being an extrovert isn't necessary. It's simply the way people feel after you interact with them.

The research uncovers a cost-free way leaders can improve results and loyalty, and create a positive work environment. The key is finding the centers of energy in the company.

"Early in our research, we'd meet leaders who knew something was wrong, but they couldn't put their finger on it," Baker said. "Now they can do a relational energy survey, draw an energy map and show the bright parts of their organization and the black holes. It's hard to figure out what's going on until they see a map. It's like seeing an X-ray."

Cameron says there's a need for companies to recognize relational energy and find ways to make it work for them.

"Do people get promoted or hired because they're a positive energizer? No, it's not even on the agenda," Cameron said. "So here's a resource that's been ignored but is a major predictor of performance."

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