



Western
Research

Established in 1878, Western University has a long history of leadership in research that produces tangible, global impact on health, culture, environment and economies.

Located in London, Ontario, Canada, Western roots itself in a history of excellence, but continues to eye next-generation discoveries across disciplines that will forever change the landscape of our planet.

Success, however, is rarely achieved in isolation – instead, it results from local, national and global partnerships. Many of Western's successes, for example, have been made possible only through close collaboration with, and leadership by, partners at Robarts Research Institute and the affiliated Lawson Health Research Institute, including its teaching hospitals.

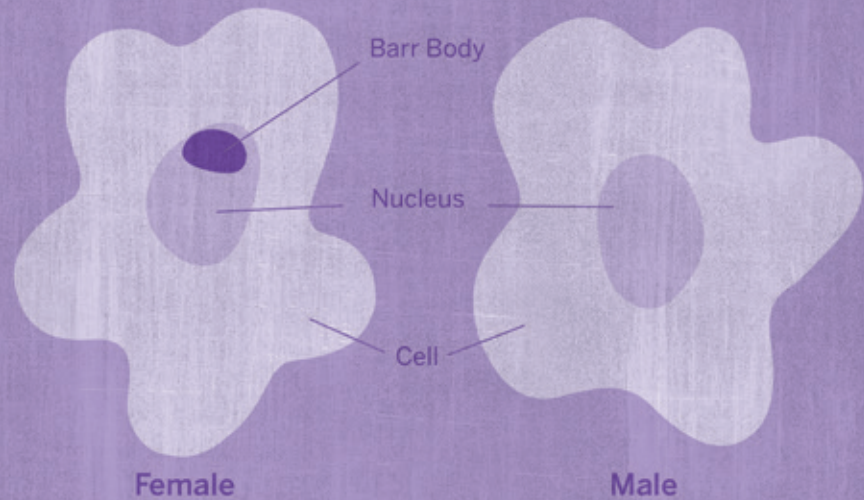
From the concept of insulin in 1920 to ongoing progress in human clinical trials of an HIV vaccine, Western continues to lead efforts to address the world's largest problems.

This is a sample of just 51 discoveries by researchers and teams we are proud called – and continue to call – Western home.

1. As a part-time faculty member, Sir Frederick Banting rose from his sleep in 1920 and wrote down the 25 words that would lead to his discovery of insulin.



2. Dr. Murray Barr discovered the sex chromatin – now known as the *Barr body* – in 1948, ushering in a new era in research and diagnosis of genetic disorders.



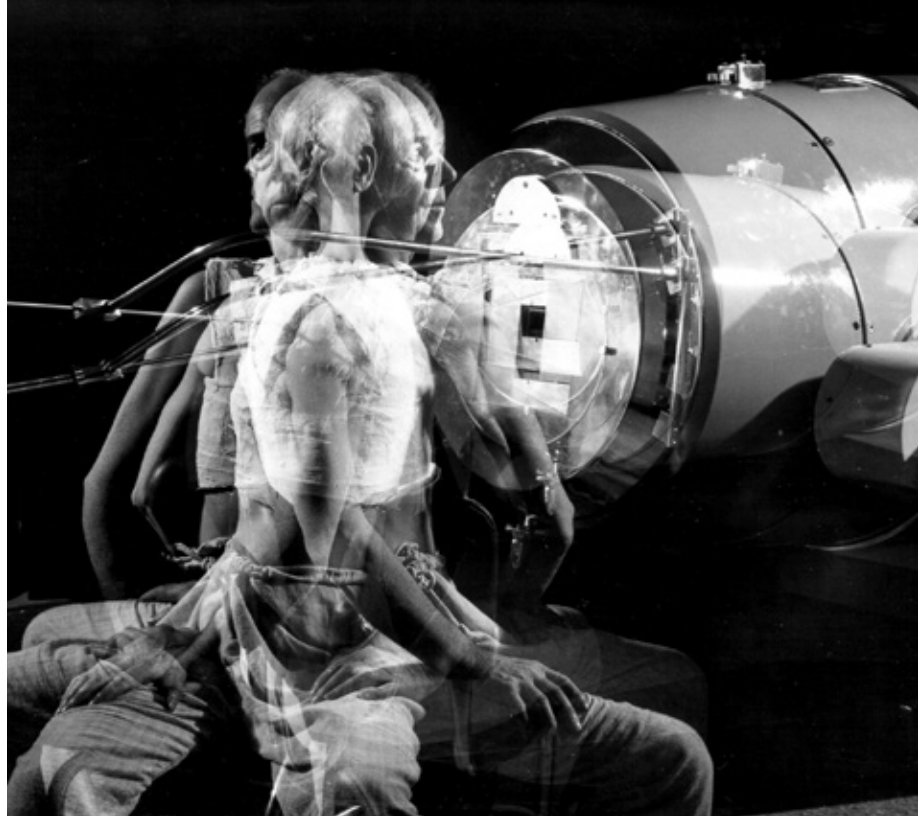
3. Western established the first Master's of Business Administration program outside the United States in 1948.



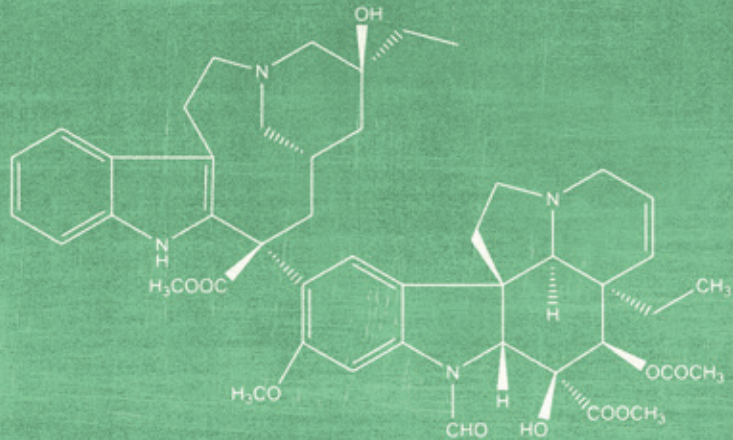
4. During the 1950s, Tony Brown provided the genetic basis of insect resistance to insecticides, and was the first to identify the chromosomal loci responsible for DDT resistance.



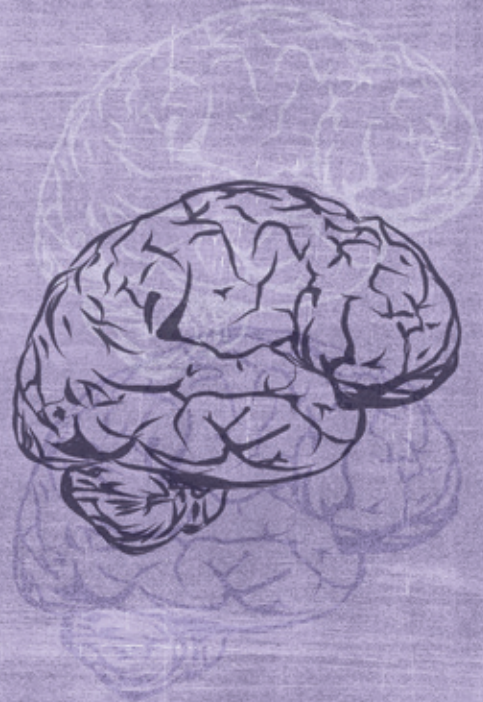
5. Researchers led by Dr. Ivan Smith developed the world's first 'cobalt bomb' to treat cancer in 1951, doubling the survival rate for early-stage cervix cancers from 30% to 60%, and benefiting an estimated 35 million cancer patients.



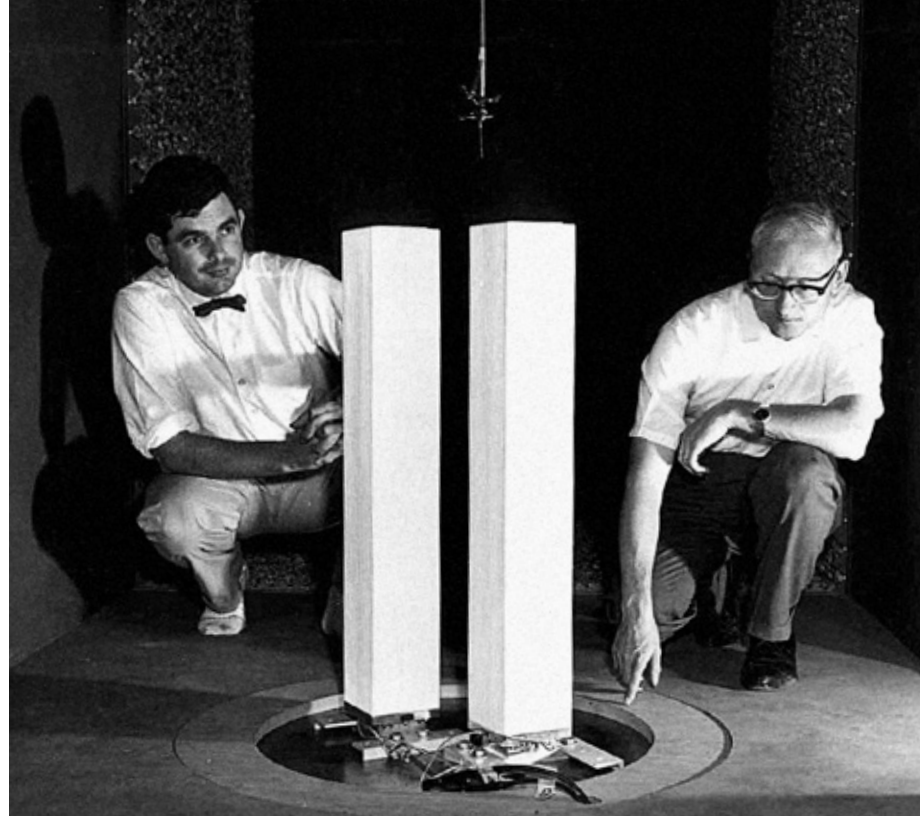
6. In 1958, Drs. Robert Noble and Charles Beer isolated the anti-cancer drug 'vinblastine' – the first of a series of chemotherapy drugs for cancer care – which is still used today.



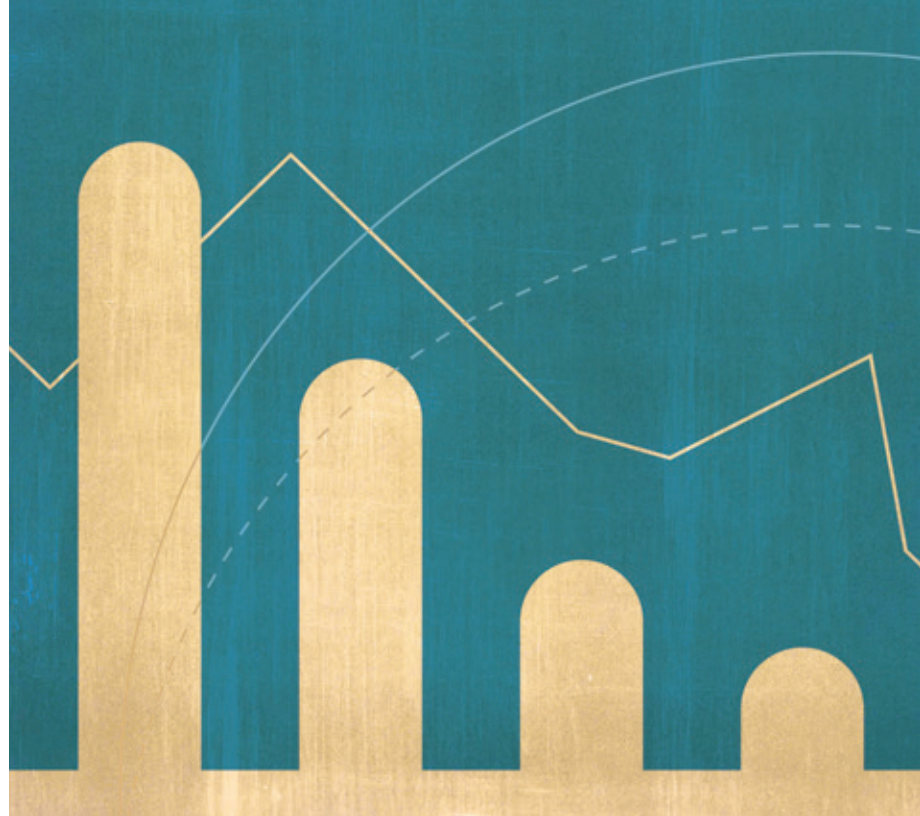
7. In 1958, Dr. Charles Drake pioneered the world's first surgical treatment for cerebral aneurysms at the base of the brain.



8. Alan Davenport's discovery that wind tunnels could be used to develop wind loads to make structures safer and more economical led to recognition of the *Alan Davenport Wind Loading Chain* as the basis for the modern practice of wind engineering around the world.



9. Economist John Whalley has revolutionized policy analysis in areas that include trade and taxation, and pioneered the use of Computational General Equilibrium (CGE) models to analyze expected and unexpected effects of public policy change.



10. Paul de Mayo's extensive contributions to photochemistry during the 1960s resulted in the *de Mayo Reaction* – a form of photochemical enone cycloaddition – being named in his honour.



11. During her long career at Western, zoologist Helen Battle pioneered the use of fertilized fish eggs to study the effects of pollutants on aquatic life and drinking water, and of carcinogenic substances on cell growth.



12. Grant Reuber was the first economist to explicitly use the inverse relationship between unemployment and inflation as a policy constraint, meaning policy-makers could no longer institute policies that lowered inflation without worrying about raising unemployment, and vice versa.



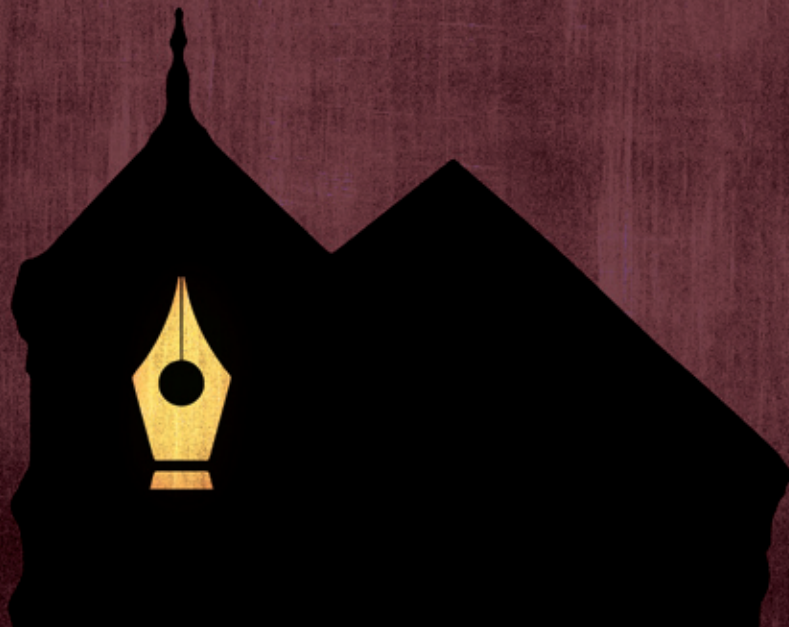
13. Western opened the first-of-its-kind *Boundary Layer Wind Tunnel Laboratory* in 1965, defining the field of wind engineering and testing such structures as the World Trade Center, CN Tower and Confederation Bridge.



14. By developing the process of ultrapyrolysis and using a variety of natural biomass products during the 1970s and 1980s, Maurice Bergougnou discovered 'green oil,' which is biodegradable and toxicologically safe.



15. The English Department houses Canada's longest-running Writer-in-Residence program, having hosted writers who include Joan Barfoot, Alice Munro, Penn Kemp and Margaret Laurence, since 1972.



16. In 1978, Dr. Henry Barnett led the Canadian study demonstrating Aspirin can prevent strokes, opening the door for the use of Aspirin to prevent heart disease.



17. During the 1980s, a team led by Khadry Galil promoted, advanced and expanded a surgical glue from a liquid derivative of cyanoacrylate now used worldwide for everything from emergency medicine and blocking aneurysms, to clamping large blood vessels and periodontology.



18. In 1981, Dr. Fred Possmayer discovered a method of extracting and purifying natural surfactant from a cow's lung to help premature infants breathe, saving millions of lives worldwide.



19. A team at University Hospital, led by Dr. Calvin Stiller, announced success in a trial using cyclosporine to stop the progress of Type 1 diabetes in 1982.



20. Canada's first human brain MRI was conducted in London in 1982, leading to pioneering advances in cardiovascular, orthopaedic and neonatal MRI.



21. Throughout the 1980s and 1990s, Richard Seewald and Susan Scollie led teams that developed the *Desired Sensation Level* (DSL) method for pediatric hearing instrument fitting – technology now used worldwide.



22. Researchers with the *Multi-Organ Transplant Program* at University Hospital performed the world's first successful combined liver and bowel transplant in 1988.



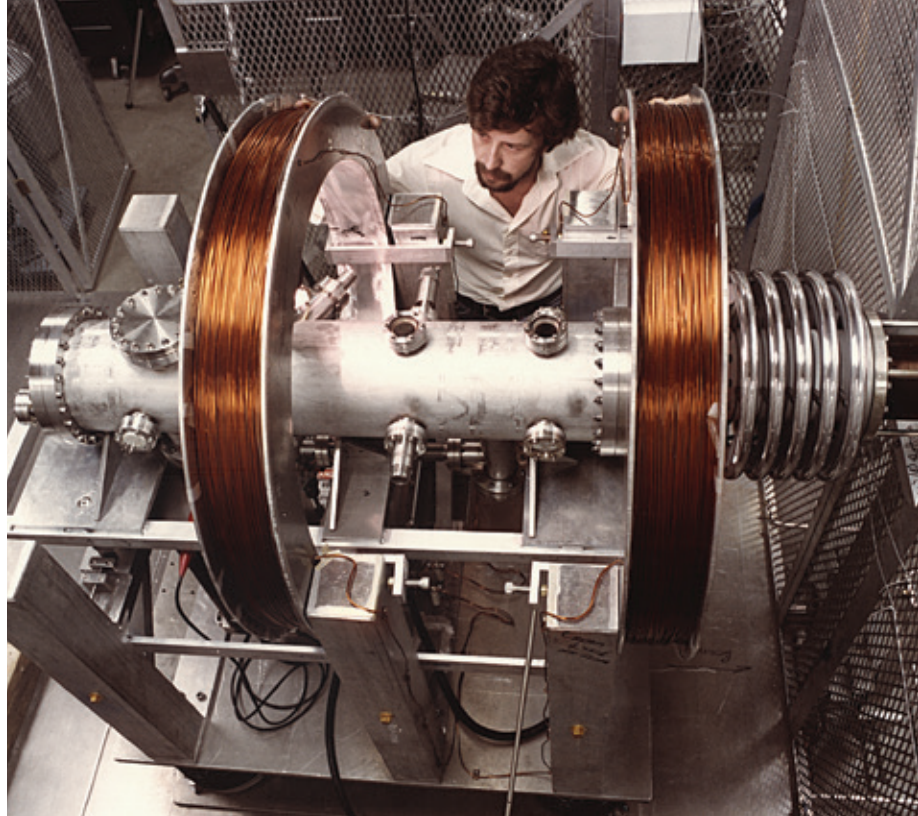
23. Specializing in industrial and organizational psychology, John Meyer and Natalie Allen developed the *Commitment Scales* to categorize ways in which employees are attached to their organizations.



EMPLOYEE COMMITMENT SCALE



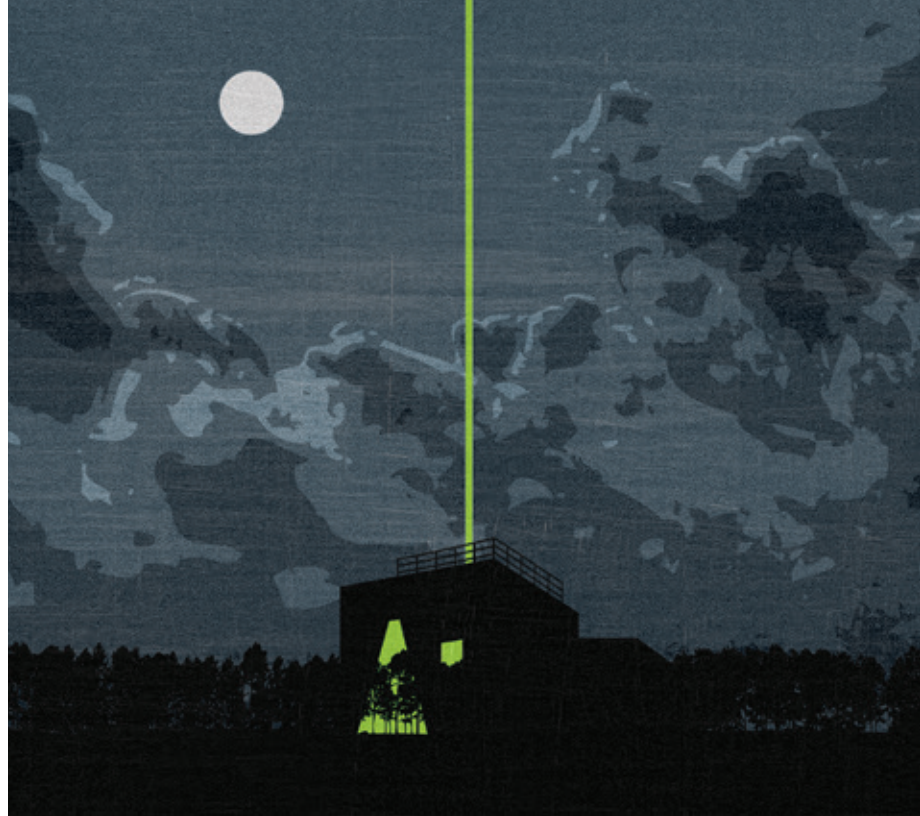
24. Peter J. Schultz built the first positronic beam device in Canada and used it to advance the study of solid surfaces and thin films in the 1980s and 1990s.



25. Dr. David Bailey discovered in 1991 that taking grapefruit juice with medication can inhibit drug metabolism in humans – the first discovery of a food producing this effect.



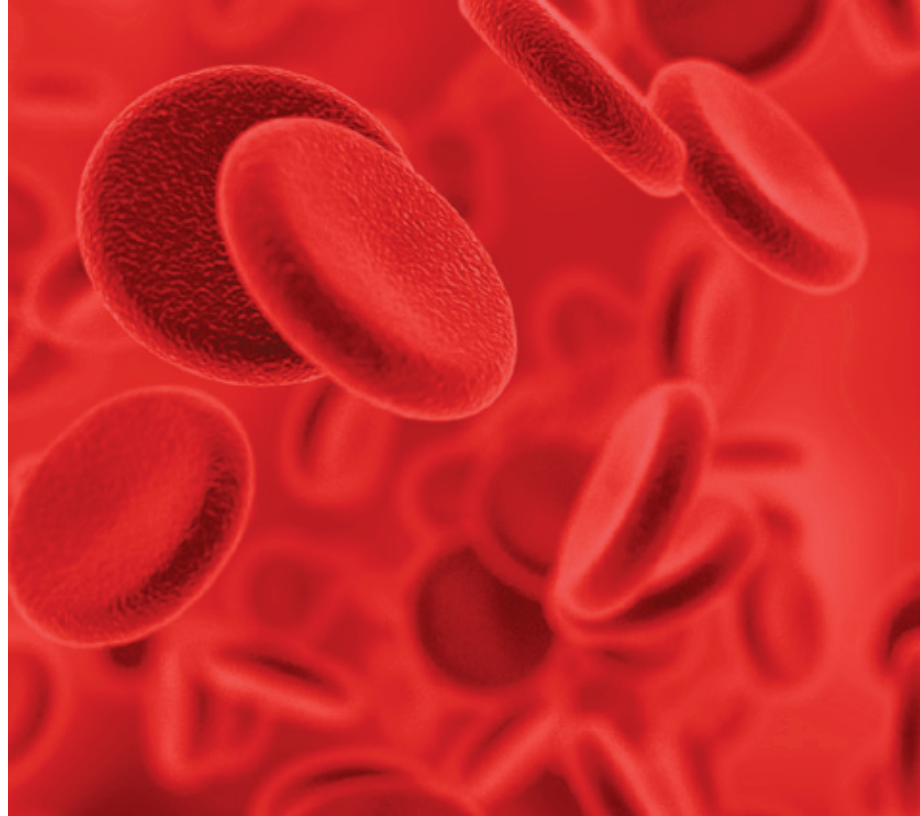
26. In 1993, a team led by Robert Sica built and demonstrated the first practical applications of large liquid metal mirrors by integrating one into *Western's Purple Crow Lidar*, which allows some of the highest time and space measurements of atmospheric temperature and composition in the upper atmosphere and improves knowledge of weather and climate phenomena.



27. In 1997, Paul Weigert discovered that near-Earth asteroid 3753 Cruithne is the planet's first companion asteroid – also referred to as 'Earth's second moon.'



28. Perfusion CT technology developed by Ting-Yim Lee in 1999 has been licensed worldwide to GE Healthcare, helping doctors immediately track blood flow to the brain after stroke – saving time and lives.



29. During the 2000s, Murray Huff demonstrated that a flavonoid derived from citrus fruit can help prevent weight gain and other signs of metabolic syndrome, which may lead to Type 2 Diabetes and increased risk of cardiovascular disease.



30. A wastewater treatment technology developed by George Nakhla and Jesse Zhu at the *Particle Technology Research Centre* in the 2000s is 10 times more efficient than conventional wastewater treatment methods.



31. During the 2000s, Miodrag Grbić led an international consortium that sequenced the genome of the spider mite, one of the world's most destructive agricultural pests, causing more than \$1 billion in damage annually.

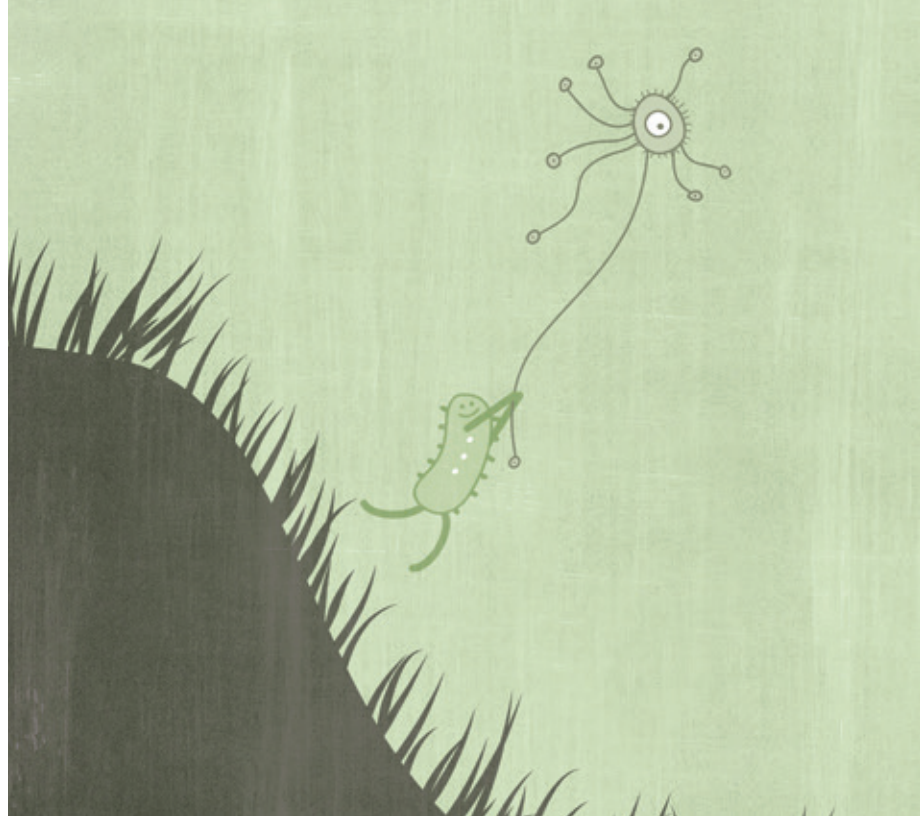


Photo by Thomas Van Leeuwen
and Wim Grunewald

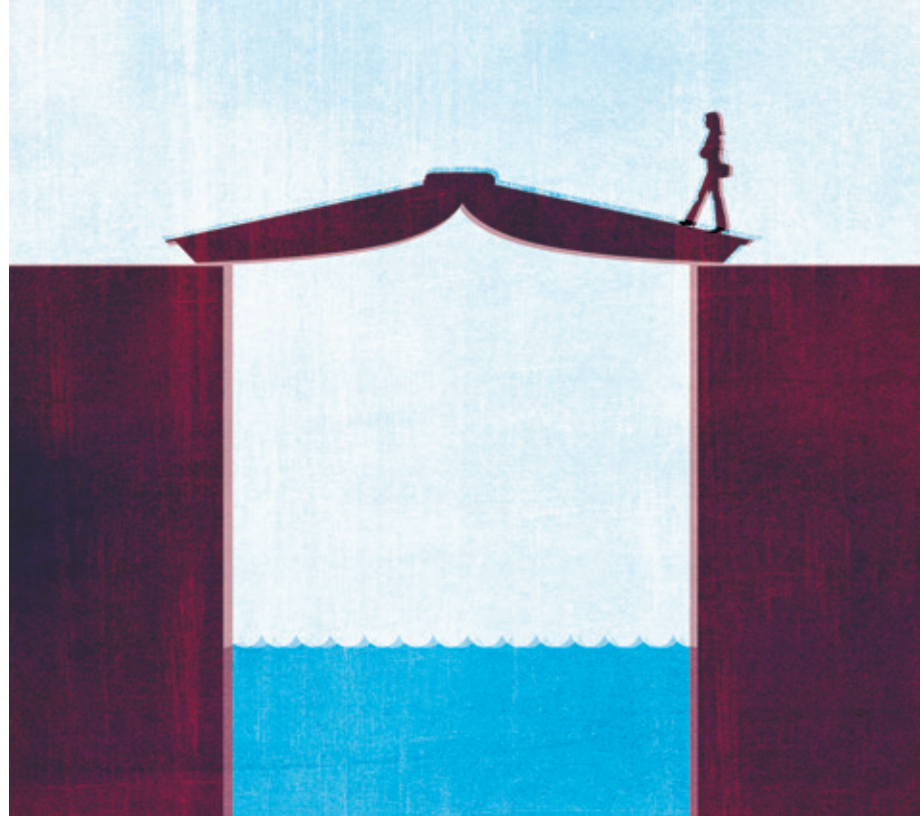
32. Western hosted the world's first Aboriginal Policy Research conference in 2002 to promote evidence-based research related to indigenous affairs and issues worldwide.



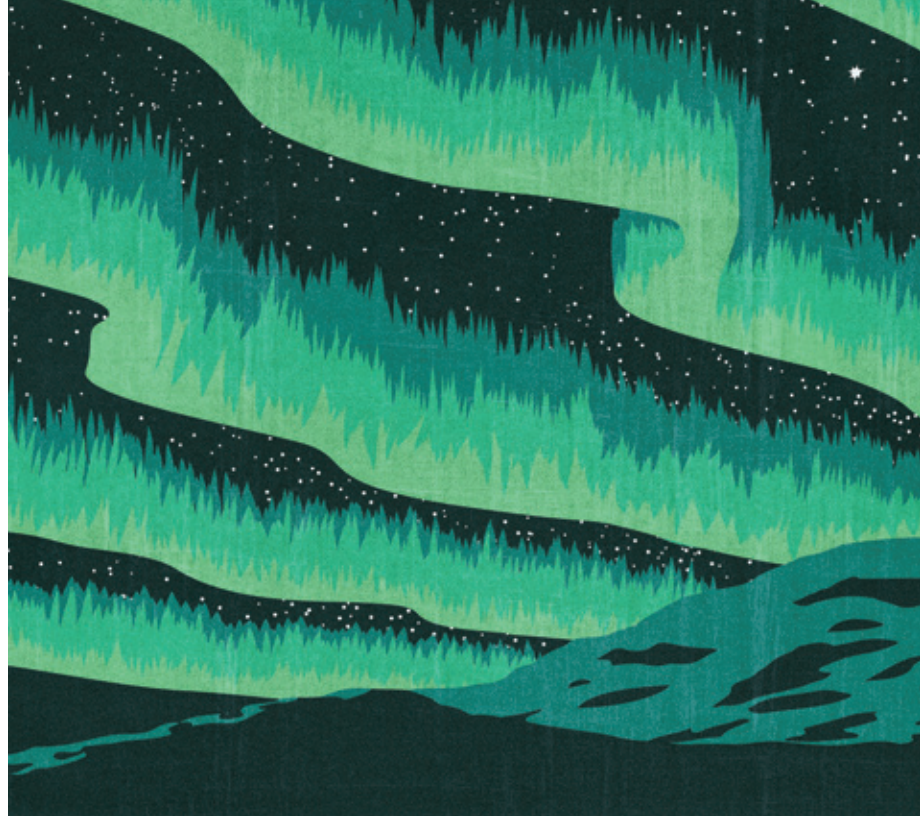
33. A team led by Paula Foster demonstrated for the first time in 2006 that MRI can be used to detect a single cell in a living animal, allowing scientists to track cellular movement and disease.



34. Established in 2006, the Bridges Project was the first-of-its-kind in Canada to provide an innovative adult education centre specifically for women living in abusive or violent situations.



35. Julia O'Sullivan authored the first education report focusing solely on the children of Canada's North in 2007.



36. In 2007, Neil Banerjee led a team of Canadian scientists announcing discovery of the oldest evidence of life on Earth – the fossilized trackways of slithering microbes in a 3.35-billion-year-old Australian rock.

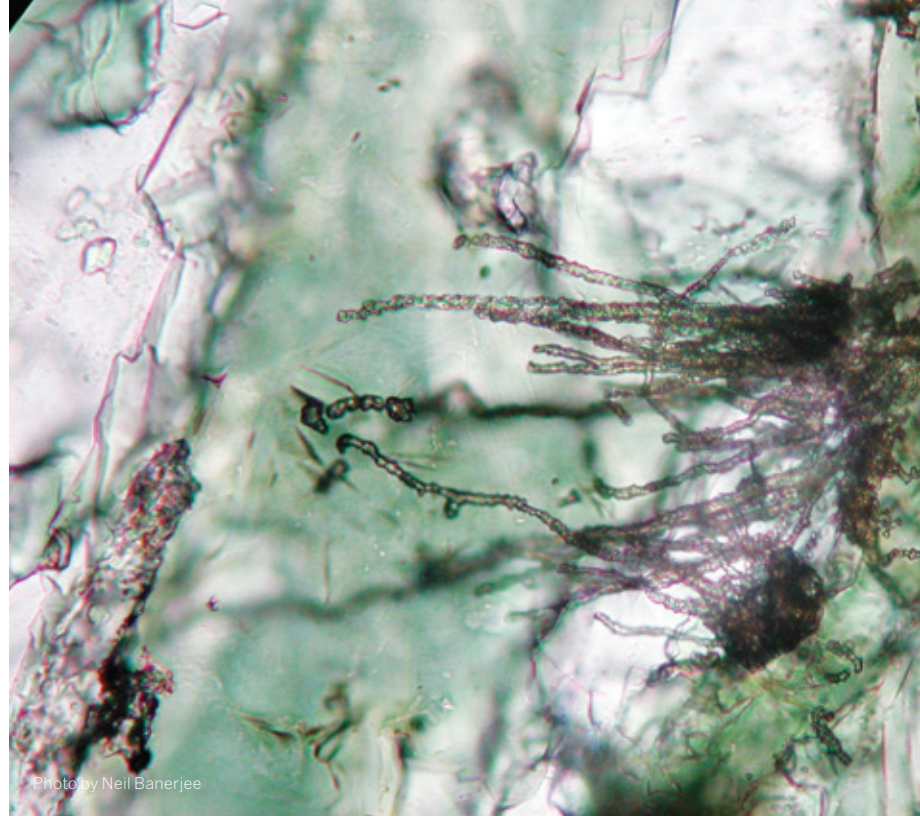
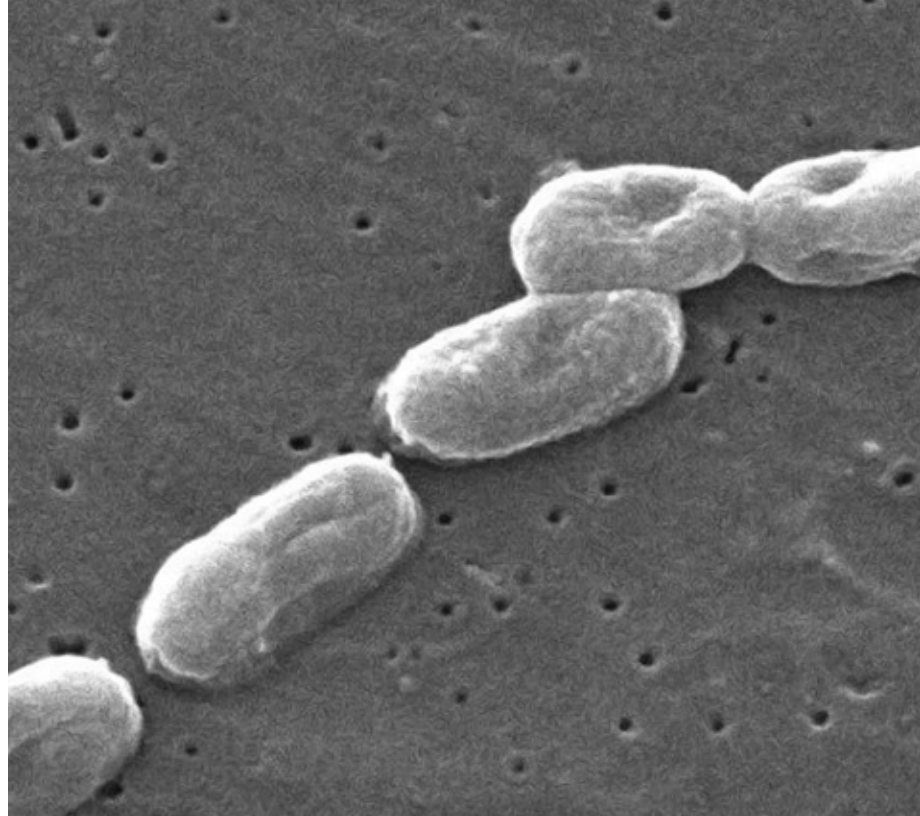
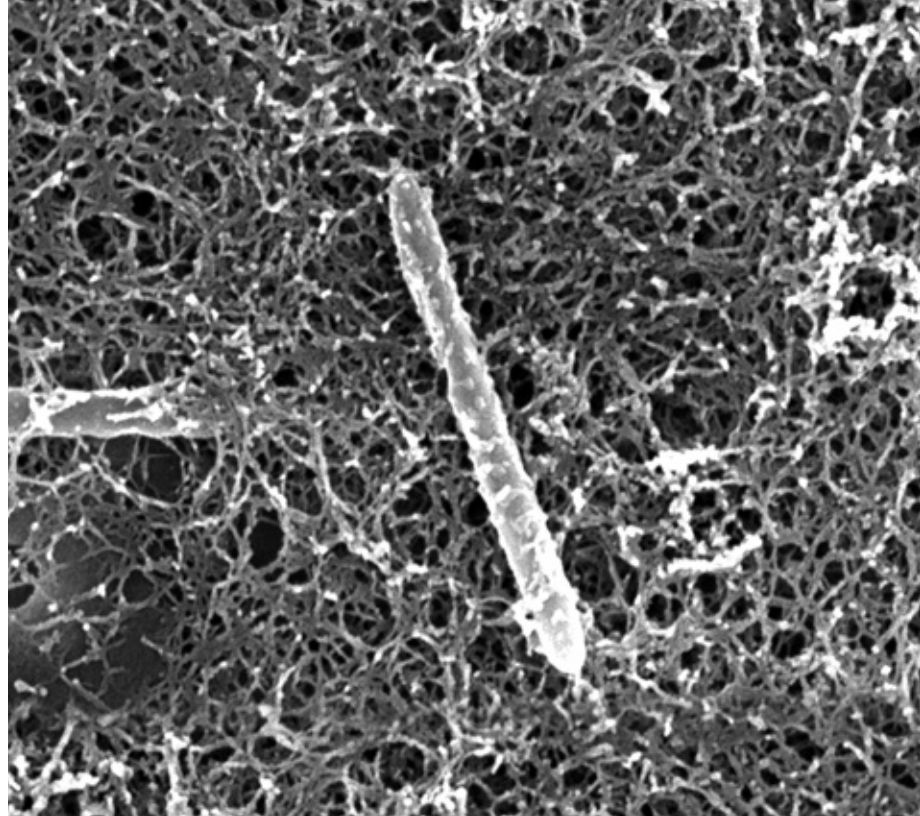


Photo by Neil Banerjee

37. In 2007, an international team of researchers led by Miguel Valvano discovered a method for compromising the drug-resistant qualities of *B. cenocepacia*, a bacteria that can lead to fatal lung infections in people with cystic fibrosis.



38. In 2008, Gordon Southam's team identified the first ecosystem ever found to have only a single biological species – more than 1.5 miles beneath the surface of the Earth, in South Africa.



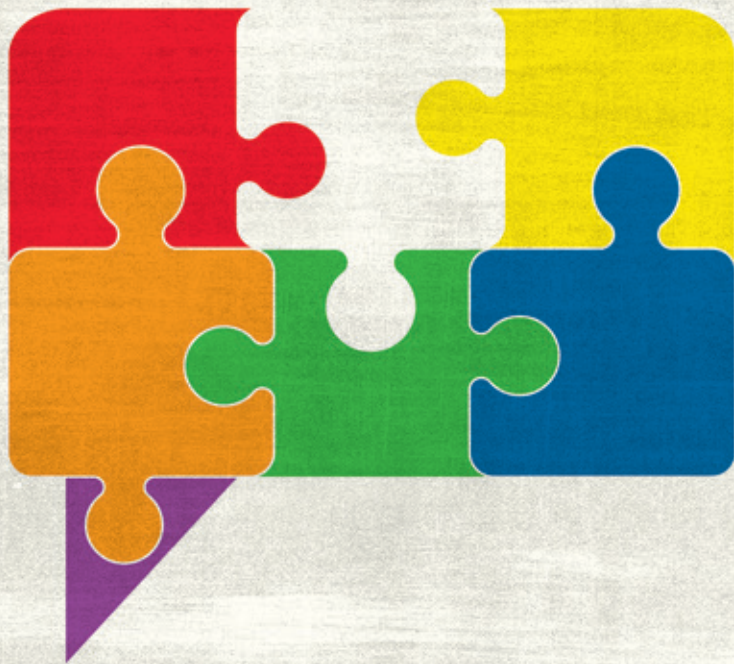
39. In 2008, a team of chemists developed pancake-shaped nanoparticle pairs that show a large shift in their absorption spectra, allowing them to be used as biosensors.



40. In 2008, Graham Thompson helped isolate a region on the honeybee genome that controls when workers help or cheat on their queen. It was the first time genes for selfish cheating behaviour had been isolated from any social animal, providing a strong validation of sociobiological theory.



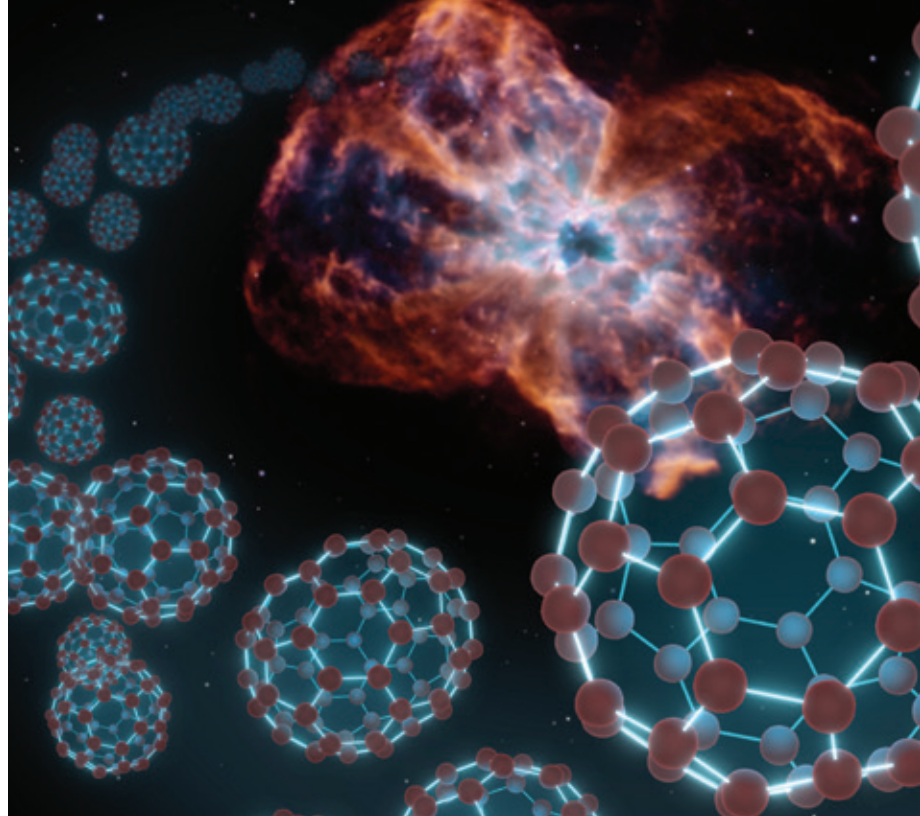
41. Although long part of the very diagnostic criteria that individuals with Autism Spectrum Disorder (ASD) have global difficulty with 'linguistic pragmatics' – i.e., making appropriate use of context or knowledge of what is reasonable to say – Robert Stainton helped discover a rich array of pragmatic abilities in people with ASD.



42. A landmark 2008 study by researchers at Western and Lawson found common arthroscopic surgery of the knee to be ineffective at reducing joint pain or improving joint function among sufferers of osteoarthritis.



43. Using NASA's *Spitzer Space Telescope*, Jan Cami and colleagues discovered carbon molecules known as 'buckyballs' in space for the first time in 2010, thereby confirming the existence of the largest molecules known to exist in space.



44. Researchers at *The Insurance Research Lab for Better Homes* applied the first realistic hurricane wind load simulation to a full-scale house in 2008, providing valuable information for how to make structures safer.



45. Studying the genetic basis of schizophrenia, Shiva Singh and Dr. Richard O'Reilly demonstrated in 2011 that identical twins do not necessarily share identical DNA, which may provide new opportunities to treat the illness.



46. In 2011, Pauline Barmby discovered some standard stars used to measure distances can change their masses, which improved understandings of the size of the universe and galaxies within it.



47. In 2012, a team led by Charles Weijer established the world's first ethical guidelines for cluster randomized trials.



48. Based on long-term research about German-Jewish composer Hans Gal, Annette Barbara Vogel has produced a series of world-premiere recordings.



49. In 2013, Lorina Naci led a study, which, for the first time, used a simple test of attention and neuroimaging to read human thought via brain activity when conveying specific “yes” or “no” answers.



50. A team led by Adrian Owen continues its groundbreaking work related to minimally conscious patients, using EEG to show some patients are able to reliably follow commands, and using fMRI to demonstrate they can experience emotion.



51. Chil-Yong Kang has developed the first and only preventative HIV vaccine based on a genetically modified killed whole virus, which is currently in Phase II Human Clinical Trials.



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MEMORANDUM FOR THE RECORD

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