

KISR Innovation Brief
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Creating a sustainable city: Time, common sense and persistence

[According to the researchers](#), transformative action needs to navigate political, social and legal feasibility. Urban planners constantly face these dilemmas, and academics may easily overlook them. But plans can run into problems, derailing promising opportunities for sustainability.

Study provides first genome-wide evidence for functional importance of unusual DNA structures

[Some regions of the human genome](#) where the DNA can fold into unusual three-dimensional structures called G-quadruplexes (G4s) show signs that they are preserved by natural selection. When G4s are located in the regulatory sequences that control how genes are expressed, or in other functional but non-protein coding regions of the genome, they are maintained by selection, are more common, and their unusual structures are more stable, according to a new study.

Faster, greener technique to improve recycling process for electric vehicle batteries

[Researchers working on the Faraday Institution](#) project on the recycling of lithium-ion batteries (ReLiB) at the Universities of Leicester and Birmingham have solved a critical challenge in the recovery of materials used in electric vehicle batteries at the end of their life, enabling their re-use in the manufacture of new batteries. The new method, which uses ultrasonic waves to separate out valuable material from the electrodes, is 100 times quicker, greener and leads to a higher purity of recovered materials relative to current separation methods.

Hot nights confuse circadian clocks in rice, hurting crop yields

[Rising nighttime temperatures are curbing crop yields for rice](#), and new research moves us closer to understanding why. The study found that warmer nights alter the rice plant's biological schedule, with hundreds of genes being expressed earlier than usual, while hundreds of other genes are being expressed later than usual.

Speedy nanorobots could someday clean up soil and water, deliver drugs

[University of Colorado Boulder researchers have discovered](#) that minuscule, self-propelled particles called "nanoswimmers" can escape from mazes as much as 20 times faster than other passive particles, paving the way for their use in everything from industrial clean-ups to medication delivery.

Scientists obtain magnetic nanopowder for 6G technology

[Material scientists have developed a fast method for producing epsilon iron](#) oxide and demonstrated its promise for next-generation communications devices. Its outstanding magnetic properties make it one of the most coveted materials, such as for the upcoming 6G generation of communication devices and for durable magnetic recording. The work was published in the Journal of Materials Chemistry C, a journal of the Royal Society of Chemistry.

Engineering seeds to resist drought

[Researchers have devised a way to protect seeds](#) from the stress of water shortage during their crucial germination phase, and even provide the plants with extra nutrition. Simple and inexpensive, the process could be deployed in arid regions to facilitate agriculture on drought-stressed land.

