From one of this year’s world-changing ideas to an entry in the Guinness World Records, scientists in Singapore did the country proud. FENG ZENGKUN highlights five of the top 10 discoveries this year. Read about the other five next week.

NEW MEKONG TREASURES

On average, one new species of plants and animals was found every two days last year in the Greater Mekong region. The 208 species discovered included a new monkey, a wolf snake and a self-cloning lizard, the World Wide For Nature said. A highly threatened biodiversity hot spot in the world, the region is home to endangered species like the tiger and Mekong dolphin.

EIGHT NEW SPECIES DISCOVERED

Five new mammal species were discovered, including a new tiger-like species “as beautiful as an heiress” — described by FENG ZENGKUN. One of them is an all-female species that reproduces via cloning — Live lizards were found on mountainous Kachin state in Myanmar, one of the regions with the largest number of new species discovered last year. The team said the lizards could be transformed into bacteria-busting products such as gels, sprays and lotions.

BACTERIAL SUICIDE BOMBERS

A TEAM from Nanyang Technological University’s School of Mechanical and Chemical Engineering and Singapore’s Agency for Science, Technology and Research was involved in the discovery. The team had already found that P. aeruginosa, a bacterium that is commonly found in the digestive system to seek out and digest food, could also sense other bacteria around them. In earlier studies, they found bacteria could sense other bacteria around them, and secrete toxins to kill them to ensure their own survival. It is hoped that the bacteria could be modified a harmless strain of E. coli to be used against drug-resistant bacteria.

WEAPONS GAINING GROUND

For their work, the team was awarded the Singapore National Science Award by the National University of Singapore and National University Hospital. The team’s research was published in August in the journal Molecular Systems Biology. They work on even drug-resistant bacteria, as bacteria compete for survival. In the laboratory, this would mean bacteria clusters would evolve and become resistant to drugs.

NEW MEKONG IN NUMBERS

1,584 new species newly identified in 2010

300 million people depend on its rivers, forests and wetlands for food and livelihood

650 fish species found in the Mekong River

4,800km long, the river runs through six countries: Cambodia, Laos, Thailand, Myanmar, Vietnam and China

NEW WOLF SNAKE

A new wolf snake discovered by the World Wide For Nature has a black and white color scheme like an Elvis-like hairstyle. Locals claim that the three monkeys that live there are connected to the ancient burmese monkey. The team is working on the next generation of diagnostic devices, the MicroKit for influenza detection.

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**The science of Christmas**

**Does the Star of Bethlehem exist? Can Santa really deliver all his presents on Christmas Eve? With today being Christmas Eve,** *The Straits Times* looks at the why's and how's of these familiar festive icons.

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**O CHRISTMAS TREE**

- The average growing time for a tree to reach 2m is seven years.
- The tree-growing companies in the United States, Germany, Denmark and Norway.

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**NO FAKE TREES**

- Real Christmas trees are sold each year in Singapore, and are kept for two years to ensure the trees are medium-sized trees suitable for indoor use. The first Christmas trees in Singapore were brought in about 1900 trees.

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**IN ORCHARD ROAD**

- Along the 2.6km-long road, 130 trees are decorated, including 600,000 lights. People work 60 hours per week to set up the lights. The trees are wrapped in ornaments, lights and others that cannot be turned on by light exposure.

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**SNOW IN SINGAPORE**

- Snow in the 313 Snow Dome is made by refrigerating water inside a dome. Snow falls on the dome until it is almost not visible. The dome is maintained at a temperature of -3°C, and the outside is kept at about 1°C. The snow on the dome is kept to a thickness of about 5mm.

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**FRANKINCENSE IN DECLINE**

- Frankincense, a fragrant resin used in perfumes, before the baby Jesus by the three kings. Frankincense will decline by 90 per cent in the next 50 years.

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**HIGH FIVE**

Last week, we featured five of this year's top 10 discoveries, from one of the world's smallest gears to one of the smartest robots — all developed in local labs. **GRACE CINDA** highlights the other five best in 2011.

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**PRESSURE SENSOR CONTACT LENSES**

- PATIENTS with the eye disorder glaucoma could see care has a high-tech monitor: a smart contact lens that measures eye pressure around the clock. A glaucoma, a death-by-eye pressure has one of several factors that can damage the optic nerves, eventually causing blindness. The condition affects about 2 per cent of the world's population, or 60 million people. Singapore is working on a device to monitor the pressure of vision over the 24-hour period.

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**ENERGY STORE MEMBRANE IMPROVED**

- A CNT has been developed, which may have the potential to store energy more efficiently than batteries. This has important uses, especially for storing the energy produced by alternative technologies like solar and wind power.

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**HOW CANICEL RADS EVOLVE**

- AFTER a pan-dominant HIV infection in Africa, the new HIV strains have been found to be more resistant to traditional drugs. This year, one of the largest ongoing sets of data, 12 months of viral load and 75 months of virology and virologic follow-up of one group-evolutionary studies of chronic venereal diseases. This study suggests that such evolutionary studies require a comprehensive geographic approach, specifically, 14 strains of HIV viruses to mix with local viruses and form new strains. This has led to an increased diversity of HIV strains and infections, and makes finding a cure for this newly mutated version more difficult.

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**SHINING IN THE DARK**

- When two celestial objects appear to pass each other in the night sky, the phenomenon is called an apogee. This happens only once every 130 years, at his peak about the December solstice.

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**ICY STARS**

- Scientists have found that the planet's core, a turbulent ocean of hot, liquid metal, spins on a 26-hour cycle. Stars with masses of 8 to 20 times the mass of the Sun can spin so fast that its outer layers start to peel away, forming a ring that can be detected by telescopes.

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**12 COSTLY DAYS OF CHRISTMAS**

- According to the annual Christmas Price Index (CPI) released by the Christmas Price Index (CPI), the cost of a Christmas in 2011 is predicted to be 12.9 per cent higher than last year. The CPI includes all the main ingredients required to prepare a Christmas meal.

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**HOLIDAY **

- TOMORROW is Christmas Day, one of the most important religious observances in the Western world. Christmas Day is celebrated by Christians around the world. The day is marked by the exchange of gifts, the singing of carols, and the attending of church services.

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**MASTERCUTING STOMACH SURGERY**

- **PATIENTS with stomach cancers may no longer need a lengthy operation, or an external cut and stitches, to remove cancerous growths.** This method is safer for patients and may be performed on up to 90 per cent of patients who are suitable for the procedure, and from last year.

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**MASTERFUL STOMACH SURGERY**

- **MASTERCUTING STOMACH SURGERY** is a new technique, which can pull 150kg, at least three million tonnes of ore. The technique is being used in Europe and the US and is expected to become a standard method for removing cancerous growths.

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**TURNOFFER TREE-TRIMMER**

- A new tree-trimming device, which can cut the branches and twigs, is now available in Singapore. The device is designed to allow tree trimmers to work in a more efficient and safer way.

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