

# Science INSIGHTS®

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## NEWS

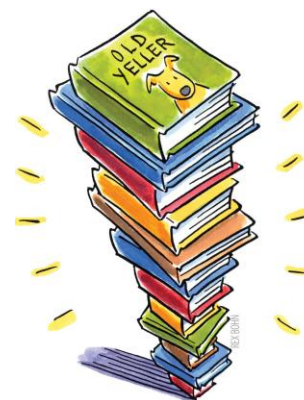
- 81 **No Prisoners' Organs for Transplantation**  
*(Hangzhou, CHINA)*
- The Oldest Tomatillo Discovered**  
*(Denver, USA)*
- India's Mission to Mars**  
*(New Delhi, INDIA)*
- 82 **Giant Snakes Could Back Again**  
*(Gainesville, USA)*
- Greenhouse Gas Volumes Reached New High in 2012**  
*(Geneva, SWITZERLAND)*
- Do We Need Pay for the Outer Space Exploitation?**  
*(New York, USA)*



page 81

## EDITOR'S CHOICE

- 83 **CELL BIOLOGY: Ack1 and TRAIL Receptor Membrane Dynamics**
- EDUCATION: Parents' Role in Reading Motivation between Immigrant and Native Students**
- MEDICINE: Does Targeted Temperature Play A Role in Cardiac Arrest?**



page 83

## PICTURE STATION

- 84 **Barceloneta Beach (1896)**  
*By Pablo Ruiz y Picasso (Spain)*

## PERSPECTIVE

- 85 **Mobile Phone Short Messages for Health Professionals**  
*By Yusheng Liu, Xirong Guo, Rong Shen, Fuzhou Wang, Xiaofeng Shen*



### COVER

Some reports concerned that mobile phone short messages can help health caregivers more focused on their work through reminding them what need do next, and positive results were presented showing that such “beep message” improves patients overall outcomes and satisfaction. Regarding this usage, several drawbacks need mentioned before it was recommended as routine reminder. Detraction from normal work, over-weighed dependence on this kind of remind, and uniform and non-individualized messages all will make the healthcare system lose flexibility and true efficacy. See page 85.

*Image: BASE illustrating group*

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## Hangzhou, CHINA

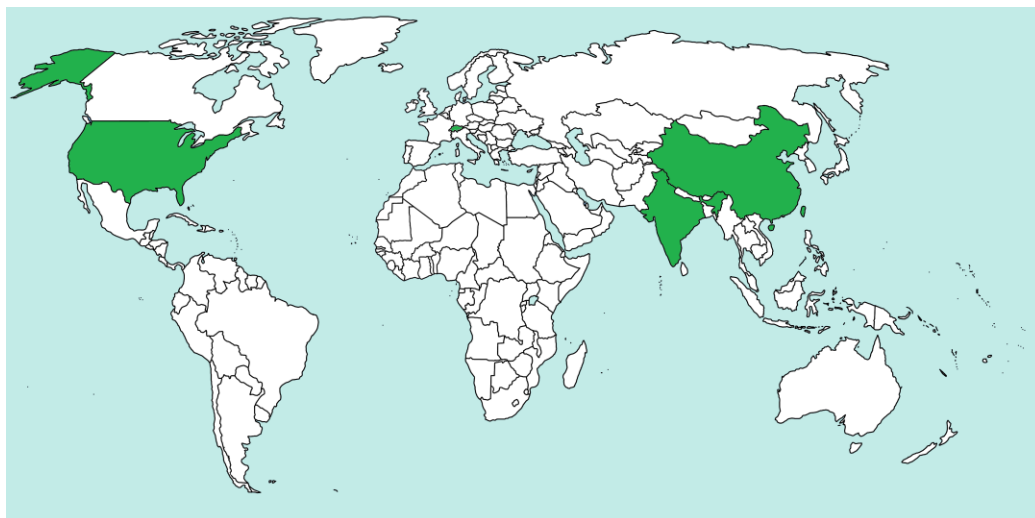
### No Prisoners' Organs for Transplantation

Even though the regenerative medicine has made great progress in past decades, it is still inadequate for the whole medical market to satisfy its entire requirement for organ transplantation. China is the only country that still systematically takes organs from executed prisoners for use in transplant operations, a decades-long practice that has drawn widespread international criticism. China plans to end its controversial practice of using the organs of executed prisoners for transplantation by around the middle of next year. By mid-2014, all hospitals licensed for organ transplants will be required to stop using organs from executed prisoners and only use those voluntarily donated and allocated through a fledging national system. To cut back on its dependency on prisoners' organs, China has launched pilot volunteer organ donor programs in 25 provinces and municipalities, with the aim of creating a nationwide voluntary scheme by the end of 2013. Organ supply still falls far short of demand due in part to the traditional Chinese belief that bodies should be buried or cremated intact. An estimated 300,000 patients are wait-listed every year for organ transplants, and only about one in 30 ultimately receives a transplant. ■

## Denver, USA

### The Oldest Tomatillo Discovered

A one-inch (23 millimeters) wide fossilized tomatillo, still in its papery shell, was discovered at the fossil-rich Laguna del Hunco, Argentina, where ancient lakebeds interlayer with vol-



canic ashes, providing paleontologists with precisely dated discoveries. This is the earliest fruit from the tomato family ever found in South America with a 52.2-million-year-old age. Tomatillos are members of the *Solanaceae* (nightshade) family, which includes tomatoes, potatoes and eggplants. Both fossil and genetic evidence suggests that *Solanaceae* plants originated and diversified in South America. The earliest South American tomato fossil is about 16 million years



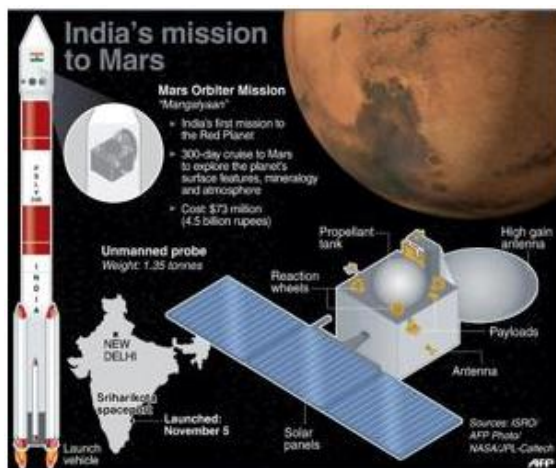
old. Scientists sequenced the tomato genome in May 2012. The tomato family molecular clock, based on the genetic data and fossil evidence, suggests the tomato genome expanded abruptly about 60 million years ago. A molecular clock estimates when species diverged in the past. The two plants once populated a giant Gondwana forest that stretched across Australia, Antarctica, South America

and Africa when the landmasses were joined in the supercontinent. Some of the ancient species still thrive in Australia and South Asian microclimates, or at Africa's southern tip, but most went extinct in South America. ■

## New Delhi, INDIA

### India's Mission to Mars

We are still in chasing for the space exploitation. A 350-tonne rocket carrying an unmanned probe soared into a slightly overcast sky on schedule at 2:38 pm (0908 GMT), monitored by dozens of scientists at the southern spaceport of Sriharikota, India. This is the India's first mission to Mars, completing the first stage of an 11-month journey that could see New Delhi's low-cost space programme win Asia's race to the Red Planet. The country has never before attempted interplanetary travel, and more than half of all missions to Mars have ended in failure, including China's in 2011 and Japan's in 2003. Only the United States, Russia and the European Space Agency have been successful. The gold-coloured probe, the size of a small car, will aim to detect methane in the Martian atmosphere, which could provide evidence of some sort



of life form on the fourth planet from the sun. There have been recent setbacks for India too, including when its Moon probe Chandrayaan lost contact with its controllers in 2009. Another, larger launch vehicle blew up after take-off in 2010. The programme also has to contend with critics who say a country that struggles to feed its people adequately and where more than half have no toilets should not be splurging on space travel. ■

## Gainesville, USA

### Giant Snakes Could Back Again

Modern science makes impossible possible. Imagine a snake the length of a school bus, with a mouth that opens wider than you can spread your arms. Not only *could* such a snake exist, it *did* exist and may exist again in the future not because of science development but of as temperatures warm. The Paleocene Epoch lasted about 9 million years, starting with the fall of the dinosaurs 65 million years ago. On the other end of the spectrum, mammals were much smaller in warmer climes. Consider the horse, which, during certain periods in earlier epochs, looked as if it would make a perfect little pet. When temperatures spiked twice at about 55 million and 53 million years ago, the size of

mammals shrunk. The changes come about when temperatures rise into the mid-90s for a sustained period of time; the thought is that larger mammals have a harder time regulating body temperatures and finding nutrition. As terrifying as the thought of a gigantic snake might be, or as precious as the thought of a football-size horse might be, don't go looking for them any time soon. ■

## Geneva, SWITZERLAND

### Greenhouse Gas Volumes Reached New High in 2012

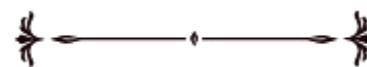
As reported by the World Meteorological Organization (WMO) that the atmospheric volumes of greenhouse gases blamed for climate change hit a new record in 2012. The accelerating trend was driving climate change, making it harder to keep global warming to within 2 degrees Celsius, a target agreed at a Copenhagen summit in 2009. Greenhouse gas emissions are set to be 8-12 billion tonnes higher in 2020 than the level needed to keep global warming below 2 degrees. If the world pursues its "business as usual" trajectory, it will probably hit the 2 degree mark in the middle of the century noting that this would also affect the water cycle, sea levels and extreme weather events. Delegates from over 190 nations meet in Warsaw next week for a U.N. conference to work on emission cuts under a new climate pact to be signed by 2015, but to come into force only in 2020. The WMO bulletin said the volume of carbon dioxide, or CO<sub>2</sub>, the primary greenhouse gas emitted by human activities, grew faster in 2012 than in the previous decade, reaching 393.1 parts per million (ppm), 41 percent above the pre-industrial level. The amount of the

gas in the atmosphere grew by 2.2 ppm, higher the average of 2.02 ppm over the past 10 years. The second most important greenhouse gas, methane, continued to grow at a similar rate to the last four years, reaching a global average of 1819 parts per billion (ppb) in 2012, while the other main contributor, nitrous oxide, reached 325.1 ppb. ■

## New York, USA

### Do We Need Pay for the Outer Space Exploitation?

We are living in this universe. Our earth only belongs to one small part of the whole space. We human being strives to exploit the outer space and attempt to find possible candidates for our globe. Some criticisms concerned about the space pollution from the human activities in the outer space. Your tax dollars have been hard at work since the 1950s pushing the frontiers of space exploration funding government agencies like NASA. Yet that progress has come at a price: mankind has polluted space with waste. Reaching up to 1,242 miles from the earth's surface, hundreds of thousands of pieces of orbiting litter are increasingly making operations in space riskier. A piece of space debris even 4 inches in length smashing into an astronaut or space vehicle at 20 times the speed of sound can have devastating consequences. Some experts want taxes to be levied to finance a space cleanup, especially before the anticipated boom in "commercial space exploration" becomes a reality. ■



## CELL BIOLOGY

## Ack1 and TRAIL Receptor Membrane Dynamics

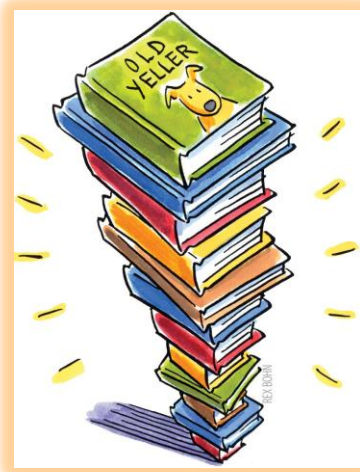
Activation of TNF-related apoptosis-inducing ligand (TRAIL) receptors accumulating in lipid raft membrane domains is of great importance in triggering cell death, which holds promise for treatment of cancer due to its ability to selectively kill cancer cells while sparing normal cells. A new study led by Dr. Ingvar Ferby from Ludwig Institute for Cancer Research, Uppsala Branch, Sweden, reported that activated Cdc42-associated kinase 1 (Ack1) is required for ligand-induced TRAIL receptor recruitment to lipid rafts and induction of cell death. In this study, the researchers investigated the underlying regulatory mechanisms of the regulatory role of TRAIL-R 1 and 2 IN lipid raft membrane microdomains, which is required for TRAIL-induced cell death by facilitating receptor clustering and formation of the death-inducing signaling complex. In the study, TRAIL triggered a transient up-regulation of Ack1 and its recruitment to lipid rafts along with TRAIL-R1/2. siRNA-mediated depletion of Ack1 disrupted TRAIL-induced accumulation of TRAIL-R1/2 in lipid rafts and efficient recruitment of caspase-8 to the death-inducing signaling complex. Furthermore, pharmacological inhibition of Ack1 did not affect TRAIL-induced cell death, indicating that Ack1 acts in a kinase-independent manner to promote TRAIL-R1/2 accumulation in lipid rafts. The interesting findings identified Ack1 as an essential player in the spatial regulation of TRAIL-R1/2. ■

*J Biol Chem* 2013; 288(46):32922

## EDUCATION

## Parents' Role in Reading Motivation between Immigrant and Native Students

Whether your children are interested in reading? Were you involved in the process of reading motivation of your children? Is there any difference between immigrant and native students in reading motivation? Let's read through the story presented by Dr. Caroline



Villiger from University of Teacher Training, Switzerland. In the study, the researchers found that immigrant parents are differently involved in fostering their children academically, and parental involvement has a significant impact on reading motivation development, and the differences in reading motivation are not mediated by parental involvement. In brief, immigrant students usually report high levels of academic interest and motivation compared to their native peers. The analyses were conducted with data from 891 Swiss fourth-graders and their families. Immigrant students received less emotional support from their parents, although the latter had significantly higher expectations for their child's reading achievement. In addition, the three aspects of parental involvement investigated had a significant impact on the development of reading motivation.

In mediation analyses, just one of the 12 effects tested appeared to be a mediation effect. Therefore, our parents, please think carefully about your children's reading motivation. You can be involved in more, but it is not necessarily play a role. ■

*Intl J Edu Res* 2014;64:12

## MEDICINE

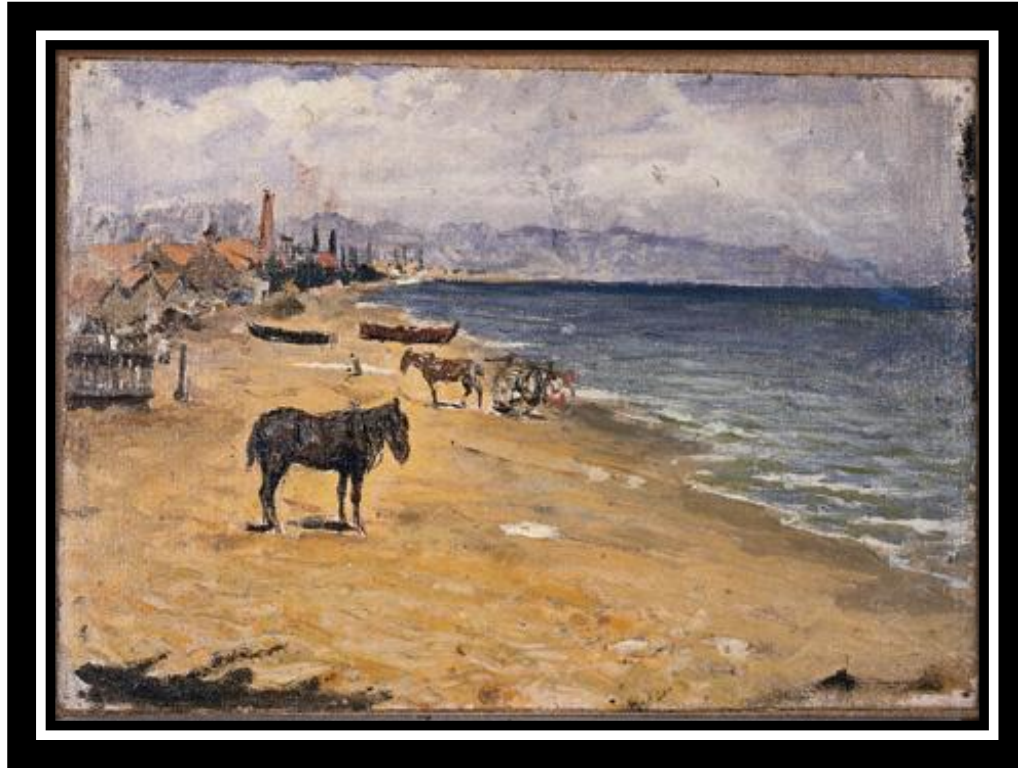
## Does Targeted Temperature Play A Role in Cardiac Arrest?

Therapeutic hypothermia is recommended by international guidelines for unconscious survivors of out-of-hospital cardiac arrest in reducing the risk of death or poor neurologic function, but the supporting evidence is limited. Could we save more lives and improve clinical outcomes when targeted hypothermia was administered? In an international, multicenter, randomized trial headed by Dr. Niklas Nielsen from Helsingborg Hospital, Sweden, reported that in unconscious survivors of out-of-hospital cardiac arrest of presumed cardiac cause, hypothermia at a targeted temperature of 33 °C did not confer a benefit as compared with a targeted temperature of 36 °C. Of the study, the researchers enrolled 950 unconscious adults after out-of-hospital cardiac arrest of presumed cardiac cause to targeted temperature management at either 33 °C or 36 °C. At the 180-day follow-up, 54% of the patients in the 33 °C group had died or had poor neurologic function according to the Cerebral Performance Category, as compared with 52% of patients in the 36 °C group. On the basis of these results, decisions about which temperature to target after out-of-hospital cardiac arrest require careful consideration. ■

*New Engl J Med* 2013, Nov. 17, 2013. DOI: 10.1056/NEJMoa1310519

# Barceloneta Beach

By Pablo Ruiz y Picasso



**Barceloneta Beach** - Barcelona, 1896  
Oil on canvas - 24,4 x 34 cm - MPB 110.073  
Museu Picasso of Barcelona, Spain

# Mobile Phone Short Messages for Health Professionals

Yusheng Liu,\* Xirong Guo,† Rong Shen,† Fuzhou Wang,\*‡ Xiaofeng Shen\*,<sup>Δ</sup>

**Information communication technology has made great progress in past decades, whereas how much could the health professionals benefit from these techniques? Some reports concerned that mobile phone short messages can help health caregivers more focused on their work through reminding them what need do next, and positive results were presented showing that such “beep message” improves patients overall outcomes and satisfaction. Regarding this usage, several drawbacks need mentioned before it was recommended as routine reminder. Detraction from normal work, over-weighed dependence on this kind of remind, and uniform and non-individualized messages all will make the healthcare system lose flexibility and true efficacy.**

\*: Department of Anesthesiology and Critical Care Medicine, Nanjing Maternity and Child Health Care Hospital, Nanjing Medical University, Nanjing 210004, China

†: Institute of Pediatrics, Nanjing Maternity and Child Health Care Hospital, Nanjing Medical University, Nanjing 210004, China

‡: Division of Neuroscience, The Bono Academy of Science and Education, Winston-Salem, NC 27157, USA

Δ: Correspondence to: Dr. Xiaofeng Shen, No. 123, Tianfei Xiang, Mochou Rd., Nanjing 210004, China. Tel: +86-25-5222-6115; Fax: +86-25-8420-0723; Email: [sxf0418@njmu.edu.cn](mailto:sxf0418@njmu.edu.cn)

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**S**EVERAL studies had focused on the role of cell phone text messages in promoting health-care adherence to diseases management, and obtained intriguing results in practice (1-4). Again, Zurovac and colleagues published their work in the Journal and suggested the use of text messaging in case-management practice could improve health workers' performance in controlling malaria in resource-limited settings (5). As the authors declared that they received a long-term improvement in outcomes relative to other published data. We cannot fully agree with what the authors



said i.e. it is questionable whether or not all healthcare workers can tightly adhere to what the text messages suggested in a long-term period especially when the contents are invariant. To this question, we performed a survey upon the willingness and self-rated adherence to text-message's suggestion in the context of postoperative analgesia (Table 1).

In our study, we found the 72 physicians participated in the survey up to 86.1% did not want repeated short messages without any changes in contents, and they would even delete the

message without reading it. But only ten of them left praised such a text message reminded performance. Based on this, we further asked the survey participants why they did so and what they really wanted to. The first answer was they did not want identical and reiteration, and they want to a changeable style and should be reminded intermittently. Therefore, are there same questions on the recent publication (5)? Of our participants, 77.8% prefer to receiving only one message per day, and 12.5% of them do not want to get any message remind, and none is willing to be reminded five times or more.

In collection, mobile phone message remind for health professionals

**Table 1. Participants' demographics and response preference.**

Variable	Value
Total surveys sent out	95
Total respondent	72/95 (75.7%)
Respondent Male/Female	52 (72%)/20 (28%)
<b>Survey Questions</b>	
No repeated messages with same contents	62/72 (86.1%)
No reading and delete the message directly	44/62 (70.9%)
It is useful for health improvement	10/72 (13.8%)
Messages detract me from routine work	41/72 (56.9%)
It might be a message-dependent	58/72 (80.5%)
It will affect individualized treatment	47/72 (65.3%)
<b>How many messages are the best?</b>	
0 message per day	9/72 (12.5%)
1 message per day	56/72 (77.8%)
3 messages per day	7/72 (9.7%)
5 messages per day	0
>5 messages per day	0

has dual effects on the improvement of healthcare quality. For the most health caregivers, they prefer to receiving as less message remind as possible one day. It should be considered carefully before recommending such remind in routine care. ■

### ACKNOWLEDGEMENTS

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### CONFLICT OF INTERESTS

None

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