The toxins we touch

TMU teams up with US EPA to address toxic threats to kids’ health

By Val Crawford

At a June 2015 TMU conference, two top US EPA researchers praised the university’s ground-breaking work measuring children’s exposure to environmental toxins. They said that in the US this research is being expanded to address toxins from consumer goods, as even iconic children’s toys like “rubber duckies” have been found hazardous.

The TMU researchers are preparing their findings for publication, but those at the conference saw some exciting results. In short, they have found ways to estimate children’s exposures to toxins at home and at school.

Former Taiwan environment minister and TMU Prof. Winston Dang spent 20 years at the US Environmental Protection Agency and at the US Food and Drug Administration. He has continued to work closely with his US colleagues, and since 2009 has hosted three TMU conferences to discuss this research.

Karen Bradham, a senior scientist with the EPA’s Office of Research and Development, spoke about “Bioavailability and Bioaccessibility: Health Risks and Risk Management Decisions,” and ex-EPA senior scientist Haluk Ozkaynak spoke on “Children’s Exposures to Contaminants from Contact with Outdoor Soil and Indoor Exposures to House Dust and SVOCs from Consumer Products.”

TMU study weighs children’s risks

The conference program explained the team’s collaborative bioavailability/bioaccessibility research, listing Bradham, Ozkaynak, Dang, and TMU professors Janice Chien, Ching-Yao Hu, and Hsing-Cheng Hsi as collaborators on a four-year plan.

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Below: US EPA scientists Karen Bradham and Haluk Ozkaynak joined Prof. Winston Dang and Prof. Janice Chien’s team in a Taitung site visit in June.
Letter from the President

Since I returned to lead my alma mater, I’ve worked on improving TMU’s connections with the wider world through support for international students and related programs, as well as our teaching, research and business partnerships.

Part of this is cultivating the best people for our organization. Some are recruited from outside, but our school’s existing talent has made us strong. So I’m proud to have rewarded and expanded the roles and responsibilities of many who have served our school for years.

We have “gone to the roots” to internationalize at every level. Increasing our roster of global partners, lecturers and faculty has gone hand in hand with increasing our on-campus capabilities. We’ve strengthened our international cooperation as well as our very productive ties with industry.

TMU has enriched its core facilities and laboratory resources to optimize our human resources. In fact, we are sparing no effort as we seek to become a world leader in health professions and research. In 2014 our school was recognized as Taiwan’s top private university in the QS World University Rankings, as well as #46 in Asia and in the top 100 worldwide in medical science.

We have attracted research partnerships with top academics from Sweden, Germany and India—and with more than ten Academicians from Taiwan’s own top think tank, Academia Sinica. Among these, Prof. Jacqueline Whang-Peng has helped us develop our cancer research team. She was not only the first woman trained as a surgeon at National Taiwan University, but also the first woman scientist at the US National Institutes of Health.

TMU also is rapidly expanding its use of new technologies to offer educational resources online 24/7, including our most popular online course on Chinese Medicine that has already benefited more than 1000 students. We will soon have two other courses joining this one on FutureLearn, a major MOOC platform based in the United Kingdom.

We have new programs as well: a joint degree in Nanotechnology with the University of Southern California, and a Biomedical Materials five-year degree that confers both Master’s and Ph.D. degrees. Students can use their market-ready research results instead of writing an academic thesis to qualify for graduation in this exciting new program. This naturally ensures a smooth transition to rewarding careers and abundant job offers.

Because new programs deserve new tools, we keep adding state-of-the-art equipment to expand our research abilities and innovations. The Ministry of Education has provided more than NT$85 million for new equipment since 2012, and we will spend NT$50 million more on animal and cell imaging systems soon.

These improvements and investments show our drive to globalize and to lead. With students from 42 countries joining us so far, we have quite a world at TMU. Please join us!

President Yun Yen

“In 2014 our school was recognized as Taiwan’s top private university in the QS World University Rankings, as well as #46 in Asia and in the top 100 worldwide in medical science.”
By Shelly Chen and Sugar Lin

Jacks are used to lift tilted homes so they can be balanced and restored. They are also used to lift vehicles to remove pressure from the wheels and allow vital repairs. Now human spines can benefit from the same concept with innovative surgical jacking.

Humps due to vertebral compression fractures can be corrected through reinforcement, allowing patients to regain a comfortable upright posture. Older patients can once again walk with their heads facing forward and their eyes lifted from the ground.

Professor Yung-Hsiao Chiang, Director of Center for Neurotrauma and Neuregeneration of Taipei Medical University says middle-aged and elderly patients with insufficient bone density experience compression fractures with the slightest accident. If the fracture site appears in the midback area, the spine has a tendency to become crooked. In addition to intense pain, regular daily activities become difficult. These patients need and deserve medical relief from this postural imprisonment.

Traditional open reduction and fixation surgery for vertebral fractures requires fixation of the spine above and below the fracture site, often involving one to two levels above and below the fractured segment. Even though this traditional surgery can straighten the curved spine, it also sacrifices range of motion because of three to five vertebral bodies becoming firmly fixed together. In addition, the fractured vertebral body will continue to break down due to bone loss, and the risk of subsequent fractures still exists.

Professor Chiang has led a pioneering medical team to become the first to develop minimally invasive intravertebral reduction surgery for spine fracture. The new operation abandons the need for large incisions to install eight screws and two long metal rods. It requires only two small jacks and two tiny 0.5 cm wounds where the two jacks are placed directly into the site of a compression fracture. The jacks are then progressively expanded to restore the height of the collapsed vertebra. Bone cement is then delivered to fill the newly restored vertebral space and to secure the jacks.

Fifteen minutes after the procedures, the jacks and vertebral bone cement are firmly solidified and the surgery is finished. In addition, based on one-year follow-up data, the treated vertebral body becomes quite sturdy post-operatively, so that re-fracture or deformation are very uncommon. Usually the patients are discharged on the day after surgery and allowed to return to normal daily activity.

Dr. Chiang compares the compression fractures of the spine to a collapsed house. Traditional vertebral fracture reduction surgery requires use of the houses next door—sometimes even four of them—to hang steel beams and strengthen the stability of a collapsed house before starting construction work.

In contrast, a minimally invasive jack holds the house up without disturbing neighboring vertebrae. Clearly this method is relatively more simple and straightforward.

As of late 2014, Professor Chiang had analyzed twenty vertebral compression fracture patients

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Below: Mrs. Jiang told television reporters at the press conference that she was walking comfortably as soon as she returned from the operating table.
whose spine angles improved from negative 14.2 degrees preoperatively to postoperative angles of positive 6.6 degrees. As for the pain scores of up to 10 points as the maximum, the patients’ pain scores improved from an average of 8.2 points preoperatively to 2 points postoperatively. For the disability scores with a maximum of 80 points, average patient scores improved from 70 points preoperatively to 10 points postoperatively. And especially significant is the improvement in life satisfaction scores, which improved from 30 points preoperatively to 70 out of a possible 100 points postoperatively.

These patients were very positive in their appraisal of the new method, with 92.5% of the patients willing to introduce the method to people with the same problems.

For example, Mrs. Jiang is a 62-year-old housewife who fell during a workout, and immediately felt sharp and nearly unbearable pain due to a compressed vertebra pressing on her spinal cord. Yet right after Mrs. Jiang returned from the operating room to the ward, she was able to get off of the bed and walk comfortably by herself. “Miraculous!” said Mrs. Jiang.

Professor Chiang said about 150,000 cases of vertebral compression fractures occur in Taiwan annually, mostly affecting the elderly—and fewer than 5% are immediately treated. Sometimes their lack of mobility causes other problems in their internal organs, such as gastrointestinal and urinary tract symptoms. This can lead to a vicious cycle of serious illness and finally death.

Jacks for backs: continued from page 3

Above: The procedure inserts a tiny jack, expands it and fills the cavity with fast-setting bone replacement material. This provides a sturdy and quick solution with minimal recovery time or risk of infection.
TMU expert makes Ebola news
Simple process turns survivors’ blood materials into protection with minimal cost

By Mike Wu, Global Health and Development student, USA

The Ebola epidemic has raised fears of a global pandemic. Although international health organizations and local governments are scrambling to contain the outbreak, there is no method to prevent it from spreading.

Yet there is hope. WHO experts have met with TMU Prof. Thierry Burnouf to discuss whether convalescent blood (from Ebola patients who have recovered) can be used as a treatment.

He wrote in the Lancet that, “whole blood, together with convalescent plasma, might be the only available clinical option in the treatment of Ebola patients at present. National governments should develop sustainable local blood services for an adequate supply of safe blood as a priority.”

The WHO experts concurred that using convalescent blood to treat infected patients is indeed a viable option that has worked for other cases similar to Ebola, and established a simple randomized clinical trial to validate the procedure. Bioprocessing specialist Burnouf directs TMU’s Graduate Institute of Biomedical Materials and Tissue Engineering.

The convalescent blood can be processed into several products such as platelets, red blood cells and immunoglobulins, and these can be given to infected people to fight the virus. However, in order to implement these measures, there must be a stable infrastructure to collect blood, store it, test it, and then refine and transfer these products to those who need them.

Convalescent blood transfers are not a new technology; Burnouf noted in an interview with this reporter that these processes were helpful in fighting previous outbreaks such as SARS, Spanish influenza in Europe, and avian flu.

Burnouf urges further development of blood-handling systems for several reasons. Whole blood transfer are dangerous because the blood may contain also other viruses (HIV, HBV), parasites, and malaria—plus there is also the issue of blood compatibility.

“In the case of Ebola, it is good to use whole blood, but it would be much better to use plasma via aphaeresis. Through aphaeresis, blood is passed through a machine which automatically separates the plasma from the blood, and sends the blood back to the donor. Using this system, you can collect the plasma more often, since the red blood cells are going back to the donor.

“The next step in blood refining would be to treat the plasma by inactivating not only the Ebola virus, but also other viruses such as HIV, TB, [and] HBV, which can be very prevalent in the population. Platelets can be used to treat cancer, immunodeficient diseases, malaria. Plasma can be directly transfused to people with severe bleeding disorders and other infectious diseases.”

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Left: TMU Prof. Thierry Burnouf discusses a student poster at the recent Research Week displays.
The bilateral medical cooperative method has had a breakthrough! This spring, TMU and the Ningbo health authorities (abbreviated NHPPC) signed a trust-operation-management agreement under which the Ningbo Medical Center’s Lihuili Hospital will be managed by a team affiliated with Shuang Ho Hospital.

As China seeks to reform public medical institutions and perfect its hospital administration systems, it has selected Ningbo city as a candidate to conduct the first trial of new public hospital reform. Through the agreements, contracts, and letters of intent signed in 2013, both Taipei Medical University and Ningbo’s Lihuili Hospital’s eastern wing have undergone a year of preparations, with both parties formally signing the trust-operation-management treaty and cooperation agreement on March 30. These agreements were signed and witnessed by: Ningbo City Mayor Zi-Yue Lu, Ningbo Deputy Mayor Ming-Hua Zhang, NHPPC committee director Ren-Yuan Wang, Ningbo people’s chief government secretary Jian-She Wang, as well as TMU President Yen Yun and Chief Secretary Chun-Ming Si, Administrative Development Center Chief Executive Mai-Si Wu, and Shuang Ho Hospital Superintendent Zhi-Xiong Wu.

This part of the public Lihuili Hospital’s is to be managed and operated by a TMU team for ten years as the Taipei Medical University Ningbo Medical Center.

President Yen said that by seconding excellent staff and administrative teams, TMU will bring the most modern administrative techniques and theory to the operation. TMU hopes to aid the hospital in establishing high-efficiency operation mechanisms and reasonable performance evaluation standards, and to improve the attitudes of the local populace toward the medical services offered there.

TMU will receive compensation as determined by China’s city-level hospital guidelines, which measure the public good, services provided, quality of care, and administrative efficiency.

Ningbo City Mayor Zi-Yue Lu said at the signing ceremony that by entrusting TMU with this hospital management, Lihuili is setting up a modern management system that is a step toward a happier society. He also hoped that TMU will send its finest administrators and medical experts to impart TMU’s advanced management expertise to Ningbo’s health system. He urged all Ningbo public health institutions to develop their technical expertise and find breakthroughs, and pledged whole-hearted support of the government toward this ground-breaking cooperative health project.

Within three to five years, the project aims for accreditation at a level 3 / grade C or higher ranking as a general hospital in Zhejiang Province through JCI accreditation. Within ten years, TMU hopes that the Lihuili team will feature the best managerial systems and highest-quality doctors, and that it will be the best in the region as a large-scale comprehensive hospital.

TMU has decided to send an operations specialist team composed of nine members. In addition, TMU will be assigning a consulting team to coordinate human resources between TMU and Lihuili. These doctors and specialists in different medical disciplines will assist in clinical duties as well as offering specialized care, mentorship programs, and other services to cultivate the professionals working at Lihuili.

In its recent preparations for the project, Lihuili has sped up its construction efforts to set up necessary large medical machinery and facilities and complete testing operations. They are continuing to recruit new talent while training their teams in the applications and use of the new systems.

With TMU’s impressive experience and expertise in hospital management, there is much anticipation for the project from both sides, and it is hoped that this cooperative medical project will serve as a model for future medical agreements, while bringing health and well-being to many people.
TMU recently hosted Oxford University Prof. Myles Axton’s important lecture on publication advice, in particular focusing on well-organized and concise abstracts, journal selection and what makes research newsworthy.

He said that scholarly writers should have clear answers to the following questions:

**Why is the topic important?**

**What is known about it already?**

**What is not known yet?**

**What did you (the author) do, and what did you find?**

**What do these findings mean in terms of their implications?**

**How should others act on or use these findings?**

Prof. Axton also dissected an abstract onscreen that answers these questions, starting with “an introduction comprehensible to all readers” rather than specialists, then providing a detailed background. One sentence each should house the general problem and the main result, which can be linked to previous work and put in a general context and shown to have a broader usefulness if possible.

He said he’s mystified as to why so many writers fail to separate their results from their discussion, a criterion he called “the mark of a good paper.” For example, observations mention figures and graphs, describe the data and identify features of this data. In contrast with these narrow statements about results, interpretations note agreement with predictions, relationships between theory and observations (including needs for new theories), and chart patterns in the data.

Another tool Prof. Axton mentioned was the “semantic outline” of the paper, in which every statement in every section is seen in terms of a hypothesis, the evidence for this, and the method for determining. “A paper is an advertisement” so writers should use repetition to build one message and present it from as many angles as there’s relevant evidence.

Teachers too can demand semantic outlines of their students who are writing papers, and can change the order or randomize their statements to check logic. Prof. Axton called this “a great test idea”:

"A paper is an advertisement, so writers should use repetition to build one message and present it from as many angles as there’s relevant evidence.”

make a chart with empty columns headed Hypothesis/Evidence/Method and ask students to fill it out.

Prof Axton mentioned two sets of reviewers: the journal’s screening editors and, for the fortunate, peer reviewers. However, he called novelty “the only criterion” for scholarly publication, because “conceptual advances” are why journals exist.

“How many people will change their work because of this paper? That is the impact and the utility for the journal.”

However, different journals have different readerships—his company’s flagship journal, the venerable Nature, is for scientists, decision-makers, and the public, while the journal closest to his own work, Nature Medicine/Genetics, is much more for a readership of researchers. To this end he travels partly to collect new peer reviewers, as these improve the journal and its impact by also raising submissions. Since 2006 his company has raised the number of Chinese peer reviewers and in turn submissions from Chinese writers now account for 5% of papers, of which a respectable 15% are accepted for publication.

Prof. Axton advised writers to choose their target journals by appropriate scope, not by impact factor. He also urged writers to make presubmission enquiries, as these often give a yes/no answer within 48 hours if sent through the online submission system. “Shop for journals that care about your work” and offer to add data if they’re interested—because the papers that are accepted on a presubmission basis tend to be accepted.

His own organization had a novel business plan: “We fired our publisher” and now many journals work together, sharing promising papers and sometimes referring authors to several relevant journals that might publish them. Naturally this expands writers’ options and networks, and this can be helpful for other papers to come.
On 1 June 2015, TMU celebrated its 55th anniversary since the Ministry of Education approved the founding of Taipei Medical College. Foreign diplomats from Taiwan’s allied nations were among the VIPs who attended a special ceremony in the Auditorium that featured a performance by international students from the United States, Indonesia, India and Vietnam. Elsewhere on campus, hundreds of students participated in the annual day of sports events to commemorate the occasion.

**Chinese Language Competition**

TMU’s Chinese Language Competition winners went on to sweep the intercollegiate competition on May 26. Bettie Jean Baptiste of St. Lucia reprised her first-place victory, Parulian Dormaida Gultom of Indonesia took second, and Sara Estrada Rivera of Nicaragua took third place, with TMU winner and fellow intercollegiate competitor Mantosh Kumar joining the group photo. Congratulations to our students for triumphing over many other schools ... although anyone who studies Chinese in Taiwan is a winner!
It was a wonderful experience for me to go to Taipei Medical University Hospital (TMUH) for a 4-week clerkship. It was a great honor for me to be the first exchange student from Kanazawa University. I rotated in Pediatrics and Endocrinology for two weeks each. In pediatrics, I was mainly with four interns who were kind enough to teach me many things. I learned how to see patients in the ward, how to evaluate infants’ health, and who did what in the hospital. I attended many conferences. All doctors and students spoke English so that I could understand. I saw many patients in the outpatient department.

In endocrinology, I attended the classes that medical students had to attend. I also attended many conferences and outpatient classes. I’d never seen that many patients getting thyroid echo examinations.

I had two great experiences when I was in Taipei. First, I was able to learn more about differences between Japan and Taiwan. It’s not only about medicine but also about culture and customs. The most surprising difference was that Taiwanese doctors and medical students can speak English fluently. Most classes are in Japanese at our School of Medicine, though the number of international researchers is increasing and there are some chances to use English.

Most Taiwanese students said that they envied us for studying medicine in our native language. However, I think it’s better to learn medicine in English so that we can easily communicate with doctors in other countries.

Furthermore, Japanese tend to think that we have to use English perfectly, and this way of thinking prevents us from using English. One doctor in TMUH told me that there is no need to hesitate to use English because it’s not our native language and that I should have confidence in my English skills. Now I really think so! I cannot communicate with them fluently but we can understand each other even if my English is not perfect.

Second, I met many kind people at TMUH. The staff of the International Office were kind and helped me. Doctors took good care of me. I made many good friends and I still keep in touch with them after coming back to Japan. They took care of me in the hospital and also they took me to many sightseeing spots on weekends. I had a wonderful time with them. Also, I had a roommate from Thailand in the international dormitory who became a good friend of mine. I am very grateful for these amazing encounters.

There are many other good experiences besides the above. TMU accepts many overseas students so I had no difficulty there. I really think I made the best choice to go there.

By Eriko Kabata
Kanazawa University 6th-year medical student
Japan student writes about his TMU experience

By Takuma Suzuki

I like Taipei because the Taiwanese are very hospitable. I feel that way more than ever after this exchange program. I enjoyed and learned a lot, although this was my first time to go abroad as an exchange student.

Dr. Su and Dr. Wang taught me about Family Medicine and explained the patients' chief complaints when I studied in their department during the first week. When I asked questions, they listened carefully and were willing to communicate, though my English was not fluent. Thanks to their kind support, I learned a lot about Family Medicine. I was very happy when the doctors bought me delicious beef noodles at lunchtime.

Doctors and nurses also welcomed me in Urology department during the 2nd week. At first, they talked to me in Chinese, but I couldn't understand what they were saying. I could hear only one phrase “Jinze” and they wrote down the word. I got it! Jinze is 金澤 (Kanazawa)! I will never forget the moment. This was my first time to understand Chinese words. I learned about urology, especially surgery. Dr. Lin taught me anatomy and the means of the operation in English and Japanese. I was happy to know there are non-Japanese people who like Japan. I'm thankful to Dr. Lin very much. I'm waiting for him in Japan.

I learned in the department of OB/GYN during the 3rd and 4th weeks. Doctors seemed very busy but they found some time to teach me the anatomy of the operation and why they chose the procedure.

Below: Takuma Suzuki enjoys an outing in the city with local TMU students.

Also, they taught me about patient symptoms and how to decide the diagnosis at the outpatient department. The most impressive experience was a visit to the Reproductive Medicine Center.

TMU students took me to lunch and dinner in their private time. We went to night markets, Maokong and karaoke, etc. I was touched by their warm hospitality. We talked about our futures: which major to choose, opinions about working in home country or abroad, and love stories. I spent a very happy time and am thankful for them.

The most common feature among all people whom I met in Taipei is hospitality. They always talked to me and were willing to communicate with me. My English ability was not good enough, but I felt they didn't care about this. Whenever I started talking, they listened to me carefully and replied with jokes.

I enjoyed this exchange because of their hospitality. I am motivated to study Medicine, English and Chinese harder as I want to see and talk with them again. I am deeply grateful to all the people who gave me this wonderful chance.

Below: Getting to know other students over an icy treat.

TMU expert makes Ebola news: from page 5

While an approved vaccine may not yet be released, this process is good news for those on the front lines. TMU is proud to host this renowned expert and his laboratory. But the man who first killed HIV in blood products in 1984 cautions that still greater efforts must be made in this area:

“The Ebola crisis this year is not the end of it. There will be other viruses, influenza, SARS, etc., will occur—and we must be prepared. Even countries that are well-developed (Hong Kong) had difficulties handling SARS.”
Joint USC nanomedicine degree program sees big potential in smallest particles

The new Graduate Institute of Nanomedicine and Medical Engineering is a dual degree study program organized by TMU with University of Southern California.

This postgraduate program applies nanotechnologies to medicine, pharmacy and health science-related topics. Inter-disciplinary research teams will link nanotechnologies to biomedical engineering and translational medicine, among other fields. With a strong focus on linking research findings to clinical applications, this program will enhance Taiwan’s performance by using nanotechnologies to provide solutions for a wide range of medical problems.

Key objectives for the program’s teaching and research include:
- Development of nanomedical technology talent
- Increased exchange and collaboration between nanomedicine researchers
- Applications of nanotechnologies to cancer research and reproductive medicine
- Nanotechnology research and related applications for in-vivo and molecular imaging
- Diversifying teaching practice through introduction of international faculty and curriculum

Strengthening exchanges between international research teams

Building on the existing research strengths of academics in-house, the program’s two major interests—nanotechnology and medical engineering—will facilitate topic-focused joint research and resource sharing between TMU and USC academics.

The program will be delivered through a combination of face-to-face instruction and distance learning. There will be opportunities for students and faculty members in both institutions to work together, and the ideas discovered through such interactions will benefit teaching and research.

Students will take part in subject-focused joint research and be co-supervised by TMU and USC faculty members through visits and/or virtual meetings.
By Kevin Yang

Many patients who have injured nervous systems are paralyzed and robbed of their ability to perform daily tasks. Among them are those with spinal cord injuries (SCI), who lose control of their ability to urinate. Neuroprosthetic devices have been developed for these SCI patients, but they still have many drawbacks preventing widespread use. We have an obligation to improve current technology and help these patients regain their independence and control over their lives, this is why I study neuroprosthetics at TMU.

I had almost been too busy with my own research to notice another TMU institute’s ambitious Research Week program, but one of the events caught my eye and I knew I had to attend. “Reanimation and control of the paralyzed arm” was discussed by Professor Robert Kirsch, biomedical engineering chair at Case Western Reserve University.

In the presentation, Professor Kirsch shared his research on Functional Electrical Stimulation (FES), a technique that stimulates nerves of paralyzed patients with electrical currents to invoke muscle activity, and thus achieve functional control over their paralyzed limbs.

His work focuses on helping patients with cervical spinal cord injury regain control over their arms. Many of these quadriplegic patients hope they might one day perform the simple task of scratching their own nose, a gesture most of us perform daily without a thought.

In order to know where to correctly place electrodes to perform nerve stimulation, Professor Kirsch’s lab has built one of the most accurate human arm simulations in existence, featuring muscle coordination and time-delayed artificial neural networks. This sophisticated simulation allows researchers to go beyond the limitations of using human arms as models.

Professor Kirsch estimates that the simulation accelerated work on FES of the arm by 20 years. Using the simulation and feedback from clinical doctors, they devised a FES system that would allow paralyzed limbs to move again.

However, a problem remained: how would patients input commands to control their arms? At first they devised control systems where patients controlled the stimulated arm with eye, tongue, neck or ear movements and voice commands. This method was successful, but it was unintuitive, difficult to learn and slow. Professor Kirsch called it a bad interface, but it was all they had at the time.

A few years later, the intracortical electrode array was developed, which allows activity of the brain to be recorded. By replacing the old interface with the new, the paralyzed patients should be able to move their arms just by thinking about this.

In order to test the new FES setup for paralyzed arms, a patient volunteered to undergo training to control a virtual arm by sending commands with his brain. The patient’s brain activity was recorded and analyzed, and appropriate corresponding movements were shown on the screen. After he mastered a two-dimensional simulation, they moved on to a three-dimensional training simulation with 3-D glasses.

When the training was concluded, the volunteer had the FES electrodes implanted in his arms. On the first day of testing, he was able to move his fist towards and away from his face just by thinking about it, a task that many paralyzed patients have only dreamed of achieving once more. These brave volunteers are pioneers of the future.

The success of the test opened doors to future neuroprosthetics developments. Many of the techniques for FES in spinal cord injury patients can be transferred to help patients with amyotrophic lateral sclerosis (which many know as the “water bucket challenge” disease).
Now that TMU is discussing a master’s dual degree program with Case Western Reserve University, our own researchers may be part of the team that achieves these breakthroughs working with FES researchers. I am eagerly pursuing this possibility of taking advantage of the program myself, hoping that with new experiences and cooperation with other researchers I may be able to contribute more to the development of neuroprosthetic technology.

According to pioneers in the subject such as Helmut Brand, Jurgen Pelikan, Diane Levin-Zamir, Stephen van den Brouke and Kristine Sorensen, health literacy becomes much more important with the exploding amount of health information that has become available.

For example, due to recent advances, anyone experiencing symptoms need only search the Internet to make a quick self-diagnosis. The problem is that a shocking number of websites give bad information, and most of the public does not know which sources provide unbiased, reliable information. With health literacy comes the ability to better make educated judgments about one’s health.

When we asked how health literacy might affect patient interactions with doctors, we learned that health literacy improves various aspects of hospital visits—including reducing them in number, cost and seriousness (i.e., more preventive care and fewer late, expensive and often futile treatments, in the case of advanced cancers that can be found and diagnosed sooner).

An issue that doctors increasingly encounter is patients who do not complete their prescribed doses of antibiotics. Implementing new practices such as the “teach back” method, in which the patient demonstrates their understanding of instructions, as well as explaining the importance of completing the prescription, helps to correct prescription-related compliance and comprehension problems.

There are also many incidents in which a patient’s culture may play a role in how that person handles an illness—and which doctor that patient is likely to trust. Patients who understand their illness and who both understand and trust their treatment plans are more likely to follow steps to improve their health.

The take-home message of these interviews is that health literacy isn’t just a matter of reminding people to exercise and eat healthy foods. Health literacy is a comprehensive understanding of health and all of the many factors that contribute to it. And it empowers clients while strengthening health systems to better target their resources.
What newcomers need to know about Taiwanese culture

By Val Crawford

The Canadian Chamber of Commerce and the Taiwanese expat online platform offered a workshop by consultant John Groot for foreigners who want to know about how to bridge cultural gaps in Taiwan.

Unsurprisingly, one topic was long working hours—and the expectation that no one can leave until the boss leaves. This may not be such a concern for students … except that Taiwan's university laboratories often expect longer hours from students working on research than in similar situations abroad.

Another topic was “emotional self-regulation.” It is a big mistake to get angry, and almost invariably this will not get a positive outcome. You will lose face, others will lose face, you will be seen as immature and untrustworthy, and everyone who sees this unseemly display of lost self-control will avoid dealing with you. Better to pause from action on the issue, make quiet inquiries through an intermediary, and otherwise avoid making a scene. This is seen as weakness in the West, but as cool strength and smarts in Taiwan.

Similarly, a way of respecting others is “leaving a back door” so that you do not force anyone to say “no” to you directly. This is respectful and will avoid situations where they feel forced to say yes but mean no. Deferring a decision or allowing them to “get back to you” is much better than demanding acceptance or refusal.

In Western business cooperation, “business before pleasure” means that dealing can be done directly and then both parties go celebrate with drinks and dinner. In Taiwan, building relationships comes before building specific agreements—so potential business relationships may appear to go very slowly at first.

Furthermore, Groot said that these relationships must be inter-group, not just between individuals. So outsiders must be careful to study the hierarchy of an organization they hope to work with, and must communicate correctly with the appropriate counterpart or supervisor—not by asking the opinions of lower-ranking staff who have no authority to negotiate. Never make a superior lose face by addressing their employees for a direct answer—this negates the former’s social status and is quite insulting.

In university life, this rule has its counterpart: always try to go through the proper channels—and don’t jump past direct supervisors and bypass layers in the hierarchy. This will cause hard feelings on the part of the bypassed people, who will lose face because their ability to solve whatever problems has been implicitly devalued. This will also cause annoyance to the higher-ranking person, who relies on the bypassed person to take care of the matters assigned to them—also, they are unlikely to assist in your crime against “face” by bypassing the supervisor again to take the action you request.

Even if your issue is entirely valid, and they are sympathetic, others may not be able to help without causing further social damage. The rule: know the hierarchy and respect it, and cultivate relationships with the appropriate levels without involving “outsiders” in unit or departmental matters—unless very serious communication problems arise. Even then, you should move very quietly in making tentative inquiries and clarifying your understanding before asking anyone else to get involved.

Similarly, for all the talk about globalization, TMU remains firmly and coherently Taiwanese. So outsiders should “manage their expectations” about making any SOP, practice, protocol or unit more Western in terms of directness, transparency, or changes in values or goals. Do not assume that just because outsiders clearly are involved in a setting, our ways of doing things will be seen as appropriate. One case study Groot provided mentioned a woman who hoped to change her department but she left in frustration within two years when others resented her pushy approach and provided obstacles, even with some verbal support from upper management.

Another interesting suggestion was to develop an understanding of indirect communication—and to become comfortable with silences in relationships with Taiwanese counterparts.
Positive impressions can be made by people willing to participate in group activities, not always with the expectation of directly building relationships with one person at a time. While Taiwanese activities seem over-scripted and over-rehearsed to outsiders, patience and good humor in the face of these time commitments will build trust.

There is a huge emphasis on preparation and propriety, and this both slows progress and creates expectations that outsiders may not be aware of, particularly with displays of high-status gifts or entertainment where Westerners may be spontaneous and personal. Entertaining at home is not a warm-hearted gesture that the guest is welcomed into the family — it is an insult that implies that everyday food and entertainment will suffice. Similarly, potlucks, sports dates and picnics are not appropriate for business contacts here, though they would be normally normal in many Western countries.

Yet remember that to bring food and other gifts to different settings is appropriate or even essential. Gifts on the occasion of first meeting people can include something special to eat, and when you return from a trip your local colleagues will expect goodies.

Groot also said that in Taiwan, lower-ranking employees are reluctant to brainstorm or share ideas because of the expectation that such ideas represent the company and should be approved by supervisors. They may appear risk-averse, and may not even want to speak in meetings. Certainly there will be no debating of different positions in public, for this offers the prospect of one side or the other being in a position of losing.

These insights are the nutshell-view reflecting the two dozen participants’ combined decades of foreigner experience in Taiwan. University students can share their own stories and perspectives in future TMU Outwards issues!

Why a good abstract matters: continued from page 7

He urged writers to “keep reading; stay up to date” on research related to one’s own. He also said that writers can request a detailed rejection letter specifying reasons, if they receive a vague “boilerplate” letter that “Your paper does not meet our needs at this time.”

There is even an appeal process, although this might take three weeks; Nature Genetics’ scope is based on the risk that various diseases pose and how gene networks and wiring affect these. About 20% of submitted papers go to peer review, and they must meet the criteria of Form and Novelty. What is the conceptual advance here, and what are the most recent citations in the paper.

The novelty factor must clarify how this result is exceptional or how a practice or resource can be improved or applied usefully. With 165 journals in the field of genetics, he said rarer tumor types may not have been studied yet, but replication of a study in a new group is less publishable, due to “diminishing returns” after big studies. Another fatal and unethical mistake is using too few animals: “Do it right or don’t do it at all.”

“Using too few animals for a study to provide solid results is a fatal mistake: Do it right or don’t do it at all.”

“It is a big mistake to get angry, and almost invariably this will not get a positive outcome.”

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He cited one “bad paper” that he said cost US$50 million for a study on ALS that had poor or no “power calculation.”

However, another useful and novel area of advice concerned the roles of different authors. While many journals require all authors to have participated in all stages of the research and writing, the Nature group asks merely that the authors have read and agreed to all of the paper’s contents—and encourages an “author contributions list” that specifies which roles each author played.

These roles include funding, project administration, supervision, publication, data curation, resources, investigation, computation, formal analysis, methodology and study conception. Such a list is more honest and more informative, Prof. Axton argued, and this represents the work of a large team more accurately.

Although research in Taiwan by Steve Wallace found that 70% of Taiwan papers that are rejected are not rejected for scientific content but for English problems, Prof. Axton said that “We can publish your paper if it is publishable.” Authors may be steered toward additional language editing at their own expense, so perhaps this investment should be made earlier to make the submitted paper as clear and nonproblematic as possible for the journal staff, who unlike peer reviewers must eventually make accepted papers consistent in terms of journal style and quality.

In conclusion, Prof. Axton asked TMU researchers to consider the Nature Group for publishing, and thanked the university for offering him some interesting briefings on the best of our current research.
This work first studies arsenic and metal-contaminated soil oral bioavailability and bioaccessibility, then assesses metals bioaccessibility from soil and sediments of contaminated sites in Taiwan. Although the team has been quite successful in measuring how much dust children encounter, Ozkaynak began his remarks by noting that “We don’t know what’s in the dust, either indoors or out.”

He noted a site visit to Guandu before the conference: “We were looking at naturally occurring volcanic arsenic in an area irrigated for agriculture.” He went on to both explain the collaboration with Taiwan partners and to survey the US EPA’s expanded focus on indoor pollution and toxic exposures from consumer products.

Why study soil and dust?

Soil and house dust carry many toxins that humans encounter through airborne particulates, ingestion and skin exposures. Ozkaynak said dust is a “complex mixture of biologically derived material, particulate matter and chemicals deposited from use of indoor consumer products, aerosols, and soil particles brought in by foot traffic.”

Its infinite mix of toxins is the challenge to researchers, as “quantity and composition varies with seasonal and environmental factors … [and dust] contains many different types of chemical residues” that can vary by “size, surface texture, moisture, polarity and chemical composition” as well as by season.

Ozkaynak showed that some children’s exposures dramatically exceed EPA recommended values for daily soil and dust ingestion: five to ten percent of kids were estimated to eat dirt (“geophagy”) at some point, especially autistic children, so this is an important risk consideration.

The team’s study regarding “Predicted Soil and Dust Ingestion Rates” found the 95th percentile was exposed to levels several times higher than normal, amounting to several grams of soil and dust daily.

Skin adherence, mouthing analyzed

This research he credited in part to TMU, specifically calling the work of Prof. Janice Chien’s team “immensely important” and “the best data on youngest age groups.”

TMU’s study of children’s soil and dust ingestion is designed to:

1. Obtain the soil/dust conditions in 4 separate regions of Taiwan.

2. Investigate the mouthing frequencies, time activity and estimate soil and dust ingestion rates to children under 3 years old. Recruit additional children and add to study older kids (3-6 years old) to study soil and dust ingestion rates, and determine soil to skin adherence factors for the older children during different play activities on different types of soil.

3. Compare the mouthing frequencies and estimate soil and dust ingestion rates of children between...
...measure and compare kids’ exposures

potentially contaminated sites and non-contaminated sites.

The goal is to collect the data to establish localized exposure factors. This knowledge helps policymakers and risk managers make better decisions to protect Taiwan’s children.

‘Safe’ exposure limits unsafe for kids

Most data relating to “safe” exposures to toxins is based on research with adults. The TMU team’s work proves that children’s exposures are higher—because children first crawl and play on floors, and then constantly move their hands to their mouths and ingest toxins they picked up.

Because toxins pose greater long-term risks to children’s developing bodies, “safe” adult exposure levels are unsafe for children. Exposures and risks vary for children in different age groups, so setting limits is a complex matter.

The TMU research process begins in homes and day-care centers, where children’s hands, arms, legs and feet are rinsed with distilled water. The resulting fluid is analyzed to see how much silica (an easily-traced component in floor dust) they have picked up in their daily activities.

After comparing these results, Ozkaynak discussed exposures to consumer product chemicals. He referred to a book, “Slow Death by Rubber Duck,” noting that “Consumer products are often chemically treated [using] semi-volatile organic compounds [SVOCs] that escape from products over time and accumulate in indoor environments.”

Mimicking digestion in the lab

US EPA Senior Scientist Karen Bradham returned the discussion to soil and dust by showing how her research reduces environmental remediation costs by making risk estimates more realistic.

Bradham said incidental ingestion of contaminated soils is more significant than ingestion via food and air. Her agency’s regional offices get frequent calls about children with high blood levels of lead arsenicals from mining, smelting and pesticides.

Remediating toxic sites requires the expensive “dig and haul” method that costs about one million US dollars per acre to strip off the top foot of soil. Her current studies focus on more accurately estimating risks via bioavailability research.

Her in-vitro model reduces the need for animal testing by mimicking digestion with chemical processes (“my specialty” she noted drily). This method was proven “the best and the easiest” by an Australian team that reproduced 40 different soils to test it. She can now apply 20 years of research on arsenic in drinking water to cases of soil contamination.

TMU Public Health and Nutrition Dean Shin-Han Tsai said the conference’s message about environmental toxins must be shared, because “Nobody knows a [rubber] duck could be a chronic danger to their health.”

Conference organizer Winston Dang ended the event with the sage observation that “Risk assessment determines the order of hazards. But who pays [to remove or remediate these]?”

Below: TMU professors Janice Chien and Winston Dang (left) accompanied Bradham and Ozkaynak on a site visit to Guandu, where naturally occurring arsenic is a concern in rice fields.
Immediate past president Jimmy Huang offered the following brief summary of TMU Toastmasters in its first generation:

*In TMU Toastmasters, we always strive to provide you the environment to practice English public speaking skills regularly.*

*In our first year, we have many overseas students joining our meetings. This can not only let us know each other’s cultures and languages, but also help us cultivate a wonderful environment to learn English communication with each other.*

As a charter member and frequent language evaluator at TMU meetings, I can actually say that despite the club’s short history, the meetings are run better than ones I’ve attended at National Taiwan University. The club, whose paid membership is now 26 and regular attendance is about the same, maintains websites and a Facebook page.

Having hosted a Japanese Toastmaster who is taking the public speaking group to help inmates in his country and Mongolia, the TMU club is volunteering to hold a demonstration meeting at a juvenile detention facility in Tucheng in June so that the prison staff can become supportive of Toastmasters for the kids to benefit.

The club has had pleasure outings to Danshui and a Halloween costume party. The charter ceremony was attended by TMU President Yun Yen as well as the immediate Past President of the global organization, George Yen. District Governor Eric Liang, Education Governor for Taiwan Caroline Kiang, M2 District Governor Victoria Wang, and Paul Sharp of TGIF and Mike Yang of China Toastmasters all joined the club to celebrate its successful chartering of a chapter of the world’s largest voluntary organization.

And the humorous speech contest was a hoot – proving that cross-cultural understanding benefits when we try to make others laugh. The winning humorous speeches were:

- **3rd place:** Louix Chua from Hong Kong: “Masculine or Feminine?”
- **2nd place:** Xiao Hai-Ji, “Selfies”
- **1st place:** Annie Huang, “Mr. Slow”
Six years of Taiwan Medical Mission in Sao Tome lead to new TMU gift shop selling world’s rarest beans

By George Chiu

Take a sip of rare São Tomé Coffee and taste a partnership that reaches around the world. This excellent brew is from one of the world’s smallest coffee producers, and TMU is very proud to be able to sell a small quantity of this scarce crop through the new TMU Store online (https://www.tmushop.org/bin/home.php—also check the website for logo merchandise and craft items from our African partners).

São Tomé and Príncipe is a small nation that enjoys warm official relations with Taiwan. Its two main islands lie off Africa’s northwestern coast like emeralds sitting on the sea.

São Tomé coffee tastes rich and sweet because of the perfect balance of volcanic soil nutrients and mountain farming conditions.

Although São Tomé residents share this beautiful landscape and an optimistic, hospitable culture, many people lack comprehensive health care because the nation has insufficient medical resources.

Since 2009, the Taiwan Medical Mission Team sent by Taipei Medical University to São Tomé and Príncipe has provided warm and enthusiastic medical support services to help the people of this very special land. The mission team has expanded its work to include routine services as well as bringing in physicians with different specialties to serve more people.

Other Taiwan projects improving the health situation include a telemedicine examination program and research addressing the problem of parasites afflicting schoolchildren. These different approaches and services of the Taiwan Medical Mission Team have nurtured a successful diplomatic relationship between Taiwan and São Tomé and Príncipe.

São Tomé and Príncipe is located many miles offshore from Africa’s northwestern coast. This location brings problems with logistics and transport affecting medical facilities and resources to meet health care demands. Sometimes life-saving treatments are not available for patients with urgent or serious illness; preventive care and screening services also are lacking.

For this reason, since March 2010, the Taiwan Medical Mission Team has built up a telemedicine program to conduct health care consultations and meetings periodically to discuss ways to treat patients with serious medical conditions.

Several children who suffered from serious burns were transferred to Taiwan for expert care and reconstructive surgeries. These cases gathered widespread public support in Taiwan that showed our nation’s compassion.

Seeking to continue this relationship between São Tomé and Príncipe and the Taiwan Medical Mission Team and expand its benefits with upgraded medical technology, the Dr. Ayres De Menezes Hospital and Taipei Medical University recently signed an agreement regarding a new emergency room and its staffing. This provides for emergency care training programs combined with new hardware systems to improve service quality.

These training programs greatly strengthen the small nation’s local health care workforce and demonstrate Taipei Medical University’s caring and professionalism.
Big news: TMU opens two new colleges and hospital

Since 2010, TMU has had seven colleges. But this August we will have a ceremony to welcome two important new divisions that will house our new faculties of Medical Engineering and Management.

Engineering is an important approach to unite the health sciences and basic research, and specifically to link engineering technologies and clinical medicine. This will help us to develop biomedical materials, treatment equipment, tissue regeneration technologies, nanotechnologies and photoelectronics applications. We will use these innovations to enhance medical treatments and cure diseases.

Our expansion into the sphere of management is equally promising. We will seek better integration of the resources of our university and its hospitals. As we coordinate our management to reflect a more diverse set of strategies and a wider knowledge base, we can improve our clinical services quality and promote our innovations.

With these two colleges, we can better face a dramatically changing health care environment and the intensely competitive world of research and biotechnologies. The visions of these managers and engineers will lead to optimal integration of our resources for excellence.

Our central educational mission will also benefit those who hire our graduates, as we are nurturing and cultivating staff who can produce useful strategies that lead to better practice, allowing both our university and their future employers to compete with the best worldwide.

Please see page six for the full story about TMU’s management team that will run a new hospital in Ningbo, China. This is not only a milestone for our university: it also marks the first time a private international management team has been chosen to lead a public hospital by the Chinese government. This distinction reflects our hospitals’ high standards and global reputation for quality care.

After five years, our magazine is also changing, as it is moving from International Office management to the Publications Section. So readers can look forward to a new design and other changes in our December issue.

TMU’s soccer team sweeps fifth Medical Championship

By Yankuba B. Manga, TMU doctoral student

The TMU football team will never disappoint our fans. This April was the third time TMU played in Taipei Arena (Municipal Stadium) for the Third-Level Universities Championship. In 2011 our first encounter against Tamkang University ended in a 2-1 loss. This year was a revenge match, and we beat TKU 2-0. This win means our second time as crown Champions of this university league. The first time we won this title was against National Taiwan University of Science and Technology in 2013.

Praise is due to all the coaches, players, great sponsors and supporters of TMU Soccer Team. Last and foremost, congratulations to all of our international student players, who have shown great performance on the field and off.

Proof of this is that these players also have claimed the title in the Taiwan Medical Universities Championship five times in a row, from 2010 to 2015.