Abstracts of UP Diliman's Registered Intellectual Properties

TECHNOLOGY TRANSFER is one of the major programs through which UP Diliman facilitates the dissemination of its research and creative work outputs. Within the framework of the Revised Intellectual Property Rights (IPR) Policy of the University of the Philippines and the country's Technology Transfer Act, the University assists researchers and creative workers in the protection, licensing, patenting, copyrighting, commercialization and/or deployment of their works. Tangible achievements along these lines are showcased through the registered intellectual properties of UP Diliman that are described in this section. The registered IPs include:

Patents and Utility Models

• **CoaTiN®** (Titanium Nitride Thin Film Formation on Metal Substrate by Chemical Vapor Deposition in a Magnetized Sheet Plasma Source)	Henry J. Ramos
• **1P-OBIC** (Method for Generating High-Contrast Images of Semiconductor Sites via One-Photon Optical Beam-Induced Current Imaging and Confocal Reflectance Microscopy)	Caesar A. Saloma, Jelda Jayne C. Miranda & Vincent Ricardo M. Daria
• **2-Photon** (Two Color (Two Photon) Excitation with Focused Excitation Beams and a Raman Shifter)	Caesar A. Saloma, Jonathan A. Palero & Wilson O. Garcia
• **RTE Cooked Rice** (Retrogradation-resistant Shelf-stable Cooked Rice)	Ma. Patricia V. Azanza

Patent Pending

• **Moblocks®** (Time-Sensitive Assimilation Device for Use in Tangible User Interface (TUI) Devices)	Michael L. Abundo, Luther Paul D. Caranguian, Carlos Primo C. David, Josef Karlo S. Diaz, Luis G. Sison & Pablito Tolentino Jr.
• **Oral Vaccine** (Clay Microencapsulation of Non-Infective Pathogens for Oral Vaccine Development)	Anacleto M. Argayosa, Chelo S. Pascua, Florentino C. Sumera, John Anthony D.L. Yason & Alpha Rae M. Espigar
• **Bioactive Coating for Stents** (Bioactive Coating for Intravascular Drug Eluting Stents and Implantable Medical Devices Using Carrageenan-Chitosan- Hyaluronan Complex)	Jhalique Jane R. Fojas

• **Algal Bloom Detection Kit** (A Gamma-based Receptor Binding Assay for In-site Monitoring of Paralytic Shellfish Toxins)	Lourdes J. Cruz, Elvira Z. Sombrito & Aileen L. de Leon
• **Amebiasis Kit** (Rapid and Accurate Detection Kit for Amebiasis Patients through Salivary IgA)	Windell L. Rivera, Angeline Odelia C. Concepcion & Alexander Edward Dy

For Patent Application

• **RTE Noodles** (Retrogradation-resistant Ready-to-eat (RTE) Asian noodles)	Ma. Patricia V. Azanza, Kristia May T. Marte & Maria Lorina C. Morales
• **MotesArtXP** (MotesArtXP: Wireless Sensor Networks for Monitoring Temperature and Relative Humidity in Art Spaces)	Ian Christopher Tolentino, Robin Christian S. Juson, Bernard James Tan, Marc Caesar R. Talampas, Luis G. Sison & Maricor N. Soriano

Trade Secrets, Trademarks, Service Marks, and Copyrights

• **Pyrodinium Culture** (Development of Semi-Commercial Scale (Tank Culture) of Pyrodinium for Neosaxitoxin and Saxitoxin Production)	Rhodora V. Azanza & Lourdes J. Cruz
• **Seamoy®** (Seaweed-Based Air Freshener Gel)	Marco Nemesio E. Montaño & Banaag Glorioso-Lajera
• **UP Sablay** (UP in Alibata Characters and Device)	Carmen G. Diaz de Ventanilla, Antoinette B. Hernandez, Rogelio L. Juliano Jr., Virginia D. Monje, Consuelo J. Paz & Abraham P. Sakili

Industrial Designs

• **LUAL –** Kiln Firing as Art and Metaphor of Birthing	Ma. Rita Badilla-Gudiño
• **Takeaway Packaging System** (Greener Fast Food Packaging in the Philippines)	Patricia T. Mallare

CoaTiN™: TiN Coating Technology (Titanium Nitride Thin Film Formation on Metal Substrate by Chemical Vapor Deposition in a Magnetized Sheet Plasma Source)

Henry J. Ramos

The invention relates to a titanium nitride film chemical vapor deposition process on metal substrate using a magnetized sheet plasma source. Interest in new coatings and surface treatment methods has been on the upsurge during the last decade of the 1990s, especially for titanium nitride (TiN). A TiN film is a remarkably hard and wear-resistant coating on tools since it decreases the rate of abrasive wear during the cutting process as well as the chemical interaction between the tool and the work piece because of its chemical inertness. Several techniques such as chemical vapor deposition, physical vapor deposition, ion plating, ion beam-assisted deposition, sputtering, and hybrid processes have been used to prepare TiN films. The films produced by these techniques, however, often exhibit poor adhesion to the substrate, require high deposition temperature, need a relatively long duration of time for thin film formation, and cover a limited substrate surface. The present invention surmounts these problems through the discovery of a deposition process where: a) there is no heating mechanism introduced, b) the synthesis of the film is relatively short, and c) the synthesis can be done over a wide area of substrate surface, without sacrificing the quality of the film. Although the invention demonstrates the capacity of synthesizing titanium nitride for small-sized samples, the wide area plasma could very well serve the coating of larger samples. (Source: CoaTiN® Patent Document)

This invention was granted patents in the Philippines (Patent No. 1-2004-502138 issued on 5 November 2009), the United States (Patent No. 7,438,955 issued on 21 October 2008), Japan (Patent No. 4481657 issued on 26 March 2010), Europe (Patent No. 1485516 issued on 24 August 2011), and Malaysia (Patent No. MY-148608-A issued on 15 May 2013).

1P-OBIC Microscopic Imaging for Semiconductor Sites (Method for Generating High-contrast Images of Semiconductor Sites via One-photon Optical Beam-induced Current Imaging and Confocal Reflectance Microscopy)

Caesar A. Saloma
Jelda Jayne C. Miranda
Vincent Ricardo M. Daria

This invention relates to a method of precisely determining the location of defects in an integrated circuit (IC). The invention, in one broad sense, is about the discovery that exclusive high-contrast images of semiconductor sites can be generated quickly and accurately from the 1P-OBIC image and the confocal reflectance image which are obtained via one and the same excitation beam that is focused on the IC sample. The process makes use of the fact that: (1) confocal images are optically-sectioned images while 1P-OBIC images are exclusive low-contrast images of semiconductor sites, and (2) both the confocal image and 1P-OBIC image are produced with an optical beam. (Source: 1P-OBIC Patent Document)

Because the method can produce two images in a single scan, there is no need for separate imaging instruments, thus making 1P-OBIC microscopic imaging significantly less expensive than commercial failure detection facility.

This invention was granted patents in the Philippines (Patent No. 1-2005-500056 issued on 23 November 2007) and the United States (Patent No. 7,235,988 issued on 26 June 2007).

2-Photon (Two-color, Two-photon Excitation with Focused Excitation Beams and a Raman Shifter)

Caesar A. Saloma
Jonathan A. Palero
Wilson O. Garcia

This invention relates to a method for inducing highly localized light absorption in materials via two-color (two-photon) excitation (2CE). The invention, in one broad sense, is the discovery that two-color (two-photon) excitation with focused beam(s)

may be achieved with a Raman shifter. The process makes use of the fact that the Raman shifter could act as the light source for all the excitation wavelengths (l_1,l_2) that are needed in two-color excitation. This work provides a promising first step towards the realization of a practical 2CE microscope. The Raman shifter is a versatile excitation light source for 2CE. It is inexpensive and simpler to construct and operate than a dye laser which requires a cavity resonator, a spectrometer for spectral tuning, and a dye regulator assembly. With a Raman shifter, the optimal conditions for spatial and temporal overlap between the two excitation pulses is achieved without great difficulty unlike in set-ups where l_1 and l_2 are obtained from two different light sources. (Source: 2CE Patent Document)

This invention was granted patents in the Philippines (Patent No. 1-2005-500584 issued on 15 July 2008) and the United States (Patent No. 8,227,256 issued on 24 July 2012).

RTE Cooked Rice (Retrogradation-resistant Shelf-stable Cooked Rice)

Ma. Patricia V. Azanza

During calamities, people sometimes have to be evacuated to safety in evacuation centers. Evacuees could stay for days in these centers. These places usually do not have adequate cooking equipment, and evacuees usually rely on ready-to-eat canned goods, biscuits, or "instant noodles" from disaster-relief agencies for their meals. In military field operations, Filipino soldiers do not risk their lives by giving away their position to the enemies via the smell and smoke from cooking. As such, they also rely on ready-to-eat food. However, these foods are usually not nutritionally adequate for a whole day's meal, let alone a single meal.

This invention provides a novel solution to the aforementioned problems by producing cooked rice or *kanin* that is shelf-stable for several months without being subject to retrogradation or firming, while still exhibiting the characteristics of newly-cooked rice even without the reheating step. The invention relates to pouched acid pasteurized cooked milled rice product that is resistant to retrogradation during storage at ambient conditions for three months. Resistance to retrogradation of the treated product is attributed to the synergistic effects of the

use of acidic carbohydrates, incorporation of cooking oil, and selection of rice cultivar that belongs to low apparent amylase content.

This invention is registered as Philippine Utility Model No. 1-2011-000008 issued on 3 October 2011.

Moblocks® (Time-sensitive Assimilation Device for Use in Tangible User Interface (TUI) Devices)

Michael L. Abundo
Luther Paul D. Caranguian
Carlos Primo C. David
Josef Karlo S. Diaz
Luis G. Sison
Pablito Tolentino Jr.

Moblocks® is a fun, educational toy for mission-based games and creative play. It teaches direction and orientation, strategic planning and basic programming through a series of story missions and problem solving adventures. It aims to develop an embedded system for Mobile Robot (mobot) Control-based on Tangible User Interface (TUI). The system is composed of a mobot, wooden blocks, a tray and a play area. The blocks represent the instructions to the robot. The tray has slots for four blocks and sensors to detect the sequence of blocks. It commands the robot over a wireless link.

Moblocks® appeals to the senses. All parts of its playset are real and tangible objects. Compared with manipulating elements on a computer screen, kids go through a direct and experiential learning. It also promotes critical thinking and problem-solving skills when kids sequentially program the robot. In remote control cars, kids can simply employ trial-and-error to drive the car to a target location. But in Moblocks®, kids learn to strategize by thinking ahead and planning before making the robot move.

A Philippine patent application has been filed for this invention (Application No. 1-2009-000107; patent pending). Moblocks® is a registered trademark with Registration No. 4-2008-002702.

Oral Vaccine (Clay Microencapsulation of Non-infective Pathogens for Oral Vaccine Development)

Anacleto M. Argayosa
Chelo S. Pascua
Florentino C. Sumera
John Anthony D.L. Yason
Alpha Rae M. Espigar

As with any type of farming, aquaculture's viability and profitability depend on the volume and quality of the yield. This requires, among other things, that the fish be free from illnesses, in order to avoid fish deaths that in turn will reduce harvest. Some factors that cause diseases in fish are poor water quality, high density (overcrowding), high water salinity, and the presence of predators such as snails and birds. There are available vaccines to prevent diseases, which are administered to the fish either by injection, immersion, or oral administration. Administration by injection is a tedious task because it requires a lot of time and effort, and may even cause stress to the fish. On the other hand, immersion allows fingerlings to be vaccinated at an early stage but it is still a more tedious process when compared to oral vaccination. However, the problem with current oral vaccines in the market is that they are known to be less effective than the other methods since the protection they provide is only short-term.

The current invention involves a process that yields an oral a vaccine for fishes that provides both long-term immunization for the fish and ease of administration for the farmers. The process enhances the effectiveness of the oral vaccine through the clay microencapsulation of the antigen. The clay protects the antigen so that it is still intact when it reaches the fish's hind gut, where immunization takes place more effectively. The vaccine can be incorporated into fish pellets to make administration easier.

While the invention's initial application is for fish vaccine development, the inventors' research also showed that it may be applicable for use in shrimps and even other animals. More importantly, the invention has the potential for use in human vaccine development.

This invention won 1st place in the 2013 Ambassador Alfredo M. Yao Intellectual Property Awards organized by the Philippine Chamber of Commerce and Industry

in collaboration with the Intellectual Property Office of the Philippines and the Department of Science and Technology.

A Philippine patent application for this invention has been filed on 30 August 2013 (Application No. 1-2013-000256; patent pending).

Bioactive Coating for Stents (Bioactive Coating for Intravascular Drug Eluting Stents and Implantable Medical Devices Using Carrageenan-Chitosan- Hyaluronan Complex)

Jhalique Jane R. Fojas

The number of heart disease cases in the Philippines is on the rise, and heart ailment is one of the leading causes of deaths in the country. While there are no data on angioplasty procedures in the country, the cost of a vascular stent, let alone a procedure, is no doubt high. Although health insurances, both from the private and government sectors, are available, they might not be sufficient to cover the cost of procedures and treatments for heart disease. A more affordable stent will therefore offer financial relief to heart patients. The main purpose of the invention is to produce a bioactive coating for intravascular stainless steel stents and stainless steel implantable medical devices using a polymer complex of Carrageenan-Chitosan- Hyaluronan.

The bioactive coating synthesized with the layer-by-layer self-assembly method using carrageenan, chitosan, and hyaluronan is an improvement of the coating process for metal using bioactive polymers and existing stainless steel stent products. Moreover, the biopolymer coating is capable for drug encapsulation and release. The final product is characterized as biocompatible and hemocompatible, anti-neoplastic, anti-inflammatory and capable of drug elution that can help in healing the damaged area.

A Philippine patent application has been filed for this invention on 17 December 2013.

Algal Bloom Detection Kit (A Gamma-based Receptor Binding Assay for In-site Monitoring of Paralytic Shellfish Toxins)

Lourdes J. Cruz
Elvira Z. Sombrito
Aileen L. de Leon

Paralytic shellfish poisoning (PSP) is among the contamination problems that greatly affect the waters worldwide. Hence, there is a high demand for a sensitive and specific method that can be easily used in field laboratories for the efficient monitoring of paralytic shellfish toxins.

Algal Bloom Detection Kit is a novel gamma-based assay system that enhances the utilization of the radioactivity-based receptor binding assay (RBA) technology by expanding its application for field/on-site monitoring of the paralytic shellfish toxins, such as saxitoxin. Detection by the assay is achieved through the use of more common, portable, and cheaper materials and counting equipment. Regional and provincial agencies, especially in developing countries with no means to establish and maintain a central lab RBA facility, will largely benefit from the technology, since the system can be promptly deployed to affected remote sites, with only a provisional laboratory as requirement.

A Philippine patent application has been filed for this invention on 16 October 2013.

Amebiasis Kit (Rapid and Accurate Detection Kit for Amebiasis Patients through Salivary IgA)

Windell L. Rivera
Angeline Odelia C. Concepcion
Alexander Edward Dy

Worldwide, deaths due to amebiasis may reach up to 100,000 annually. The infection is prevalent in areas where proper sanitation systems are lacking. In the Philippines, prevalence rate is between 2% and 8%. Current diagnostic tools for amebiasis all require stool samples, which are inconvenient to acquire and may even cause further

contamination. One of these methods, stool microscopy or fecalysis, yields results within hours of submitting a sample but requires a no-meat diet of three to four days. Other diagnostic methods have no dietary requirements and also provide results in a matter of hours; however, they are more expensive than stool microscopy.

The present invention features an Amebiasis Kit that provides a more convenient and a cheaper tool to diagnose amebiasis infections. The Kit only requires saliva samples rather than stool samples from patients. It is also self-contained and results can be visualized in about 3.5 hours. The Kit has a sensitivity of 94.1% and specificity of 97.6% with an overall diagnostic accuracy of 98% when compared with Polymerase Chain Reaction. Its cost is much cheaper than other *E. histolytica* detection kits currently available in the market.

A Philippine patent application has been filed for this invention on 28 November 2008 (Application No. 1-2008-000437; patent pending).

RTE Noodles (Retrogradation-resistant Ready-to-eat (RTE) Asian noodles)

Ma. Patricia V. Azanza
Kristia May T. Marte
Maria Lorina C. Morales

The invention relates to a process of producing pasteurized ready-to-eat (RTE) cooked Asian noodles comprising mung bean and rice-cornstarch noodles, which are resistant to retrogradation and shelf-stable during storage at ambient temperature for two months. Moreover, they do not do not require further cooking, reheating, or hot water hydration. Retrogradation control is attributed to the synergistic action of a mixture of humectants, oils, and acids added during the steeping and cooking of noodles.

A Philippine patent application will be filed for this invention.

MotesArtXP (MotesArtXP: Wireless Sensor Networks for Monitoring Temperature and Relative Humidity in Art Spaces)

Ian Christopher M. Tolentino
Robin Christian S. Juson
Bernard James Tan
Marc Caesar R. Talampas
Luis G. Sison
Maricor N. Soriano

Manual monitoring of an area's microclimate is tedious, in that a person needs to periodically take readings at multiple points in an area at certain time intervals. An alternative would be to use dataloggers, which are devices equipped with sensors, memory, and a power source. They are usually deployed at certain points in an area, left for some time, and collected afterwards. Though this approach is less tedious than manual monitoring, the readings it provides are not real-time. Dataloggers typically have limited battery life, which also limits the amount of time that they can be deployed in an area. Both manual and automatic monitoring using dataloggers can be expensive in terms of time and equipment cost.

MotesArtXP allows a user to measure and monitor the microclimate of an area automatically, unobtrusively, and in real-time. Since it employs power optimization schemes, the monitoring period is longer than that can be achieved by using dataloggers. MotesArtXP also allows the monitoring of more points within an area than that can be monitored by using dataloggers for the same price.

A Philippine patent application will be filed for this invention.

Pyrodinium Culture (Development of Semi-commercial Scale (Tank Culture) of Pyrodinium for Neosaxitoxin and Saxitoxin Production)

Rhodora V. Azanza
Lourdes J. Cruz

Saxitoxin is a neurotoxin responsible for Paralytic Shellfish Poisoning (PSP) that is prevalent during algal blooms or "red tides". Analysts require purified saxitoxin samples to calibrate test used to measure seawater toxin levels and shellfish toxin concentrations. However, aside from its use in chemical analysis, saxitoxin is considered a Schedule 1 substance by the Chemical Weapons Convention. As such, export and import of the product is limited, and these trade restrictions are causing the decrease of available saxitoxin as calibration chemicals used for algal bloom monitoring and water safety analysis.

In this invention, laboratory maintained strains of *Pyrodinium bahamense* var. *compressum* are used to produce *Pyrodinium cells* for semi-commercial scale production of neosaxitoxin and saxitoxin. The product is used strictly for chemical analysis and calibration of PSP Assays, as well as for saxitoxin research.

Pyrodinium Culture is protected as a trade secret.

Seamoy™: Seaweed-based Air Freshener

Marco Nemesio E. Montaño
Banaag Glorioso-Lajera

Many air fresheners contain substances that are harmful to the nervous system and respiratory tract. They can cause nausea, vomiting, dizziness, watery eyes, and chest pain. Thus, healthier and natural alternatives to commercial air-fresheners are needed.

Seamoy™, a seaweed-based air freshener, uses a minimal amount of chemicals and does not generate any hazardous waste. It makes use of whole seaweeds as base, instead of the extracted polysaccharide, thus reducing production costs. Although the gel produced using the whole dried seaweed is not translucent in form, the gel strength remains the same as that of the carrageenan-based gel.

The base allows a slow release of the essence, thus prolonging the air freshener's shelf life. Its residue is biodegradable, thereby making the product environment-friendly. The addition of citric acid inhibits microbe growth. The freshener also has anti-clogging properties, which makes it appropriate for use in rooms with air-conditioning units. Finally, unlike the fresheners commercially available, Seamoy™ can be divided into shapes and sizes for easier packing and utilization.

Seamoy™ is protected as a trade secret and is a registered trademark.

UP Sablay (UP in Alibata Characters and Device)

Carmen G. Diaz de Ventanilla
Antoinette B. Hernandez
Rogelio L. Juliano Jr.
Virginia D. Monje
Consuelo J. Paz
Abraham P. Sakili

The UP Sablay is the official academic costume of the University of the Philippines. The Sablay uses the official colors of the University, maroon and green, as well as yellow gold, which stands for high standards of values and excellence. The colors, based on the Pantone ProSim color chart, are Pantone 195 CVP (maroon), Pantone 349 CVP (green), and Pantone 138 CVP (yellow gold).

The name of the University is represented by the indigenous letters ᜓ and ᜉ, originating from the indigenous alphabet called *baybayin* or *katitikan*, which are equivalent to the Roman letters U and P, respectively. The curvilinear design called *ukkil* or *ukit,* which resembles a sprouting plant, signifies life. The geometric designs (in zigzag and diamond patterns) are common design elements gracing the attires and functional objects of indigenous peoples from Batanes to Tawi-tawi. Arranged continuously and rhythmically, these geometric designs highlight the diverse cultural communities in the Philippines and the University's pursuit of knowledge, cultural enrichment, and scientific advancement.

The UP Sablay is a registered copyright since 2002. It is also a registered service mark with Registration No. 4-2002-0010939 issued on 26 April 2006.

LUAL – Kiln Firing as Art and Metaphor of Birthing

Ma. Rita Badilla-Gudiño

Having experienced firing and birthing, the artist was convinced that a consonance exists between the two processes. In ceramic art, the ceramic pieces are the artworks. The process that leads to the production of these objects is conventionally considered as expedient to the form, but not the form itself. However, in light of the contemporary notions that process can also be formed, the artist was stimulated to pursue an assertion that a kind of kiln firing can be created and framed as the art itself, because it is the embodiment of its metaphorical relation to birthing. Kiln art is relatively new in the field of international ceramic arts. In the small local community of potters and ceramic artists, no one has pursued kiln art. This knowledge provided an artistic challenge and a heuristic opportunity for the artist.

LUAL is made from clay, shaped into a sculptural kiln in the form of a birthing woman. It was fired inside KUMOT Kiln, a removable kiln that was customized to transform LUAL from a clay sculpture to a ceramic kiln structure. While LUAL is being fired, it is simultaneously firing SIBOL, the sculptural clay babies with human and plant features into ceramic sculptures. Thus, the firing of LUAL utilizes a double kiln design concept.

LUAL is a registered industrial design.

Takeaway Packaging System (Greener Fast Food Packaging in the Philippines)

Patricia Ann T. Mallare

Packaging plays an integral role in anything that we do. We interact with it every day. It protects the products that we buy. It ensures that these products will not be contaminated; likewise, it increases the products' shelf-life. In turn, it protects us from harmful toxins that can get to us through the products we purchase. Packaging therefore, in any shape or form, affects our lives directly and indirectly.

Like everything else around us, packaging needs to be linked with the 'green' lifestyle. This means that the environmental impact of the packaging system – from its

production, which includes material selection and processing, to its disposal – needs to be considered.

This project developed an eco-friendly takeaway packaging system for local fast food chains. The design features a new clamshell system and takeaway strap made from paper-based materials. A reusable strap made from recycled plastic is introduced to encourage customers to reuse it for another takeaway order. This new design addresses compliance to the ban on plastic and Styrofoam packaging, and promotes a greener lifestyle among Filipinos.

The takeaway packaging system is a registered industrial design.