Joint Event on

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International Conference on

PHARMACEUTICAL CHEMISTRY & DRUG DISCOVERY

&

Global Congress on

TOXICOLOGY AND PHARMACOLOGY

September 10-11, 2018 | Dublin, Ireland

DAY 1

Keynote Forum

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Larisa Klapshina, Asian J Biomed Pharmaceut Sci 2018, Volume 8 | DOI: 10.4066/2249-622X-C2-004

Larisa Klapshina
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Biography

Larisa Klapshina has received her PhD from Razuvaev Institute of Organometallic Chemistry of Russian Academy of Sciences, IOMC RAS (Nizhny Novgorod, Russia). Currently, she is a Senior Researcher at IOMC RAS. She and her group work in organic and organometallic synthesis and functional materials in biophotonics and biomedicine. She is author of about 100 articles.

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Note:

MULTIFUNCTIONAL ANTICANCER DRUGS FOR PERSONALIZED MEDICINE BASED ON CYANO-ARYL PORPHYRIZING PIGMENTS: EFFICIENT PHOTOSENSITIZERS IN PDT AND NEW TYPE OF FLUORESCENT MOLECULAR ROTORS FOR REAL-TIME MONITORING OF PDT TREATING

For a long time, the idea of separated diagnostic and therapeutic approaches was predominant in the development of new drugs in medicine. However, recently a significant increase has been observed in the trend to create the drugs which effectively combine diagnostic and therapeutic approaches. The development of multifunctional agents which allows effective therapy and non-invasive real-time monitoring of individual therapeutic response to the treatment procedure is an important challenge for modern pharmaceutical chemistry. Here we report the new series of novel aryl-cyano porphyrazine pigments containing heteroatoms (O, N, S) in the aromatic groups in the peripheral frame of macrocycle. We established that design of aryl substituents framing macrocycle provides a fine-tuning of photophysical and photodynamic properties of cyano-aryl porphyrazine pigments. *In vivo* experiments showed selective accumulation of porphyrazine in tumor that was indicated by higher fluorescence intensity in the tumor area in comparison with the normal tissues. High efficiency of cyano-aryl porphyrazine free bases as photosensitizers had been demonstrated by experiments *in vivo* on PDT of the CT26 tumors. Moreover, this series of tetrapyrroles showed the strong dependence of the fluorescence parameters (quantum yield and fluorescence life time) on the local viscosity. Such the dyes termed fluorescent molecular rotors (FMR) are very promising agents for optical sensing of intracellular viscosity. Since viscosity and diffusion rate in the domains of live cells define functional state of cells such the sensing allows, in principle, real-time monitoring of the tumor response to therapeutic procedure. We first proposed theoretical model describing the FMR properties of novel porphyrazine series as the unique example of FMR photophysical behavior originated within porphyrazine annular structure. The model is based on the twisted intramolecular charge transfer (TICT) mechanism upon photoexcitation and arises from segmental mobility of several potentially rotatable π-donor aryl groups which alternate with strongly electron withdrawing CN-groups. We believe that innovative cyano-aryl porphyrazines we developed are very promising for personalized medicine as photosensitizers in PDT with additional function of real-time optical monitoring of the tumor response to PDT treatment.

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Biography

Yu-Cheng Kuo is a Chinese Medical Doctor, Assistant Professor and Editor in *Chief for Journal of Applied Sciences and Research.* He is also the Master of Pharmacology and the PhD holder of Electric Engineering in Biomedical field. He teaches Pharmacology in Taipei Medical University and pulse diagnosis in Chinese Medicine University in Taiwan. Since 2007, he has always been invited to give speech in the international conference for the research of pulse diagnosis and scientific modernization of Chinese Medicine. Meanwhile, he applied these studies to new drug development and invested a biomedical company– Nature Wise which owns the specific HDAC8 inhibitors and can pass the blood brain barrier.

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Note:

MERIDIAN ON PHARMACOLOGY AND NEW DRUG DEVELOPMENT

Compared to conventional western medicine based on anatomy and chemistry particles, traditional Chinese medicine physicians practice clinic following "Chi". What is "Chi"? After 25 years study of pulse diagnosis, we defined it as wave or periodic signal. Under this definition, we could recognize the reality of meridians or harmonics between time and frequency domain phenomenon with Fourier transform. Moreover, we could discover the basis of Chinese Medicine based on the mathematics and physics of meridian. With second harmonic generation law and the energy conservation law on meridians, we proved the core mathematic property and philosophy of the Chinese five elements theorem. From the balance of the forces on the artery wall by Newton's law of mechanics, we derived the radial resonance equation to describe the physical property of the blood pressure wave propagation and transmission in the arteries. Meanwhile, radial resonance theorem explains the physiology of circulation system and builds up the basis of pulse diagnosis on meridians. Based on the results obtained from both animal and clinical experiments, we verified the pulse diagnostic method on meridians recorded in medical literature classic and designed a pulse apparatus according to this meridian principle. Through the pulse diagnostic apparatus, we could map the meridians to harmonics and quantitatively analyze the pathological excess or deficiency of the meridians including the five zang-organs and six fu organs of the patient (pathological matrix). In addition, a series of pharmacology research analyses of acupuncture, Chinese herbs, herbs prescription formula and western drugs on the reinforcing or reducing effect of meridians were being carried out. Even laser acupuncture could be found the effects on harmonics or meridians which described as VAS or resonance therapy in Europe. On the other hand, with matrix operation on harmonics, we were able to simulate the whole make up meridian function of a prescription formula which is composed of several herbs (pharmacological matrix). In clinic, we found that the pathological indicator on meridians-HCV (coefficient of variations of harmonics magnitude) could quantitatively reflect the severity of diseases and evaluate the outcome of patients. From health to death, life struggles between convergence and divergent of negative entropy revealed by the HCV of meridian. Combining the HCV, the pathological and pharmacological inverse matrixes, we developed an algorithm for the AI system to give prescription following the Chinese Medicine Bible: Shang Han Za Bing Lun, such as the white tiger and green dragon formulae. This is also the basis to give acupuncture or laser acupuncture prescription. With Meridian theory, we discovered a series of compounds from Cnidii Fructus which a simplest herb formula is described in Shang Han Za Bing Lun. Including BMX, these compounds have been identified as HDAC8 inhibitor. Meanwhile, we developed these compounds guided by the meridian effect on liver and gallbladder which dominate the blood perfusion of brain recorded in Chinese Medicine classic literature. As we expected, BMX passes through BBB (blood brain barrier) in our study. These results provide confidence to us for brain cancer therapy and completed USFDA pre-IND meeting this year. As light, life and medicine owns the duality of particle and wave.

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Robert P Bianchi
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Biography

Robert P Bianchi is currently the President and Chief of Scientific and Technical Affairs at the Prescription Drug Research Center, Bradenton, FL. He is a retired laboratory Director for the Drug Enforcement Administration after 34 years of federal service, where he held increasingly responsible positions as an Analytical Chemist for the FDA and DEA to the Chief of DEA's Laboratory Operations Section. He was also Director of the DEA Special Testing and Research Laboratory where extractability experiments were conducted more than 20 years ago. Since 2005 he has been working with the pharmaceutical industry and FDA on developing *in vitro* protocols to evaluate abuse deterrent formulations and has been actively involved in sharing his experience with the regulatory, treatment, pharmaceutical abuse and law enforcement community. He has provided drug related consultations to more than 30 organizations/companies concerned about OTC and prescription drug abuse and has made numerous presentations to the regulatory, treatment, pharmaceutical, abuse and law enforcement communities.

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GOVERNMENT AND INDUSTRY RESPONSE TO THE US OPIOID EPIDEMIC

Prescription drug abuse has been declared an epidemic in America by the Centers for Disease Control and Prevention. According to the National Safety Council Prescription Nation 2016, the United States makes up 4.6 percent of the world's populations but consumes 81 percent of the world supply of oxycodone. The FDA is responsible for protecting the public health by assuring the safety, efficacy and security of human and veterinary drugs while assuring patient access. This is a responsibility shared with the pharmaceutical industry, treatment facilities, educational institutions, and federal, state and local law enforcement agencies. FDA is also responsible for advancing the public health by helping to speed innovations that make medicines more effective, safer, and more affordable and by helping the public get the accurate, science-based information they need to use medicines and foods to maintain and improve their health. Toward that end, the FDA issued guidance for industry in April 2015 under the title, abuse-deterrent opioids-evaluation and labeling, which contains the following statement: the goal of the laboratory-based studies, category should be to evaluate the ease with which the potentially abuse-deterrent properties of a formulation can be defeated or compromised. The FDA also issued draft guidance for industry in March 2016 (finalized November 2017) the general principles for evaluating the abuse deterrence of generic solid oral opioid drug products. This presentation will discuss abuse deterrent technology currently approved or in development and the required *in vitro* studies designed to evaluate extractability or tamperability. The FDA position on abuse deterrent delivery systems and the history of abuse deterrent opioid development will also be discussed. Studies on the efficacy of a new formulation to deter abuse will also be discussed.