



2nd Annual Meeting
of
The Good Practice in TCM Research
Association

中医药规范研究学会第二届年会

PROGRAM AND ABSTRACT BOOK

Graz, Austria
August 30, 2013
<http://www.cgcm2013.org>





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The Organizing Committee wants to express its gratitude to the following companies and institutions for financial support of the 2nd Annual Meeting of The Good Practice in TCM Research Association (GP-TCM RA):



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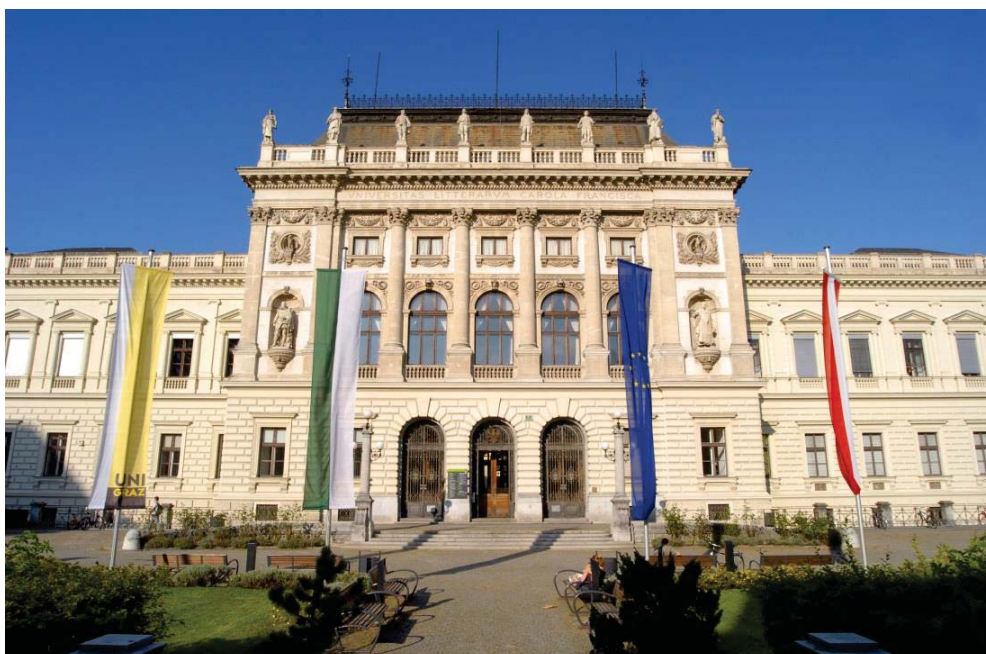
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PATRONAGE

Mag. Franz Voves, Governor of Styria
Mag. Siegfried Nagl, Mayor of Graz



PREFACES



Dear Participants of the 2nd Annual Meeting of The Good Practice in TCM Research Association!

On behalf of the Scientific and the Local Organizing Committees, and also as the current President of The Good Practice in TCM Research Association (GP-TCM RA), I want to welcome you in the charming city of Graz.

It is a great honour that the TCM Research Center Graz has been endowed with the organisation of the 2nd Annual Meeting of GP-TCM RA, and we are thankful that it can be hosted at Karl-Franzens-University.

The GP-TCM RA was officially launched in 2012, as a follow-up organisation of the EU-funded coordination action project dedicated to TCM research. The project resulted in recommendations on best practice issues related to various aspects of Chinese herbal medicine and acupuncture research, leading to state-of-the-art reports and guidelines published in an open access special issue of *Journal of Ethnopharmacology* (2012;140:455-643).

The GP-TCM RA aims to disseminate, validate and further develop these guidelines through continued interregional, interdisciplinary and intersectoral collaborations. It has recently achieved charitable status and has been entered onto the Register of Charities of UK. Membership of the Association is open to scientists and professionals who support the objectives and abide by the rules of the Association.

A major topic of this year's conference is TCM Research in Europe – opportunities and challenges. In addition to five invited lectures, the scientific committee has accepted six short lectures and 19 poster presentations. So we are looking forward to an interesting programme.

I want to thank the members of the local organising committee for their great engagement, and also the members of the scientific committee, as well as all sponsors, including the state of Styria, the city of Graz, and Karl-Franzens-University of Graz for their generous support.

We did our best to create a perfect meeting atmosphere and we hope that you will enjoy the conference.

A handwritten signature in blue ink, reading 'Rudi Bauer'.

Prof. Dr. Rudolf Bauer
President of GP-TCM RA



Dear participants of the 12th Meeting of the Consortium for Globalization of Chinese Medicine (CGCM) and the 2nd Annual Meeting of The Good Practice in TCM Research Association!

Chinese Medicine holds a unique treasure of knowledge with a global potential for the development of new medical treatments. It is a great pleasure for the University of Graz to host the 12th Meeting of the Consortium for Globalization of Chinese Medicine (CGCM) and the 2nd Annual Meeting of The Good Practice in TCM Research Association. Providing a platform for regulatory-industrial-academic exchanges and potential research collaborations, the CGCM is of great international importance.

In 2007, the TCM Research Center Graz was established as a joint institution by the University of Graz and the Medical University of Graz, concentrating on Herbal Medicine Research and Acupuncture Research. Recognizing the vital importance of international exchange, the scientists of the Center work together with research partners worldwide. Co-operations with Chinese institutions are naturally of great interest in the field of TCM. The Good Practice in TCM Research Association with its founding president Prof. Rudolf Bauer, pharmacist at the University of Graz, plays an active role in promoting joint projects of European and Chinese scientists.

I warmly welcome all participants of the two meetings at the University of Graz, which is the second oldest and second largest university in Austria. I wish you fruitful discussions as well as a good time in our beautiful city, the capital of the Province of Styria.

Univ.-Prof. Dr. Christa Neuper
Rector of the University of Graz



**Ladies and Gentlemen,
Dear members of the GP-TCM RA!**

A cordial welcome to Graz, the World Cultural Heritage City, the City of Human Rights and the City of Design!

All three titles have one thing in common: They are all connected to UNESCO. If we leave out the U-N and O, then it is about Education, Science, and Culture. We like to think that our city is built on these three pillars and that they are the backbones of our development!

Knowledge is power. Research and the resulting competitive edge form the basis for surviving in today's global competition. The ever growing body of knowledge, which is making it more and more difficult to gain an insight into and an overview of specialized fields, means that working in networks is indispensable. These networks between universities provide the foundation for world-class research.

However, networks are a significant factor for progress and development on all levels—both for individuals as well as projects and businesses.

Therefore, I would like to wish your congress meeting a successful outcome and hope to be able to welcome you again soon in our city!

Yours sincerely,

Siegfried Nagl
Mayor of Graz, the capital of the Province of Styria



Dear participants of the 2nd Annual Meeting of The Good Practice in TCM Research Association!

The highest value to each and every one of us is our health. Health, undisputedly, is the basis for a good quality of life and thus it should be preserved and developed by the supply of the best medical care. Additionally, it should be brought to as many people as possible that prevention in the form of a healthy life-style is fundamental to personal well-being. In this context, a healthy diet, sufficient physical exercise and a life in functioning social structures as well as in harmony with nature contribute decisively to a living in good health.

Traditional Chinese medicine (TCM) is becoming increasingly popular. Hence, it is an honor for Styria to host the 12th annual meetings of the Consortium for Globalization of Chinese Medicine as well as the 2nd annual convention of the Good Practice TCM Research Association, which will take place in Graz from 26th to 30th of August 2013. International experts will give lectures on the use of traditional Chinese medicine with regard not only to the preservation of health, but also to its effectiveness in the treatment of particular diseases. TCM is characterized by an attractive cost-benefit ratio, therefore it is of special significance particularly in the field of prevention.

I would like to thank the organizational team for their great commitment to bring these meetings to Styria. Moreover, I cordially welcome the participants in Graz and wish all of you prosperous scientific talks as well as an interesting and personally enriching stay in Styria!

Mag. Franz Voves
Governor of Styria

VENUES, REGISTRATION & INSTRUCTIONS

MEETING VENUE:

University of Graz
015C Resowi-Zentrum, HS15.12, 1st floor
Universitätsstraße 15
8010 Graz, Austria

HOW TO REACH THE MEETING VENUE BY PUBLIC TRANSPORT:

The University of Graz can be reached by several busses:

Main railway station to Meeting Venue:

- ➔ bus number 63 (stop “Universität”),
- ➔ bus number 58 (stop “Mozartgasse”)
- ➔ bus number 58E (stop “Uni/Resowi”)

Jakominiplatz to Meeting Venue:

- ➔ bus number 30 (stop “Mozartgasse”)
- ➔ bus number 39 (stop “Uni/Resowi”, final stop)

REGISTRATION AND INFORMATION DESK OPENING HOURS:

August 29, 2013 (Thursday) 8:00 - 17:00 at University of Graz, Universitätsstraße 15
August 30, 2013 (Friday) 8:00 - 17:00 at University of Graz, Universitätsstraße 15

INSTRUCTIONS FOR

➔ oral contributions

The duration of invited lectures will be 30 min and of short lectures 10 min plus 5 min for discussion. Presenting authors are requested to provide their (power point) presentation during the break before their session.

For oral presentations the following equipment is available: PC, beamer (single projection). Please contact the Organizing Secretariat if you need overhead projection.

➔ poster contributions

Participants are responsible for mounting their posters and removing them (Location: Foyer C, Resowi-Zentrum). The organizers will provide the equipment needed. The size of the posters should be 84 cm x 119 cm (DIN A0) or 33 inch x 47 inch, respectively (width x height). Posters will be on display the whole day. Posters should be mounted on 30th August before 9:00 am. Presenting authors are requested to be available at their poster during the poster session (10:30 – 11:00).

➔ internet

Computers with internet access will be provided at the registration area. Detailed information regarding log-in will be provided on site.

WLAN is available free of charge at the area of the University:

Username: cgcm

Password: cgcm2013

SCIENTIFIC PROGRAM

09:00	Opening and Award Ceremony (Chairman: Rudolf Bauer)
09:30	Invited Lecture 1 (Chairman: Qihe Xu) Jan van der Greef, Leiden Chinese and Western Medicine based integrated diagnosis as template for evaluating and designing Systems Medicine
10:00	Invited Lecture 2 (Chairman: Qihe Xu) Tommy Yung-Chi Cheng, New Haven What it takes to globalize Chinese Medicine. A case study of Phy906/kd018
10:30	Coffee break and Poster Session)
11:00	Invited Lecture 3 (Chairman: Peter Hylands) Geoffrey Burnstock, London Purinergic signalling and the hypothesis for its involvement in acupuncture
11:30	Invited Lecture 4 (Chairman: Peter Hylands) Reinhard Länger, Vienna The regulatory situation of TCM products in Europe
12:00	Lunch Break
12:30	GP-TCM RA Annual Members Meeting
14:00	Short lectures (Chairman: Taiping Fan) SL 1 Fazlin Mohd Fauzi, Alexios Koutsoukas, Rob Lowe, Kalpana Joshi, Tai-Ping Fan, Andreas Bender Chemogenomics approaches in rationalising compound action of traditional Chinese and Ayurvedic medicines SL 2 Atanas G. Atanasov, Elke H. Heiss, Jian N. Wang, Shi P. Gu, Jing Bu, Clemens Malainer, Limei Wang, Nanang Fakhruddin, Matthias P. Kramer, Lisa Baumgartner, Angela Ladurner, Anna Vuorinen, Stefan M. Noha, Stefan Schwaiger, Judith M. Rollinger, Daniela Schuster, Hermann Stuppner, Verena M. Dirsch Discovery and characterization of honokiol from Cortex Magnoliae as a novel promising anti-diabetic lead SL 3 Guoan Luo, Qionglin Liang, Yiming Wang Traditional Chinese medicine clinic system biology research system and practice SL 4 Wen-Fei Chiou, Yi-Tsau Huang Current and prospective research in the National Research Institute of Chinese Medicine, Taiwan SL 5 Clara BS Lau, Virginia KM Lau, Jacqueline CW Tam, CL Liu, Patrick KK Lai, Sum MH To, Frankie HF Kwok, CP Lau, Erik CH Ko, Juliana CN Chan, Simon KS Poon, PC Leung, KP Fung A two-herb formula modulated diabetic wound healing through mechanisms of fibroblast regeneration, angiogenesis and anti-inflammation SL 6 Rohan Grace, Valentina Razmovski-Naumovski, Sebastian Waach, Guang-lu Li, Jing-zheng Song, Yong-qiang Zhou, Rudolf Bauer, Kelvin Chan Similarity and difference in chemical profile and antioxidant activity between Chinese materia medica decoction pieces and their aqueous granules: Danggui, Danshen and Sanqi
15:30	Invited Lecture 5 (Chairman: De-an Guo) Xin-sheng Yao, Guangzhou How traditional medicine can play an important role in global healthcare
16:00	Best Poster Award and Closing (Chairman: Rudolf Bauer)

POSTER PRESENTATIONS

BEST POSTER AWARD sponsored by Agilent!

The best poster will be acknowledged by a monetary prize of 300 Euro, sponsored by Agilent. The Scientific Committee will select the best presented poster during the poster session.

LIST OF POSTER PRESENTATIONS

- Poster 1** ***In vitro* and *in vivo* Antioxidant Potential of a Polyherbal Antimalarial as an Indicator of its Therapeutic Value.**
Protus Arrey Tarkang, A. P. Nwakiban Atchan, J. Kiuate, F. A. Okalebo, G. A. Agbor, A. N. Guantai
- Poster 2** ***In vitro* assessment of the protective activity of Danggui against cisplatin-induced nephrotoxicity**
Bunel V., Antoine M.-H., Nortier J., Duez P., Stévigny C.
- Poster 3** **Protective effects of ginseng essence on CCl₄-induced oxidative stress and liver injury in rats**
Ching-Yi Weng Kuan-Hung Lu, Lee-Yan Sheen
- Poster 4** **Increased macrophage cholesterol efflux induced by faltarindiol from *Rhizoma et Radix Notopterygii***
Limei Wang, Xin Liu, Nicole Schilcher, Constance V. Voss, Elke H. Heiss, Rudolf Bauer, Verena M. Dirsch, Atanas G. Atanasov
- Poster 5** **Identification and characterization of xanthohumol from hops (*Humulus lupulus*) as a novel inhibitor of vascular smooth muscle cell proliferation**
Rongxia Liu, Atanas G. Atanasov, Elke H. Heiss, Verena M. Dirsch
- Poster 6** **Improvement of Early Ventricular Remodeling after Myocardial Infarction by a Modified Traditional Chinese Medicine Sini Decoction**
Karoline Peter, Jianggang Liu, Dazhuo Shi, Lei Zhang, Guoju Dong, Dawu Zhang, Shan He, Johannes Jakowitsch, Heimo Breiteneder, Yan Ma
- Poster 7** **Turmerones enhanced anti-proliferative activities of curcumin in human colonic cancer cells and endothelial cells**
Grace GL Yue, Lei Jiang, Carmen KM Chan, Eric CW Wong, Kwok-Pui Fung, Ping-Chung Leun and Clara BS Lau.
- Poster 8** **Preventive and therapeutic effects of *Schisandrae Fructus* on diet-induced obesity, hyperlipidemia and hepatic steatosis**
Elaine Wat, Vanilla Xin Zhang, Chi Man Koon, Yan Ping Wang, Kwok-Pui Fung, Clara BS Lau, and Ping-Chung Leung.
- Poster 9** **Impact of processing on the content of carboxyatractyloside and atractyloside in *Xanthii fructus* (Cang`erzi)**
Nikles S., Heuberger H, Hilsdorf E, Bauer R

- Poster 10 Knowledge-based discovery of *in vitro* anti-fibrotic activities**
Yuen Fei Wong, Qin Hu, Xiu-Li Zhang, Shanshan Qu, Xin-Miao Liang, Qingyang Kong, Bruce M Hendry and Qihe Xu.
- Poster 11 A combined top-down/bottom-up approach for triterpenoid saponins profiling in plants using a hybrid triple quadrupole linear ion trap mass spectrometry**
Zhixiang Yan, Ru Yan
- Poster 12 Exploration and analysis of the role of TCM in Cancer care - with report of 4 typical cases treated in UK**
Dan Jiang, Lily Li
- Poster 13 Measurement of translesion synthesis by fluorescent capillary electrophoresis and pyrosequencing: 8-oxodG bypass modulation by natural products.**
Amandine Nachtergaele, Catherine Charles, Martin Spanoghe, Alexandra Belayew and Pierre Duez
- Poster 14 The retrospective clinical study on the Characters of TCM zheng of aSAH with delayed cerebral vasospasm and its outcome prognostic reasons**
Guo Jianwen, Li Juehui
- Poster 15 ‘Analysis-through-separation’ method to analyze TCM sample using mid-infrared spectroscopy (MIR)**
Suqin Sun, Qun Zhou
- Poster 16 Development of a simple TLC-bioautographic assay based on the inhibition of hemozoin synthesis for screening of natural sources antimalarial compounds**
Philippe N. Okusa, Zaïneb Haddadi, Pierre Duez
- Poster 17 Comprehensive flavonoids profiling in plants by multiple scanning modes using a hybrid triple quadrupole linear ion trap mass spectrometry**
Zhixiang Yan, Ru Yan
- Poster 18 *De novo* Assembly and Comparative Analysis of the *Salvia miltiorrhiza* Mitochondrial Genome**
Jun Qian, Xiang Luo, Yingjie Zhu, Jiang Xu, Ying Li, Haibin Xu, Hongmei Luo, Jingyuan Song, Chao Sun, Shilin Chen
- Poster 19 Authentication of *Menisperm Rhizoma* and its adulterants using DNA barcodes**
Pei Yang, Shilin Chen, Dianyun Hou, Hui Yao

ABSTRACTS

INVITED LECTURES

Invited Lecture 1

Chinese and Western Medicine based integrated diagnosis as template for evaluating and designing Systems Medicine

Jan van der Greef^{1,2}

¹Sino-Dutch Centre for Preventive and Personalized Medicine, TNO & University of Leiden, The Netherlands

²SU BioMedicine, Zeist, The Netherlands

Integration of Chinese and Western medicine offers an innovative approach towards addressing unmet medical needs in current Health Care. Especially in the area of chronic diseases there is a need for novel personalized medicine. For prevention health promotion strategies are required instead of extrapolated disease management based practices.. The need for developing such novel interventions is high on the research agenda in life sciences.

Bridging and integrating Chinese and Western medical strategies requires a deep understanding of underlying philosophies and practices. Systems science, introduced as systems biology in the biomedical domain, provides such a bridge to connect and understand these different aspects. Merging of both domains yields entries into a new level of system diagnosis and system medicine.

In particular the generation of a scientifically validated and accepted systems diagnosis platform is required before all merits of Chinese medicine can be understood and appreciated in other health care systems.

In this presentation top down and bottom up diagnosis is shown to be essential in capturing the complementary nature of combined Chinese and Western medicine knowledge. However, the resulting deep phenotyping methodology needs additional methodologies to enable the study of individual dynamic aspects of systems diagnosis and for bridging concepts such as Yin/Yang balance with system coherence.

Invited Lecture 2

OPPORTUNITY AND CHALLENGE FOR GLOBALIZATION OF CHINESE MEDICINE: USING PHY906 (KD018) AS AN EXAMPLE

Yung-Chi Cheng

Henry Bronson Professor of Pharmacology, Yale University, 333 Cedar Street, SHMB-226, New Haven, CT 06520

Given the aging population increase around the world, the medicine needed today will no longer be just for the treatment of diseases but also for the prevention of the diseases and the enhancement of the quality of life of patients. The current mainstream drug discovery approach, which is the "Reduction Approach," will not be sufficient to meet the needs. This offers the opportunity for the development of traditional Chinese medicine (TCM), which historically claimed to be useful taking the holistic approach, for those unmet needs to fulfill the needs of the population. There are several critical challenges: (1) High quality and consistency of drug preparation; (2) Acceptable evidenced-based clinical efficacy; (3) Safety; and (4) Some knowledge of its actions such as the interaction with drugs y used by individuals, the sites of action and active ingredients involved in TCM. In this presentation, I will share with you our experience in employing PHY906 (KD018), a four herb GMP preparation based on *Huang Qin Tang* which was first described 1800 years ago, as adjuvant for the treatment of cancer patients undergoing chemotherapy and/or radiation therapy as a prescribed drug in the US.

To advance the potential usage of traditional Chinese medicine for current and future needs, collaboration is critical among investigators with multiple disciplines of science and technology. A world-wide a consortium was formed "Consortium for the Globalization of Chinese Medicine" (CGCM), www.tcmmedicine.org, to provide a platform to enhance the interaction and collaboration among those investigators.

Acknowledgements: This work was supported by a grant from NCI/NIH #PO1CA154295. Dr. Cheng is a NFCR Fellow.

Invited Lecture 3**Purinergic signalling and the hypothesis for its involvement in acupuncture**Burnstock G¹¹*Autonomic Neuroscience Centre, University College Medical School, Rowland Hill Street, London, NW3 2PF, UK.*

The talk will begin with a background review of the main conceptual steps leading to our current understanding of purinergic signalling, i.e. ATP as an extracellular signalling molecule. This will include ATP as a cotransmitter, identification of P1 (adenosine), P2X (ATP) ion channel and P2Y (purine and pyrimidine) G protein-coupled receptors, ectonucleotidases and cellular release of ATP via vesicular exocytosis and/or pannexin and connexin hemichannels. Purinergic mechanosensory transduction involved in urine voiding and intestinal peristalsis and in the initiation of visceral pain will be described. A hypothesis for the mechanisms underlying acupuncture will be described, where ATP released from keratinocytes and mast cells in response to activation by needles, heat, electrical stimulation and laser acts on P2X3 receptors on cutaneous sensory nerves to modulate, via interneurons, autonomic motor neuron activity in the brain stem. It is also proposed that there will be purinergic modulation of the pain pathways to the conscious centres in the cortex. Experiments designed to test this hypothesis will be described.

Invited Lecture 4**The regulatory situation of TCM products in Europe**Länger R¹¹*Austrian Medicines and Medical Devices Agency, Traisengasse 5, 1200 Wien, Austria*

Products containing herbal ingredients originating from traditional Chinese medicine are widespread in the European Union. Most of them are treated as food supplements at the moment. The granting of a marketing authorization as medicinal product is impossible due to the lack of adequate clinical data. However, with the EU directive 2004/24 also traditionally used products got the chance to enter the area of medicinal products. However, there are fundamental concerns, whether Traditional Chinese Medicines should be treated as traditional herbal medicinal products (THMP) in the sense of the European legislation: For example, in TCM the diagnosis by a doctor is essential, self-treatment is unusual. In contrast, registered traditional herbal medicinal products are intended and designed for use without supervision of a medical practitioner for diagnostic purposes or for prescription or monitoring of treatment.

Moreover, medical terms used in TCM may differ considerably in their meaning from similar terms in the Western sense. Therefore in the case of a registration of a TCM product the indication, contraindications and warnings have to be translated into a language which is unambiguous for the layman with European background.

The extemporaneous production in the pharmacy based on a prescription offers a more individual therapeutic approach. In this case the pharmacist is responsible for the quality of the herbal substances used for manufacture as well as for the finished product (e.g. decoction). The discussions on acceptable minimum standards for the quality of herbal substances versus usual standards for pharmacopoeia monographs remain controversial.

The presentation will give an update on the regulatory aspects of TCM products and substances in Europe.

*Invited Lecture 5***How traditional medicine can play an important role in global healthcare**

Xin-Sheng Yao ^{1,2*}, Yi Dai ¹, Zhi-Hong Yao ¹, Hao Gao ¹, Yang Yu ¹ and Jin-Shan Tang ¹

¹ *Institute of Traditional Chinese Medicine & Natural Products, Guangdong Province Key Laboratory of Pharmacodynamic Constituents of TCM and New Drugs Research, Jinan University. West 601, Huangpu Avenue, Guangzhou. 510632, P.R. China*

² *College of Traditional Chinese Materia Medica, Shenyang Pharmaceutical University. 105 Wenhua Road, SHenyang, 110016, P.R. China*

TCM is rarely used alone, but used in formulas, called TCM prescription (TCMPs, known as “Kampo” in Japanese). In fact, the power of TCM lies in the effectiveness of TCM formula. There are a total of 1062 monographs recorded in Chinese Pharmacopoeia (2010 edition) Part I. Among them, 1033 are for prescription preparations. It reflects the Chinese traditional medicine characteristics, and can not be found in pharmacopoeias of other nations. Traditional Chinese prescription preparations are most likely to make important contributions to human healthcare of the world in the future, which entrust the people's expectation of disease control and prevention as well as prolonging life time. However, most of TCM products are lacking evaluation of clinical efficacy according to EBM principles. In addition, the active principles and the mechanisms of action which associated with efficacy or side effects are NOT clarified yet. The scientific contents of TCMPs are still "inexplicable". Current methods for monitoring TCMPs were based on the similarity of HPLC profiles, and the quality control standards were just some characteristic components. There were no evidences to prove whether these characteristic components are associated with efficacy or adverse reaction. Therefore, these existing approaches can not ensure TCMPs as complex systems to be "safe, effective, stable and controllable". It became the main obstacle for TCMPs to in foreign countries. It should be put on the agenda of Chinese government and scientists to solve these problems.

The aim is NOT to transform TCMPs into pure compounds, but that TCM as such can meet the quality requirements of modern drugs to be safe, effective, stable and controllable. The completion of the project not only needs to gather the scientific power of the Chinese nation, to implement the spirit of innovation, to combine chemistry and biology closely, to plan research carefully and to design a top-level strategy, but it also needs to use the research experience of traditional medicines from other countries, as well as a long term effort!

SHORT LECTURES

Short lecture 1

CHEMOGENOMICS APPROACHES IN RATIONALISING COMPOUND ACTION OF TRADITIONAL CHINESE AND AYURVEDIC MEDICINES

Fazlin Mohd Fauzi,^{1,2} Alexios Koutsoukas,¹ Rob Lowe,³ Kalpana Joshi,⁴ Tai-Ping Fan,⁵ Andreas Bender^{1,}*

¹Unilever Centre for Molecular Science Informatics, Department of Chemistry, University of Cambridge, Lensfield Road, CB2 1EW, United Kingdom; ²Universiti Teknologi MARA (UiTM) Malaysia, 40 450 Shah Alam, Selangor, Malaysia; ³Blizard Institute of Cell and Molecular Science, Barts and The London School of Medicine and Dentistry, The Blizard Building, 4 Newark Street, London E1 2AT, UK; ⁴School of Health Sciences, University of Pune, Pune 411007, India; ⁵Department of Pharmacology, University of Cambridge, Tennis Court Road, Cambridge, CB2 1PD

Traditional Chinese medicine (TCM) and Ayurveda have been used in man for thousands of years.[1] While the link to a particular indication has been established in man, the mode-of-action (MOA) of the formulations is relatively unknown. In our recent study,[2] we aim to understand the MOA of formulations used in traditional medicine using *in silico* target prediction, which predicts protein targets (hence, MOAs) given the chemical structure of a compound. We were able to establish several links between suggested MOAs and experimental evidence. In particular, compounds from the 'tonifying and replenishing medicinal' class exhibit a hypoglycemic effect[3] which can be connected to sodium-glucose transporters, SGLT 1 and 2[4], and Protein Tyrosine Phosphatase 1B[5]. Similar results were obtained with Ayurvedic anti-cancer drugs. Here, both primary anti-cancer targets, which directly participate in cancer pathogenesis, *i.e.* steroid-5-alpha-reductase 1 and 2 were predicted, as well as synergistic targets, *i.e.* p-glycoprotein (blocking this efflux pump increases intracellular concentration of primary active ingredient)[6]. Additionally, some targets may point to possible novel MOAs and side effects. Most notably, GPBAR1 which was predicted as a target for both 'tonifying and replenishing medicinal' and anti-cancer classes, suggest an influence of the compounds on metabolism.[7] Understanding the MOA of these compounds is beneficial as it can potentially be developed into drugs, with higher efficacies in the clinic than in the current drug discovery setting. This can be a promising endeavor as the phenotypes of these compounds are well known, indicating both the therapeutic impact and efficacy against a certain disease.

Acknowledgements: The authors would like to thank Unilever, Universiti Teknologi MARA, Malaysia and Ministry of Higher Education of Malaysia

References: 1. Patwardhan, B. Warude, D. et al. (2005) *Evidence-based complementary and alternative medicine* 2:465-473. 2. Mohd Fauzi, F. Koutsoukas, A. et al. (2013) *J Chem Inf Model* 53:661-673. 3. Zhao, C-S. Yin, W-T. et al. (2005) *J Altern Complement Med* 8:309-314. 4. Idris, I. Donnelly, R. (2009) *Diabetes Obes Metab* 2009, 11:79-88. 5. Elchebly, M. Payette, P. (1999) *Science* 283:1544-1548. 6. Patel, K.J. Tannock, I.F. (2000) *BMC Cancer* 9:356. 7. Watanabe M, Houten SM, et al. (2006) *Nature* 439:484-489.

Short lecture 2

Discovery and characterization of honokiol from Cortex Magnoliae as a novel promising anti-diabetic lead

Atanas G. Atanasov,¹ Elke H. Heiss,¹ Jian N. Wang,² Shi P. Gu,² Jing Bu,² Clemens Malainer,¹ Limei Wang,¹ Nanang Fakhruddin,^{1,5} Matthias P. Kramer,¹ Lisa Baumgartner,³ Angela Ladurner,¹ Anna Vuorinen,⁴ Stefan M. Noha,⁴ Stefan Schwaiger,³ Judith M. Rollinger,³ Daniela Schuster,⁴ Hermann Stuppner,³ Verena M. Dirsch¹

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Agonists of the nuclear receptor peroxisome proliferator-activated receptor gamma (PPAR γ) are pharmacologically used to fight hyperglycaemia associated with the metabolic syndrome and diabetes type 2. In spite of being clinically effective, currently used PPAR γ agonists have serious side effects (e.g., weight gain), making the discovery of novel ligands highly relevant.

Using a combination of computer-aided approaches, phytochemistry, and molecular pharmacological techniques, we identified honokiol from the traditional Chinese herbal drug Magnolia bark (*Magnoliae officinalis* cortex, Hou Po) as promising novel PPAR γ agonist. To evaluate the efficacy of honokiol in a cell model relevant for metabolic

disease, we compared its ability to stimulate glucose uptake and lipid accumulation in 3T3-L1 adipocytes with the clinically used full PPAR γ agonist pioglitazone. Whereas honokiol stimulated glucose uptake similar to pioglitazone, it did not induce lipid accumulation in 3T3-L1 pre-adipocytes nor mouse embryonic fibroblasts, in clear contrast to pioglitazone. This promising activity pattern was also confirmed in diabetic KKAY mice orally given honokiol or pioglitazone for 35 days. Whereas in both the honokiol- and the pioglitazone-treatment group blood glucose levels were significantly lowered, only honokiol also suppressed weight gain [1].

The identified PPAR γ activation pattern, in combination with the blood sugar lowering and weight gain suppressing properties, recommend honokiol as a promising new pharmaceutical lead or dietary supplement to combat metabolic disease.

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Short lecture 3

Traditional Chinese medicine clinic system biology research system and practice

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Considering the present problems in researches, such as “the formula, disease, and syndrome exist in isolation of their respective”, as well as “the separation of gene, protein, metabolites as research subjects”, the clinical systems biology research system should be constructed which characterized by multi-level biomarker group. The integrated biomarker system should be composed of multi-level indicators, including TCM syndrome indicators, clinic biomedical indicators, imaging indexes as well as systems biology biomarker groups. And the systems biology biomarker groups should contain multi-level biomarkers, such as gene, protein and metabolites. The established integrated biomarker system can be applied to early warning of disease, clinical diagnosis and treatment, personalized medicine, disease prognosis as well as the efficacy evaluation. The recently TCM clinical systems biology research on diabetic nephropathy of our group was used as an example in this paper to introduce the proposed idea. The tentative integrated biomarker system (IBS) has been discovered and screened on the basis of TCM syndrome indicators, clinic biomedical indicators, together with some systems biology biomarkers, which obtained by metabolic profiling analysis, quantitative analysis of fifteen fatty acids, twenty-one purine and pyrimidine and eight mercaptan amino acid, as well as the fourteen diabetic nephropathy related gene. The established IBS can be used for the auxiliary diagnosis of diabetic nephropathy with Qi and Yin deficiency as well as the efficacy evaluation of Tangshen formula. The referred research would provide relevant reference material for the application of systems biology on TCM clinic research and practice. Clinically directive strategies on modernization research of traditional Chinese medicine should be the best way for the development of TCM.

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Short lecture 4

Current and prospective research in the National Research Institute of Chinese Medicine, Taiwan

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In the context of government re-structuring in Taiwan, an act of the National Research Institute of Chinese Medicine (NRICM) has just been passed in the Taiwan Legislature in May, 2013, whereby transferring the NRICM to the jurisdiction of Ministry of Health and Welfare (MHW) with the President Edict. At least 26 research fellows are organized into 5 research divisions: (1) Division of Basic Chinese Medicine, (2) Division of Clinical Chinese Medicine, (3) Division of Chinese Materia Medica Development, (4) Division of Chemistry for Chinese Medicine

and (5) Division of Literature and Informatics for Chinese Medicine. In the MHW, there is a Bureau of Chinese Medicine & Pharmacy in charge of policy, planning, regulation and licensing matters. Our Institute publishes about 50-60 SCI papers annually. Currently, some research program projects are being executed in our Institute including (1) evaluation of the processing (炮製) of Chinese herbs by pharmacological and chemical profiling approaches; (2) identification and preparation of herbs, and finger-printing of active compounds from the herbal formula “Bu-yang Huan-wu Decoction (補陽還五湯)”, and deciphering the active components and key targets for enhancing endogenous neurogenesis and neuro-development in ischemic stroke mice, etc. Our Institute has recruited 3 adjunct professors (Chinese Medicine doctors) to the Division of Clinical Chinese Medicine to assist evaluation and conduction of clinical trials for Chinese medicines and acupuncture. From year 2014 on, the NRICM will be more mission-oriented in the Science & Technology Research Program of the MHW.

Short lecture 5

A TWO-HERB FORMULA MODULATED DIABETIC WOUND HEALING THROUGH MECHANISMS OF FIBROBLAST REGENERATION, ANGIOGENESIS AND ANTI-INFLAMMATION

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The dried roots of *Astragalus membranaceus* (AR) and *Rehmannia glutinosa* (RR) are two herbs commonly used in Chinese medicines for treatment of diabetes and its complications. The objective of the present study was to examine the wound healing effect of formula NF3 (AR and RR in the ratio of 2:1) and its potential mechanisms of action. Using diabetic foot ulcer animal model, oral administration of NF3 (0.98 g/kg) was found to significantly promote wound closure when compared to control (water) group. The diabetic wound healing effect of NF3 was in fact attributed to the synergistic interaction between its two component herbs. In the *in vitro* mechanistic studies, NF3 could significantly i) stimulate fibroblast (Hs27) proliferation; ii) increase cell migration and tubule formation of endothelial cells (HUVEC and HMEC-1); and iii) inhibit nitric oxide production from LPS-stimulated macrophage cells (RAW 264.7). Since ischemia and oxygen deprivation are commonly observed in diabetic foot ulcer patients, the wound healing efficacy of NF3 was further confirmed in diabetic foot ulcer rat model with hindlimb ischemia. Furthermore, a randomized, double-blind, placebo-controlled clinical study showed that 6-months treatment with NF3 (5 g twice daily, oral administration) also promoted wound healing in type 2 diabetic patients with foot ulcer. In conclusion, herbal formula NF3 could enhance diabetic wound healing through actions of fibroblast regeneration, angiogenesis and anti-inflammation.

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Short lecture 6

Similarity and difference in chemical profile and antioxidant activity between Chinese materia medica decoction pieces and their aqueous granules: Danggui, Danshen and Sanqi

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At the Braga AGM in July 2011, GPTCM Consortium* members raised the issues on quality and activity of Chinese materia medica (CMM) granules, which were further discussed at the Joint Workshop of the Working Packages (WP1, WP3 and WP7) in Strasbourg in September to consider methodology for quality control of CMM granules to cope with their increasing use in TCM practice. WP6 members from a systematic review recommended that more rigorous research comparing granules with CMM decoction pieces is required [1]. Our

JCTCM team applying chromatography (TLC, UPLC-PDA), chemometric analysis and antioxidant assays compared the chemical profiles and anti-oxidant activity, using established antioxidant assays (ABTS, FRAP and DPPH) [2], of the 3 CMM decoction pieces and their granules: *Angelicae Sinensis Radix* (Danggui), *Salviae Miltiorrhizae Radix et Rhizoma* (Danshen), and *Notoginseng Radix et Rhizoma* (Sanqi). Decoction pieces were first extracted in water (traditional method), freeze-dried then extracted by methanol. The granules were extracted in methanol only to remove the excipients. Statistical analysis of similarity between samples was performed by hierarchical agglomerative clustering analysis (HCA) and principle component analysis (PCA) [3]. Aqueous extraction predominantly revealed polar compounds, which presented as characteristic groups especially from the decoction pieces; while non-polar components were detected with more variations in groupings from the granule extracts, which raise questions about production processes among manufacturers. No significant difference was detected in antioxidant activities, though higher values were observed in decoction pieces. Practitioners should consider the differences among the products in order to support their dosage regimes.

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S C I E N T I F I C

POSTER PRESENTATIONS

Poster 1

***In vitro* and *in vivo* Antioxidant Potential of a Polyherbal Antimalarial as an Indicator of its Therapeutic Value.**

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Following the ethnopharmacological justification of the use of *Nefang*, a polyherbal product composed of *Mangifera indica* (bark and leaf), *Psidium guajava*, *Carica papaya*, *Cymbopogon citratus*, *Citrus sinensis*, *Ocimum gratissimum* (leaves), for the management of malaria [1], the antioxidant potential was evaluated for its therapeutic value. *In vitro* antioxidant activities of the constituent plants extracts was evaluated by DPPH [2], Total Protein Estimation [3] and FRAP [4] methods. *In vivo* antioxidant capacity of the polyherbal product was evaluated in CCl₄ oxidative stress-induced male *Wistar* rats by administration of 100 and 500 mgkg⁻¹ BW of *Nefang* for 14 days preceded by analysis of plasma biochemical markers and oxidative stress markers in RBC hemolysate: Superoxide Dismutase activity [5], catalase activity [6], lipid peroxidation by the malondialdehyde (MDA) [7] and total proteins assays [8]. Data analysed using the one-way ANOVA, Waller-Duncan 5% Probability Test and Pearson's Correlation Test. Results = Mean ± SD. Derived values for DPPH (%), TP and FRAP (mg catechine equivalent/g extract): **MiB**-90.11/66.33/587.08, **MiL**-90.76/61.73/590.17, **Pg**-91.65/67.15/ 644.17, **Cp**-13.88/6.41/117.95, **Cc**-33.74/17.03/166.72, **Cs**-13.81/7.59/78.90, **Og**-59.52/34.42/353.0 with a high positive correlation (p<0.01). Biochemical and oxidative stress analysis revealed a dose-dependent significant (p<0.05) decrease in CHOL, TGY, ALT, AST, MDA and increase in SOD, TP and CAT. *In vitro* results suggest a strong free radical scavenging activity and oxidant reducing capacity of *MiB*, *MiL* and *Pg* indicating their relevant contribution in the *in vivo* antioxidant potential of *Nefang*, in addition to its hypolipidemic, renal and hepatoprotective activity. This antioxidant potential is a good indication of its therapeutic capacity.

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Poster 2

***In vitro* assessment of the protective activity of Danggui against cisplatin-induced nephrotoxicity**

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Introduction. Renal proximal tubular epithelial cells (RPTEC) are major targets of nephrotoxic drugs such as cisplatin (CisPt), an alkylating agent indicated for cancer treatments. Current techniques aiming at reducing nephrotoxicity in CisPt-treated patients are still unsatisfactory and can only partially prevent acute kidney injury (AKI). RPTEC apoptosis is frequently observed, leading to partial and transient kidney injury. Defects in the regeneration process can trigger the onset of severe atrophy, followed up by fibrotic repair progressively resulting in chronic kidney disease and irreversible loss of the renal function.

Recent evidence indicates that the Chinese herb Danggui (*Radix Angelicae sinensis*) could protect the kidneys against various types of insults, among which CisPt-induced AKI.

This study attempts to identify compounds/mechanisms able to prevent CisPt-induced nephrotoxicity.

Methods. HK-2 cells were incubated with CisPt, and/or with a methanolic extract of *Angelica sinensis* (AS). Potential protective effects were assessed through 4 mechanisms that could alleviate CisPt nephrotoxicity: (i) prevention of cellular death and apoptosis; (ii) modulation of regeneration capacities; (iii) reduction of extracellular matrix (ECM) deposition; and (iv) prevention of dedifferentiation processes via the β -catenin pathway.

Results. Upon CisPt co-treatment, AS reduced apoptotic rate, resulting in an increased cell survival. AS alone was able to promote cellular proliferation and wound-healing capacities. CisPt-induced collagen deposition could be limited by AS co-treatment, and β -catenin relocalization was restrained.

Conclusions. Danggui may have a protective effect towards CisPt-induced AKI. Tubular cell loss may be limited and regeneration is likely to be enhanced. Both effects may concur in reducing the severity of AKI. Reducing ECM deposition and β -catenin relocalization may contribute to limit the fibrosis onset and development.

Poster 3

Protective effects of ginseng essence on CCl₄-induced oxidative stress and liver injury in rats

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Liver fibrosis is the excessive accumulation of extracellular matrix proteins including collagen that occurs in most types of chronic liver diseases. The major components of ginseng essence include four herbs, *Panax quinquefolius*, *Panax ginseng*, *Nelumbo nucifera* and *Lilium longiflorum*. Ginsenosides are major active compounds in ginseng essence, and have been reported as the active compounds of hepatoprotection, anti-tumor and anti-inflammatory effects in many researches. Carbon tetrachloride (CCl₄)-induced liver injury is one of the methods to evaluate hepatic protection as recommended by the Department of Health, Taiwan. CCl₄ can extensively induce oxidative stress through cytochrome P450 to form trichloromethyl peroxy radicals (Cl₃COO•), which will result in lipid peroxidation and liver damage. In the treatment groups, different doses of ginseng essence (0.625, 1.25 and 3.125 g/kg bw/day) had been administered orally every day for 9 weeks, including 8-week induction of CCl₄. The effects of ginseng essence on liver function, oxidative stress and inflammation assessment index *in vivo* were investigated. In conclusion, there are ginsenoside Rg₁, Re, Rb₁, Rc, Rd and Rg₃ in ginseng essence. Moreover, ginseng essence could ameliorate the oxidative stress and inflammation to improve liver function and abnormal metabolism of lipid in CCl₄-induced rats. Additionally, it could inhibit the activation of hepatic stellate cells by elevating the activities of antioxidative enzymes and the content of antioxidant; and also, it could ameliorate liver fibrosis. Therefore, ginseng essence could be a promising hepatoprotective product in the future.

Keywords: ginseng essence, carbon tetrachloride, oxidative stress, hepatoprotection, ginsenoside

Poster 4

Increased macrophage cholesterol efflux induced by faltarindiol from *Rhizoma et Radix Notopterygii*

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Excessive cholesterol deposition in the atherosclerotic plaque and the transformation of macrophages into cholesterol-enriched proatherogenic foam cells is critical for the pathogenesis of atherosclerosis. Cholesterol efflux (ChE), the initial step of reverse cholesterol transport (RCT), can enhance the export of cholesterol from macrophages resulting in an anti-atherosclerotic effect. Therefore identification and characterization of molecules that modulate ChE is relevant to combat atherosclerosis.

By a combination of methods applied *in vitro* and *in vivo*, faltarindiol, isolated from the traditional Chinese herbal drug *Rhizoma et Radix Notopterygii*, was identified as ChE activator. Faltarindiol dose-dependently activated ChE in THP1 macrophages, while cell viability was not affected (determined by resazurin conversion and LDH release assay). Western blot analysis was further employed to identify up- or down-regulation of transporters involved in the cholesterol efflux (e.g., ATP-binding cassette transporter A1 and G1 (ABCA1 and ABCG1), and

scavenger receptor class B member 1 (SR-BI)). Since increased protein expression levels of plasma membrane transporter ABCA1 were detected, we further employed quantitative real time PCR to assess the ability of falcariindiol to modify ABCA1 mRNA level. Although falcariindiol can increase ABCA1 mRNA levels significantly, the effect observed at protein level is stronger, suggesting a complex mechanism of action. Characterization of the molecular mechanism underlying the ChE-enhancing action of falcariindiol is expected to increase the basic knowledge about the mechanisms regulating macrophage ChE with potential applications for prevention of atherosclerosis.

Poster 5

Identification and characterization of xanthohumol from hops (*Humulus lupulus*) as a novel inhibitor of vascular smooth muscle cell proliferation

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Atherosclerosis is the primary cause of coronary artery disease, one of the major causes of death in the western world. Proliferation of vascular smooth muscle cells (VSMC) is one of the major pathologic events in atherosclerosis and restenosis, making characterization of novel compounds that could block it highly relevant. Nuclear factor E2-related factor-2 (Nrf2) is a transcription factor mainly known for orchestrating antioxidant and cytoprotective reactions in response to oxidative and electrophilic stress. However, previous studies have implied Nrf2 signaling also in the regulation of VSMC proliferation [1].

Aim of this study was to investigate whether xanthohumol, a known Nrf2 activator from hops (*Humulus lupulus*), exerts anti-proliferative activity in VSMC.

We found that xanthohumol inhibits platelet-derived growth factor (PDGF)-induced proliferation of VSMC with an IC_{50} of 3.49 μ M as quantified by a resazurin conversion assay. Xanthohumol further inhibited BrdU incorporation in newly synthesized DNA with an IC_{50} of 10.0 μ M. To examine whether the inhibition of PDGF-induced proliferation of VSMCs can be attributed to cytotoxic effects of xanthohumol, we assessed cell membrane and nuclear integrity. Xanthohumol did not lead to LDH (lactate dehydrogenase) release when applied in concentrations up to 15 μ M. Furthermore, no differences of cell nucleus morphology were detected by DAPI staining.

In conclusion, we identify the natural product xanthohumol from hops as a novel inhibitor of VSMC proliferation. Further investigations are under way to address the causal involvement of Nrf2 activation in the observed anti-proliferative effect.

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Poster 6

Improvement of Early Ventricular Remodeling after Myocardial Infarction by a Modified Traditional Chinese Medicine Sini Decoction

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Sini Tang (SNT) is a popular traditional Chinese herbal formula, described in the "Treatise on cold-induced diseases", a medical collection from ancient China. SNT was characterized as a remedy acting on the heart, kidney and spleen meridians and was used to treat syndromes corresponding to heart failure and myocardial infarction (MI). A modified rat model of MI was used in this study to evaluate the improvement of early ventricular remodeling (VR) and cardiac function after MI by SNT. We show that the ventricular cavity area of the SNT groups were decreased significantly. SNT inhibited the left ventricle end-systolic dimension (LVDs) and improved the left ventricular function of the ejection fraction (EF%). SNT decreased the expression of atrial natriuretic

peptide (ANP) levels in the serum and increased the vascular active marker nitric oxide (NO), which limits vascular inflammation. This was confirmed by a reduced expression of the pro-inflammatory cytokines and Toll-like receptors (TLR-2 and TLR-4). The collagen volumes of SNT groups were significantly decreased and accompanied by a lower level of transforming growth factor- β 1 (TGF- β 1) in myocardial tissue. Our data indicate that the Chinese herbal remedy SNT has the potential to improve early ventricular remodeling and cardiac function after MI.

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Poster 7

Turmerones enhanced anti-proliferative activities of curcumin in human colonic cancer cells and endothelial cells

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Turmeric, rhizome of *Curcuma longa*, is a commonly used spice and herbal medicine in Indian and China. The active ingredient curcumin, which has low water solubility and poor bioavailability, has been used as a chemopreventive agent for colonic cancer [1,2]. We previously showed the presence of lipophilic components (α/β - and aromatic-turmerones) of turmeric could facilitate the absorption of curcumin into intestinal Caco-2 cells [3], and that α/β -turmerones had anti-proliferative activities in human breast cancer cells *in vitro* [4]. In this study, we hypothesized that in the presence of turmerones or other components of turmeric extract, the anti-proliferative and anti-angiogenic activities in cancer cells and endothelial cells of curcumin would be enhanced. Hence, the anti-proliferative activities of curcumin alone and curcumin plus turmerones were compared in human colonic cancer cells HT-29, HCT-116 and human umbilical vein endothelial cells HUVEC. Our results showed that the IC₅₀ values produced by curcumin plus turmerones (6.7 μ g/mL in HT-29, 2.6 μ g/mL in HCT-116, 1.7 μ g/mL in HUVEC) were smaller than those by curcumin alone (8.4 μ g/mL in HT-29, 4.2 μ g/mL in HCT-116, 2.6 μ g/mL in HUVEC), implying that anti-proliferative activities of curcumin plus turmerones were stronger than curcumin alone. In conclusion, our study reported for the first time the superior anti-proliferative activities of curcumin plus turmerones than curcumin alone in human colonic cancer cells and endothelial cells. Together with modulation of absorption by turmerones, the use of curcumin plus turmerones may lead to more benefits in cancer therapy.

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Poster 8

Preventive and therapeutic effects of Schisandrae Fructus on diet-induced obesity, hyperlipidemia and hepatic steatosis

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Schisandrae Fructus (FS) is a traditional Chinese herb commonly used as a liver tonic. Evidence suggests that ethanolic or aqueous extract of FS could exert beneficial effects on non-alcoholic fatty liver disease [1]. However, its preventive and therapeutic effects on high-fat diet-induced metabolic syndrome (including obesity, hyperlipidemia and hepatic steatosis) have not been previously investigated and hence the aim of our present study. Firstly, we investigated if FS aqueous extract (FSE) could exert therapeutic effects in obese Sprague Dawley (SD) rats which were induced with high-fat (HF) diet for 10 weeks, followed by 8 weeks of 0.3 or 0.6 g/kg

FSE oral administration. Results showed that FSE caused a dose-dependent decrease in: a) body weight (628 vs 563 and 563 g), b) fat pad mass (epididymal fat mass: 14.9 vs 14.5 and 9.4 g; perirenal fat mass: 18.0 vs 12.3 and 11.4 g; and inguinal fat mass: 21.8 vs 16.6 and 16.5 g); and c) plasma lipids (triglyceride: 0.75 vs 0.64 and 0.56 mmol/l; and cholesterol: 2.52 vs 2.19 and 2.18 mmol/l). Secondly, we investigated if FSE, given as a dietary supplement, could prevent diet-induced metabolic syndrome in SD rats supplemented with normal chow or HF diet, with or without 0.45% FSE supplementation (dose equivalent to 0.6g/kg FSE group). Results showed that after 8 weeks of feeding, FSE significantly reduced body weight (491 vs 447 g), fat pad mass (epididymal fat mass: 8.2 vs 5.7 g; perirenal fat mass: 12.6 vs 8.5 g; and inguinal fat mass: 17.4 vs 13.5 g), liver weight (13.4 vs 11.6 g) and plasma lipids (triglyceride: 1.03 vs 0.83 mmol/l; and cholesterol: 2.06 vs 1.70 mmol/l) in high-fat-fed rats. In conclusion, our data suggested the potential of FSE being used as a protective or therapeutic agent for patients with metabolic syndrome.

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Poster 9

Impact of processing on the content of carboxyatractyloside and atractyloside in *Xanthii fructus* (Cang'erzi)

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The fruits of *Xanthium sibiricum* Patr. ex Widder (Asteraceae), in Chinese Cang'erzi, are used in Chinese traditional medicine for the treatment of sinusitis, nasal congestion and nasal discharge. They contain toxic diterpene glycosides, atractyloside (ATR) and carboxyatractyloside (CATR). *Xanthium* fruits have to be roasted for detoxification. Aim of this study was the development of qualitative and quantitative analytical methods for atractyloside and carboxyatractyloside in untreated and roasted *Xanthium* fruits by HPLC and TLC.

A new HPLC-method has been developed to analyze and identify ATR and CATR using LC-DAD-MS/MS. The limit of detection was 1.464 ng/3 µl. It was found that the average concentration of CATR in roasted fruits was much lower than in the untreated fruits, sometimes zero, while the ATR content was increased, indicating that the roasting process can in fact reduce toxicity. Untreated dried fruits contained on average 0.17 % CATR and 0.04 % ATR. Roasted fruits contained on average 0.07 % CATR and 0.17 % ATR. When investigating the influence of different drying temperatures on the content of ATR and CATR in *Xanthii Fructus*, the best reduction of CATR was achieved in samples which were dried at a temperature of 110°C. ATR and CATR could also be detected by TLC.

Poster 10

Knowledge-based discovery of *in vitro* anti-fibrotic activities

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Fibrosis is characterised by excessive extracellular matrix deposition and distortion of normal tissue architecture, often leading to chronic organ failure. Few drugs effectively target fibrosis, making the condition a leading cause of mortality. This report summarises our findings in the discovery of *in vitro* anti-fibrotic activities from herbal entities used in traditional Chinese medicine (TCM). An innovative model of fibrosis induced by transforming growth factor β1 in NRK-49F normal rat kidney fibroblasts established in our laboratory was used to quantify anti-fibrotic activities [1]. Selection of 21 herbal compounds, 12 individual herbs and 27 herbal formulae was guided by the literature [2]. Among these herbal entities, five compounds (Quercetin, Baicalin, Baicalein, Salvianolic acid B

and Emodin), ethanolic extracts of three herbs (Danshen, Huangqin and Dahuang) and decoctions of 16 formulae (Fuzhenghuayu, Chailingtang, Baweidihuangwan, Yinchonhaotang, Mahuangtang, Guiyuanfang, Xiaochaihutang, Qingganhuoxuetang, Buzhongyiqitang, Bushenrougantang, Yiqihuoxuetang, Yigankang, Guzhangpian, Kangxianbaogantang, Hujinkeli and Xuelongchongji) showed reproducible anti-fibrotic activities. Selection of additional 26 herbs and one fungus was advised by two senior TCM practitioners. Among them, methanolic extracts of Lingzhi, Shiliuhua, Baibeiyege, Jixueteng, Moyao, Liedang, Meiguijie and Gusuibu showed reproducible anti-fibrotic activities. We also found three methanolic herbal extracts (Chuanwutou, Yimucao and Dangshen) had very potent, moderate and mild pro-fibrotic activities, respectively [3]. Thus, while medicinal materials used in TCM are rich resources for discovering anti-fibrotic activities, the pro-fibrotic effects of some herbs used in TCM also deserve further studies.

Acknowledgements: Supported by Kidney Research UK, Innovation China UK and the FP7 GP-TCM project. We thank TCM Dr. Dan Jiang (Sheffield, UK) and Professor Dunxu Wu (Shanghai University of TCM) for advice.

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Poster 11

A combined top-down/bottom-up approach for triterpenoid saponins profiling in plants using a hybrid triple quadrupole linear ion trap mass spectrometry

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A top-down/bottom-up strategy for comprehensive triterpenoid saponins (TS) profiling in plants was proposed using a triple quadrupole linear ion trap mass spectrometry. The MS/MS spectra of TS standards in positive mode revealed TS with free hydroxyl groups in the aglycone exhibited successive water elimination accompanied with loss of glucose, while those without free hydroxyl groups in aglycone showed poor fragmentation and only underwent nonspecific glucose elimination. Therefore, the "top-down" strategy initiated with neutral loss triggered enhanced product ion scan (NL-EPI) of m/z 162+18(n) and 162+18(n)+17 to monitor protonated and ammoniated TS, respectively, followed by NL-EPI of m/z 162 and 179 for detecting TS without free hydroxyl groups in the aglycones. Screening of TS without a terminal glucose is implemented in a "bottom-up" manner by precursor ion triggered EPI scan (PI-EPI) of the aglycone fragments determined by NL-EPI to explore all TS glycones. Multiple reaction monitoring (MRM)-EPI was ultimately used for in-depth TS profiling based on the theoretical combinations of all aglycones and glycones. In the negative mode, all investigated TS favored a direct glucose loss and most TS formed abundant formic acid adducts. Thus, NL-EPI of m/z 162 and 46 were employed to boost coverage and sensitivity. This approach was applied for profiling TS in *Astragali Radix* (*Huangqi*) and detected 40 new TS. This approach provides high sensitivity and selectivity, serving as a powerful tool for TS profiling in plants. However, it may not work well for TS with poor fragmentation or strong alkali metal ions binding affinity.

Acknowledgements: Supported by the Science and Technology Development Fund of Macao SAR (FDCT043/2011/A2) and the University of Macau (MYRG207(Y2-L4)-ICMS11-YR))

Poster 12

Exploration and analysis of the role of TCM in Cancer care - with report of 4 typical cases treated in UK

*Dan Jiang & **Lily Li

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The treatment of Cancer is the most difficult subject in the world health protocol. At present, the efficacy of routine treatment of cancer in the medical mainstream is mixed, and although progressing, is not always entirely satisfactory. Complementary and Alternative Medicine (CAM) is rarely suggested for the treatment of cancer in

the UK, and there are considerable regulatory restrictions on its use. The reason for this is that its effectiveness is not satisfactorily proven. The author reviews current literature on the treatment of cancers in TCM, researched by means of randomly assigned and controlled clinical trials with large samples, ranging from the assessment of quality of life, to that of anti-cancer effects and properties, through to the reregulation of the immune system, the correction of side effects from Radiotherapy and Chemotherapy, relief of post-operative complications and the promotion of patient rehabilitation. It is argued that TCM may be indicated as appropriate for each of these aspects of the treatment of cancer. She also explores and analyses four cases in which patients diagnosed with cancer were successfully treated by TCM in the UK, and still survive in a good state of health. She also analyses the mechanisms by which TCM may be effective in the treatment of cancer. Although the capacity of TCM to completely kill cancer cells may be weaker than in the treatment of conventional western medicine, it may be preferred in the case of patients who are living with cancer for whom the emphasis of treatment is on the maintenance of a good quality of life. It is the author's belief that ideas fundamental to TCM may add significantly to those which underpin the western medical model, and complement the mainstream treatment of cancer, and it is her intention here to evaluate the effectiveness of TCM in the treatment of cancer as evidenced in examples from current research.

Key words: TCM, Cancer care

Poster 13

Measurement of translesion synthesis by fluorescent capillary electrophoresis and pyrosequencing : 8-oxodG bypass modulation by natural products.

Amandine Nachtergaele¹, Catherine Charles^{1, 2}, Martin Spanoghe³, Alexandra Belayew⁴ and Pierre Duez^{1, 2}

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The DNA damage tolerance mechanism translesion synthesis (TLS) relies on a series of specialized DNA polymerases able to bypass a lesion on a DNA template strand during replication or post-repair synthesis. TLS inserts a base opposite this lesion, correctly or incorrectly, depending on the lesion, the involved DNA polymerase(s) and the sequence context. To measure the correct or mutagenic outcome of 8-oxo-7,8-dihydro-2'-deoxyguanosine (8-oxodG) bypass by TLS DNA polymerases, we developed and validated two analytical methods : (i) a semi-quantitative denaturing capillary electrophoresis method with fluorescent detection of an oligonucleotide labelled at 5' end with the fluorochrome Alexa488® (1) and (ii) a quantitative pyrosequencing method. After an *in vitro* primer-extension assay through 8-oxodG in the presence of nuclear protein extract obtained from normal human intestinal epithelial cells (FHs 74 Int cell line), reaction products are analysed by either denaturing capillary electrophoresis (measurement of elongation for the strand opposite to the lesion) or by pyrosequencing (determination of inserted nucleotides in front of the lesion).

Some polyphenols found in natural products were evaluated for their influence on the correct or mutagenic outcome of translesion synthesis through 8-oxodG. We found that some of them significantly influence the outcome of translesion synthesis in either an error-free or a mutagenic way.

These tests are straightforward, fast, reproducible and easily adaptable to other sequences and lesions. They have therefore a wide range of applications in the biological field, notably to elucidate TLS mechanisms and modulators.

Acknowledgements: We would like to thank Professor B. Blankert (UMONS) for his scientific and material support. A. Nachtergaele gratefully acknowledges the fellowship granted to her by UMONS.

References: A. Nachtergaele, C. Charles, M. Spanoghe, M. Gadenne, A. Belayew, P. Duez, Measurement of translesion synthesis by fluorescent capillary electrophoresis: 7,8-Dihydro-8-oxodeoxyguanosine bypass modulation by natural products. *Analytical Biochemistry* 440 (2013) 23-31.

Poster 14

The retrospective clinical study on the Characters of TCM zheng of aSAH with delayed cerebral vasospasm and its outcome prognostic reasonsGuo Jianwen¹, Li Juehui²¹Guangdong province hospital of TCM, Dade Road No.111, Yuexiu District, Guangzhou City, 510000, CHINA²Guangzhou University of TCM, Airport Road No.12, Baiyun District, Guangzhou City, 510405, CHINA

Objective: (1)To comprehensive assess the influencing factors for DCVS, and whether the occurrence of DCVS affect the prognosis or not. (2)To study the change of zheng after in patients with aSAH of acute period. (3)To analysis the evolution of zheng after the patients with DCVS. **Methods:** The indicators were analyzed with univariate and logistic multi-factors regression analysis to find the factors which can impacted DCVS after aSAH, while analyzed the influence between DCVS and the prognosis. Zheng was typed four stages: preoperative, postoperative day 1, postoperative day 7 and the period of the occurrence of DCVS, and to analysis the dynamic changes of zheng of four periods from yin syndrome and yang syndrome and sub-type analysis, as well as the relation between TCM zheng and the period of DCVS. **Results:** (1)The zheng of yang syndrome throughout the acute of period. (2)The zheng of yang syndrome throughout the acute postoperative period, and the main sub-type were syndrome of phlegm-heat blocking internally. (3)The measures of lowering intracranial pressure was a protective factor for the incidence of postoperative DCVS. (4)The increaser of the incidence of postoperative DCVS, the higher of the GOS score. **Conclusion:** (1)The zheng of yang syndrome throughout the acute of period, and the main sub-type were syndrome of wind-phlegm, Phlegm-Heat Accumulation, phlegm-heat blocking internally and Wind-Fire. So the TCM treatment should be set the principles of dispeling the wind, clearing the heat, reducing the fire, removing the phlegm and inducing resuscitation. (2)The measures of lowering intracranial pressure postoperative can reduce the incidence of DCVS. (3)The reduce of the incidence of postoperative DCVS can improve the prognosis of hospital discharge.

Acknowledgements: Guangdong province hospital of TCM

Poster 15

'Analysis-through-separation' method to analyze TCM sample using mid-infrared spectroscopy (MIR)

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Since the medicinal effects of TCM are believed to come from the holistic function of various components which are not completely clear today, the contents of several so-called index components cannot accurately represent the quality of each TCM sample. Herein, we present an 'analysis-through-separation' method to analyze TCM sample using mid-infrared spectroscopy (MIR) follow the principle of 'fractional from holistic, qualitative before quantitative'.

Most compounds, even the complex TCM samples have fingerprint-like infrared spectral features, which makes MIR be a versatile label-free analytical technique. A first hint of a TCM sample with no or little prior knowledge, as well as guidelines for further investigations, can be obtained from its infrared spectrum, which simultaneously contains information concerning both organic and inorganic components.

Now that the separation in TCM research is necessary, the separation procedures should be 'guide and supervised' by MIR. Our researches indicate that improper separation is quite normal in TCM analysis. This may cause the incompletely extraction and some impurity substances may be interfused into the target compounds. Guided by the MIR, the molecular structure of each target compound can be recognized by comparing its infrared spectrum with those of the standard reference materials or resolved by the combination of various analytical methods, then some proper methods can be developed to determine the content of the compound.

Therefore, both the total and particular components in the mixture samples can be investigated accurately and simply by the analysis-through-separation scheme with the help of the infrared spectra.

Poster 16

Development of a simple TLC-bioautographic assay based on the inhibition of hemozoin synthesis for screening of natural sources antimalarial compoundsPhilippe N. Okusa, Zaïneb Haddadi, Pierre DuezLaboratory of Therapeutic Chemistry and Pharmacognosy, Faculty of Medicine and Pharmacy, University of Mons, 19 Av. Maistriau, 7000 Mons, Belgium (Philippe.OKUSANDJOLO@umons.ac.be)

Malaria is a major health problem affecting more than 200 million people and causing more than 600,000 deaths each year (1). With the development of drug resistance to available treatments, there is an increasing need for antimalarial compounds which can be provided by natural sources, particularly medicinal plants (2). The discovery of new antimalarial molecules needs rapid and efficient biological tests in order to routinely screen plant extracts and to drive the purification of active compounds (3). This poster reports the development of a simple TLC-bioautographic assay to screen for inhibitors of the malarial pigment synthesis; using low-cost commercially available reagents the bioautography is based on a classical *in vitro* test measuring the inhibition of synthetic β -hemin polymerization. Spraying of reagents (hemin and HCl) on the TLC plate is followed by heating to initiate the formation of β -hemin; active compounds are visualized as clear spots against a brown background. The experimental parameters have been carefully optimized: (i) concentration of reagents: 50 mM of hemin, HCl 1M; (ii) temperature of heating: 90°C; (iii) heating time: 5 minutes; (iv) use of surfactant: tween 80. This optimized method has been successfully used to detect antimalarial drugs acting by the inhibition of hemozoin formation, chloroquine and quinine. This assay can be used in the screening of natural sources for antimalarial activity.

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Poster 17

Comprehensive flavonoids profiling in plants by multiple scanning modes using a hybrid triple quadrupole linear ion trap mass spectrometryZhixiang Yan, Ru Yan*

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Flavonoids are among the most ubiquitous phenolic compounds found in nature serving a variety of functions in plants and associating with a number of health benefits for humans. Typically, they are co-identified with many other secondary metabolites using the untargeted metabolomics. The limited quality of data obtained from untargeted metabolomic workflow calls for a shift from the breadth-first to the depth-first screening strategy when a specific biosynthetic pathway was focused on. Here we introduced a novel analytical approach for flavonoids profiling in plants using a hybrid triple quadrupole linear ion trap (Qtrap) mass spectrometry. The approach includes four steps: (1) Preliminary profiling of major aglycones by multiple ion monitoring triggered enhanced product ion scan (MIM-EPI). (2) Glycones profiling by precursor ion triggered EPI scan (PI-EPI) of major aglycones. (3) Comprehensive aglycones profiling by combining MIM-EPI and neutral loss triggered EPI scan (NL-EPI) of major glycone. Unique neutral loss of one ammoniated sugar unit was observed in flavonoid glycosides and proven to be very informative and confirmative. (4) In-depth flavonoids profiling by MRM-EPI with elaborated MRM transitions and ramped conditions. This approach was applied for profiling flavonoids in *Astragali Radix* (*Huangqi*), a famous herb widely used for medicinal and nutritional purposes in China and detected 422 flavonoids, among which less than 40 have been previously reported in this medicinal plant. This approach provides versatility, sensitivity and high through-put that required for flavonoids profiling in plants and serves as a useful tool for plant metabolomics.

Acknowledgements: Supported by the Science and Technology Development Fund of Macao SAR (FDCT043/2011/A2) and the University of Macau (MYRG207(Y2-L4)-ICMS11-YR))

Poster 18

De novo Assembly and Comparative Analysis of the *Salvia miltiorrhiza* Mitochondrial Genome

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Salvia miltiorrhiza is a potential model medicinal plant with great economic and medicinal value. The complete mitochondrial (mt) genome sequence of *Salvia*, the first sequenced member of the Lamiaceae family, is reported here. We first applied the third generation sequencing technology, PacBio RS, coupled with 454 and SOLiD to successfully assemble the plant mt genome. The mt genome of *Salvia* is a 499,236 bp single circular molecule with a GC content of 44.39%. It contains 44 protein-coding genes, 22 tRNAs and 4 rRNAs. 18 cis-splicing and four trans-splicing introns are present in 11 genes. The *cox1* gene contains a group I intron, which encodes an endonuclease displaying two LAGLIDADG motifs. Comparative sequence analysis has been conducted among the five asterid mt genomes. They share a set of 31 protein-coding genes and several ribosomal proteins have been lost in some species. The proportion of the *Salvia* mt genome exhibiting 80 or more percent similarity to the mt genomes of *Boea*, *Mimulus*, *Nicotiana* and *Daucus* constitutes, respectively, 23.4%, 24.1%, 19.6% and 15.8% of the total size. Repeat analysis revealed three large and 80 small interspersed repeat pairs, comprising 30,175 bp (6.0%) of the genome, which is much smaller than that of the other asterids. This indicates repeats may not play an important role in the *Salvia* mt genome proliferation. The *Salvia* mt genome contains a fragment of 16,684 bp derived from the chloroplast, which is the largest known single chloroplast integration event among the published angiosperm mt genomes.

Poster 19

Authentication of *Menispermis Rhizoma* and its adulterants using DNA barcodes

Pei Yang¹, Shilin Chen¹, Dianyun Hou¹, Hui Yao^{*1}

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The appearance of DNA barcoding in identifying medicinal material brought a new brand dawn to the medicine markets. The objective of this research was to introduce a new and effective method of identifying medicinal material in the modern medicine market. *Menispermis Rhizoma*, a traditional Chinese medicine used as an analgesic and antipyretic, widely distributed in North China, was chosen as an example to explain how DNA barcoding work. In this paper, DNA barcoding was explained particularly, and meanwhile, the ability of ITS/ITS2 and *psbA-trnH* sequences in distinguishing *Menispermum dauricum* and its adulterants were verified critically. Choosing the root, medicinal part, as the experimental material, this research contained a total of 59 samples belonging to 7 species from different locations and markets. The amplification rate and sequencing efficiency of ITS and *psbA-trnH* regions were assessed, and the inter- and intra- genetic distances, the NJ phylogenetic trees were calculated and constructed. Moreover, the secondary structures of ITS2 demonstrated that all the three regions could complete the identification of the *M. dauricum* and its adulterants with few inter-species variation and more intra-species variations; meanwhile, inter- and intra- distance conformed to the result; the NJ phylogenetic trees also clustered one species into one branch. However, the *psbA-trnH* exhibited a lower sequencing efficiency owing to the common existed poly structures, while ITS/ITS2 regions performed well in all the items investigated. In conclusion, ITS/ITS2 was suggested as a suitable DNA barcode in authenticating *Menispermis Rhizoma* and its adulterants.

CITY TOURS

All tours include an English speaking guide. The price per person is calculated on a minimum of 20 participants. The tours will be departing from the front of the Resow-Zentrum.

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A certificate of attendance will be given to all registered participants during the Meeting.

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Admission to the meetings will be granted only if the organizers have received the registration fee. Delegates who have made late payments should bring a copy of the receipt to the Meeting. Failure to show this receipt on request gives the organizers the right to charge the full amount prior to admission.

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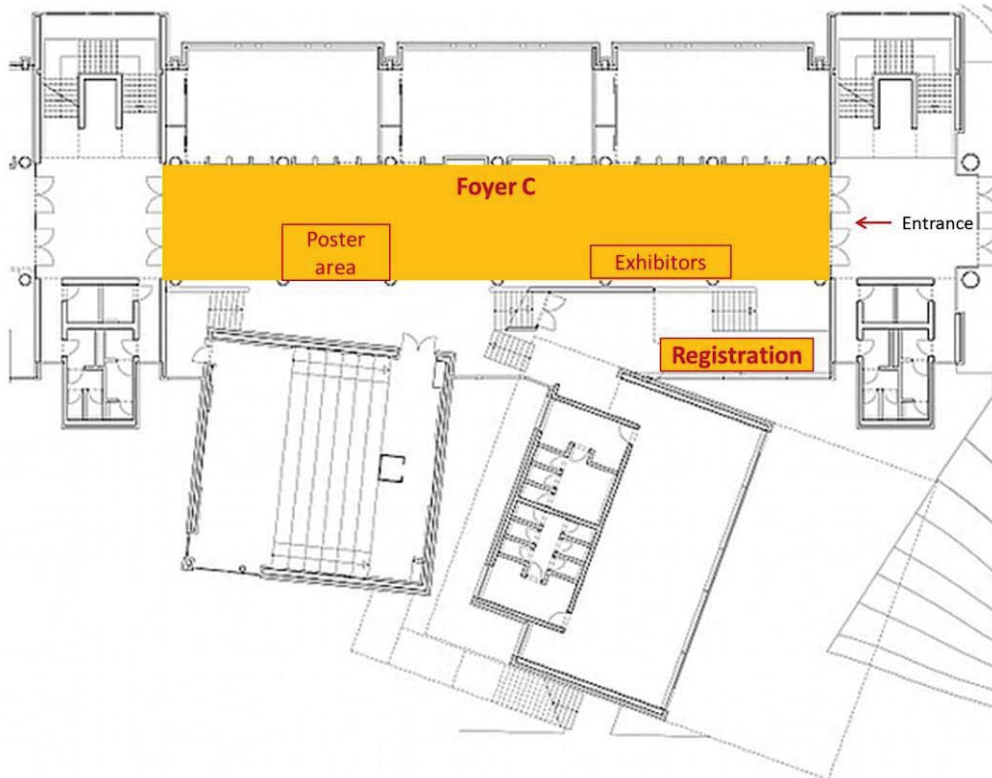
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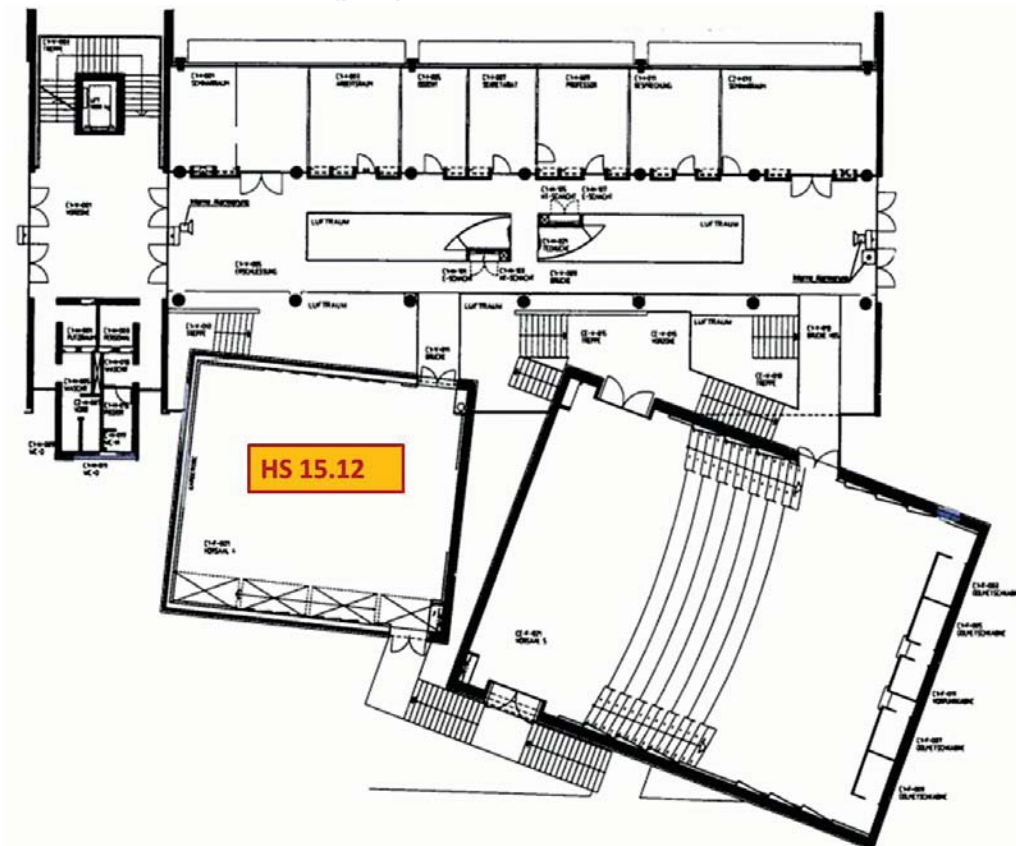
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NOTES



廣東省中醫院

Guangdong Provincial Hospital of Chinese Medicine (GPHCM)
The Second Clinical College of Guangzhou University of Chinese Medicine
Guangdong Provincial Academy of Chinese Medical Sciences

Guangdong Provincial Hospital of Chinese Medicine (GPHCM) was founded in 1933. It is one of the earliest hospitals of TCM in China, and now becomes a hospital group of 5 top-class branch hospitals, 4 outpatient clinics with 3150 ward beds. The total Staff is over 4000 and the total value of medical equipment is approximately worth over 1 billion RMB. It is one of the hospitals with the largest service amount in China for 15 consecutive years since 1998. In 2012, the annual outpatient service was over 6.38 million.



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 - It has formed overall pattern for chronic kidney disease, menopausal syndrome and atopic dermatitis
- √ National Research Center for Clinical Trial
 - Established in 2001, and have finished 40 trials for TCM accorded with ICH-GCP since 2009
 - Set up a web-based randomization system for TCM trials
 - Clintrial 4.4 software was used in clinical data management
 - Using EDC system and project management software in clinical trial
- √ National Center for Clinical Evaluation
 - To form overall pattern of a focus of disease in chronic kidney disease
 - To evaluate the clinical outcomes for TCM research
- √ Guangdong International Clinical Research Center of Chinese Medicine
 - Phase I-IV Clinical trials service
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 - Herb formula as research candidates for new drugs
- √ Center for Methodology in Clinical Research
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- In collaboration with the IBM China Research Lab, the clinical-research synthetic digital platform was invented, and was granted the Asian Creative Prize by Wall Street Journal.
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