16th Meeting of Consortium for Globalization of Chinese Medicine, Guangzhou, China

Session Report

Bioinformatics: Omic approach & data analysis
9.30-12.00; Sunday 20 August 2017

Chair: Noraznawati Ismail, Universiti Malaysia Terengganu

Co-Chair: Qihe Xu, King's College London

Panelists: Hua Zhou, MUST

Sun-Chong Wang, National Central University Taiwan

Alexander Lau, The Chinese University of Hong Kong

23 abstracts, 8 oral

No	Title	Affiliation	Speaker
25, 26	Pharmacological inventions of ketone utilization alleviate late reperfusion damage in ischemia myocardium Discovery of potential active compounds responsible for the protective effects of Gua-lou Xie-bai decoction on hypoxia/reoxygenation injury in H9C2 cells by virtual screening	Macau University of S&T	Hua Zhou
31	Identification and comparison of the functions of TCM herbs/formulas using deep learning of residual convolutional neural networks on national health insurance data	National Central University, Taiwan	Sun-Chong Wang
34	Text-mining electronic health records of stroke patients undergoing integrative Chinese-Western medicine rehabilitation	The Chinese University of Hong Kong	Alexander LAU
39	Meta-analysis of differential expression of non-coding RNAs in ovarian cancer for discovering drug targets of natural products	University of Macau	Siu-wai LEUNG
40	Secretomics of TGF-β1-induced Fibrogenesis and the Antifibrotic Effects of Scutellariae Radix and Baicalein	King's College London	Qihe Xu
41	1000 Medicinal Plant Genomes (1KMPG) Project	CAMS	Chang LIU
43	Systems Biology approaches to the function and mode of Traditional Chinese Medicine for new drug development	Southern University of Science and Technology	Yu-hui HU

043

Systems biology approaches to the function and mode of TCM for new drug development

Southern University of Science and Technology

Prof Yu-hui HU

- In a project known as MecoTCM, Dr Hu and her colleagues brought the connectivity score concept into the understanding of the mode of action of TCM, helping understand the similarities and differences among drugs.
- Reproducibility and accessibility of such methodology were discussed.

25, 26
Pharmacological inventions of ketone utilization alleviate late reperfusion damage in ischemia myocardium

- The authors identified the mitochondrial pathway, oxidative stress and the Ketone pathway and the SCOTs/ACAT1 pathway in ischemia-reperfusion injury and the protective roles for Gensing and Rg1.

- The implications of Rg1:Rg3 ratio and a possible Rg1:Rg3 antagonism and the true biological roles of the identified pathways were discussed.

039

Meta-analysis of differential expression of non-coding RNAs in ovarian cancer for discovering drug targets of natural products

- The authors identified, through mata-analysis, of ncRNAs in ovarian cancer.
- The importance of such ncRNAs as biomarkers and possible targets and how to target them by TCM were discussed.

040

Secretomics of TGF-β1-induced Fibrogenesis and the Antifibrotic Effects of Scutellariae Radix and Baicalein

- The authors concluded that conditioned media offer rich proteomic information important in understanding TGF-β1-induced fibrogenesis and its pro-inflammatory context; and the is invaluable in identify drug-specific and dose-dependent mechanisms.
- The need for making the best use of any available samples including cell lysates, media, exosomes and optimised protocols was discussed.

041

1000 Medicinal Plant Genomes (1KMPG) Project

- The authors updated progress of the 1KMPG project and deliverables delivered so far.

- The technical issues of the identity and quality of the starting materials, plant organ used for sequencing, sequencing platform, and implications to authentication of TCM herbs, etc were discussed.

031. Identification and comparison of the functions of TCM herbs/formulas using **deep learning of residual convolutional neural networks** on national health insurance data

- The authors decribed their efforts in meaningful analysing clinical data to inform clinical practice and facilitate TCM research.

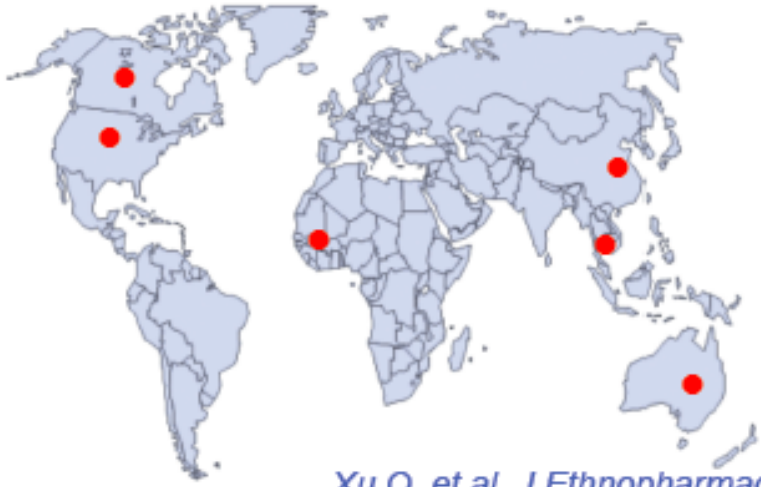
- The importance of such analysis in future development of network pharmacology and pharmacovigilance were discussed

The FP7 GP-TCM Project

(€1m, 2009-2012)

Qihe Xu: PI and Coordinator of the Project
Peter Hylands: PI, *In-Vitro* & *In-Silico* Pharmacology
Bruce Hendry: Co-PI, Clinical Studies

- A network of 10 WPs, comprising 200 scientists from 24 countries and 110 institutions → 1 new international society
- 43 papers on good practices, priorities, challenges, opportunities and state of the art of omic studies of TCM;
- TCM a priority for EU-China cooperation under Horizon 2020.



Xu Q, et al. J Ethnopharmacol 2012

Top 10 GP-TCM grand opportunities

1	TCM for long-term conditions and chronic diseases, top challenges for Europe
2	**Maturing omics & improving systems biology methodology for TCM research**
3	TCM as adjunct therapy
4	**Openness for EU and China to jointly fund clinical studies**
5	GP-TCM good practice guidelines have started to be developed
6	**Chinese government recently announced a $308 billion biotech industry expansion scheme**
7	Common ground exists between modern personalised health and personalised TCM
8	**Network pharmacology methodology for TCM research**
9	China's open policy and increasing funding to scientists in China create good collaborating opportunities
10	**TCM knowledge based discovery**

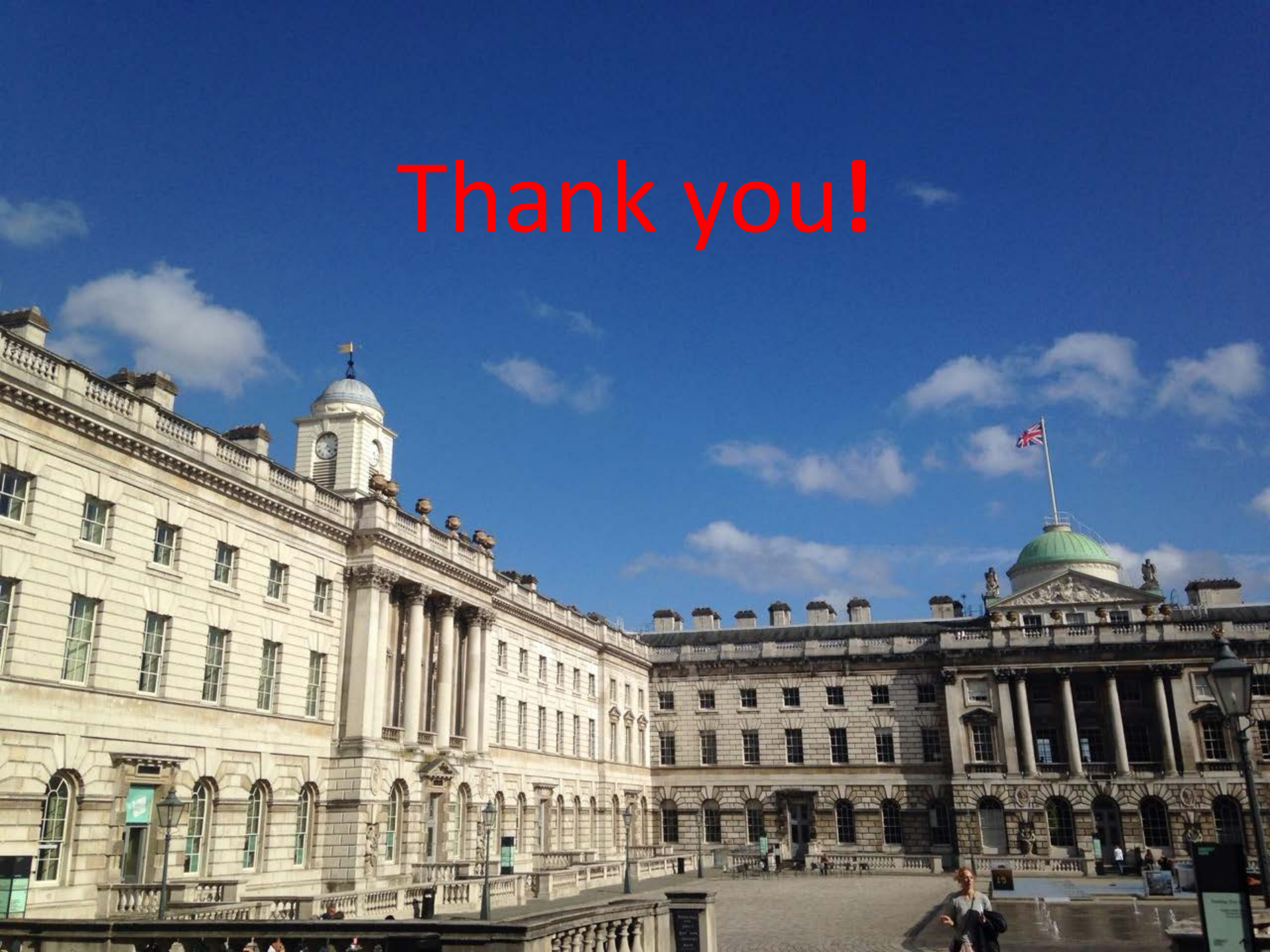
Uzuner H, et al. TCM research in the post-genomic era: good practice, priorities, challenges and opportunities. J Ethnopharmacol. 2012;140:458-68.

Conclusions

- Omic technologies are unbiased, holistic approaches, good at inspiring unbiased holistic views, unveiling the hidden beauty of biology, generating new hypotheses and supporting a holist understanding of the mode of action of TCM;

- **They allow us to see forest and trees, however, to make sense of them, it depends on knowledge obtained from reductionist approaches, such as functions of individual genes/proteins.**

- Systems biology, bioinformatics and network pharmacology provide powerful tools in understanding TCM, while being enriched by TCM by taking interactions within the Nature-Human-TCM mega systems.


Thank you!