

Summary Report for Session 4

Polychemical Activities and Mechanism Study I
(Neurological, Metabolic and Cardiovascular Diseases)

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July 27, 2026

NeuroPlas-N: Optimization of a Novel Phytochemical Formulation Targeting A β and Tau Pathology in Alzheimer's disease

Speaker: [Ashok Iyaswamy](#), Hong Kong Baptist University, Hong Kong

Major findings:

- The study screened two formulations (NeuroPlas-N-16, N-21) from 24 TCM-derived compounds
- NeuroPlas-N-16, N-21 reduced A β accumulation and tau hyperphosphorylation, and improved learning memory in AD models via activating autophagy-lysosomal pathway

Impacts:

- The study identified two promising disease-modifying candidates for AD
- The study enhanced our understanding of autophagy and neuroplasticity in AD pathogenesis

Comments and suggestions from Panel members:

- Apply metabolomics and proteomics to identify each compound's targets
- Evaluate long-term chronic toxicity and drug-drug interactions before clinical use

Corynoxine alleviates the tauopathy driven by TFE3 dysfunction-mediated autophagy impairment

Speaker: Jia Liu, Hong Kong Baptist University, Hong Kong

Major findings:

- TFE3 dysfunction-induced autophagy impairment leads to Tau hyperphosphorylation and cognitive decline in mice
- Corynoxine activates TFE3, promotes Tau clearance, and rescues memory deficits in 3xTg AD mice

Impacts:

- The study identified TFE3 as a novel therapeutic target for tauopathies
- The study validated Corynoxine as a promising AD drug candidate

Comments and suggestions from Panel members:

- Elucidate the upstream signaling pathways that regulate TFE3 activity in the context of chronic neurodegeneration
- Explore TFE3 activity in patient-derived samples as a potential biomarker for patient stratification in clinical trials.

Red yeast rice reduces hyperlipidemia related cardiovascular and cerebrovascular disease

*Speaker: **Yu-Chiang Hung**, National Yang Ming Chiao Tung University, Taipei*

Major findings:

- Both RYR and statins effectively reduced total cholesterol and triglycerides
- Combination of RYR and statins reduced ER visits and hospitalizations for stroke and MI in patients with hypertension and kidney disease

Impacts:

- The study validated RYR as a safe, effective alternative or adjunct to statins
- The study provided real-world evidence from large cohort (N=337,104) for TCM integration

Comments and suggestions from Panel members:

- Conduct prospective RCTs to confirm retrospective findings
- Standardize RYR active ingredient for quality controls

ATG-125 alleviates diabetic gastrocnemius muscle atrophy by suppressing proteolysis signaling and enhancing mitochondrial biogenesis in db/db Mice

*Speaker: **Chen-Ying Wei**, Chang Gung University, Taoyuan*

Major findings:

- ATG-125 restored myofiber integrity and muscle structure in db/db mice
- ATG-125 activated anabolic IGF1R/PI3K/AKT/mTOR pathway and suppressed catabolic AMPK-FOXO3A-MuRF1 axis

Impacts:

- The study provides first multi-target phytochemical therapy for diabetic myopathy
- The study expands TCM applications beyond metabolic control to muscle complications

Comments and suggestions from Panel members:

- Evaluate ATG-125 in other muscle atrophy models, such as cachexia, sarcopenia
- Identify active compounds and their synergistic mechanisms via metabolomics

A novel herbal supplement improves motor function and motor learning in aged mice, associated with neuroprotective features and brain metabolome regulation

*Speaker: **Chung-Chih Yang**, Academia Sinica, Taipei*

Major findings:

- API restored motor performance in aged mice to young mouse levels
- API enhanced vitamin B6 metabolism and steroid biosynthesis toward young-like state

Impacts:

- The study provided metabolomics-based evidence for herbal neuroprotection
- The study supports API as functional supplement against age-related motor decline

Comments and suggestions from Panel members:

- Clarify whether the active components cross the BBB or act the roles via the gut-brain axis
- Identify active compounds and their synergistic mechanisms via metabolomics

ATG-125 restores bile acid homeostasis and ameliorate liver injury in FXR-deficiency mice under high-fat high sucrose conditions

*Speaker: **Chen-Yu Hsu**, Chang Gung University, Taoyuan*

Major findings:

- FXR deficiency combined with high-fat high sucrose (HFHS) diet markedly altered bile acid composition
- ATG-125 partially restored these bile acids and attenuated liver injury in mice

Impacts:

- The study highlights bile acid remodeling as a therapeutic mechanism via gut-liver axis in liver disease
- The study suggests a FXR-independent modulation of bile acid metabolism in liver disease

Comments and suggestions from Panel members:

- Distinguish direct effects vs microbiota-mediated effects on bile acid metabolism
- Link bile acid changes to inflammatory and metabolic outcomes

Dihuang yinzi promotes post-stroke neurogenesis by reshaping the inflammatory microenvironment via JAK-STAT-mediated Treg/Th17 balance

*Speaker: **Yimiao Luo**, Hong Kong University, Hong Kong*

Major findings:

- Dihuang Yinzi (DHYZ) enhances neurogenesis and improves functional recovery in stroke rats
- It restores the Treg/Th17 balance by suppressing JAK2 and STAT3 phosphorylation

Impacts:

- The study links DHYZ chemistry to immune modulation and neurogenesis
- The findings support DHYZ for stroke rehabilitation and identify BBB-penetrating compounds as potential quality markers

Comments and suggestions from Panel members:

- The BBB-penetration and treatment timing of the compounds should be pay more attention during the experiments

Calcium signaling pathway alterations in dexamethasone-induced depressive rats: effects of gamma Oryzanol and curcumin solid dispersions

Speaker: [Siripaporn Kesyou](#), Naresuan University, Thailand

Major findings:

- GOSD, CurSD, and their combinations reduced immobility time in forced swim test
- Proteomics revealed changes in calcium signaling proteins linked to calbindin

Impacts:

- The study identified calcium signaling and calbindin as novel antidepressant targets.
- The study validated solid dispersion to overcome poor solubility of natural compounds.

Comments and suggestions from Panel members:

- Compare the capacity of CurSD and Curcumin in BBB penetration
- Evaluate the pharmacokinetics and chronic toxicity profile of GOSD and CurSD in animal models

Neuroprotective effects of YIV-906 on hemin-induced neurotoxicity: The involvement of A1/A2 astrocytic and M1/M2 microglial polarization

Speaker: Yang-Jie Tseng, National Yang Ming Chiao Tung University, Taipei

Major findings:

- YIV-906 attenuated hemin-induced neurotoxicity in primary cortical neurons by preserving synaptic and neurite biomarkers
- YIV-906 promotes M2/A2 glial polarization and improves motor function in mice

Impacts:

- The study positions YIV-906 as a multi-target neuroprotective candidate for intracerebral hemorrhage
- The study validated glial polarization modulation as a therapeutic strategy for secondary brain injury

Comments and suggestions from Panel members and Prof. Yung-Chi Cheng:

- YIV-906 is a standardized four-herb formulation derived from “Huang Qin Tang”, but is not just “Huang Qin Tang”, so establishing a high phytomic quality control (QC) technology is very important for the QC, Safety and Efficacy of herbal drugs for clinical use.
- Future directions may detect whether YIV-906 plays neuroprotective roles via gut-brain axis

Summary of this session

This session highlights that TCM is a scientifically testable and multi-target system. TCM provides a novel strategy for the treatment of **Neurological, Metabolic and Cardiovascular Diseases**. Future success would depend on robust QC, safety profiling, multi-omics integration, and AI-powered mechanistic research, which will bridge ancient wisdom with modern precision medicine.

Future directions and recommendations for TCM Research

- **QC**: Adopt Phytomic QC (FDA-recognized) for batch consistency; use chemical fingerprints and BBB-penetrating compounds as markers.
- **Safety**: Mandatory acute/chronic toxicity and drug-drug interaction studies before clinical use.
- **BBB & Gut-Brain Axis**: Determine if compounds act directly or via microbiota; prioritize gut-brain axis for oral TCM.
- **Multi-omics + AI**: Integrate proteomics, metabolomics, and AI to map compound-target networks and predict active ingredients.
- **Clinical Translation**: Use biomarker-driven trials and combine with standard therapies for comorbidity management in human diseases.



Thank you very much !
謝謝 !