# The June 2020 Newsletter of
# The GP-TCM Research Association

## Contents of the GP-TCM RA Newsletter June 2020




**Acknowledgements:** The editors would like to thank Dr **Clara Lau** (Hong Kong), Dr **Chi Zhang** (Beijing), Prof **Hubiao Chen** (Hong Kong), Prof **Jiqing Liu** (Shenzhen), Prof **Rudolf Bauer** (Graz), Prof **Thomas Efferth** (Mainz), Prof **Jianping Liu** (Beijng), Prof **Pierre Duez** (Mons), Prof **Zhongzhen Zhao** (Hong Kong), and the **WJTCM Editorial Office** (Beijing) for their invaluable contributions.



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# The June 2020 Newsletter of
# The GP-TCM Research Association

## Highlights on Academic Achievements of GP-TCM RA Members

1. **A loop-based and AGO-incorporated virtual screening model targeting AGO-mediated miRNA–mRNA interactions for drug discovery to rescue bone phenotype in genetically modified mice.** *Advanced Science*. 2020. https://doi.org/10.1002/advs.201903451

Several virtual screening models are proposed to screen small molecules only targeting primary miRNAs without selectivity. Few attempts have been made to develop virtual screening strategies for discovering small molecules targeting mature miRNAs. Mature miRNAs and their specific target mRNA can form unique functional loops during argonaute (AGO)-mediated miRNA–mRNA interactions, which may serve as potential targets for small-molecule drug discovery. Thus, a loop-based and AGO-incorporated virtual screening model is constructed for targeting the loops. The previously published studies have found that miR-214 can target ATF4 to inhibit osteoblastic bone formation, whereas miR-214 can target TRAF3 to promote osteoclast activity. By using the virtual model, the top ten candidate small molecules targeting miR-214-ATF4 mRNA interactions and top ten candidate small molecules targeting miR-214-TRAF3 mRNA interactions are selected, respectively. Based on both in vitro and in vivo data, one small molecule can target miR-214-ATF4 mRNA to promote ATF4 protein expression and enhance osteogenic potential, whereas one small molecule can target miR-214-TRAF3 mRNA to promote TRAF3 protein expression and inhibit osteoclast activity. These data indicate that the loop-based and AGO-incorporated virtual screening model can help to obtain small molecules specifically targeting miRNA–mRNA interactions to rescue bone phenotype in genetically modified mice. (Corresponding author **Aiping Lu is the President of GP-TCM RA**)

2. **Nanocarriers to enhance solubility, bioavailability, and efficacy of artemisinins.** *World Journal of Traditional Chinese Medicine.* 2020. DOI：10.4103/wjtcm.wjtcm_2_20

The therapeutic potential of artemisinin (ART) and its derivatives (ARTs) is not limited to malaria but has been recently expanded to other infections with protozoans, trematodes, or viruses as well as to cancer. Due to their limited poor water and oil solubility, rapid degradation by the liver, and short half-life, they have a low bioavailability after oral administration. Consequently, there is a pressing necessity to formulate new ART preparations to raise its bioavailability and efficacy. Nanosized drug delivery systems represent important tools in modern medicine with wide clinical applications, because of their potential modulation of pharmacokinetic and biodistribution. This review focuses on

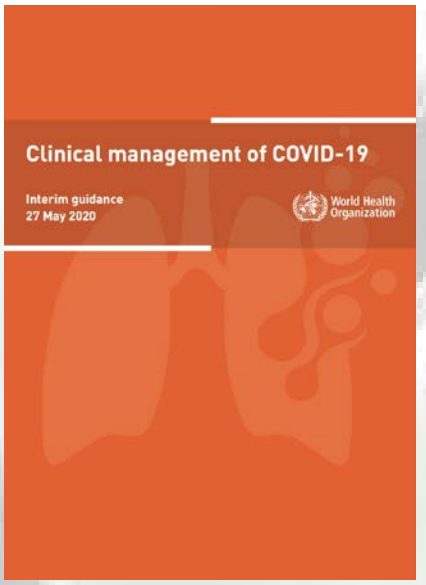
polymer-based systems, lipid-based systems, and inorganic nanoparticles loaded with ARTs. The overall goal of this field of research is to enhance their solubility and stability to improve bioavailability at much lower doses and to increase long-term safety. In addition, the opportunity to reach highly specific site-targeted delivery by these nanocarriers confers a high medicinal value. Remarkably, most of the reported nanoparticulate drug delivery systems are biologically inactive or marginally immunogenic, generating no antigenic or pyrogenic reactions but only partial intrinsic toxicity. As clinical studies in human patients are available so far, there is a pressing need to translate preclinical results on ART-based nanosystems into clinical settings.
(Corresponding author **Thomas Efferth is a member of the Board of Directors of GP-TCM RA**)

3. **The potential effects and use of Chinese herbal medicine pine pollen (Pinus pollen): A bibliometric analysis of pharmacological and clinical studies.** *World Journal of Traditional Chinese Medicine.* 2020. DOI：10.4103/wjtcm.wjtcm_4_20

The objectives of this study are to conduct a comprehensive literature search and bibliometric analysis to identify the breadth and volume of pharmacological and clinical studies on pine pollen (Pinus pollen) and to identify the potential effects and the use of pine pollen. Three Chinese electronic databases and two English electronic databases were searched for pharmacological and clinical studies on pine pollen. Data were extracted and analyzed and included publication year, authors,study type, pharmacological research topics or clinical diseases/conditions, usage and type of preparation, authors' conclusions, and adverse effects. Of 239 publications identified, 180 were pharmacological studies, 37 were clinical trials, and 22 were reviews. Numbers of publications increased particularly from 2004 onward. The top 10 most frequent topics in pharmacological studies were immune regulation, antisenility, antioxidation, liver protection, inhibiting prostate hyperplasia, inhibiting tumor cell proliferation, lowering blood glucose, lowering blood lipids, antifatigue, and improving intestinal function. The top 10 most frequent clinical diseasestreated or where pine pollen was used as an adjuvant were bedsores, diaper dermatitis, hyperlipidemia, oral mucositis, eczema, hyperplasia of prostate, hypertension, prostatitis, type 2 diabetes mellitus, and radiodermatitis. Eight trialsreported no adverse events associated with pine pollen, one reported mild gastrointestinal reactions, but symptoms disappeared without special management. There have been an increasing number of publications on pine pollen during the past 20 years. Pharmacological studies have shown many potential benefits, and clinical studies have indicated some positive effects when it is either used as a single herb or as an adjuvant to treat disease. Its use as a topical agent, especially for skin diseases, was notable.
(Corresponding author **Jian-ping Liu is the co-chairperson of GP-TCM RA Interest Group of Acupuncture-moxibustion and Meridians**)

## Selected information on COVID-19

1. **Clinical management of COVID-19**: This guidance document is intended for clinicians caring for COVID-19 patients during all phases of their disease (i.e. screening to discharge). This update has been expanded to meet the needs of front-line clinicians and promotes a multi-disciplinary approach to care for patients with COVID-19, including those with mild, moderate, severe, and critical disease. The following sections are entirely new: COVID-19 care pathway, treatment of acute and chronic infections, management of neurological and mental manifestations, noncommunicable diseases, rehabilitation, palliative care, ethical principles, and reporting of death; while previous chapters have also been significantly expanded. Details: https://www.who.int/publications/i/item/clinical-management-of-covid-19




2. **Guideline-based Chinese herbal medicine treatment plus standard care for severe coronavirus disease 2019 (G-CHAMPS): Evidence from China**. *Frontiers in Medicine*. 2020. In January, national guidelines were developed and recommended for use throughout China to fight coronavirus disease 2019 (COVID-19). Chinese herbal medicine (CHM) was also included as part of the treatment plans at various stages of COVID-19. We conducted a pilot randomized, controlled trial in patients with severe COVID-19 in Wuhan, China. Eligible adult patients were randomly assigned in a 2:1 ratio to receive either CHM plus standard care or standard care alone for 7 days. The primary outcome was the change in the disease severity category of COVID-19 after treatment. Between Jan 31, 2020, and Feb 19, 2020, 42 out of 100 screened patients were included in the trial: 28 in the CHM plus standard care group and 14 in the standard care alone group. Among 42 participants who were randomized (mean [SD] age 60.43 years [12.69 years]), 21 (21/42, 50%) were aged ≥65 years, 35 (35/42, 83%) were women, and 42 (42/42, 100%) had data available for the primary outcome. For the primary outcome, one patient from each group died during treatment; the odds of a shift toward death was lower in the CHM plus group than in the standard care alone group (common OR 0.59, 95% CI 0.148–2.352, P =

0.454). Three (two from the CHM plus group and one from the standard care alone group) patients progressed from severe to critical illness. After treatment, mild, moderate, and severe COVID-19 disease accounted for 17.86% (5/28) vs. 14.29% (2/28), 71.43% (20/28) vs. 64.29% (9/28), and 0% (0) vs. 7.14% (1/28) of the patients treated with CHM plus standard care vs. standard care alone. **Conclusions:** For the first time, the G-CHAMPS trial provided valuable information for the national guideline-based CHM treatment of hospitalized patients with severe COVID-19. The effects of CHM in COVID-19 may be clinically important and warrant further consideration and studies. Details: https://doi.org/10.3389/fmed.2020.00256

3. **Use of herbal drugs to treat COVID-19 should be with caution**. *The Lancet*. 2020. On April 14, 2020, a Chinese official announced at a press conference that indications of three patent herbal drugs were approved to be expanded to include COVID-19 symptoms. This included Lianhuaqingwen capsules and Jinhuaqinggan granules for mild conditions, and Xuebijing (injectable) for severe conditions.These drugs are widely used to treat COVID-19 in China. The official claimed the patent herbal drugs can effectively relieve symptoms, such as fever, cough, and fatigue, and reduce the probability of patients developing severe conditions, but without giving further details. So far, no high-quality, rigorously peer-reviewed clinical trials of herbal drugs have been reported in internationally recognised journals. The approvals, based on in-vitro investigations and anecdotal clinical data, will probably lead to several worrisome consequences. Details: DOI:https://doi.org/10.1016/S0140-6736(20)31143-0
4. **Clinical trial results prove efficacy and safety of TCM capsules on mild COVID-19 patients.** Chinese experts and doctors have provided clinical trial data on the efficacy and safety of traditional Chinese medicine (TCM) Lianhua Qingwen (LH) capsules on COVID-19 patients, which show that the capsules can apparently relieve symptoms and increase the cure rate of patients exhibiting mild symptoms. Trial data showed after 14 days of regular treatment, assisted with LH capsules, the resolution rate of main clinical symptoms (fever, fatigue and cough) hit 57.7 percent on the 7th day of treatment. It reached 80.3 percent on the 10th day, and 91.5 percent on the 14th day, according to a document that LH capsules producer Yiling Pharmaceutical sent to the Global Times on Wednesday. Details: https://www.globaltimes.cn/content/1189698.shtml

## Recommended Reading

**Effects of acupuncture versus cognitive behavioral therapy on cognitive function in cancer survivors with insomnia: A secondary analysis of a randomized clinical trial**. *Cancer*. 2020. Cancer-related cognitive impairment is a prevalent, disruptive condition potentially exacerbated by sleep disturbances. The current study was performed to evaluate the effects of acupuncture versus cognitive behavioral therapy for insomnia (CBT‐I) on objective and subjective cognitive function in cancer survivors with insomnia. Using data from a randomized clinical trial (160 survivors) that compared acupuncture versus CBT-I for insomnia occurring in cancer survivors, the authors analyzed cognitive outcomes and their relationship to insomnia symptoms. Analysis was limited to 99 patients who reported baseline cognitive difficulties. Interventions were delivered over 8 weeks. Objective attention, learning, and memory were evaluated using the Buschke Selective Reminding Test. Subjective cognitive function was assessed using the Brown Attention‐Deficit Disorder Scales. Insomnia symptoms were assessed using the Insomnia Severity Index. All outcomes were collected at baseline, week 8, and week 20. From baseline to week 8, acupuncture produced statistically significant within-group improvements in objective attention (Cohen D , 0.29), learning (Cohen D , 0.31), and memory (Cohen D , 0.33) that persisted to week 20 (all P < .05), whereas CBT-I produced a statistically significant within-group improvement in objective attention from baseline to week 20 (Cohen D , 0.50; P < .05); between‐group differences were not statistically significant. Both interventions produced statistically significant within‐group improvements in subjective cognitive function at weeks 8 and 20 compared with baseline (all P < .001); between‐group differences were not statistically significant. In the acupuncture group, patients with clinically meaningful responses with regard to insomnia symptoms demonstrated a significantly greater improvement in subjective cognitive function compared with those without clinically meaningful insomnia responses (P = .006). **Conclusions:** Among cancer survivors with insomnia, both acupuncture and CBT‐I produced significant improvements in objective and subjective cognitive function. However, the effect sizes varied and only survivors in the acupuncture group demonstrated a significant relationship between cognitive and sleep outcomes. These preliminary findings warrant further investigation to guide the personalized management of patients with cancer-related cognitive impairment. Detail: https://doi.org/10.1002/cncr.32847

## Invitation from the Official Journal of GP-TCM RA

### 1. WJTCM Call for papers: Herbal Medicine Analysis and Quality Standards.

**World Journal of Traditional Chinese Medicine (WJTCM)**

The official journal of WFCMS and GP-TCM

Special Issue on

**Herbal Medicine Analysis and Quality Standards**

CALL FOR PAPERS

Guest Editor
Prof. De-an Guo

Guest Editor
Prof. Rudolf Bauer

Guest Editor
Prof. Ikhlas Khan

Qualitative and quantitative determination of the effective components together with other workable approaches in traditional Chinese medicines and other herbal medicines is the reasonable and effective comprehensive quality control method, which is the fundamental basis for their quality standard setting and thereby to guarantee the clinical efficacy and safety of herbal medicines at large.

We invite researchers home and abroad to contribute original research articles as well as reviews on the topic of herbal quality.

Potential topics include but are not limited to:

a. Phytochemical analysis of complex herbal mixtures.
b. Development of state of the art analytical methods.
c. Tactics for herbal quality standard elaboration
d. Metabolic analysis of herbal drugs and herbal finished products.
e. Application of new quality control technology and methods in herbal industry.

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Authors can submit their manuscripts via the Manuscript System at https://mc03.manuscriptcentral.com/wjtcm.

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**Manuscript Due**
June. 30, 2020

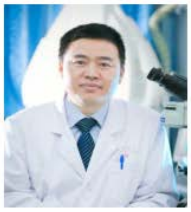
**Intended publication date**
November 30, 2020

## 2. WJTCM Call for papers: Pharmacology and Toxicology of Herbal Medicine.

Special Issue on
**Pharmacology and Toxicology of Herbal Medicine**

CALL FOR PAPERS

Guest Editor
Prof. Hongxi Xu



Guest Editor
Prof. Xuanbin Wang

Guest Editor
Prof. Pulok Kumar Mukhrjee

The special issue on *Pharmacology and Toxicology of Herbal Medicine* focuses on the biological effects and mechanisms of herbal medicine. It has a broad scope, covering basic research to clinical studies regarding pharmacology and toxicology.

We cordially invite researchers and experts to contribute original research articles as well as reviews on pharmacology and toxicology of herbal medicine.

Potential topics include but are not limited to:

a. Bioactive principles from herbal medicine,
b. Biological, pharmacological activities and mechanisms of herbal medicine,
c. Genomics, proteomics, metabolomics, pharmacoinformatics studies on herbal medicine,
d. Toxicology of herbal medicine.

Authors can follow the author instructions and submit their manuscripts via the Manuscript System at: https://mc03.manuscriptcentral.com/wjtcm

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**Deadline for submission**
January 30, 2021

**Intended publication date**
April 30, 2021

## 3. WJTCM Call for papers: Systems Biology and Metabolomics of Traditional Chinese Medicine

Special Issue on

**Systems Biology and Metabolomics of Traditional Chinese Medicine**

CALL FOR PAPERS

Guest Editor
Prof. Xi-jun Wang

Guest Editor
Prof. Hai-tao Lu

Guest Editor
Prof. Toshiaki Makino

Traditional Chinese Medicines (TCMs) are evidenced to confer therapeutic actions by largely interacting with dysregulated multi-layers molecules that underlie diseases, which can be defined as the holistic characteristics of TCMs to treat different diseases.

The fact is that systems biology, and metabolomics have the robust-capacity to better understand the holistic characteristics by globally deciphering the complex interactions between TCMs and diseases associated with dysregulated molecules. Currently, they are widely used to address many key questions in TCMs involving chemical characterization, therapeutic efficacy, toxicology and metabolic features, etc.

We invite the scholars in the niches to contribute research articles, reviews, and perspectives to this special issue.

Potential topics include but are not limited to:
a. metabolomics of TCMs
b. multiple omics of TCMs
c. network pharmacology of TCMs
d. systems biology of TCMs

Authors can submit their manuscripts via the Manuscript System at https://mc03.manuscriptcentral.com/wjtcm

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**Intended publication date**
October 30, 2021

## 4. WJTCM Call for papers: Processing of Chinese Medicinal Materials (Zhongyao Paozhi)

Special Issue on
**Processing of Chinese Medicinal Materials (Zhongyao Paozhi)**

CALL FOR PAPERS

**Guest Editor**
Prof. Tu-lin Lu

**Guest Editor**
Prof. Zhi-ling Yu

**Guest Editor**
Prof. Yuan-shiun Chang

In traditional Chinese medicine (TCM) practice, one of the distinctive features is the use of processed Chinese medicinal materials (Yinpian). It is Zhongyao Paozhi, a unique pharmaceutical technique, that transforms raw Chinese medical materials into Yinpian. Zhongyao Paozhi plays a pivotal role in guaranteeing the clinical efficacy and safety of TCM therapies.

We invite researchers home and abroad to contribute original research articles as well as reviews on the topic of Zhongyao Paozhi.

Potential topics include but are not limited to:

a. Scientific basis of Zhongyao Paozhi.
b. Intelligentization of Zhongyao Paozhi.
c. Techniques of Zhongyao Paozhi.
d. Quality standards of adjuvant materials for Zhongyao Paozhi.
e. Quality markers of Yinpian.
f. Quality standards of Yinpian.

Authors can follow the author instructions and submit their manuscripts via the Manuscript System at: https://mc03.manuscriptcentral.com/wjtcm.

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## 5. WJTCM Call for papers: Biosynthesis-Driven Quality Design of Materia Medica

**World Journal of Traditional Chinese Medicine (WJTCM)**

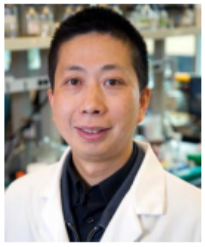
The official journal of WFCMS and GP-TCM

Special Issue on

**Biosynthesis-Driven Quality Design of Materia Medica**

CALL FOR PAPERS

Guest Editor
Prof. Wan-Sheng Chen



Guest Editor
Prof. Ji-Xun Zhan

Guest Editor
Prof. Shu-Juan Zhao

Biosynthesis and metabolic engineering together with molecular breeding provides an attractive approach to enhance the yield of effective components in medicinal plants and thus to improve or design the quality of Chinese Materia Medica, which is a great motivation for the sustainable development of the entire supply chain of traditional Chinese medicines.

We invite researchers home and abroad to contribute original research articles as well as reviews on the topic of biosynthesis-driven quality design of Chinese Materia Medica and other herbs.

Potential topics include but not limited to:

a. Elucidation and mapping of biosynthetic pathways of the effective components.

b. Metabolic engineering or regulation for the improvement of herbal quality.

c. Progress in understanding the biosynthesis of effective components.

d. Application of molecular breeding technology to medicinal plants.

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Authors can submit their manuscripts via the Manuscript System at https://mc03.manuscriptcentral.com/wjtcm.

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**Intended Publication Date**
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## 6. WJTCM Call for papers: Qi Deficiency and Blood Stasis

**World Journal of Traditional Chinese Medicine (WJTCM)**

The official journal of WFCMS and GP-TCM

Special Issue on

**Qi Deficiency and Blood Stasis**

CALL FOR PAPERS

Guest Editor
Prof. Jing-Yan Han

Guest Editor
Prof. Jian-Xun Liu

Guest Editor
Prof. Jing-Yuan Mao

Guest Editor
Prof. Ming-Jun Zhu

Qi deficiency and blood stasis is a common feature in coronary heart disease, cardiac hypertrophy, myocardial ischemia-reperfusion injury and heart failure, for which there is a lack of effective prevention and treatment methods in modern medicine. Some traditional Chinese medicine (TCM) has shown beneficial effect on heart diseases in clinic, and increasing clinical and basic studies have been carried out devoting to the mechanism behand these medicines, particularly focusing on their potential of tonifying Qi and promoting blood circulation, as well as the scientific essence of the Qi deficiency and Blood Stasis. In order to exchange the latest research results in this field, we have organized special issues of Qi deficiency and blood stasis, tonifying Qi and promoting blood circulation. Experts from this field are welcome to contribute original research articles or reviews.

Potential topics include but not limit to:

a. Reviews on Qi deficiency and blood stasis, tonifying Qi and promoting blood circulation

b. Clinical studies regarding Qi deficiency and blood stasis and tonifying Qi and promoting blood circulation

c. Basic studies regarding Qi deficiency and Blood Stasis and tonifying Qi and promoting blood circulation

d. Pharmacological mechanisms of tonifying Qi and promoting blood circulation

Authors can submit their manuscripts via the Manuscript System at https://mc03.manuscriptcentral.com/wjtcm.

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## Invitation from Frontiers: Ethnopharmacological Responses to the Coronavirus Disease 2019 (COVID-19) Pandemic

For more information, please visit: https://www.frontiersin.org/research-topics/14125/ethnopharmacological-responses-to-the-coronavirus-disease-2019-covid-19-pandemic?from=timeline&isappinstalled=0#overview

### About this Research Topic

Coronavirus disease 2019 (COVID-19) as a pandemic has highlighted some unforeseen and tremendous challenges for our lives and individuals' survival on a global scale. It may have been foreseen from an epidemiological perspective as a risk, but the enormous medical, societal, scientific, and technical challenges have so far been beyond our imagination. Ethnopharmacology is uniquely placed to contribute to the longer-term solutions to this pandemic and help in managing the immediate effects. The medical challenges are both linked to the immediate treatment and prevention of COVID-19, but also to managing symptoms and discomforts of those affected with COVID-19.

With vaccination not yet a reality, there are tasks in terms of novel antiviral treatment strategies. The numerous symptoms affecting importantly the respiratory, immune, and other systems can be treated using adjuvant therapies, and these are often based on traditional and local medical practices for similar diseases. There can be no 'traditional' medical treatment of this disease, but ethnopharmacology can contribute to novel ways to treat and support patients affected by COVID-19. Clinical research on COVID-19 is at its infancy.

The pandemic has ruptured value chains, not only for industrial goods, both also for local and traditional medicines, as well as for those which have become global commodities. At the same time, the outbreak has been linked to local practices and we will need a one-health agenda to understand the causes and to contribute to the prevention of further pandemics.

Ethnopharmacology is a bridge between social and the biomedical research. We need to understand what the 'general public' and professionals are currently doing to treat the disease and what consequences this has. Is there a more evidence-based use of any adjuvant therapy? How will such a therapy contribute to the management of secondary symptoms?

With Frontiers' vision to continuously empower the academic community with innovative solutions, which will contribute to better lives globally, we have a particular responsibility to support evidence-based scientific approaches in all fields of research, to provide inter- and transdisciplinary solutions and to enable the translation of scientific findings into solutions for all.

With this collaborative Research Topic, we invite colleagues to contribute wit high quality research with a focus on COVID-19, and how Ethnopharmacology can contribute to this research agenda. The specific themes plan to focus on include:

• Novel (and repurposed) natural antiviral agents
• Novel (and repurposed) natural immunomodulatory agents as an adjuvant treatment
• Respiratory pharmacology and the role of natural products as an adjuvant treatment
• Cellular and molecular mechanism of natural products in the prevention and treatment of COVID-19-associated diseases
• Natural products approach in multi-organ effects of COVID-19
• Pre-clinical and clinical updates on adjuvant treatments with herbal medicines
• Community responses and approaches from integrative and community medicine / primary healthcare
• Increasing drive for exotic medicines and supplements and the use of adjuvant therapies
• The impact of the pandemic on medicinal plant production and sourcing.

The present Research Topic welcome manuscripts addressing the above challenges, including what can be learned from previous epidemics like the Severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) outbreaks. It is open to clinical, preclinical, and social science research, also with the vision to integrate strategies for an optimal way of managing this disease.

All Article Types currently published in the section are welcome (see list **here**). The manuscripts will be peer-reviewed and will need to fully comply with the **Four Pillars of Best Practice in Ethnopharmacology** (check **here**). In all research dealing with plant extracts or other natural substances/compounds, the composition and the stability of the study material must be described in sufficient detail. Please also, note specifically the guidelines concerning *Pharmacological Requirements* (Section 1), as well as the need for testable scientific approaches to evaluate the effects of traditional medicinal preparations (Section 3d).

For your information, the Article Processing Fees will be waived for COVID-19 and health-related articles submitted to this Research Topic within the deadline of **July 15th**.

We look forward to your contribution to this huge challenge and task.

**Keywords**: Coronavirus, COVID-19, natural products, antiviral agents, herbal medicine

**Important Note**: All contributions to this Research Topic must be within the scope of the section and journal to which they are submitted, as defined in their mission statements. Frontiers reserves the right to guide an out-of-scope manuscript to a more suitable section or journal at any stage of peer review.

## Monthly Chinese Materia Medica Highlights

Chinese agarwood (*Aquilaria sinensis,* Thymelaeaceae, 白木香（沉香）, left) and sandalwood (*Santalum album,* Santalaceae, 檀香, right)

*Aquilaria sinensis* (endemic to southern China) and *Santalum album* (native to southern Asia) are valuable botanical resources that are widely utilized by pharmaceutical, incense, perfumery, and sculpture industries. Wild species of both plants are vulnerable and are protected by relevant local and international regulations. Great efforts have also been made to develop the cultivation in order to ensure their sustainable utilization.

In Chinese *materia medica*, the resin-containing heartwood of *Aquilaria sinensis* and other species outside China from the same genus (aquilariae lignum resinatum) and the heartwood of *Santalum album* (santali albi lignum) have similar functions of regulating qi, relieving pain, warming the middle, and stopping vomiting. However, aquilariae lignum resinatum stands out because it also assists the kidney in grasping qi, and calms panting.

| 白木香（沉香） | 檀香 |
|---|---|
| 身为千仞气轩昂 | 黄金之树用心材 |
| 万里行舟入内香 | 日日闻香异域来 |
| 纹理通幽寻庙宇 | 庙宇楼阁常遇见 |
| 珍稀不比痛时忙 | 痛时仍需共灶台 |

The above colour photographs, English texts and Chinese poems are contributed by Prof **Hubiao Chen** (Hong Kong), Dr **Ping Guo** (Hong Kong) and Prof **Jiqing Liu** (Shenzhen), respectively. This column is advised by Prof **Zhongzhen Zhao** (Hong Kong).