East Meets West Medicine Forum

NICM
The science of integrative medicine

Jerome Sarris
Professor of Integrative Mental Health

Deputy Director, NICM, Western Sydney University;
NHMRC Clinical Research Fellow;
Honorary Principal Research Fellow,
Department of Psychiatry,
Melbourne University
WHY COMPLEMENTARY MEDICINE?

- 70% of Australians
- $5b per annum
- 40% chronic diseases national health priorities
- <1% NHMRC funding for research
Purchased vitamins in the last 6 months: men vs women

NICM

- An Integrative Medicine Research Institute - 70 academics, staff, students

- Research Unit 1995; CompleMED 2001; NICM 2007 Govn seed

- ERA 5: Well above world standards (Excellence in Research for Australia)

- External Advisory Boards, Research Committees

- Strong national and international research linkages

- Strengths in Chinese Medicine and Nutraceuticals (Preclinical/Clinical)

- Nationally competitive grants, Govn and university seed funding, industry research grants, consultancies, philanthropy
NICM 2018
WESTMEAD MEDICAL PRECINCT
STRATEGIC GOALS

Traditional knowledge, healthy futures: 2015-2020

Advocacy
Develop and Disseminate objective, evidence-based information

Quality research
Advance clinically Relevant research to Promote wellness and address national health priorities

Excellence
Develop a dynamic and innovative culture that secures success

Educating and training
Provide world-class training and education

Patient centric
Develop best practice in integrative medicine
Vision
Assist in the evolution of healthcare with the use of evidence-based integrative medicine.

Mission
Conduct research that advances our knowledge and understanding of natural and traditional medicine and promotes evidence-based integrative healthcare.

Values
We embrace three core values that are the foundation upon which we continue to build our Institute and its future success. These values are:

Making a difference
Through our shared values, we are committed as a team to making a difference in integrative medicine. Our strategic alliances and collaborative achievements result in continuous learning and long-term impact.

Wellbeing
We empower people with their own wellbeing through scientific evidence and informed choice.

Global leadership
Through rigorous scientific investigation and innovation, we strengthen our global reputation in research excellence, and build capacity as a powerful advocate of evidence-based natural and traditional medicine.
BENCH TO BEDSIDE RESEARCH

THREE CORE RESEARCH PLATFORMS

1. **Preclinical development:** State of the art facilities and expertise in identification, bioactivity and mechanisms of action of herbal medicines

2. **Clinical trials:** Supports best practice and international standards in clinical research (ICH), wide hospital and specialist collaborations

3. **Research translation and policy:** Facilitates translation of research outcomes into health practice, contribute to relevant policy areas
## NICM RESEARCH PROGRAM

<table>
<thead>
<tr>
<th>&gt;&gt; TGA GMP accredited laboratories - stability testing</th>
<th>&gt;&gt; PC2 accredited pharmacology laboratories – mechanistic studies</th>
<th>&gt;&gt; ICH compliant clinical trial facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Healthy hearts</strong>: preventing and treating cardiovascular and metabolic disorders</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Healthy minds</strong>: preventing and treating neurocognitive and mental health disorders</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Healthy women</strong>: promoting sexual and reproductive health</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Healthy lives post-cancer</strong>: staying healthy through the cancer journey</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indigenous medicines</strong>: strengthening knowledge of traditional medicine culture</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Focus on herbal medicines and nutrient nutraceuticals, acupuncture, mind-body interactions (tai chi, meditation)
HEALTHY MINDS
PREVENTING AND TREATING
NEUROCOGNITIVE AND
MENTAL HEALTH DISORDERS
Nutritional medicine as mainstream in psychiatry

Jerome Sarris, Alan C Logan, Tasnime N Akbaraly, G Paul Amminger, Vicent Balanzá-Martínez, Marlene P Freeman, Joseph Hibbeln, Yutaka Matsuoka, David Mischoulon, Tetsuya Mizoue, Akiko Nanri, Daisuke Nishi, Drew Ramsey, Julia J Rucklidge, Almudena Sanchez-Villegas, Andrew Scholey, Kuan-Pin Su, Felice N Jacka, on behalf of The International Society for Nutritional Psychiatry Research

Psychiatry is at an important juncture, with the current pharmacologically focused model having achieved modest benefits in addressing the burden of poor mental health worldwide. Although the determinants of mental health are complex, the emerging and compelling evidence for nutrition as a crucial factor in the high prevalence and incidence of mental disorders suggests that diet is as important to psychiatry as it is to cardiology, endocrinology, and gastroenterology. Evidence is steadily growing for the relation between dietary quality (and potential nutritional deficiencies) and mental health, and for the select use of nutrient-based supplements to address deficiencies, or as monotherapies or augmentation therapies. We present a viewpoint from an international collaboration of academics (members of the International Society for Nutritional Psychiatry Research), in which we provide a context and overview of the current evidence in this emerging field of research, and discuss the future direction. We advocate recognition of diet and nutrition as central determinants of both physical and mental health.

Lancet Psychiatry 2015; 2: 271–74
"Nutrition and nutraceuticals should now be considered as mainstream elements of psychiatric practice, with research, education, policy, and health promotion reflecting this new paradigm."

Jerome Sarris¹,², Alan C. Logan³, Tasnime N. Akbaraly⁴,⁵, G. Paul Amminger⁶, Vicent Balanzá-Martínez⁷, Marlene P. Freeman⁸, Joseph Hibbitts⁹, Yutaka Matsuoka¹⁰, David Mischoulon¹¹, Tetsuya Mizoue¹², Akiko Nanri¹³, Daisuke Nishi¹³, Natalie Parletta¹⁴, Drew Ramsey¹⁵, Julia J. Rucklidge¹⁶, Almudena Sanchez-Villegas¹⁷,¹⁸, Andrew Scholey², Kuan-Pin Su¹⁹,²⁰, Felice N. Jacka²¹,²²,²³,²⁴

World Psychiatry 00:00 - Month 2015
Key Evidence

Double-blind RCT evidence for:

- Omega-3 Fatty acids, St John’s wort, SAMe in depression
- Kava and a range of plant medicines for anxiety
- Vitamin D for schizophrenia
- N-acetyl cysteine for psychotic and compulsive disorders
- Acupuncture, Yoga, Mindfulness for depression
- Lifestyle Medicine- Diet, exercise, Greenspace for general mental health and mood improvement
Can We Use Nutraceuticals with Medications?

Adjunctive Nutraceuticals for Depression: A Systematic Review and Meta-Analyses

Jerome Sarris, Ph.D., M.H.Sc., Jenifer Murphy, Ph.D., David Mischoulon, M.D., Ph.D., George I. Papakostas, M.D., Maurizio Fava, M.D., Michael Berk, M.D., Ph.D., Chee H. Ng, M.D.

Objective: There is burgeoning interest in augmentation strategies for improving inadequate response to antidepressants. The adjunctive use of standardized pharmaceutical-grade nutrients, known as nutraceuticals, has the potential to modulate several neurochemical pathways implicated in depression. While many studies have been conducted in this area, to date no specialized systematic review (or meta-analysis) has been conducted.

Method: A systematic search of PubMed, CINAHL, Cochrane Library, and Web of Science was conducted up to December 2015 for clinical trials using adjunctive nutrients for depression. Where sufficient data were available, a random-effects model analyzed the standard mean difference between treatment and placebo in the change from baseline to endpoint, combining the effect size data. Funnel plot and heterogeneity analyses were also performed.

Results: Primarily positive results were found for replicated studies testing S-adenosylmethionine (SAMe), methylfolate, omega-3 (primarily EPA or ethyl-EPA), and vitamin D, with positive isolated studies for creatine, folic acid, and an amino acid combination. Mixed results were found for zinc, folic acid, vitamin C, and tryptophan, with nonsignificant results for inositol. No major adverse effects were noted in the studies (aside from minor digestive disturbance). A meta-analysis of adjunctive omega-3 versus placebo revealed a significant and moderate to strong effect in favor of omega-3. Conversely, a meta-analysis of folic acid revealed a nonsignificant difference from placebo. Marked study heterogeneity was found in a Higgins test for both omega-3 and folic acid studies; funnel plots also revealed asymmetry (reflecting potential study bias).

Conclusions: Current evidence supports adjunctive use of SAMe, methylfolate, omega-3, and vitamin D with antidepressants to reduce depressive symptoms.

An adjunctive antidepressant nutraceutical combination in treating major depression: Study protocol, and clinical considerations

Jerome Sarris a,b,*, Con Stough b, Chad Bousman b,c,d,e, Jenifer Murphy a, Karen Savage a,b, Deidre J. Smith a, Ranjit Menon a, Suneel Chamoli f, Georgina Oliver a, Michael Berk c, Gerard J. Byrne f, Chee Ng a, David Mischoulon g

a The University of Melbourne, Department of Psychiatry, The Melbourne Clinic, Australia
b Swinburne University of Technology, Centre for Human Psychopharmacology, Australia
c The University of Melbourne, Department of Psychiatry, Parkville, Australia
d Florey Institute of Neuroscience and Mental Health, The University of Melbourne, Parkville, VIC, Australia
e The University of Melbourne, Department of General Practice, Parkville, VIC, Australia
f The University of Queensland, Discipline of Psychiatry, Australia
g Depression Clinical and Research Program, Department of Psychiatry, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA

ARTICLE INFO

Article history:
Available online xxx

Keywords:
S-Adenosyl methionine
SAMe
Omega-3
Antidepressant
Nutraceutical
Nutrient
Depression
RCT
Protocol

ABSTRACT

Current treatment for major depressive disorder (MDD), a prevalent and disabling mental illness, is inadequate, with two-thirds of people treated with first-line antidepressants not achieving remission. MDD is for many a chronic condition, often requiring multiple treatment attempts, thus development of additional interventions is urgently required. An emerging approach to improve non-response to antidepressants is the use of adjunctive nutraceuticals. The pathophysiology of MDD is considered to involve a range of abnormalities (monoamine impairment, neuroendocrinological changes, reduced brain-derived neurotrophic factor, and cytokine alterations). By targeting an array of these key neurobiological pathways via specific nutraceuticals (S-adenosyl methionine; [SAMe], 5-HTP [active tryptophan], folic acid [active folic acid], omega-3 fatty acids, and zinc), there is the potential to provide a more comprehensive therapeutic biological approach to treat depression. We are currently conducting a National Health and Medical Research Council funded study in Australia (APP1048222). The clinical trial is phase II/III, multi-site, 3-arm, 8-week, randomised, double-blind, placebo-controlled study using SAMe + folic acid versus a combination nutraceutical (SAMe, 5-HTP, folic acid, omega-3, and zinc) or matching placebo in 300 currently depressed participants with diagnosed MDD who are non-responsive to current antidepressants (ANZCTR, protocol number: 12613001300763). The results may provide evidence for a novel adjunctive neurobiological approach for treating depression.

© 2015 Published by Elsevier Ltd.
8 week 3-arm double-blind RCT

- SAMe vs. Combination Nutraceutical vs. Placebo for adults with current depression who are taking an antidepressant and are non-responsive

- Also studying biomarkers (including pharmacogenomics)
### Acupuncture for depression

**Cochrane Database of Systematic Reviews 2010, Issue 1.**

Caroline A Smith¹, Phillipa PJ Hay², Hugh MacPherson³

#### 1.1.1 Manual acupuncture

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Acupuncture</th>
<th>No treatment</th>
<th>Std. Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen 1998 (1)</td>
<td>-11.7</td>
<td>10.9</td>
<td>-0.54 [-1.56, 0.48]</td>
</tr>
<tr>
<td>Allen 2006 (2)</td>
<td>13.5</td>
<td>19</td>
<td>-0.78 [-1.27, -0.28]</td>
</tr>
<tr>
<td>Bosch 2015 (3)</td>
<td>23.8</td>
<td>11.34</td>
<td>0.15 [-0.54, 0.83]</td>
</tr>
<tr>
<td>Cheng 2007 (4)</td>
<td>17.82</td>
<td>6.48</td>
<td>-1.48 [-2.33, -0.64]</td>
</tr>
<tr>
<td>MacPherson 2013 (5)</td>
<td>9.8</td>
<td>7.12</td>
<td>-0.40 [-0.63, -0.18]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>217</td>
<td>241</td>
<td>-0.56 [-0.98, -0.15]</td>
</tr>
</tbody>
</table>

Heterogeneity: $\tau^2 = 0.12; \text{Chi}^2 = 10.47, \text{df} = 4 (P = 0.03); \text{I}^2 = 62\%$

Test for overall effect: $Z = 2.68 (P = 0.007)$

#### 1.1.2 Electro-acupuncture

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Acupuncture</th>
<th>No treatment</th>
<th>Std. Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheng 2007 (6)</td>
<td>19.56</td>
<td>6.48</td>
<td>-1.26 [-2.10, -0.43]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>20</td>
<td>10</td>
<td>-1.26 [-2.10, -0.43]</td>
</tr>
</tbody>
</table>

Heterogeneity: Not applicable

Test for overall effect: $Z = 2.97 (P = 0.003)$

Total (95% CI) 237 251 100.0% -0.66 [-1.06, -0.25]

Heterogeneity: $\tau^2 = 0.14; \text{Chi}^2 = 13.73, \text{df} = 5 (P = 0.02); \text{I}^2 = 64\%$

Test for overall effect: $Z = 3.19 (P = 0.001)$

Test for subgroup differences: $\text{Chi}^2 = 2.17, \text{df} = 1 (P = 0.14), \text{I}^2 = 54.0\%$

---

Footnotes:
1. HAMD
2. HAMD
3. BDI
4. HAMD
5. PHQ-9
6. HAMD

---

ACUPUNCTURE VS NO TREATMENT AT THE END OF TREATMENT
# Acupuncture vs Medication Alone

## 3.1.1 Manual Acupuncture vs SSRI

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Acupuncture Mean</th>
<th>SD</th>
<th>Total</th>
<th>Medication Mean</th>
<th>SD</th>
<th>Total</th>
<th>Weight</th>
<th>Std. Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ding 2003 (1)</td>
<td>14.12</td>
<td>1.53</td>
<td>30</td>
<td>14.62</td>
<td>2.74</td>
<td>30</td>
<td>3.2%</td>
<td>-0.18 [-0.69, 0.32]</td>
</tr>
<tr>
<td>Dong 2007 (2)</td>
<td>16.24</td>
<td>3.91</td>
<td>20</td>
<td>14.12</td>
<td>3.75</td>
<td>10</td>
<td>2.4%</td>
<td>0.63 [0.24, 1.11]</td>
</tr>
<tr>
<td>Du 2005 (3)</td>
<td>17.02</td>
<td>6.68</td>
<td>78</td>
<td>15.72</td>
<td>5.84</td>
<td>25</td>
<td>3.4%</td>
<td>0.20 [0.26, 0.65]</td>
</tr>
<tr>
<td>Fan 2005 (4)</td>
<td>18.52</td>
<td>7.13</td>
<td>14</td>
<td>15.48</td>
<td>8.01</td>
<td>25</td>
<td>2.7%</td>
<td>0.16 [0.50, 0.81]</td>
</tr>
<tr>
<td>Feng 2011 (5)</td>
<td>9.88</td>
<td>1.27</td>
<td>40</td>
<td>13.72</td>
<td>2.05</td>
<td>40</td>
<td>3.0%</td>
<td>-2.23 [-2.79, -1.67]</td>
</tr>
<tr>
<td>Fu 2000 (6)</td>
<td>13.78</td>
<td>5.63</td>
<td>68</td>
<td>14.96</td>
<td>6.75</td>
<td>176</td>
<td>4.0%</td>
<td>-0.17 [-0.43, 0.08]</td>
</tr>
<tr>
<td>He 2006 (7)</td>
<td>10.15</td>
<td>3.02</td>
<td>96</td>
<td>12.36</td>
<td>3.15</td>
<td>86</td>
<td>3.9%</td>
<td>-0.71 [-1.02, -0.40]</td>
</tr>
<tr>
<td>He 2012 (8)</td>
<td>7.97</td>
<td>5.48</td>
<td>38</td>
<td>7.21</td>
<td>4.6</td>
<td>36</td>
<td>3.4%</td>
<td>0.15 [0.31, 0.80]</td>
</tr>
<tr>
<td>Li 2004 (9)</td>
<td>15.8</td>
<td>6.1</td>
<td>48</td>
<td>15.72</td>
<td>5.84</td>
<td>25</td>
<td>3.3%</td>
<td>0.01 [0.47, 0.49]</td>
</tr>
<tr>
<td>Liu 2006 (10)</td>
<td>19.24</td>
<td>5.13</td>
<td>101</td>
<td>18.9</td>
<td>5.02</td>
<td>145</td>
<td>4.0%</td>
<td>0.07 [0.19, 0.32]</td>
</tr>
<tr>
<td>Ma 2011 (11)</td>
<td>11.73</td>
<td>5.68</td>
<td>31</td>
<td>11.34</td>
<td>8.63</td>
<td>29</td>
<td>3.2%</td>
<td>0.06 [0.44, 0.57]</td>
</tr>
<tr>
<td>Pel 2006 (12)</td>
<td>14.86</td>
<td>5.24</td>
<td>62</td>
<td>13.08</td>
<td>5.72</td>
<td>58</td>
<td>3.7%</td>
<td>0.07 [0.29, 0.43]</td>
</tr>
<tr>
<td>Giao 2007 (13)</td>
<td>9.73</td>
<td>3.31</td>
<td>20</td>
<td>10.67</td>
<td>7</td>
<td>20</td>
<td>2.6%</td>
<td>1.22 [-1.91, -0.54]</td>
</tr>
<tr>
<td>Wenbin 2002 (14)</td>
<td>7.5</td>
<td>7.3</td>
<td>32</td>
<td>8.7</td>
<td>6.9</td>
<td>30</td>
<td>3.2%</td>
<td>-0.17 [0.67, 0.33]</td>
</tr>
<tr>
<td>Xiao 2014 (15)</td>
<td>13.43</td>
<td>6.39</td>
<td>30</td>
<td>16.93</td>
<td>7.3</td>
<td>30</td>
<td>3.2%</td>
<td>-0.51 [-1.03, 0.00]</td>
</tr>
<tr>
<td>Zhang 2005a (16)</td>
<td>11.2</td>
<td>2.3</td>
<td>43</td>
<td>10.8</td>
<td>3.2</td>
<td>43</td>
<td>3.6%</td>
<td>0.14 [-0.28, 0.57]</td>
</tr>
</tbody>
</table>

Subtotal (95% CI): 762 [0.05, 0.04]

Heterogeneity: Tau² = 0.23; Chisq = 91.15, df = 15 (P < 0.00001); I² = 84%

Test for overall effect: Z = 1.69 (P = 0.09)

## 3.1.2 Electro-Acupuncture vs SSRI

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Acupuncture Mean</th>
<th>SD</th>
<th>Total</th>
<th>Medication Mean</th>
<th>SD</th>
<th>Total</th>
<th>Weight</th>
<th>Std. Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dong 2007 (17)</td>
<td>9.78</td>
<td>2.91</td>
<td>18</td>
<td>14.12</td>
<td>3.75</td>
<td>10</td>
<td>2.2%</td>
<td>-1.31 [-2.18, -0.46]</td>
</tr>
<tr>
<td>Duan 2008 (18)</td>
<td>14.66</td>
<td>2.37</td>
<td>23</td>
<td>15.21</td>
<td>2.03</td>
<td>12</td>
<td>2.6%</td>
<td>-0.15 [-0.85, 0.55]</td>
</tr>
<tr>
<td>Li 2007 (19)</td>
<td>13.22</td>
<td>6.32</td>
<td>32</td>
<td>14.29</td>
<td>6.39</td>
<td>24</td>
<td>3.1%</td>
<td>-0.17 [-0.70, 0.36]</td>
</tr>
<tr>
<td>Sun 2010 (20)</td>
<td>10.04</td>
<td>2.27</td>
<td>14</td>
<td>11.82</td>
<td>4.48</td>
<td>20</td>
<td>2.7%</td>
<td>-0.45 [-1.10, 0.20]</td>
</tr>
<tr>
<td>Sun 2013 (21)</td>
<td>9.46</td>
<td>3.17</td>
<td>10</td>
<td>12.48</td>
<td>4.38</td>
<td>25</td>
<td>2.4%</td>
<td>-0.64 [-1.32, 0.01]</td>
</tr>
</tbody>
</table>

Subtotal (95% CI): 98 [0.85, 0.10]

Heterogeneity: Tau² = 0.05; Chisq = 6.02, df = 4 (P = 0.20); I² = 34%

Test for overall effect: Z = 2.49 (P = 0.01)
SAI-LUO TONG DEVELOPMENT (10 YEARS)

**Preclinical Phase**
- Extraction Methods
- Chemical Definition
- Quality Control
- Stability Studies
- Active Constituents
- Proximal Dosage Ratio
- Dose Regimen
- Toxicity studies
- PD studies
- PK studies

**Clinical Phase**
- Phase I
  - Tolerance study
- Pilot Phase II
  - RCT in Australia (n=62)
- Phase II
  - Dosage Determining study in China (n=325)
- Phase III multi-centre
  - RCT trials x 2 (Australia and China)

**PROFESSOR DENNIS CHANG**

nicm.edu.au
Kava for the Treatment of Anxiety
RESEARCH INTO KAVA EFFICACY - TIMELINE

2009
- Short-Term 1x1 Week Crossover RCT (n=60)
  * Kava ↓ Anxiety Symptoms

2010
- Acute RCT Crossover Kava vs. Oxazepam and Placebo using computerised cognitive battery + driving simulator (n=22)
  * Kava shows no impairment

2011
- 6-Week Pilot RCT Kava vs. Placebo GAD (n=75)
  * Kava effective in GAD
  * GABA transporter polymorphisms found to modify response

2012
- Outlined methods for safe Kava production, formulation, & key clinical guidelines
  * Several high-impact papers
  * Results presented to South Pacific governments

2014
- Final Study 16-Week RCT Kava vs. Placebo GAD (n=210)
  * To confirm Efficacy + Safety Genomics Biochemistry
Neuroimaging measures

• 1H-MRS- Brain metabolites (GABA)

• fMRI - Activation during International Affective Picture System (IAPS)- anticipatory anxiety model

Anxiety scale measures

• Spielberger State-Trait Anxiety Inventory (STAI) pre- and post- scans

Genomic measures

• GABA pathway SNPs and GABA gene expression
The efficacy of smartphone-based mental health interventions for depressive symptoms: a meta-analysis of randomized controlled trials

Joseph Firth¹,², John Torous³,⁴, Jennifer Nicholas⁵,⁶, Rebekah Carney⁷, Abhishek Pratap⁷,⁸, Simon Rosenbaum⁵,⁶, Jerome Sarris¹,⁹

¹NIMH, School of Health and Science, Western Sydney University, Sidney, Australia; ²Faculty of Biology, Medicine and Health, Division of Psychology and Mental Health, University of Manchester, Manchester, UK; ³Department of Psychiatry and Division of Clinical Informatics, Beth Israel Deaconess Medical Center, Boston, MA, USA; ⁴Harvard Medical School, Boston, MA, USA; ⁵Black Dog Institute, University of New South Wales, Sydney, Australia; ⁶Faculty of Medicine, School of Psychiatry, University of New South Wales, Sydney, Australia; ⁷Sage Bionetworks, Seattle, WA, USA; ⁸Department of Biomedical Informatics and Medical Education, University of Washington, Seattle, WA, USA; ⁹Department of Psychiatry, University of Melbourne, Professorial Unit, The Melbourne Clinic, Melbourne, Australia

(World Psychiatry 2017;16:00-00)
Examples of Other Research Areas & Projects

• N-acetyl cysteine for OCD, Bipolar Disorder, Schizophrenia
• GUT FEELINGS: Prebiotic foods vs Probiotics vs Synbiotics vs Placebo
• Multi-nutraceutical formulation studies: OCD, First-episode psychosis
• Adjunctive L-theanine for clinical anxiety
• Healthy Body Healthy Mind Program
• Acupuncture clinical trial for peri-natal depression
• Global Ayahuasca Project
• AMCREC- Medicinal Cannabis Research & Education Collaboration
PANCULTURAL GREENHOUSE & GARDEN PROJECT

PAN-CULTURAL MEDICINAL PLANT RESEARCH AND DEVELOPMENTAL INITIATIVE

FROM BUSH TO BENCH TO BEDSIDE AND BEYOND

VALUE PROPOSITION
To advance human health and industry using traditional and new scientific knowledge

WESTERN SYDNEY UNIVERSITY PLATFORMS OF EXPERTISE AND KNOWLEDGE - UNLIMITED POTENTIAL

PLANT CULTIVATION & GERMLASM DEVELOPMENT
- Growth Conditions: Nutrients, water, fertilization, stress, microenvironments, hydroponics, soil
- Controlled Facilities: Field, glasshouses, polyhous, growth chambers
- Elite Novel Varieties: Natural breeding, Genetic modification, Quarantine import

PLANT GENOMICS & DISCOVERY OF METABOLIC PATHWAYS
- Next Generation Sequencing: Genome assembly, transcriptomics, epigenetics
- Metabolic Pathways: Biosynthesis, degradation, regulation & storage
- Functional Genomics: Markers, genes, mutagenesis, chemical screens
- Structure elucidation: 1D, 2D NMR, MS, IR, UV, X-ray, Polarimetry

METABOLITE IDENTIFICATION & ISOLATION
- Metabolomics: Mass spectrometry
- Chromatography: TLC, Column, SFE, HPLC
- Safety: Cell toxicity, mutagenicity, iminity

PHARMACOLOGY & CLINICAL TESTING
- Disease basis: Neurobiological, (Neuroprotection), Anti-inflammatory, Antibiotic/microbial
- Efficacy: Cell models, Animal models, Human studies
- Consultancy: Work with key stakeholders to drive policy change

INTELLECTUAL & CULTURAL PROTECTION OF KNOWLEDGE
- Agreements: Confidentiality, Collaborative, Commercial
- IP protection: Strategy relevant to technology being developed

COMMUNITY EDUCATION & BUSINESS DEVELOPMENT
- Outreach & Education: Engagement of community, schools & government to enhance awareness
- Commercialisation: Demand-side issues, Spin-off company, Licensing options
- Industry/competition: BD consultants, Venture capitalists, Product scale-up

Medical Applications: Dementia, Depression, CNS Disorders, Osteoarthritis, Inflammatory disorders, Chronic Pain, Antibiotic resistance; Topical anti-bacterials

TRADITIONAL AND ENVIRONMENTALLY SUSTAINABLE MEDICINAL PLANTS
- AUSTRALIAN NATIVES: Curcuma australasica/Turmeric, Orthosiphon aristatus, Sea Parsley, Eucalyptus benthamill Alphitonia petriei, Bunya Nuts, Kakadu Plum
- PAN-PACIFIC: Saffron, Withania, Orthosiphon stamineus
- PSYCHOTROPIC PLANTS: Medicinal Cannabis, Papaver somniferum and Acacias species
Disclosures: Prof Sarris has received either presentation honoraria, travel support, clinical trial grants, book royalties from Integria Healthcare & MediHerb, Pfizer, Taki Mai & South Pacific Elixirs, Bioceuticals & Blackmores, Soho-Flordis, Healthworld, HealthEd, HealthMasters, Elsevier, Chaminade University, International Society for Affective Disorders, Complementary Medicines Australia, Terry White Chemists, ANS, Key Pharmaceuticals, Society for Medicinal Plant and Natural Product Research, Omega-3 Centre, the National Health and Medical Research Council, CR Roper Fellowship