



2019國際藥物化粧品

暨保健科技研討會

International conference on pharmaceutical & cosmetic sciences
and health biotechnology (ICPCH 2019)

Oct. 23-24, 2019

Chia Nan University of
Pharmacy & Science

WELCOME

Welcome to “2019 International Conference on Pharmaceutical & Cosmetic Sciences and Health Biotechnology” in Tainan, Taiwan. On behalf of Chia-Nan University of Pharmacy and Science (嘉藥) and Chi-Mei Medical Center (奇美醫院), I would like to express my sincere appreciation to welcome all the participants including our distinguished guests, keynote speakers from Japan, Hong-Kong, Thailand, as well as moderators and department chairs of College of Pharmacy and Science. Special thanks also to Prof. Mingjiuan Wu, Dean of College of Pharmacy and Science, for bringing this important international conference to Tainan.

Chia-Nan University of Pharmacy and Science was founded in 1966. It is now a leading university of professionals in the fields of pharmacy, health care, and science, with approximately 400 faculties and 13,000 students. We currently offer four-year Bachelor’s degree programs, two-year senior college programs, and Master’s degree programs. Courses are offered among the five colleges: the College of Pharmacy and Science, the College of Human Ecology, the College of Humanities and Applied Information, the College of Sustainable Environment, and the College of Recreation and Health Management.

Today’s conference is funded by the Higher Education Sprout Project of MOE and aims in global cooperation in teaching and research for higher education. I believe through these two days’ discussion and poster section, we can share knowledge, current research experiences, and experimental outcomes. With this dedication, scientists can transform this into innovations and make a breakthrough in medical, cosmetic, and health fields. At the end, we are looking forward to more international cooperation with you. I hope everyone enjoy the program that we have arranged. Thank you to the many people who planned and executed this exceptional conference. Last but not least, enjoy your stay in Tainan, the historic capital of Taiwan, and please take some time off to tour around our beautiful campus.

President: Chen, Hong-Chu, Ph.D.
Chia Nan University of Pharmacy & Science
Oct.23, 2019

Organizers

- College of Pharmacy and Science, Chia Nan University of Pharmacy and Science, Tainan, Taiwan
- Chi Mei Medical Center, Tainan, Taiwan

Sponsors

- “Higher Education Sprout Project” from Ministry of Education, Taiwan, ROC
- “Human Resources Infrastructure to Nurture Talent and Boost Employment & Subsidies for Technological and Vocational Colleges and Universities to Optimize Environments for Job Ready Skills Programs” from Ministry of Education, Taiwan, ROC

Committees

Chairs

- Prof. Ming-Jiuan Wu, Chia Nan University of Pharmacy & Science
- Prof. Jhi-Joung Wang, Chi Mei Medical Center

Program Committees:

- Prof. Pin-Shern Chen, Chia Nan University of Pharmacy & Science
- Prof. Wen-Yueh Ho, Chia Nan University of Pharmacy & Science
- Prof. Jinn-Rung Kuo, Chi Mei Medical Center
- Prof. Ching-Gong Lin, Chia Nan University of Pharmacy & Science
- Prof. Mei-Fen Shih, Chia Nan University of Pharmacy & Science
- Prof. Meng-We Wan, Chia Nan University of Pharmacy & Science
- Prof. Jeng-Jer Yang, Chia Nan University of Pharmacy & Science
- Prof. Ching-Fen Yeh, Chia Nan University of Pharmacy & Science

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2019 International conference on pharmaceutical &
cosmetic sciences and health biotechnology (ICPCH 2019)

Oct. 23-24, 2019



Organizations: College of Pharmacy and Science, Chia Nan University of
Pharmacy and Science, Tainan, Taiwan
Chi Mei Medical Center, Tainan, Taiwan

Venue: No.60, Sec. 1, Erren Rd., Rende Dist., Tainan City 71710, Taiwan

1st Day Agenda

Oct. 23, 2019 (Wed)

Keynote speeches

3rd Floor of International Conference Center

Time	Event	Speaker	Moderator
9:00-9:30	Registration		
9:30-9:40	Opening Remarks	Hong-Chu Chen, Ph.D	President of CNU
9:40-10:20 Keynote 1	Possibilities of Aroma Compounds in Pharmaceutical, Cosmetics and Health	Takane Fujimori, Ph.D. Tokyo University of Agriculture	Kuan-Han Lee, Ph.D.
10:20-10:50	Break		
10:50-11:30 Keynote 2	Big data analysis for drug screening and discovery	Benjamin Yat-Ming Yung, Ph.D. Hong Kong Polytechnic University	Jhi-Joung , Wang, M.D., Ph.D.
11:30-12:10 Keynote 3	Herbal Cosmeceuticals: Research and Development	Pimporn Leelapornpisid Chiangmai University	Mei-Fen Shih, Ph.D.
12:10-12:20	Poster Session Opening Ceremony 3rd Floor of International Conference Center		
12:20-14:20	Lunch		
Master Lectures: B1 FL of Information and General Classroom Building			
14:20-15:10	Master Lecture 1 Possibilities of Aroma Research in Pharmaceutical, Cosmetics and Health by Takane Fujimori, Ph.D. Room Qs003	Master Lecture 2 Big Data Analysis for Revealing Gene-Gene Interactions in Cancer by Benjamin Yat-ming Yung, Ph.D. Room Qs004	Master Lecture 3 Herbal Nanocosmeceuticals by Pimporn Leelapornpisid Room Qs007
15:10-17:00	Panel Discussion Room Qs004		

2nd Day Agenda**Oct. 24, 2019 (Thu)****Oral Presentation Session A:****AI in Medicine****Room Cs401**

Time	Title	Speaker
09:00~09:10	Opening Remarks	Jhi-Joung Wang, M.D., Ph.D
09:10~09:30	The application of smart medical care in otolaryngology	Ching-Feng Liu Chi Mei Medical Center
09:30~09:50	AI outcome prediction in older ED patients with influenza	Chien-Cheng Huang, Chien-Chin Hsu, Yuan Kao, Hung-Jung Lin, Chung-Feng Liu, Chia-Jung Chen, Ya-Wei Kuo, Shu-Lien Hsu, Tzu-Lan Liu, Jhi-Joung Wang Chi Mei Medical Center
09:50~10:10	AI outcome prediction in ED chest pain patients	Chien-Cheng Huang, Chien-Chin Hsu, Yuan Kao, Pei-I Zhang, Hung-Jung Lin, Chung-Feng Liu, Chia-Jung Chen, Ya-Wei Kuo, Shu-Lien Hsu, Tzu-Lan Liu, Jhi-Joung Wang Chi Mei Medical Center
10:10~10:30	Artificial intelligence aided early warning system of in-hospital cardiac arrest	Chia-Te Liao, Hung-Jung Lin, Ya-Wei Kuo Chi Mei Medical Center
10:30~10:50	BREAK	
10:50~11:10	A smart cross-platform instant message collaboration system	Chia-Te Liao, Ching-Hung Chang, Hung-Jung Lin, Ya-Wei Kuo, Jing-Jia Lin Chi Mei Medical Center
11:10~11:30	A conceptual infrastructure of big medical data and AI computing	Chia-Jung Chen, Chung-Ann Wang, Tzu-Lan Liu, Chung-Feng Liu, June-Dong Lin, Jhi-Joung Wang Chi Mei Medical Center
11:30~11:50	AI prediction of the requirement of intensive care unit admission after lung resection surgery	Ying-Jen Chang, Chung-Feng Liu, Miao-Chuan Lin, Shu-Chin Chiang, Jhi-Joung Wang Chi Mei Medical Center
11:50~12:00	Q & A	
12:00-12:30	Poster Session Close Ceremony 3rd FL of International Conference Center	

嘉南藥理大學藥理學院 奇美醫療財團法人奇美醫院 合辦

教育部 高教深耕計畫 優化技職校院實作環境計畫

2nd Day Agenda**Oct. 24, 2019 (Thu)****Oral Presentation Session B:****3D Printing in Medicine Room Cs501**

Time	Title	Speaker
09:00~09:05	Opening Remarks	Jinn-Rung Kuo, M.D., Ph.D
09:05~09:25	Collector for injection lines identification and storage	Yu-Chen Tung, Pei-Chen Huang, Chia-Chen Hsu, Shu-Hui Hu, Jui-Yu Weng, Jinn-Rung Kuo, Jhi-Joung Wang Chi Mei Medical Center
09:25~09:45	Ruyi roller	Yi-Chen Lee, Ling Yeh, Chun-Tin Cheng, Chi-His Lin, Shu-Chin Ma, Hui-Ying Chiang, Jui-Yu Weng, Jinn-Rung Kuo, Jhi-Joung Wang Chi Mei Medical Center
09:45~10:05	Oxygen universal adapter	Chia-Chun Hsieh, Chia-Ling Wu, Ya-Ting Chang, Hui-Fang Chen Chi Mei Medical Center
10:05~10:25	Counter-aid needle-collecting box	Tung-Hui Jen, Chien-Yu Huang, Wei-Jan Hsu, Jinn-Rung Kuo, Jui-Yu Weng, Jhi-Joung Wang Chi Mei Medical Center
10:25~10:40	BREAK	
10:40~11:00	3D-print whole-body vascular model for neurovascular intervention simulation	Te-Chang Wu, Jinn-Rung Kuo*, Jhi-Joung Wang, Jui-Yu Weng Chi Mei Medical Center
11:00~11:20	Air Cushion Nest	Ching Tao, Ching-Yu Lee, Li-Ling Kuo, Kai-Fang Chang, Jui-Yu Weng, Jinn-Rung Kuo, Jhi-Joung Wang Chi Mei Medical Center
11:20~11:40	Thermal clothing	Ching-Yu Lee, Li-Chun Liu, Ching Tao, Ya-Ching Yang, Jinn-Rung Kuo, Jhi-Joung Wang, Jui-Yu Weng Chi Mei Medical Center
11:40~12:00	Pneumatic gloves	Ya-Ting Chang, Hui-Fang Chen, Chia-Chun Hsieh, Chia-Ling Wu Chi Mei Medical Center
12:00-12:30	Poster Session Close Ceremony 3rd FL of International Conference Center	

嘉南藥理大學藥理學院 奇美醫療財團法人奇美醫院 合辦

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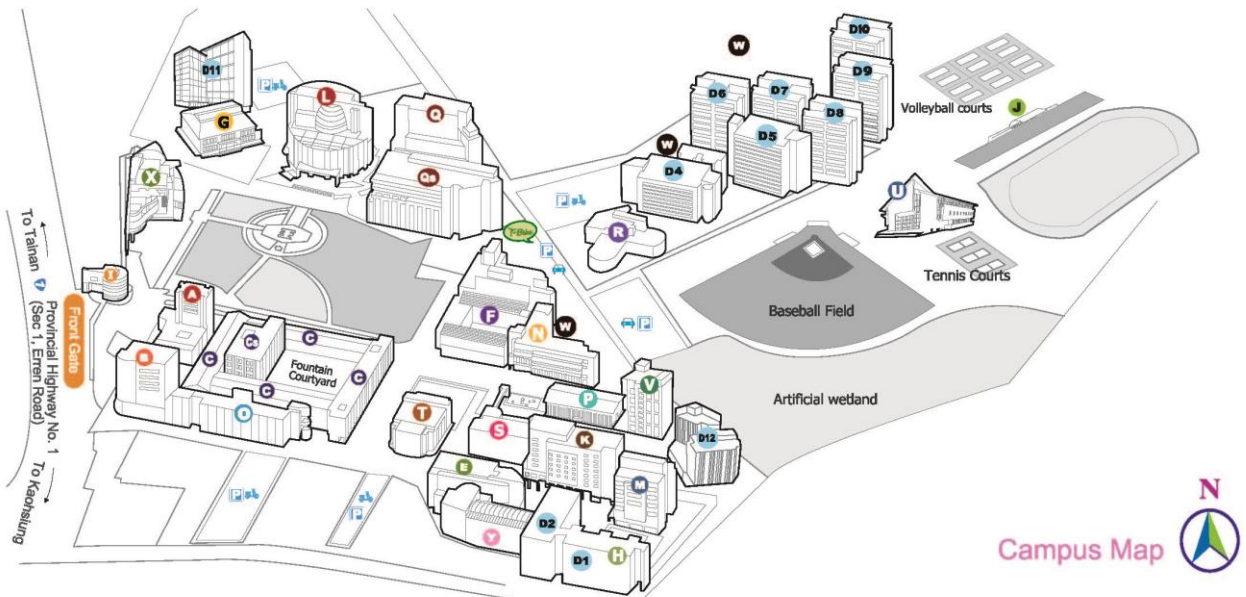
Venue

Chia Nan University of Pharmacy & Science

No.60, Sec. 1, Erren Rd., Rende Dist., Tainan City 71710, Taiwan (R.O.C.)

TEL : +886-6-2664911

Campus Map Chia Nan University of Pharmacy & Science



- | | | | |
|---|--|---|--|
| A Administration Building | E Environmental Sustainability Building | M Recreational Therapy and Research Building | S Student Activity Center |
| B Song Tian Building | F Food Science Building and Training Pharmaceutical Factory | N Lee Chin-Hsing Laboratory Building | T Auditorium |
| C General Classroom Building | G Badminton Courts | O Occupational Safety Building | U Shao Tsung Gymnasium |
| C1 Classroom and Laboratory Building | H Swimming Pool | P Pharmacy Building | V Ying-Jie Dormitory VI 1.2F |
| D1, D2 Ying-Jie Dormitory I ~ III | I Security Office (front gate) | Q Ho Seng Pharmaceutical Sciences Center | X International Conference Center |
| D4 ~ D6 Jin-Juan Dormitory A ~ G | J Grandstand | R Information and General Classroom Building (north) | Y Childhood Education Building |
| D7 Ying-Jie Dormitory V | K Hwei Chen Building | R Information and General Classroom Building (south) | W Waste Water Treatment Plant |
| D8 Ying-Jie Dormitory VI 3~10F | L Library and Information Building | R Training Restaurant | |

FUJIMORI Takane , Ph.D 藤森 嶺

DATE OF BIRTH 9/4/1945

EDUCATION

1976 Hokkaido University Ph. D. of Agriculture
1970-1971 Tokyo University of Education (University of Tsukuba) Master of Science
1966-1970 Waseda University Bachelor of Science

WORK EXPERIENCE

2017- Flavor Fragrance Association Representative Director
2016- Tokyo University of Agriculture Guest Professor
2010-2016 Tokyo University of Agriculture, Department of Food and Cosmetic Sciences Professor
2000-2010 Tokyo University of Agriculture Guest Professor
2000-2006 Soda Aromatic Co. Ltd.
1999-2010 Tamagawa University Research Fellow
1996-2005 Obihiro University of Agriculture and Veterinary Medicine Guest Professor
1971-2000 Japan Tobacco Inc. (Central Research Institute)

AWARD

1999 Achievement Award (Weed Science Society of Japan)
1979 JSBBA Award for Young Scientists (Japan Society for Bioscience, Biotechnology, and Agrochemistry)



Keynote Speech 1

Possibilities of Aroma Compounds in Pharmaceutical, Cosmetics and Health

Takane Fujimori

Human beings have used natural aroma for several thousand years. The history of using aroma compounds for our life styles started in the late 1980's for two reasons. One is the success in isolating natural aroma compounds from plants. The other is that chemical synthesis of aroma compounds started. In the new situation natural aroma compounds and chemical synthetic compounds began to be used. Today we eat foods with a lot of kinds of flavors and we live in the aromatic atmosphere using fragrance materials.

Having been able to use high-performance GC/MS and high-resolution NMR since the 1960's, we can discover new compounds and determine their structure relatively easily. I conducted a research on tobacco aroma constituents in the 1970's and 1980's, and I discovered a lot of new natural aroma compounds, mainly carotenoid-derived compounds and cyclic diterpenoid-derived compounds. They often existed in very small amounts in the essential oil, but sometimes had very valuable aroma with a very low threshold.

We investigated the aroma components of essential oil of Oyomogi (*Artemisia montana*) and their sedative effect available in the field of cosmetics¹. Our research results indicated the stress-reducing effects of the essential oil breathed through the nose. Good aroma compounds are valuable for flavor and fragrance products, and they can also be useful for our health.

1) Kunihiro K., Myoda T., Tajima N., Gotoh K., Kaneshima T., Someya T., Toeda K., Fujimori T., and Nishizawa M.: *J. Oleo Sci.* 66, 843, (2017)

Master Lecture 1

Possibilities of Aroma Research in Pharmaceutical, Cosmetics and Health

Takane Fujimori

Human beings have used natural aroma for several thousand years. The history of using aroma compounds for our life styles started in the late 1980's for two reasons. One is the success in isolating natural aroma compounds from plants. The other is that chemical synthesis of aroma compounds started. In the new situation natural aroma compounds and chemical synthetic compounds began to be used. Today we eat foods with a lot of kinds of flavors and we live in the aromatic atmosphere using fragrance materials.

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I would like to talk about brilliant possibilities of aroma research.

- 1) Kunihiro K., Myoda T., Tajima N., Gotoh K., Kaneshima T., Someya T., Toeda K., Fujimori T., and Nishizawa M.: *J. Oleo Sci.* 66, 843, (2017)

Benjamin Yat-Ming Yung

Ph.D.

Former Head and Chair Professor

Department of Health Technology & Informatics

Hong Kong Polytechnic University

Biography

Professor Yung obtained his Ph.D. in Pharmacology from Baylor College of Medicine. He had his postdoctoral training in the lab of the Nobel Laureate Arthur Kornberg at Stanford University. He was the Dean of Research Development and professor at Chang Gung University in Taiwan. He is currently a chair-professor of Biomedical Sciences at The Hong Kong Polytechnic University. For the past 40 years, he has systematically explored the biological role of NPM in cancer. Prof. Yung has published over 100 scientific papers that cover broad range of scientific disciplines and techniques. His achievements and recognitions are reflected in many prestigious awards, including Outstanding Researcher Award, Outstanding Cancer Research Award and Ministry of Education Outstanding Teacher Award.

Keynote Speech 2

Big data analysis for drug screening and development

Benjamin Yat Ming Yung

In our recent developed big data analysis platform for analysing the interactions among genes, we compare distributions of gene co-expressional correlations between neoplastic and normal states. We reveal their structural differences to define a strongly co-expressed gene network with the best coherence to neoplasm phenotype. This study has assured a novel structural co-expression network analysis platform, which unveils cancer pathogenesis and its potential treatment strategy. While there is clinical benefit of target therapy, some patients do not respond to the therapy. To identify a molecular gene interaction network of target therapy benefit, we conducted our big data analysis of primary carcinoma from patients with target therapy. Gene co-expression analysis discovers novel unregulated patterns of gene network for understanding cancer biology, identifying new targets for treatment, drug screening and development and all these innovations contribute to great science. This platform can be applied to other diseases for diagnostic, prognostic and therapeutic investigation.

Master Lecture 2

Big data analysis for revealing gene-gene interactions in cancer

Benjamin Yat Ming Yung

Nucleophosmin (NPM-1) is an important nucleolar phosphoprotein with pleiotropic functions in various cellular processes. NPM-1 is capable of shuttling between the nucleolus and cytoplasm. NPM-1 is associated with growth control pathways, cellular differentiation and apoptosis. We developed a structural strategy to identify NPM1-1 co-expressed gene networks that are important for cancer. Using this strategy, we found a transcriptome-wide reduction of co-expression connectivity in chronic myelogenous leukemia (CML), reflecting potentially loosened molecular regulation. NPM-1 established more co-expression linkages with BCR-ABL pathways and ribosomal protein networks in CML than normal. This finding implicates important roles of NPM-1 in conveying tumorigenic signals and unveiling cancer pathogenesis.



Name: Associate Professor Pimporn Leelapornpisid

Educational Background:

M.Pharm (Pharmaceutics), Chulalongkorn University, 1983, Thailand.

B.Sc.Pharm (2 nd Honor), Chulalongkorn University, 1979, Thailand.

Present position: Associate Professor and Head of Graduate Program in Cosmetic Science, Faculty of Pharmacy, Chiangmai University, Chiangmai, Thailand.

Working experiences:

Training:

- 1995, Cosmetic research fund from Cosmetic Foundation, Japan
- 1999, Researcher exchange grant from JSPS-NRCT, Japan
- 2002, Researcher exchange grant from ASEA-UNINET, Austria.
- 2009, Researcher exchange grant from ASEA-UNINET, Austria.

Certificate:

-2004, Certificate in Food safety and HACCP, training at Faculty of Food Agriculture, Chiangmai University

-1995 Certificate in Training at Basic Research Laboratories of Shiseido Research Center, Yokohama, JAPAN.

-1986 Certificate in Pharmaceutical Technology, University. Ghent University, Ghent, Belgium.

Experties:

- Research and development of pharmaceutical, cosmetic and spa products.
- Nanotechnology in cosmetic science and cosmetic delivery system.
- Aromatherapy.

Others:

-Scientific committee of The first Symposium on Cosmetic and Health Innovations, Bangkok, May 26-27, 2007

-Scientific committee of The second Symposium on Cosmetic and Health Innovations, Bitech Bangna Bangkok, Nov 2-4, 2008

-Scientific committee of The Fourth International Conference of Natural products for Health and Beauty (NATPRO 4), 2013

- Reviewer of PACCON conference, 2011

- Reviewer of AGRC conference, 2012

- Reviewer of NATPRO 4 conference, 2013

- Reviewer of Pakistan Journal of Pharmaceutical Sciences, 2013-2015

- Reviewer of The second International Conference on Food and Applied Biosciences, 2014

- Reviewer of British Journal of Pharmaceutical Research, 2014.

- Reviewer of AFRICAN JOURNAL OF PURE AND APPLIED CHEMISTRY, 2015

- Reviewer of Advancement in Medicinal Plant Research. 2015

- Reviewer of Journal of Food Science and Technology. 2015

- Reviewer of Songklanakarin Journal of Pharmaceutical Science. 2018-2019

-Scientific committee of The Cosmetic & Beauty International Conference 2019 (CBIC2019)

Books:

1. Cosmetic for Skin 1989 (revised in 2008).
2. Cleansing Cosmetics 1989 (revised in 2002).
3. Cosmetic Emulsion : 1994).
4. Natural Cosmetics : 2001 (revised in 2007).
5. Aromatherapy : 2002 (revised in 2004).

Awards:

1. **Poster presentation award** “ Development of antiacne products from medicinal plants cultivated in highland: part1.” First International Conference of Natural products for Health and Beauty, Mahasarakham University, Mahasarakham, Thailand, 19-21 October, 2005.

2. **Poster presentation award** “ Development of antiacne gels Containing the extract from *Excoecaria cochinchinesis* Lour.” National Conference of Natural sources and active compound discovery. Asia Hotel, Bangkok, Thailand, 24-25, April, 2008.
3. Delcam (Thailand) Co., Ltd. Sponsor a **special award in Health & Medicine Session to the best paper**. HO-05 Application of Chitosan for Preparation of Arbutin Nanoparticles as Skin Whitening. Porjai Rattanapanadda, Pimporn Leelapornpisid, Phuriwat Leesawat and Surapol Natakarnkitkul. The Sixth Thailand Materials Science and Technology Conference (MSAT-6), Miracle Grand Convention Hotel Bangkok, Thailand, August 26-27, 2010.
5. **Oral presentation award** “ Development of gel for reducing fever from Thai herbal extracts” The seventh National conference on Thai Traditional Medicine and Alternative Medicine, Bangkok, 1-3 September, 2010.
6. **Oral presentation award** ‘ Application of Gac fruit peels for cosmetic products” The eleventh National conference on Thai Traditional Medicine and Alternative Medicine, Bangkok, 2-5 September, 2014.
7. **The hall of fame awards 2017**: winner of publishing in a high impact factor journal in 2016 (in the category of more than 10 years of Government services at Faculty of Pharmacy, Chiang Mai University) by Faculty of pharmacy, Chiang Mai University
8. **Inspiration Technology Transfer Award 2017**: given by STeP Northern Sciences Park, Chiang Mai University.
9. **Silver Prize on the invention** of “ Shikakai extract : Novel Multi-Action Anti-aging Resolution given by Korea Invention Promotion Association in Seoul, Korea exhibited at the Seoul Tnternational Invention Fair 2018, Dec 6-9, 2018.
10. **Special Award**, in honor of the highest standard of excellence presented by the valuable invention entitled “ Shikakai extract : Novel Multi-Action Anti-aging Resolution given by Agricultural Research Development Agency exhibited at the Seoul Tnternational Invention Fair 2018, Dec 6-9, 2018.

Publication:

1. **P. Leelapornpisid**, S. Pruksakorn, S. Chansakaow and T. Ittiwittayawat (2005): Anti microbial Activity of Herbal Extracts on *Staphylococcus aureus* and *Propioni bacte rium acnes*: Acta Hort.(ISHS)679:97-104.
2. S. Chansakaow, **P. Leelapornpisid**, K. Yosprasit and P. Tharavichitkul (2005): Antibac terial Activity of Thai Medicinal Plant Extracts on The Skin Infectious Microorganisms: Acta Hort.(ISHS)678:153-157.
3. Surachai Teachaoei, , **Pimporn Leelapornpisid**, Dammrong Santiarwan and Saisa morn Lumyong (2007) Preliminary Screening of Biosurfactant – Producing Micro organism Isolated from Hot Spring and Garages in Northern Thailand: KMITL Sci.Tech.J. Vol.7 No.S1 Nov: 38-43.
4. Intira Thampayak,Naowarat Cheeptham,Wasu Pathom-Aree,**Pimporn Leelapornpisid** and Saisamorn Lumyomg (2008) Isolation and Identification of Biosurfactant Producing Actinomycetes from Soil: Research Journal of Microbiology 3(7):499-507.
5. W.Srinuanchai,A.Chaiwan,V.Niwattananun,**P.Leelapornpisid**,S.Vechabhikul and S. Chan sakaow (2008): Quality and Effect on Central Nervous System of Volatile oils from Thai Citrus Plants. วารสารสุขภาพ วิทยาศาสตร์และเทคโนโลยี ปีที่ 8 ฉบับที่ 2:133-148.
6. P.Chuarienthong, N.Lourith and **P.Leelapornpisid** (2010): Clinical efficacy comparision of antiwrinkle cosmetics containing herbal flavonoids International. Journal of Cosmetic Science,32,99-106.
7. **Pimporn Leelapornpisid**, Watcharaporn Khamrat and Dummrong Santiarworn (2010): Purification and Antioxidant Activities of Phycocyanin From *Spirulina Platen sis*. Journal of Chemistry and Chemical Engineering, ISSN 1934-7375, USA. July ,Vol4 no. 7.
8. Nasapon Povichit, Ampai Phrutivorapongkul, Maitree Suttajit, Chaiyavat Chaiyasut and **Pimporn Leelapornpisid** (2010): Phenolic content and *in vitro* inhibitory effects on oxidation and protein glycation of some Thai medicinal plants. Pakistan Journal of Pharmaceutical Sciences, Vol 23, No.4, October ,403-408.
9. Nasapon Povichit, Ampai Phrutivorapongkul, Maitree Suttajit and **Pimporn Leela pornpisid** (2010): Antioxidant and antiglycation acitivities of extract from

- heartwood of *Artocarpus lakoocha* Roxb" *Maejo Int. J. Sci. Technol* , Vol 4, No3, October,
10. Stefan Toegel, Shengqian Q.Wu, Miguel Otero, Mary B Goldring, **Pimporn Leela pornpisid**, Catharina Chiari, Alexander Kolb, Frank M Unger, et al.(2011) *Caesalpenia sappan* extract inhibits IL1 – mediated overexpression of matrix metalloproteinases in human chondrocytes. *Gene and Nutrition* Springer.
 11. Chayakorn Pumas, Yuwadee Peerapornpisal, Panmuk Vacharapiyasophon, **Pimporn Leelapornpisid**, Walailuk Boonchum, Masaharu Ishi and Chartchai Khanonghuch (2012) Purification and Characterization of a Thermostable Phycoerythrin from Hot Spring Cyanobacterium *Leptolyngbya* sp.KC45. *Int.J.Agric,Biol.*,14:121-125.
 12. **Pimporn Leelapornpisid**, Dammrong Santiarworn, Suchart Panjaisri and Tanya Sonthi koon (2012): Development of Topical Antimicrobial Gel Containing Beehive extract. *J.Chem.Chem.Eng.*6:307-312.
 13. Ampai Phrutivorapongkul, Kanokwan Kiattisin, Pensak Jantrawut, Sunee Chansakaow , Suwanna Vejabhikul and **Pimporn Leelapornpisid** (2013): Appraisal of biological activities and identification of phenolic compound of African Marigold (*Tagetes erecta*) flower extract. *Pak. J. Pharm. Sci.*, Vol.26, No.6, November, pp1071-1076
 14. Kiattisin Kanokwan, Richard Randal Wickett, Jantrawut Pensak, Phrutivorapongkul Ampai and **Leelapornpisid Pimporn** (2013): Marigold flower extract loaded Nano emulsion by PIT Technique for Cosmetic application: Optimization and Characterization. *Int.J.Ph. Sci., Sep-Dec*,5(3):2090-2101
 15. **Leelapornpisid Pimporn**, Kiattisin Kanokwan, Jantrawut Pensak and Phrutivora pongkul Ampai (2014): NANOEMULSION LOADED WITH MARIGOLD FLOWER EXTRACT (*TAGETES ERECTA* LINN) IN GEL PREPARATION AS ANTI-WRINKLES COSMECEUTICAL *Int J Pharm Pharm Sci*, Vol 6, Issue 2, 2014: 231-236.
 16. Omboon Vallisuta, Veena Nukoolkarn, Ampol Mitrevej, Narong Sarisuta, **Pimporn Leelapornpisid**, Ampai Phrutivorapongkul, Nuttanan Sinchaipanid (2014): **In vitro studies on the cytotoxicity, and elastase and tyrosinase inhibitory activities of marigold (*Tagetes erecta* L.) flower extracts.** *EXPERIMENTAL AND THERAPEUTIC MEDICINE* 7: 246-250, 2014,246

17. Lapatrada Mungmai, Yuwadee Peerapornpisal, Busabun Sirithunyalug, Supat Jiranu sornkul, and **Pimporn Leelapornpisid**, (2014): Extraction, Characterization and Biological Activities of Extracts from Freshwater Macroalga [*Rhizoclonium hieroglyphicum* (C.Agardh) K tzing] Cultivated in Northern Thailand. **Chiang Mai J. Sci.** 41(1) : 14-26
18. **Pimporn Leelapornpisid**, Sunee Chansakaow, Suvisa Na-Boonlong and Pensak Jan trawut (2014): DEVELOPMENT OF CREAM CONTAINING NANOSTRUCTURED LIPID CARRIERS LOADED MARIGOLD (*TAGETES ERECTA* LINN) FLOWERS EXTRACT FOR ANTI-WRINKLES APPLICATION. *Int J Pharm Pharm Sci, Vol 6, Issue 5*, 309-313
19. **Pimporn Leelapornpisid**, Lapatrada Mungmai, Busabun Sirithunyalug, Supat Jira nusornkul and Yuwadee Peerapornpisal (2014): A Novel Moisturizer Extracted from Fresh water Macroalga [*Rhizoclonium hieroglyphicum* (C.Agardh) K tzing] for Skin Care Cosmetic. **Chiang Mai J. Sci.** 2014; 41(5.2):1195-1207.
20. WANTIDA CHAIYANA, RUNGSINEE PHONGPRADIST, **PIMPORN LEELAPORNPI SID** (2014): CHARACTERIZATION OF HYDRODISTILLATED POMELO PEEL OIL AND THE ENHANCEMENT OF BIOLOGICAL ACTIVITIES USING MICROEMULSION FORMULATIONS. *Int J Pharm Pharm Sci, Vol 6, Issue 9*, 596-602
21. Waruttaya Kassakul, Werner Praznik, Helmut Viernstein, Darunee Hongwiset, Ampai Phrutivorapongkul and **Pimporn Leelapornpisid** (2014): CHARACTERIZATION OF THE MUCILAGES EXTRACTED FROM *HIBISCUS ROSA-SINENSIS* LINN AND *HIBISCUS MUTABILIS* LINN AND THEIR SKIN MOISTURIZING EFFECT. *Int J Pharm Pharm Sci, Vol 6, Issue 11*, 453-457.
22. WANTIDA CHAIYANA, RUNGSINEE PHONGPRADIS, **PIMPORN LEELAPORNPI SID**, SONGYOT ANUCHAPREEDA (2015): MICROEMULSION-BASED HYDROGEL FOR TOPICAL DELIVERY OF INDOMETHACIN. *Int J Pharm Pharm Sci, Vol 7, Issue 2*, 213-219.
23. **Leelapornpisid, P.**, S. Rattanachitthawat and S. Chansakaow. (2015): "Appraisal of Free Radical Scavenging Activities and Inhibitory Effect on Lipid

- Peroxidation Related to Phenolic Content of Seed Extracts from Lychee (*Litchi chinensis* Sonn.)". *IJAIR* 3.4 (2015): 979-984.
24. Thananya Nantararat, Sunee Chansakaow, **Pimporn Leelapornpisid** (2015): OPTIMIZATION, CHARACTERIZATION AND STABILITY OF ESSENTIAL OILS BLEND LOADED NANOEMULSIONS BY PIC TECHNIQUE FOR ANTI-TYROSINASE ACTIVITY. *Int J Pharm Pharm Sci, Vol 7, Issue 3*:308-312.
25. WORRAPAN POOMANEE, WANTIDA CHAIYANA, NUTJEERA INTASAI, **PIMPORN LEELAPORNPI SID** (2015): BIOLOGICAL ACTIVITIES AND CHARACTERIZATION OF THE POD EXTRACTS FROM SOMPOI (*ACACIA CONCINNA* LINN.) GROWN IN NORTHERN THAILAND. *Int J Pharm Pharm Sci, Vol 7, Issue 2*, 213-219.
26. **Pimporn Leelapornpisid**, R.Randall Wickett, Sunee Chansakaow and Nitima Wongwattananukul (2015): **Potential of native Thai aromatic plant extracts in antiwrinkle body creams.** *J.Cosmet.Sci.*,66,219-231 (July/August)
27. Chaiyana W., Anuchapreeda S., **Leelapornpisid P.**, Phongpradist R., Viernstein H., Mueller M. (2016). Development of Microemulsion Delivery System of Essential Oil from Zingiber cassumunar Roxb. Rhizome for Improvement of Stability and Anti-Inflammatory Activity. *AAPS PharmSciTech*. DOI:10.1208/s12249-016-0603-2.
28. Kanokwan Kiattisin, Thananya Nantararat and **Pimporn Leelapornpisid** (2016) Evaluation of antioxidant and anti-tyrosinase activities as well as stability of green and roasted coffee bean extracts from *Coffea arabica* and *Coffea canephora* grown in Thailand. **Journal of Pharmacognosy and Phytotherapy** Vol. 8(10), pp. 182-192.
29. Nichana Nakpanich, Wantida Chaiyana and **Pimporn Leelapornpisid** (2017) Antioxidant Activities and Stability of Seed Kernel Extracts from Mango (*Mangifera indica* Linn.) Cultivated in Northern Thailand. *Chiang Mai J. Sci.* 2017; 44(2) : 573-583
30. Worrapan Poomanee, Wantida Chaiyana, R. Randall Wickett, **Pimporn Leelapornpisid** (2017) Stability and solubility improvement of Sompoi (*Acacia concinna* Linn.) pod extract by topical microemulsion. *Asian journal of pharmaceutical sciences*.

31. Chaiyana W., Punyoyai C., Somwongin S., **Leelapornpisid P.**, Ingkaninan K., Waranuch N., Srivilai J., Thitipramote N., Wisuitiprot W., Schuster R., Viernstein H. and Mueller M. (2017). Inhibition of 5 α -Reductase, IL-6 Secretion, and Oxidation Process of *Equisetum debile* Roxb. ex Vaucher Extract as Functional Food and Nutraceuticals Ingredients. *Nutrients*. Vol. 9(10), 1105.
32. Nichcha Nitthikan, **Pimporn Leelapornpisid**, Surapol Natakankitkul, Wantida Chaiyana, Monika Mueller, Helmut Viernstein, Kanokwan Kiattisin (2018) Improvement of Stability and Transdermal Delivery of Bioactive Compounds in Green Robusta Coffee Bean Extract Loaded Nanostructured Lipid Carriers (NLCs)
33. Worrapan Poomanee, Wantida Chaiyana, Monika Mueller, Helmut Viernstein, Watcharee Khunkitti, **Pimporn Leelapornpisid** (2018) In-vitro investigation of anti-acne properties of L. kernel extract *Mangifera indica* and its mechanism of action against *Propionibacterium acnes*. *Anaerobe* 52 (2018) 64e74. journal homepage: www.elsevier.com/locate/anaerobe
34. Wantida Chaiyana, Pimporn Leelapornpisid, Jaroon Jakmunee IDand Chawalit Korsamphan (2018) Antioxidant and Moisturizing Effect of *Camellia assamica* Seed Oil and Its Development into Microemulsion. *Cosmetics* **2018**, 5, 40; doi:10.3390/cosmetics5030040:
35. ศิรณา:บัวดอกตูม, Yuthana:Phimolsiripol, Pimporn:Leelapornpisid. 2018 ; Effect of varieties and parts of Ceylon spinach on antioxidant and antimicrobial properties of mucilage. *Srinakharinwirot Science Journal* 1 : 159 - 174.
36. Kanokwan Kiattisin, Nichcha Nitthikan, Worrapan Poomanee, Pimporn Leelapornpisid , Helmut Viernstein and Monika Mueller (2018) Anti-inflammatory, Antioxidant Activities and Safety of *Coffea arabica* Leaf Extract for Alternative Cosmetic Ingredient. *Chiang Mai J. Sci.* 2018; 45(x) : 1-11 <http://it.science.cmu.ac.th/ejournal/> Contributed Paper

Presentation:

1. Phuriwat Leesawat Pimporn Leelapornpisid, Jakkapan Sirithunyaluk (2004) : Determination Optimal Properties and Formulation of Chitosan for Film

coating of Tablet. Presented at Faculty of Pharmacy, Chiangmai University . 25-26 June.

2. Pimporn Leelapornpisid, Suchart Panjaisri and Chaivat Chaiyasut (2004) Development of antibacterial preparations containing biologically fermented product from some medicinal plants. The Asian Pharmacy Congress, 17th, FAPA, 30 Nov-2 Dec , Bangkok Thailand.
3. Pimporn Leelapornpisid, Chaivat Chaiyasut , Ampai Prutiworapongkul (2005) Anti-free radical Capacities of Some Thai Medicinal plants in Family Zingiberaceae . International Symposium on Nanotechnology: Drug delivery system and Free radical School 2005. Duangtawan Hotel, Chiangmai Thailand. 21-22 Feb.
4. Wisanu T, Boonsom L, Chaiyawat C, Pimporn L (2005) Determination of arbutin in skin-whitening cosmetics by high performance liquid chromatography. 31 Congress on Science and Technology of Thailand, Nakhon Ratchasima . 18-20 October.
5. Pimporn Leelapornpisid, Sunee Chantaraskaew and Sumalee Pruksakorn (2005): Development of antiacne products from medicinal plants cultivated in highland: part1. First International Conference of Natural products for Health and Beauty, Mahasarakham University, Mahasarakham, Thailand, 19-21 October
6. Wanwisa Srinuanchai, Wirat Niwattananun, Pimporn Leelapornpisid, Suwanna Veja bhikul, Sunee Chansakaow (2006) Chemical constituents and effect on central nervous system of essential from Thai Citrus plants. 32nd Congress on Science and Technology of Thailand, Queen Sirikit National Convention Center, October 10-12.
7. Pimporn Leelapornpisid, , Sunee Chansakaow , Chaiyawat Chaisut , Nitima Wong watananukul (2007): Antioxidant activity of some volatile oils and absolutes from Thai Aromatic plants. International workshop on Medicinal and Aromatic plants. Lotus Pang Suan Kaew Hotel, Chiangmai, Thailand. January 15-18.
8. Arsa, P., Leelapornpisid, P., Phrutivorapongkul, A. and Pruksakorn, S. "Antibacterial activity of Thai herbal extracts on *Propionibacterium acnes*".

The 1st symposium on Cosmetic and Health Innovations, May 26-27, 2007, Swisotel Nai Lert Park Hotel, Bangkok, Thailand.

9. Leelapornpisid, P., Chaiyasut, C., Phrutivorapongkul, A. and Wongcharoen, N. "Anti oxidant activity of some Thai herbal extracts". การประชุมวิชาการ เรื่อง จั๊บกระแส: การรักษาและยาใหม่ 3 Natural Sources & Active Compound Discovery, April 24-25, 2008, Asia Hotel, Bangkok, Thailand.
10. Nasapon Povichit, Ampai Phrutivorapongkul, Chaiyavat Chaiyasut and Pimporn Leela pornpisid (2007) Antioxidative and Protein Glycation Inhibitory Activities of Some Thai Medicinal Plant Extracts in *In Vitro*. The first Symposium on Cosmetic and Health Innovation, Park Nai lert Hotel, Bangkok, Thailand. May 26-27.
11. Nithiwadee Wongcharoen Pimporn Leelapornpisid †, Chaiyavat Chaiyasut, Ampai Phru tivorapongkul (2007) Antioxidant activities of some Thai herbal extracts 1 The first Symposium on Cosmetic and Health Innovation, Park Nai lert Hotel, Bangkok, Thailand. May 26-27.
12. Taechaey, S., Leelapornpisid, P., Santiawarn, D. and Lumyong, S. (2007) Priliminary screening of biosurfactant-producing microorganisms isolated from hot spring and garages in northern Thailand. The 5th International symposium on biocontrol and biotechnology, Khon Kaen University, Thailand. Nov, 1-3.
13. **Pimporn Leelapornpisid**, Chaiyavat Chaisut, Panee Sirisaard, Suchart Panjaisri and Maitree Suttajit (2007): Biologically Fermented Product from Medicinal Plants for Health and Beauty ; The Third Asian Vegetarian Congress , Kaohsiung, Taiwan. 3 - 7 November.
14. Pimporn Leelapornpisid, Sunee Chansakaow, Chaiyavat Chaiyasut, Nitima Wongwa ttananukul (2007) Antioxidant Potential of Thai Aromatic Flowers and Herbs The third Global Summit on Medicinal and Aromatic Plants , Chiangmai Thailand. November 21-24.

15. Pimporn Leelapornpisid, Sunee Chantaraskaew Sumalee Pruksakorn and Wipavee Ubonsak (2008) Development of antiacne gels Containing the extract from *Excoecaria cochinchinesis* Lour. National Conference of Natural sources and active compound discovery. Asia Hotel, Bangkok, Thailand, 24-25 April.
16. Pimporn Leelapornpisid, Sunee Chantaraskaew and Supatta Thumsongmuang (2008): Free radical scavenging activities of Litchi seed extract. The Second International Conference of Natural products for Health and Beauty, Naresuan University at Phayoa, Phayoa, Thailand, 17-19 December.
17. Pimporn Leelapornpisid, Sunee Chantaraskaew Chaiyavat Chaiyasut, R. Randal Wickrtt and Nitima Wongwattananukul (2008) Antiaging body massage cream from Thai aromatic plants The Second International Conference of Natural products for Health and Beauty, Naresuan University at Phayoa, Phayoa, Thailand, 17-19 December.
18. Surachai Teachaoei, Wai Prathumpai, Saisamorn Lumyong and Pimporn Leelapornpisid, (2008): Cultural medium optimization and production of biosurfactant using a two-level fractional factorial design. The Second International Conference of Natural products for Health and Beauty, Naresuan University at Phayoa, Phayoa, Thailand, 17-19 December.
19. Pimporn Leelapornpisid, Palasri Chuarianthong and Nattaya Lourith (2008) The development of antiaging products containing bioflavonoids. The first SRFF-Thai Meeting and workshop on Advances of Free Radicals Oxidative Stress and Their Evaluation Methods, Amora Taepae Hotel, Chiangmai, 15-16 December.
20. Pimporn Leelapornpisid, Chaiyavat Chaiyasut, Suchart Panjaisri, Helmut Viernstein and Frank M. Unger (2009): DEVELOPMENT OF ANTIBACTERIAL PREPARATIONS CONTAINING FERMENTED PRODUCTS FROM SOME THAI HERBS. III International Conference on Environmental, Industrial and Applied Microbiology. BioMicroWorld 2009, Lisbon Portugal, 2-4 December.
21. Surachai Teachaoei, Pimporn Leelapornpisid, Wai Prathumpai, Saisamorn Lumyong, Helmut Viernstein and Frank M. Unger (2009): Identification and

- Emulsification Properties of a Biosurfactant Produced by Bacteria from Soil, Chiang Mai, Thailand. .III International Conference on Environmental, Industrial and Applied Microbiology. Bio Micro World 2009, Lisbon Portugal ,2-4December.
- 22.W. Khamrat¹, P. Leelapornpisid and D. Santiarworn (2010): Antioxidant activity of phy cocyanin from *Spirulina platensis*. Pure and Applied Chemistry International conference 2010, PACCON2010 ,Ubon Ratchathanee University, Ubon Ratchathanee, Thailand , Jan 21-23. Proceeding , pp192-195.
- 23.Porjai Rattanapandda, Phuriwat Leesawat, Surapol Natakarnkitkul and Pimporn Leela pornpisid (2010): Preparation of Chitosan Microparticles Containing Arbutin as Skin Whitening. TRF-MAG Congress IV 30 Mar- 1 Apr, Chonbuli:. 368
- 24.Sonthikoon,Dammrong Santiarworn,Suchart Panjaisri and Pimporn Leelapornpisid (2010): Development of Topical Antimicrobial Gel Containing Beehive extract. TRF-MAG Congress IV, TRF-MAG Congress IV 30 Mar- 1 Apr, Chonbuli:. 362
- 25.Porjai RATTANAPANADDA, Phuriwat LEESAWAT, Surapol NATAKARNKITKUL and Pim porn LEELAPORNPID*(2010): Application of Chitosan for Preparation of Arbutin Nanoparticles as Skin Whitening. The Sixth Thailand Materials Science and Technology Conference (MSAT-6), August 26-27, 2010 ,Miracle Grand Convention Hotel Bangkok, Thailand (MSAT-6).
- 26.Pimporn Leelapornpisid, Ampai Prutivorapongkul, Sumalee Pruksakorn¹ and Pimjai Arsa (2010): CHEMICAL CONSTITUENTS AND ANTIBACTERIAL ACTIVITY ON ACNE RELATED MICROORGANISMS OF *Cleistocalyx nervosum* var.*paniala* SEED EXTRACT.39th IVU World Vegetarian Congress 2010,Jakarta,Oct 1-6.
- 27.Ampai Prutivorapongkul, Nithiwadee Wongcharoen, Pimporn Leelapornpisid and Chai yavat Chaisut (2010): CHEMICAL CONSTITUENTS AND ANTIOXIDANT ACTIVITY OF *CURCUMA COMOSA* ROXB. 39th IVU World Vegetarian Congress 2010,Jakarta,Oct 1-6.
- 28.Suwisa Na Boonlong ,Sunee Chansakaow , Ampai Prutivorapongkul, Suwanna Veja bhikul and Pimporn Leelapornpisid (2010): ANTIOXIDANT

- ACTIVITY AND TOTAL PHENOLIC CONTENT OF THAI MARIGOLD EXTRACT (*Tagetes erecta*). The 1st Kamphaengsaen International Natural Products Symposium: *October 23-24, 2010* Swissotel Le Concorde Hotel, Bangkok, Thailand. Proceeding , pp192-195.
29. Tanya Sonthikoon, Dammrong Santiarworn, Suchart Panjaisri and Pimporn Leelapornpisid (2011): Development of Topical Antimicrobial Gel Containing Beehive extract. Pure and Applied Chemistry International conference 2011, PACCON2011 ,Miracle grand hotel Bangkok, Thailand , Jan 5-7. Proceeding
 30. Poonrat Leelapun, Ampai Prutivorapongkul and Pimporn Leelapornpisid (2012): Development of Antiaging Products Containing Natural substances TRF-MAG Congress V. Chonbuli.
 35. Rungtiwa Mahawan, Manu Deedom and Pimporn Leelapornpisid (2012): Development of anti-acne Hydrogel Containing Natural substances TRF-MAG Congress V Chonbuli: .210
 36. Weeraya Preedalikit, Usanee Vinijetkhumnuan and Pimporn Leelapornpisid (2012): Development of Patch Containing Longan seed extract for Joint Inflammation TRF-MAG Congress V, Chonbuli: 226
 37. Pimporn Leelapornpisid, Sunee Chantaraskaew and Supatta Thumsongmuang (2011): Free radical scavenging activities and Inhibitory Effect on Lipid Peroxidation Related to Phenolic Content of Seed Extracts from Lychee. The 3^E IFSCC 2011 Conference, Bangkok, Thailand, October 31-November 2, p361.
 38. Siriwan Prommaree, Mayuree Kunlayavattanakul and Pimporn Leelapornpisid (2011): Skin Nourishing Effect of Serum Containing *Moringa Oleafera* Lam Extracts. The 3^E IFSCC 2011 Conference, Bangkok, Thailand, October 31-November 2, p360.
 39. Weeraya Preedalikit, Usanee Vinijetkhumnuan and Pimporn Leelapornpisid (2011): DEVELOPMENT OF TRANSDERMAL PATCH CONTAINING LONGAN SEED EXTRACT The 3^E IFSCC 2011 Conference, Bangkok, Thailand, October 31-November 2, p495
 40. Rachakrich Wongpongkham, Nuttaya Lourith and Pimporn Leelapornpisid (2011): Development of Activated Carbon from Tropical Almond seed for

Cosmetic Application The 3 E IFSCC 2011 Conference, Bangkok,Thailand, October 31-November 2,p496

41. Kanokwan Kiattisin, Ampai Phrutivorapongkul and Pimporn Leelapornpisid. (2011): DEVELOPMENT OF NANOEMULSION SYSTEM FOR LOADING MARIGOLD EXTRACT BY PHASE INVERSION TEMPERATURE (PIT) EMULSIFICATION METHOD The 3 E IFSCC 2011 Conference, Bangkok,Thailand, October 31-November 2,p413
42. Achariya Jiraapiwattana, Suwanna Vejabhikul, Sunee Chansakaow, Pimporn Leela pornpisid (2012):DEVELOPMENT OF NANOSTRUCTURE LIPID CARRIER FOR LOADING MARIGOLD (*Tagetes erecta* L.) EXTRACTS. Pure and Applied Chemistry International conference 2012, PACCON2012 ,The Empress Convention Center, Chiangmai ,Thailand , Jan 11-13. Proceeding
43. Weeraya Preedalikit, Usanee Vinijetkhumnuan and Pimporn Leelapornpisid (2012): Optimization of Hydrogel Transdermal patch Formulation Containing Longan SeedExtract . AGRC 2012.The first ASEAN PLUS THREE DRADUATE RESEARCH CONGRESS. 1-2 March, Chiangmai,Thailand.p 243.
44. **Pimporn Leelapornpisid**, Sunee Chansakaow and Supatta Thumsongmuang (2012): Development of Cream Containing Lychee Seed Extract as Anti-wrinkle Cosmetic The Fourth International Conference of Natural products for Health and Beauty, Chiang mai Orchid Hotel , Chiangmai,Thailand,28-30 November.
45. Ampai Phrutivorapongkul, Supat Jiranusornkul, Darunee Hongwiset and **Pimporn Leelapornpisid** (2012): Mucilages extracted from some Thai plants: physicochemical properties and skin moisturizing potential The Fourth International Conference of Natural products for Health and Beauty, Chiangmai Orchid Hotel , Chiangmai,Thailand,28-30 November.
46. **Leelapornpisid P**, Jiraapiwattana A, Chansakaow S and Vejabhikul S. Marigold flower extract loaded nanostructure lipid carrier as antiwrinkle Cosmeceutical 15th Asian Chemical Congress 2013, Singapore, Aug 19-23.
47. Kanokwan Kiattisin, Pensak Jantrawut, Ampai Phrutivorapongkul and **Pimporn Lee lapornpisid** (2013) : Nanoemulsion containing anti-oxidative

- marigold flower extract for cosmetic application** 15th Asian Chemical Congress 2013, Singapore, Aug 19-23
48. Wantida Chaiyana, Nabhaporn O-ariyakul, Aueporn Chaiwan and Pimporn Leelapornpisid*(2013): **Cosmeceutical Tea Seed Oil Microemulsion-based Gel with Antioxidant and Skin Moisturizing Effects** The 29th National Graduate Research Conference, Mae Fah Luang University, 24-25 October. (Proceeding)
 49. Wantida Chaiyana, Napaporn O-ariyakul, Aueporn Chaiwan and Pimporn Leela pornpisid. (2013): **Antioxidant activity of tea seed oil from Eastern and Northern Thailand.**The ninth Chiangmai University Research Conference, 2-3 Dec 2013.
 50. Thananya Nantararat, Sunee Chansakaow, Pimporn Leelapornpisid (2013): **Screening of Some Thai Aromatic Plants for Anti-tyrosinase Activity, The ninth Chiangmai University Research Conference, 2-3 Dec 2013.**
 51. Thaksa-on Rattanayuan, Ampai Phrutivorapongkul and Pimporn Leelapornpisid **Flavonoid Content and Tyrosinase Inhibitory Effect of *Tagetes erecta* Flower Extracts.** AGRC, 2013. (Proceeding)
 52. Waruttaya Kadsakul, Ampai Phrutivorapongkul, Darunee Hongvised and Pimporn Leelapornpisid (2014): **Application of Mucilages from Malvaceous Plants for Skin Moistuizer, TRF-MAG Congress VII, The Twin Tower Hotel Bangkok ,2- 4 Apr,2014.**
 53. Thanunya Nuntarat, Sunee Chansakaow, and Pimporn Leelapornpisid (2014): **Development of Nanoemulsions containing Thai Aromatic Plant Extracts for Skin Whitening, TRF-MAG Congress VII, The Twin Tower Hotel Bangkok, 2- 4 Apr,2014.**
 54. **Pimporn Leelapornpisid and Aueporn Chaiwan (2014):** Application of Gac fruit peels for cosmetic products” The eleventh National conference on Thai Traditional Medicine and Alternative Medicine, Bangkok, 2-5 September,2014.
 55. Kanokwan Kiattisin and Pimporn Leelapornpisid (2014): **SKIN MOISTURIZING EFFECT OF SOME THAI MUCILAGENEOUS PLANTS FOR SKIN CARE COSMETIC .Complementary treatment for cancer and diseases,CTCD 2014.**

56. **Pimporn Leelapornpisid**, Weeraya Preedalikit and Usanee Vinijketkhumnuan (2015): Hydrogel Transdermal Patch Containing Longan (*Dimocarpus longan Lour.*) Seed Extract and Its Characterization, The Third International Conference on Herbs for Health and Beauty, 29-30 Jan,2015, University of Phayao,Thailand.
57. Riva A, Rojanapanus, Kaewvichit S and **Leelapornpisid P**. Development of Lidocaine mucoadhesive films. Proceeding of 4TH Current Drug Development International Conference 2016, Phuket, Thailand, 1-3 June.
58. Nithikan N, **Leelapornpisid P**, Natakankikul S, Kiattisin K, Development of Nanostructured Lipid Carriers Containing Robusta Coffee Bean Extract for Cosmetic Application. Paper presented at Maejo university annual conference 2017. Maejo University, Chiang Mai, Thailand 7-8 December 2017. (Poster presentation)
59. Neungreuthai Chomchoei, Kanokwan Kiattisin and Pimporn Leelapornpisid* Development of Chitosan Derivative Based Hydrogel Patch for Cosmetic Application. Paper presented at Maejo university annual conference 2017. Maejo University, Chiang Mai, Thailand 7-8 December 2017. (Poster presentation)
60. P. Doungsaard, S Chansakaow, J Sirithunyalug, P Leelapornpisid : Extraction and Biological Activities of Longan (*Dimocarpus longan Lour.*) Leaves Extracts. 4TH PHARMACEUTICAL RESEARCH CONFERENCE 2018 Challenging The Inquisitive Minds: Frontier Of The Future 24 – 26 August 2018 | Cyberjaya, Malaysia. (Oral presentation)
61. Worrapan Poomanee, Watcharee Khunkitti, Wantida Chaiyana, **Pimporn Leelapornpisid**: Evaluation of Antimicrobial Effect of Mango Seed Kernel Extract and Its Mechanism of Action Against *Staphylococcus aureus*. 4TH PHARMACEUTICAL RESEARCH CONFERENCE 2018 Challenging The Inquisitive Minds: Frontier Of The Future 24 – 26 August 2018 | Cyberjaya, Malaysia. (Oral presentation)
62. N Chomchoei, K Kiattisin and **P Leelapornpisid**: Development and Evaluation of Carboxymethyl Chitosan Based Hydrogel Patch for Cosmetic Application. 4TH PHARMACEUTICAL RESEARCH CONFERENCE 2018 Challenging

The Inquisitive Minds: Frontier Of The Future 24 – 26 August 2018 | Cyberjaya, Malaysia. (Oral presentation)

63. Nichcha Nitthikan, **Pimporn Leelapornpisid**, Surapol Natakankitkul, Kanokwan Kiattisin: Green Robusta Coffee Bean Extract Loaded in Nanostructured Lipid Carriers for Cosmetic Application 4TH PHARMACEUTICAL RESEARCH CONFERENCE 2018 Challenging The Inquisitive Minds: Frontier Of The Future 24 – 26 August 2018 | Cyberjaya, Malaysia. (Oral presentation)
65. Pimjai Doungsaard, Jakkapan Sirithunyalug, Sunee Chansakaow, Lue Shang-Chian, Lin Wei-Chao, **Pimporn Leelapornpisid**: *In vitro* investigation of the anti-aging potential of *Dimorcarpus longan* leaves extracts. The 4TH International Conference on One Science “ One world,One medicines,Omne Science: the Way Forward for Better Health” (Poster presentation)
66. Thananya Nantarata, Wei-Chao Linb, Shang-Chian Lueb, Sunee Chansakaowa, Jakkapan Sirithunyaluga, **Pimporn Leelapornpisid**,: COMPARISON OF ANTIOXIDANT, ANTI-MMP –2,-9 AND ANTI-HYALURONIDASE ACTIVITY BETWEEN EXTRACTS FROM BLACK AND WHITE SESAME SEED CAKE (SESAMUM INDICUM LINN.) The Fifth International Symposium on Pharmaceutical and Biomedical Sciences April 26th – 28th, 2019 Cappadocia – Turkey (Oral presentation)
67. **Pimporn Leelapornpisid**, Worrapan Poomanee, Pornchai Ratchtanapan, Yuthana Phimolsiripol, Darunee Hongwiset CARBOXYMETHYL CHITOSAN: A POTENTIAL ACTIVE MOISTURIZING AGENT FOR COSMETIC APPLICATION The Fifth International Symposium on Pharmaceutical and Biomedical Sciences April 26th – 28th, 2019 Cappadocia – Turkey (Oral presentation)

Invited Speaker:

1. Advancement in Cosmeceuticals and Nutraceuticals, 3rd PHARMACEUTICAL RESEARCH CONFERENCE 2016 Cyberjaya, Malaysia
2. Nanotechnology in cosneceuticals, 4TH PHARMACEUTICAL RESEARCH CONFERENCE 2018 Challenging The Inquisitive Minds: Frontier Of The Future, 24 – 26 August 2018 Cyberjaya, Malaysia

3. Northern Thai Aromatic Plants for Spa Business, The CBIC 2019 Cosmetic and Beauty International Conference, MFU. 7-9 October,2019

Keynote Speech 3

Herbal Cosmeceuticals: research and development

Pimporn Leelapornpisid

In recent years, plants and herbs are increasingly of interest to research and develop for cosmeceutical and nutraceutical application. Consumers believe that natural products are more safe and environmental friendly than that of synthetic ones. Thus, the herbal extracts are widely used in cosmetic industry all over the world. However, the products containing herbal extract need to realize for safety and efficiency leading to the highest of customer benefits. The safety of cosmetic products that contained herbal extracts is considered as the hygiene and contaminants in herbal extraction. In addition, the content of active compounds had to be considered. Therefore, the standardization of herbal extract is very important and may affect the quality of finished products. Moreover, its stability as well as skin permeation are also important factors affecting the quality and effectiveness of herbal cosmeceutical products. Most of herbal cosmeceutical products focus on anti-aging, skin whitening, anti-acne and skin nourishment. Lots of Thai plants have been screened for anti-oxidant, anti-tyrosinase, anti-MMPs, anti-inflammatory and anti-acne that have also been developed into cosmeceutical products along with efficacy and skin irritation tests in human volunteers. Some important Thai herbal extracts have been reported to exhibit anti-wrinkles and /or skin whitening effects such as Marigold (*Tagetes erecta*) flower extract, Lychee (*Litchi chinesis* Sonn) seed extract, Shikakai (*Acacia concinna*) pod extract, Red water lily (*Nymphaea rubra* Roxb.ex Andrew) petal extract and also the essential oil obtained from Wansaulong (*Amomum uliginosum* Koen) leaf. Whereas the extracts from Mangosteen (*Garcinia mangostana* Linn) and Mango (*Mangifera indica* L) seed kernel exhibited an interesting anti-acne capability.

Master Lecture 3

Herbal Nanocosmeceuticals

Pimporn Leelapornpisid

Nanotechnology has become more popular in many scientific fields such as pharmaceuticals, textiles, agriculture and especially in cosmetics and topical application, since 2000. The sizes of nanoparticles are generally in the range of 1-100 nm, they are distinguished into malleable nanoparticles (organic substances) and rigid nanoparticles (inorganic substances). Malleable nanoparticles are liposomes, niosomes, polymeric nanoparticles, fullerenes, dendrimers, solid lipid nanoparticles (SLN), nanostructured lipid carriers (NLC) and nanoemulsion including microemulsion. The examples of rigid nanoparticles are a colloidal structure, made from metal (gold or silver), silica, titanium dioxide and iron oxide. Nanoparticles present many benefits for the delivery of active compounds through the skin including greater bioavailability, prolonged gradual release of the active compounds, improved their stability, and better therapeutic outcomes through deeper penetration. Nowadays, nanotechnology was increasingly applied for cosmetic products such as sunscreen, anti-aging, skin whitening as well as various of hair care and hair treatment products. Due to the fact that a variety of bioactive compounds that found in plants exert potent biological properties such as antibacterial, anti-inflammatory, antioxidant, anti-tyrosinase and anti-aging activities along with more safe than chemical constituents, they have also been used in several cosmetic purposes as mentioned above. However, the major drawbacks of using phytoactive compounds are their instability and less skin penetration leading to the lower efficacy and therapeutic or benefit outcomes. Nanoparticles containing herbal extracts are thus developed in order to solve these problems through the enhancement of skin efficacy and protection of the active constituents. Lots of research as well as herbal nanocosmeceutical product development for skin care focused on anti-aging, skin whitening and also anti-acne. Some examples of Thai herbal nanocosmeceuticals are: nanoemulsion and nanostructured lipid carriers loading with the extract from *Tagetes erecta* flower for anti-aging, nanoemulsion loading with essential oils from *Gardenia angusta* (L.) Merr. and *Cymbopogon citrates*, for skin whitening and nanoemulsion loading with mango (*Mangifera indica* L) seed kernel extract for anti-acne purposes.

Oral A (AI in medicine)

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Oral Session A: AI in Medicine

The application of smart medical care in otolaryngology

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Abstract:

The reason why people can understand conversations in very noisy environments is that listeners place more emphasis on the speech signals rather than on the noise. However, hearing impairments reduce the ability to direct selective attention to the target talker. Conventional hearing aids use directional microphones to amplify sound and reduce background noise, however, they do not work well in an environment with multiple noise sources. Even with current technology, noise reduction in hearing aids is still an obstacle that patients with hearing impairments encounter.

Using advanced artificial intelligence (AI), we developed dynamic noise reduction technology that helps select and improve the target sound and reduce verbal and non-verbal interfering background noise. The study results show that even in environments with multiple noise sources, the voice of the target speaker can be filtered and selectively amplified providing enhanced quality, naturalness, clarity, and speech understanding.

Keywords: Hearing aids, Artificial intelligence, Dynamic noise reduction

Oral Session A: AI in Medicine

AI outcome prediction in older ED patients with influenza

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Abstract:

From clinical experience and observation in emergency room practice, an elderly patient's condition can be complex and change very rapidly. Provision of appropriate and timely treatment has been challenging. Influenza is a common seasonal disease in the elderly population, which may require hospitalization for treatment and can cause serious complications such as sepsis and even death. Since health care resources are often limited during the flu season, outcome predictions for influenza treatment in elderly patients is important. Based on the literature review, we used artificial intelligence (AI) and machine learning algorithms to develop predictive models for influenza in the elderly and imported the models into the emergency information system.

The 10 potentially predictive variables for influenza mortality are tachypnea (respiratory rate), severe coma (GCS), hypertension, coronary artery disease, cancer, bedridden, leukocytosis (WBC), bandemia, anemia (hemoglobin), and elevated CRP. These variables were used to predict eight disease outcomes: same-day follow-up visit, 3-day follow-up visit, 14-day follow-up visit, hospitalization admission, concurrent pneumonia, concurrent sepsis or shock, ICU stay, and death. Using electronic medical records of three Chi Mei hospital campuses from 2009-2018, 5,508 patients were identified as subjects for the study. After data cleaning and transformation, SMOTE (Synthetic Minority Oversampling Technique) was used to counteract this imbalance.

Results indicated that the Random Forest (RF)-based method achieved the best performance and predictive accuracy. Among the eight outcome prediction variables, except for "hospitalization admission" and "concurrent pneumonia" (with predictive accuracy of 66 % and 72%, respectively), the predictive accuracy of all other variables ranged from 92% to 99%. Chi Mei Hospital has integrated these models into its emergency information system in clinical practice. The online satisfaction surveys showed a high level of satisfaction. The research team plans to conduct more literature review and consult experts to obtain more accurate prediction results.

Keywords: Artificial intelligence, Elderly Influenza, Emergency

Oral Session A: AI in Medicine

AI outcome prediction in ED chest pain patients

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Abstract:

Objectives: In the emergency department (ED), predicting adverse outcomes in the patients with chest pain is still a troubled issue. Big data-driven and machine learning (ML) approach has never been implemented in the Healthcare Information System (HIS). Therefore, we conducted this study to clarify this issue.

Methods: In total, 85,254 ED patients with chest pain in three hospitals between 2009 and 2018 were recruited. We randomized the patients into a 70%/30% split for ML model training and testing. We used 14 clinical variables from their electronic health records to construct a random forest model with the synthetic minority oversampling technique preprocessing algorithm to predict acute myocardial infarction (AMI) <1 month and death <1 month. Comparison among random forest, logistic regression, support-vector clustering (SVC), and K-nearest neighbors (KNN) for predictive accuracies were also performed.

Results: Predicting adverse outcomes using the random forest had the areas under the curves of 0.92 for AMI <1 month and 1.00 for death <1 month. The random forest had the best predictive accuracies than logistic regression, SVC, and KNN. We further applied the predictive model to the HIS to assist physicians' decisions in real time.

Conclusions: ML is a promising method to assist ED physicians in predicting adverse outcomes in the ED patients with chest pain in real time. Further studies about evaluations of the effectiveness and impact are warranted.

Keywords: Acute myocardial infarction; Chest pain; Emergency department; Death; Machine learning; Prediction; Random forest.

Oral Session A: AI in Medicine

Artificial intelligence aided early warning system of in-hospital cardiac arrest

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Abstract:

In-hospital cardiac arrest causes heavy stress and burden for the clinicians and public health. With the tight connection with electronic health records, many healthcare institutes buildup a rapid response team to reduce the occurrence. However, this strategy still has challenges because of the accuracy and false alarms. Rule-based method, like National Early Warning System (NEWS), is proposed to be an alarm for cardiac arrest events, but it is not effective. Therefore, we applied an artificial intelligence aided early warning system to help prediction of the events. The system was developed by machine learning initially, but the area under receiver operating characteristic curve (AUROC) was only 0.70. Then, we redesigned the method, and used a deep learning model to find the better prediction. After the implementation, the deep learning-based early warning system did not only improve the false alarms, but also mitigate the rate of cardiac arrest events.

Keywords: Hospital cardiac arrest, National Early Warning System (NEWS), Early warning system, Machine learning, Deep learning

Oral Session A: AI in Medicine

A smart cross-platform instant message collaboration system

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Abstract:

Background

Prompt reperfusion intervention is crucial for the patients with ST-segment elevation myocardial infarction (STEMI), and the time interval between arriving hospital and inflating intracoronary balloon (door-to-balloon time, DTB) should be less than 90 minutes and even shorter. To precisely record and reduce the DTB time, our hospital created and implemented a digital system, Acute Myocardial Infarction Software Technology-Aids Decision (AMISTAD), since July 2018, which replaced the traditional telephone connection before primary percutaneous intervention (PCI). The objective of the study was to investigate whether the new digital system could reduce DTB time.

Methodology and technology used

AMISTAD system includes three parts, electrocardiogram (ECG) and DTB time monitor by artificial intelligent (AI), immediate information cross-platform, and interactive voice response (IVR). When patients with chest pain arrived at the hospital, ECG was simultaneously read by AI and triage staffs. Once STEMI was suspected, the system would automatically call ER doctors and the on-duty cardiologist immediately. All clinicians were able to obtain all information of the patient through the mobile app, including history, physical examination, ECG, chest X-ray, and laboratory data. The cardiologist could decide whether primary PCI should be activated by switching on the virtual button on the app. If primary PCI was activated, the system would simultaneously contact all members of the primary PCI team through IVR. All members receiving the call needed to press the number given by IVR, and this may prevent that someone did not answer. Moreover, each time point was shown on the monitor and recorded, including ECG completion time, cardiologist response time, the activation time of primary PCI, arriving catheter room time, and DTB interval.

We retrospectively collected the relevant data of the STEMI patients receiving primary PCI before and after this system. The multivariate regression model was used to determine the association between the digital system and DTB time.

Result

A total of 18 STEMI patients (65.4 ± 9.4 years old, 83% for male) received primary PCI from October to December in 2018 after the application of AMISTAD system, while 23 STEMI patients (64.1 ± 9.3 years old, 83% for male) were identified as the comparator before AMISTAD from October to December in 2017. Each time interval before and after AMISTAD system were 9.61 versus 4.22 minutes ($p=0.003$) for door to ECG completion, 17.7 versus 10.0 minutes ($p=0.007$) for door to notifying the cardiologist, 23.26 versus 14.17 minutes ($p=0.02$) for door to activating primary PCI, and 73.13 versus 64.56 minutes ($p=0.05$) for DTB.

Conclusion

Prompt reperfusion treatment is critical for STEMI patients. With the aids of software technology, we demonstrated a significant reduction in DTB time in STEMI management via the self-innovated AMISTAD system.

Keywords: ST-segment elevation myocardial infarction (STEMI), DTB time (door-to-balloon time),

Primary percutaneous intervention (PCI), Artificial intelligent (AI).

Oral Session A: AI in Medicine

A conceptual infrastructure of big medical data and AI computing

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Abstract:

Based on electronic medical records of three Chi Mei hospital campuses from 2009 to 2018, we used a Random Forest learning algorithm to develop an AI predictive model for influenza in the elderly. Ten potentially predictive variables were used to predict eight outcomes, including hospitalization admission, concurrent sepsis or shock, and death, etc. The AI Center and Information Management Office worked together to carry out data cleaning and alignment for creating an AI platform that provides original data source, big database solutions, AI computing, and AI-powered system services. The original data from medical records as well as Lab and vital sign data were converted to the big database using the ETL (Extract, Transform, and Load) processes. The AI computing platform uses the information in the big database to perform AI modeling which was then transformed to web services on the AI-driven hospital information system.

The AI computing services consist of three main software modules: 1) AI prediction web service, which performs predictive calculation, 2) eigenvalue extraction web service, which mines electronic medical record data required for AI calculations, and 3) disease prediction web service that integrates data from HIS, eigenvalue extraction, and AI prediction to obtain prediction results. When used in the ER, the AI-driven information system automatically screens elderly patients with influenza and calculates the prediction results, which could be immediately displayed as a Web page by clicking the "AI Prediction" button. This study proposes a set of AI-driven information systems that has been applied in clinical practice at a medical center, which may serve as a reference for healthcare facilities to deploy AI-based solutions.

Keywords: AI infrastructure, Clinical outcome prediction, AI computing, Web service.

Oral Session A: AI in Medicine

AI prediction of the requirement of intensive care unit admission after lung resection surgery

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Abstract:

Lung resection surgery is one of the major surgeries. Post operation intensive care unit admission may be required due to the dependence of ventilator. After patients regaining muscle power, weaning ventilator can be considered. We used the database of anesthesia and surgery, which includes pre-anesthetic laboratory data and anesthetic medications. Machine learning algorithm can help us to build the models for predict the admission rate of intensive care unit. Pre-anesthetic laboratory data includes pulmonary function test, lung resection volume, pre-operation saturation, exercise tolerance, history of cardiovascular disease and patients' age. A machine learning algorithm of Random Forest model had better performance in accuracy, precision, recall, F1 and AUC than other models. Moreover, our model can also let the patient and family know benefits of Sugammadex medication. A total of 277 patients with lung resection surgery in Chi-Mei Medical Center were collected from 2018/01/01 to 2019/07/31. The intensive care unit admission rate has been undergoing SMOTE management for imbalanced-processing. The results of four models testing show that Random Forest model has the best performance (accuracy: 0.903; precision: 0.91; sensitivity: 0.95; specificity: 0.86; F1: 0.9; AUC: 0.902). Clinical applications: 1) Random Forest model can provide anesthesiologist the probability of post-operative intensive care unit admission, by keying the pre-operation conditional items. Personalized prediction can improve the effectiveness in pre-anesthetic consultation. 2) Random Forest model can also provide partial evidence that patients using Sugammadex will decrease the probability of post-operative intensive care unit admission.

Keywords: Lung resection, Pulmonary function test, Artificial Intelligence, Pre-anesthetic consultation, Intensive care unit

Oral B (3D printing in medicine)

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Oral session B: 3D Printing in Medicine

Collector for injection lines identification and storage

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Abstract:

Patients rely on various injection lines which connect with vital equipment to maintain lives. Some of these lines are used to supplement infusion. Others are only for drawing blood or monitoring vital sign. It takes a lot of time for the nurses to find the right line. Therefore, if we can help nurses find the right line quickly. Not only can we shorten the time of administration or infusion, but we can also reduce the error under emergency conditions. In addition, these injection lines are scattered around the patients. When the nursing staff helps the patient change position, they must grab up all the lines. There is no product that has the function of management and recognizing lines simultaneously on the market for the clinical personnel to use.

There are some notions revolving around our invention. First, new collectors are inspired by building blocks. This easily-composed structure enables nurses to build them up in the circular shape, which makes them arrange numerous lines more efficiently. Second, the concept of the chromatology plays an important role in the product. Since the medical personnel has collaborative ideas on the symbol of specific colors, it would be beneficial for the staffs to identify the right line at first glance. With the design that related to structural and colorimetric aspects, we believe that this device could obviously decrease the possibility of accidentally removing lines. Furthermore, it could increase the safety of arranging lines, accuracy rate of injecting medicine, and the indemnification of the patient's lives.

Keywords: 3D printer, Collector, Injection lines identification

Oral session B: 3D Printing in Medicine

Ruyi roller

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Abstract:

"Ruyi roller" is a detachable rehabilitation aid. It can be used for the patient who receives knee or hip joint replacements. The device can be easily disassembled and replaced with a function of rolling and massaging. Because of detachable devices, its storage is easily and convenient.

This device can be disassembled and assembled into three tools.

The first tool is a roller - when both handles are hidden. The user scrolls his calf back and forth on the roller. The user can easily perform active flexion exercises of the hip and knee joints while massaging the calf. The second one is a massage stick - when both handles are exposed outside the roller. The user put the massage stick on the area to be massaged and rolls both handles with hands. This tool can be used to massage larger areas. The last one is a shaft - When the outer layer of the roller is removed. The user put the shaft on the area to be massaged and rolls with both handles. The tool can be used to massage smaller areas. The material of the contact surface between the skin and the roller are slightly convex silicone strips. When the calf is massaged, the silicone strip makes the skin feel comfortable and makes it easier to scroll the roller, helps the user flex his hip and knee more easily.

"Ruyi roller" is easy to be operated, safe, and reusable. It helps the user to perform active exercise and massage more easily and reduces swelling and stiffness of the limbs. It helps to improve user's comfort, increase joint mobility after hip or knee replacements, and restore the function of daily living activities as soon as possible.

Keywords: Rolling, Arthroplasty, Rehabilitation

Oral session B: 3D Printing in Medicine

Oxygen universal adapter

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Abstract:

Creative motivation :

The venturi mask is used clinically by adjusting the oxygen concentration in sequence as the patient's condition changes. During the treatment, six different color of the venturi mask connectors are used depending on the oxygen concentration. Therefore, patient units often have different color venturi mask connectors or different oxygen therapy devices, such as nasal cannula, making the patient's bedside seem messy. In addition, when the patient's condition is critical, the medical staff need to replace the high-concentration venturi mask connector. It takes 6-7 minutes to replace it or takes longer, when ask the staff to the treatment room to take the connector.

In summary, in terms of the patient's dimension, the time to replace the venturi mask affects the efficiency of the patient's use of oxygen. In addition, the indirect patient care activity time is increased, when the staff replaces the venturi mask with six different oxygen concentrations, or takes it back and forth to the treatment room. Therefore, for the clinical use efficiency, the creation of "oxygen universal adapter" will connect different oxygen concentrations of venturi mask connectors and other oxygen therapy equipment together.

Keywords: Oxygen universal adapter, Oxygen therapy

Oral session B: 3D Printing in Medicine

Counter-aid needle-collecting box

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Abstract:

Patient safety is an issue for all countries that deliver health services, whether they are privately commissioned or funded by the government. Acupuncture treatment is the most common invasive treatment method for Traditional Chinese Medicine in which thin needles are inserted into specific documented points of the body. The increasing popularity of acupuncture worldwide has led to growing demands for safer practice. There is a growing literature on adverse events associated with acupuncture that the most common adverse events occur was leaving needle in the patient's body with the incidence rate about 3.3%. The consequences of the needle left on the patients were a major threat to the safety of patients.

Leaving needles in a patient's body could happen any steps throughout an acupuncture therapy including recording the number of needles at the beginning of a treatment process inaccurately, medical incidents occurred during treatment, and missing out some needles during needles removing phase at the end of treatment. Removing the needles is the last step of an acupuncture therapy, which can be regarded as a final examination step before completing an acupuncture therapy. Improving the accuracy of needle counting during the phase of removing needles is critical. This project aims to design needle collecting containers which have counting function via 3D printing techniques to reduce human errors by improving the counting accuracy at needles removing step.

Keywords: Leaving needle, 3D printing techniques

Oral session B: 3D Printing in Medicine

3D-print whole-body vascular model for neurovascular intervention simulation

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Abstract:

Build-up of proximal access with stable guiding catheter is the first and mandatory step for success of all neuroendovascular procedures. However, tortuous aortic arch (type III arch) and aortic variant (bovine variant) are always challenging for the beginners of neuro-interventionalists. The major cause is lack of experience to conquer these strenuous arch anatomy with relatively less prevalence in daily practice. On the other hand, simulation model is becoming an important technique in neurosurgical training nowadays. Therefore, we had set-up patient-specific 3D vascular models used in the angiography suite for the resident training to improve their performance and safety in neuroendovascular procedures.

We retrospectively reviewed the thoracic CT angiography imaging databank of our institution to enroll one case with type I aortic arch, one case with bovine variant and another two cases with type III aortic arch for build-up of patient-specific 3D vascular models. A total of 4 full-sized carotid-aortic-iliac models were printed by an X-CUBE SLA 3D printer using SLA material. The type I aortic arch model was used for introduction of this simulation system. The bovine variant model was used for SIM 2 catheter practice. The type III aortic arch model was used as the final test of trainee's performance to cope with difficult aortic arch. These 3D simulators had been used in the neuro-interventional training course for the residents of our hospital. According to the responses of these trainees, the major advantage of this simulation system is repeated experience of SIM 2 catheter usage and confidence while dealing with difficult aortic arch.

Recently, two 3D-print patient-specific intravascular simulation models of cerebral aneurysms

had been accomplished. Moreover, a continuous pulsatile pump and intravascular pressure sensors were also incorporated into the 3D-print vascular simulator as a complete simulation system for neuro-interventional training and pre-operation simulation.

Keywords: 3D print, Neurovascular intervention, Simulation

Oral session B: 3D Printing in Medicine

Air Cushion Nest

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Abstract:

The provision of appropriate nesting and proper positioning has an impact on the prognosis of premature infants. Literatures showed that improper nesting and resting are associated with bradycardia, apnea and hypoxemia in premature infants. The two positioning aids currently used for premature infant care not only do not provide sizes for individual needs, but they do not stay stable and durable, leading to an increased nursing hours.

Air Cushion Nest is permeable and not easy to deform and it allows for high temperature washing. Nurses can adjust the size of the nest according to the body of the babies and their body movements. The nest can provide appropriate support, maintain correct alignment of head, trunk and limbs, reduce pressure, and simulate limb movement that may reduce breathing pauses in premature infants. Furthermore, the preterm infants are more likely to gain weight due to enhanced sense of security, self-regulation, and reduced stress by the provision of comfortable boundaries.

Keywords: Air cushion, Nesting, Positioning

Oral session B: 3D Printing in Medicine

Thermal clothing

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Abstract:

Body temperature care is considered as one of the important indicators for assessing neonatal care; it is also outlined in the Neonatal Resuscitation Program (NRP) guidelines. Polyethylene bags are currently used in most medical facilities for thermal preservation and Hypothermia prevention. However, its airtight nature does not allow for partial openings when emergency treatment is required, thus resulting in hypothermia in newborns.

The idea of this thermal clothing came from the small cloak and sunroof of car. Its Innovation features include:

1. The inflatable structure that serves as an airlock to block cold air, prevent body heat loss, and preserve thermal stability;
2. The air cushion design distributes pressure;
3. A transparent design in the front allows for observation of breathing;
4. The umbilicus opening ensures that an urgent catheter insertion can be performed timely;
5. The 2-way zipper enables easy treatment of extremities and better medical cable management;
6. The one-piece clothing can be used as baby blanket.

Keywords: Newborns, Body temperature care, Thermal preservation

Oral session B: 3D Printing in Medicine

Pneumatic gloves

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Abstract:

These pneumatic gloves are comfortable and easy to wear. After wearing these gloves, previous constriction marks, skin edema and abrasions have all improved. The pneumatic ball over the palm area also encourages hand movement as well as maintain muscle strength and grip when they grasp the ball. Most importantly, many medical procedures such as blood sugar monitoring and testing blood oxygen concentration can all be done with the gloves on, taking less time than the standard restraint gloves that have to release wrist restraint when access to the patient's fingers are required.

Innovation Value

The pneumatic gloves encourage hand movement, provide easy-to-wear comfort, reduce self-extubation and maintain safety. They will be an ideal assistive device to save nurses' time on putting on/taking off gloves and performing care tasks such as blood glucose or blood oxygen monitoring, thus leading to greater patient/family and nurse satisfaction.

Keywords: Restraint glove, Pneumatic

Session 1: Pharmaceutical Sciences

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Poster session: Pharmaceutical Sciences**Exploring the microRNA expressions in HeLa cell-derived extracellular vesicles after gene delivery by non-viral vectors****Chia-Wei Lin¹, Ming-Shiou Jan¹, Jung-Hua Kuo^{2*}**¹ Institute of Biochemistry, Microbiology and Immunology, Chung Shan Medical University, Taichung city, Taiwan² Department of Pharmacy, Chia Nan University of Pharmacy and Science, Tainan city, Taiwan

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Abstract:

After the non-viral delivery of genetic material into cancer cells, the molecular mechanisms of intercellular communication are still not precisely understood. Among the various biological functions of cell-derived extracellular vesicles (EVs), the most well-known is that of intercellular communication, which they accomplish by shuttling molecular messengers such as microRNA (miRNA) to target cells. Therefore, the aim of this study is to probe the miRNA profiles in cancer cell-derived EVs in responses to cationic non-viral gene delivery systems for better understanding the molecular mechanisms of intercellular communication in cancer cells after non-viral gene delivery.

Lipofectamine 2000 and linear jet polyethylenimine are used for the delivery of gene fluorescent protein plasmid in HeLa cervical cancer cells. EVs are extracted and the contents of RNA are subject to next generation sequencing on a HiSeq 2500 platform. The differentially expressed miRNAs were identified and confirmed by real-time quantitative reverse transcriptase-polymerase chain reaction. Lipoplexes resulted in more up- and down-regulated expressed miRNAs than those of polyplexes. Two overlapped up-regulated miRNAs (hsa-miR-143-3p and hsa-miR-193b-3p) were quantitatively consistent with the results from sequencing data. Our findings might provide further molecular information of intercellular communication in cancer cells mediated by non-viral gene delivery systems.

Keywords: MicroRNA, Extracellular vesicles, Non-viral vectors

Poster session: 1**Potential protective effects of Lycopene like extract on DEHP-induced cell proliferation and migration in vascular smooth muscle cells****Dai Lun Yang[#], Yu Hui Chiu[#] Mei-Fen Shih^{*}**

Department of Pharmacy, Chia-Nan University of Pharmacy & Science, Tainan, Taiwan

[#] Equal contribution^{*} To whom correspondence should be addressed. e-mail: meifenshih@mail.cnu.edu.tw**Abstract:**

Proliferation of vascular smooth cells (VSMC) has been particularly linked to development of atherosclerotic plaques. Most of inducers of atherosclerosis in experimental models were proinflammatory cytokines, such as IL-1 β or&/or TNF- α . In this study, we used di(2-ethylhexyl) phthalate (DEHP), which is one of the most common compounds used as plasticizers in most of plastic product, as a potential inducer. Previously, we have demonstrated that the possible mechanisms of DEHP-induced atherosclerosis include increasing MMP-2 and MMP-9 expression and these regulatory pathways in VSMC. Lycopene, an oxygenated carotenoid with great antioxidant properties, has shown both in epidemiological studies and supplementation human trials a reduction of cardiovascular risk. However, its protective mechanisms against DEHP-induced VSMC proliferation and migration were not elucidated previously. VSMC was treated with 3.5 ppm DEHP with or without lycopene-like extract (dose between 1 and 200 μ M) for 24, 48, and 72h prior to cell proliferation and cell migration were evaluated. DEHP-induced proliferation and cell migration were prevented by treatment of lycopene-like extract t in a dose dependent manner. In conclusion, lycopene-like extract may have potential role in preventing DEHP-induced atherosclerosis development.

Keywords: Lycopene-like extract, vascular smooth cells, di(2-ethylhexyl) phthalate

Poster session: 1**The health education effect on the patients with gout from pharmacists of community health insurance pharmacy****Su-Jong Chen¹, Ming-Chong Wu¹, Chiu-Lan Chen^{1*}**¹Department of Pharmacy, Chia-Nan University of Pharmacy and Science, Tainan city, Republic of China (ROC)

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Abstract:

Gout is a common inflammatory joint disease. Although the pathogenesis of gout is well understood today, chronic gout is still poorly managed, and the incidence and prevalence of gout are increasing. Therefore, the purpose of this study is to provide medication counseling and guidance for gout patients with chronic prescription from the pharmacists of the community pharmacy. So that patients can self-care and implement in daily life. The pre-test questionnaire and pharmacist's intervention was first conducted, and the patient's biochemical data from hospital (including uric acid value, renal function, glycosylated hemoglobinemia, blood lipid, and other) were collected with agreement. After four months and four times of intervention, the post-test of the questionnaire and related biochemical data were collected for analysis and comparison. After four times of pharmacist's health education for chronic gout patients, their knowledge were improved in gout medication, gout disease, lifestyle changes, and role of pharmacists in community health insurance pharmacies ($p < 0.05$). In the other, the diet management, regular exercise, life style changes and improvement of drug compliance, also reflected in the blood uric acid concentration and frequency of attack. The results of this study show that the intervention of the pharmacists of the community health insurance pharmacy for chronic gout's patients can control the frequency of gout attack, improve the quality of life, promote labor productivity, and effectively reduced health care medical resources.

Keywords: Lowering uric acid therapy, Drug compliance, Gout diet management.

Data Integrity Risk Management in Pharmaceutical Factory The Case Study of Company

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Abstract:

Background

Recently, domestic and foreign pharmaceutical companies involved in data integrity of cGMP violations have increased alarmingly and have attracted the attention of national health authorities.

In August 2019, the Department of Food and Drug Administration (TFDA) of the Ministry of Health and Drug Administration issued the Data Management and Integrity Practices to respond to common data management deficiencies and to clarify the importance of pharmaceutical companies in the integrity management of data in the pharmaceutical process.

This study is aimed at the lack of data management and corresponding measures of pharmaceutical companies.

Method

This study examines the data management measures implemented by the analysis of case drug companies, including the maturity of the equipment and instrument data preservation system, the use of evaluation and quality management test data flow record " Failure Mode Effect Analysis (FMEA)", the examination of the risks faced by case drug companies in the whole life cycle of data generation, output, input, etc., Based on the results of the assessment, suggestions for improvement are put forward to bring the inspection data into line with the principle of "ALCOA+".

Results

According to the results of the data management principle "ALCOA+" published by MHRA in 2018, controls on the use of cGMP electronic systems in data management key items Raw Data, Audits Trail, True Copy, and cGMP Electronic Systems Data Life Cycle case-based drug companies use systematic assessment methods to effectively ensure data integrity (Data Integrity, DI) to ensure a safe and stable consistency of drug quality.

Discussion

In order to ensure the quality of the data received, in addition to on-site audits, it is more likely that remote data audits will be performed in the future, in order to in response to international trends, pharmaceutical companies must actively consider the topics that should be strengthened for the promotion of computerized systems.

Keywords: Failure Mode Effect Analysis (FMEA) , ALCOA+, Data Integrity(DI)

Session 1: Pharmaceutical Sciences

Effect of xanthohumol on vascular calcification

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Abstract:

Vascular calcification (VC) is prevalent in patients with atherosclerosis, chronic kidney disease, diabetes mellitus, and hypertension, is a strong independent predictor of increased cardiovascular morbidity and mortality. VC is an active, cell-regulated process. Recent studies on the regulatory mechanism of cardiovascular calcification have been focused osteogenic dedifferentiation, matrix vesicles, extracellular matrix degradation & mineralization and cell apoptosis. Xanthohumol (XN), a bioactive prenylated flavonoid in hops (*Humulus lupulus* L.) and beer, has long been used in traditional medicine as a sedative and antimicrobial agent. More recently, attention has been devoted to the protective effects on the cardiovascular and metabolic diseases. However, the role of xanthohumol in VC is still unclear. In this study, an *in vitro* model of rat aortic vascular smooth muscle cells (VSMCs) calcification induced by β -glycerophosphate (β -GP) are used to identify the effect and mechanisms of XN on VC. Methods: Incubation of VSMCs with β -GP for 14 days induced an osteoblast-like morphological change. The mineralization was visualized by Von Kossa and Alizarin red staining. Alkaline phosphatase activity (ALP) and calcium content were also detected. The protein expression of osteoblastic differentiation markers and signaling pathways were determined by western blot and immunocytochemistry. Results: Our data showed that xanthohumol concentration-dependently reduced β -GP-induced osteoblastic differentiation and calcification of VSMCs including ALP activity, calcium content and bone morphogenetic protein-2 (BMP-2), Runt-related transcription factor 2 (Runx2), sodium-phosphate cotransporter Pit-1 and β -catenin expression as well as the formation of mineralized nodule. Furthermore, xanthohumol was shown to inhibit the β -GP-induced ROS production, apoptosis and protein expressions of caspase-3 and -9, which are known contributors to vascular calcification. Therefore, this study indicates that xanthohumol may have a role in prevention of calcification-associated vascular diseases. Further animal studies are needed to substantiate these novel findings.

Keywords: vascular calcification, xanthohumol, β -catenin, Runt-related transcription factor 2, apoptosis

Implementation Status and Satisfaction Survey of Community Pharmacy Internship

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Abstract

This study is based on the survey and analysis of the feedback questionnaires after the completion of the internship course of the 104-level pharmacy department students of Chia Nan University of Pharmacy and Science. In addition to understand and summarize the actual results, it also discusses how to improve the current project so that the future course will help interns consider the employment planning.

In this study, a total of 186 valid questionnaires were obtained, and 94.1% internship location was pharmacists' personal self-owned pharmacies, followed by the chain pharmacy systems. The results showed that the pharmacy interns had high satisfaction with the internship system, the internship content, the pharmacy and the guiding pharmacists. Most of the pharmacy interns believed that the internship of the community pharmacy would indeed affect employment choice, employment confidence and professional skills. Internships in different types of community pharmacies will affect the satisfaction of interns..

It is obvious that the internship course of the community pharmacy is indeed an indispensable part of the training of professional pharmacy talents.

Keywords : Community pharmacy internship, Community pharmacy type, Satisfaction

Poster session: 1

The study of Chinese herbal medicines on melanogenesis

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Abstract:

The melanogenesis is a series of enzyme's catalyzation and tyrosinase is a key enzyme, which catalyzed oxidative reaction. Therefore, many studies have developed antioxidants for whitening effects, mainly through inhibition of tyrosinase activity. Chinese herbal medicines such as *Schelechtenda chinensis*, *Punica granatum* peel, *Terminalia chebula* and *Fallopia multiflora* are rich in polyphenolic compounds and have excellent antioxidant effects. Consequently, this study aims to investigate how water extracts of *Schelechtenda chinensis*, *Punica granatum* peel, *Terminalia chebula* and *Fallopia multiflora* affect melanogenesis. Through *in vitro* tyrosinase activity assay, cell viability assay, and cellular melanin assay, we examine whether these water extracts can inhibit melanogenesis. The results show that water extracts of *Schelechtenda chinensis*, *Punica granatum* peel, *Terminalia chebula* can inhibit extracellular of tyrosinase activity in a dose-dependent manner. However, water extracts of *Schelechtenda chinensis*, *Punica granatum* peel, *Terminalia chebula* have the stronger cytotoxicity on B16 cell, and *Fallopia multiflora* has no cytotoxicity even up to 200 μ g/ml. However, low-dose without cytotoxicity of *Schelechtenda chinensis*, *Punica granatum* peel, *Terminalia chebula* and *Fallopia multiflora*, have the insignificant effect on inhibition of melanin content. Although the three Chinese herbal medicine extracts can inhibit tyrosinase activity *in vitro*, but they can't inhibit melanogenesis in the B16-F1 cell line. It may result from water soluble ingredient which can't enter melanosomes to inhibit melanogenesis, although they have antioxidant effect and inhibit the activity of tyrosinase *in vitro*.

Keywords: *Schelechtenda chinensis*, *Punica granatum* peel, *Terminalia chebula*, *Fallopia multiflora*, tyrosinase, melanogenesis.

Lipoxygenase Inhibitory Constituents from the Kino of *Eucalyptus citriodora*

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Abstract:

A new lipoxygenase inhibitory flavonoid, 8-[1-(*p*-hydroxyphenyl)ethyl]rhamnocitrin (**1**) together with four known compounds, cinnamic acid (**2**), *p*-coumaric acid (**3**), caffeic acid (**4**), and gallic acid (**5**) were isolated from the kino of *Eucalyptus citriodora* and their structures were elucidated on the basis of spectroscopic methods including 2D NMR spectra. These compounds were tested for inhibitory activity against 15-lipoxygenase. Compound **1** showed stronger inhibitory activity (IC_{50} 27.6±0.7 μM) than the positive control quercetin (IC_{50} 37.5±0.8 μM)..

Keywords: *Eucalyptus citriodora*, kino, lipoxygenase, flavonoid

Poster session: 1**Analysis of abused drugs in E-liquid****Yu-Tang Lin 、 Cheng-Hong Lin 、 Yu-Ping Kuo ***

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Abstract:

In this study, we try to determine the concentrations of nicotine, lorazepam, flunitrazepam and XLR-11 in the electronic cigarette oil by high performance liquid chromatography with diode array detector (HPLC/DAD). Agilent poroshell 120 EC-C18, 2.7 μ m 4.6 \times 100 mm was used as the separation column. The optimal separation conditions were: pH 6 phosphate buffer solution (A) and methanol (B) mixed solution as mobile phase, gradient elution steps 0~5 min 50 % 60 % B; 5~7 min 90 % B; 7~10min 90% B; 10~13 min 50 % B; injection volume 10 μ L, flow rate 0.8 mL/min, and detected at 254 nm and 259 nm.

The results show that the linear correlation coefficients r of the calibration curve for all these contents are 0.990 or more, and the relative standard deviations (RSDs) of the concentrations of these substances in the home-made samples are $\pm 2\%$. And the recoveries rate 80%-120%.

Poster session: 1**Study on Change of Relationship Between Potentially Inappropriate Medications and Polypharmacy with Pharmacist Intervention****Tzu-Chueh Wang^{1*}, Hai-Lin Lu², Kung-Chuan Hsu³**¹ Department of Pharmacy, Chia Nan University of Pharmacy and Science, Tainan city, R.O.C² Department of Pharmacy, Chia Nan University of Pharmacy and Science, Tainan city, R.O.C³ Giraffe Pharmacy, Tainan city, R.O.C

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Abstract:

In Taiwan it has become an aged society, that aging is a big issue for the public. Polypharmacy (PP) and Potentially inappropriate medication (PIM) are prominent prescribing issues. The pharmaceutical care started in 2010 as the pharmacists take their responsibility for every to their health. The aim of this study is to find the Change of Relationship Between PIMs and Polypharmacy with Pharmacist Intervention (PI).

This was a population-based study using Hcare database. Data was conducted from January 1, 2017, to December 31, 2017. Patients with over 65 years old and at least 5 times of pharmacist intervention was included in this study. Then, records without medication records in the first time was excluded. Beers Criteria 2015 version used to determine PIM occurred, and the PP divided into 3 class: non-PP with less than 5 medications use, PP with 4 to 9 medications, and excessive PP with more than 10 medications at the same visit time. Multivariable logistic regression was used to the relation of PIM and PP.

Total 58,595 patients were included in this study. There were 29394 male patients. The age distribution of 27,199 young-old patients, 23,577 mid-old patients, and 7819 old-old patients. Before PI, there were 25,925 individuals with excessive PP, and it increased to 33,448 individuals after PI. Patients with PIM occurred were 48,239 individuals before PI, and 51,018 individuals after PI. The excessive PP group was 30.7 times (OR:30.7,95%CI=28.4-33.2) to the PIM prescriptions than non-PP group before PI, and it decrease to 18.2 times after PI(OR:18.2,95%CI=16.8-19.2).

In this study, PI will not decrease the situation of PP, but it will help patients with PP or excessive pp less chance to exposure to PIM prescriptions. It will help elders to have good quality of life.

Keywords: Pharmacist intervention, Polypharmacy, Potentially inappropriate medication

Poster session: 1**Association Between Potentially Inappropriate Medications and Polypharmacy in the Frequent User of Outpatient Service****Wan-Chun Chao¹, Tzu-Chueh Wang^{2*}, Hai-Lin Lu³, Kung-Chuan Hsu⁴**¹ Department of Pharmacy, Wuri Lin Shin Hospital, Taichung City, R.O.C² Department of Pharmacy, Chia Nan University of Pharmacy and Science, Tainan city, R.O.C³ Department of Pharmacy, Chia Nan University of Pharmacy and Science, Tainan city, R.O.C⁴ Giraffe Pharmacy, Tainan city, R.O.C

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Abstract:

Aging may cause physical deterioration or changes in body composition, so the use of medications requires more careful to avoid unnecessary side effects, and thus the development of potentially inappropriate medications (PIMs). Aging is accompanied by multiple diseases that lead to take more medication at the same time, that is also called polypharmacy (PP). The interaction between drugs will be more serious. This study intends to analyze the tendency of PIM in order to provide physicians and pharmacists to pay more attention in the future.

This study using Hcare database with medication records from 2017. The Hcare system conducted pharmaceutical care records from patients with 90 times outpatient service usage in the past year (frequent user of outpatient service). After receiving the database we exclude patient under 65 year old and patients without medication record. Beers Criteria 2015 version used to determine PIM occurred, and the PP divided into 3 class: non-PP with less than 5 medications use, PP with 4 to 9 medications, and excessive PP with more than 10 medications at the same visit time. Multivariable logistic regression was used to the relation of PIM and PP.

Total 75,750 individuals were included in this study, with 37,705 males. The age distribution of 34,485 young-old patients, 31,143 mid-old patients, and 10,122 old-old patients. The excessive PP group was the most one in PP classification. Patients with PIM occurred were 63,778 individuals. The excessive PP group was 32.1 times (OR:32.1,95%CI=29.9-34.5).

According to previous result, the correlation between the PIM and the PP use in the elderly of frequent user of outpatient service is extremely related with excessive PP. When the elderly takes more medications at the same time, the more likely they are to encounter the PIM prescription, if the pharmacist can check the appropriateness of them, and tracking whether the side effects occurred, and to communicate with doctors or other medical personnel to reduce patient discomfort or emergency medical use.

Keywords: Pharmacist intervention, Polypharmacy, Potentially inappropriate medication

Session 1: Pharmaceutical Sciences

Acetylaszonalenin and related compounds produced by mutational semi-biosynthesis in *Neosartorya fischeri*

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Abstract:

Acetylaszonalenin, a mycotoxin, also known as LL-S490 β , has been found to be the major secondary metabolite produced by *Neosartorya fischeri* during liquid culture. The biosynthesis of gene cluster, including non-ribosomal peptide synthetase (AnaPS), prenyltransferase (AnaPT) and acetyltransferase (AnaAT), has been shown to be involved in the synthesis process by in vitro enzyme biochemical studies.

We used hygromycin resistance marker (*hph*) to replace *ku80* gene to disrupt the non-homologous end-joining (NHEJ) of the DNA repair mechanism, and further construct uridine/uracil auxotrophic strains. Deletion of the *pyrG* gene (encoding orotidine-5'-phosphate decarboxylase)]. The *Dku80/DpyrG* double-knockout strain of *N. fischeri* NRRL181 (CN1009) was obtained and the gene replacement of *anaPS* was carried out using the *pyrG* gene of *Aspergillus fumigatus* (*AfpyrG*).

In this study, we successfully produced aszonalenin and acetylaszonalenin, the dominant secondary metabolite in *Neosartorya fischeri*, by a mutational semi-biosynthetic platform, comprising a *ku80/pyrG* double-knockout strain of *N. fischeri* NRRL181 and an intermediate precursor, 1,4-benzodiazepine-2,5-dione, feeding technique.

Keywords: *ku*; acetylaszonalenin; benzodiazepinedione; mutational semi-biosynthesis

Will Suggamadex decrease the possibility of intensive care unit admission, compared with traditional muscle relaxant reversal drug? —A pre-anesthetic prediction by machine learningShu-Chin Chiang¹, Chung-Feng Liu², Miao-Chuan Lin¹, Jhi-Joung Wang^{1,2}, Ying-Jen Chang¹

Chi Mei Medical Center

¹Department of Anesthesiology, Chi Mei Medical Center, Tainan, Taiwan²Department of Medical Research, Chi Mei Medical Center, Tainan, Taiwane-mail: amy221488234@yahoo.com.tw**Abstract:**

Lung resection surgery is one of the major surgeries. Post operation intensive care unit admission may be required due to the dependence of ventilator. After patients regaining muscle power, weaning ventilator can be considered. We used the database of anesthesia and surgery, which includes pre-anesthetic laboratory data* and anesthetic medications.

Machine learning[#] can help us to build the models for predict the admission rate of intensive care unit.

*Pre-anesthetic laboratory data includes pulmonary function test, lung resection volume, pre-operation saturation, exercise tolerance, history of cardiovascular disease and patients' age.

[#]Machine learning: RandomForest model had better performance in accuracy, precision, recall, F1 and AUC than other models.

Machine learning can improve the risk explanation in pre-anesthetic consultation clinics.

Machine learning can also let the patient and family know benefits of suggamadex medication.

Data collection period: From 2019/01/01 to 2019/07/31. We included all of the patients who received lung resection surgery in Chi Mei Medical Center.

The number of raw data: suggamadex group: 125. Non-suggamadex group: 144.

The study items of raw data: pulmonary function test, lung resection volume, pre-operation saturation, exercise tolerance, history of cardiovascular disease and patients' age

Training and Testing: Randomized sampling 70% raw data for model training, and the rest of 30% raw data for model testing.

Raw data management: The intensive care unit admission rate has been underwent SMOTE management for imbalanced-processing.

The results of model testing: RandomForest model has the best testing result, in both suggamadex model and non-suggamadex model. Accuracy: suggamadex model/non-suggamadex model:

0.78/0.88、 Precision: 0.78/0.89、 Recal: 0.78/0.88、 F1: 0.78/0.88, and AUC 0.77/0.88.

Keywords: Lung resection surgery, Pulmonary function test, Pre-anesthetic consultation, Suggamadex, Intensive care unit, Machine learning

Pharmaceutical Sciences

Emission characteristics of aromatic allergens in PM_{2.5} from essential-oil tower incense burning

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Abstract:

This study adopted commercially available tower incense (Thailand-star life, Thailand-มะลิ, Taiwan-night market) and compared the amount of aromatic allergens in essential-oil tower incense and those in incense ash and smoke (produced by burning essential-oil tower incense) that contain PM_{2.5}. The results showed that the aromatic allergens in PM_{2.5} contained in smoke produced by the essential-oil tower incense burning accounted for 2% of organic carbon emissions and were therefore considered as crucial substances. Among the aromatic allergens produced, α -hexylcinnamaldehyde had the highest proportion, accounting for 29.8%–38.49% of the emissions (499.4–765.5 $\mu\text{g g}^{-1}$) and was the main source of Thai-brand incense. The main source of Taiwanese-brand incense was Benzyl salicylate, which accounted for 42.66% (57.2–1088.8 $\mu\text{g g}^{-1}$) of the emissions, followed by isoeugenol (10.42%–34.11%; 265.8–678.5 $\mu\text{g g}^{-1}$) and vanillin (9.83%–8.06%; 23.2–25.5 $\mu\text{g g}^{-1}$). Other types of aromatic allergens accounted for less than 3% of the emissions, which was a tiny amount and completely decomposed. Therefore, people who use essential-oil tower incense must pay attention to ventilation and avoid inhaling excessive smoke produced by the burning of essential-oil tower incense to prevent the occurrence of contact and respiratory allergy.

Keywords: Essential-oil tower incense burning, aromatic allergens, Terpenols, Eugenols

Poster session: #**8-Hydroxyquinoline derivatives induces apoptotic cell death via oxidative stress changes in skin cancers****Hsiou-Yu Ding¹, Leong-Perng Chan², Ya-Ping Tseng³, Ting-Hong Tsai¹, Chia-Hua Liang^{1*}**

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Abstract:

8-Hydroxyquinoline is a well-known molecule that owing to its metal-complexation ability is commonly used for metal precipitation. Previous research has established that iron that is bound to the lipophilic chelator, 8-hydroxyquinoline, is strongly toxic and may cause lipid peroxidation in human lung cancer cells. The incidence of skin cancers is increasing worldwide. More than 1 million skin cancers are diagnosed annually in the United States making skin cancer by far the most common cancer. In this work, a novel 8-hydroxyquinoline derivative was synthesized. Moreover, we demonstrated that mitochondria pathway is involved in apoptosis induced by tris(8-hydroxyquinoline)iron. Tris(8-hydroxyquinoline)iron increases reactive oxygen species and reduces glutathione levels in skin cancer cells. This study is the first to suggest that reactive oxygen species have been implicated as pivotal in tris(8-hydroxyquinoline)iron-induced skin cancer cells apoptosis.

Keywords: 8-Hydroxyquinoline derivatives, oxidative stress, skin cancer

Poster session: Pharmaceutical Sciences**The comparison of the chemometric method and the internal standard addition method for the LC/MS² detection of drug abuse****Jia-Der Fang**

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Abstract:

The LC/MS² determination of drug abuse always use the internal standard addition method. But the internal standard is difficult to be synthesized or too expensive to buy it! In the study, we try to use the chemometric method, general standard addition method (GSAM) to replace the internal standard addition method for the LC/MS² detection of drug abuse. The GSAM use the mathematic matrix to make up the uncertainty from the electrospray ionization and the mass analyzer efficiency. According to the results of the study, the determination result of GSAM can be compared to that of the internal standard addition method. And the GSAM can be applied to the quantitative detection of multicomponent mixture.

Keywords: Drug abuse, LC/MS², GSAM, Internal standard addition method

Investigation on the habits of people's medication use

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Due to the advanced medical environment today, the role of pharmacist is getting more important in public health and medication consultation. Pharmacists need to take an active role understanding whether people have enough medication knowledge, and provide the right concept of medication use. However, there are still many people who have a lot of myths about drugs, including taking the wrong medicine, buying medications from unknown sources, drugs hoarding, and taking medication with foods that are contraindicated. Therefore, this specific study is to explore how much people know about the knowledge of medicines. The results show the main way for people to get medicines is obtained from clinics. About the remaining medicines, most people threw them directly into the trash, and among them, flu medicines account for the majority. Nearly half of the people do not know that hospitals can recycle medicines. Most people have taken medication as directed. However, there are still many patients, who believe that their condition has improved, decide to stop taking drugs on their own.

Pharmaceutical Sciences

Emission characteristics of aromatic allergens in PM_{2.5} from essential-oil tower incense burning

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Abstract:

This study adopted commercially available tower incense (Thailand-star life, Thailand-มะลิ, Taiwan-night market) and compared the amount of aromatic allergens in essential-oil tower incense and those in incense ash and smoke (produced by burning essential-oil tower incense) that contain PM_{2.5}. The results showed that the aromatic allergens in PM_{2.5} contained in smoke produced by the essential-oil tower incense burning accounted for 2% of organic carbon emissions and were therefore considered as crucial substances. Among the aromatic allergens produced, α -hexylcinnamaldehyde had the highest proportion, accounting for 29.8%–38.49% of the emissions (499.4–765.5 $\mu\text{g g}^{-1}$) and was the main source of Thai-brand incense. The main source of Taiwanese-brand incense was Benzyl salicylate, which accounted for 42.66% (57.2–1088.8 $\mu\text{g g}^{-1}$) of the emissions, followed by isoeugenol (10.42%–34.11%; 265.8–678.5 $\mu\text{g g}^{-1}$) and vanillin (9.83%–8.06%; 23.2–25.5 $\mu\text{g g}^{-1}$). Other types of aromatic allergens accounted for less than 3% of the emissions, which was a tiny amount and completely decomposed. Therefore, people who use essential-oil tower incense must pay attention to ventilation and avoid inhaling excessive smoke produced by the burning of essential-oil tower incense to prevent the occurrence of contact and respiratory allergy.

Keywords: Essential-oil tower incense burning, aromatic allergens, Terpenols, Eugenols

Poster session: 1**Comparison of different MAE extraction equipment for the extraction of constituents from Japanese Honeysuckle (*Lonicera japonica* Thunb.) herbs****Jeng-Fen Huang, Yu-Wei Tien, Li-Yin Chen***

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Abstract:

Microwave extraction, also known as microwave-assisted extraction (MAE), refers to techniques and methods for extracting various chemical components from plants, minerals, animal tissues, etc. in a microwave reactor using a suitable solvent. Microwave extraction is less limited by solvent affinity, more solvents are available, and the amount of solvent is reduced compared to conventional extraction methods. Furthermore, microwave extraction can be used for large-scale production, it is safe and reliable, and it is non-polluting. It belongs to green engineering.

There are two sets of MAE equipment in our lab currently, namely Milestone ETHOS X and Milestone START SYNTH. These two sets of equipment are used to compare the extraction of constituents from Japanese Honeysuckle (*Lonicera japonica* Thunb.).

Keywords: MAE, Japanese Honeysuckle, *Lonicera japonica* Thunb.

Poster session: 1

Effectiveness of Sedative Hypnotics Medication Education Strategies

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Abstract:

A survey of recommended sleeping hours association with age groups by the National Sleep Foundation (NSF) found that daily sleep time decreases with age. As a result, elders are frequently exposure to sleeping medications to ensure that they can get sufficient sleep quality. However, the Drug Abuse Bulletin of the Health and Welfare Department of the Taiwan Ministry of Health and Welfare pointed out that Sedative Hypnotics have become the most frequently misused medication in recent years. Therefore, the promotion of propaganda appropriate use education of Sedative Hypnotics is an important policy for preventing drug abuse.

Cross-sectional designed education strategies assist in the Sedative Hypnotics medication. The data were collected from 107 participants in education activities at two hospitals in Taiwan in 2018. The research tools, proposed by Van Foundation, consisted of items and categories in Sedative Hypnotics knowledge, performance and the related assessment. SPSS statistical software package was used to process the data file.

This study explored the effectiveness of the education strategies intervention of Sedative Hypnotics, and suppose that the learners impressed when using of education strategies to intervene in the use of Sedative Hypnotic.

According to the result, it's inferred that the safety advocacy of education strategies involved in Sedative Hypnotics medications can improve their knowledge and correctly usage. The evaluation reflected the subject group scored better in all categories after the awareness campaign.

Keywords: Board game, Correct medication education, Health education

Poster session: 1**HPLC Assay of Volatile Oils Extracted by Supercritical-Fluid from Ingredients of Huo Xiang Zheng Qi San****Po-Chou Yen, Hung-Hong Lin, Tz-Chiang Tang***

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Abstract:

A rapid and reliable HPLC method was developed to assay the major volatile oils of certain Ingredients, i.e. Bai Zhi, Bai Zhu, Hou Po, Sheng Jiang, for chinese herb Huo Xiang Zheng Qi San which were extracted by using CO₂ supercritical fluid extraction setup. With the proposed method, volatile oils of these Ingredients can be separated satisfactorily during periods of 20 ∙ 50 ∙ 65 ∙ 80 mins, respectively.

Under optimized condition with NUCLEODUR 100-5 C18, Htecanalytical column (length: 15cm,id: 4.6mm) , which is guarded by EC 4/3 UNIVERSAL RP guard column,the satisfactorily linear calibration range of volatile oil concentraions for Bai Zhi, Bai Zhu, Hou Po, Sheng Jiang were obtained with squared correlation coefficients(R²) 1.0000, 0.9958, 0.9991, 0.9999, respectively.

The developed method has been applied for the determination of encapsulation ratios of those volatile oils microencapsulated by β -cyclodextrin with good results.

Keywords: HPLC, Bai Zhi, Bai Zhu, Hou Po, Sheng Jiang, Huo Xiang Zheng Qi San, β -cyclodextrin, encapsulation ratio.

Poster session: 1**The Effectiveness of Training Program of Seeding Teacher for Anti-Drug Abuse in West Central District in Tainan City****Yuan-Chun Chen¹, Tzu-Chuen Wang^{2*}**¹ Department of Pharmacy, Chia Nan University of Pharmacy and Science, Tainan city, R.O.C² Department of Pharmacy, Chia Nan University of Pharmacy and Science, Tainan city, R.O.C

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Abstract:

The “Non-Drug abuse health country project” was held in Tainan City in 2013, that was combined with District Office, and the Development Association to invite community residents to promote the drug awareness and promote anti-drug seeding teacher through lectures. Seeding teacher was trained to identify and care for drug abuse users and their families, that they can provide information or assistance from relevant referral units in 2016.

In this study was according to the policy from Public health bureau of Tainan City, to recruit volunteers as seed teacher, and conducting anti-drug advocacy lectures in West Central District of Tainan City. The speech event information was scattered, and the audience was recruited for 5 sessions, and the number of people receiving the case was 320. The exclude criteria was aged under 20-year-old. Data was analyzed by excel, and student’s t-test was used to determine the effect of training program.

As a result of this study, population of seeding teacher was most of the age in group of 61-year-old and about, in gender of female, and highest education of senior high school. In the knowledge of anti- awareness scale, there is no difference with the training (before 18.1 ± 3.28 out of 20, and after 17.8 ± 4.64 , $p=0.37$). The anti-drug cognition score was 3.56 ± 1.07 before training, and significant increase to 3.96 ± 1.27 after the training ($p < 0.001$).

After the results of the announcement, it was found that in terms of the degree of recognition has not increase, and they feel lack of confidence to distinguish and refuse of drugs. It should be suggested that the anti-drug-related propaganda messages should be increased, and should use the effective propaganda type that people can carry out, design appropriate anti-drug education propaganda in order to expand the effectiveness.

Keywords: Anti-drug campaign, Drug abuse, Urban areas

Poster session: 1

Education of anti-drug program in North District in Tainan City

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Abstract:

Drug abuse not only affect the health but also generate social issue, criminal behaviors, and have a potential impact on the country's image. When the lecture held, it will help people to increase the knowledge to against drug. The education of anti-drug program held in three part, to classification the drug, to avoid the damage of drug, and to keep away from drug.

stratified sampling was used to collect the population, total 452 individual was collected. An anonymous questionnaire was used to detect the effeteness of education. People under 20-year-old was exclude in this study. After collect the Data Excel software was used to analyze, and Student's t-test was used to verify the effeteness of the education of anti-drug program.

After the analysis, population of 334 females and 118 males and the most frequent of aged 61-year-old above. In the concept of I can against the drug abuse with no difference (before 17.6 ± 3.5 out of 20, and after education 17.7 ± 5.0 , $p=0.58$). In the knowledge of classification the drug, to avoid the damage of drug, the score is significant increase after the education (before 3.4 ± 1.5 out of 5, and after education 3.6 ± 1.5 , $p=0.03$).

After the education, the knowledge of classification the drug, to avoid the damage of drug, the score is significant increase. The most gender is female and most of the audience are elders, it might affect the result. In the future, the differences between gender and age can be further analyzed.

Keywords: Anti-drug strategy, Knowledge of drug abuse, Public communication

Poster session: 1. Pharmaceutical Sciences

The inhibitory effect of benzodiazepinedione derivatives on breast tumorigenesis

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Abstract:

Little is known about the anti-cancer activity of a benzodiazepinedione (BDZ) family. We synthesized some 1,4-benzodiazepine-2,5-dione derivatives and test their anti-tumor activity. The results showed that five BDZs had significantly inhibitory effect on fibroblast-mediated breast tumorigenesis of MDA-MB-468 cells by soft agar colony formation assay. The cell viability assay showed that the chloric and bromic BDZs decreased survival of breast cancer MDA-MB-468 cells and fibroblasts, however, they also exhibited toxic to non-cancer epithelial M10 cells. Two methylated BDZs decreased breast cancer's viability whereas they showed little inhibitory effect on cell viability of fibroblasts and M10 cells. In addition, combination of 1,4-benzodiazepine-2,5-dione and doxorubicin had additional inhibitory effect on breast cancer cells. Here, we showed some methylated BDZ derivatives may be a good candidate for anti-tumor therapeutics.

Keywords: benzodiazepinedione, breast cancer, fibroblast

Poster session: Pharmaceutical Sciences**Membrane-bound thrombomodulin promotes smooth muscle cell-mediated vascular inflammation**

Kuan-Chieh Wang^{1*}, Po-Sheng Chen^{2,3}, Hsing-Chun Chung³, Ting-Yu Huang⁴, Ying-Li Lin⁴, Guey-Yueh Shi⁴, Hua-Lin Wu⁴, Yi-Heng Li²

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Abstract:

In normal arteries, smooth muscle cells (SMC) is the predominant cell type in the media and in a quiescent, contractile state. Activation of vascular SMCs is an important mechanism in atherosclerosis and vascular injury-induced neointima formation. After vascular injury, not only medial but also neointimal SMCs display large amounts of thrombomodulin (TM), a glycoprotein expressed on the cell which plays an important role in anti-coagulation. In this study, our goal is to clarify the functional role of TM expressed on the vascular smooth muscle cells (SMCs) in phenotypic switching and vascular injury-induced neointima.

Results showed that cultured human SMCs exhibited a predominantly rhomboid (synthetic) phenotype with related high expression of TM. TM knockdown in human SMCs promoted a spindle-shaped morphology change, accompanied by decreased expression of synthetic phenotype and increased expression of contractile phenotype marker. Moreover, proliferation, tumor necrosis factor- α -induced nuclear factor- κ B activation and interleukin-6 production in TM knockdown human SMCs were reduced. Transgenic mice with SMC-specific TM deletion (SM22-cre^{tg}/TM^{flox/flox}) mice, compared with their wild type counterparts (SM22-cre^{tg}/TM^{+/+}), had significantly less cellular proliferation, decreased neointima area and neointima/media area ratio in the vascular wall at 4 weeks after carotid ligation. In conclusion, this is first report indicated that vascular membrane-bound TM in SMCs play a pivotal role on regulation of SMC phenotype, SMC cell behavior and the pathogenesis of injury-induced neointimal hyperplasia. Thus, it makes TM be a relevant target for the treatment of SMC-mediated vascular diseases.

Keywords: Neointima; Smooth muscle cell; Thrombomodulin; vascular diseases

Poster session: #1**The biosynthetic pathway characterization of UV-protective compounds in
*Micrococcus luteus*****Hsu-Hua Yeh^{1,2}, Shu-Lin Chang^{2,3,4,*}**¹Department of Pharmacy, Chia Nan University of Pharmacy and Science, Tainan, Taiwan²*Drug Discovery and Development* Center, Chia Nan University of Pharmacy and Science, Tainan, Taiwan³Bachelor Program in Cosmeceutical and Biotech Industry, Chia Nan University of Pharmacy and Science, Tainan, Taiwan⁴Department of Cosmetic Science, Chia Nan University of Pharmacy and Science, Tainan, Taiwan

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Abstract:

Micrococcus luteus is one of normal flora on human skin that can produce the ultra violet (UV) resistant pigments such as sarcinaxanthin and other carotenoids. The biosynthesis process of sarcinaxanthin have been identified. However, to our best knowledge, there is no related research focused on the relevance between UV influence and UV-protective compound production in *M. luteus*. Here, for the first time, we explored the relation between the UV stimulation and biosynthetic gene expression for UV-protective compound production. With a great UV absorbability and antioxidant property as the result of its carotenoid chemical structure, sarcinaxanthin can be applied in skin care and health food products and this study may pave the way to improve the production of similar material obtained from microorganism.

Keywords: *Micrococcus luteus*, UV-protective, biosynthesis

Poster session: #1

Elucidation of gliotoxin biosynthesis using heterologous expression approach

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Abstract:

Due to its wide range of biological activity, gliotoxin, a member of the epipolythiodioxopiperazine (ETP) family, has received considerable attention from the scientific community. Despite the identification of gliotoxin cluster, however, the steps in the gliotoxin biosynthesis has remained elusive. As an alternative to the biochemical and gene knock out approaches, we used a heterologous expression strategy to reconstitute the gliotoxin biosynthesis in *A. nidulans*. Here, we identified a monooxygenase that is involved in the gliotoxin biosynthesis pathway through catalyzing hydroxylation at the α -position of the phenylalanine moiety of the molecule. This bottom-up heterologous approach is novel and allows us to gain insights to the gliotoxin pathway.

Keywords: Heterologous expression, gliotoxin

Poster session: #1**Identification the products of nonribosomal peptide synthetases in *Neosartorya fischeri*****Shu-Lin Chang**^{1,2,3}, **Hsu-Hua Yeh**^{3,4*}¹Bachelor Program in Cosmeceutical and Biotech Industry, Chia Nan University of Pharmacy and Science, Tainan, Taiwan²Department of Cosmetic Science, Chia Nan University of Pharmacy and Science, Tainan, Taiwan³Drug Discovery and Development Center, Chia Nan University of Pharmacy and Science, Tainan, Taiwan⁴Department of Pharmacy, Chia Nan University of Pharmacy and Science, Tainan, Taiwan

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Abstract:

Natural products derived from fungi play important roles in pharmaceutical industry. Among them, nonribosomal peptide synthetases (NRPSs) are multimodular enzymes that produce nonribosomal peptides (NRPs). Fungal NRPS products or their derivatives have various important biological activities, such as antitumor and antibiotic activities. Here, we investigated the NRPS products in *Neosartorya fischeri* with a knockout strategy. Using fusion polymerase chain reaction and transformation approach, we generated the NRPS knockout strains in *N. fischeri*. We next use liquid chromatography/mass spectrometry to determine the metabolite profiles of the mutant strains compared with parental host. Identification the chemical products can facilitate the elucidation of NRP biosynthetic pathways in *N. fischeri*.

Keywords: Nonribosomal peptide synthetase, *Neosartorya fischeri*, knockout

Studies on the Callus Induction and Shoot Regeneration of *Leucas chinensis* (Retz)

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Abstract

Axillary buds, internodes, and leaf discs obtained from healthy plantlets and were used to establish an *in vitro* development for *Leucas chinensis* (Retz). Among different organ explants, only leaf discs cultured in MS medium containing 1 mg/l 2,4-D for 2 months resulted in a maximum rate of compact callus formation. For adventitious shoots regeneration, the combination of NAA and BA would induce shoot formation. Under this treatment, multiple shoots were induced per culture directly from axillary buds in a month.

Key words: *Leucas chinensis* (Retz), Callus, Shoot regeneration

Will Suggamadex decrease the possibility of intensive care unit admission, compared with traditional muscle relaxant reversal drug? —A pre-anesthetic prediction by machine learningShu-Chin Chiang¹, Chung-Feng Liu², Miao-Chuan Lin¹, Jhi-Joung Wang^{1,2} Ying-Jen Chang¹

Chi Mei Medical Center

¹Department of Anesthesiology, Chi Mei Medical Center, Tainan, Taiwan²Department of Medical Research, Chi Mei Medical Center, Tainan, Taiwane-mail: amy221488234@yahoo.com.tw**Abstract:**

Lung resection surgery is one of the major surgeries. Post operation intensive care unit admission may be required due to the dependence of ventilator. After patients regaining muscle power, weaning ventilator can be considered. We used the database of anesthesia and surgery, which includes pre-anesthetic laboratory data* and anesthetic medications.

Machine learning[#] can help us to build the models for predict the admission rate of intensive care unit.

*Pre-anesthetic laboratory data includes pulmonary function test, lung resection volume, pre-operation saturation, exercise tolerance, history of cardiovascular disease and patients' age.

[#]Machine learning: RandomForest model had better performance in accuracy, precision, recall, F1 and AUC than other models.

Machine learning can improve the risk explanation in pre-anesthetic consultation clinics.

Machine learning can also let the patient and family know benefits of suggamadex medication.

Data collection period: From 2019/01/01 to 2019/07/31. We included all of the patients who received lung resection surgery in Chi Mei Medical Center.

The number of raw data: suggamadex group: 125. Non-suggamadex group: 144.

The study items of raw data: pulmonary function test, lung resection volume, pre-operation saturation, exercise tolerance, history of cardiovascular disease and patients' age

Training and Testing: Randomized sampling 70% raw data for model training, and the rest of 30% raw data for model testing.

Raw data management: The intensive care unit admission rate has been underwent SMOTE management for imbalanced-processing.

The results of model testing: RandomForest model has the best testing result, in both suggamadex model and non-suggamadex model. Accuracy: suggamadex model/non-suggamadex model:

0.78/0.88、 Precision: 0.78/0.89、 Recal: 0.78/0.88、 F1: 0.78/0.88, and AUC 0.77/0.88.

Keywords: Lung resection surgery, Pulmonary function test, Pre-anesthetic consultation, Suggamadex, Intensive care unit, Machine learning

Poster session: #1**Identification of nonribosomal peptide synthetase products in *Monascus*****Shu-Lin Chang**^{1,2,3}, **An-Jui Chi**⁴, **Hsu-Hua Yeh**^{3,4*}¹Bachelor Program in Cosmeceutical and Biotech Industry, Chia Nan University of Pharmacy and Science, Tainan, Taiwan²Department of Cosmetic Science, Chia Nan University of Pharmacy and Science, Tainan, Taiwan³Drug Discovery and Development Center, Chia Nan University of Pharmacy and Science, Tainan, Taiwan⁴Department of Pharmacy, Chia Nan University of Pharmacy and Science, Tainan, Taiwan

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Abstract:

Monascus species are known to possess various important of medicinally beneficial activities. Nonribosomal peptide synthetases (NRPSs) are multimodular enzymes that produce a variety of bioactive compounds. Here, we conducted heterologous expression system in *Aspergillus nidulans* to explore the NRPS products of *Monascus ruber*. First, *M. ruber* NRPS genes that under the control of an inducible promoter were generated with fusion-PCR method and then transformed into *A. nidulans*. After induction, the metabolites of the overexpression strains were analyzed using liquid chromatography/mass spectrometry. This study will help to unlock the metabolites from the *M. ruber* and provide useful development resources for healthcare and medical centers.

Keywords: Nonribosomal peptide synthetase, *Monascus ruber*, Heterologous expression

Poster session: #1**Identification of polyketide synthase products in *Aspergillus oryzae*****Hsu-Hua Yeh^{1,2}, Shu-Lin Chang^{2,3,4,*}**¹Department of Pharmacy, Chia Nan University of Pharmacy and Science, Tainan, Taiwan²*Drug Discovery and Development* Center, Chia Nan University of Pharmacy and Science, Tainan, Taiwan³Bachelor Program in Cosmeceutical and Biotech Industry, Chia Nan University of Pharmacy and Science, Tainan, Taiwan⁴Department of Cosmetic Science, Chia Nan University of Pharmacy and Science, Tainan, Taiwan

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Abstract:

Non-reducing polyketide synthases (NR-PKSs) are responsible for a variety of fungal aromatic compounds. Genome sequencing of fungal species has revealed a large number of NR-PKSs but their products are still unknown. We have examined the eight species in the Broad Institute *Aspergillus* comparative database and identified 71 NR-PKSs that could be classified into seven major groups. We are interested in determining the chemical products of unusual NR-PKSs with non-canonical architectures. Through the genome mining and phylogenetic analysis, we found that FAS α and FAS β are both required in most Group IV NR-PKSs which known to responsible for aflatoxin and sterigmatocystin biosynthesis. Among them, however, a NR-PKS (PKS_AO1) from *A. oryzae* is the only case that without FAS α /FAS β genes located nearby. In this study, we used a heterologous expression strategy to express this NR-PKS in *A. nidulans* and identify the products to uncover the role of PKS_AO1.

Keywords: Heterologous expression, polyketide synthases

Session 2: Cosmetic Sciences

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Poster session: #**CXCL8 as the main inflammatory mediators in skin cancer cells****Yu-Fei Hsu¹, Leong-Perng Chan², Cheng Liu³, Pin-Ju Chen¹, Chia-Hua Liang^{1*}**

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Abstract:

Nonmelanoma skin cancer is the most common malignancy worldwide. Cutaneous squamous cell carcinoma (SCC) is one of the most common human non-melanoma skin malignancies. Its incidence varies considerably and is reported increasingly. Moreover, molecular changes and mechanisms that regulate development and progression of nonmelanoma skin cancer remain unclear. CXCL8 (chemokine (C-X-C motif) ligand 8) is a chemokine produced by macrophages and other cell types such as epithelial cells, airway smooth muscle cells and endothelial cells. This study demonstrated CXCL8 as the main inflammatory mediators in skin cancer cells. Higher IL-1, IL-6, IL-8, TNF- α protein levels were found in SCC tissue than in NCMT. CXCL8 had the highest expression in SCC than in NCMT followed by other inflammatory mediators. Additionally, exposure of SCC cells to CXCL8, the expression of IL-1, IL-6 and TNF- α was higher than vesicle control. Synthetic CXCL8 siRNA abrogated the expression of IL-1 β by SCC cells. These results examine that CXCL8 is the major stimulus and co-operative effects for inflammatory mediators in nonmelanoma skin cancer.

Keywords: CXCL8, inflammatory, skin cancer

Poster session: 2 Cosmetic Science

Evaluation of polymer rheology in toothpaste

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Abstract:

Different amount polymeric thickeners are added to the toothpaste products by means of change the concentration (addition amount) and storage temperature of the thickener. To explore the effects of the above-mentioned variable toothpaste stability and rheological behavior.

Toothpaste is a necessity in life. Toothpaste depends mainly on its ability to properly remove food debris and biofilm formed on the surface of the tooth without destroying the physical and chemical integrity of these surfaces. At present, there are few studies on the rheology of toothpaste. In our study, addition to the physical properties of toothpaste, such as viscosity, elasticity, rheology, etc.

Keywords: rheology, toothpaste, hysteresis

Poster session: 2

Comparison on the bioactivities of the flowers and leaves from two varieties of *Clitoria ternatea*

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Abstract:

The butterfly pea (*Clitoria ternatea*) was originated from tropical Asia and later was brought into Taiwan in 1920. In South East Asia, the flowers were used as food coloring agent to dye various rice products, pastries or drinks. In India traditional medicine, the flowers were used as an antidote to treat venomous snake bite, whereas the leaves were broadly used as a brain stimulant and to enhance memory and mental capacity. At present, the flower pigments of butterfly pea are commonly used to prepare colorful drinks in Taiwan. These pigments are from two variants of *C. ternatea* flowers, which were *C. ternatea* var. single blue (simple flower) and *C. ternatea* var. double blue (double flower). The aim of this study was to compare the potency of both flowers and leaves of these two variants of *C. ternatea* applied in cosmetics. The plant materials were extracted by 50% ethanol solution. The antioxidant activities and whitening effects of the extracts were determined through analyzing their DPPH radical scavenging abilities and anti-tyrosinase activities. Study showed that both flowers and leaves exhibited good antioxidant activities. The flowers revealed higher radical scavenging ratios than those of the leaves, and the flower of 'double blue' had greater activity than that of 'single blue'. Meanwhile, the flower of 'single blue' showed the highest anti-tyrosinase effect among the extracts and displayed higher activity as compared to Vitamin C

Keywords: *Clitoria ternatea*, Antioxidant activity, Anti-tyrosinase activity

Poster session: 2

Development of safe amino acid surfactant detergent

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Abstract:

Detergent is used to remove lipid and the attachment above, however, improper use of detergent may cause excessive degreasing, which leads to dry hair and skin, even symptoms like redness, swelling, itching, etc.

In our development of the detergent, we chose amino-acid as the research object. The product features not only its strong detergency, but also being safe and non-irritating. Only with the important features can consumers take the product into long term use. In order to achieve our goal and find out the optimal formula, the products underwent a series of safety tests and quality assessment. We also added some ingredients to strengthen the moisture retention and foaming power of our product so that it can be provided with favorable texture and efficacy to the consumers while preventing damage to the skin by reducing the using duration.

According to our research, the optimal addition of lactate is 0.3ml. The amino-acid facial cleanser and shampoo with this formula have the viscosity, pH value and foaming power that best meet our goal. Furthermore, our product can be used reassuring since it is proved to be non-irritating with biological solution tests. The detergency and moisture retention of it also match people's expectation. However, when it comes to fragrance, people still choose detergents with additional essence.

Keywords: Cosmetic, detergent

Poster session: Cosmetic Sciences

Molecular characterization of a synthesized flavonoid on human keratinocytes

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Abstract:

Skin barrier dysfunction, such as sebum deficiency or imbalance of keratinocyte proliferation and differentiation, can lead to skin diseases. *Scutellaria baicalensis* extracts contain various flavonoids and have anti-inflammatory, antioxidant, anti-cancer, antibacterial, anti-viral, and anti-aging effects.

Oroxylin A, the least abundant flavonoid in *S. baicalensis* extracts, has a wide range of pharmacological activities, including anti-inflammatory, anti-cancer, anti-allergic and antibacterial effects. Previous studies showed different synthetic methods to produce oroxylin A, but the synthetic conditions are highly toxic and explosive. In this study, a milder, time-consuming, safe and high-yield one-pot reaction was used to synthesize the required oroxylin A.

Keratinocytes were treated with different concentrations of oroxylin A, and there was no cytotoxicity in the periods of treatments. Human whole-genome microarray analysis was used to identify significantly expressed genes that may contribute to the response, and then the gene ontology enrichment analysis could perform the signaling pathways by gene expression profiling. After quantitative polymerase chain reaction analysis, the results indicated lipid metabolism and the regulation of differentiation and proliferation of keratinocytes maybe involved. Therefore, we speculated that when the skin is stimulated by environmental changes or external mechanical stress, if it can accelerate the metabolism of keratinocytes, it might be able to achieve the effect of repairing skin abnormalities. In addition, the gene microarray analysis used in this study can be used to clarify the possible regulatory pathways of the compounds administered to cells, which can be applied to evaluate the safety and effectiveness of raw materials of cosmetics for the skin in the future.

Keywords: Oroxylin A; Human keratinocytes; Microarray analysis; Quantitative real-time polymerase chain reaction

Poster session: Cosmetic Sciences

Molecular characterization of acetylaszonalenin on human keratinocytes

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Abstract:

Filamentous fungi produce secondary metabolites with distinct structures and various biological activities for a wide range in medical, biotechnology, and food fields. *Neosartorya fischeri* is a fungus usually grown in a humid environment such as soil, processed food, and decaying vegetation. Acetylaszonalenin is the major secondary metabolite in *N. fischeri* and showed low cytotoxicity in human keratinocytes. For elucidating the potential and possible bioactivity of this compound in cosmetic field, human keratinocytes were used as experimental cell lines. To better understand the mechanisms involved in the response of human keratinocytes to acetylaszonalenin, microarray analysis was used to help identify significantly expressed genes that may contribute to the response. After obtaining a large-scale survey of the variations in gene expression patterns and gene ontology enrichment analysis, we found that acetylaszonalenin might affect the lipid metabolism, cell growth and differentiation of keratinocytes. The expression of candidate genes involved in these pathways were confirmed by real-time quantitative polymerase chain reaction analysis. In future, we hope that acetylaszonalenin could be applied to develop the ingredients in cosmetic or medical field.

Keywords: *Neosartorya fischeri*; Acetylaszonalenin; Human keratinocytes; Microarray analysis; Quantitative real-time polymerase chain reaction

Poster session: 2

Application of Adlay extracts on hand creams and toning lotions

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Abstract:

According to the literature, Adlay (*Coix lacryma-jobi* var. *ma-yuen*) is abundant in lipids, amino acid, carbohydrates and other nutrients. Adlay is both odorless and colorless, so we select Adlay as the raw material in the studies. Aim of this study was to study the application of Adlay extracts on hand creams and toning lotions.

In order to use the extracts of Adlay, so we added the extracts of Adlay into the toning lotion and explored the idea of the solubility between the surfactant and Adlay extracts. It is the second question of the studies. There are two reasons why we used Adlay. One reason is the characteristic of Adlay, it is rich in lipids. And the other reason is that it could be combined with silicone oil and produced precipitation of Adlay's fiber. Thus, exploring the use of two kinds of silicone oil to the toning lotion and what kind of combination and usage amount will cause the least precipitation of Adlay's fiber are the third question of the studies. Because Adlay is starch, it is very easy to breed the bacteria. Hence, exploring three kinds of preservatives and what kind of combination is the mildest to the skin are the fourth question of the studies.

The research method in the study was that we used distilled water and 1,3-Butylene Glycol as the solvents and we also abstracted the Adlay by microwaved. After abstracting, we added them to the hand cream and toning lotion, separately. To test the whitening effect of the hand cream, we used skin tester to detect it. Through the proofing the samples, we explored the solubility of Adlay extracts to the toning lotions. Through the skin patch test, we knew the skin reaction to the preservatives.

Based on the consequences, we concluded that adding the Adlay extract into the hand cream with other whitening active may increase the effect and it is suitable for cream. In the toning lotion, the surfactant and the silicone oil have good solubility and the preservatives won't cause the serious reactions. Consequently, the extract applies in the toning lotion suitably.

Keywords: Adlay, whitening, toning lotion, silicone oil and preservatives

Poster session: S2-8**Phytoprotective Capacity and Antioxidant Activity of Alcoholic Extract from the Flowers of Wax Apple in Human Dermal Fibroblasts**Chia-Chyuan Liu¹, Wen-Yueh Ho¹, and Tsai-Hsiu Yang^{2*}¹Department and Institute of Cosmetic Science, Chia-Nan University of Pharmacy and Science, Tainan 71710, Taiwan²Department of Health and Nutrition, Chia-Nan University of Pharmacy and Science, Tainan 71710, Taiwan; E-Mails: connie@mail.cnu.edu.tw (T.-H. Y.)**Abstract:**

Ultraviolet A (UVA) irradiation contributes to major changes in skin aging as a result of the downregulation of procollagen I content. This process is likely mediated by matrix metalloproteinases. Identification of phytonutrients that can increase the amount of collagen synthesis may improve anti-aging therapy. Wax apple is one of important economic crops in Asia, whereas the phytoprotective effect of wax apples against UV light-induced skin aging remained mostly uncertain. In the present study, we investigated the antioxidant capacity and protective effects against UVA damage from alcoholic extract of the wax apple flowers (AEWA) in human dermal fibroblasts Hs68 cells. We then explored the improving effects of AEWA on UVA-induced decrement of procollagen I and investigated the probable mechanism underlying those effects. Hs68 cells were treated with AEWA for the indicated times followed by UVA irradiation. The antioxidant ability of AEWA was evaluated by various *in vitro* assessments. The phytoprotective effect of AEWA on UVA-induced procollagen downregulation and metalloproteinase-1 (MMP-1) expression/activity were examined using western blotting and gelatin zymography. The malondialdehyde (MDA) accumulation measured by method of thiobarbituric acid-reactive substances (TBARS). Levels of NFκB was assayed by ELISA. *In vitro* assessment revealed that AEWA exhibited remarkable anti-oxidative potential, including scavenging capacity for oxidative radicals and inhibitory effect on lipid peroxidation. Chronic exposure of UVA irradiation to Hs68 cells with AEWA prevented the UVA-induced cell death and the downregulation of procollagen I in a dose-dependent manner. Meanwhile, this AEWA treatment also ameliorated the UVA-induced the upregulation/activation of matrix metalloproteinase-1 (MMP-1), the production of malondialdehyde (MDA), and the intracellular NFκB levels. Our findings highlighted the phytoprotective effect of AEWA against UV light-induced skin aging and may provide an alternative option in cosmetic and pharmaceutical applications in anti-aging skin care.

Keywords: Flowers of wax apple; UVA; Procollagen I

Amelioration of *Crassulaceae* on skin damage in a scald model

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Crassulaceae is one of the traditional Chinese medicine, the current commonly used *Rhodiola*, *Rhodiola* plants for the roses. Evidences indicate that scald injury in rodent models is associated with severe inflammatory response and oxidative damage. Oxidants and cytokines play important roles in scald-induced multiple organ failure. Studies have shown that extracts of *Rhodiola* root through in vitro experiments has antioxidant properties. The present study investigates whether extracts of *Crassulaceae* (EC) can improve against scald-induced oxidative and inflammatory injury. The rats with scald induction revealed apparently increasing levels of oxygen radical absorbance capacity (ORAC), lipid peroxidation (MDA), TNF- α , and IL-1 β in plasma and integumentary tissue. As a result of EC treatment after 48 hours (twice daily), the plasma and integumentary high levels of ORAC, MDA, TNF- α , and IL-1 β were significantly diminished in rats. Additionally, the situation of scald-induced skin damage by judging from the skin sections with H and E staining was also ameliorated after treatment with EC in rats. Accordingly, we speculate that EC may improve against the scald-induced oxidative and inflammatory skin injury. The *Crassulaceae* has a great potential development and application for treatment of burn.

Poster session: #2**Synthesis and antimicrobial properties of 1-alkyl-3-phenyl imidazolium ionic liquids****Yi-Rong Chen¹, Hui-Ming Wu¹, Chia-Chyuan Liu¹, Tsai-Hsiu Yang², Wen-Yueh Ho^{1*}, Kuen-Lin Leu^{1*}**¹ Department of cosmetic science, Chia Nan University of Pharmacy and Science, Tainan, Taiwan² Department of Health and Nutrition, Chia Nan University of Pharmacy and Science, Tainan, Taiwan

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Abstract:

Cationic antimicrobial agents could act as the role of preservatives in many cosmetics for stable conservation. Therefore, artificial synthesis of different cationic antimicrobial agents will be significant in future. In this study, we intended to prepared the 1-alkyl-3-phenylimidazole bis-aromatic ring imidazole as the major structure and changed it with different functional groups on the hydrophilic end and different length of the alkyl chain to assess the effect of antimicrobial activity. The antimicrobial activity was evaluated by disc diffusion assay and minimum inhibitory concentration test. We utilized these synthetic compounds which were bonded with C10-C16 alkyl length against *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Candida albicans* and *Aspergillus niger*. We found that the cationic liquids of C10-C16 chain length showed better antimicrobial effect. For example, the compound, 5g, exhibited good inhibition in the growth of *Candida albicans* and *Aspergillus niger* by viewing of inhibition zone, 31.17±1.61 and 19.50±0.87 mm individually. In addition, the antimicrobial effect of compound 5g is better than that of the commercial agent, benzalkonium chloride. The best results of minimum inhibitory concentration for compound 5c and 5b were 7 ppm on *Candida albicans* and 40 ppm on *Aspergillus niger* individually. Therefore, the results in this study showed that bonding the longer chain length of C10-C16 alkyl group in cationic liquids displayed the better antimicrobial properties.

Keywords: Ionic liquids, Antimicrobial, Disc diffusion assay, Minimum inhibitory concentration

Poster session: #**Comparison of biodegradability of anionic surfactants by isolated bacteria from industrial waste****Sing Cih Lee¹, Chao Hsien Lin^{2*}**¹ Institute of Cosmetic Science, Chia-Nan University of Pharmacy and Science, Tainan, ROC² Institute of Cosmetic Science, Chia-Nan University of Pharmacy and Science, Tainan, ROC

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Abstract:

Anionic surfactants are widely used in the cosmetics industry as cleansers and emulsifiers. This study focused on cultivating contaminating bacteria discovered in commercial cleansing products. The results from 16S rDNA genetic sequencing tests identified these five Gram-negative strains of bacteria: *Klebsiella alba*, *Pluralibacter gergoviae*, *Burkholderia vietnamiensis*, *Pseudomonas putida*, and *Pseudomonas pseudoalcaligenes*. The purpose of this study was to compare which bacteria were more effective at biodegrading anionic surfactants.

The assessment results of 11 common raw materials found in commercial cleansers revealed that Sodium Laureth Sulfate-1N (SLES) and Lauramidopropyl Betaine are the materials that are most easily degradable. The comparison was based on a standard preparation of 20% Sodium Dodecyl Sulfate (SDS) to test the biodegrading capability of each bacteria and produced a result of *Pseudomonas pseudoalcaligenes* > *Pluralibacter gergoviae* > *Klebsiella alba* > *Pseudomonas putida*, while *Burkholderia vietnamiensis* was unable to grow in the solution of 20% SDS.

To further test the biodegrading properties of the bacteria, the SDS solution was heated. It was a surprise to discover that the heat reduced the bacteria's biodegradation capability. This may be due to the production of sulfuric acid, short-chain fatty acids and dodecyl alcohol after heating, which increases the acid value that inhibits the growth of microorganisms. The application of Methylene-blue active substances and acid value tests also obtained consistent results.

With regard to the problem of keeping detergent processing plants bacteria-free, it is recommended to add 5% lactic acid to cleansing products because of its helpful antibacterial properties. In order to prevent the spread of microorganisms that thrive on Fe²⁺ (such as *Burkholderia vietnamiensis*), a 0.01% Ethylenediaminetetraacetic acid (EDTA) solution should be able to inhibit their growth.

Results based on the above tests can serve as references for formulating of cleanser products, and the technical barriers can be used to avoid bacterial contamination within these products as well. In addition, the biodegradation features of surfactants on germ strains can also be applied to future treatment of industrial wastewater.

Keywords: SDS-degrading bacteria, alkylsulfatase enzyme, detergents, surfactant, biodegradation capability, industrial wastewater, biofilm, bioremediation, multidrug-resistant

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Poster session: #**The Assistive Devices for Poliomyelitis Patients: A Case Study****Chiung-Wei Huang, Zhi-Yuan Su**^{1,2}Department of Information Technology, Chia Nan University of Pharmacy and Science, Tainan City, Taiwan (R.O.C.)

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Abstract:

This study examines how assistive devices and technologies, such as prostheses, wheelchairs, and scooters, support a polio patient's daily life. In the study, we analyzed the benefits that assistive devices have brought to a polio patient; meanwhile, we noticed that there is still room for improvement for those devices. The study conducted a case study of a female patient. We led interviews to realize how assistive technologies facilitate her mobility and then observed her daily use of those devices in her home and workplace. For instance, the wheelchair that the patient has been currently in use did increase her mobility, yet she would wish to have an electric one with a control pad so that she could easily control the wheelchair and save her strength. Another two examples of assistive devices are the elevator and the tailor-made kitchen in the patient's home. The patient designed an elevator to carry her in a wheelchair moving up and down between floors; this elevator largely reduced her leg discomfort. The kitchen was particularly designed with a lower countertop, which enabled the patient to cook while sitting in her wheelchair. Still, there is room for improvement in assistive devices and technologies: the demand in tailor-made and sports-related assistive devices. As she is getting older, said the patient in her interview, she would have more demands in tailor-made devices to suit her daily needs. Also, there seem less proper assistive devices for the physically challenged who would like to enjoy sports such as swimming and hiking. The room for further improvement would be the future goals for research and development of assistive devices and technologies, which could better enhance the well-being and life qualities of the physically challenged soon.

Keywords: assistive devices, poliomyelitis, prosthesis

Poster session: 3**Corneal-curvature, visual acuity, and spherical equivalents change for Orthokeratology treatment in Taiwan****Li- Chen Chang¹, Hsiu-Ling Lin¹, Chiu-Lan Chen^{1*}**¹Department of Pharmacy, Chia-Nan University of Pharmacy and Science, Tainan city, Republic of China (ROC)

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Abstract:

Orthokeratology (OrthoK) lens is a kind of anti-geometric hard contact lens. It is worn before going to bed then removal during daytime, which can be maintained high quality vision in day. Therefore, it is a good way to control myopia. The purpose of this retrospective study is to evaluate whether wearing OrthoK lens can control myopia and without irreversible damage. Eighty-three children with 7 to 16 years old who wearing OrthoK lens were compared with 29 children who wearing glasses. More than 3 years of myopia control, changes before and after OrthoK treatment, the corneal curvature, visual acuity, and spherical degree change were collected and analyzed. Compared with baseline, the visual acuity, spherical degree, and corneal curvature were significantly changed in the middle and low myopia ($P < 0.01$). OrthoK treatment of myopia significantly reduces the degree of myopia after wearing. The curvature of the cornea changes from the center to the periphery. Continuous plastic molding can provide stable and good naked vision during the day. The corneal curvature and initial corneal curvature are not significant different after 2 weeks of suspension. The difference indicates that the safety is high and there is no irreversible damage. This study suggest that OrthoK treatment is more suitable for the younger ones with low initial degree of myopia.

Keywords: Orthokeratology, Corneal-curvature, Visual acuity, Spherical equivalents, Myopia.

Poster session: 3

Characterization of organic acids and microorganisms in three fruit yeast starters

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Abstract:

There has been a trendy wave of baking naturally leavened bread with fruit yeast starter recently. In this research, we investigated the pH profile, organic acid composition, fermentation capacity, and microorganisms in the yeast starters of three organic fruits, including cherry tomato, guava, and strawberry. Strawberry starter had the fastest pH drop rate, followed by guava, and cherry tomato the slowest. Organic acids were then analyzed by HPLC and found that acetic acid and lactic acid accounted for two major types of metabolites, responsible for the decreased pH. On the other hand, the cherry tomato starter had the strongest fermentation capacity, followed by guava, and strawberry the weakest. The phenomena correlated well with the amount of microorganisms grown in potato dextrose agar (PDA) from different starters. Finally, microorganisms were identified using matrix-assisted laser desorption/ionization–time off light mass spectrometry (MALDI-TOFMS) and 16S/18S rRNA gene sequence (16S/18S rRNA) analysis. It was found that *Hanseniaspora sp.* and *Pichia sp.* are the major yeast strains; while *Lactobacillus brevis* is the only lactic acid bacteria found in the cherry tomato and guava starters.

Keywords: yeast, lactic acid bacteria, RNA gene sequencing, MALDI-TOF profiling

Poster session: 3***Vernonia patula* (Dryand.) Merr. and *Leucas chinensis* (Retz.) R. Brown exhibit antioxidant and anti-inflammatory activities****Pei-Shan Wu¹, Jingyueh Jeng², Jeng-Jer Yang^{3,4}, Pin-Syuan Wu¹, Ming-Jiuan Wu^{1*}**¹ Department of Biotechnology, Chia-Nan University of Pharmacy and Science, Tainan, Taiwan² Department of Medicinal Chemistry, Chia-Nan University of Pharmacy and Science, Tainan, Taiwan³ Bachelor Program in Pharmaceutical Botanicals & Health Applications, Chia-Nan University of Pharmacy and Science, Tainan, Taiwan⁴ Department of Pharmacy, Chia-Nan University of Pharmacy and Science, Tainan, Taiwan

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Abstract:

There is a growing interest in searching for natural products with antioxidant and anti-inflammatory activities. Five hōng sà (癩散) are traditional Taiwanese folk medicines for the treatment of various inflammatory diseases. The five herbs of hōng sà include the root of *Euonymus laxiflorus* Champ. ex Benth. (大丁癩), and the aerial parts of *Justicia procumbens* L. (鼠尾癩), *Leucas chinensis* (Retz.) R. Brown (虎咬癩), *Viola diffusa* Ging (茶匙癩) and *Vernonia patula* (Dryand.) Merr (柳枝癩). Using LPS-treated RAW264.7 cells and BV2 cells as screening platforms, we found that the ethanol extracts of *V. patula* and *L. chinensis* strongly inhibited nitric oxide and IL-6 production without significant cytotoxicity. They also suppressed the expression of pro-inflammatory genes and induce Nrf-2-mediated Phase II genes. They quenched DPPH and ABTS free radicals and had strong antioxidant activities. LC-Mass was used for the identification of luteolin, oleanolic acid and ursolic acid as their active components. This research provides, for the first time, the scientific support for the traditional use of hōng sà.

Keywords: *Vernonia patula* (Dryand.) Merr., *Leucas chinensis* (Retz.) R. Brown, microglial cells, RAW264.7

Poster session: 3**Neuroprotective Effects of Isoflavone Metabolites****Pei-Shan Wu¹, Hsiou-Yu Ding², Te-Sheng Chang³, Ming-Jiuan Wu^{1*}**¹ Department of Biotechnology, Chia-Nan University of Pharmacy and Science, Tainan, Taiwan² Department of Cosmetic Science, Chia-Nan University of Pharmacy and Science, Tainan, Taiwan³ Department of Biological Sciences and Technology, National University of Tainan, Tainan, Taiwan

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Abstract:

It was demonstrated that isoflavones can cross the blood-brain barrier, making them desirable candidate agents for the prevention of neurological symptoms. 8-Hydroxydaidzein (8-OHD, 4',7,8-trihydroxyisoflavone) is an isoflavone found only in fermented soy food. 3'-Hydroxygenistein (3'-OHG; 3',4',5,7-Tetrahydroxyisoflavone) and 3'-hydroxydaidzein (3'-OHD; 3',4',7-Trihydroxyisoflavone) are the natural metabolites of genistein and daidzein. Current results showed that 8-OHD, 3'-OHD and 3'-OHG inhibited LPS-stimulated production of nitric oxide (NO) production and migration in BV2 microglial cells. They also inhibited iNOS, IL-6, IL-1 β and CCL2 gene expression in BV2 cells. 3'-OHD and 3'-OHG protected mouse neuroblastoma Neuro 2A (N2a) cells from LPS- and 6-hydroxydopamine (6-OHDA)-mediated cytotoxicity and stimulated neurite outgrowth. 8-OHD increased neurite growth in N2a cells, which LPS-activated BV2 conditional medium was transferred to. The underlying molecular mechanism remains unclear.

Keywords: 8-hydroxydaidzein; 3'-hydroxygenistein; 3'-hydroxydaidzein; BV2 microglial cells; neuroblastoma Neuro 2A

Poster session: 3**To Investigate the Mechanism and Function of Nucleobindin-2 in Human Hepatoma Cells****Hsiu-Ping Tsao¹, Ren-Hao Li¹, Chih-Han Li¹, Hut-Min Chang¹, Jui-Hsiang Hung^{1,2*}**¹Department of Biotechnology, Chia Nan University of Pharmacy and Science, Tainan, Taiwan²Drug Discovery and Development Center, Chia Nan University of Pharmacy and Science, Tainan, Taiwan

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Abstract:

Hepatocellular carcinoma is a common malignancy affecting approximately one million people worldwide annually. Recent studies have shown that appetite-associated nucleobindin-2 (NUCB-2) is over-expressed in clinical tumor samples such as gastric cancer, prostate cancer, renal cell carcinoma, endometrial carcinoma cells, colon cancer and breast cancer. The survival rate of high-level expression of NUCB-2 in cancer patients was lower than cancer patients with low-level expression of NUCB-2. In addition, overexpression of NUCB-2 was observed in liver cancer by using bioinformatics analysis. The liver cancer patients with NUCB-2 overexpression are associated with poor prognosis. However, the effect of NUCB-2 overexpression on tumor cells is still unclear. In this project, we evaluated the novel role and mechanisms of NUCB-2 overexpression in hepatoma cells. Our results indicated NUCB-2 mRNA expression level was induced by ER stress as determined with RT-PCR and real-time PCR, and induction of NUCB-2 protein level was significantly increased by ER stress. Increased ER stress by pre-S2 Δ protein was significantly enhanced NUCB-2 expression. We also observed that the overexpression of NUCB-2 was corrected with ER stress in human hepatocellular carcinoma tumor samples. Consequently, this mechanistic research may provide a molecular basis to develop a biomarker and novel cancer chemotherapeutic agent for high level expression of NUCB-2 in cancer patients.

keywords : Endoplasmic reticulum stress, Nucleobindin-2, real-time PCR, RT-PCR, HBV large surface mutant protein pre-S2 Δ , Hepatocellular carcinoma, Huh-7, HepG2, MCF-7, Tunicamycin, Brefeldin A.

Poster session: 3***Antrodia cinnamomea* boosts the anti-tumor activity of sorafenib in xenograft models of human hepatocellular carcinoma****Wei-De Wu¹, Pin-Shern Chen¹, JingYueh Jeng¹, Jui-Hsiang Hung^{1,2*}**¹Department of Biotechnology, Chia Nan University of Pharmacy and Science, Tainan, Taiwan²Drug Discovery and Development Center, Chia Nan University of Pharmacy and Science, Tainan, Taiwan

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Abstract:

Hepatocellular carcinoma (HCC) has been recognized worldwide as one of the major causes of cancer death. The medicinal fungus *Antrodia cinnamomea* (*A. cinnamomea*) has been served as a functional food for liver protection. The aim of the present study was to investigate the potential activity of *A. cinnamomea* extracts as safe booster for the anticancer activity of sorafenib, a multi-kinase inhibitor approved for the treatment of HCC. The biologically active triterpenoids in the ethanolic extracts of *A. cinnamomea* (EAC) were initially identified by HPLC/LC/MS then the different extracts and sorafenib were assessed *in vitro* and *in vivo*. EAC could effectively sensitize HCC cells to low doses of sorafenib, which was perceived via the ability of the combination to repress cell viability, and to induce cell cycle arrest and apoptosis in HCC cells. The ability of EAC to enhance sorafenib activity was mediated through targeting mitogen-activated protein (MAP) kinases, modulating cyclin proteins expression and inhibiting cancer cell invasion. Moreover, the proposed combination significantly suppressed ectopic tumor growth in mice with high safety margins compared to single-agent treatment. Thus, this study highlights the advantage of combining EAC with sorafenib as a novel adjuvant therapeutic strategy against HCC.

Keywords: *Antrodia cinnamomea*, sorafenib, hepatocellular carcinoma, adjuvant therapy, HepG2, Huh-7.

Poster session: 3**Systematic Analysis of *CCDC167* Gene Expression Alterations and Clinical Outcomes by Bioinformatics in Breast cancer****You-Wei Liu¹, Pei-Hsiang Yeh¹, Jui-Hsiang Hung^{*1,2}**¹Department of Biotechnology, Chia Nan University of Pharmacy and Science, Tainan, Taiwan²Drug Discovery and Development Center, Chia Nan University of Pharmacy and Science, Tainan, Taiwan

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Abstract:

Breast cancer is the second leading cause of death in women with malignant tumors in Taiwan. It is known that certain factors increase the risk of breast cancer, such as gene mutation and amplification, radiation, lifestyle, obesity and alcoholism. Though some protein drugs and small molecule drugs have been developed for the treatment of breast cancer, but breast cancer in the cure have a certain degree of difficulty and failure rate. Therefore, the development of new therapeutic targets for breast cancer is an important research direction of basic medicine. In order to explore genes with therapeutic potential, we expect to use biological information to develop potential target genes. First, we analyzed the Oncomine database and found that the *CCDC167* gene was overexpressed in breast cancer and showed a low level of expression in other normal tissues. Further use Survnexpress, PROGene, PrognoScan, Kaplan Meier plotter, STRING The human protein ATLAS and database analysis. According to the results of the analysis, *CCDC167* gene is over-expressed in the samples of breast cancer patients, leading to significant reduction in the survival rate of the patients. The expression level of *CCDC167* was determined by Real-time PCR in M10, MCF-7, MDA-MB-468 and MDA-MB-231 cells. The results showed that the overexpression of *CCDC167* mRNA in MCF-7, MDA-MB-468 and MDA-MB-231 cells. In the future, we will evaluate the role of *CCDC167* in breast cancer development. The outcome of the current study may server as a basis to develop a novel therapeutic target gene for breast cancer.

keywords : Breast cancer, Bioinformatics, real-time PCR, *CCDC167*, M10, MCF-7, Huh-7, MDA-MB-468, MDA-MB-231.

Poster session: #**Growth-related oncogene alpha regulate the progression of skin cancer cells****Yu-Pei Hsu¹, Ting-Hong Tsai², Leong-Perng Chan³, Pin-Ju Chen², Chia-Hua Liang^{1*}**¹ Department of Health and Beauty, Shu-Zen Junior College of Medicine and Management, Kaohsiung, Taiwan² Department of Cosmetic Science and Institute of Cosmetic Science, Chia Nan University of Pharmacy and Science, Tainan, Taiwan³ Department of Otolaryngology-Head and Neck Surgery, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung, Taiwan

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Abstract:

Growth-related oncogene alpha (Gro α) is specific overexpression in tumor cells and can as a target for cancer cells. Skin cancer is the most common of all human cancers, with 1 million people in the U.S. diagnosed each year with some type of the disease. Cancer occurs when normal cells undergo a transformation and grow and multiply without normal controls. This study will clarify the roles and pathways of Gro α in skin squamous carcinoma cells. In microarray analysis, Gro α is significantly 22.3-fold higher in SCC specimens than in non-cancerous matched tissue (NCMT). Gro α stimulated the proliferation and cell colony formation of SCC25 cells at 0.1-10 nM, but not dysplastic oral mucosa DOK cells and immortalized keratinocyte HaCaT cells. Treating SCC cells with Gro α significantly increased cell migration. These results suggest that Gro α mediated the skin cancer cells progression.

Keywords: growth-related oncogene alpha, progression, skin cancer

Poster session: 3**Chronic stimulation of the autophagy-inducing ingredient of areca nut might upregulate autophagy activity to promote tumor growth**

Chang-Ta Chiu¹, Shyun-Yeu Liu², Ching-Yu Yen², Bang-Yen Liu³, Zi-Yu Sun³, Chun-Yi Wu³, Ji-Lung Deng³, Young-Chau Liu^{4,5*}, Mei-Huei Lin^{3,4*}

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Abstract:

Areca nut (AN) is a popular carcinogen worldwide causing various diseases including oral and esophageal carcinomas. Our previous studies demonstrated that AN extract (ANE) and its 30-100 kDa fraction (ANE 30-100K) can induce autophagy in different types of cells. Chronic ANE 30-100K stimulation (CAS) resulted in higher autophagy activities in different malignant cells under serum-free (SF) conditions. CAS also led to stronger resistance of tumor cells against stressed environments including cisplatin and serum deprivation, able to be reverted by autophagy inhibitors, chloroquine (CQ) and 3-methyladenine (3-MA). To verify whether CAS also provides similar growth advantage for tumor cells in vivo, an esophageal carcinoma cell line CE81T/VGH and nude mice were chosen as the experimental models. The preliminary results revealed that CAS-treated CE81T/VGH cells expressed higher levels of microtubule-associated protein 1 light chain 3A/B-II (LC3-II) and showed stronger tolerance under SF conditions, which was also inhibited by CQ and 3-MA in vitro. Furthermore, CAS-treated CE81T/VGH cells developed significantly larger tumors in mice that could be also mitigated by CQ and 3-MA treatments. Collectively, these results suggest a tumor promotive role of CAS through upregulation of autophagy in tumor cells and the therapeutic potential of autophagy inhibition for these tumors.

Poster session: #**Sinomenine inhibits invasion of human lung cancer cells through reverse of epithelial-mesenchymal transition and downregulation of miR-21 expression****Yi-Ching Liao, Shu-Ting Tsai, Pei-Yu Chao, Pin-Shern Chen ***

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Abstract:

Sinomenine is an alkaloid found in the root of the climbing plant *Sinomenium acutum*. Recent studies have found that sinomenine can inhibit breast cancer and colorectal cancer by inhibiting tumor proliferation, migration, invasion, and inducing apoptosis. This study is aimed to investigate the effect and mechanism of sinomenine on inhibiting invasion on human lung adenocarcinoma cell line A549 in vitro. Results demonstrate that viability of A549 cells was inhibited by sinomenine in a dose-dependent manner. When treated with sub-toxic doses of sinomenine, cell invasion is markedly suppressed. Sinomenine also significantly elevates epithelial marker E-cadherin expression, while it concomitantly decreases mesenchymal marker vimentin expression, suggesting it suppresses epithelial-mesenchymal transition (EMT). Sinomenine reduces the mRNA level of matrix metalloproteinase-2 (MMP-2), MMP-9 and extracellular inducer of matrix metalloproteinase (EMMPRIN), but increases the expression of reversion-inducing cysteine-rich protein with kazal motifs (RECK), as well as tissue inhibitor of metalloproteinase-1 (TIMP-1) and TIMP-2. Moreover, sinomenine downregulates oncogenic microRNA-21 (miR-21), which has been known to target RECK. Downregulation of miR-21 by miR-21 inhibitor increases RECK expression and decreases cell invasion, suggesting that downregulation of miR-21 by sinomenine may contribute to elevate RECK expression and subsequently inhibiting cell invasion. Taken together, the results reveal that inhibition of A549 cell invasion by sinomenine may be, at least in part, through downregulating expression of MMP and miR-21. These findings demonstrate an attractive therapeutic potential for expression of in lung cancer anti-metastatic therapy.

Keywords: Sinomenine, invasion, epithelial-mesenchymal transition, microRNA-21, MMPs

Poster session: 3**Isolation and characterization of a microbial strain (CNU23) capable of decomposing fish scales****Nai-Yueh Tien*, Ming-Jiuan Wu**

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Abstract:

This study aims to identify an environmental isolate, CNU23, which can decompose fish scales. CNU23 was isolated from the decomposed scales soaking solution and cultured in NA medium. The optimal culture condition was found to be using TSB medium at 30°C with shaking at 160 rpm. The exponential (log), stationary, and death phases were 2-5 h, 6-24 h and 24 h after inoculation, respectively. The doubling time was calculated as 1 h. A streak plate showed CNU23 colonies were white, flat, opaque, and round shape with smooth edges. CNU23 was a Gram (+) bacterium with low casein hydrolysis activity, as 5% casein medium plate remained opaque after 24 h incubation but with slightly clear zone after 48 h storage at 4°C. 16S rRNA PCR with PS1F/PS2R primers and DNA sequencing indicated CNU23 was *Enterococcus faecium*.

Keywords: decomposing fish scales, bacteria identification, RNA gene sequencing, *Enterococcus*

Poster session: 1**A Novel Acidic Glycosylation of Ganoderic Acid A via Recombinant Glycosyltransferase of *Bacillus subtilis*****Chien-Min Chiang 1,* , Te-Sheng Chang 2, Jiumn-Yih Wu 3, Yu-Wei Wu 4,5, Yu-Han Kao 2 and Tzi-Yuan Wang 6,***

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Abstract:

Ganoderic acid A (GAA) is a bioactive triterpenoid isolated from a medicinal fungus, *Ganoderma lucidum*. Our previous study showed that *Bacillus subtilis* ATCC (American type culture collection) 6633 strain could biotransform GAA to compound (1), GAA-15-O-b-glucoside, and compound (2). Even though we identified two glycosyltransferases (GT) for catalyzing the synthesis of GAA-15-O-b-glucoside, the chemical structure of compound (2) and its corresponding enzyme remain elusive. In the present study, we identified BsGT110, a GT from the same *B. subtilis* strain, for the biotransformation of GAA into compound (2) under acidic glycosylation. BsGT110 showed an optimal glycosylation activity toward GAA at pH 6 but lost most of its activity at pH 8. Through a scale-up production, this product was successfully isolated using preparative high-performance liquid chromatograph and was identified to be a new triterpenoid glucoside (GAA-26-O-b-glucoside) by mass and nuclear magnetic resonance spectroscopy. The results of kinetic experiments showed that the turnover number (k_{cat}) of BsGT110 at pH 6 (k_{cat} = 11.2 min⁻¹) was 3-fold higher than that at pH 7 (k_{cat} = 3.8 min⁻¹), indicating that the glycosylation activity of BsGT110 toward GAA was favor at the acidic pH 6 condition. In short, we identified that BsGT110 is a unique GT that have activity on the glycosylation of triterpenoid at the C-26 position under acidic conditions but lost most of its activity at alkaline ones, suggesting that acidic solutions may enhance the catalysis activity of this and similar types of GTs toward triterpenoids.

Keywords: UDP-glucose glycosyltransferase, ganoderic acid A, biotransformation

Poster session: 3

A Genome-Centric Approach Reveals a Novel Glycosyltransferase from *Bacillus thuringiensis* GA A07 Strain Responsible to Catalyze 15-O-Glycosylation of Ganoderic Acid A

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Abstract:

Strain GA A07 was identified as an intestinal *Bacillus* bacterium of zebrafish, which has high efficiency to biotransform the triterpenoid, ganoderic acid A (GAA), into GAA-15-O- β -glucoside. To date, there are only two known genes of *Bacillus subtilis* ATCC 6633 strain, viz., BsUGT398 and BsUGT489, which can catalyze such a biotransformation. It is thus worthwhile to identify novel genes responsible for this biotransformation. Herein, by assembling and analyzing the complete genome of strain GA A07, we identified a novel enzyme that can biotransform GAA. The genome size of the GA A07 strain was 5,272,357 base pairs (bps) with 5094 predicted open reading frames, 42 ribosomal RNAs, and 106 transfer RNAs. Four additional circular plasmids, the genome sizes of which were 305,586, 112,660, 88,290, and 29,762 bps, were also determined. A phylogenomic analysis pinpointed the GA A07 strain as belonging to the species *Bacillus thuringiensis*. In total, 40 glycosyltransferase (GT) family genes were identified from the complete genome, among which three genes (FQZ25_16345, FQZ25_19840, and FQZ25_19010) were closely related to BsUGT398 and BsUGT489. Two of the three candidate genes, FQZ25_16345 and FQZ25_19010, were successfully cloned and expressed in a soluble form in *Escherichia coli*, and the corresponding proteins, BtGT_16345 and BtGT_19010, were purified for a biotransformation activity assay. An ultra-performance liquid chromatographic analysis further confirmed that only one of the purified proteins, BtGT_16345, had the key biotransformation activity of catalyzing GAA into GAA-15-O- β -glucoside. The optimal conditions for the enzyme activities of BtGT_16345 were pH 7.0, 10 mM of magnesium ions, and 30 °C. In addition, BtGT_16345 showed glycosylation activity toward seven flavonoids (apigenin, quercetin, naringenin, resveratrol, genistein, daidzein, and 8-hydroxydaidzein) and two triterpenoids (GAA and antcin K).

Keywords: UDP-glucose glycosyltransferase, UGT, ganoderic acid A, biotransformation

Application of new health biotechnology and health-care computer science to predict the prognosis of lung cancer resection

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Abstract:

According to the latest statistics from the Department of Health and Welfare lung cancer is one of the leader causes of death in Taiwan. Lung cancer resection surgery is a complex operation. Patients may require intensive care until anesthesia recovery is complete, muscle function returns, gas exchange improves, and vital signs are stable. However, prognosis still differ between patient who were relatively health before surgery, from who had many underlying diseases. Literature has shown that patients with poor prognosis are usually associated with poor preoperative pulmonary function, poor cardiovascular status, and older age etc., however, there is no research on the use of the latest computer science to develop prognostic prediction models for postoperative outcomes. We have observed in clinical practice that BRIDION accelerates recovery from general anesthesia, improves respiratory muscle training, reduces the risks of postoperative residual paralysis, and reduce the risk of tachyarrhythmia during the recovery phase. Chi Mei hospital incorporated new health biotechnology and health-care computer science to establish prediction models to compare postoperative outcomes between patients undergoing lung cancer resection surgery treated with BRIDION and NEOSTIGMINE during the recovery phase.

Keyword:

health biotechnology, lung cancer,bridion, anesthesia

Poster session: 3**Study on antioxidant activity of fermented black chokeberry (*Aronia melanocarpa*)****Chin-Yuan Liu¹, Jeng-Jer Yang^{2,3*}**¹ Big Bear Pharmaceutical CO.,LTD, Taipei, Taiwan² Bachelor Program in Pharmaceutical Botanicals & Health Applications, Chia-Nan University of Pharmacy and Science, Tainan, Taiwan³ Department of Pharmacy, Chia-Nan University of Pharmacy and Science, Tainan, Taiwan

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Abstract:

Aronia also known as the wild chokeberry or black chokeberry, is a small berry of the genus *Aronia melanocarpa* (Michx.) Elliott of the Rosaceae, native to the eastern woods of North America. The varieties are divided into black fruit, red fruit and purple fruit, which are cultivated as commercial crops because of their unique antioxidant properties. This study mainly carried out liquid fermentation of *Aronia melanocarpa*, and analyzed the components (total sugars, proteins, total phenols, flavonoids) and their antioxidant tests before and after fermentation: Trolox equivalent antioxidant capacity, DPPH free radicals scavenging ability, reducing power, ferrous chelate activity, superoxide dismutase-like (SOD-like, SOD-L) activity test.

The results of various tests and analysis showed that the same effect as the standard product can be achieved at the concentration detected by each sample compared with the control standard. The fresh *Aronia* are rich in Vit C, polyphenols and total flavonoids. When diluted 100 times, the Trolox equivalent antioxidant capacity and DPPH free radical scavenging capacity can still reach 83.86% (ABTS) and 83.76% (DPPH). The Trolox equivalent antioxidant capacity, DPPH free radical scavenging ability and reducing power activity of the *Aronia* lyophilized powder are the strongest natural health care products with strong antioxidant power. The final pH value of the aging yeast extract is 3.2, which can inhibit the growth of most harmful bacteria. After 20 times dilution, the broth can achieve a good DPPH scavenging free radical ability, and the reducing power is as high as 63.25% compared with the standard 0.1% Vit C. The SOD-like activity of the *Aronia* is 20 times diluted at the concentration, and its activity is better than other samples. This may be caused by yeast, lactic acid bacteria, etc. during fermentation, will produce SOD-like substances. The active ingredients and antioxidant capacity of the *Aronia melanocarpa* are not inferior to the fresh fruit after fermentation. We believe that the *Aronia* will be beneficial to health after being fermented, and has the potential for further research and development. At present, several kinds of *Aronia* Jiaosu series products have been developed, which can be separated from other black chokeberry products on the market, and it is expected to bring health to the public.

Keywords: *Aronia melanocarpa*; Black chokeberry; anti-oxidation; deep processing fermentation; enzyme (Jiaosu)

Poster session: #**Multiple membrane blood feeding system for mosquito repellent bioassay****Yung-Chun Wu¹, Yi-Pey Luo^{1*}**¹ Department of Biotechnology, Chia-Nan University of Pharmacy and Science, Tainan, Taiwan

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Abstract:

To assess the efficacy of new insect repellents, an efficient and safe in vitro bioassay system using a multiple-membrane blood-feeding device and a cocktail meal was developed. The multiple-membrane blood-feeding device facilitates the identification of new insect repellents by the high-throughput screening of candidate chemicals. A cocktail meal was developed as a replacement for blood for feeding females of *Aedes aegypti* (L.) (Diptera: Culicidae). The cocktail meal consisted of a mixture of salt, albumin and dextrose, to which adenosine triphosphate was added to induce engorging.

The IC₅₀ values of DEET, PMD, IR3535 and Picaridin were 1.40%, 1.54%, 1.08% and 0.44%, respectively. In practice, these methods should raise significant concern with regard to the accidental transmission of disease, the unknown toxicity of the compound and the welfare of humans and animals.

Keywords: *Aedes aegypti*, Multiple-membrane blood feeding system, Repellent, Repellence, Bioassay.

Poster session: 3

A Marathon Online Information Platform for Public Health

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Abstract:

Like the old sayings that go, “Life is not merely living but living in health.” and “Exercise for your health!” Numbers of Marathon competitions held in Taiwan are growing rapidly over the past several years, and the majority are very sensational and pioneering. It is also worthy to observe that the regularity and characteristic of those competitions organized in Taiwan are almost the top of the world. They become Taiwan the most qualified countries in organizing the competitions. By applying the online Marathon platform constructed by Taiwan’s Nonprofit Organization, the 100 Marathons Association in Taiwan (MAT100), competitors can track record and discover their individual scores to inspire more citizens to join the Marathon competitions.

Keywords: Marathon, Public Health, online platform

Poster session: 3

An Intelligent Public Health Platform

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Abstract:

Physiology-based wearables and tele-communication have developed into a part of our everyday lives, with all the benefits come questions of security, privacy, and accessibility. Unfortunately, such technology usually utilized for the young. The objective of our research was to employ Internet of Things (IoT) and telecommunication to follow our daily health and discover the health questions in advance, especially for the elderly. A real-time physiological system was applied to provide the protection of the elderly. By real-time observation with decision-making apparatuses, several services, and a web visualized dashboard, users' families can realize users' daily physiological variation and achieve care in the smart home. We concluded that this intelligent and low-cost wi-fi system can provide more efficient and sustainable in healthcare.

Keywords: wearables, IoT, smart home

Poster session: 3**A bacterial toxin elicits programmed necrotic cell death through calcium-signaling pathway****Pei-Jhen Lu¹, Yu-Chung Chen^{1*}**

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Abstract:

Vibrio vulnificus is the causative agent of seafood-related diseases, such as primary septicemia and wound infection in human, particularly in those with certain underlying diseases especially in patients with chronic liver disease. In human body, macrophage is an important defense phagocyte in the host against invading microorganisms. In response to this host defense, *V. vulnificus*, like many pathogenic bacteria, may evolve strategies to counter the bactericidal effect of macrophage.

In this study, we report that the cytotoxin gene (*h*) of *V. vulnificus* cause an increase in the intracellular calcium concentration and the subsequent production of ROS. In addition, the cytotoxin gene (*h*) induces mitochondrial damage and cell death via calcium. Taken together, these results show that *V. vulnificus* cytotoxin gene (*h*) triggers a programmed cell death in macrophages through Ca²⁺/ROS-mediated mitochondrial dysfunction.

Keywords: macrophage, mitochondria, *Vibrio vulnificus*

S3-21**Antifungal Potential of Extracellular Metabolites Produced by *Lactobacillus kitasatonis* against *Candida albicans*****Po-Hsun Tseng, Mei-Chun Kuo* ,Ming-Jiuan Wu**

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Abstract:

Candida albicans (*C. albicans*) is the common polymorphic opportunistic pathogen, mainly in aged patients with impaired immune system (i.e., cancer, transplant, or HIV patients). Current antifungal drugs is challenging as toxicity, drug interactions, and drug resistance. In this study, we investigated the effects of the extracellular microbial metabolites on invasive *C. albicans* and the antibacterial mechanisms. First, we collected the culture filtrates of *Bacillus*, *Pseudomonas*, *Lactobacillus* and *Aspergillus* for the inhibition test of *C. albicans*. We found that the *Lactobacillus kitasatonis* (*L. kitasatonis*) showed the best antifungal activity in microplate-based liquid medium assay. Secondly, we examined the cell-free supernatants of *L. kitasatonis* to inhibit the mycelial pattern and the biofilm formation of *C. albicans*. In addition to the inhibition of *C. albicans*, we also studied the antibacterial mechanism of *L.kitasatonis*. The results showed that the supernatant contained organic acids, H₂O₂ and various antibacterial proteins. Furthermore, we found that the competitive adhesion by *L. kitasatonis* can also effectively prevent the mucosal adhesion of *C. albicans* in the invasive stage.

Keywords: *Candida albicans*, *Lactobacillus kitasatonis*, Biofilm

Study on the effect of medicinal fungi extract on wound healing in scalded mouse model

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1. Department of Biotechnology, Chia Nan University of Pharmacy & Science

Abstract:

The progression of scalded wound healing may roughly divide into three stages: the inflammatory phase, the proliferative phase, and the tissue reconstruction phase. The mechanism of wound healing includes that cells interact with cell mediators, such as cytokines, growth factors, protein enzymes, and nitrogen oxides produced during inflammation, which affects the rate of wound healing. Accumulating evidence revealed that medicinal fungal extracts have anti-inflammatory effects. In this study, a scalded mouse model was well established and used to investigate the effect of medicinal fungi extract on scalded wound healing.

Our results demonstrated that the time required for scalded wound healing was significantly shorter than other groups such as positive and negative control groups. Therefore, it was found that the extract of medicinal fungi may contain some ingredients resistant to inflammation and promote tissue repair. Since the medicinal fungal extract has a significant effect on the healing of scalded wounds, this extract may have the potential to develop as a scald drug.

Keywords: medicinal fungal extract, scalded wound healing, inflammation

Poster session 3: Health Biotechnology

Characterization of leptin in zebrafish (*Danio rerio*)

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Abstract:

Mammalian Leptin plays a crucial role regulate the of balance. It is a product of adipocytes and endocrine encoded by the obese gene (*ob*). There was no report related to the characterization of leptin B gene during the early embryonic development of fish. In this study, we observed the spatio-temporal characteristics of zLepB by whole-mount *in situ* hybridization of zebrafish. There is no maternal effect related to zLepB, however a gradually gene expression occurred during 12hpf somite stage till hatched. The first 5 days post fertilization; we found zLepB was significantly expressed in fertilized embryos located at larval head and internal organs. In the future, we can continue to explore whether Leptin affects individual organ development and function.

Keywords: Leptin, zebrafish

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