



2nd ICMHS & 2nd LSC

PROCEEDING

PROCEEDING

The 2nd International Conference of Medical and Health Sciences (ICMHS) and The 2nd Life Sciences Conference (LSC) 2016

*"Towards a Better Quality of Life
through Interdisciplinary Research"*

Yogyakarta, 9th-10th December 2016
The Alana Hotel and Convention Center

ISBN: 978-602-757-793-0



9 786027 577930



PROCEEDING

The 2nd International Conference of Medical and Health Sciences (ICMHS) and The 2nd Life Sciences Conference (LSC) 2016

*"Towards a Better Quality of Life
through Interdisciplinary Research"*

Yogyakarta, 9th-10th December 2016
The Alana Hotel and Convention Center

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

TABLE OF CONTENT

COMMITTEE	viii
WELCOMING SPEECH	
Welcome Message from Committee	ix
Welcome Message from Dean	x
Welcome Message from Rector	xi
Welcome Message from the Head of Provincial Health Office Special Region of Yogyakarta	xiii
KEYNOTE SPEAKER OF INTERNATIONAL CONFERENCE	xv
REVIEWER	xvi
FULL ARTICLE	
Diabetic Neuropathy - A Chance Towards A Better Treatment <i>Tri Wahyuliati</i>	2
Herbal Medicine a Holistic Approach; in Case of Food Supplement Formulation of <i>Sauropus androgynus</i> and <i>Elephantopus scaber</i> to Modulate Immune and Hormonal System in Pregnant <i>Salmonella typhi</i> Infected Mice <i>Muhammad Sasmito Djati</i>	10
Continuing Competence of Practicing Nurses in Indonesia <i>Fitri Arofiati, SKep.,Ns, MAN Ph.D</i>	19
The Influence of Neuromuscular Taping (NMT) in Walking Speed for the Patients After Ischemic Stroke <i>Umi Budi Rahayu</i>	29
Correlation between Larvae Free Number with DHF Incidence in Sleman, Yogyakarta, Indonesia <i>Tri Wulandari Kesetyaningsih, Sri Andarini, Sudarto, Henny Pramoedyo</i>	34
Correlation Interdialytic Weight Gain-Idwg towards Physical and Psychological Health to Quality of Life in Patients with Hemodialisa <i>Cecilya Kustanti, Maria Putri Sari Utami</i>	42

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Quality of Life in Hemodialysis Patiens with Hypertension <i>Maria Putri Sari Utami, Elsy Maria Rosa, Azizah Khoiriyati</i>	48
Environmental Housing Characteristic of Pulmonary Tuberculosis Sufferers in Slum Area <i>Iwan Stia Budi, Yustini Ardillah, Indah Purnama Sari, Dwi Septiawati</i>	55
Exploration Study in Psychological Changed on First Trimester Pregnant Women at Kembaran II Health Center, Banyumas <i>Wilis Dwi Pangesti, Dewi Ambarwati, Inggat Ratna Kusuma</i>	63
The Anxiety of Pregnant Mother with History of Abortion in Health Service 2 Banyumas Qualitative Study <i>Evicenna Naftuchah Riani, Wilis Dwi Pangesti, Diah Atmarina Yuliani</i>	72
Analysis of Infection Control Risk Assessment and Strategies to Reduce Health-Care Associated Infections in RS PKU Muhammadiyah Gamping Yogyakarta <i>Nurmalita Sari, Elsy Maria Rosa</i>	76
Health Promotion Program for Disaster Eruption of Mount Merapi Refugee in Youth Centre Sleman Distric, Yogyakarta Special Province, Indonesia <i>Novitasari Ratna Astuti</i>	91
Pap Smear is Important Screening of Cervical Cancer for Women <i>Ivanna Beru Brahmana</i>	100
Analysis of Compliance on Implementing Standard Precautions on Dental Health Service at PKU Muhammadiyah Gamping Hospital of Yogyakarta <i>Maria Margaretha S Nogo Masa, Elsy Maria Rosa</i>	108
Qualitative Study of Stakeholders' Knowledge Regarding Alert Village Program in Ogan Ilir Regency <i>Asmaripa Ainy, Iwan Stia Budi</i>	123
The Influence of Parents Knowledge and Health Care Access to the Identification of Children with Hearing Impairment <i>Asti Widuri, Alazi, Muhammad Pringgo Arifianto</i>	131

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

The Comparison of Maternal Leukocytosis Incidence between Preterm Premature Rupture of Membranes and Premature Rupture of Membranes at Term in Panembahan Senopati Hospital Bantul Yogyakarta <i>Choirotun Jum'iyatin Nisak, Supriyatningsih</i>	137
Analysis of Patient Safety Culture Instrument by MaPSaF <i>Arum Astika Sari, Arlina Dewi</i>	143
The Relationship of Fish Consumption to Cognitive Development in Students of SD Saptosari, Gunungkidul, Yogyakarta <i>Dewi Ngaisyah</i>	158
Inter Professional Education and Collaborative Practice: Reflection from Health students <i>Wiwik Kusumawati, Ika Setyawati, Romdzati, Likky Tiara Alphianti</i>	164
Steroidal Saponin in Ethanol Extract Tuber of Purple Yam (<i>Dioscoreaalata L.</i>) Decrease IL-4 Density of Blood Sera on BALB/c Mice Model Digestive Tract Allergy <i>Sri Nabawiyati Nurul Makiyah, Muhaimin Rifa'i, Widodo, Muhammad Sasmito Djati</i>	173
Managerial Leadership Competence in PKU Muhammadiyah Hospital of Gamping <i>Ranggit Oktanita, Qurratul Aini, Ekorini Listiowati</i>	184
Malaria Occurrence Factor Analysis Based on Elevation of Sea Surface in the District of OganKomeriungUlu, South Sumatra <i>Pademi Alamasyah, Chairil Anwar, Dwi Setyawan, Laila Hanum</i>	200
Increasing Family Involvement to Reduce of Cigarette Consumption with Participatory Learning Action (PLA) Approach <i>Tri Hastuti Nur Rochimah, Salmah Orbayinah</i>	212
Air Pollution Effect to Human Health in Palembang City <i>Marsidi, M.T. Kamaluddin, Fauziah N. Kurdi, Novrikasari</i>	230
Identification of Patient Satisfactory Profile for Outpatient Pharmaceutical Service at Private and Government Hospital within Semarang District <i>Pramitha Esha Nirmala Dewi, Novita Dwi Dahliyanti</i>	241

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Intervention of Family Nutritional Awareness to Increase Family's Food Security <i>Fatmalina Febri, Anita Rahmiwati, Fenny Etrawati</i>	249
The Effects of Exercises in Molecular Neuron Cells of Cerebellum in Congenital Hypothyroidism Rats <i>Idiani Darmawati, Marten Bhara Suryo Aji, Zulkhah Noor</i>	258
The Effect of Air Freshener Exposure on Corneal Thickness of White Rat (<i>Rattus norvegicus</i>) <i>Yuningtyaswari, Pajar Sigit Nugroho</i>	265
The Correlation between Education about Personal Hygiene and Knowledge and Attitude of Personal Hygiene of the Adolescent <i>Kusbaryanto, Wahana</i>	272
The Relationship between Sports Activities and Premenstrual Syndrome In SMA N 1 Sentolo, Kulon Progo <i>Fenthy Vabiella, Alfaina Wahyuni</i>	277
Relationship Thyroid Status to the Physical Growth and Psychomotor Development on Children Under 2 Years in Endemic Areas of Iodine Deficiency Disorders in District Samigaluh of Kulonprogo Regency <i>Adang Muhammad Gugun, Zulkhah Noor, Jifani Rasyad, Mardylla Nur Fitriany..</i>	282
Baby Blood Vessel Detection-Based Touch Sensors <i>Ade Pajar Pirdianto, Anna Nur Nazila Chamim</i>	299
Analysis of Factors that Influence Smokers Using Alcohol among Students in a Private University in Yogyakarta <i>Iman Permana, Gibran Ilham Setiawan</i>	306
The Effectiveness of Combined Warm Water Foot Submerging and Breath Relaxation Therapy on Lowering the Blood T Pressure in Hypertensive Patients in the Work Area of Puskesmas Penumping Surakarta <i>Prima Trisna Aji, Novita Kurnia Sari, Sri Nabawiyati Nurul Makiyah</i>	315
Assessment of Interprofessional Communication and Collaboration: Using Multi Methods <i>Sri Sundari Purbohadi</i>	335

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Bed Side Teaching as Effort for Decreasing Needle Stick and Sharp Injury in Clinical Practice Students of PSIK FKIK UMY <i>Azizah Khoiriyati, Novita Kurnia Sari</i>	342
The Relationship between Working Period and Cholinesterase Blood Levels among Pesticides-Spraying Workers in the Oil Palm Plantation <i>Restu Dewi Lestari, Merry Tiyas Anggraini</i>	350
The Effect of Interpersonal Relationship toward Birth Satisfaction <i>Hema Dewi Anggraheny</i>	356
Effect of Early Mobilization Education of The Level Anxiety and Independence of Patients After Total Knee Replacement in Hospital <i>Amik Muladi, Sagiran, Azizah Khoiriyati</i>	363
The Effect of Normal Dose Extract Gempur Batu Kejibeling (<i>Strobilanthus crispus.BL</i>) to the Histological of Rat's Digestive Tract <i>Yoni Astuti, Ali Usodo Mulyo, Harminani</i>	371
Effectiveness of Alcohol 70%, Clorhexidine Gluconate 4% Soap and Irgasan DP 300 as Hand Sanitizers in Reducing Bacterial Growth <i>Inayati, Pinter Hartono</i>	377

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Committee of ICMHS & LSC 2016

Supervisor	dr. Ardi Pramono, Sp.An, M.Kes
Chair	dr Iman Permana, M.Kes, Ph.D
Partner	Dr Zahid Iqbal, Ph.D
Secretary	Winnie Setyonugroho, S.Ked, MT, Ph.D
Secretariat	dr Bramantyas Kusuma H, M.Sc Futuh Hidayat, SEI Elida Tri Grahani, SE
Treasury	dr Hidayatul Kurniawati, M.Sc
Scientific section	Dr dr Ikhlas M Jenie, M.Med, Sc Dr Sri Nabawiyati Nurul Makiyah, S.Si, M.Kes Lia Fitriana, SP
Programme section	dr Ika Setyawati, M.Sc dr Imaniar Ranti, M.Sc dr Ahmad Ikliludin, SpM
Publication and Documentation section	dr April Imam Prabowo Arif Hadiano, ST
Logistic and Transportation	dr Muhammad Kurniawan, M.Sc Aris Nuryanta, SH Muhammad Ma'rifatullah Katiga Putra Dwi Hatmo Budi, S.IP
Fund Raiser	dr Maria Ulfa, MMR dr Akhmad Syaiful Fatah Husein, SpAn

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

**Chair person of The 2nd International Conference of Medical and
Health Sciences and The 2nd Life Sciences Conference 2016**



Welcome to Jogja, sugeng rawuh!

For the second time, the Faculty of Medicine and Health Sciences Universitas Muhammadiyah Yogyakarta is going to conduct the 2nd International Conference of Medical and Health Sciences (ICMHS) this December in vibrant Yogyakarta, Indonesia. This year we are going to collaborate with the Life Sciences Society of Pakistan for their 2nd Life Sciences Conference (LSC) with Dr. Zahid Iqbal as the general secretary.

This year's conference theme "Towards a better quality of life through interdisciplinary research" will be celebrating an era of seamless interdisciplinary integration and collaboration in scientific innovations with the involvement of more extensive topics and disciplines in the conference. We aim to exhibit the products of that kind of approach in solving challenges, improving the quality of life, and creating sustainable developments. We are happy to announce that our conference is filled with Invited speakers from Pakistan, United States of America, Uni Emirates Arab, Malaysia and Indonesia. Presentations will be conducted in oral as well as poster that covers topics from medicine, public health, dentistry, pharmacy, biomedical to agriculture. To put more credibility to the conference we are collaborating with Isra Medical Journal and the Asian Journal of Agriculture and Biology to publish selected papers from the event. Other paper will be published in the ISBN Proceeding book.

The last but not least, enjoy the conference, start networking and sharing ideas, and let immerse yourself to the heritage cultural ambient of Jogja, sumonggo!

Yogyakarta, 1st December 2016

dr. Iman Permana, M.Kes, Ph.D.

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

**Dean of Faculty of Medicine and Health Sciences,
Universitas Muhammadiyah Yogyakarta**



Assalamu'alaikum Wr. Wb.

Science, especially in the areas of health and life growing more rapidly. We need to work together in the research of various disciplines to the advancement of science and to provide benefits to human life.

After successfully organized international scientific meeting last year, the Faculty of Medical and Health Sciences Universitas Muhammadiyah Yogyakarta, held the second scientific meeting ICMHS along with "2nd Life Sciences Conference". In this second scientific meeting, FKIK UMY collaborates with various researchers, among others from Pakistan, Malaysia, and the United States. Taking the theme "Towards a better quality of life through interdisciplinary research" we hope to establish cooperation with various parties to be able to contribute ideas to the civilization of human life.

Finally, we congratulate the scientific meeting in the city of Yogyakarta Indonesia. Enjoy the beautiful city of Yogyakarta with priceless historical relics. We hope that this meeting can run smoothly and provide benefits to the advancement of knowledge.

Wassalamu'alaikum Wr. Wb.

Yogyakarta, 1st December 2016

dr. Ardi Pramono, M.Kes, Sp.An.

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Rector of Universitas Muhammadiyah Yogyakarta



Assalaamu'alaikum Wr. Wb.

Ladies and Gentlemen,

Welcome to the 2nd International Conference on Medical and Health Science in conjunction with the 2nd Life Sciences Conference 2016

Welcome to Yogyakarta City of Tolerance

Our Faculty of Medicine and Health Sciences has been doing such international conference almost every year for the last ten years. This and other previous conferences are the things that supporting our vision as an excellence and Islamic university, a young and global university. We will always try to keep monitoring the development of science through sending more lecturers to do the sabbatical leave overseas, doing international research collaborations and also the international conference. Each department should do this strategy of internationalization so that each department has its own network. Faculty of medicine and health science is one of the most progressive units in implementing this strategy by inviting international experts on a regular basis. This program will certainly strengthen our vision.

International conference on medicine and health sciences is a smart choice to offer our lecturers access to the most recent development of the subjects. The participants will also gain the same knowledge and latest information on medicine and health sciences. As everyone knows that the development of science and technology are faster today compared to the previous period. Information technology, computer, and other development havefastened the transformation of medicine and health science into the different and more complex stage.

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Cellular technology, for instance, can be used for several functions including those that directly impacts our daily life. There is no long distance call anymore today because cellular phone can do everything we need to contact other people far from where we stand anytime anywhere. People will finally innovate cellular phone for the sake of personal health services. We will in the future using our simple cellular phone to detect our body temperature, blood pressure, even how much fat we have in our body and how much it is supposed to be. We may also be able to check the health of our body without leaving our house and order medicine without going into the drug store. Everything is almost possible as long as we think hard for the better of people in the future. Enjoy the conference and don't forget to visit our rich tourist destinations, mountains, beaches or caves (underground waterways).

Thank you

Wassalaamu'alaikum Wr. Wb.

Prof. Dr. Bambang Cipto, MA

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Keynote Speech

**by Head of Provincial Health Office Special Region of Yogyakarta
in International Conference
of Medical and Health Sciences and Life Sciences Conference**

The Alana Hotel and Convention Center, Yogyakarta, December 9-10, 2016

The honorable:

- Rector of Muhammadiyah University of Yogyakarta,
- The Dean of Medical and Health Sciences Muhammadiyah University of Yogyakarta,
- The chairman of organizing committee of the international conference of medical and health,
- Distinguished guests and colleagues.

Assalamu'alaikum Warahmatullahi Wabarakatuh,

First of all, we thank God for His blessings that today we may attend the International Conference of Medical Health Towards a Better Quality of Life Through Interdisciplinary Research in Yogyakarta.

My distinguished colleagues,

In Indonesia National Long Term Development Plan (2005-2024), the Indonesian Ministry of Health have determined a paradigm shift that have governed health services in health development plan. There has been a shift from Curative Health Services to Preventive and Promotive Health Services.

Recently, Indonesia suffers from a triple burden of diseases as health development challenges. The triple burden of diseases are: 1) the backlog of common infections, undernutrition, and maternal mortality; 2) the emerging challenges of non-communicable diseases (NCDs), such as cancer, diabetes, heart disease; and 3) mental illness, and the problems directly related to globalization, like pandemics and the health consequences of climate change.

Dear colleagues,

Here are some data that show several health problems in Indonesia:

1. Maternal mortality rate in 2015 is 4,809 cases, infant mortality rate in 2015 is 22,267 cases;
2. Regarding to children under the age of five, the national stunting rate is 37.2% which consists of 18% for very short dan 19.2% for short (Riskesdas 2013);

The 2nd International Conference of Medical & Health Sciences and The 2nd Life Sciences Conference 2016

3. HIV testing coverage is 14% dan antiretroviral (ARV) therapy coverage is 65.58% (Directorate General of Disease Control and Prevention Ministry of Health, 2015);
4. Tuberculosis (TB) notification rate in 2015 is 73.5% and tuberculosis treatment success rate is 72% (Directorate General of Disease Control and Prevention Ministry of Health, 2015).

Distinguished guests,

Indonesia Health Development Program in 2015-2019 strengths in improving human quality life through Health Indonesia Program with family approach. The Indonesian Ministry of Health issued The Minister of Health Regulation (Permenkes) No. 39 Year 2016 as a Guideline of Implementation of Health Indonesia Program with Family Approach. This program has 12 main indicators as markers of a family health status. Currently, many health programs have been implemented by Indonesian Ministry of Health, Provincial Health Offices, and District Health Offices. However, many health problems, some as mentioned above, still become health burdens. We may ask a question whether the programs that we conducted have answered the health problems we have in Indonesia.

It would be better if all health programs that we implement based on scientific health research, especially interdisciplinary research. The research should be related to detection, prevention, and treatment of diseases or problem solving for better health.

My dear colleagues,

Being a province with speciality, Special Region of Yogyakarta placed Traditional Medicine as one of the priority programs in Provincial Medium Term Development Plan (2017-2022). We still encounter many challenges in developing Traditional Medicine, especially in providing services which are based on scientific evidence.

Distinguished colleagues,

We look forward to results of interdisciplinary research which would support health problem solving, especially by developing traditional medicine in Yogyakarta. We believe that collaboration in interdisciplinary research would improve quality of human life.

Finally,

Thank you for your attention. We wish you a successful conference.

Wassalamu'alaikum Warahmatullahi Wabarakatuh,

On behalf of
the Head of Provincial Health Office
Special Region of Yogyakarta

Drg. Pembajun Setyaningastutie, M.Kes

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

**SPEAKER OF
INTERNATIONAL CONFERENCE**

Zahid Iqbal

Al-Nafees Medical College Isra University Islamabad Campus Islamabad, Pakistan
"One Health Program for Public Health Benefit"

Prof. Dr. Abdul Khaliq

Professor, Department of Agronomy, University of Agriculture, Faisalabad
"Role of Agriculture in Poverty Alleviation of Rural Areas"

Fitri Arofati

Universitas Muhammadiyah Yogyakarta, Indonesia
"Continuing Professional Development of Practicing Nurses in Indonesia"

Tri Wahyuliati

Universitas Muhammadiyah Yogyakarta, Indonesia
"Diabetic Neuropathy - A Chance Towards A Better Treatment"

Mohammad Khalid Ashfaq

University of Mississippi, USA
"Natural Products –Use or Misuse"

Muhammad Mukhtar

American University of Ras Al Khaimah, United Arab Emirates
"Emerging Biotechnologies and Genomic Medicines in Human Health and Well-Being"

Muhammad Sasmito Djati

Brawijaya University Malang, Indonesia
"Herbal Medicine a Holistic Approach: in case of food supplement formulation of Sauropusandrogynus and Elephantopuscaberto modulate immune and hormonal system in pregnant Salmonella typhi infected mice"

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

REVIEWER

1. Dr. Zahid Iqbal, Ph.D (Isra University, Islamabad, Pakistan)
2. Prof. Dr. Abdul Khaliq (University of Agriculture, Faisalabad)
3. Dr. Mohammad Khalid Ashfaq, DVM, DTVM, MS, Ph.D (University of Mississippi, USA)
4. Dr. Muhammad Mukhtar, Ph.D (American University of Ras Al Khaimah, United Arab Emirates)
5. Dr. Ir. Muhammad Sasmito Djati, MS. (Brawijaya University Malang, Indonesia)
6. Fitri Arofiati, S.Kep., Ns., MAN., Ph.D (Universitas Muhammadiyah Yogyakarta, Indonesia)
7. Dr. SN Nurul Makiyah, S.Si., M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
8. dr. Iman Permana, M.Kes, Ph.D (Universitas Muhammadiyah Yogyakarta, Indonesia)
9. Dr. dr. Ikhlas M. Jenie, M.Med, Sc (Universitas Muhammadiyah Yogyakarta, Indonesia)
10. Dr. dr. Arlina Dewi, M.Kes, AAK (Universitas Muhammadiyah Yogyakarta, Indonesia)
11. dr. Oryzati Hilman, M.Sc, CMFM (Universitas Muhammadiyah Yogyakarta, Indonesia)
12. Dr. Dra. Yoni Astuti, M.Kes, Ph.D (Universitas Muhammadiyah Yogyakarta, Indonesia)
13. Dr. drg. Tita Ratya Utari, Sp. Ort (Universitas Muhammadiyah Yogyakarta, Indonesia)
14. Dr. dr. Tri Wahyuliati, Sp.S, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
15. Dr. Elsy Maria Rosa, M.Kep (Universitas Muhammadiyah Yogyakarta, Indonesia)
16. Dr. dr. Titiek Hidayati, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
17. Dr. Shanti Wardaningsih, M.Kep., Ns., Sp.Kep.J., Ph.D. (Universitas Muhammadiyah Yogyakarta, Indonesia)
18. Dr. dr. Sri Sundari, M.Ke (Universitas Muhammadiyah Yogyakarta, Indonesia)
19. Dra. Lilis Suryani, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
20. Drh. Tri Wulandari K, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
21. Dr. dr. Wiwik Kusumawati, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
22. Sabtanti Harimurti, S.Si., M.Sc., Ph.D., Apt. (Universitas Muhammadiyah Yogyakarta, Indonesia)

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

**SPEAKER OF
INTERNATIONAL CONFERENCE**

**Herbal Medicine a Holistic Approach; in Case of Food Supplement
Formulation of *Sauropus androgynus* and *Elephantopus
scaber* to Modulate Immune and Hormonal System in Pregnant
Salmonella typhi Infected Mice**

Muhammad Sasmito Djati

Departement of Biology, Faculty of Mathematic and Natural Sciences, Brawijaya
University Malang, Indonesia.

Email: msdjati@ub.ac.id

Abstract

Herbal Medicine is one uniqueness medicinal approach, basic way of thinking of traditional medical is human healthy by means of balance condition of human bodies. Body's human balance should be approach systemic, holistic, and material, as well as immaterial domain. One case of complicated system in human is pregnancy, pregnant women are one of higher risk population for *Salmonella typhii* infection. Typhoid fever during pregnancy can cause decreasing immune system and imparity of the hormonal system. Indonesia have a lot of herbal medicine, there are *Elephantopus scaber* (Tapak Liman) and *Sauropus androgynus* (Katuk). Both can use as a herbal supplement for pregnant women because they have functioned as an anti-inflammatory effect, anti-microbial and stimulate reproduction hormone. The aim of this study was to investigate the efficacy of *E. scaber* and *S. androgynus* as a food supplement for modulating immune and hormonal system in Pregnant mice with *Salmonella typhii* infection. Pregnant mice were orally infected with *S. typhii*, at a concentration 10^7 CFU/mL. Extract of *E. scaber* and *S. androgynus* were administered orally using formulation 100:0% (T3), 75:25% (T4), 50:50% (T5), 25:75% (T6), and 0:100% (T7), with initial doses of 200 mg/kg body weight (BW) *E. scaber* and 150 mg/kg BW *S. androgynus*. Lymphocyte cell was isolated from bone marrow, spleen, and lymph node. Pregnant BALB/c mice serum was isolated from the orbital vein. FACS analysis was done to measure the relative number of B220⁺ cell and CD4⁺IL2⁺ T cell. The hormonal level was analysis using ELISA assay. The data were analyzed using one-way ANOVA, with significance level $p < 0.05$, followed by a Tukey test. The statistical analysis software used SPSS version 16.0. The result shows that the combination leaves extract of *E. scaber* and *S. androgynus* have efficacy to modulated immune system such as B220⁺ in bone marrow and also lymph node, IL2, and CD4 T cell. Beside, both leaves extract are also modulating hormonal system like prolactin hormone in pregnant mice with *S. typhi* infection.

The 2nd International Conference of Medical & Health Sciences and The 2nd Life Sciences Conference 2016

INTRODUCTION

Indonesia is second largest world biodiversity country, that's means it has potential plant, microbes diversities for improving pharmaco-bio-prospecting. Traditionally, Indonesian people has indigenous knowledge to keep their own health by using medicinal Indonesian endemic plant. However, indigenous knowledge has not scientifically proven yet, but some people believe in some way that's right way. One thing that basic way of thinking of indigenous knowledge is holistic logical frame work of thinking. Simplifying holistic way of thinking is integrating various variables to approach and solved one case disease preventive or curative model. Pregnancy is one interesting model to studying holistic phenomena's for understanding herbal medicine. *Salmonella enteric* serovar Typhi are bacteria gram-negative that caused of typhoid fever in tropical countries. The most frequent population for *Salmonella* infection are pregnant woman, children, and individual that lack immune system like HIV patients.¹ Pregnant woman have a serious concern because they have different immune system condition to response the implantation of an embryo which basically non-self antigen, therefore they have a higher risk of infectious diseases.² Our recent study proved that *Salmonella* in pregnancy can decrease the immune system.³ Basyaruddin, *et al* (2015),⁴ explain, the relative number of B220⁺ in pregnant *Salmonella* infection mice were decreased compared with pregnant normal mice. Another study shows that *Salmonella* has an ability to suppress the production of IL-2 cytokine by CD4⁺ T cell.⁵ Beside immune system, *Salmonella* also disturbs the stability of the hormonal system in Pregnancy. During the first and second trimesters of pregnancy, prolactin levels were significantly reduced by infection with the parasite compared with a control group.⁶ LPS that contained in the cell wall of *S. typhi* could increased the level of progesterone and estrogen more than a normal group.^{7, 8}

Pregnant human or animal that have *Salmonella* infection are very dangerous condition, not only for the maternal but also for the fetus. Khaista *et al* (2013),⁹ explain *S. typhi* have been found to be associated with pregnancy loss and miscarriage. Another study Pejic-Karapetrovic, *et al.* (2007),¹⁰ explain, typhoid fever in pregnant woman give impact on physiological changes, miscarriage, premature, toxicity and fetal loss. *S. typhi* are able to proliferate in the placenta, it makes necrosis and inflammation in fetus and leading to fetal loss.¹¹

The common treatment that given to preganant woman with *Salmonella infection* was using antibiotic, such as chloramphenicol, ampicillin, and trimethoprim-sulfamethoxazole. It have teratogenic effect for the fetus.¹² Indonesia have a lot of herbal plants. It can use as a food supplement that safe for pregnant woman with *Salmonella* infection. *Elephantopus scaber* (Tapak Liman) is a plant that already proven can improve the immune system. Stigmasterol contained in *E. scaber* serves to stimulate

naïve CD4⁺ T cells to differentiate into Th1 or Th2 cells.¹³ Flavonoid compounds can improve the IL-2 activity and lymphocyte proliferation.¹⁴ *Sauropus androgynus* (katuk) are already proven can improve the hormonal and immune system. Ethanolic extract of *S. androgynus* leaves are able to increase the production of volatile fatty acid. VFA is secondary metabolic that can lead the improvement of hormonal system.¹⁵ Based on that analysis this study aimed to identify the efficacy of *E. scaber* and *S. androgynus* leaves extract to modulating immune and hormonal system in Pregnant mice with *S.*

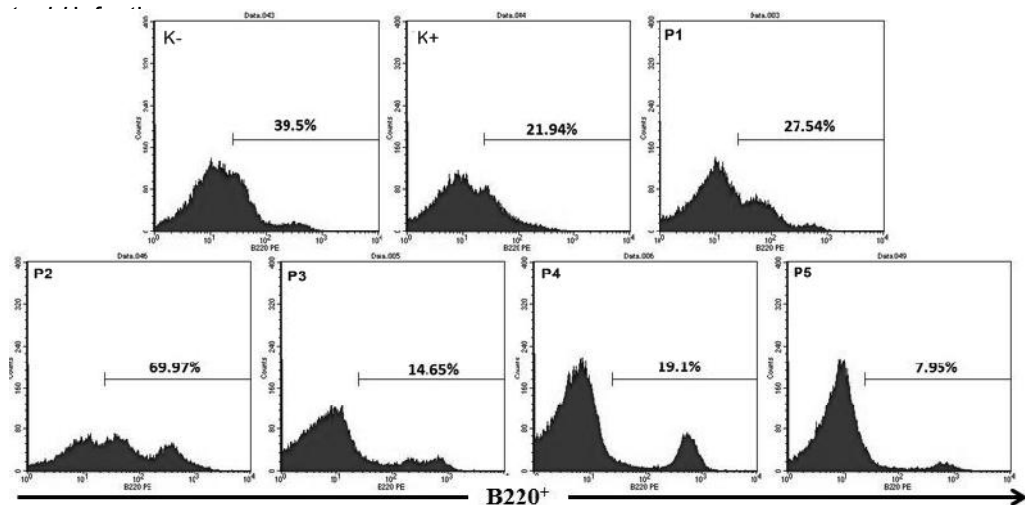


Figure 1. Effect of different formulation of ethanol extract of *E. scaber* and *S. androgynus* leaves on the relative number of B lymphocyte cells (B220⁺) from BM. K-, control; K+, *S. typhi* infection; P1, *S. typhi* infection with 100% of *E. scaber*; P2, *S. typhi* infection with 75% of *E. scaber* and 25% of *S. androgynus*; P3, *S. typhi* infection with 50% of *E. scaber* and 50% of *S. androgynus*; P5: *S. typhi* infection with 25% of *E. scaber* and 75% *S. androgynus*; P5: *S. typhi* infection with 100% of *S. androgynus*. Values are mean of three replicate determinations with $p < 0.05$ (This data already published).¹³

Beside B lymphocyte cells, this study also measured the level of IL-2 produced by CD4⁺ T cells. IL-2 has role as proliferation and survival of T cells, besides that IL-2 is an agent for differentiation of naive T cells into effector and memory cells.¹⁶ In this study, the infection of *S. typhi* could decrease significantly ($P < 0.05$) the level of IL-2 produced CD4⁺ T Cells compared with the normal group (K-). The administration of *E. scaber* and *S. androgynus* leaves extract has been proven could lead increasing the level of IL-2 produced by CD4⁺ T cells. The highest level of IL-2 was occurred in the P5 group, while the lowest level of IL-2 was occurred in the P3 group (Figure 2). Nevertheless, the level of IL-2 from all of the groups treatment (P1-P5) are not significant different ($P < 0.05$) compared with the control group (K-) (Figure 2).

The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016

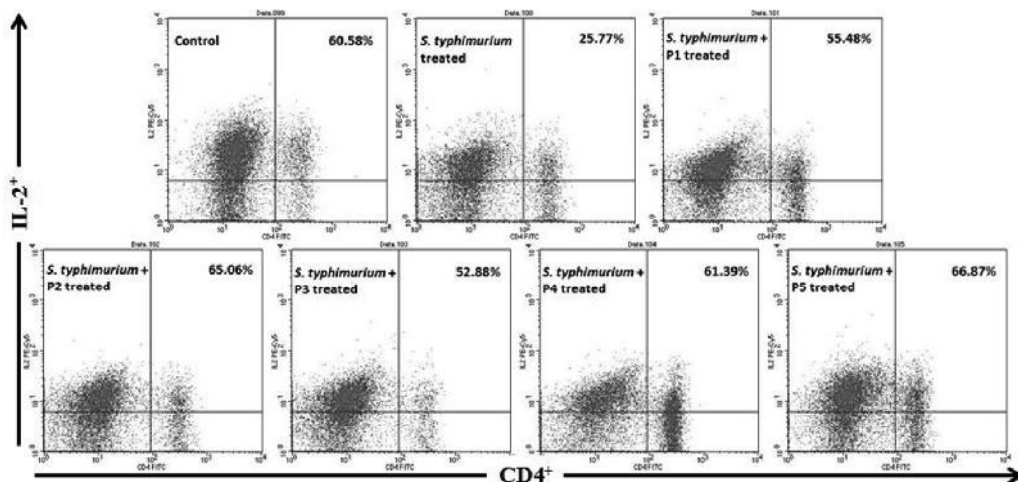


Figure 2. Effect of different formulation of ethanol extract of *E. scaber* and *S. androgynus* leaves on the relative number from IL-2 produced by CD⁺ T Cells. K-, control; K+, *S. typhi* infection; P1, *S. typhi* infection with 100% of *E. scaber*, P2, *S. typhi* infection with 75% of *E. scaber* and 25% of *S. androgynus*; P3, *S. typhi* infection with 50% of *E. scaber* and 50% of *S. androgynus*; P5: *S. typhi* infection with 25% of *E. scaber* and 75% *S. androgynus*; P5: *S. typhi* infection with 100% of *S. androgynus*. Values are mean of three replicate determinations with $p < 0.05$ (This data already published) (Djati, 2016).

The effect of *E. scaber* and *S. androgynus* leaves extract to prove that both of the plants could modulated the level of B cells and IL-2 cytokine. This study agrees with the result of Nurmamulyosari (2015),¹² that the combination of *E. scaber* and *S. androgynus* extract could increased the level of B220+ cells in lymph node. Another study explains that both plants also modulate the immune system via increase the level of IL-2, CD4+, and IFN- γ . B- cell differentiation is influenced by many cytokines, such as IL-2, IL-4, IL-6, IL-10, and IL-21.¹⁷ Berglund et al. (2013),¹⁷ study explain that IL-2 have a role during B-cell differentiation. IL-21 is a cytokine that induced CD25 (IL-2R α) in normal condition. IL-21 had role as induced the B cells to the stimulatory effect of IL-2 via STAT3 (Figure 3).

In this study we examined the possible effectiveness of formulation of *E. scaber* and *S. androgynus* to promoting B lymphocyte cell and also IL-2 produced by CD4+ T cells. The treatment of P1 and P2 given the possible effective treatment to promote not only B220+ but also IL-2 produced CD4+ T cell. This study agreed with Nurmamulyosari (2015),¹² that the flavonoid contained in both plants were able to increase production of IL-2, IL-4, and IL-1 cytokine wich gives direct impact on proliferation and differentiation of T cells and B cells. Beside flavonoid, saponin also contains in the *E. scaber* and *S. androgynus* leaves extract. Flavonoid and saponin have role as induced the cell proliferation via sythesis the proto-oncogene c-fos and c-myc. The proto-oncogene role

as cell proliferation is increasing the mitogen signal transduction through the increased expression of cytokine IL-2 (Jannah, 2016)

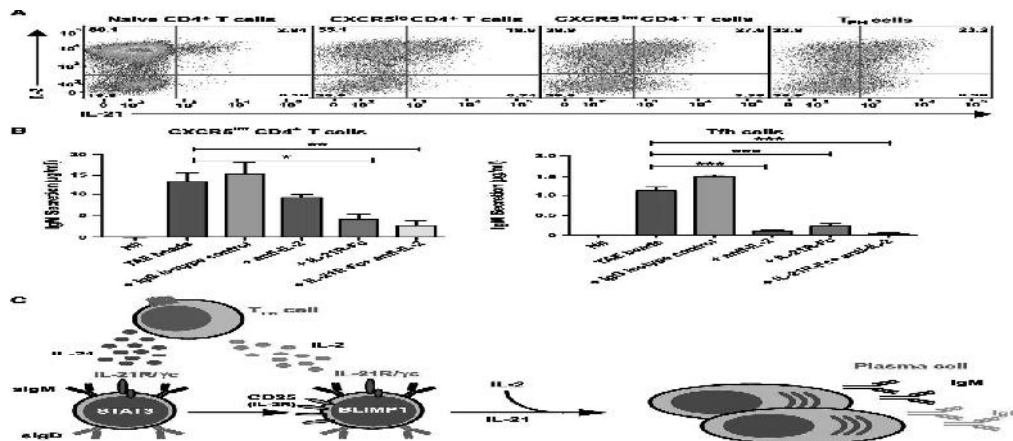


Figure 3. Pathways of IL-21 induced activation of B cells via STAT 3, while from the expression of Thf cells would reveal IL-2 to induced activation of B cell via BLIMP 1. Both IL-2 and IL-21 have similarities in their structure and functional. IL-2 and IL-21 are secreted by activated CD4+ T cell (Berglund et al, 2013).

The expression level of prolactin hormone

The prolactin level from all group treatments were showed in figure 4. The infection of *S. typhi* could decreased the level of prolactin compared with the level of prolactin of the normal pregnancy mice (K-). The decreasing of level prolactin occurred not only in 9 pregnancy but also 13 and 17 days pregnancy after *S. typhi* infection. The extract leaves of *E. scaber* and *S. androgynus* were administrated for 5 group treatments given a various level of prolactin hormone. In the 13 days pregnancy, the P2 and P5 treatments could increased significantly ($P < 0.05$) the level of prolactin hormone compared with the K+ group. In 17 days pregnancy only P5 treatment could increased significantly ($P < 0.05$) the level of prolactin hormone compared with the Salmonella infection group (K+).

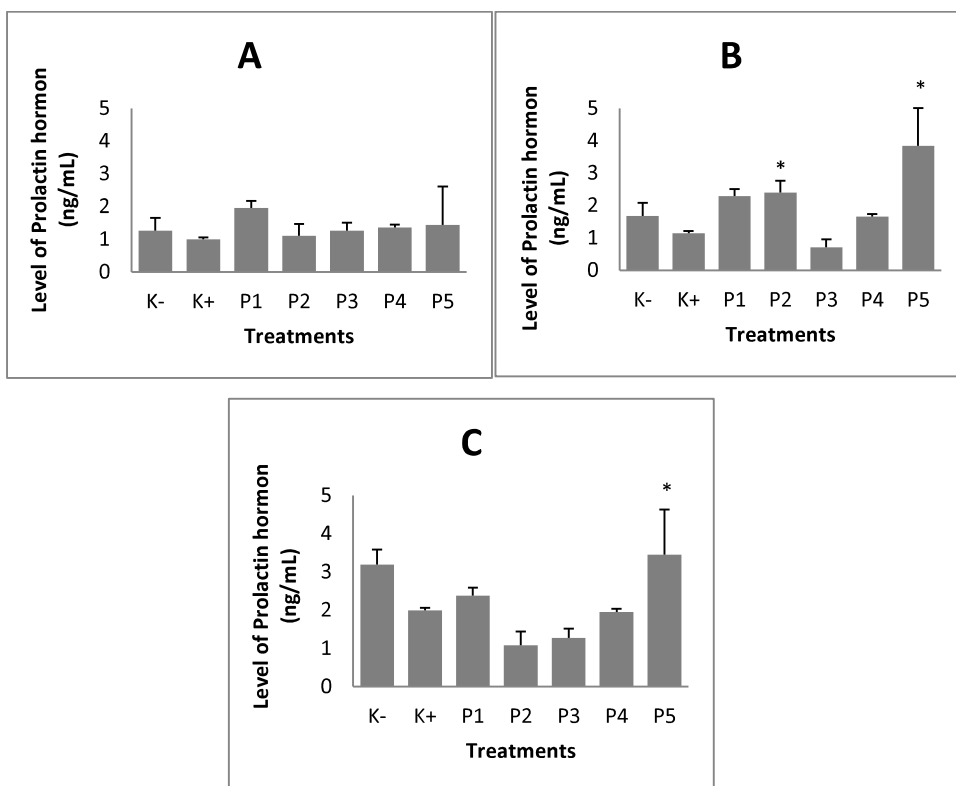


Figure 4. (A) Prolactin hormone level in 9 days pregnancy after *S. typhi* infection and administrated with combination *E. scaber* and *S. androgynus* leaves extract. (B). Prolactin hormone level in 13 days pregnancy after *S. typhi* infection and administrated with combination *E. scaber* and *S. androgynus* leaves extract. (C) Prolactin hormone level in 17 days pregnancy after *S. typhi* infection and administrated with combination *E. scaber* and *S. androgynus* leaves extract. K-, control; K+, *S. typhi* infection; P1, *S. typhi* infection with 100% of *E. scaber*; P2, *S. typhi* infection with 75% of *E. scaber* and 25% of *S. androgynus*; P3, *S. typhi* infection with 50% of *E. scaber* and 50% of *S. androgynus*; P5: *S. typhi* infection with 25% of *E. scaber* and 75% *S. androgynus*; P5: *S. typhi* infection with 100% of *S. androgynus*. Values are mean of three replicate determinations with $p < 0.05$ (This data processed to be published).¹³

Prolactin is a major pregnancy hormone, it was complicated mechanism to understanding, they have role as supports endocrine system such as maintenance the level of progesterone and estrogen during pregnancy,^{18, 19} besides that they also have role as erythropoiesis simulation.¹³ The finding reported herein is *S. typhi* infection not only reduced the level of B lymphocyte and IL-2 produced CD4⁺ T cells, but also reduced the levels of prolactin hormone. Lipopolysaccharides (LPS) contained in cell wall of gram-negative bacteria was found to lead activation of macrophage, this makes the production of a proinflammation cytokine such as IL-6, IL-1 β , and TNF- α increased.²⁰

The 2nd International Conference of Medical & Health Sciences and The 2nd Life Sciences Conference 2016

Proinflammation cytokine is one of factor inhibitor prolactin, when the proinflammation cytokine increased, it would be inhibited the production of prolactin, so that the level of prolactin hormone was decreased.

The administrated of *E. scaber* and *S. androgynus* extract was proved increased the level of prolactin hormone. Both of the plants contain flavonoid apigenin. In the another report explains that flavonoid apigenin could inhibit LPS-induced up-regulation of pro-inflammatory cytokines, such as IL-1 β , IL-6 and IL-12 β .²⁰ MAPK-mediated signaling pathways have a major role in LPS-induced pro-inflammatory cytokine. Another pathway, LPS activates ERK1/2, p38 MAPK, and Jun N- terminal kinase (JNK). Zhang et al (2014),²⁰ explain that ERK1/2 has ben shown to induce LPS-induced IL-6 production. Apigenin inhibited LPS-induced IL-1 β and TNF- α production by inhibiting caspase-1 activation through the disturbance of NLRP3 inflammasome assembly. Apigenin also prevented LPS-induced IL-6 and IL-1 β production by reducing the mRNA expression by inhibiyng ERK1/2 activation. Beside apigenein, Flavonoid luteolin that contains in the *E. scaber* and *S. androgynus* also could inhibit LPS-induced pro-inflammation. Another study report that luteolin had activity to reducing the activation of several MAPK family members, and its inhibitory action on TNF- α release correlation with inhibition of ERK 1/2, p38, and CK2 activation.²¹

CONCLUSION

The combination extract of *E. scaber* and *S. androgynus* were proven as a modulator of the production of B220, IL-2 produced by CD4+, and prolactin hormone. The effective formulation of combination extract leaves of *E. scaber* and *S. androgynus* to modulated the relative number of B220+ was P1 and P2. Both extract plants also effective to increased the level of IL-2 produced by CD4+ T cells, especially in P1-P5. The effective treatment to induce prolactin hormone is P2 and P5, it was not simple one but complicated mechanism, balance system, holistic mechanism as well.

REFERENCES

1. Shukla, G., Verma, I., Sharma, L. Effect of *Salmonella entric Serovar Typhimurium* in Pregnant Mice: A Biochemical and Histopathological Study. *Gastroenterology*. 2012; 5 (3): 103-111.
2. Djati, M.S., Rahma, Y.A., Dwijayanti, D.R., Rifa'i, M., Rahayu, S. Optimizing Combination of *Elephantopus Scaber* and *Sauropus Androgynus* Extract For Modulating Prolactin Hormone And Erythropoiesis In Pregnant Mice After *Salmonella Typhi* Infection. Accepted article in the Tropical Journal of Pharmaceutic Research. 2016.
- 3.

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

4. Djati M.S., Dwijayanti, D.R., Rifa'i, M, Synergetic Modulation of T Lymphocyte and TER 119+ Cell Using Combination of *Elephantopus scaber* and *Polyscias obtusa* Extract in Pregnant Mice After *Salmonella typhi* Infection. *Int J Pharmn Bi Sci*, 2015; 6 (4B): 1228-1234
5. Basyarudin, M., Djati, M.S., Rahayu, S. Bone Marrow Cells Lymphocyte Activity of Pregnant Mice with Therapy of *E. scaber* and *S. androgynus* Post Infection *Salmonella typhimurium*. *J Exp Life Sci*, 2015; 5 (1): 50-55.
6. Djati, M.S., Dwijayanti, D.R., Rifa'i, M. Herbal Supplement formula of *Elephantopus scaber* and *Sauropus androgynus* promotes IL-2 Cytokine Production of CD4+ T Cells in Pregnant Mice with Typhoid Fever. *Open life sci*, 2016; 11 (Issue 1): 211-219.
7. Khadim, R.A. & Al-awadi, H. Changes in Testosterone, Progesterone and Prolactin Levels in Pregnant Women with Chronic Toxoplasmosis. *Medical J of Babylon*. 2013; 10 (issue 3): 699-708.
8. Richards, R. G. & Almond, G.W. Lipopolysaccharide Induce Increases in Porcine Serum Cortisol and Progesterone Concentration are not Mediated Solely by Prostaglandin F2 α . *Inflammation*, 1994; 18 (2): 203-204.
9. Im, H., Park, N., Kwon, Y., Shin, S., Kim, D., Chun, Y. Bacterial Lipopolysaccharides Induce Steroid Sulfatase Expression and Cell Migration Through IL-6 Pathway in Human Prostate Cancer Cells. *Biomol Ther*. 2012; 20 (6): 556-561.
10. Khaista, N., Singla, N., Bansal, N., Chander, J. *Salmonella typhi* Isolation in a Pregnant Woman: Determining the Importance. *J Clin Diagnostic Res*, 2013; 7 (9): 2100-2101.
11. Pejic-Karapetrovic B, Gurnani K, Russell MS, Finlay BB, Sad S, Krishnan L. Pregnancy Impairs the Innate Immune Resistance to *Salmonella typhimurium* Leading to Rapid Fatal Infection. *J Immunol*. 2007; 179 (9): 6088-96.
12. Vigliani, M.B. & Bakardijev, A.L. First Trimester Typhoid Fever with Vertical Transmission of *Salmonella typhi*, an Intracellular Organism. *Case Rep Med*, 2013; 2013: 973297..
13. Nurmamulyosari, L.D., Djati, M.S., Widyarti, S. Bioactivity of Combination *Elephantopus scaber* and *Sauropus androgynus* on the Level of B220 cells of Lymph Node in Pregnant Typhoid BALB/c Mice. *J. Exp. Life Sci*. 2015. 5 (2): 68-71.
14. Djati, M.S. 2016. *Elephantopus scaber* and *Sauropus androgynus* Regulate Macrophages and B Lymphocyte Cells during *Salmonella typhi* Infection. The proceeding of 1st International Basic Science Conference, Jember, 26-27 September 2016.
15. Jannah, N., Djati, M.S., Widyarti, S. Immunomodulatory Effect of *Elephantopus scaber* and *Sauropus androgynus* Extract to Cellular Immune Response in

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

- Pregnant *Mus musculus* Infected by *Salmonella typhimurium*. *J Exp LifeSci*, 2016; 6 (1): 5-9.
16. Subekti, S., Sumarti, S.S., Murdiarti, T.B. Pengaruh Daun Katuk (*Sauropus androgynus* L. Merr) dalam Ransum terhadap Fungsi Reproduksi pada Puyuh. *JITV*, 2008; 13 (3): 167-173.
 17. Blattman, JN., Garyson JM., Wherry EJ, Kaech SM, Smith KA, Ahmed R. Therapeutic Use of IL-2 to Enhance Antiviral T-cell Responses in Vivo. *Nat Med*, 2003; 9 (5): 540-547
 18. Berglund, L.J., Avery D.T., Ma, C.S., Moens L., Deenick E.K., Bustamante, J., et al. IL-21 Signalling Via STAT 3 Primes Human Naive B Cells to Respond to IL-2 to Enhance Their Differentiation Into Plasmablasts. *Blood*, 2013; 122 (24): 3940-3950.
 19. Mednick, D.L., Barkley, M.S., Geschwind, I.I. Regulation of Progesteron Secretion by LH and Prolactin During the First of Pregnancy in the Mouse. *J Reprod Fert*, 1980; 60 (1): 201-207.
 20. Dorrington, J. Gore-Langton, R.E. 1981. Prolactin Inhibits Oestrogen Synthesis in The Ovary. *Nature*. 290 (5807): 600-2.
 21. Zhang, X., Wang, G., Gurley, E.C., Zhou, H. Flavonoid Apigenin Inhibits Lipopolysaccharide-Induced Inflammatory Response through Multiple Mechanisms in Macrophages. *Plos One*, 2014; 9 (9): 1-18.
 22. Xagorari, A., Roussos, Charis., Papapetropoulos, A. Inhibition of LPS-Stimulated Pathways in Macrophages by the Flavonoid Luteolin. *Br J Pharmacol*, 2002; 136 (7): 1058-1064.