

# **1st International Conference Postgraduate School (ICPSUAS 2017)**

**Implementation of Climate Change  
Agreement to Meet Sustainable  
Development Goals**

Advances in Social Science, Education and  
Humanities Research Volume 98

Surabaya, Indonesia  
1 – 2 August 2017

## **Editors:**

**Hj. Sri Iswati  
Anwar Ma'ruf**

**Dina Sunyowati  
Ignatius Nalarkusumamurti Sutirto**

ISBN: 978-1-5108-5690-5

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2018) by Atlantis Press  
All rights reserved.  
<https://www.atlantis-press.com/proceedings/icpsuas-17>

Printed by Curran Associates, Inc. (2018)

For permission requests, please contact the publisher:

Atlantis Press  
Amsterdam / Paris

Email: [contact@atlantis-press.com](mailto:contact@atlantis-press.com)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

Search

Series: [Advances in Social Science, Education and Humanities Research](#)

**Proceedings of the 1st International Conference  
Postgraduate School Universitas Airlangga :  
"Implementation of Climate Change Agreement to Meet  
Sustainable Development Goals" (ICPSUAS 2017)**

---

ORGANIZERS

---

**Steering Committee**

**Prof. Ir. Moch. Amin Alamsjah, M.Si., Ph.D.**

Airlangga University, Indonesia

**Prof. Dr. Hj. Sri Iswati, S.E., M.Si., Ak.**

Airlangga University, Indonesia

**Prof. H. Hery Purnobasuki, Drs., M.Si., PhD.**

Airlangga University, Indonesia

**Prof. Dr. Nyoman Tri Puspaningsih, M.Si.**

Airlangga University, Indonesia

**Prof. Dr. Nunuk Dyah Retno L., Drh., MS.**

Airlangga University, Indonesia

**Prof. Dr. H. Muslich Anshori, S.E., M.Sc., Ak., CA.**

Airlangga University, Indonesia

**Prof. Dr. Fendy Suhariadi, M.T., Psi.**

Airlangga University, Indonesia

### **Organizing Committe**

**Prof. Hj. Romziah Sidik, Drh., Ph.D.**

Airlangga University, Indonesia

**Dr. Suparto Wijoyo**

Airlangga University, Indonesia

**Suryo Kuncorojakti, Drh., M.Vet.**

Airlangga University, Indonesia

**Hardany Primarizky, Drh., MVM.**

Airlangga University, Indonesia

**Asmaul Chusna**

Airlangga University, Indonesia

**Fira Nurafini, S.El.**

Airlangga University, Indonesia

### **Scientific Committe**

**Herlambang Pradana, S.H., M.A., Ph.D.**

Airlangga University, Indonesia

**Dr. Prihartini Widiyanti, Drg., M.Kes.**

Airlangga University, Indonesia

**Prof. Dr. Sri Agus Sudjarwo, Drh., Ph.D.**

Airlangga University, Indonesia

**Iman Harymawan, S.E., MBA., Ph.D.**

Airlangga University, Indonesia

**Dr. Ferdiansyah, dr., Sp.OT.**

Airlangga University, Indonesia

**Prof. Myrtati Dyah Artaria, Dra., M.A., Ph.D.**

Airlangga University, Indonesia

**Dr. Dewi Retno Suminar, Dra., M.Si.**

Airlangga University, Indonesia

**Dr. Suryani Dyah Astuti, M.Si.**

Airlangga University, Indonesia

**Prof. Dr. Subagyo Adam, M.S.**

Airlangga University, Indonesia

**Prof. Dr. Hari Suprpto, Ir., M.Agr.**

Airlangga University, Indonesia

**Dr. Agung Dwi Wahyu Widodo, dr., M.Si.**

Airlangga University, Indonesia

**Dr. Sri Herianingrum, S.E., M.Si.**

Airlangga University, Indonesia

**Dr. Ahmad Yudianto, dr., SpF., M.Kes., S.H.**

Airlangga University, Indonesia

**Dr. Christijogo Sumartono, dr., Sp.An. (KAR)**

Airlangga University, Indonesia

**Dr. Sarwirini, S.H., M.S.**

Airlangga University, Indonesia

**Dr. Lilik Pudjiastuti, S.H., M.H.**

Airlangga University, Indonesia

**Dr. Windijarto, S.E., MBA.**

Airlangga University, Indonesia

**Tan Evan Tandiono, S.E., S.Pd.K.**

Airlangga University, Indonesia

**Dr. Nove Hidajati, Drh., M.Kes.**

Airlangga University, Indonesia

**Dr. Rimayanti, Drh., M.Kes.**

Airlangga University, Indonesia

**Ratna Damayanti, Drh., M.Kes.**

Airlangga University, Indonesia

**M. Gandul Atik Y., Drh., M.Kes.**

Airlangga University, Indonesia

**Kukuh Leksono, S.H., LL.M.**

Airlangga University, Indonesia

**Wilda Prihatiningtyas, S.H., M.H.**

Airlangga University, Indonesia

## **Conference Editor**

**Prof. Dr. Hj. Sri Iswati, S.E., M.Si., Ak.**

Airlangga University, Indonesia

**Prof. Dr. Anwar Maâ€™ruf, drh., M.Kes.**

Airlangga University, Indonesia

**Dr. Dina Sunyowati, S.H., M.Hum.**

Airlangga University, Indonesia

**Ignatius Nalarkusumamurti Sutirto**

Airlangga University, Indonesia

## **Atlantis Press**

Atlantis Press is a professional publisher of scientific, technical and medical (STM) proceedings, journals and books. We offer world-class services, fast turnaround times and personalised communication. The proceedings and journals on our platform are Open Access and generate millions of downloads every month.

For more information, please contact us at: [contact@atlantis-press.com](mailto:contact@atlantis-press.com)

▶ PROCEEDINGS

▶ JOURNALS

▶ BOOKS

▶ PUBLISHING SERVICES

▶ ABOUT

▶ NEWS

▶ CONTACT

▶ SEARCH

---

[Home](#) [Privacy Policy](#) [Terms of use](#)



Copyright © 2006-2020 Atlantis Press



# TABLE OF CONTENTS

## SESSION: INDUSTRY, INNOVATION AND INFRASTRUCTURE

<b>ANALYSIS OF FACTORS THAT INFLUENCE THE RISK OF OCCUPATIONAL ACCIDENTS IN TERMS OF BEHAVIORAL ASPECTS (STUDY ON AIRCRAFT PAINT REMOVAL WORKERS IN PT. X)</b> .....	1
<i>Hesti Fiskalisa Purbayanti, Tri Martiana</i>	
<b>EARLY STUDY THE POTENCY OF TURMERIC (CURCUMA DOMESTICA VAL.) AS IMMUNOSTIMULATOR FOR LAYERS CHICKENS AGAINST AVIAN INFLUENZA (AI) VACCINE</b> .....	7
<i>Dyah Widhowati, Nurul Hidayah, Retina Yunani, Mijania Malia</i>	
<b>THE USE OF CELL FREE FETAL DNA [CFF-DNA] AS NON-INVASIVE TECHNIQUES ON PATERNITY TEST [FORENSIC IDENTIFICATION]</b> .....	10
<i>Ahmad Yudianto</i>	
<b>LIBRARIAN : ANALYSIS FACTORS OF CAREER DEVELOPMENT</b> .....	13
<i>Dimas Agung Trisliatanto, Koko Srimulyo, Helmy Prasetyo Yuwinanto, Mirza Dewi Suntari, Lastika Kusumawardhani</i>	
<b>THE COMPETENCY DEVELOPMENT MODEL BASED ON PERFORMANCE</b> .....	19
<i>Dimas Agung Trisliatanto, Fahih Suaedi, Fahmi Muhammad Az-Zuhri, Teguh Prasetyo, Rizka Pranatasari</i>	
<b>IDENTIFICATION HUMAN AND ANIMAL BLOOD MIXTURES USING HUMAN CYTOCHROME B GENE</b> .....	26
<i>Wimbuh Tri Widodo, Abdul Hadi Furqoni, Ahmad Yudianto, Sri Puji Astuti Wahyuningsih</i>	
<b>ANATOMICAL PATHOLOGY AND RADIOLOGY APPEARANCE OF BALLISTIC WOUND RESULT OF CAL. 177 AIR RIFLE WITH 4,5 MM PELLETS ON EXTRIMITY OF THE DOG (CANIS LUPUS FAMILIARIS) AT DIFFERENT SHOOTING DISTANCES</b> .....	29
<i>B. Putra, J. Rahmahani, E. Aksono, D. Legowo, B. Christoffel</i>	
<b>JOB SATISFACTION AND JOB MOTIVATION TOWARD PERFORMANCE THROUGH ORGANIZATIONAL COMMITMENT</b> .....	33
<i>Dimas Agung Trisliatanto, Tan Evan Tandiyono, Dimaz Ganjar Harry Pradana, Pristiandi Teguh Cahya, Nur Anilawati</i>	
<b>QUALITY AND QUANTITY TEST OF DNA FROM SPERM IN WATER IMMERSION</b> .....	39
<i>Abdul Hadi Furqoni, Wimbuh Tri Widodo, A. Yudianto</i>	
<b>IMMUNOMODULATION EFFECT OF MENIRAN (PHYLLANTHUS NIRURI LINN) ON BLOOD PROFILE OF BROILER CHICKENS INFECTED WITH ENTEROTOXIN OF ANTIBIOTIC-RESISTANT ESCHERICHIA COLI</b> .....	42
<i>Retno Sri Wahjuni, Emy Koestanti Sabdoningrum, Sri Hidanah, Diyantoro, R. Wahjuni</i>	

## SESSION: OPENING

<b>OBESITY IN PETS - ONE HEALTH AND ANIMAL WELFARE CONSIDERATIONS</b> .....	45
<i>Shane Ryan</i>	
<b>ENZOOTIC BOVINE LEUKOSIS: HOW TO PREVENT THE DISEASE AND CONTROL THE SPREAD OF BLV INFECTION.</b> .....	50
<i>Takeshi Haga</i>	
<b>CARBON ACCOUNTING REFLECTION AS A RESPONSE TO FACE THE CLIMATE CHANGE</b> .....	52
<i>Sri Iswati</i>	
<b>DEVELOPMENT OF LEGAL THEORY FOR ENVIRONMENT PROTECTION AND REMEDY FOR VICTIMS IN JAPAN</b> .....	56
<i>Yuzuru Shimada</i>	
<b>AN OVERVIEW OF THE SEAWEED CULTIVATION IN SEVERAL COUNTRIES: TECHNOLOGY AND CHALLENGE</b> .....	62
<i>Mochammad Amin Alamsjah</i>	

## **SESSION: GENDER EQUALITY**

<b>COULD THE EXISTENCE OF MICROFINANCE INSTITUTION FOR ALLEVIATION POVERTY IN RURAL AREA? A CASE STUDY IN WOMEN'S COOPERATIVE IN MAGERSARI VILLAGE, PLUMPANG SUB-DISTRICT, EAST JAVA, INDONESIA</b> .....	69
<i>Rustinsyah</i>	
<b>WOMEN EMPOWERMENT TO SUPPORT FAMILIES ECONOMY IN SUKAMUKTI CIAMIS INDONESIA</b> .....	76
<i>Nuning Kurniasih, Pawit M. Yusup, Engkus Kuswarno</i>	
<b>THE INFLUENCE OF EMOTIONAL INTELLIGENCE TO THE PERFORMANCE OF FEMALE LECTURERS AT SEVERAL PRIVATE COLLEGES IN BALIKPAPAN</b> .....	79
<i>Mardatillah</i>	

## **SESSION: RESPONSIBLE CONSUMPTION AND PRODUCTION**

<b>UTILIZATION OF DIGESTIBLE NUTRIENTS OF FEED RATIONS CONTAINING BLACK GLUTEN AND RED RICE BY MINI REX RABBIT</b> .....	83
<i>S. Romziah , K. Emy, H Sri</i>	
<b>PRODUCTION OF CARP IMMUNOGLOBULIN M EXPOSED WITH WHOLE PROTEIN FROM MYXOBOLUS KOI SPORE THROUGH FEED AS AN IMMUNOSTIMULANT</b> .....	87
<i>Moch. Saad, Gunanti Mahasri, Woro Hastuti Satyantini</i>	
<b>THE INFLUENCE OF THE DIFFERENT COMMERCIAL PROBIOTIC ON THE BIOFLOC NUTRITION</b> .....	94
<i>Endang Dewi Masithah, Fitri Anisha Kurniawati, Azhar Muhammad Helmi</i>	

## **SESSION: GOOD HEALTH AND WELL-BEING**

<b>ANTIGENIC PROTEIN OF LEUCOCYTOZOON CAULLERYI SCHIZONT INDUCING CELLULAR IMMUNE RESPONSE: TLR-2 AND CD4 AS MARKER</b> .....	98
<i>Nunuk Dyah Retno Lastuti, Endang Suprihati, Dony Chrismanto, Anwar Ma'Ruf</i>	
<b>INFECTIOUS RESPIRATORY SUSPECT MALLEUS IN PONY HORSE AT SIDOARJO EAST JAVA INDONESIA</b> .....	102
<i>Arya Pradana Wicaksono, Romziah Sidik</i>	
<b>CONSUMER PROTECTION ON THE CIRCULATION OF COSMETIC ONLINE</b> .....	104
<i>Lilik Pudjiastuti, Emanuel Sujatmoko, Indrawati</i>	
<b>THE TRADITIONAL WAY IN PREVENTING AND OVERCOMING HEALTH PROBLEMS AMONG SULFUR MINERS IN THE CRATERS OF IJEN</b> .....	109
<i>Wisnu Setiadji, Myrtati D. Artaria</i>	
<b>SELF INDEPENDENCE OF FAMILY PLANNING IN URBAN AREA GRESIK DISTRICT</b> .....	114
<i>Yuly Sulistyorini, Nunik Puspitasari, Diah Indriani, Rachmah Indawati</i>	
<b>ANALYSIS OF THE EFFECT OF INDIVIDUAL, FAMILIAL AND ENVIRONMENTAL FACTORS ON FAMILY STIGMA OF LEPROSY IN JOMBANG REGENCY, EAST JAVA INDONESIA</b> .....	118
<i>Nasrudin , Tjipto Suwandi, Cholichul Hadi, A. Yusuf, R. Hargono</i>	
<b>THE FREQUENCY OF Y-PATTERN DENTAL TRAITS ON LOWER MOLAR OF JAVANESE DEUTROMALAYID</b> .....	123
<i>Aprian A. Prastya, Myrtati D. Artaria</i>	
<b>ANTIDIABETIC EFFECT ON TEA OF PLUCHEA INDICA LESS AS FUNCTIONAL BEVERAGE IN DIABETIC PATIENTS</b> .....	126
<i>Yesiana Dwi Wahyu Werdani, Paini Sri Widyawati</i>	
<b>DESIGN OF A WIRELESS TELEMETRIC SENSOR SYSTEM FOR MONITORING THE DEVELOPMENT AND TREATMENT OF CHRONIC DIABETIC FOOT INJURIES</b> .....	130
<i>Suryani Dyah Astuti, Tri A. Prijo, Wirda A. Ridyananda, I. Suhariningsih</i>	
<b>ACTIVATION OF FAK EXPRESSION IN INFLUENCING BONE DENSITY BY EXERCISE TRAINING FOR DECREASIS OSTEOPOROTIC RISK</b> .....	133
<i>Nurul Mahmudati, Hawin Nurdiana</i>	
<b>ANTIMICROBIAL USAGE SURVEILLANCE OF CATTLE IN INDONESIA TO ADDRESS ANTIMICROBIAL RESISTANCE</b> .....	136
<i>Havan Yusuf, Syafrison Idris, Mathilde Paul, Theera Rukkwamsuk</i>	

<b>EFFECTS OF HEAT EXPOSURE DURATION ON SALIVA TRACES ON CIGARETTE BUTTS AS FORENSIC IDENTIFICATION TOOLS</b> .....	141
<i>Mely Purnadianti, Andika Aliviameita, Diah Ayu Nur Rochmawati, Dian Amanovitasari</i>	
<b>THE USAGE OF VISUM ET REPERTUM (VER) AS A SCIENTIFIC EVIDENCE IN ANIMAL ABUSE ACCORDING TO THE PERSPECTIVE OF THE PENAL CODE (KUHP) AND THE LAW OF CRIMINAL PROCEDURE CODE (KUHAP) IN INDONESIA</b> .....	144
<i>A. Bilqishti, N. Ignatius, H. Pudji, Haniyah, Sadjijono</i>	
<b>POLICY INSTRUMENTS ON REPRODUCTIVE HEALTH AS REALIZATION OF CIVIL RIGHTS IN GENDER EQUALITY AND JUSTICE</b> .....	148
<i>Lina Hastuti, Lilik Pudjiastuti, Sukardi</i>	
<b>MODEL OF ADOLESCENT REPRODUCTIVE HEALTH INFORMATION DISSEMINATION IN BANDUNG WEST JAVA INDONESIA</b> .....	153
<i>Nuning Kurniasih</i>	
<b>RELATION EFFECT OF VARIATION TIME STORAGE YAM TUBER (PACHYRRHIZUS) TO CHOLESTEROL RATTUSNORVEGICUS</b> .....	157
<i>Anggi Khairina Hanum Hasibuan, Wa Ode Diana, Yosephin Anis Widiyanti</i>	
<b>PROTEIN SIGNAL TRANSDUCERS AND ACTIVATORS TRANSCRIPTION (STAT) AS GROWTH PROMOTER</b> .....	162
<i>Anwar Ma'Ruf, Ngakan Made Rw, M. Sukmanadi, Ratna Damayanti</i>	
<b>POTENTIAL PROTEIN GHRELIN ORIGIN OF PLANT AS ENERGY BALANCE SETTINGS FOR FEED EFFICIENCY</b> .....	166
<i>Nove Hidayati, Chairul Anwar, Ratna Damayanti</i>	
<b>ANTIOXIDANT ACTIVITY ASSAY OF ALPHA-MANGOSTIN FOR AMELIORATION OF KIDNEY STRUCTURE AND FUNCTION IN DIABETIC MICE</b> .....	170
<i>Saikhu Akhmad Husen, Firas Khaleyla, Arif Nur Muhammad Ansori, Raden Joko Kuncoroningrat Susilo, Dwi Winarni, Salamun</i>	
<b>RISK ANALYSIS OF OCCUPATIONAL DISEASES IN HARBOR COMMUNITY</b> .....	175
<i>Martiana Tri, N. Widajati</i>	
<b>THE VASCULAR DISTRIBUTION USING COLOR DOPPLER SONOGRAPHY IN AXILLARY NODES OF BREAST CANCER TO ASSES METASTASIS</b> .....	179
<i>Lailatul Muqmiroh, Lies Mardiyana, Heru Purwanto, Sri Agustiniingsih</i>	
<b>PHOTODYNAMIC INACTIVATION FOR PHATOGENIC BACTERIA: ADDING CHLOROPHYLL AND OXYGEN</b> .....	185
<i>Basitha Febrinda Hidayatulail, Moh. Yasin, Suryani Dyah Astuti</i>	
<b>THE EFFECT OF DAYAK ONION (ELEUTHERINE PALMIFOLIA) TUBER EXTRACT IN LIVER MALONDIALDEHYDE (MDA) LEVEL IN MALE WISTAR RATS INDUCED BY ALLOXAN</b> .....	189
<i>Risqia Damayanti, Anwar Ma'Ruf</i>	
<b>FISH PROTEIN PROFILE SUBMERGE ALUM SOLUTIONBASED ON SDS-PAGE</b> .....	192
<i>Akhmad Mubarak, S. Darmawati, T. Endang</i>	
<b>EFFECTIVENESS TEST OF AKAR KUCING PLANT EXTRACT (ACALYPHA INDICA LINN) TO LOWER TOTAL CHOLESTEROL LEVELS IN RATS (RATTUS NOVERGICUS) WHICH INDUCED HYPERCHOLESTEROLEMIA DIET</b> .....	195
<i>Retno Sri Wahyuni, Fitria Agung Nugrahaningtyas, Nove Hidayati, Rochmah Kurnijasanti</i>	

## **SESSION: DECENT WORK AND ECONOMIC GROWTH**

<b>INDICATOR OF ZAKAT OVER MUZAKKI AN EXPLANATORY STUDY ON BAZNAS OF CENTRAL JAVA PROVINCE</b> .....	198
<i>Suraji, Sri Iswati</i>	
<b>KAILI WOMEN'S EMPOWERMENT IN INDONESIA</b> .....	202
<i>Indah Ahdiah, B. Suyanto, I. Wirawan</i>	
<b>THE ROLE OF MUHAMMADIYAH IN THE DEVELOPMENT OF SOCIAL CAPITAL COMMUNITY</b> .....	206
<i>Sri Iswati, Sri Herianingrum, Muslich Anshori, H. Effendie, Tika Widiastuti, Ririn Tri Ratnasari</i>	
<b>ROLE OF SOCIAL EUNTERPRENEURSHIP ON POVERTY REDUCTION AND ECONOMIC GROWTH IN INDONESIA</b> .....	211
<i>Risma Ayu Kinanti, Sri Iswati, Tjiptohadi Sawarjuwono, Ririn Tri Ratnasari</i>	
<b>WAQF PRODUCTIVE EFFICIENCY: EVIDENCE FROM YAYASAN BADAN WAKAF SULTAN AGUNG, SEMARANG</b> .....	217
<i>Tika Widiastuti, Wahyuningsih</i>	

<b>EFFECT OF THE FINANCING OF SHARIA BANK ON THE INFLATION IN INDONESIA .....</b>	<b>225</b>
<i>Anas Alhifni, Rully Trihantana Rully, Maya Apriyana</i>	
<b>EMPOWERING COMMUNITY INFORMATION GROUP: STRATEGIC COMMUNICATION PLAN IN COMMUNICATION AND INFORMATICS OFFICE OF MALANG CITY .....</b>	<b>230</b>
<i>Dani Maroe Beni</i>	
<b>EVALUATION OF INVESTMENT POLICY IN THE FORM OF TAX HOLIDAY IN ORDER TO INCREASE INDONESIAN ECONOMIC GROWTH .....</b>	<b>240</b>
<i>Resha Dwiayu Pangesti Mulyono, Elia Mustikasari</i>	
<b>THE EXTERNAL AND INTERNAL FACTORS ON MICRO, SMALL AND MEDIUM ENTERPRISE (SME) FINANCING IN ISLAMIC BANK .....</b>	<b>244</b>
<i>Fira Nurafini, Raditya Sukmana, Sri Herianingrum</i>	
<b>ANALYSIS OF THE ROLE SHARIA FINANCING AND CHARACTERISTICS OF BUSINESS INSTITUTIONS TO MICRO, SMALL AND MEDIUM ENTERPRISE (MSMES) DEVELOPMENT IN SOLOK CITY OF WEST SUMATERA .....</b>	<b>249</b>
<i>Neng Kamarni, Muslich Anshori</i>	
<b>THE LINKAGE BETWEEN ECONOMIC GROWTH AND DEFORESTATION IN OIC (THE ORGANIZATION OF ISLAMIC COOPERATION) COUNTRIES .....</b>	<b>253</b>
<i>Rani Puspitaningrum, Raditya Sukmana, Imron Mawardi</i>	
<b>EMPLOYEES' COMMITMENT BUILDING THROUGH SOCIAL ESTEEM AT THE REMUNERATION'S INCREASEMENT OF RECOGNITION AN SELF-ACTUALIZATION NEED IN MASLOW THEORY .....</b>	<b>259</b>
<i>Djoko Soelistya</i>	
<b>THE DYNAMIC ANALYSIS ON IMPACTS OF EDUCATION AGAINST POVERTY REDUCTION .....</b>	<b>262</b>
<i>Sri Herianingrum, Sri Iswati, Muslich Anshori</i>	
<b>THIRD PARTY FUNDS, NUMBER OF CAPITAL, AND NON PERFORMING FINANCING TO THE NUMBER OF MUDHARABAH FINANCING IN INDONESIA'S SHARIA BANKING .....</b>	<b>266</b>
<i>Muhammad Iqbal Surya Pratiko, Ririn Tri Ratnasari</i>	
<b>ISLAMIC WORK ETHIC AND SATISFACTION WITH INTRINSIC MOTIVATION AS MEDIATOR VARIABLE .....</b>	<b>272</b>
<i>Rio Eriawan Putra Tohari, Ririn Tri Ratnasari</i>	
<b>BUILDING SOFT SKILLS AS THE PEOPLE-JOB FIT TO OVERCOME COUNTERPRODUCTIVE WORK BEHAVIOR IN CREDIT ASSESSMENT BANKING SECTOR: A LITERATURE REVIEW .....</b>	<b>276</b>
<i>Dewi Khrisna Sawitri</i>	
 <b><u>SESSION: CLEAN WATER AND SANITATION</u></b>	
<b>THE MANAGEMENT MODEL ON INTEGRATED SETTLEMENT WASTEWATER TREATMENT SYSTEM (SPAL) IN SUPPORTING HEALTH DEVELOPMENT .....</b>	<b>281</b>
<i>Lilik Pudjiastuti</i>	
<b>WATER TRADE IN ISLAMIC BUSINESS ETHICS PERSPECTIVE: EVIDENCE FROM INDONESIA .....</b>	<b>285</b>
<i>Bahrina Almas, Tjiptohadi Sawarjuwono, Sri Iswati</i>	
 <b><u>SESSION: ZERO HUNGER</u></b>	
<b>OPTIMIZATION OF FOOD ESTATE PROGRAM THROUGH CASH WAQF TO ACHIEVE FOOD SOVEREIGNTY OF INDONESIA .....</b>	<b>290</b>
<i>Denizar Abdurrahman Miraj, Ummi Muthia Fathy, Muhammad Nafik Hadi Ryandono, Tjiptohadi Sawarjuwono</i>	
 <b><u>SESSION: CLIMATE ACTION</u></b>	
<b>BLUE CARBON: ROLE OF SEA TO THE BALANCE OF CLIMATE WITHIN THE MITIGATION FRAME OF CLIMATE CHANGE .....</b>	<b>294</b>
<i>Sunyowati Dina, Ria Tri Vinata</i>	

<b>LOCAL CONCERN ON PLASTIC BAG CHARGE IN INDONESIA: DO WE REALLY CARE?</b> .....	298
<i>Nuzulul Kusuma Putri</i>	
<b>MAKING MODEL OF VILLAGE REGULATION BASED ON GOOD VILLAGE GOVERNANCE IN INDONESIA</b> .....	302
<i>Suparto Wijoyo, Radian Salman, Bagus Oktafian Abrianto</i>	
<b>STRIP INTERCROPPING PRODUCTIVITY OF MODERN MAIZE HYBRID VARIETIES WITH PULSE CROPS ON A DRYLAND</b> .....	309
<i>I Komang Damar Jaya, Sudirman, Rosmilawati</i>	
<b>ANISAKIDAE AS A BIOINDICATOR CANDIDATE IN RESPONSE OF ENVIRONMENTAL DAMAGE</b> .....	313
<i>Hartanto M. Raharjo, Setiawan Koesdarto, Qabilah C. K. N. Sumarsono, Febrina D. Permatasari, Zafitri N. Wastomi, Nurul S. A. Sari</i>	
<b>ANALYSIS OF THE DISCLOSURE OF GREENHOUSE GAS EMISSIONS AND ENVIRONMENTAL PERFORMANCE IN LISTED FIRMS AT JAKARTA ISLAMIC INDEX (JII)</b> .....	316
<i>Dwi Swasana Ramadhan, Azizah Anshori, Sri Iswati, Sri Herianingrum</i>	
<b>MARINE ENVIRONMENT AND CLIMATE CHANGE : LEGAL ASPECTS OF PROTECTION AND PREVENTION AGAINST CORAL REEFS DEGRADATION IN INDONESIA</b> .....	321
<i>Dina Sunyowati, Annisa Firdhausy</i>	

### **SESSION: ZERO POVERTY**

<b>ISLAMIC CONCEPTS AS EFFORT TO UTILIZE WASTELAND OF PUBLIC REVENUE DISTRIBUTION</b> .....	325
<i>Ridan Muhtadi, Sri Iswati, A. Rohman</i>	
<b>INFLUENCE OF INFLATION ON POVERTY IN SURABAYA AND ISLAMIC SOLUTIONS IN ERADICATING POVERTY</b> .....	331
<i>Amaliah Al Azmi, S. Iswati, R. Sukmana, R. Ratnasari</i>	
<b>ECONOMIC DEVELOPMENT IN INDONESIA: INTEGRATED MODEL OF ISLAMIC FINANCIAL INCLUSION</b> .....	335
<i>Laila Masruro Pimada, N. Firdaus</i>	
<b>POVERTY ALLEVIATION: AN ECONOMIC PRACTICE STUDY OF ISLAM IN CULTURE</b> .....	341
<i>Renny Oktafia, M. Anshori, I. Mawardi</i>	
<b>DETERMINANTS OF SUCCESS IN VENTURE CAPITAL ASSISTANCE RECIPIENTS IN YAYASAN DANA SOSIAL AL-FALAH (YDSF) SURABAYA</b> .....	345
<i>Doddy Koesnadhi, Tika Widiastuti, Sri Herianingrum</i>	
<b>OPTIMIZING FUND MANAGEMENT OF MOSQUE CASH FOR ECONOMIC EMPOWERMENT OF PEOPLE</b> .....	350
<i>Sri Wulandari, T. Sawarjuwow, S. Iswati</i>	
<b>ENHANCING FARMER'S INDEPENDENCE BY BAITUL MAAL WAT TAMWIL CONCEPT</b> .....	355
<i>Vina Septiana Permatasari, T. Sawarjuwono, S. Iswati</i>	
<b>THE MOVING OUT OF POVERTY OF MUSTAHIQ PRODUCTIVE ZAKAT IN INDONESIA</b> .....	359
<i>Imron Mawardi, Tika Widiastuti, Puji Sukmaningrum</i>	
<b>ISLAMIC FINANCIAL DEVELOPMENT AS EFFORTS TO ACCELERATE ECONOMIC DEVELOPMENT AND POVERTY ALLEVIATION</b> .....	365
<i>Elsi Mersilia Hanesti, Sri Herianingrum, Raditya Sukmana</i>	
<b>HADD AL- KIFAYAH (SUBSISTENCE CRITERIA) AS A MEASUREMENT OF ISLAMIC SOCIO-ECONOMIC SECURITY</b> .....	372
<i>Imron Mawardi, Sri Herianingrum, T. Widiastuti</i>	

**Author Index**

# Antigenic Protein of *Leucocytozoon caulleryi* schizont Inducing Cellular Immune Response: TLR-2 and CD4 as Marker

 Nunuk Dyah Retno Lastuti<sup>1(a)</sup>

 Endang Suprihati<sup>1)</sup>
<sup>1)</sup>Department of Parasitology, Faculty of Veterinary Medicine  
Universitas Airlangga, Surabaya

<sup>a)</sup> Corresponding Author: [nunuk\\_dyah@yahoo.com](mailto:nunuk_dyah@yahoo.com)

 Dony Chrismanto<sup>2)</sup>
<sup>2)</sup>Study Program of Animal Health, Faculty of Vocation  
Universitas Airlangga, Surabaya

 Anwar Ma'ruf<sup>3)</sup>
<sup>3)</sup>Department of Basic Medical Science  
Universitas Airlangga, Surabaya

**Abstract:** Leucocytozoonosis is caused by *Leucocytozoon caulleryi* and is responsible for death in chickens by bleeding. Leucocytozoonosis is an endemic disease in Indonesia and incidences have been reported in several regions in East and Central Java. The financial losses caused by this disease include growth disorders in chick, decreased egg production, higher mortality rate and also a higher production cost. This research aims to detect TLR-2 and CD4 expression as a cellular immune response in rabbits immunised by the protein of *L.caulleryi* schizont. It is needed as a preliminary research study for molecular vaccine development which is considerably effective when it comes to preventing leucocytozoonosis occurrence in Indonesia. This research study was performed in several stages i.e. the isolation of *L.caulleryi* schizont from a chicken liver infected with leucocytozoonosis to be based on the clinical signs observed, microscopic examination, and the pathological changes in the other chicken organs. The purification of the soluble protein of *L.caulleryi* schizont including the immunisation of the rabbits. Each of the experimental rabbits was injected with 500 µg of *L.caulleryi* schizont protein and added adjuvant complete with a ratio of 1:1. Every two weeks the injection was performed with the same protein with a dosage of 500 µg each and an added adjuvant that was incomplete (the booster was performed 5 times in 2 weeks). The examination of the cellular immune response of CD4 and TLR-2 expression in the rabbits' T cells using an immunocytochemistry method visualised by fluorescein isothiocyanate. The examination of the results was done by immunocytochemistry showing TLR-2 and CD4 expression as yellow to green fluorescent colour, mainly in the 5<sup>th</sup> booster where the activation of the CD4 co-receptor and TLR-2 occurred. The conclusion shows that the antigenic protein of *L.caulleryi* schizont has the ability to induce a cellular immune response through the co-receptors CD4 and TLR-2 in the rabbits' T cells as the preliminary

research in the sub-unit vaccine development for leucocytozoonosis in chickens.

**KEY WORD:** antigenic protein, *Leucocytozoon caulleryi*, schizont, TLR-2, CD4.

## I. INTRODUCTION

Leucocytozoonosis is one of the diseases caused by *Leucocytozoon caulleryi* in poultry, which is transmitted by flies *Culicoides* sp. or *Simulium* sp. Leucocytozoonosis is an endemic disease in Indonesia and incidences have been reported in several regions in East and Central Java. *Leucocytozoon* parasites infect a large number of avian hosts, including the domestic chicken, and causes a significant economical loss to the poultry industry (1). The financial losses impacted by this disease include growth disorders in chicks, decreased egg production, higher mortality rate and also a higher production cost (2, 3, 4, 6). The occurrence of leucocytozoonosis in broiler is between 7-40%, while the mortality rate in chicks is about 7-50% and in layer is about 2-60% respectively (7). The clinical signs observed in chickens are green faeces, depression, a loss of appetite, vomiting blood, paralysis and death due to bleeding (8). In order to overcome leucocytozoonosis in chickens, farmers have carried out the dispensing of medications, eradicating flies using insecticides, and improving the water irrigation in the area around the henhouse, but the latter method is less efficient due to the rapid growth of flies. Based on the vaccine developed by Onaga *et al* (1999), chickens can be protected from *L.caulleryi* infection by giving them a second generation schizont extract and blood serum containing an antigen (5). The weakness of this live vaccine administration is due to the possibility of infection because the parasites may become pathogens when the host's condition is weakened. Molecular vaccine development is considerably more effective when it comes to preventing leucocytozoonosis occurrence in

Indonesia. Based on the phylogenetic analysis of Cytochrome B *Leucocytozoon* spp in broilers, it was shown that the *L.caulleryi* from various endemic regions is highly homologous (>95%) (6). Referring to the problems above, a preliminary research about the rabbits' immune response induced by *L. caulleryi* schizont protein with TLR-2 and CD4 as marker to explore the cellular immune response is necessary.

TLR is a membrane protein that helps receptor recognition patterns in response to various molecule derivatives from microbes and stimulated innate immunity due to microbe molecule exposure. TLR is known to be a recognition receptor which is involved in pathogen-associated molecular patterns (PAMP) recognised by pattern recognition molecules (PRMs). A phagocytes development system in recognising pathogens can be stimulated any time to respond as an inflammatory system. TLR stimulation through microbial product initiates the signalling pathways which activate not only the innate immunity but also adaptive immunity (9, 10). CD4+T cells play a central role in immune protection and the B cells to produce antibodies, to induce the macrophages to develop enhanced microbicidal activity, to recruit neutrophils, eosinophils, and basophils to the sites of infection and inflammation, and through their production of cytokines and chemokines (11). As a vaccine kit candidate, it is required to know whether or not the *L.caulleryi* protein can induce either humoral or cellular immune response, because then a favourable immune response and immunogenic protein can be explored. Immunogenic protein has main characteristics such as a heavy molecule weight, homogeneity and a complex chemical structure and alienation (13, 15). It is necessary to study whether the results of the immunogenic proteins from a liver containing *L. caulleryi* can be developed for use in a vaccine in the effort to overcome Leucocytozoonosis, for example, with a vaccination program for chickens with a vaccine sub-unit that is safe in its use.

## II. METHODS

### A. Isolation and identification of *L.caulleryi* schizont

Schizont *L.caulleryi* isolated from chicken liver infected by leucocytozoonosis is based on the clinical signs observed, microscopic examination and the pathological changes of other chicken organs. Microscopic examination was performed to detect any gametosit stadium developed in eritrosit. Then, further assesment was done on several other organs such as the liver, spleen and intestine to detect the schizont stadium by crushing the organ and a pathological examination. The chicken liver and spleen containing schizont *L.caulleryi* was isolated in 50-100 mg or 0.05 ml cultured wet pellets, with a 2-3 ml 2-Drehydration solution/sample buffer added. Next, the sample was put on ice, sonicated for 30 seconds and cooled down to -80°C for 5 minutes. This treatment was repeated four times. The sample was centrifuged using a microcentrifuge (16.000 x g) for 20-30

minutes at 18-20 °C, and was then taken out from the centrifuge, Supernatan was put into a clean tube and the sample was stored at -80°C.

### B. Immunization of rabbits

This research used five rabbits treated as per the animal welfare concept. They were given a health examination based on both clinical symptoms and laboratory tests. All of the animals were handled in strict accordance with Ethical Clearance and the experiment was approved by the Ethical Committee of the Faculty of Veterinary Medicine, of the Universitas Airlangga, No: 630-KE. Four-month old naïve rabbits were prepared for the immunisation trial at the laboratory of experimental animals, in the Faculty of Veterinary Medicine at the Universitas Airlangga. Each of the experimental rabbits were injected with 500 µg *L.caulleryi* schizont protein (0.3 ml) with an added Freund adjuvant complete (Sigma, USA) with a ratio of 1:1. The injection was performed every two weeks with the same protein with a dosage of 500 µg each and with the added adjuvant incomplete (Sigma, USA). The immunisation (booster) was performed 5 times in 2 weeks. Prior to the first injection, about 10 ml of rabbit blood was taken for TLR-2 and CD4 examination as preliminary data (control) and whole blood examination was conducted at the end of the first booster until the fifth booster (13, 15).

### C. Examination of TLR 2 and CD4 expression using Immunocytochemistry

The principle of immunocytochemistry examination is that it is an immunology technique used to visualise specific proteins or antigens in the cells using the first antibody ([www.abcam.com/index](http://www.abcam.com/index) html). Several stages of the examination will be explained: 1) the blood sample is washed using 10% PBS-T20 five times, and the sample is fixated with 100% methanol (10 minutes) or with paraformaldehyde in PBS pH 7,4 for 15 minutes at room temperature, 2) the sample is washed twice using cold PBS, the sample is incubated for 10 minutes in PBS consisting of 0.1% Triton X-100 or 100 mM digitonin, and then the cells are washed in PBS three times for 5 minutes, 3) the cells are incubated with 1% BSA in PBS-T20 for 30 minutes, and incubated in conjugated antibody TLR 2-FITC labelled (Abcam's RabMab, USA) and CD4-FITC labeled (Abcam's RabMab, USA) and diluted in 1% BSA in PBS-T20 at room temperature for an hour or at night at a temperature of 4°C, 4) the cells are washed three times in PBS (5 minutes for each washing). The results were examined by using a fluorescent microscope using a magnification of 200 times, to find out whether the yellow to green fluorescent colour from the T cells expresses TLR-2 and CD4.

### III. RESULTS AND DISCUSSION

The cellular immune response was shown by the expression of TLR-2 and CD4 in the rabbit T cells marked by the yellow to green fluorescent colour after the rabbit immunisation (Figure 1 and Figure 2).

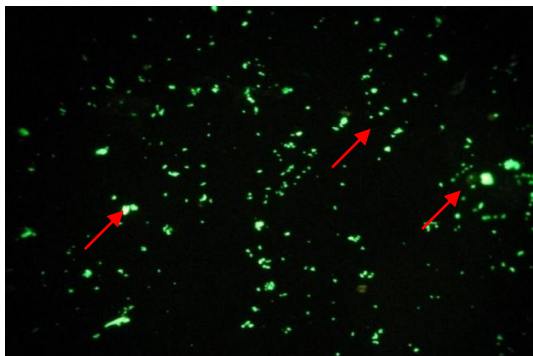


Figure 1. TLR2 expression in rabbit T cells visualized by Fluorescein Isothiocyanate (FITC) (200x magnification).

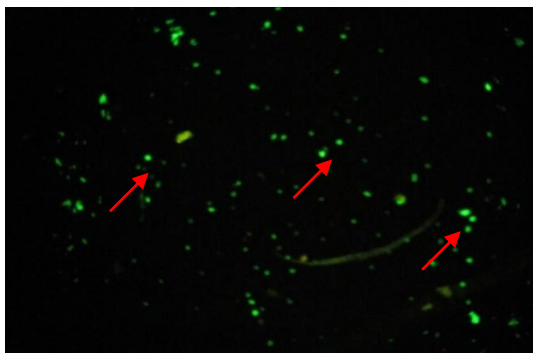


Figure 2. CD4 expression in rabbit T cells visualized by Fluorescein Isothiocyanate (FITC) (200x magnification).

It has been known that the toll-like receptor (TLR) is a receptor that can recognise the ligand from microbes or parasites which are involved in innate immunity. Along with new developments, TLR not only plays a role in innate immunity but also in adaptive immunity (12, 13). The examination results from the immunocytochemistry shows that there is a yellow to green fluorescent colour visualised by fluorescein isothiocyanate (FITC). It shows that the stadium schizont *L.caulleryi* protein has a ligand that is recognised by TLR 2 as a form of signal transduction which activates and induces a cellular immune response such as the lymphocyte T of the rabbits after immunisation. In accordance with the principles of the immunisation method, which is an increasing degree of immunity, it provides protective immunity by inducing a memory response towards a specific pathogen with a non-virulent or non-toxic antigen (14).

According the results of the research, it is shown that the antibody TLR-2 can recognise the ligand from the protein antigen *L.caulleryi* schizont by stimulating T cell activation, marked by the presence of yellow to green fluorescent colour which increased in accordance with the treatment from the various boosters. When the antigen of *L.caulleryi* schizont enters the body, it will be caught by macrophage or dendritic cells and the phagocytes cells will be activated by TLR as a signal transducer. *L.caulleryi* schizont possess a ligand or pathogen-associated molecular pattern (PAMP) which is recognised by TLR-2. Ligands that are recognised by TLR-2 consist of lipoprotein/lipopolyptide, flagelin, ssRNA and CpG DNA. The schizont of *L.caulleryi* is an intracellular microorganism which contains antigens. When the antigen enters the body, it will be caught by a macrophage and the phagocytes cells will be activated by the TLR as a signalling pathway. The signal produced by TLR will activate the transcription factor NFκB which stimulates cytokine production (10, 16). NFκB activation is initiated by a signal which recruits MyD88 and interacts with the IL-1 receptor associated kinase (IRAK). Autophosphorylation then occurs, separating MyD88 and activating the TNF receptor associated factor 6 (TRAF-6) to activate the IκB kinase (IKK). Activated IKK will activate NFκB to transcript gene IL-12, IL-10, IL-4, TNF-α, IFN-γ. IL-2 roles will increase the cytolytic activity from the cytolytic T lymphocytes. This will also promote Th1 cells development together with CD8 activation in order to produce IL-2 which stimulates the proliferation and differentiation of B cells that will produce antibodies. IL-4 is a cytokine which is produced by subset Th2 from Th cells CD4 that function to induce Th2 cells differentiation and stimulate IgE production. (17, 18).

The main function of CD4 is acting as a transduction signal in antigen recognition and to strengthen the bond between T cells and antigen-presenting cells (APC). APC produces IFN-γ and IL-12 that stimulate the differentiation of CD4+ cells into Th1 which plays a major role in delayed hypersensitivity reactions. CD4+ T-cells produce a protein named IL-4 cytokine which helps B lymphocytes in antibody production and phagocytosis to destroy ingested microbes (11, 17). CD4 molecules as a co-receptor are a surface cell molecule which are expressed by various types of cells in the immune system which were formed by cluster differentiation. The accessory molecule is used as a marker of Th cell activation with B cells and cytotoxic T cells maturation, which is responsible in regulating chronic inflammatory reactions towards antigens through macrophage stimulation. Lymphocytes B activation is marked by a significant increase ( $p < 0,05$ ) in the antibody titer of rabbits injected with the protein of *L.caulleryi* schizont (15, 19). As a vaccine kit candidate, the schizont *L.caulleryi* antigen injected in to rabbits needs to induce a cellular immune response, marked by T cell lymphocyte activation which expresses TLR 2 in accordance with humoral immune response. There was an antibody (IgG) titre enhancement produced by B lymphocytes (14, 15).



### Conclusion

The antigenic protein of *L.caulleryi* schizont has the ability to induce a cellular immune response through the expression of TLR-2 and CD4 in the rabbits' T cells. The TLR-2 signal plays a role in innate immunity, but also in adaptive immunity. The antigenic protein of *L.caulleryi* schizont may contain ligand which acts as a receptor that is involved in pathogen-associated molecular patterns (PAMP). This study is a preliminary research to explore the immunogenic protein which plays a role in immune system activation for future studies in vaccine development to overcome leucocytozoonosis in chickens.

### Acknowledgment

We would like to thank the Ministry of Research, Technology and Higher Education in Indonesia. This study was supported by research grant 2015. We would also like to thank the Rector of Universitas Airlangga and the Director of Research and Innovation Department, of Universitas Airlangga.

### References

1. Abbas, A.K., Litchman, A.H. Cellular and Molecular Immunology. 5<sup>th</sup>. Ed. International Edition. Elsevier Saunders Inc. Philadelphia, Pennsylvania, 41-105, 411-432 (2005).
2. Gotanda T, Doi M, Eiguchi Y, Tanaka Y, Kobayashi S and Fujisaki Y, 2002. Characterization of Monoclonal Antibodies against the second generation schizonts of *Leucocytozoon caulleryi*. *J Vet Med Sci*. 64(3):281-283.
3. Imura T, Sato S, Sato Y, Sakamoto D, Isobe T, Murata K, Holder AA, Yukawa M. The apicoplast genome of *Leucocytozoon caulleryi*, a pathogenic apicomplexan parasite of the chicken. *Parasitol Res* 113:823-828, 2014.
4. Ito A, Gotanda T. The correlation of protective effects and antibody production in immunized chickens with recombinant R7 vaccine against *Leucocytozoon caulleryi*. *J Vet Med Sci* 64(5):405-411, 2002.
5. Lastuti, N.D.: Specific antigenic protein 57.3 kDa of *Sarcoptes scabiei* var. *caprae* as material candidate of scabies diagnostic kit for goat and Toll-like receptor mediated Immune Responses. Doctoral diss. Postgraduate Program. Universitas Airlangga (2009).
6. Lee HR, Koo BS, Jeon EO, Han MS, Min KC, Lee SB, Bae Y, Mo IP. Pathology and molecular characterization of recent *Leucocytozoon caulleryi* cases in layer flocks. *J Biomed Res*, 30(6): 517-524, 2016.
7. Lastuti N.D, Suprihati E, Chrismanto D. Exploration of antigenic protein of *Leucocytozoon caulleryi* as diagnostic kit leucocytozoonosis on broiler chickens. *Media Kedokteran Hewan* 29 (3): 213-222 (2013).
8. [Majewska M, Szczepanik M](#). The role of Toll-like receptors (TLR) in innate and adaptive immune responses and their function in immune response regulation. [Postepy Hig Med Dosw \(Online\)](#). 60:52-63 (2006).
9. Nakamura K, Ogiso M, Shibahara T, Kasuga H and Isobe T. Pathogenicity of *Leucocytozoon caulleryi* for specific Pathogen Free Laying Hens. *J of Parasitol* .87:1202-1204, 2001.
10. Nakata K, Watarai S, Kodama H, Gotanda T, Ito A, Kume K. Cellular immune responses in chickens induced by recombinant R7 *Leucocytozoon caulleryi* vaccine. *J Parasitol* 89(2):419-422 (2003).
11. Pasare C, Medzhitov,R. Control of B cell Responses by Toll-like receptor. *Nature*, 364-438, 2005.
12. Singh., Dimri, U., Sharma, B., Saxena, M.: Assessment of the cytokine profile in peripheral blood mononuclear cells of naturally *Sarcoptes scabiei* var. *canis* infested dogs. *Veterinary Parasitology*. 206:253-257 (2014).
13. Suprihati E. Phylogenetic analysis of gen cytochrome B *Leucocytozoon* sp. on broiler chicken in endemic area, Indonesia. Doctoral diss. Postgraduate Program. Universitas Airlangga, 2013.
14. Soekardono S, 1986. Chicken *Leucocytozoonosis* in Java and Bali. Doctoral diss. Postgraduate Program, Institut Pertanian Bogor, 12-15, 1986.
15. Vollmer, J.: CpG motifs to modulate innate and adaptive immune responses. *Int Rev Immunol* 25, 125-134 (2006).
16. Xiao, H, Li, X., Abbot, D.W. Analysis of TLR Expression, Regulation and Signalling. Signalling by Toll like receptor. Edited by Gregory WK. CRC Press. Taylor & Francis Group. Chapter 3, 39-55, 2008.
17. Yarovinsky, F.H., Kanzier., Hieny, S, Coffman, R.L, Sher, A.: Toll-like Receptor Recognition Regulated Immunodominance in an Antimicrobial CD4+Tcell Response. *Immunity* 25, 655-664 (2006).
18. Zhao W, Pang Q, Xu R, Liu J, Liu S, Li J, Monitoring the Prevalence of *Leucocytozoon sabraezesi* in Southern China and Testing Tricyclic Compounds against Gametocytes. *PLoS ONE* 11(8): e0161869. <https://doi.org/10.1371/journal.pone.0161869>, 2016.
19. Zhu J, Paul WE. CD4 T cells: fates, functions, and faults. *Blood*, Sep 1;112(5):1557-69. doi: 10.1182/blood-2008-05-078154. (2008).