

# Blood chemistry profiles of DMBA-induced mammary tumor in female sprague dawley rats

Cite as: AIP Conference Proceedings **2108**, 020043 (2019); <https://doi.org/10.1063/1.5110018>  
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# Blood chemistry profiles of DMBA-induced mammary tumor in female Sprague Dawley rats

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**Abstract.** Although aerobic glycolysis (Warburg effect) in cancers had been accepted as a significant characteristic of cancer, changes in metabolic state in each stage of tumorigenesis remain to be explored. In this preliminary study, we analyzed the changes of several blood chemistry parameters intending to describe the general metabolic state of the early and advanced stages of tumorigenesis in rat mammary tumor models. The mammary tumor was induced in female Sprague Dawley (SD) rats by subcutaneous injection of 7, 12-dimethylbenz[a]anthracene (DMBA). The rats were palpated on the breast every week after DMBA induction to detect tumor development. Blood chemistry examinations including blood glucose, triglyceride, cholesterol, HDL-cholesterol, urea, and creatinine, were performed at 8-weeks and 12-weeks after DMBA induction. Rats were fasted 12-14 hours before retro-orbital blood collection. The spectrophotometer measured all the parameters. The palpable mammary tumor was firstly detected at 7-weeks on 1 of 4 DMBA induced rats. At three weeks later all rats had palpable tumors that also confirmed by ultrasound imaging. The blood chemistry measurements revealed that DMBA-induced rats had a significantly higher level of triglyceride ( $p=0.001$ ) and creatinine ( $p=0.018$ ); and glucose ( $p=0.007$ ) at 8-weeks and 10-weeks after DMBA induction compared to the non-induced rats, respectively while not in the other parameters. The stages of tumor development may have a different profile of blood chemistry parameters. Further research should be performed to elucidate whether the profile could describe the metabolic reprogramming during tumorigenesis.

Keywords: Mammary tumor, blood chemistry, tumor metabolism, DMBA, Sprague Dawley

## INTRODUCTION

Cancer remains a major health problem around the world including in Indonesia [1]. The high incidence and mortality rates are still high mainly due to the limited method of early diagnosis and the unsatisfactory conventional treatment for cancer. The main factors that cause these limitations are the mechanism and the course of cancer (carcinogenesis) which is very complicated. Comprehensive knowledge of carcinogenesis can be the basis for the development of reliable diagnostic techniques and more effective new treatment methods.

One important mechanism in cancer growth is the metabolic process. Metabolism is the main factor underlying the survival and unlimited proliferation ability of cancer cells. The ability of cancer cells to carry out metabolic changes to meet their anabolic and energetic needs is one of the hallmarks of cancer [2]. In contrast to normal cells, fundamental metabolic changes in cancer cells include: 1) increased glucose and glutamine uptake; 2) the use of opportunistic modes of obtaining nutrients; 3) the use of intermediates derived from the glycolysis pathway and the tricarboxylic acid cycle for biosynthesis and the production of NADPH; 4) increased demand for nitrogen; 5) impaired regulation of genes involved in regulating metabolism; and 6) metabolic interactions with tumor microenvironment [3].

We suggest that the metabolic process that takes place during tumor growth to malignancy may be detected through changes in the metabolites circulating in the blood. Therefore, this preliminary study aims to analyze several blood chemistry examinations, including glucose, cholesterol, HDL-cholesterol, triglycerides, urea, and creatinine in Sprague Dawley rats induced by the carcinogen 7,12-Dimethylbenzathracene (DMBA).

## **MATERIALS AND METHODS**

### **Animals**

The study used eight white healthy female *Ratus norvegicus* from Sprague-Dawley strains weighing 125-175 grams aged eight-week-old. The animals were bred in Animal Laboratory of Entomology Laboratory, Faculty of Medicine Universitas Hasanuddin under ideal conditions of temperature, humidity, and light. They received appropriate pellets and filtered water.

### **Experimental Design**

The animals were housed in three treatment groups. Rats were acclimatized for 14 days and were monitored the weight every week. The first group was induced of DMBA subcutaneously in the lower nipple area with a single dose of 25 mg DMBA dissolved in 0.5 mL sunflower oil and 0.5 mL 0.9% sodium chloride. The second group as a normal control given 0,5 ml sunflower oil and 0,5 ml 0,9 % sodium chloride and the last group as a negative control. The observation was made on changes in body weight, cancer incidence number and type of cancer every day for 14 weeks. The mammary tumors were measured and weighed, and the findings recorded. After 14 weeks, all the animals are terminated and dissected for removal of tumor tissue. The tumor tissues were made histopathology preparation and examined using a light microscope. Histological findings were not reported here. Animal blood was taken for metabolic analysis, to determine the levels of glucose, cholesterol, HDL-cholesterol, triglycerides, urea, and creatinine by using the colorimetric method. The wavelength of each parameter are (Glu= 510 nm; Tg.= 505 nm; Chol= 505 nm; HDL Chol= 505 nm; Ur= 578 nm; Cr=546 nm) (Adapted from Química Clínica Aplicada S.A).

## **RESULTS**

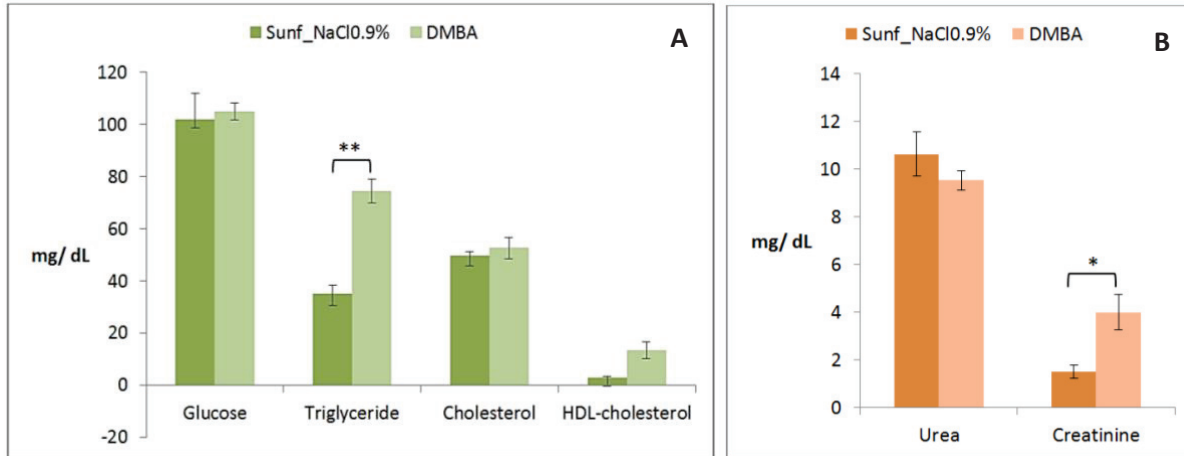
### **Tumor development and rat growth**

Palpation on mammary gland area was performed to detect the tumor development. Dense and hard tumor mass in the breast area was firstly detected at the seventh week in 1 of 4 rats receiving DMBA injections. Three weeks later all mice that received DMBA injections had a tumor mass that should be suspected of originating from the breast. Ultrasound examination was performed to confirm the formation of the tumor. The results showed heterogeneous echo images with calcification and irregular margins in the abdominal area which indicated malignancy. Further confirmation by histopathological examination will be carried out yet we could not report the results in this report because we are still waiting for the final stages of the carcinogenesis.

Until the week eight, there was no difference in rat growth ( $p = 0.582$ ) which was assessed from the average weight gain of  $17.50 \pm 5.44$  g and  $21.50 \pm 4.21$  g, in DMBA-induced and control rats, respectively. Entering the week nine the rats that received DMBA began to experience weight loss and became increasingly evident at week 10 with an average weight loss of  $10.75 \pm 6.21$  g. The weight of the control rats was constant when they entered the week 8 and decreased slightly at week 10.

### **Blood chemistry profiles at week eight after DMBA induction**

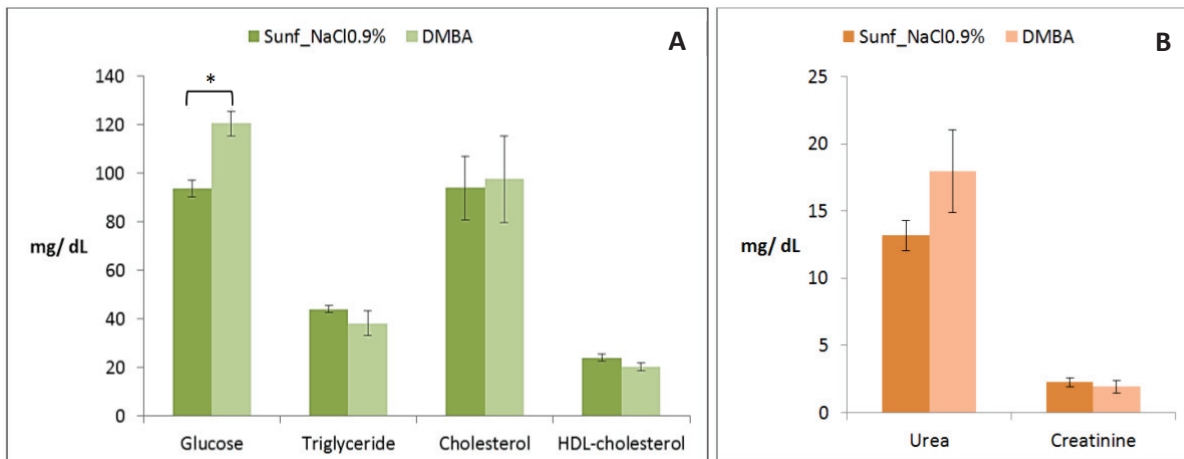
There was a significantly higher triglyceride level ( $p = 0.001$ ) in DMBA-induced rats compared to control rats (Sunf\_NaCl0.9%) while glucose ( $p = 0.796$ ), cholesterol ( $p = 0.538$ ), and HDL- cholesterol ( $p = 0.081$ ) levels were not significantly different. Creatinine level was also significantly higher in DMBA-induced rats ( $p = 0.018$ ) compared to Sunf\_NaCl0.9% rats but not at urea levels.



**FIGURE 1.** Blood chemistry profiles at week eight after DMBA induction. Blood glucose, triglyceride, cholesterol, and HDL-cholesterol levels (A); blood urea and creatinine levels (B) were measured using spectrophotometer. \* $p < 0.05$ ; \*\* $p \leq 0.001$ .

### Blood chemistry profiles at week ten after DMBA induction

At week ten, more parameters are expected to show a significant difference, but in reality, the only glucose level of DMBA rats was significantly higher ( $p = 0.007$ ) compared to Sunf\_NaCl0.9% rats. Triglyceride ( $p = 0.873$ ), cholesterol (0.341), HDL-cholesterol (0.146), urea (0.218), and creatinine (0.279) levels did not show any significant differences between the two groups.



**FIGURE 2.** Blood chemistry profiles at week ten after DMBA induction. Blood glucose, triglyceride, cholesterol, and HDL-cholesterol levels (A); blood urea and creatinine levels (B) were measured using spectrophotometer. \* $p < 0.05$ .

## DISCUSSION

Metabolic changes in cancer have long been known to have a significant role in the development of cancer. However, how the intratumoral metabolic activities are reflected in blood chemistry profiles still showed controversial results.

The results of this study revealed DMBA-induced rats had a significantly higher triglyceride concentration than the control group even though the concentration values among the two groups were still within the normal limits of rat blood triglycerides. Higher triglyceride concentrations at week eight after DMBA induction may be related to the development of cancer. Previous research showed tumor cells expressed malic enzyme which was a lipogenic enzyme in which its activity correlates with *de novo* fatty acid synthesis [4-6]. Besides, lipoprotein

lipase (LPL) may regulate the clearance of blood from tissue to tissue and its activity in white adipose tissue is reduced in patients with cancer thus contributing to hypertriglyceridemia [7-8].

Different conditions occur in the week ten after DMBA induction. DMBA rats showed a higher fasting blood glucose level ( $120.45 \pm 5.01$  mg / dL) compared to the control group. The value was considered to be above the normal value of fasting blood glucose levels in rats ( $71.10 \pm 23.25$  mg / dL) [9]. This elevated levels of blood glucose was likely to indicate an increase in glucose requirements for cancer development. In this respect, hyperglycemia could provide a high glucose fuel source for cancer cells supporting rapid proliferation. Indeed, in vitro studies with cancer cell lines indicate that high concentrations of glucose levels regulate enhanced expression of genes associated with promoting cancer cell proliferation, invasion, and migration [10-12]. Very dramatic weight loss at week ten accompanied by increased glucose levels might be a sign of an increase in the gluconeogenesis pathway to meet glucose requirements for cancer progression. Comprehensive research needs to be carried out to support this notion.

## CONCLUSION

Changes in triglyceride and blood glucose levels at different stages in DMBA-induced rats may determine the role of triglyceride and glucose metabolism in the development of cancer. More comprehensive research needs to be conducted at the more various stages of cancer development and an adequate number of samples assessing the activity of metabolic pathways and their specific metabolites.

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Pada saat presentasi oral, alokasi waktu yang diberikan selama 10 menit yang terbagi menjadi (**7 menit presentasi, dan 3 menit tanya jawab**). Terakhir PPT presentasi oral dibuat dalam bahasa Inggris.

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**Abstrak ASMICBS 2018 Malang\_Prodi S2 Ilmu Biomedik PS Unhas**

9 messages

**Ika Yustisia** <ikayustisia@gmail.com>

Fri, Oct 26, 2018 at 2:04 AM

To: ASMICBS 2018 Malang &lt;asmicbs2018@gmail.com&gt;

Yth. Panitia ASMICBS 2018 Malang

Bersama ini terkirim abstrak kami (2 judul) dari Prodi S2 Ilmu Biomedik Sekolah Pascasarjana Universitas Hasanuddin Makassar, yaitu:


1. 7,12-Dimethylbenz(a)anthracene induced breast cancer in Sprague Dawley rats proved by ultrasound imaging
2. Blood chemistry profiles of DMBA-induced mammary tumor in female Sprague Dawley rats

Terima kasih

Hormat kami,

Ika Yustisia  
Departemen Biokimia Fakultas Kedokteran  
Universitas Hasanuddin Makassar

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**2 attachments** **Abstrak ASMICBS 2018\_ArifM\_kirim.docx**  
18K **Abstrak ASMICBS 2018\_Padlianah\_kirim.docx**  
17K

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**ASMICBS 2018 Malang** <asmicbs2018@gmail.com>

Fri, Oct 26, 2018 at 2:18 AM

To: Ika Yustisia &lt;ikayustisia@gmail.com&gt;

Dear Ika Yustisia

Terimakasih telah mengirimkan abstrak pada kegiatan ini.

Informasi yang dapat kami sampaikan, yaitu manuskrip ilmiah secara lengkap dapat dikirimkan ke email [asmicbs2018@gmail.com](mailto:asmicbs2018@gmail.com) paling lambat tanggal **30 Oktober 2018**. Abstrak dengan persetujuan author akan kami publikasi pada **AIP proceeding yang terindeks Scopus** dengan biaya tambahan sebesar **Rp 900.000,-**

Jika masih ada hal yang kurang jelas, silahkan kontak kami secara langsung. Beritahukan kami, jika saudara telah membaca email ini. Sekali lagi, kami ucapkan terimakasih atas partisipasi saudara dengan mengirimkan abstrak pada kegiatan yang kami

selenggarakan.

Best Regards  
Windy Y.B

**NB:**

Kami ingin mengkonfirmasi, untuk judul abstrak yang dikirimkan sebelumnya mengenai "**High expression of FBP1 in invasive breast carcinoma: a preliminary study on cancer gluconeogenesis**", apakah dengan demikian saudara mengirimkan 3buah abtraj pada kegiatan ini?

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*Local Committee  
3rd Annual Scientific Meeting of Indonesian Consortium for Biomedical Sciences  
(ASMICBS) 2018  
Master Program in Biomedical Sciences  
1st Floor, Graha Medika (C) Building, Faculty of Medicine, Universitas Brawijaya  
Jl. Veteran Malang, East Java, Indonesia, 65145*

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Ika Yustisia <ikayustisia@gmail.com>  
To: ASMICBS 2018 Malang <asmicbs2018@gmail.com>

Fri, Oct 26, 2018 at 2:27 AM

Yth. Panitia ASMICBS

Benar kami mengirimkan 3 abstrak. Namun untuk abstrak yang pertama kali dikirim dengan judul "**High expression of FBP1 in invasive breast carcinoma: a preliminary study on cancer gluconeogenesis**" masih menunggu kepastian yang akan presentasi karena tiba2 ybs mohon waktu untuk mempertimbangkan jadi/ tidak ikut kegiatan ini dgn alasan keluarga. Pagi ini saya akan minta kepastiannya dan segera menyampaikan kepada Panitia ASMICBS. Untuk abstrak 2 terakhir sudah konfirmasi akan ikut kegiatan.

Terima kasih banyak. Akan segera kami kirim full articlanya.

Hormat kami,

Ika Yustisia

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ASMICBS 2018 Malang <asmicbs2018@gmail.com>  
To: Ika Yustisia <ikayustisia@gmail.com>

Fri, Oct 26, 2018 at 2:29 AM

Dear Ika Yustisia

Terimakasih atas informasi yang telah diberikan. Kami tunggu kabar baik dari saudari.  
Sampai bertemu di Malang

Best Regards  
Windy Y.B

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**ASMICBS 2018 Malang** <asmicbs2018@gmail.com>

Tue, Oct 30, 2018 at 3:39 PM

To: Ika Yustisia <ikayustisia@gmail.com>

Dear Ika Yustisia

Bersama dengan ini, kami ingin menginformasikan bahwa Abstrak yang saudara(i) kirimkan pada kegiatan yang kami selenggarakan **DITERIMA** dan saudara(i) akan mengikuti Kegiatan **ORAL PRESENTATION** sesuai jadwal. Adapun jadwal Oral presentation akan diumumkan pada tanggal **12 November 2018** di website kegiatan [www.asmicbs2018.fk.ub.ac.id](http://www.asmicbs2018.fk.ub.ac.id) . Abstrak dengan persetujuan author akan kami publikasi pada **AIP proceeding yang terindeks Scopus** dengan biaya tambahan sebesar **Rp 900.000,-**.

Jika masih ada hal kurang jelas, silahkan kontak kami secara langsung. Beritahukan kami, jika saudara(i) telah membaca email ini. Sekali lagi, kami ucapkan terimakasih atas partisipasi saudara(i) dengan mengirimkan abstrak pada kegiatan yang kami selenggarakan.

Best Regards  
Windy Yuliana B

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**ASMICBS 2018 Malang** <asmicbs2018@gmail.com>

Sun, Nov 11, 2018 at 6:27 PM

To: Ika Yustisia <ikayustisia@gmail.com>

Dear Ika Yustisia

Bersama ini kami kirimkan **LoA** dari abstrak yang telah diterima. Adapun LoA tersebut sebagaimana terlampir. Informasi tambahan yang dapat kami sampaikan terkait pelaksanaan **Oral Presentation** yaitu setiap peserta akan diberikan waktu **selama 10 menit (7 menit Presentasi dan 3 menit Tanya Jawab)**. Dimohonkan agar setiap peserta dapat mempersiapkan **powerpoint presentation** dalam **bahasa inggris**.

Jika masih terdapat hal yang kurang jelas, jangan ragu untuk menanyakan kami secara langsung. Sekali lagi kami ucapkan selamat dan terimakasih atas partisipasi saudara. Sampai bertemu di malang.

Best Regards  
Windy Yuliana B

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## 2 attachments

 **Padlianah.pdf**  
360K

 **Muhammad Arif.pdf**  
362K

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**Ika Yustisia** <ikayustisia@gmail.com>  
To: mutmainahnina35.mn@gmail.com, padlianahana@gmail.com

Mon, Nov 12, 2018 at 6:59 AM

Assalamu'alaikum Ana dan Nina

Bersama ini terkirim surat penerimaan dari KIBI

Terima kasih

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**2 attachments**

 **Padlianah.pdf**  
360K

 **Muhammad Arif.pdf**  
362K

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**ASMICBS 2018 Malang** <asmicbs2018@gmail.com>  
To: Ika Yustisia <ikayustisia@gmail.com>

Wed, Nov 14, 2018 at 6:39 AM

Dear Ika Yustisia

Bersama ini kami kirimkan kan kembali LoA penerimaan Abstrak. Kami memohon maaf adanya kesalahan penulisan nama pada LoA sebelumnya. Mohon kiranya dimaklumi

Atas perhatiannya kami ucapkan terimakasih

Best Regards  
Windy Yuliana B

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 **Mutmainnah Arif.pdf**  
204K

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**Ika Yustisia** <ikayustisia@gmail.com>  
To: mutmainahnina35.mn@gmail.com

Wed, Nov 14, 2018 at 6:41 AM

----- Forwarded message -----

From: **ASMICBS 2018 Malang** <[asmicbs2018@gmail.com](mailto:asmicbs2018@gmail.com)>

Date: Wed, Nov 14, 2018, 6:40 AM

Subject: Re: Abstrak ASMICBS 2018 Malang\_Prodi S2 Ilmu Biomedik PS Unhas

To: Ika Yustisia <[ikayustisia@gmail.com](mailto:ikayustisia@gmail.com)>

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 **Mutmainnah Arif.pdf**  
204K



**3<sup>rd</sup> Annual Scientific Meeting of Indonesia  
Consortium for Biomedical Sciences  
Post-Graduate Program, Faculty of Medicine**  
Universitas Brawijaya, Malang  
Jl. Veteran Malang 65145. Telp. (0341) 575790



No : 043/Pan-ASMICBS/X/2018  
Lampiran : -  
Perihal : Penerimaan Abstrak

Kepada Yth.:

1. **Padlianah** (Master Program of Biomedical Science on Biochemistry and Molecular Biology Sekolah Pascasarjana Universitas Hasanuddin Makassar)
2. Muhammad Arif (Master Program of Biomedical Science on Pharmacology Sekolah Pascasarjana Universitas Hasanuddin Makassar)
3. Ika Yustisia (Departemen of Biochemistry Faculty of Medicine Universitas Hasanuddin Makassar)

Dengan hormat,

Kami dengan senang hati memberitahukan bahwa abstrak saudara yang berjudul: **“Blood chemistry profiles of DMBA-induced mammary tumor in female Sprague Dawley rats”** telah diterima untuk sesi presentasi oral dalam **3<sup>rd</sup> Annual Scientific Meeting for Biomedical Sciences** tahun 2018 di Malang.

Sekali lagi, kami mengucapkan selamat dan berterima kasih atas partisipasi Saudara dalam kegiatan ini. Kami berharap dapat bertemu Saudara di Malang pada 22-23 November 2018.

Malang, 2 November 2018  
Ketua Panitia



dr. Hidayat Sujuti, Ph.D, SpM  
NIP. 196701231996011001



Ika Yustisia &lt;ikayustisia@gmail.com&gt;

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**Manuskrip Mutmainnah Arif dan Padlianah\_Unhas Makassar**

2 messages

**Ika Yustisia** <ikayustisia@gmail.com>

Tue, Oct 30, 2018 at 11:13 AM

To: ASMICBS 2018 Malang &lt;asmicbs2018@gmail.com&gt;

Yth. Panitia ASMICBS 2018

Bersama ini terkirim 2 manuskrip mahasiswa kami atas nama Mutmainnah Arif dan Padlianah dari Prodi Magister Ilmu Biomedik Sekolah Pascasarjana Universitas Hasanuddin Makassar.

Terima kasih

Salam hormat,

Ika Yustisia

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**2 attachments** **Manuskrip Arif M\_ASMICBS\_301018.docx**  
726K **Manuskrip Padlianah\_ASMICBS2018\_301018.docx**  
2326K

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**ASMICBS 2018 Malang** <asmicbs2018@gmail.com>

Tue, Oct 30, 2018 at 3:15 PM

To: Ika Yustisia &lt;ikayustisia@gmail.com&gt;

Dear Ika Yustisia

Terimakasih telah mengirimkan abstrak pada kegiatan ini.

Informasi yang dapat kami sampaikan, yaitu manuskrip ilmiah secara lengkap dapat dikirimkan ke email [asmicbs2018@gmail.com](mailto:asmicbs2018@gmail.com) paling lambat tanggal **20 November 2018**. Abstrak dengan persetujuan author akan kami publikasi pada **AIP proceeding yang terindeks Scopus** dengan biaya tambahan sebesar **Rp 900.000,-**

Jika masih ada hal kurang jelas, silahkan kontak kami secara langsung. Beritahukan kami, jika saudara(i) telah membaca email ini. Sekali lagi, kami ucapkan terimakasih atas partisipasi saudara dengan mengirimkan abstrak pada kegiatan yang kami selenggarakan.

Best Regards

Windy Y.B

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*Local Committee*

***3rd Annual Scientific Meeting of Indonesian Consortium for Biomedical Sciences  
(ASMICBS) 2018***

*Master Program in Biomedical Sciences*

*1st Floor, Graha Medika (C) Building, Faculty of Medicine, Universitas Brawijaya*

*Jl. Veteran Malang, East Java, Indonesia, 65145*



Ika Yustisia &lt;ikayustisia@gmail.com&gt;

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## Konfirmasi keikutsertaan kegiatan ASMICBS 2018 Malang

2 messages

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**Ika Yustisia** <ikayustisia@gmail.com>

Fri, Oct 26, 2018 at 9:12 PM

To: ASMICBS 2018 Malang &lt;asmicbs2018@gmail.com&gt;

Yth. Panitia ASMICBS 2018

Dengan hormat

Bersamaan ini kami mengkonfirmasi keikutsertaan kami dalam kegiatan ASMICBS 2018 di Malang untuk abstrak kami yang berjudul:  
yaitu:

- 1). 7,12-Dimethylbenz(a)anthraceneinduced breast cancer inSprague Dawley rats proved by ultrasound imaging
- 2). Blood chemistry profiles ofDMBA-induced mammary tumor in female Sprague Dawley rats

Kedua abstrak tersebut sudah kami kirim sebelumnya.

Adapun abstrak yang kami kirim terlebih dahulu dengan judul:

**High expression of FBP1 in invasive breast carcinoma: a preliminary study on cancer gluconeogenesis**, batal berpartisipasi karena yang akan presentasi berhalangan hadir.

Saat ini kami sedang mempersiapkan manuskrip kami. Insya Allah paling lambat tanggal 30 Oktober kami kirimkan berikut biaya pendukung (registrasi presenter dan prosiding).

Terima kasih

Hormat saya,

Ika Yustisia

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**ASMICBS 2018 Malang** <asmicbs2018@gmail.com>

Fri, Oct 26, 2018 at 9:40 PM

To: Ika Yustisia &lt;ikayustisia@gmail.com&gt;

Dear Ika Yustisia

Terimakasih atas konfirmasi yang telah disampaikan ke pihak panitia.

Silahkan melakukan registrasi pada wensite asmicbs2018. Jika terdapat kendala dan terdapat hal yang masih belum jelas. Silahkan langsung menghubungi kami.

10/5/21, 3:04 PM

Gmail - Konfirmasi keikutsertaan kegiatan ASMICBS 2018 Malang

Best Regards

Windy Y.B

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*Local Committee*

***3rd Annual Scientific Meeting of Indonesian Consortium for Biomedical Sciences  
(ASMICBS) 2018***

*Master Program in Biomedical Sciences*

*1st Floor, Graha Medika (C) Building, Faculty of Medicine, Universitas Brawijaya*

*Jl. Veteran Malang, East Java, Indonesia, 65145*

# 3<sup>rd</sup> Annual Scientific Meeting of Indonesian Consortium for Biomedical Sciences



## Pre-Conference Workshop

Will be Held at **Faculty of Medicine, Universitas Brawijaya,**  
**21<sup>st</sup> November 2018.** We will conduct **3 kinds of workshops :**

1. Bioinformatics , 2. Nanomedicine, 3. Isolation-purification of natural resources and Flowcytometry.

## Conference Schedule

**Venue :** Savana Hotel (Jl. Letjen Sutoyo No. 79 Malang)

**Important Date :**

1. **Abstract submission, 26<sup>th</sup> October 2018**
2. **Conference : 22nd -23rd November 2018**

**Registration :** <http://fk.ub.ac.id/asmicbs2018/en/registration/>

1

### CONTACT PERSON

Husnul : 08113646739  
Yayan : 081334756682:  
asmicbs2018@gmail.com

2

### CONFERENCE FEE

Early bird : 600K IDR  
After 1 November 2018  
: 800K IDR

3

### WORKSHOP

WS I or II : 1000K IDR  
WS III : 1500 IDR  
Before 10<sup>th</sup> November  
2018



**Dr. dr. Ina Rosalina,**  
**SpA(K), MKes,**  
**MH.Kes**

Director of  
Traditional Health  
Services



**Prof. Mikio Nishizawa, MD.**  
**PhD**

Dept. of Biomedical  
Sciences,  
Ritsumeikan  
University, Japan



**Sharida Fakurazi, PhD**

Faculty of Medicine  
and Health  
Sciences, University  
Putra Malaysia

## Conference Schedule, Day I, 22<sup>nd</sup> November 2018

Time	Agenda	PIC
07.30 - 08.00	Registration	Committee
08.00 - 08.30	Speech and Opening Ceremony	
	Dean Faculty of Medicine UB	Dr. dr. Sri Andarini, MKes
	Chair Person of KIBI	Dr. rer. physiol. dr. Septelia Inawati Wanandi
	Rector of UB	Prof. Dr. Ir. Nuhfil Hanani, MS
08.30 - 09.00	Keynote Speech : Herbal Medicine in Indonesia	Dr. dr. Ina Rosalina D, Sp.A(K) (Director of Traditional Health Services, Ministry of Health Republic of Indonesia )
09.00 - 09.15	Coffee break	Committee
	Session 1	Moderator : Prof. Dr. dr. Loeki Enggar Fitri, MKes, SpParK
09.15 - 09.45	The Role of Natural Resources on Cytokines production for Drugs Development	Prof. Mikio Nishizawa, PhD (Ritsumeikan University, Japan)
09.45 - 10.15	Nano-medicine in Biomedical Sciences	Sharida Fakurazi, PhD (University Putra Malaysia)
10.15 - 10.45	Discussion	
	Session II	Moderator : Prof. Dr. dr. Soemarno, DMM., SpMK(K)
10.45 - 11.15	Bioinformatics for Screening and Prediction Pathways and Diagnosis of Diseases	Setia Permana, SSI, PhD (Polytechnic of Statistics - STIS Jakarta)
11.15 - 11.45	Herbal for SLE	Prof. Dr. dr. Kusworini, MKes (Universitas Brawijaya)
11.45 - 12.15	Discussion	
12.15 - 13.15	Break	Committee
13.14 - 16.00	Oral and Poster Presentation	Committee

## Conference Schedule, Day II, 23<sup>rd</sup> November 2018

Time	Agenda	PIC
07.30 - 08.00	Registration	Committee
	Session I	Moderator : Dr. Drs. Swi Winarsih, Apt. MS
08.00 - 08.30	Design and Characteristics of Nano-medicine	Dr. rer.nat. Fredy Haryanto, SSI, MSi (Institut Teknologi Bandung)
08.30 - 09.00	The Formulation of Herbal Medicine for Cancer	Prof. Dr. Djoko Agus Purwanto, Apt, MSi (Universitas Airlangga)
09.00 - 09.20	Discussion	
09.20 - 09.30	Coffee break	Committee
	Session II	Moderator : Dr. rer.nat. Tri Yudhani MR, MSc
09.30 - 10.00	Herbal for Malaria	Prof. Dr. dr. Loeki EF., MKes, SpParK (Universitas Brawijaya)
10.00 - 10.30	Physalis for Hypertension	Dr. drg. Nur Permatasari, MS (Universitas Brawijaya)
10.30 - 11.00	Herbal for Cardiovasculer	dr. M. Saifur Rohman, PhD, SpJP, FICA (Universitas Brawijaya)
11.00 - 11.30	Discussion	
11.30 - 12.30	Break	Comittee
12.30 - 15.00	Oral Presentation	
15.00 - 15.20	Closing Ceremony	Committe

## Rakernas KIBI : 23<sup>rd</sup> November 2018 at Hotel Savana

Supported by :



**BUCHI Corporation**

