names
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PREFACE

Assalamu'alaikum Wr. Wb.

All praises are due to ALLAH SWT, God Almighty, Who made this International Conference of successful. The International Conference on Natural, Mathematical and Environmental Sciences (NAMES) 2015 is organized by the Faculty of Mathematics and Natural Sciences (FMIPA), Lambung Mangkurat University, Banjarbaru, South Kalimantan. This conference covered a wide range of topics, including biology, chemistry, physics, mathematics, pharmacy, computer science, material Science, and environmental science.

All papers were compiled into the proceedings book which had six sections, namely Biology, Pharmacy, Chemistry, Mathematics, Physics, and Computer Sciences. This book was also publised in the NAMES Website http://names.fmipa.unlam.ac.id. I am glad that for the first time both types of books can be realized.

The seminar took a theme of "Sustainable Development" as a hot issue in Banjarbaru. Banjarbaru, is a fast growing city in the province of South Kalimantan, Indonesia and famously known as an urban city with a unique natural landscape, a cultural diversity, and a friendly welcoming citizen. Moreover, Banjarbaru becomes the centre of provincial government that its government is located in Banjarmasin today. The conference provided an ideal platform to share information and discuss their scientific results and experiences, with particular references to sustain development.

I was fully satisfied to all the members of the program committee who contributed for the success in framing the program and the books. My appreciation was especially from all delegates who contributed to the success of this conference by accepting our invitation and submitting articles for presentation in the scientific program.

I can guarantee you that this book provides a full of intellectual scientific research activities. I do hope the next conference will pick up similar success, and even better.

Wassalamualaikum Wr. Wb.
Banjarbaru, March 2016

Dr. Krisdianto
Chief of Executive

TABLE OF CONTENTS

PREFACE i

TABLE OF CONTENTS ii

NAMES COMMITTEE vii

BIOLOGY 1

Ethnobotany of Food Trees By The Dayak Meratus Tribe, South Kalimantan 2

The Conflicts of Interest between Oil Palm Expansion and Environmental Sustainability in Seruyan Regency, Central Kalimantan 7

Cytotoxic activity of *Sargassum aquifolium* extracts on HeLa cell 12

Carbon Storage of Pulang Pisau Peat Swamp Forest, Central Kalimantan 18

Study on Bird Diversity in Four City Parks of Malang City, East Java, Indonesia .. 22

Children, Helminth, and Their Relationship: Study on Madrasah Ibtidaiyah Negeri (MIN; Islamic Elementary School) Kalintamui, Hulu Sungai Utara District 30

Resistance of A*edes aegypti* from Banjarbaru Towards Several Mosquito Coils . 34

An Ethnobotany of Understory Species in the Loksado Protected Forest, South Kalimantan 38

The Tourist Perception Toward The Environmental Comforts of Natural Tourism Object, Pindul Cave In Gunung kidul Regency, Yogyakarta 46

The Potency of Carbon Sink and Carbon Dioxide Absorption of *Pinus mercusii* in Baito HTI, South Konawe Regency 52

Physiological Study of Protein and Anthocyanin Content of Waterleaf Shoot (*Talinum triangulare* (Jacq.) Willd) Treated with Nitrogen+Potassium Application and Harvest Interval 58

A Study of Iron (Fe) Uptake by Purun Tikus (*Eleocharis dulcis*) Grown on Acid Mine Drainage at a Subsurface Flow Constructed Wetland 62

The Potential of *Photobacterium damselae Subsp. damselae* and *Vibrio harveyi* as Monovalent and Bivalent Vaccines of The Asian Seabass, *Lates calcarifer* Bloch 67

Characterization and Dating ^{14}C Banjar's Boat Artifact from Site of Laras Temple, Barito River-Kalimantan 180

The Effect of Cl Substituent Position in Benzoylchloride Reagent Towards the Yield of Synthesis of the Novel Lead and Substituted Compounds of 1-Benzoyl-3-Benzylurea as Prospective Anticancers..... 185

Biodiesel Production from Waste Frying Oil: Esterification Using H_2SO_4 and Transesterification Using CaO Catalyst Derived from *Anadara granosa*..... 190

Porosity and Permeability of Soil Clay-Based Mesoporous Ceramic Filter Prepared at 800, 850, and 900 °c 195

Potential of Coal Fly Ash as Pellet Adsorben to Reduce Level Hg^{2+} in Liquid Waste 202

Removal of as in Acid Coal Mine Drainage using Water Hyacint (*Eichhornia crassipes* (Mart). Solms) 206

MATHEMATICS 216

Capital-Based Risk Measures For Some Probability Models..... 217

Application Optimal Control Theory for Inventory Production System 225

Another Sum of Normal Fuzzy Ideals in *Near-Ring*..... 232

Isomorphism Theorems Of Quotien Module Over Fuzzy Submodule 235

The Impact of the Perception Value, the Image of the Company, and the Quality of the Product on the Customer Satisfactory Using Tobit Regression Analysis . 240

Parameters Estimation Of Accelerated Life Test Model On Rayleigh Distribution 247

The Formation of Portfolio of Percentage Allocation Management Module (Pamm) 254

Supporting Students in Learning the Area Measurement of Two-Dimensional Shapes 262

Confidence Intervals for Semiparametric Regression Analysis With Missing Response Based The Normal Approximation Method..... 268

An Approximate Solution for a Two Species Commensalism Model With Limited Resources 273

Bootstrap Aggregating Multivariate Adaptive Regression Spline (Bagging MARS) Model For Malnutrition Case 278

The effect of Cl substituent position in benzoylchloride reagent towards the yield of synthesis of the novel lead and substituted compounds of 1-benzoyl-3-benzylurea as prospective anticancers

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ABSTRACT

This study is related to design and synthesize of a novel lead compound 1-benzoyl-3-benzylurea and the compounds which are subtituted with Cl substituent, as prospective anticancers with antiproliferation mechanism. The purpose of this study is to obtain a novel lead compound 1-benzoyl-3-benzylurea and the compounds which are subtituted with Cl substituent at a different posisition. In order to reach such purpose, the synthesis with nucleopilic substitution reaction and modified Schotten Baumann method was done. Benzylurea as a starting material is reacted with the lead and subtituted benzoylchloride reagents (2-Cl, 3-Cl and 4-Cl). Four compounds are yielded from the synthesis, which are 1-benzoyl-3-benzylurea 36%, 1-benzoyl-3-(2-chlorobenzyl)urea 8%, 1-benzoyl-3-(3-chlorobenzyl)urea 22% and 1-benzoyl-3-(4-chlorobenzyl)urea 36%. The position of substituent towards the carbonyl group affects the compound's electropilic force. The closer the substituent to the carbonyl group, the less the electrophilic force is. Due to the fact that the synthesis yields are relatively low, it is highly recommended to do further optimation in synthesis to all of the lead and substituted compounds 1-benzoyl-3-benzylurea as prospective anticancers.

Keywords: the lead and substituted compounds 1-benzoyl-3-benzylurea, design, synthesize

Introduction

Cancer is a health issue all over the world currently, including in Indonesia. In 2013, the data of the World Health Organization, abbreviated as WHO, shows that cancer is in the 2nd place of most common cause of death, with cardiovascular as the 1st. In between 2008-2014, the number of cancer cases increases from 12.7 million to 14.1 million, followed by the number of death from 7.6 million in 2008 to 8.2 million in 2014. Based on the Basic Health Research (*Riset Kesehatan Dasar,* abbreviated to *Riskedas*) by the research and development division of Indonesian Republic's Health Department in 2007, cancer sits in the 6th place of the biggest cause of death in Indonesia. According to the 2013th *Riskedas*, cancer can strike any person in any ages, regardless the economic status and the education status of the person. The national cancer number in Indonesia is 1.4 per 1000 citizens, with the higher number on female victims of 5.7 per 1000 citizens compared to male victims of 2.9 per 1000 citizens.

In order to control cancer, the Health Ministry has done an effort through risk factor management and early detection approach. Besides such approach, efforts of patient medicating in hospitals and palliative clinics have also been done. However, all of those efforts will not work efficiently without the supports from every related factor, along with every single layer of society (www.depkes.go.id). Due to such need, the role of pharmacists as the medication provider is essential, as a factual example, in the chemotherapy medication. Chemotherapy is one of the cancer medication procedures by using anti-cancer drugs to kill or inhibit the activity of cancer cell while it is exercising its fission through various mechanisms.

Hydroxyurea is an anti-cancer drug which has been used for some decades to medicate some types of cancer. This compound dissolves in water which is distributed equally all around the body through the body fluids (Saban and Bujak, 2009). The best *Ribonucleotide reductase* inhibitor, abbreviated as RNR, is hydroxyurea, which will be absorbed after oral administration, transportation through cells, and activation of RNR enzyme, by tying the radical tyrosil in the RNR's active side.

Researches regarding the urea derivate have been done many times with urea group as the group which influences the anti-cancer activity (pharmacophore). Lokwani et al. (2011) and Lu et al. (2012) stated