

THIS IS WRITING GUIDELINES



JULY 2020

**BACHELOR OF
PHARMACY STUDY
PROGRAM**

**FACULTY OF PHARMACY
UNIVERSITAS AIRLANGGA**



FOREWORDS

Assalamu alaikum warahmatullahi wabarakatuh

Alhamdulillah. We would like to express our greatest gratitude to God the Almighty for the blessing and guidance given to the team to complete this Thesis Writing Guideline for the Bachelor of Pharmacy Study Program, the Faculty of Pharmacy, Universitas Airlangga 2020.

The Thesis Writing Guideline is a follow-up to Universitas Airlangga policy regarding the COVID-19 pandemic condition stated on the Circular of Universitas Airlangga Rector Number 888/UN3/DL/2020 on April 11, 2020, concerning the operationalization of rector's policies on learning accessibility, substances of final projects, undergraduate theses, theses, dissertations, and academic administration responding to the impacts of COVID-19 pandemic. One of the implications of this policy is that literature review can be used as a research method in an undergraduate thesis. The curriculum states that an undergraduate thesis is one of the compulsory courses taken in the final year of the study period carried out by conducting final research. The undergraduate thesis also serves as a pre-requisite for obtaining the Bachelor of Pharmacy degree. The procedure of thesis organization through literary review methods has been regulated in the Circular of the Faculty of Pharmacy Dean Number 1013/UN3.1.5/DL/2020 on the Writing Guidelines of Undergraduate Thesis with Literature Review Method for the Students of Bachelor of Pharmacy Study Program, the Faculty of Pharmacy Universitas Airlangga 2020.

This book is an improved version of the Thesis Writing Guidelines in 2018 aiming to provide guidance that will facilitate students in writing their theses according to the standard rules of scientific writing. This book includes thesis writing guidelines for various research methods provisioned, such as laboratory research, field research, dry lab research, and literature review. Students are expected to follow this guideline and all its formats in writing their thesis in the Bachelor of Pharmacy Study Program, at the Faculty of Pharmacy Universitas Airlangga.

We realize that many shortcomings happened during the preparation of this guideline. Therefore, we expect suggestions and constructive criticism to improve this book in the future.

We hope this book will be beneficial for the students.

Wassalamu alaikum warahmatullah wabarakatuh

Surabaya, July 6, 2020

Dean,

Prof. Dr. Umi Athiyah, M.Si., Apt.

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THESIS WRITING GUIDELINES

1. GENERAL PROVISIONS

1.1 Objectives

This Thesis Writing Guidelines book, hereinafter referred to as this guidebook, aims to facilitate students in writing their thesis manuscripts according to the standard rules of scientific writing. The contents of this guidebook cover writing a thesis using several research methods provisioned, such as laboratory-oriented research, field research, dry lab research, and literature review method.

Students are expected to follow this guidebook and all the formats explained in it while writing their undergraduate thesis for the Bachelor of Pharmacy Study Program at the Faculty of Pharmacy Universitas Airlangga.

1.2 Organization of Thesis Manuscript

In this guidebook, thesis manuscripts are divided into three parts, namely:

- (1) Opening Parts
- (2) Main Parts
- (3) Closing Parts

1.2.1 Opening Parts of a Thesis, consisting of:

- (1) Outer Cover and Title
- (2) Cover Page and Title
- (3) Thesis Approval Page
- (4) Plagiarism-Free Declaration Page
- (5) Online Publication Consent Page
- (6) Foreword Page
- (7) Summary Page
- (8) Abstract Page
- (9) Table of Contents Page
- (10) List of Tables Page
- (11) List of Figures Page
- (12) List of Appendices Page
- (13) List of Abbreviations and Symbols Page

1.2.2 Main Parts of a Thesis, consisting of:

- (1) CHAPTER I: Introduction
- (2) CHAPTER II: Literature Review
- (3) CHAPTER III: Conceptual Framework
- (4) CHAPTER IV: Research Methods
- (5) CHAPTER V: Findings and Discussion
- (6) CHAPTER VI: Conclusion and Suggestions

1.2.3 Closing Parts of a Thesis, Consisting of:

- (1) References
- (2) Appendices

1.3 Page Layouts and Document Printing

Page Layouts. The size of the thesis manuscript pages is 21.0 x 29.7 cm (the size of A4 paper) with portrait orientations. The page margins used are 2.5 cm (1 inch) from the upper, right, and bottom borders and 3.5 cm (1.3 inches) from the left border.

Thesis manuscripts are typed using a computer with the “Times New Roman” font size 12 in black ink with one and a half spaces and “justified” alignment. Texts in Title, Summary, Abstract, Footnotes, Tables, and Figures and their descriptions, and References are written in a single space. Texts in lists (i.e. list of contents, list of tables, list of figures, appendices, abbreviations, and tables) are written in one-and-a-half space between the lines.

The indentation for the first letter in a new paragraph starts 1 (one) centimeter from the left border of the page. A new paragraph can only be written near the bottom line of the same page if there is enough space for at least two lines of the paragraph. One last line of the remaining paragraph should not be written/continued on a new page.

The first letter after a comma, colon, semicolon, and period punctuation is typed by inserting a single space between the first letter and the punctuation.

Printing. Thesis manuscripts are printed on A4-sized white HVS papers weighing 80 grams using black printing inks (not dot-matrix printers) on one side of A4 paper weighing 80 grams (not on both sides of the paper). Tables are not necessarily printed with shading or patterns while images and diagrams are allowed to be printed in colors to highlight their visual quality.

For the thesis defense session, the original thesis manuscript may be multiplied by making copies on white HVS papers with the same weight.

All thesis manuscripts that have been declared to have passed the thesis defense session are bound with front and back covers of the same color without borders. The covers of thesis manuscripts use thick yellow papers according to the standard at the

The Faculty of Pharmacy Universitas Airlangga.

For documentation purposes, the manuscripts are printed on white 80-gram papers (HVS 80) sized 14.8 x 21.0 cm (A5 papers). To achieve this result without changing the layouts, change the font size from 12 to 14 and

rearrange the document so that it looks neat. Save the document in .pdf format. When printing the document, use A4 paper (21.0 x 29.7 cm), adjust the printer properties to document size A4, landscape orientations, and choose to print for multiple pages with 2 pages per sheet and page order horizontal.

1.4 Standardized Indonesian Language Use

The language used in the thesis manuscript is the correct and proper form of the standardized Indonesian language based on the improved Indonesian Spelling Guidelines (PUEBI). In case there are foreign words that have not been fully translatable into the Indonesian language, the author may use the original words typed in italicized fonts. An exception for the word “Abstract”, which is typed in non-italicized fonts.

In writing his/her thesis manuscript, the author must comply with grammatical principles. Sentences must be full, consisting of at least a subject and a verb. Punctuations are used accordingly to differentiate main clauses from sub-clauses, to differentiate modifiers from head phrases, and so on.

Personal pronouns, especially first-person pronouns like I and we, are not allowed to be used in a thesis manuscript, except in quotations of main references. Sentences must be arranged in certain ways so that they do not need any personal pronouns.

Syllables may be separated using hyphens according to grammatical provisions, except for the syllables of the last word located at the bottom of a page. Syllabic separation of foreign words must follow the syllabication rules of the word explained in the dictionary.

1.5 Page Numbering Guidelines

The pages of the opening part of the thesis are numbered using small Roman numerals (i, ii, iii, iv, v, and so on). The numbers are inserted at the center of the page bottom, 1 (one) centimeter above the bottom border of the page. The numbering starts at the inner cover page.

Page numbering in the main part of the thesis uses Arabic numerals (1, 2, 3, and so on). Page numbers are typed on the upper right corner of a page, 1 (one) centimeter above the first line except for the first page of each chapter (CHAPTER pages) where the page numbers are typed at the center bottom of the page, 1 (one) centimeter above the bottom border.

The printed page numbers start from the foreword page. The numbering of attachment pages is the continuation of the main part of a thesis, written in the same format.

2 OPENING PARTS OF A THESIS

2.1 Outer Cover

All words and sentences on the outer cover are typed in Times New Roman fonts. The outer cover contains the word SKRIPSI, the full name of the student (author of the thesis), the title of the thesis, the symbol of Universitas Airlangga, the sentence FAKULTAS FARMASI UNIVERSITAS AIRLANGGA, the name of the department (the structure under the faculty), the place where thesis advisory activities took place, the word SURABAYA and the year of thesis completion. All texts are typed in capital letters and dark blue color. An example of a thesis' outer cover page is presented in Appendix 1.

Details about font sizes and types are as follows:

- (1) The word SKRIPSI is typed in bold font, 2.5 cm below the top margin with capital letters using 16-point font size.
- (2) The title of the thesis is typed in bold font, 5 cm below the top margin with capital letters using 16-point font size.
- (3) The symbol of Universitas Airlangga in full color with a diameter of 5 cm is arranged in certain ways so that the symbol lies exactly at the center between the title and the word FAKULTAS FARMASI.
- (4) The full name of the student (author of the thesis) is typed at the center of the page, 2 cm below the symbol in capital letters using 12-point font size in bold.
- (5) The words FAKULTAS FARMASI UNIVERSITAS AIRLANGGA are written at the bottom center of the page, 6 cm above the bottom margin, followed by the name of the DEPARTEMEN. All texts are written in capital letters using 14-point font size in bold.
- (6) The city name SURABAYA is typed under the name of DEPARTEMEN in capital letters using 14-point font size in bold.
- (7) The year of thesis completion is typed under the city name in capital letters using 14-point font size in bold.

The title of the thesis is typed in certain ways so that its length is no longer than 4 (four) lines. For a thesis with literature review method, the words "Literature Review" are added after the title with the initial letters of each word typed in capital letters and italicized fonts. An example of a thesis' outer cover format is presented in Appendix 1. Please use the symbol of Universitas Airlangga with the same dimension and color as the example.

2.2 Blank Page

The blank page is meant as a separator between the outer cover and the inner title page.

2.3 Title Page

The thesis title page contains the same details as the outer cover page and is typed in black ink.

2.4 Thesis Approval Page

The thesis approval page contains:

The word "**Lembar Pengesahan**" is typed at the upper left corner of the page, 2.5 cm below the top margin in bold font with a font size of 14.

- (1) The title of the thesis is typed at the center of the page, a single space below "Lembar Pengesahan" using 16-point font size in bold. The initial letters of each word are typed in a capital letter.
- (2) The word SKRIPSI is typed four spaces below the title at the center of the page using 16-point font size in bold.
- (3) The sentence "Dibuat untuk memenuhi syarat mencapai gelar Sarjana Farmasi pada Fakultas Farmasi Universitas Airlangga" is typed 2 (two) spaces below the word SKRIPSI at the center of the page using 12-point font size in bold. The first letter of the sentence is typed in a capital letter.
- (4) The year of thesis completion is typed below the word "Universitas Airlangga, typed in a single space using 12-point font size in bold at the center of the page.

- (5) The word “Oleh” is typed 1.5 spaces at the center of the page below the thesis year using 12-point font size in bold. The first letter of the sentence is typed in a capital letter.
- (6) The name of the thesis author is typed three spaces below the word “Oleh” at the center of the page using 12-point font size in bold. The initial letters of each word in the author’s name are typed in a capital letter.
- (7) Student ID number (NIM) is typed one space below the author’s name at the center of the page in capital letters using 12-point font size in bold.
- (8) The sentence “Skripsi ini telah disetujui pada tanggal oleh” is typed 3 (three) spaces below the student ID number at the center of the page using 12-point font size in bold. The first letter is written in a capital letter.
- (9) The words “Pembimbing Utama “(Thesis Advisor) and “Pembimbing Serta” (Co-advisor) are typed 3 (three) spaces below the “Skripsi ini telah disetujui pada tanggal... oleh” using 12-point font size in bold. The initial letters are typed in a capital letter.
- (10) The initial letters of thesis advisors’ names are written in capital letters. The advisors’ names are typed in bold and underlined fonts without parentheses four spaces below “Pembimbing Utama” and “Pembimbing Serta” using 12-point font size. In case there are two thesis advisors, the name of the main thesis advisor is written on the left side and the name of the co-advisor is written on the right side. In case there are three thesis advisors, the name of the main advisor is placed in the middle between the co-advisors’ names on the same line. The title of the thesis advisors is written according to provisioned rules of academic degree and profession. The advisors’ ID numbers are written one space below the names.

An example of thesis approval page format is presented in Appendix 2.

2.5 Plagiarism-Free Declaration Page

Chapter 7 paragraph (1) of the Regulation of the Minister of Education Republic of Indonesia on Prevention and Control of Plagiarism in Higher Education states that “Every scientific work produced in a higher education institution must be accompanied by a statement from its author stating that a) the scientific work is free of plagiarism and b) If in the future it is proven that there is plagiarism in the scientific work, then the author is willing to accept sanctions in accordance with the provisions of statutory regulations”. Therefore, a thesis must be accompanied with a statement from the author declaring that the thesis is free of plagiarism. An example of a plagiarism-free declaration page is presented in Appendix 3.

2.6 Online Publication Consent Page

Chapter 7 paragraph (2) of the Regulation of the Minister of Education Republic of Indonesia on Prevention and Control of Plagiarism in Higher Education states that the leaders of higher education institutions must upload every scientific work made by students/lecturers/researchers/academic staffs of the institutions to the Garuda portal or other portals provisioned by the Directorate General of Higher Education. Therefore, a thesis manuscript must be accompanied with an online publication consent. The format of an online publication consent is presented in Appendix 4.

2.7 Forewords

The words KATA PENGANTAR are typed at the center of page, 2 (two) spaces below the top margin in capital letters using 14-point font size in bold. The words KATA PENGANTAR are not underlined and do not end with a period (.). The content of the Forewords is typed one space below KATA PENGANTAR in using 12-point font size with 1.5 spaces between the lines.

The Forewords page contains an expression of gratitude to the God Almighty and acknowledgment and appreciation in orderly manners to the thesis advisors, the Rector of Universitas Airlangga, the Dean of the Faculty of Pharmacy, heads of departments and divisions, heads of laboratories, thesis examiners, academic advisors, families, relatives, colleagues, and research sponsors. Names are written formally in the Indonesian language as a form of ethical addressing or appreciation to readers and aforementioned figures. Nicknames and non-formal addressing should be avoided in the forewords.

2.8 Summary

The word RINGKASAN is typed at the center of page, 2 (two) spaces below the top margin in capital letters using 14-point font size in bold. The word RINGKASAN is not underlined and does not end with a period (.). The title of the thesis is typed one space below RINGKASAN at the center in capital letters using 14-point font size in bold without periods.

The author's name is typed one space below the title using 12-point font size. The initial letters of each word in the author's name are typed in a capital letter. The content of the summary is typed 2 (two) spaces below the author's name using 12-point font size with double spaces between lines.

The summary contains the overview of the research background, problem statements, research objectives, methods used, findings and data analysis, conclusion, and suggestions. The length of a summary should not exceed 1500 words (about 3 pages).

2.9 Abstract

The word ABSTRACT is typed at the center of page, 2 (two) spaces below the top margin in capital letters using 14-point font size in bold. The word ABSTRACT is not underlined and does not end with a period (.). The title of the thesis is typed one space below ABSTRACT at the center in capital letters using 14-point font size in bold without periods. The author's name is typed two spaces below the title using 12-point font size. The content of the abstract is typed 2 (two) spaces below the author's name using 12-point font size with double spaces between lines and.

An abstract contains an overview of research objectives, methods, findings/conclusions, and suggestions. An abstract should be more concise than a summary and be written in English no longer than 250 words in a single space between lines. In general, words in an abstract should not be written in italicized fonts although they are in English. An exception is for words in other foreign languages (such as words in Latin or Greek alphabets) that need to be written in italic fonts.

At the end of an abstract, the word "Keywords" is typed in bold font, followed by several "key" words that should not be more than 5 (five) words. Keywords contain a set of terminologies that indicate and are related to the object of the study, methods/instruments used, and research topics. Keywords are typed 2 (two) spaces below the final line of abstract contents.

2.10 Table of Contents

The words DAFTAR ISI are typed at the center of page, 2 (two) spaces below the top margin in capital letters using 14-point font size in bold. The words DAFTAR ISI are not underlined and do not end with a period (.). Table of Contents is a list that contains the numbers, titles, chapters, subchapters, and their page locations. Its contents include Lembar Pengesahan (thesis approval page), Kata Pengantar (Forewords), Ringkasan (Summary), Abstract, Daftar Isi (Table of Contents), Daftar Tabel (List of Tables), Daftar Gambar (List of Figures), Daftar Lampiran (List of Appendices), Chapters and Chapter Titles, subchapters and their titles, References, and Appendices. Every number, chapter title, subchapter title, and page number are written in an orderly manner within three columns. The contents of each page are typed with 1.5 spaces between lines.

The word “Halaman” (Page) is typed in the uppermost column indicating page numbers. Chapter numbers are written in Roman numerals (I, II, III, and so on) while the numbers of subchapters are written in Arabic numerals (1, 2, 3, and so on). Each number is written without periods at the end. Subchapter numbering presented in the table of contents is arranged in a sequential manner following chapter numbers added by a period and a number based on subchapter sequences (1.1, 1.2, 1.3, and so on). The first number indicates the chapter numbers, and the second number indicates the subchapter numbers. The maximum numbering typed in a table of contents is three (1.1.1, 1.1.2, 1.1.3, and so on) without periods at the end of the third number. The third number indicates the sequence of sections in a chapter.

The name of each chapter is written in capital letters while the names of subchapters are written in capital letters for each initial letter of the words (Capitalized Each Word). The names of chapters, subchapters, and sections do not end with period.

2.11 List of Tables

The title DAFTAR TABEL and its contents are written in the same rule as the table of contents. This page contains a list of table numbers, titles, and page locations. The word “Halaman” is written above the column indicating page numbers.

2.12 List of Figures

The title DAFTAR GAMBAR and its contents are written in the same rule as the table of contents. This page contains a list of image numbers, titles, and page locations. The word “Halaman” is written above the column indicating page numbers.

2.13 List of Appendices

The title DAFTAR LAMPIRAN and its contents are written in the same rule as the table of contents. This page contains a list of appendix numbers, titles, and page locations. The numbers of appendix sequences are written in Arabic numerals (1, 2, 3, and so on). The word “Halaman” is written above the column indicating page numbers.

3 MAIN PART OF A THESIS

3.1 INTRODUCTION

In the first line of the introduction chapter, the words BAB I are written at the center of the page in capital letters, 2 (two) spaces below the top margin. The word PENDAHULUAN (the title of the chapter) is written 2 (two) spaces below BAB I. All these words are written in capital letters using 12-point font size in bold. Those words are not underlined and do not end with a period (.).

The name of the first subchapter is written three spaces below the chapter name. The initial letters of subchapter and section names are written in a capital letter and in bold. Those names are not underlined and do not end with a period (.)

The provisions in writing the numbers and titles of sub-chapters and sub-sub-chapters are as follows: Subchapter numbers are written with 2 (two) Arabic numerals, separated by a period but the last number is not followed by a period, for example, 1.1, 1.2, 1.3, and so on; sub-chapter numbers are written in 3 (three) Arabic numerals, each number is separated by a period but the last number is not followed by a period, for example, 1.1.1, 1.1.2, 1.1.3, and so on. The first number shows the serial number of the chapter, the second number shows the serial number of the sub-chapter in the chapter, and the third number shows the serial number of the sub-chapter in the sub-chapter. Subchapter numbering is arranged in certain ways so that it consists of a maximum of three digits (1.1.1, 1.1.2, 1.1.3, and so on.).

The numbers and titles of subchapters and sections must be stated in the Table of Contents.

For numbering other lists than subchapters, the format used is Arabic numerals put in parentheses, for example (1), (2), (3), and so on.

3.1.1 Background of the Study

Background of the Study is the first subchapter in the Introduction chapter. This subchapter contains the description of things that serve as the basis of research problems and the reasons why these problems are important and need to be analyzed or discussed. The research problems proposed must be supported by data from previous publications or empirical facts so that it is clear that the problems need to be analyzed. The author also needs to place the problems in a broader sense and explain the importance of the study in solving problems in a broader sense.

3.1.2 Problem Statements

The content of this subchapter is a statement or a sentence that formulates research problems proposed concretely in the form of questions about facts that are specifically asked.

3.1.3 Objectives of the Study

This subchapter contains a statement about the objective(s) to be achieved through the study. The objective(s) of the study must be clear and explicit and may contain one or more objectives.

Depending on research types or themes and the field of study, the objectives of a study can be a general objective or can be formulated into general objectives and specific objectives. They are:

- (a) **General Objectives**, refer to the overall objectives to be achieved in the study so that it can describe the direction of the study and targets to be achieved in general.
- (b) **Specific Objectives**, refer to an elaboration or staging of general objectives that is more technical/operational but remains coherent with the research problems that are going to be solved. If all specific objectives are achieved, the general objectives will be achieved too.

3.1.4 Significance of the Study

This subchapter contains the benefits of the study and the implementation of its results. The significance of a study correlates with the development of science, especially in accordance with the type or theme and field of the study, practical uses that can be utilized by other scientists to develop science, technology, and art, and the benefits of the study for society. The significance of the study may also contain expectations about the continuation and sustainability of research findings once they have been concluded.

3.2 LITERATURE REVIEW

The literature review is the second chapter of the thesis. The writing provisions of the chapter and chapter title are the same as the writing provisions of the introduction chapter. Principally, this chapter contains a systematic description of facts and research findings gathered from references that contain theories, propositions, concepts, and approaches to strengthen the background of the study, the approaches used in the study, and all things related to the main issues discussed in the study.

3.3 CONCEPTUAL FRAMEWORK

The conceptual framework is the third chapter of the thesis. The writing provisions of the chapter and chapter title are the same as the writing provisions of the introduction chapter. The conceptual framework chapter contains abstractions of theories obtained from scientific publications and findings of previous related studies that are used as conceptual frameworks to support the background and chosen methods and to predict the outcomes of the study. This chapter may contain an explanation of correlations/interconnection between variables and fundamental theories/concepts of the study that serve as the basis for solving research problems. All these concepts are organized according to scientific thinking flows so that they can be formulated as scientific statements in the form of hypotheses that are going to be examined through scientific analysis in the thesis.

The conceptual framework chapter is accompanied with a flow chart that describes the flow of research concepts and hypotheses.

Hypotheses are scientific propositions formulated from the conceptual framework of a study and the answer to the proposed research questions.

3.4 RESEARCH METHOD

Research method is the fourth chapter of the thesis. The writing provisions of the chapter and chapter title are the same as the writing provisions of the introduction chapter. This chapter comprises several subchapters containing a clear yet concise description of research type and design, research variables, research materials

and instruments, operational definitions, research operational frameworks, detailed review designs, work, procedures, and data analysis.

Types of research can be differentiated into descriptive research, analytical research, observational research, and experimental research. Meanwhile, several examples of research designs are cross-sectional, prospective, retrospective, etc.

Research materials can be in the form of materials such as chemicals, natural extracts, and experimental animals alongside the description of their specifications. Research materials also include non-material things, such as reference databases, protein structure databases, and other sources of primary data.

Research instruments are all non-ingredient equipments used to obtain research data, including spectrophotometer, HPLC, disintegration measurement tools, microscope, questionnaire, computer software, etc. alongside the description of their specifications.

The description of the designs of review processes which include methods of reference collection and review stages and techniques can be seen in Literature Review Thesis Writing Guidelines.

The research procedures subchapter contains a detailed explanation of the steps or operational stages of research. The data analysis subchapter describes the methods and approaches used in analyzing data to generate research findings.

3.5 FINDINGS AND DISCUSSION

This is the fifth chapter of the thesis. The writing provisions of the chapter and chapter title are the same as the writing provisions of the introduction chapter. This chapter contains all research findings that are relevant to research objectives and hypotheses. The research findings consist of:

- a. Raw data of laboratory or field research (these data can also be presented in Appendices if needed).
- b. Primary data from literature or databases that have been validated according to provisioned methods.
- c. Processed data in the forms of measurement results or reviews presented in tables, figures, curves, diagrams, or other forms of presentation. The flow of data processing from raw data to processed data must be easily understood.

The results of data processing and the results of experimental data analysis or reviews are directly followed by an interpretation of these findings and discussions/reasoning about:

- a. Research findings and their correlation with research objectives and the solutions for the issues analyzed in the study.
- b. Descriptions of the research findings and the findings made by previous researchers and how these previous findings correlate with the findings of the current research.
- c. Analytical or synthetic descriptions to generate conclusions and suggestions based on inductive or deductive approaches.
- d. Descriptions of the limitations of the study, the development of the study in the future, and the implications of the study to the development of science so that the study can give suggestions to other researchers and society.

3.6 CONCLUSION AND SUGGESTIONS

This chapter is the sixth chapter of the thesis. The writing provisions of the chapter and chapter title are the same as the writing provisions of the introduction chapter. This chapter contains the conclusion from research findings and suggestions that are written in separate subchapters.

The conclusion subchapter contains the conclusion/final assessment of research findings or reviews based on the previous discussion. The conclusion subchapter is not a summary, and its statement has to be relevant to the objectives of the study.

The suggestion subchapter contains the implementation and implications of the conclusion that benefit the users and things that have not been revealed in the study.

4 CLOSING PARTS OF A THESIS

4.1 References

References contains all literary sources that have been quoted or cited in the thesis manuscript, which include all literary sources used in preparing and carrying out research, discussing research findings, and generating conclusions of the thesis. Literary sources used should have high validity degree according to scientific ethics, valid sources (indicated by ISBN and ISSN), scientific contents, expertise values, and the publisher's reputation.

References is not a chapter, and therefore it does not have chapter numbers. The words DAFTAR PUSTAKA are written 2 (two) spaces below the top margin using 14-point font size in bold. The words DAFTAR PUSTAKA are not underlined and do not end with a period (.). References are organized in alphabetical order without numbering. The alphabetical order is based on the surname of the first author. Every name of literature is typed 1 (one) space between the line and the next literature is typed one space below the last line of the previous list.

4.1.1 Types of References

References used in a thesis can be in the forms of:

- a. Scientific journals (ISSN)
- b. Published books (ISBN)
- c. Proceedings of scientific seminars, symposiums, and congresses
- d. Findings of unpublished scientific articles such as undergraduate theses, theses, dissertations, and scientific reports
- e. Latest scientific information from the internet (reputable websites and clear access date)

This order indicates the validity degree of literary sources.

4.1.2 References Writing Style

Following the recommendation of the Directorate of Higher Education (DIKTI), the recommended writing format for references proposed in this guidebook is the Harvard style (see reference writing guidelines published by DIKTI). Citation writing is carried out by mentioning the author's surname and publication years, for example:

- 1) Meningkatkan glukosa darah (Ali, 2009).
- 2) Berpengaruh pada kadar sitosterol (Udin dan Umar, 2012).
- 3) jumlah kecelakan meningkat (Ana dan Ani, 2010; Ely, 2016).
- 4) perbedaan yang nyata (Rivaldo et al., 2008 dan Klose, 2011)
- 5) Menurut hasil penelitian Hasan et al., 2000, (two or more Indonesian authors)
- 6) Green et al. (2010) meneliti tentang (two or more foreign authors)
- 7) Hasil penelitian terbaru (White dan Brown, 2011) menunjukkan bahwa
- 8) Ali (2008) menyatakan bahwa

a. Reference writing formats for scientific magazines/journals are:

- (1) The name of the first author (his/her surname) is written at the beginning, followed by a comma, the initial (first letters) of his/her first name, and ended with a period. The same pattern is repeated for the second author, third author, and so on (if the authors are more than one). Do not use et al. or dkk.
- (2) Publication years, followed by a period
- (3) Title of the article, the initial letters of each word are written in a capital letter, ended with a comma, followed by
- (4) Name of the magazine or journal, the initial letter is written in a capital letter in bold, abbreviated according to international writing standards, ended with a comma, followed by
- (5) Journal volume, ended with a comma, followed by
- (6) Journal edition, ended with a comma, followed by
- (7) Page number of the article, starting from the page number where the article begins followed by a dash and the page number where the article ends, ended with a period.

Example:

Liu, L., Qin, X., and Gerson, S.L., 1999. Reduced lung tumorigenesis in human methylguanine DNA-methyltransferase transgenic mice achieved by expression of transgene within the target cell. *Carcinogenesis*, Vol. 20 No. 20, p. 279-84.

Miyagawa, C., Wu, C., Kennedy, D.O., Nakatani, T., Ohtani, K., Sakanaka, S., Kim, M., and Yuasa, I.M., 1997. Protective effect of green tea extract and tea polyphenols against the cytotoxicity of 1,4-naphthoquinone in isolated rat hepatocytes. *J. Anal. Chem.*, Vol. 12 No. 34, pp. 1901-5.

The name of the author must be written in full name following the writing guidelines of DIKTI
Example: Djoko Agus Purwanto is written Purwanto, D.A.

Riesta Primaharinastiti is written Primaharinastiti, R.

b. Reference writing formats for published books with ISBN

Books written by one author or more, for example:

Arief, B.A.S dan Bayu, B.A.S., 1992. *Pedoman Penyusunan Karya Tulis Ilmiah*. Edisi ke-1, Surabaya: Airlangga University Press, hal. 200-30.

If the publisher is located in many cities, only the first city is written.

c. Reference writing formats for books with editors

If the citation is originated from a chapter of a book:

Guy, R.H. and Hadgraft, J. eds., 2003. *Transdermal Drug Delivery*. 2nd ed. New York: Marcel

Dekker, Inc.

Beale, J.M. and Block, J.H. eds., 2011. *Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry*. 12th ed. Philadelphia: Lippincott Williams & Wilkins.

If the citation is originated from different chapters of a book:

Minna, J.D., Pass, H., Glatstein, E. and Ihde, D.C., 1997. Lung Cancer. In: V.T. De Vita, S. Rosenberg, and S. Hellman, eds. *Principles and Practice of Oncology*. Philadelphia: J. B. Lippincott Co., pp.591-705.

Block, J.H., 2011. Drug Design Strategies. In: J.M. Beale and J.H. Block, eds. *Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry*. 12th ed. Philadelphia: Lippincott Williams & Wilkins. Ch.2.

Diyah, N.W., dan Sondakh, R., 2016. Hubungan Struktur dan Proses Metabolisme Obat. Dalam: Siswandono dan B. Soekardjo, eds. *Kimia Medisinal 1 edisi ke-2*, Surabaya: Airlangga University Press. Bab 16.

d. Reference writing formats for translated books

Lachman, L., Lieberman, H.A. and Kanig, J.L. eds., 1989. *Teori dan Praktek Farmasi Industri I*. Diterjemahkan dari bahasa Inggris oleh S. Suyatmi dan I.T. Aisyah. Jakarta: UI Press.

Canetti, E., 2001. *The voices of Marrakesh: a record of a visit*. Translated from German by J.A. Underwood. San Francisco: Arion.

e. Reference writing formats for books published by official institutions

Badan Pengawas Obat dan Makanan R.I., 2006. *Petunjuk Operasional Penerapan Cara Pembuatan Obat yang Baik 2006*. Badan Pengawas Obat dan Makanan R.I.

f. Reference writing formats for theses or dissertations

Agutter, A.J., 2005. *The linguistic significance of current British slang*. Dissertation. Edinburgh University.

Diyah, N.W., 1998. *Hubungan struktur dan aktivitas antiinflamasi turunan Asam salisilat*. Tesis. Universitas Gadjah Mada.

g. Reference writing formats for scientific articles published on the internet (websites, webpages, web-published articles)

Pusat Komunikasi Publik, Sekretariat Jenderal Kementerian Kesehatan R.I., 2010, Jika tidak dikendalikan 26 juta orang di dunia menderita kanker. Diakses dari <http://www.depkes.go.id/index.php/berita/press-release/1060-jika-tidak-dikendalikan-26-juta-orang-di-dunia-menderita-kanker-.html>, pada tanggal 2 Maret 2011.

Guirguis L. M. and Lee S., 2012. Patient assessment and documentation integrated in community practice: Chat, check, and chart., *Journal of American Pharmacist Association*. 52:e241-e251. Diakses dari <http://japha.org/article.aspx?articleid=1392741>, pada tanggal 12 Februari 2013.

h. Reference writing formats for news articles from newspapers or magazines

Slapper, G., 2005. Corporate manslaughter: new issues for lawyers. *The Times*, 3 Sep.p.4b.

i. Reference writing formats for patents

Graham, C.P., Fonti, L. and Martinez, A.M., American Sugar Co., 1972. Tableting sugar and compositions containing it. U.S. Pat. 3,642,535.

j. Reference writing formats for official documents

Official documents published under anonymous authors or institutions:

Undang-Undang Republik Indonesia Nomor 36 tahun 2009 tentang Kesehatan, 2009. Jakarta.

Peraturan Pemerintah Republik Indonesia Nomor 59 Tahun 2009 tentang Pekerjaan Kefarmasian, 2009. Jakarta.

Official documents published under an official institution:

Departemen Kesehatan R.I., 2004. Keputusan Menteri Kesehatan Republik Indonesia Nomor 1027/MENKES/SK/IX/2004 tentang Standar Pelayanan Kefarmasian di Apotik. Jakarta: Direktorat Jendral Pelayanan Kefarmasian dan Alat Kesehatan Departemen Kesehatan R.I.

Department of Health, 2001. National service framework for older people. London: Department of Health.

4.2 Appendices

Appendices contain required data, including raw data that are directly related to the content of thesis manuscripts. Appendices may consist of several pages put at the end of thesis manuscripts. It may contain letters describing the specifications of research materials, additional information about reference/standard method protocols, formula derivations, measurement examples, raw research data (original printouts and instruments), and the whole research data that may disrupt the understandability of thesis contents if these data are included in the main content of thesis manuscript. Appendices can also in the forms of tables, images, and other things that are considered not parts of a thesis but are still needed as a reference in manuscript writing.

Each appendix is numbered in Arabic numerals 1, 2, 3, and so on (e.g. Appendix 1, appendix 2, and so on). Appendices with numbers and titles begin with a page containing the word LAMPIRAN in the middle of the page typed with capital letters using 20-point font size without numbering.

5 OTHER PROVISIONS

5.1 Displaying Images

5.1.1 Allowed Images

In this guidebook, the word “image” refers to pictures, illustrations, graphs, charts/diagrams, floorplans, maps, monogram charts, flowcharts, and photographs. Letters, numbers, and other punctuations in an image must be clear. Images must be blended with the paper used for thesis manuscripts, which can be printed using a printer or relevant software.

5.1.2 Unacceptable Images

The images that are not allowed to be displayed in thesis manuscripts are:

- (1) Images drawn on graph papers
- (2) Images drawn on tracing papers
- (3) Images drawn on graph papers that are glued to the thesis manuscripts
- (4) Images or pictures drawn on other pieces of paper and glued to the thesis manuscripts

5.1.2.1 Image Placement

The square border of an image, diagram, or illustration may be composed of pseudo-lines adjusted in certain ways so that the lines do not exceed the page borders (the printing border of a page). The longer side of the border can be placed in parallel with either the width or the length of a page. The images whose longest side is parallel with the length of a page should be placed on a different page separated from text contents to make them easier to read.

Images with borders parallel to the width of a page can be placed in the middle of a page between sentence lines. In this case, the image borders are placed 3 (three) spaces below the previous lines. The next sentence lines are placed 3 (three) spaces below the bottom border of the image. Image numbers and captions are placed below the image.

5.1.3 Image Numbering and Captioning Guidelines

Image numbers consist of 2 (two) Arabic numerals. The first number indicates chapter numbers, and the second one indicates image orders in the chapter (e.g. 1.1, 1.2, 1.3, and so on). Image captions are placed below the image with the initial letter capitalized. The space between image captions and text lines is 1 (one) space. Images whose dimensions are larger than text borders can be folded to reach the same size as the text page and become a part of the texts in the thesis' main parts. However, these large images should be attached separately as an appendix.

5.1.4 Image References

Images quoted from literary sources are provided with information at the bottom of the image, including the author's last name along with the publication years. The literary sources are also listed in References.

5.2 Displaying Tables

Tables are integrated into manuscript papers. The title (caption) of a page is written above the table borders. Table columns are arranged in certain ways to make the table easier to read. The space between lines in a table is 1.5 space to make the table easier to read.

5.2.1 Table Placement

Like images, tables also have borderlines that commonly consist of pseudo-lines. Tables are placed in the middle of text manuscripts in certain ways so that the table borders do not exceed the page borders and the tables are placed symmetrically in a page. Table columns can be placed parallel to either the page width or page length. If

the table columns are parallel to the page length, the table should be placed on a different page separated from the text.

Tables can be placed in the middle of a page between text lines in the main parts of a thesis. In this case, the caption of a table is placed 3 (three) spaces below the last line of the previous sentence while the last line of table captions is placed two spaces above the table borders. The bottom border of a table is placed three spaces above the next sentence.

Tables that require pages larger than the manuscript page are acceptable, but only for tables on pages that can be folded once to reach the same size as the manuscript page, which can still be included in the main body of the thesis. Larger tables should be included in the appendix.

5.2.2 Table Numbering and Captioning Guidelines

Table numbers and captions are written above the top border of the table. The initial letters of each word in table captions are capitalized. If the caption consists of two lines or more, the space between its lines is 1 (one) space. Table numbering is expressed in 2 (two) numbers separated by a period. The first number is Roman numerals indicating the chapter numbers while the second number is Arabic numerals indicating the order of tables in the chapter, for example, II.3, IV.1, and so on.

5.2.3 Tables for Secondary Data

Secondary data presented in a table and originating from a reference must state the name of the author and the publication year at the end of table captions. This reference should be stated in References.

In tables that contain data from multiple sources, every data group originating from the same source is indicated by a superscript. The description of the superscript is placed in the footnotes below the table. References can also be placed in a special column of the table. In this case, superscripts are not needed.

5.3 Using Symbols, Units, and Numbers

Variable symbols are used to facilitate the expression of a variable in a formula or mathematical expression. All letters in Greek and Roman alphabets (uppercase and lowercase) can be used to symbolize a variable. A symbol may consist of one or two letters. Symbols may contain indexes/subscripts, superscripts, or both. Some symbols are italicized. As a reminder, please use the symbols that are commonly used in pharmacy. Variable symbols should not be put at the beginning of a sentence. Therefore, sentences must be arranged in certain ways so that they do not begin with a symbol.

Units. The units used in a thesis are the International System of Units (SI). The abbreviation of these units must also follow the SI. The units are abbreviated in the lowercase of their initial letter without a period and are written in non-italic font. Initial symbols and abbreviations can be added to the units, for example, μ (micro-), m (milli-), d (deci-), h (hecto-), k (kilo-), and M (mega-).

As a noun, the name of a unit must be written in full (not abbreviated). Likewise, the name of units at the beginning of a sentence must also be written in full. The units behind a number indicating measurements are abbreviated and written in lowercase.

Numbers. The numbers here refer to Arabic numerals that are used to express:

- a. Measurements, for example, length (174 cm), mass (81,0 kg), weight (1,25 g; 0,225 g; 1,2250 g), temperature (250 °C), percentage (95.70%), etc.
- b. Page numbers
- c. Date, for example, December 28, 1966
- d. Time, for example, 10 AM or 10.45 WIB
- e. Numbers in algebraic equations and formulas, including fractions
- f. Others

A comma expresses decimals, for example, 22, 5 (twenty-two point five). The numbers of decimals depend on the sensitivity of measurement tools or methods used.

Thousands are expressed by periods, for example, 1.000.000 (one million). Numbers that are smaller than ten are expressed using words, for example, six universities while the numbers that are larger than ten are expressed using numerals, for example, 17 mangoes.

Indefinite numbers and numbers used to express an amount, in general, are expressed using words, for example, ten years ago, forty years old, half an hour later, five times a day, several hundred centimeters, and so on.

Numerals are not allowed to be used to express a number at the beginning of a sentence. If a numeral is needed at the beginning of a sentence, the numeral should be expressed in words, or the sentence should be arranged in certain ways so that the numeral is not located at the beginning of a sentence.

Roman numerals should not be used to express ratios.

5.4 Writing Formulas and Numeric Measurements

A formula is placed symmetrically within the text borders. Longer formulas can be written in two lines or more than two lines. Long formulas truncation is only performed for arithmetic operations that use the plus sign (+), minus sign (-), multiplication sign (x), and division sign (:), not the slash sign (/). The arithmetic operation signs are preceded and followed by a stroke of space between two words.

Superscripts that indicate exponents are written half of a space above the variable sign. The use of the root sign ($\sqrt{\quad}$) is expressed as fractional powers. Fractions should be expressed using decimal numbers, not using slashes. Brackets are used to highlight the hierarchy of arithmetic operations. The hierarchy of brackets used in this guidebook is defined as follows:

{{ ()}}

Every formula is numbered, and the number is written between two brackets. Formula numbering consists of two numerals separated by a period. The first number is Roman numerals which indicates the chapter where the formula is located. The second number is Arabic numerals which indicate the order of formulas in a chapter.

The substitution of a variable with its values in arithmetic operations is written according to the same provisions as formula writing. In this case, the use of an interpoint to indicate multiplication should be avoided.

5.5 Italic Fonts

Italic font is used to define the title of a book and the name of a journal in References, to define words or terms in Latin, such as the name of a plant *Sonchus arvensis* L., the name of an animal *Mus musculus*, name of a microbe *Staphylococcus aureus*, medicinal instruction in a prescription *signa intestinal externus*, and English words or terms that have not been translated. The font size of italicized texts must be the same as the size of regular texts.

5.6 Quotation Marks

Quotation marks are used in expressing foreign words that are difficult to translate into Indonesian, for example, “aging” in gravimetric methods.

5.7 Citations

The maximum length of formulas, paragraphs, or definitions cited from a literary source in the References is one-third of the whole cited text. Citations from articles or book references are indicated by stating the surname of the author and publication years.

6 FORMATS OF THESIS PROPOSALS

General provisions, procedures, and guidelines of thesis proposal writing are the same as the writing guidelines of a thesis. The difference lies in its systematics or organization, where the organization of a thesis proposal is more concise because there is no research finding to be presented. The organization of a thesis proposal is as follows:

6.1 Opening Part, consisting of:

- (1) Outer cover containing the title of the proposal and author's identity
- (2) Proposal Approval Page
- (3) Table of Contents Page
- (4) List of Tables Page
- (5) List of Figures Page
- (6) List of Abbreviations and Symbols Page (if needed)

An example of a thesis proposal's front cover format can be seen in Appendix-6

6.2 Main Part, consisting of:

- (1) CHAPTER I. Introduction
- (2) CHAPTER II. Literature Review
- (3) CHAPTER III. Conceptual Frameworks
- (4) CHAPTER IV. Research method
- (5) CHAPTER V. Research Location, Schedule, and Budget

Research plans that consist of research location, schedule, and budgets required for the research are described in CHAPTER V. These research plans can also be presented in a table or a chart.

6.3 Closing

- (1) References
- (2) Appendices

Appendices at the end of a thesis proposal may contain several pages of documents and additional information to make operational procedures of the research clearer, for example, the details of research locations, source of materials, identities of research materials, results of synthesis carried out in previous research, or orientation results used in the research. The appendices can be numbered using one Arabic numerals, for example, Appendix-1, Appendix-2, Appendix-3, and so on.

Appendix-1: The Format of Sampul Luar (Thesis' Outer Cover Page)

SKRIPSI

**SINTESIS 1-NITROBENZOIL-3-ETILTIOUREA
UNTUK MEMPEROLEH SENYAWA ANTIBAKTERI YANG
AKTIF TERHADAP *METHICILLIN-RESISTANT*
*STAPHYLOCOCCUS AUREUS***



NAMA LENGKAP HURUF KAPITAL

**FAKULTAS FARMASI UNIVERSITAS AIRLANGGA
DEPARTEMEN KIMIA FARMASI
SURABAYA
2012**

Appendix-2: The Format of Lembar Pengesahan (Thesis Approval Page)

Lembar Pengesahan

**SINTESIS 1-NITROBENZOIL-3-ETILTIOUREA
UNTUK MEMPEROLEH SENYAWA ANTIBAKTERI YANG AKTIF
TERHADAP *METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS***

SKRIPSI

**Dibuat Untuk Memenuhi Syarat
Mencapai Gelar Sarjana Farmasi Pada
Fakultas Farmasi Universitas Airlangga**

2012

Oleh :

Nama Lengkap

NIM :

**Skripsi ini telah disetujui
tanggal 1 Juli 2012 oleh :**

Pembimbing Utama

Pembimbing Serta

Prof. Dr. (Nama dan gelar resmi)

NIP. xxxxxxxx xxxxxx xxxx

Dr. (Nama dan gelar resmi)

NIP. xxxxxxxx xxxxxx xxxx

SURAT PERNYATAAN

Yang bertanda tangan di bawah ini,

Nama :

N I M :

adalah mahasiswa Fakultas Farmasi, Universitas Airlangga, menyatakan dengan sesungguhnya bahwa Naskah Tugas Akhir/Skripsi yang saya tulis dengan judul:

Sintesis 1-Nitrobenzoil-3-etiltiourea untuk Memperoleh Senyawa Antibakteri yang Aktif terhadap *Methicillin-Resistant Staphylococcus aureus*

adalah benar-benar merupakan hasil karya saya sendiri. Apabila di kemudian hari diketahui bahwa isi Naskah Skripsi ini merupakan hasil plagiasi, maka saya bersedia menerima sanksi berupa pembatalan kelulusan dan atau pencabutan gelar yang saya peroleh.

Demikian surat pernyataan ini saya buat untuk dapat dipergunakan sebagaimana mestinya.

Surabaya,

Yang membuat pernyataan,

Meterai Rp 6.000,-

Nama Lengkap

NIM

Appendix-4: The Format of Surat Persetujuan Dipublikasikan di Media Online (Thesis' Online Publication Consent Page)

SURAT PERNYATAAN

Yang bertanda tangan di bawah ini,

Nama :

N I M :

menyatakan bahwa demi kepentingan perkembangan ilmu pengetahuan, saya menyetujui abstrak Skripsi yang saya tulis dengan judul:

Sintesis 1-Nitrobenzoil-3-etiltiourea untuk Memperoleh Senyawa Antibakteri yang Aktif terhadap *Methicillin-Resistant Staphylococcus aureus*

untuk dipublikasikan atau ditampilkan di internet atau media lain yaitu Digital Library Perpustakaan Universitas Airlangga untuk kepentingan akademik, sebatas sesuai dengan Undang-Undang Hak Cipta.

Demikian surat pernyataan ini saya buat untuk dapat dipergunakan sebagaimana mestinya.

Surabaya,

Yang membuat pernyataan,

Meterai Rp6.000,-

Nama Lengkap

NIM

Appendix-5: An Example of Kata Pengantar (Forewords) of a thesis

KATA PENGANTAR

Kalimat pembuka dapat berupa ungkapan rasa syukur ke hadirat Allah SWT/Tuhan Yang Maha Esa. Disusul pernyataan terimakasih kepada semua pihak, dengan urutan sebagai berikut:

1. Pembimbing utama dan pembimbing serta (Nama lengkap dengan gelar resmi)
2. Rektor Universitas Airlangga, Dekan Fakultas Farmasi Universitas Airlangga, (Nama lengkap dengan gelar resmi).
3. Ketua Departemen, Kepala Laboratorium (Nama lengkap dengan gelar resmi), dst.
4. Penyanggah dana/ketua proyek penelitian, (Nama lengkap dengan gelar resmi)
5. Dosen penguji, Dosen wali, Dosen lainnya (Nama lengkap dengan gelar resmi)
6. Keluarga dekat seperlunya dan para sahabat/sejawat terkait
7. Semua pihak yang telah membantu menyelesaikan skripsi, staf peneliti Lembaga, Ketua Pusat Penelitian (Nama lengkap dengan gelar resmi), dll.

Kalimat penutup dapat berupa harapan dan permintaan saran/masukan dari pembaca.

Penulis

RINGKASAN

Judul Ditulis Dengan Huruf Pertama Kapital Untuk Tiap Kata Ukuran Font 14 Cetak Tebal Tanpa Diakhiri Tanda Titik Maksimum Empat Baris

Nama Lengkap

Teh memiliki kandungan polifenol flavonol yang disebut katekin (Miyagawa *et al.*, 1997). Di antara senyawa katekin yang terdapat dalam teh, (-)-epigallocatekin galat (EGCG) merupakan komponen yang terbesar (5,7 % b/b) (Wang *et al.*, 1992). EGCG dilaporkan dapat menghambat karsinogenesis, oleh benzo(a)piren (BP) dan 7,12-dimetilbenz(a)antrasena (DMBA) (Huang *et al.*, 1991). Namun sejauh ini mekanisme EGCG menghambat terjadinya inisiasi karsinogenesis belum diperoleh secara pasti.

Di antara penyebab kanker,Upaya yang tepat untuk mencegah kanker adalah dengan cara meningkatkan sistem perbaikan DNA (*DNA repair system*) khususnya O⁶-alkilguanin-DNA alkiltransferase (AGT) yang sangat berperan terhadap hambatan inisiasi karsinogenesis (Jackson *et al.*, 1997).

Jika ditinjau dari struktur kimia EGCG yang merupakan ester dari asam galat dan epigallocatekin, EGCG dapat berinteraksi dengan AGT seperti yang terjadi dengan ion karbanium (CH₃⁺) (Singer & Berg, 1992). Akibat interaksi ini, AGT dapat menjadi aktifator gen AGT sendiri sehingga ekspresinya meningkat (Takano *et al.*, 1988).

Permasalahannya adalah apakah EGCG yang terdapat dalam seduhan teh hijau dapat meningkatkan aktivitas O⁶-alkilguanin-DNA alkiltransferase (AGT) ? Tujuan penelitian ini adalah membuktikan kemampuan EGCG dalam meningkatkan aktivitas gen O⁶-alkilguanin-DNA alkiltransferase (AGT) sehingga mampu mencegah inisiasi karsinogenesis.

Untuk membuktikan kemampuan tersebut maka dilakukan pengukuran aktivitas AGT, kadar O⁶-metilguanin DNA dan analisis hambatan terjadinya mutasi pada proto-onkogen *K-ras* kodon 12, 13 ekson 1 dan kodon 61 ekson 2 oleh MNU. Percobaan dilakukan secara *in vitro* menggunakan kultur hepatosit tikus. Untuk menunjukkan bahwa telah terjadi peningkatan AGT, maka ditentukan kadar O⁶-metilguanin-DNA dengan menggunakan HPLC yang dilanjutkan dengan LSC.

Hasil yang dicapai pada penelitian ini adalah bahwa dalam selang waktu 12-48 jam, EGCG pada kadar 8,3 ppm hingga 66,7 ppm dapat meningkatkan aktivitas AGT dari 1,5 hingga 4 kali lebih besar dari kondisi konstitutif yang diukur dengan Liquid Scintillation Counter (LSC).

Dari penelitian ini disimpulkan bahwa EGCG yang terdapat dalam seduhan teh hijau dapat meningkatkan aktivitas O⁶-alkilguanin-DNA alkiltransferase. Berdasarkan hasil tersebut disarankan untuk mencari dosis EGCG yang tepat, mempelajari hubungan antara struktur kimia dan aktifitas AGT, mempelajari pengaruh langsung EGCG terhadap ekspresi gen AGT pada plasmid, dan memasyarakatkan penggunaan teh hijau untuk pencegahan kanker.

Appendix-7: An Example of Abstrak (Abstract) of a thesis

ABSTRACT

Enhancement of Alkyltransferase Activity in DNA Repairing System by Aqueous Extract of Green Tea

Nama Lengkap

(-)-Epigallocatechin gallate (EGCG) is a major component of green tea, which was reported to inhibit cancer development induced by chemical carcinogen. However, it is still not known how does the mechanism occur. In this study, the role of EGCG on the enhancement of O⁶-alkylguanine-DNA alkyltransferase (AGT) in primarily rat liver cell culture was evaluated using Liquid Scintillation Counter method. The result showed that in the range of 12-48 hour after various concentrations (8.3-66.7 ppm) of single dose EGCG treatments, the AUC (area under curve) of AGT activity was increased by 1.4- to 2.8-fold ($p < 0.01$) than the constitutive level. To confirm that the expression of AGT increased by EGCG treatment, it could be shown by the decreased of O⁶-methylguanine-DNA induced by N-methyl-N-nitrosourea (MNU). The evidence showed that the formation of this O⁶-methylguanine-DNA by MNU at the highest concentration (48 μ M) could be prevented 92,6 % by EGCG 66,7 ppm in the culture media. Furthermore, mutation of *K-ras* in codon 12th which had been proven the most frequent mutation caused by chemical carcinogen was also analyzed using PCR-SSCP method, subsequently continued by DNA sequencing. EGCG concentration of 16.6 ppm could prevent *K-ras* mutation induced by MNU 32 μ M. Result of these studies indicate that EGCG has substantial anti-cancer-initiating activity due to enhancing the AGT expression.

Keywords: green tea extract, alkyltransferase, DNA Repair System, PCR-SSCP

Appendix-8: An Example of Daftar Isi (Table of Contents) of a thesis

DAFTAR ISI

	Halaman
DAFTAR ISI	x
DAFTAR TABEL	xiii
DAFTAR GAMBAR	xv
DAFTAR SINGKATAN	xviii
BAB I. PENDAHULUAN	
1.1 Latar Belakang Permasalahan	1
1.2 Rumusan Masalah	8
1.3 Tujuan Penelitian	9
1.4 Hipotesis	9
1.5 Manfaat Penelitian	9
BAB II. TINJAUAN PUSTAKA	
2.1 Tinjauan Tentang EGCG dari Teh Hijau	11
2.2 Tinjauan Tentang Mutasi	15
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