

CHAPTER 3

3.1 Conceptual Framework

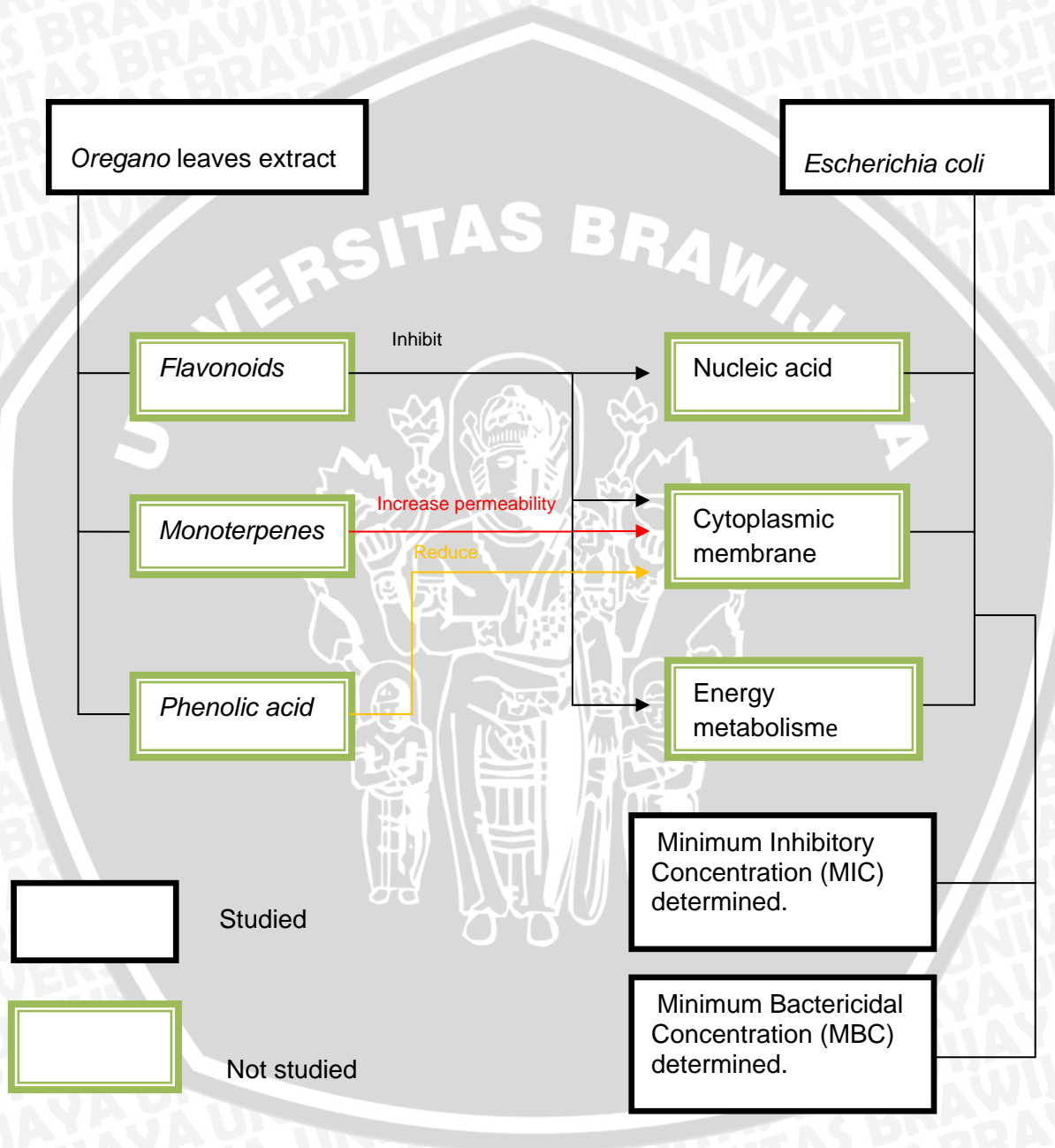


Figure 3.1 Conceptual Framework

The conceptual framework shows the components of *Oregano* leaves extract and *Escherichia coli* bacteria. The bacteria grossly consist of nucleic acid, cytoplasmic membrane, and energy metabolism components. These are the main components that work together to ensure the revival and the growth of the bacteria. On the other hand, the components of *oregano* leaves extract are *flavonoids*, *monoterpenes* and *phenolic acid* which are believed to have antibacterial properties.

Oregano leaves ethanolic extract contains active substances such as *flavonoids*, *monoterpenes* and *phenolic acid*. *Flavonoids* can inhibit the synthesis of nucleic acid, inhibit the synthesis of cytoplasmic membrane and also inhibit the process of energy metabolism and by this inhibition processes are believed to cause death of the bacteria. *Monoterpenes* increases the permeability of cytoplasmic membrane and causes intracellular leakage. *Phenolic acid* increases the permeability of outer membrane. All these components will inhibit the growth of *Escherichia coli*

3.2 Research Hypothesis

From the conceptual framework, *oregano* leaves ethanolic extract has antimicrobial effects towards the growth of *Escherichia coli* by in vitro.