

A POWERFUL *IN VIVO* ALTERNATIVE MODEL IN SCIENTIFIC RESEARCH: *GALLERIA MELLONELLA*

PANTIRA SINGKUM¹, SAN SUWANMANEE¹, POTJAMAN PUMEEESAT^{1,2} and
NATTHANEJ LUPLERTLOP^{1*}

¹Faculty of Tropical Medicine, Department of Microbiology and Immunology
Mahidol University, Bangkok, Thailand

²Faculty of Science and Technology, Department of Medical Technology
Bansomdejchaopraya Rajabhat University, Bangkok, Thailand

(Received: 20 June 2018; accepted: 30 July 2018)

Murine models are suggested as the gold standard for scientific research, but they have many limitations of ethical and logistical concern. Then, the alternative host models have been developed to use in many aspects especially in invertebrate animals. These models are selected for many areas of research including genetics, physiology, biochemistry, evolution, disease, neurobiology, and behavior. During the past decade, *Galleria mellonella* has been used for several medical and scientific researches focusing on human pathogens. This model commonly used their larvae stage due to their easy to use, non-essential special tools or special technique, inexpensive, short life span, and no specific ethical requirement. Moreover, their innate immune response close similarly to mammals, which correlate with murine immunity. In this review, not only the current knowledge of characteristics and immune response of *G. mellonella*, and the practical use of these larvae in medical mycology research have been presented, but also the better understanding of their limitations has been provided.

Keywords: *Galleria mellonella*, innate immune response, melanization

Introduction

During the past decade, several medical and scientific researches have used wide variety of *in vivo* model organisms to address biological questions. It has been statistically surveyed that a large number of *in vivo* models are experimentally investigated worldwide each year. These animals include invertebrates (yeasts, worms, flies, etc.) and vertebrates (mice, rats, primates, etc.) [1]. In 2001, 2.13 million animals have been studied in Germany. In 2009, the number of animal models that have been used in the USA approximately is 1.13 million [2].

*Corresponding author; E-mail: natthanej.lup@mahidol.ac.th