UNIVERSITI TEKNOLOGI MARA

CLONING OF RNASE L INHIBITOR (RLI)

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ABSTRACT

The RNase L inhibitor (RLI) is a new type of endoribonuclease inhibitor. RLI cDNA codes for a 68-kDa polypeptide which expression is not regulated by interferon (IFN). Its expression antagonizes the 2-5A binding ability and the nuclease activity of the endogenous RNase L. RLI does not lead to 2-5A degradation or to irreversible modification of RNase L. The aim of this study is to clone and express RLI in *E. coli*. The RT-PCR method was used to amplify the RLI. A set of primers have been designed to produce the target sequence. Few parameters were adjusted to optimize the RT-PCR for specificity and reproducibility. However due to time constraint, this study fails to amplify and clone the RLI in the *E. coli*.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Interferons (IFNs) belong to a family of cytokines produced and secreted by mammalian cells in response to various inducers, such as double-stranded ribonucleic acids (dsRNA) (Field *et al.*, 1967). Interferons induce the transcription of a large family of genes. Interferons stimulate the expression of a number of genes following interaction with specific high-affinity plasma membrane receptors. The products of these genes either singly or coordinately mediate the antiviral, growth inhibitory or immunoregulatory activities attributed to IFN. A feature common to all IFN-stimulated genes characterized thus far is the presence of a deoxyribonucleic acid (DNA) element which constitutes an IFN-responsive enhancer, usually present in the 5' upstream region of the genes (William, 1991).

The 2'-5' oligoadenylate (2-5A)/ribonuclease (RNase) L system is an IFN-inducible RNA degradation pathway which is responsible for many of the antiviral and antiproliferative effects of IFNs (Sen & Lengyel, 1992). It has been described as composed of three enzymatic activities, e.g. 2-5A-synthetase, 2-5A-phosphodiesterase, and RNase L. The 2-5A-synthetase are a family of four IFN-inducible enzymes which, upon activation by double-stranded RNA (dsRNA), convert adenosine triphosphate (ATP) into the unusual series of oligomers known