Cairo University

Faculty of Veterinary Medicine

Department of Virology

Process Development of Nano-aluminum Hydroxide Adjuvanted Rift Valley Fever Virus Vaccine

A thesis submitted by

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For the degree of Master of Veterinary Medical Sciences

(Virology)

Under Supervision of

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Dedication

To My Mother Sanaa El-Shihi the Most Wonderful and Heroic Mother ever

Essam Aly the Kindest and Most Patient Father

My Sweet and Gorgeous Sister Toka Aly

My Great and Loving Brother Mostafa Aly

To Every member of My Big Family

The Soul of My Grand Parents

To my friends who become family

Soad Eid El-Sayed

Hadeer Moustafa

Ahmed El-Wakeel

Mahmoud El-Gamal

Ahmed Ibrahim

Dina Tarek

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Abstract

In this study the aluminum hydroxide adjuvant gel used widely in a lot of human and animal vaccines and currently solely used as an adjuvant in the locally produced inactivated Rift Valley Fever vaccine was treated by ultrasonication in the presence of trehalose for dispersion of its particles. The dispersed aluminum hydroxide adjuvant was extensively studied where various physical characters were determined. The particle size of aluminum hydroxide was significantly reduced as the aggregates size ranging from 1-20 µm. As a result of dispersion, the TEM image of vaccine showed a change of the content from nonuniform and large aggregates of aluminum hydroxide with Rift Valley fever inactivated virus diffused in it to uniform particles with aluminum hydroxide adsorbed on virus surface and having a diameter of 300 nm. The vaccine with dispersed aluminum hydroxide was used in immunizing mice and showed superiority in immunogenicity when compared to the conventional vaccine.

Keywords

RVF, Nano, Aluminum hydroxide, ultrasonication

LIST OF CONTENTS

LIST OF TABLES