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شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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التوثيق الالكتروني والميكروفيلم

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Resistance of CD1 Mice to *Schistosoma mansoni* Infection Using *Fasciola gigantica* Fatty Acid Binding Protein

A Thesis

Submitted to the Faculty of Science, Cairo University

In Partial Fulfillment for the Degree of M.Sc.

In Immunology and Parasitology

BY

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APPROVAL SHEET

Title of the M.Sc. Thesis:
Resistanec of CD1 Mice to *Schistosoma mansoni* Infection Using *Fasciola gigantica* Fatty Acid Binding Protein.

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To my Father and Mother

Heartfelt Thanks

Just wanted you to

have a sign

of my appreciation

Abstract

Schistosomes are blood-dwelling flukes that infect 200 million people worldwide and are responsible for hundreds of thousands of deaths annually. Although schistosomicidal drugs and other control measures exist, the advent of an efficacious vaccine remains the most potentially powerful means for controlling this disease. In this study, native FABP from *F. gigantica* was purified from the adult worm's crude extract by saturation with ammonium sulphate followed by separation on DEAE- sephadex A-50 anion exchange chromatography and gel filtration using sephacryl HR-100, respectively. CD1 mice were immunized with the purified, native *F. gigantica* fatty acid binding protein in Freund's adjuvant and challenged subcutaneously with 120 *Schistosoma mansoni* cercariae. Immunization of CD1 mice with *F. gigantica* FABP has induced heterologous protection against *S. mansoni.* This protection evident as significant reduction in mean worm burden (72.3%), liver and intestinal egg count (81.3%% and 80.8%, respectively) and hepatic granuloma counts (42%). Also, it elicited mixed IgG1/IgG2b immune responses with IgG1 isotype predominating. This suggests that native *F. gigantica* FABP is mediated by a mixed Th1/Th2 response. In contrast, it failed to induce any significant differences in the mean total number of *S. mansoni* egg stages or in the mean granuloma diameter. This indicated that native *F. gigantica* FABP considered as a promising vaccine candidate against *S. mansoni*.

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List of Abbreviation

ADCC	Antibody dependent cell mediated cytotoxicity
AKP	Alkaline phosphatase
BCG	Bacillus Calmette-Guérin
bp	Base pair
BPB	Bromo phenol blue
BSA	Bovine serum albumin
DEAE	Diethylaminoethyl
cDNA	Complementary deoxy ribonucleic acid
CFA	Complete Freund's adjuvant
dist. H_2O	Distilled water
E. liei	*Echinostoma liei*
ELISA	Enzyme linked immunosorbent assay
EPG	Egg/gram
E/S	Excretory secretory molecules
F. gigantica	*Fasciola gigantica*
FABP	Fatty acid binding protein
Fh12	Native *Fasciola hepatica* 12 kDa fatty acid binding protein
γ	Gamma
G3PDH	Glyceraldehyde-3-phosphate dehydrogenase
GST	Glutathiones-s-transferase
hr	Hour

HIV	Human immune deficiency virus
HPV	Human papilloma virus
IFA	Incomplete Freund's adjuvant
IFN-γ	Interferon gamma.
Ig	Immunoglobulin
IL	Interluken
i.p.	Intraperitoneally
IrV-5	Irradiated vaccine antigen number five
mAb	Monoclonal antibody
MAP	Multiple antigen peptide
MGD	Mean granuloma diameter
Na2 HPO4	Monobasic sodium phosphate
Na2CO3	Sodium carbonate
NaCl	Sodium chloride
NaH2 PO4	Dibasic sodium phosphate
NaHCO3	Sodium bicarbonate
OD	Optical denisty
PBMC	Periphral blood mononuclear cell
PBS	Phosphate buffered saline
PBS-T	PBS-Tween
PI	Post-infection
PMSF	Phenylmethylsulfonyl fluoride
pNPP	P-nitrophenyl phosphate

PZQ	Praziquantel
P42	42 band protein antigen
RA	Radiation attenuated
rFh15	15kDa recombinant *Fasciola hepatica* fatty acid binding protein
rIrV-5	recombinant Irradiated vaccine antigen number five
rSjGST	Recombinant *Schistosoma japonicum* 26 kDa GST
Sb14-3-3	*Schistosome bovis* 14-3-3 protein
SbGST	*Schistosoma bovis* glutathione S-transferas
SBSP/TBRI	Schistosome Biological Material Supply program, Theodor Bilharz Research Institute.
s.c.	Subcutaneously
SD	Standard deviation
sdLN	Skin draining lymph nodes
SDS-PAGE	Sodium Dodecyl Sulphate –Polyacrylamide gel Electrophoresis
Sh28GST	*Schistosoma haematobium* glutathione S-transferase
Sj23	*Schistosoma japonicum* -23 kDa membrane antigen
Sj26 DNA	*Schistosoma japonicum* glutathione S-transferase DNA
SjGST	*Schistosoma japonicum* glutathione S-transferase
Sm14	*Schistosoma mansoni* 14 kDa fatty acid binding protein
Sm23	*Schistosoma mansoni* -23 kDa membrane antigen

SmGST	*Schistosoma mansoni* glutathione S-transferase
Sm 37	*Schistosoma mansoni* Glyceraldehyde-3-phosphate dehydrogenase
Sm 37-OVA	*Schistosoma mansoni* 37- G3PDH coupled to ovalbumin
Sm37-5	Major B cell epitope of Sm37-GAPDH
TEMED	Tetramethylenediamine
Th	T-helper cell
TNF-α	Tumor necrosis factor alpha.
TPI	Triose phosphate isomerase
TSP	Tetraspanin
UV	Ultra violet
wk	Week(s)
WHO	World Health Organization.

Contents