

Detection of expression of IL-1 β in alopecia areata patients using PCR

Thesis

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List of Abbreviations

αAlpha

βBeta

γGamma

AA.....Alopecia areata

AGA.....Androgenetic alopecia

ALA.....Aminolevulinic Acid

AP.....Alkaline Phosphatase

APS.....Autoimmune polyglandular syndrome

AT.....Alopecia totalis

ATP.....Adenosine triphosphate

AU.....Alopecia universalis

BB.....Broad band

CASP1.....Caspase 1

CD.....Cluster differentiation

CGRP..... Calcitonin gene related peptide

CMV.....Cytomegalo virus

CNS.....Central Nervous system

COX2..... Cyclooxygenase 2

List of Abbreviations (cont.)

CRH.....	Corticotrophin-releasing hormone
CyA	Cyclosporine A
DHS.....	Diameter of hair shaft
DNA.....	Deoxyribonucleic acid
DNCB.....	Dinitrochlorobenzene
DORS.....	Diameter of outer root sheath
DP.....	Dermal Papilla
DPCP.....	Diphenylcyclopropenone
EBV.....	Epstein-Barr Virus
ELAM.....	Endothelial leukocyte adhesion molecule .
FU.....	Fluorouracil
HF.....	Hair follicles
HIV.....	Human immune deficiency virus
HLA.....	Human leucocytic antigen
ICAM.....	Intercellular adhesion molecule
ICE.....	Interleukin converting enzyme
IFN.....	Interferon
Ig.....	Immunoglobulin

List of Abbreviations (cont.)

IGF-1.....	Insulin like growth factor -1
IL.....	Interleukin
IL1R.....	Interleukin1 receptor
ILCS.....	Intralesional corticosteroids
IORS.....	Irregularity of outer root sheath
IRS.....	Inner root sheath
IV.....	Intravenous
KUVA.....	Khellin- UVA
LAA.....	Areas of hair loss
LAF.....	Lymphocyte activating factor
LIF.....	Leukemia inducing factor
MCP-1.....	Monocyte chemotactic protein 1
MED.....	Minimal erythema dose
MGPs.....	Magnetic glass particles
MHC.....	Major histocompatibility complex
MICA.....	MHC class I chain- related gene A
MOP.....	Methoxypsoralen
MPD.....	Minimal phototoxic dose
NAA.....	Areas of normal scalp

List of Abbreviations (cont.)

NAAF.....National Alopecia Areata Foundation

NB.....Narrow band

NGF.....Nerve Growth Factor

NK..... Natural killer

ORS.....Outer root sheath

PBMCs.....Peripheral Blood Mononuclear Cells

PCR.....Polymerase Chain Reaction

PDT.....Photodynamic therapy

PpIX.....Potoporphyrine IX

PTGS..... Prostaglandins

PUVA..... Psoralen- UVA

P- UVB..... Psoralen UVB

SADBE.....Squaric acid dibutylester

SALT.....Severity Of Alopecia Tool

TE.....Telogen effluvium

Th.....T- helper

TIRS.....Thickness of inner root sheath

TNF.....Tumor necrosis factor

Ts.....T- suppressor

List of Abbreviations (cont.)

TAC.....Topical tacrolimus

TMP.....Trimethylpsoralen

UBC.....University of British Colombia

UV.....Ultraviolet

UVA.....Ultraviolet type A

UVB.....Ultraviolet type B

UVC.....Ultraviolet type C

VCAM.....Vascular cell adhesion molecule

VEGF.....Vascular endothelium growth factor

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2- Aim of the work



1-Introduction

Alopecia areata (AA) is a non-scarring, autoimmune, inflammatory hair loss on the scalp, and/or body. Its etiology and pathogenesis are still unknown. The site most commonly affected is the scalp (***Dan Wesserman et al., 2007***).

There is no male or female predilection for AA and persons of any age can be affected. A higher incidence is found in children and young adults, with common presentation before age of 20. Family history is present in about 10% up to 42% of patients (***Papadopoulos et al., 2000; McDonagh and Tazi-Ahnini, 2002; Gilhar and Kalish, 2006***).

Alopecia areata seems to represent heterogeneous disorder of varying etiology. Infection, neurophysiological, psychosomatic factor, genetic factors and autoimmune phenomena have been presumed (***Tazi et al., 2002***). Although the etiopathogenesis of alopecia areata is poorly understood, evidence is accumulating that it can be regarded as a T-cell mediated tissue-restricted autoimmune disease of the hair follicle, mediated by T-helper-type 1 cell response (***Hoffmann et al., 1996; Arca et al., 2004 and Kuwano et al., 2007***). This T-cell-mediated inflammation is a central component to the pathophysiology of AA, and such inflammation likely requires the actions of multiple cytokines (***Gilhar et al., 2002***).

Cytokines (such as IL-1 β and TNF α) may be responsible for the interruption of the hair cycle, and several lines of evidence suggest that IL-1 β may be responsible for the induction of reversible hair loss such as that occurring in alopecia areata.

IL-1 β acts as a potent growth inhibitor of human hair follicle (*Hoffmann et al., 1995; long Quan et al., 2006*).

The polymerase chain reaction (**PCR**) is a scientific technique in molecular biology to amplify a single or few copies of a piece of DNA across several orders of magnitude , generating thousands to millions of copies of a particular DNA sequence. The method relies on thermal cycling, consisting of cycles of repeated heating and cooling of the reaction for DNA melting and enzymatic replication of the DNA. Primers (short DNA fragments) containing sequences complementary to the target region along with a DNA polymerase (after which the method is named) are key components to enable selective and repeated amplification. (*Bartlett and Stirling, 2003*).

The PCR method can be used for the study of any mRNA of known sequence in various skin compartments for studies of skin diseases and inflammations. And could be applied to detect IL-1 β mRNA in skin biopsies and if it's connected to hair loss. (*Kirsten et al., 1992*)