Neglected tropical disease in 51 countries

Epidemiology

Caused by

Wolbachia (endosymbiotic bacteria) live in filarial nematodes

Wuchereria bancrofti
Brugia malayi
Brugia timori

Damage to

Lymphatic system

Characteristics

High flow rates and density of lymphatic vessels in dermis

High amount of Dendritic and Langerhans cells in skin that can migrate to lymph nodes

Particles of 10-100 nm are taken up easily by lymphatic capillaries

In vivo study in rats

Intradermal delivery system for lymphatic targeting

Discontinuous

Microfilariae in bloodstream

Effective

Ineffective

Therapy

Intradermal delivery

Less administration volume

DOX = 4.26-fold

DEC = 6.08-fold

ABZ = 11.99-fold

Increasing of drug targeting efficiency to lymphatic

Relative bioavailability compared to oral route

DOX = 150.43%

DEC = 107.66%

ABZ = 111.79%

Increasing of drug targeting efficiency to lymphatic

Self-applicable and reliable

Dissolving microneedles (MNs)

Painless

No clinical waste

More administration volume (larger patches)

Intradermal injection

Painful

Hazard clinical waste

Unreliable

Benefits

Effective therapy of LF

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Experiment

Results

In vivo study in rats

SLNs

MN containing drug-loaded SLNs

Drug release from SLNs

Drug-loaded SLNs

ABZ

DEC

DOX

Microfilariae

Blood capillary

Drug capillary

Lymphatic capillary

Adult filarial worms

Drug-loaded SLNs

Kill microfilariae and adult filarial worms

Oral administration of albendazole (ABZ) and diethylcarbamazine (DEC)

Oral administration of doxycycline (DOX)

Microfilariae in bloodstream

Adult filarial worms in lymph nodes

INeffective THERAPY

Beneﬁts

INTRADERMAL DELIVERY OF SOLID LIPID NANOPARTICLES (SLNs) (10-100 nm) OF ANTIFILARIASIS DRUGS

SOLUTION

EFFECTIVE THERAPY OF LF

Analysis

Experiment

Results

In vivo study in rats

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Experiment

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In vivo study in rats

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