



Neglected tropical disease in 51 countries

Epidemiology

Caused by

Wolbachia (endosymbiont bacteria) live in filarial nematodes

- Wuchereria bancrofti*
- Brugia malayi*
- Brugia timori*

Treatment

Oral administration of doxycycline (DOX)

Treatment

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



LYMPHATIC FILARIASIS (LF)

Damage to

Lymphatic system

Characteristic

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

Alternative delivery

Intradermal delivery system for lymphatic targeting

Microfilariae in bloodstream



Adult filarial worms in lymph nodes

INEFFECTIVE THERAPY

Effective

Ineffective

SOLUTION

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



Intradermal injection

Painful

Disadvantage

Hazard clinical waste

Unreliable

Less administration volume

DOX = 4.26-fold

DEC = 6.08-fold

ABZ = 11.99-fold

Increasing of drug targeting efficiency to lymphatic

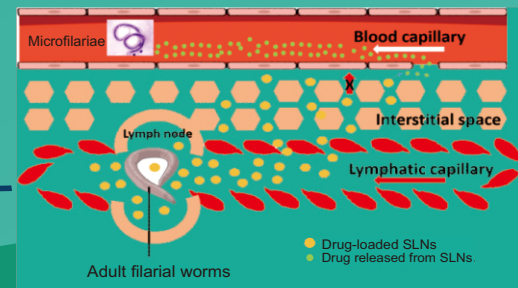
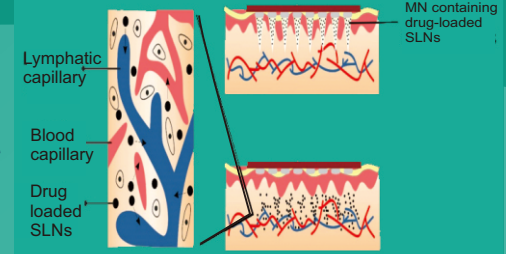
Kill microfilariae and adult filarial worms

DOX = 150.43%

DEC = 107.66%

ABZ = 111.79%

Relative bioavailability compared to oral route



Painless

Self-applicable and reliable

No clinical waste

More administration volume (larger patches)

Results

In vivo study in rats

Benefits

Disolving microneedles (MNs)

Experiment

EFFECTIVE THERAPY OF LF

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