DERMALDOSE
Intradermal drug delivery made easy
Our mission is...

…to deliver a method for intradermal drug delivery, which is patient-friendly, precise, and reliable.
Intended use of DermalDose microneedle system

- Easy for self injections at home
- No pain from injection
- No needles visible
- Dose sparing with vaccine delivery
The DermalDose system

Handheld unit: comfortable injection

Disposable container:
- Can dose 10 up to 100 µL medication/vaccine
- Unique hollow, hidden, microneedles
Intradermal drug delivery

- Immune system → strong activation for e.g. vaccination
- Rich in blood and lymphatic capillaries → fast uptake

Mantoux test for tuberculosis
Intradermal drug delivery

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- Rich in blood and lymphatic capillaries [1] → fast uptake
Intradermal drug delivery
with the DermalDose system
Pharmacokinetics
Pharmacokinetic profiles in swine

Methotrexate in rheumatoid arthritis

- MTX is the first choice for rheumatoid arthritis treatment
- 90% cleared quickly (half-life of 7-10 hrs) [3][4]
- 10% MTX moves into mostly red blood cells
- MTX in red blood cells is stable over 9 days [5]
- MTX levels in red blood cells reaches a steady state after 7 weeks (1 injection/week) [5]
Side effects

- Frequency of adverse reactions are dose dependent [10]
- In practice > 20 mg/week is a common regime

\[ y = -4.9653 + 2.8588x \]
\[ R^2 = 0.786 \]
Side effects

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Compliance

- Only 64% of patients achieved 80% adherence followed for 1 year (Harley, 2003)
- 40% of MTX users under dose injections, estimated by a treating rheumatologist
- 30% of participants withdrew within two years from a MTX study (Hoekstra, 2003)
Conclusion I
DermalDose System

- Easy for self injections at home
- No pain from injection
- No needles visible
- Includes communication technology for monitoring compliance
Research of interest

1. Can intradermal administration of MTX reduce the dose required?
2. Is MTX intradermally effective?
3. Can the dose be lowered even more when administering more frequently?
Research of interest

- Will this lead to reduction of side effects and better compliance?
Conclusion II
DermalDose System

- Easy for self injections at home
- No pain from injection
- No needles visible
- Includes communication technology for monitoring compliance
- Potential reduction of side effects as nausea?
- Potential improvement of compliance?
- Earlier remission due to improved compliance?
- Health care improvement?
References


We are inviting experts to take part in this research on intradermal methotrexate delivery