

## Introduction

Spider silk is protein-based fiber produced by spiders. The silk is secreted from the glands inside the spinnerets. It is perfect for medical using.

## Uses

### Artificial tendons and muscle grafts:

### Replace tendons and ligaments:

In Orthopedic surgery

- Does not attack the human immune system .
- Treat skin loss due to a wound, burn, infection, or surgery.

### Guide for re-growing nerves:

Aids in reconnecting severed nerve fibers.

Involves filing the veins with silk to serve as a guide structure.

### Scaffold for tissue growth:

Repair or replaced portions of or whole tissues. (i.g. bone, cartilage, blood vessels, bladder, skin, muscle).

### Medical tools:

Bandages are made by using spider silk due to its fast healing properties.

There is a possibility of using the silk in treating slow-healing wounds such as diabetic ulcers.



## Mechanism

- First, pick a suitable spider and take it to the winding room
- Use tweezers to secure the spider on foam pad
- Locate the dragline silk in spinneret
- Fasten it to the silk carrier and start winding it up



## Advantages

- Biodegradable and biocompatible.
- Spider silk production could greatly reduce many of the toxins and pollutants used in conventional petroleum based fiber and polymer production process.
- Spider silk also doesn't show allergic or inflammatory reactions,

## Disadvantage

- The survival rate of rearing is extremely low so it is difficult to raise spider in large numbers like silkworms.
- One big problem is that spider silk is difficult to harvest and large scale production from spiders alone is impossible.

## Structure & Properties

- Strong & resilient, flexible but tough.
- High thermal conductivity.
- Low density , Ductile.
- Can be stretched 2-4 times its original length, thick fibers.
- Homogenously yellow fibers have incredible physical properties.
- Consist of proteins that possess large quantities of non polar and hydrophobic amino acids like: glycine, alanine.
- Highly repetitive amino acid sequences.

## Summary

- The silk is secreted from the glands inside the spinnerets. It is perfect for medical using.
- There are several medical uses for spider silk, for example, it can be used for re-growing nerves.
- The spider silk has advantages and disadvantages.
- The properties of spider silk includes that it is strong, low density and can be stretched.

## References

- Field and practical studies from 2004 by the Germans and under the supervision of Professor Peter Vogt and the researcher Christa Melling at the University of Hanover, Germany.
- <https://kblbinvestors.com/new-breakthroughs/>
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