Nanogel Drug Delivery
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History of Drugs

- Drugs being used to improve health and extend lives date back thousands of years
- First drugs used for medicinal uses were plants
- Vast improvement in last century
- Especially with new technology called nanogels
Drug Delivery

Medicinal drugs are most often taken orally.

Swallow drug and it makes its way towards small intestine

Small intestine absorbs drug and transfers to liver through portal vein

Liver metabolizes drug and passes along left over to blood stream

Through bloods stream, drug travels to necessary parts of body
Issues with drug delivery

- Body dissolves most of drug before it reaches its destination
- Causes side effects
- Need more of drug originally due to anticipation of some of drug being dissolved
- Drug doesn’t stay in body for long periods of time
Nanogels are a new type of drug delivery system. They are created through a process called atom transfer radical polymerization. They are a mesh coating containing the drugs, that interact with cells in a positive way. Use same drug delivery through liver, but mesh coating protects drug from being dissolved. Gets into blood stream, travels to target cells.
Using endocytosis they are able to mimic essentials that cells need and get into the cell.

Once inside, the mesh lining slowly dissolves based on the thickness of the mesh.

This releases drug into cell and allows for drugs to only be taken once every month, rather than day.
Results

Nanogels react with cells in such a way that they stay inside of the target cell and slowly release the drug as needed.

Placed in mice, results show that lives have been extended up to 3 months (equivalent to 8 years in humans).

Proven that no white blood cells are damaged by drugs, allowing for body to fight for itself.
Price

- No pricing available

- Product has not been approved, therefore no price is available

- But when inferring:
  
  there is less drug needed

  The nanogel coating will cost more
Advances in Technology

- Material used to create nanogel is FDA approved
- Therefore getting approved in humans should be quick
- Test trials can move forward
- Eventually put towards autoimmune diseases, allowing patients to take pills less often
- Makes it easier to put people on medicine
Works Cited


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