

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

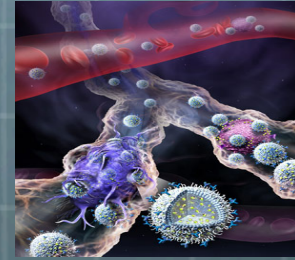
Drug Delivery

- 🌐 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

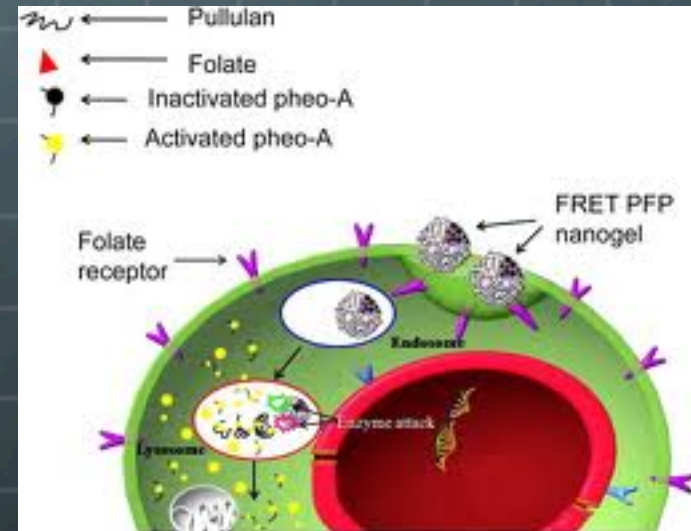
Nanogels



- 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

Nanogel Delivery

- 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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-  <http://seas.yale.edu/faculty-research/research-areas/drug-delivery>
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