UNIVERSITY of HOUSTON
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Selective Release of Doxorubicin Using PEG-Grafted Iron Oxide Nanoparticles via a *Retro* Diels-Alder Reaction

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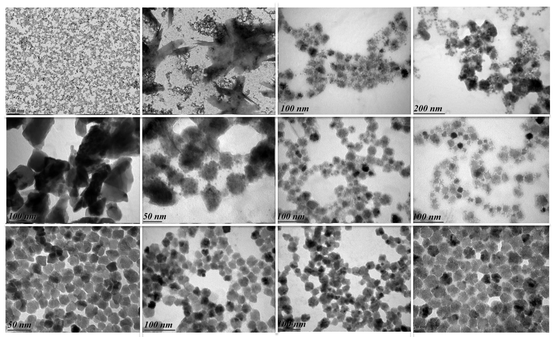
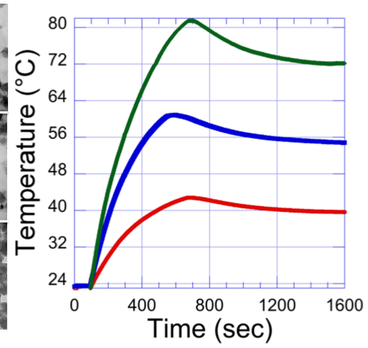
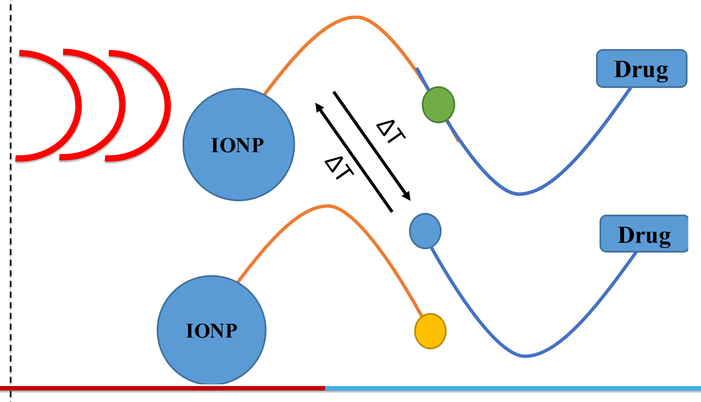
LCPO Laboratoire de Chimie des Polymères Organiques

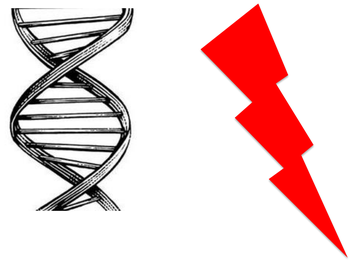
Iron Oxide Nanoparticles: Hyperthermia Agents

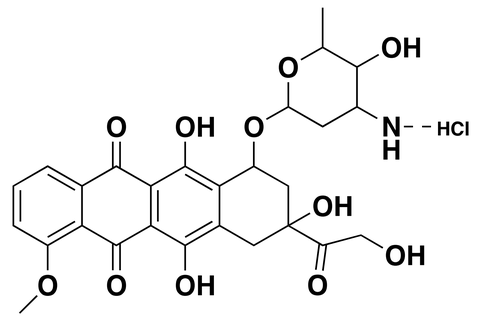




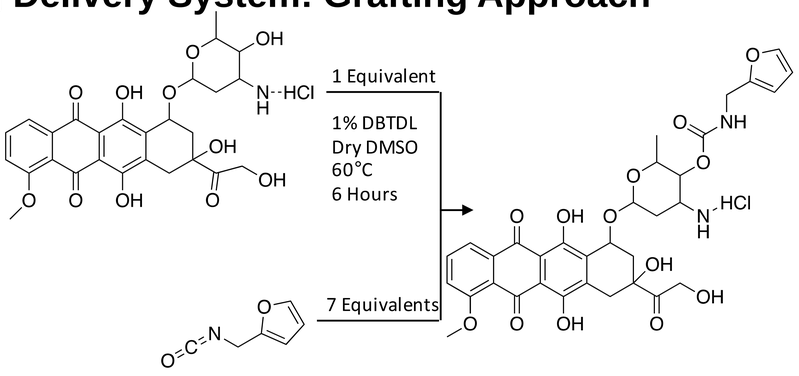


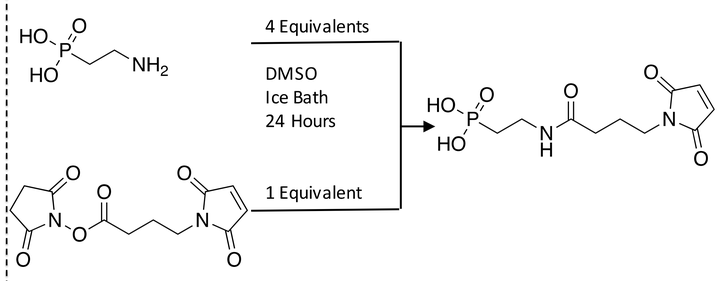
Doxorubicin: Anti-Cancer Agent



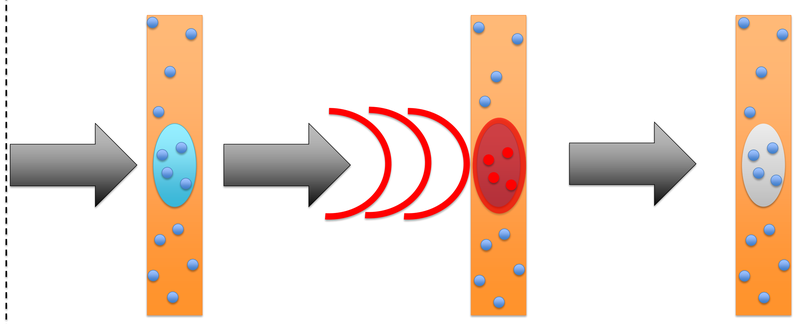


Drug Delivery System: Grafting Approach

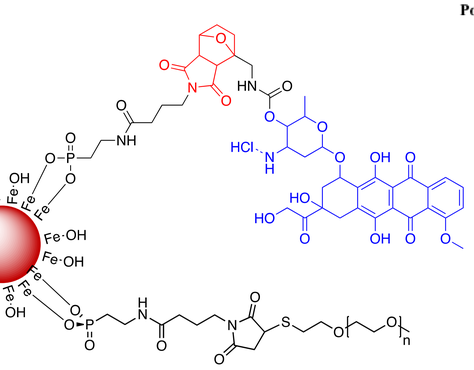


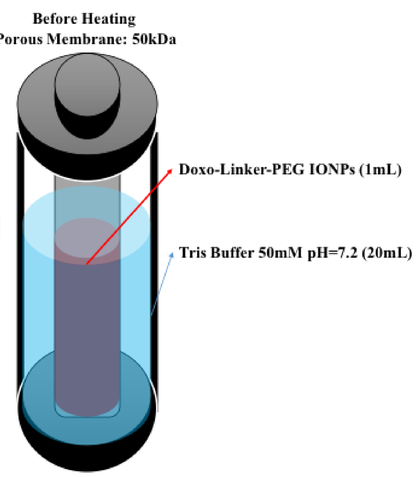


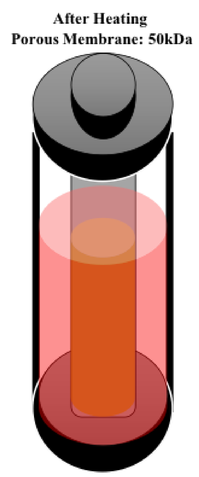
Anti-Cancer Therapy: Targeted Drug Release

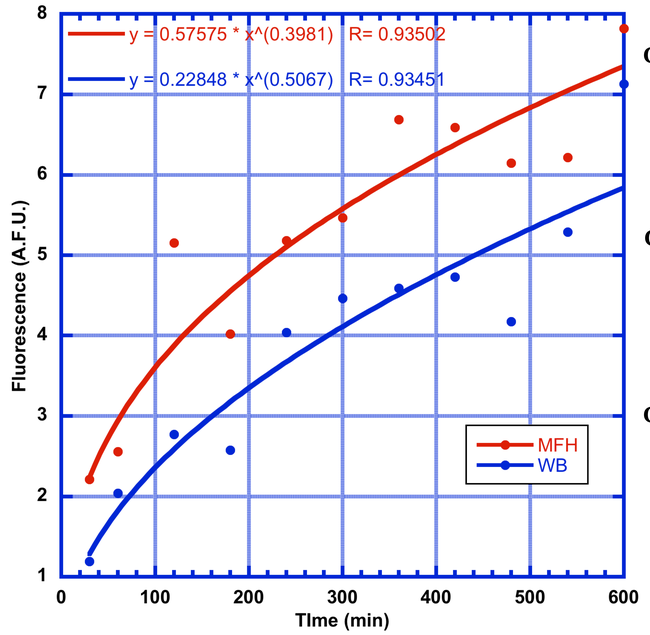


Assessing Their Potential Usage









Conclusions / Future Goals

Goal 1: Polyol Synthesis

- Water plays a crucial role in size and SAR performance for IONP production.
- Iron chlorides have superior SAR values, while Iron(Acac)$_3$ has larger sizes.
- Narrow polydispersion of IONPs were synthesized with high SAR values.

Goal 2: Thermosensitive Linker Synthesis

- Full characterization of all reaction steps.
- Purification methods for isolating doxorubicin.
- Successful synthesis of entire molecule.

Goal 3: Grafting and Drug Release Studies

- Successful grafting of modified doxorubicin.
- Stable in water with preservation of magnetic properties.
- Successful release of doxorubicin with applied heat (MFH and Water bath)
- Multiple release of drug (Diels- Alder forwards and backwards reaction competition)

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