Glioblastoma Treatment via Iron Oxide Nanoparticle Therapy

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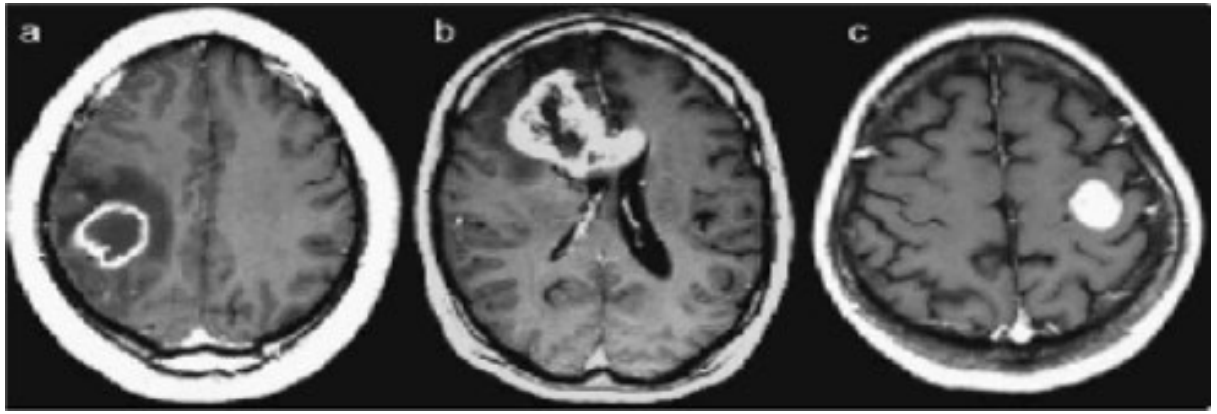
Glioblastoma Background

- Glioblastoma (GBM) – Aggressive cancer that originates from glial cells within the brain or spinal cord
- Highly resistant to therapy and the impediment of drug delivery by the blood-brain barrier (BBB) yields difficult treatment



Glioblastoma Heterogeneity via MRI

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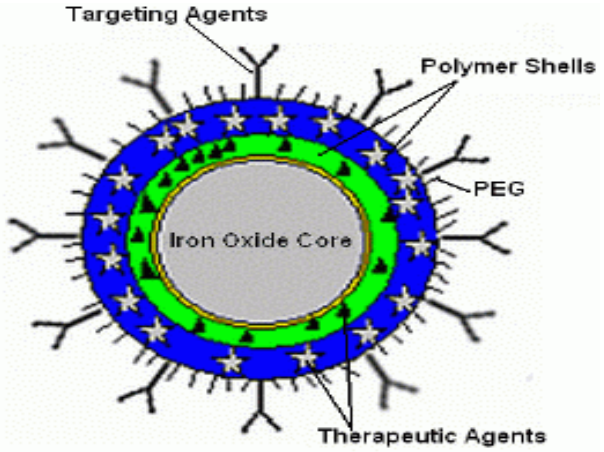
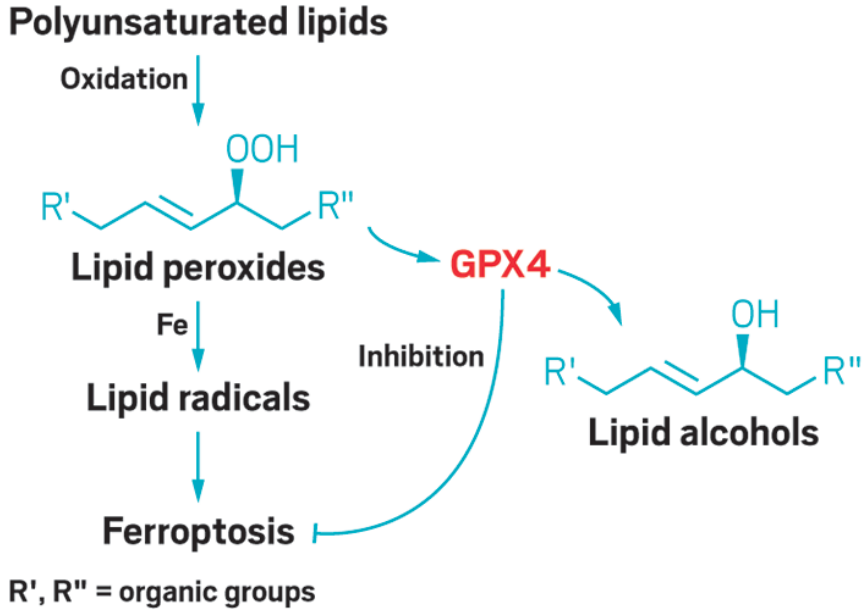
Iron Oxide Nanoparticle Background and Utility

- Iron oxide core functionalized with biocompatible polymers
- Polymers allow attachment of various drugs and cellular targeting agents for targeted drug delivery
- Capable of targeting tumors
- Capable of crossing the blood-brain barrier
- Increase blood half life of the therapeutic delivered
- Biocompatible and non-toxic to humans



GPX4 Background

- GPX4 augments sarcoma cell resistance to ROS yielding resistance to radiation
  - We presume GBM cells will present the same reults
- Knocking down the GPX4 pathway induces ferroptosis
  - Enables enhanced effects of chemotherapeutics



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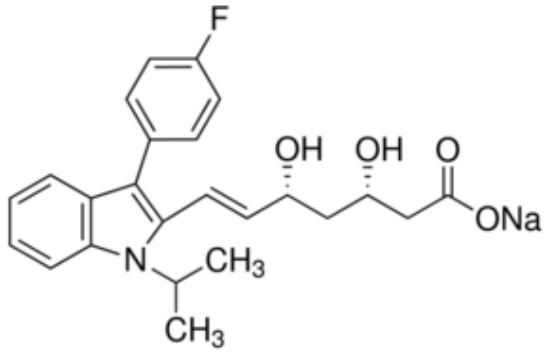
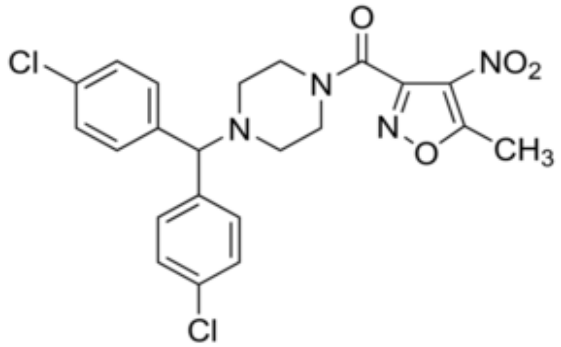
Materials and Methods

- Treated GBM6 and U87 cell lines (representative GBM cell lines) with inhibitors fluvastatin and ML210.
- 5 day incubation period
- Determined viability of GBM cells post-incubation with inhibitor via a microplate reader



Fluvastatin



ML210

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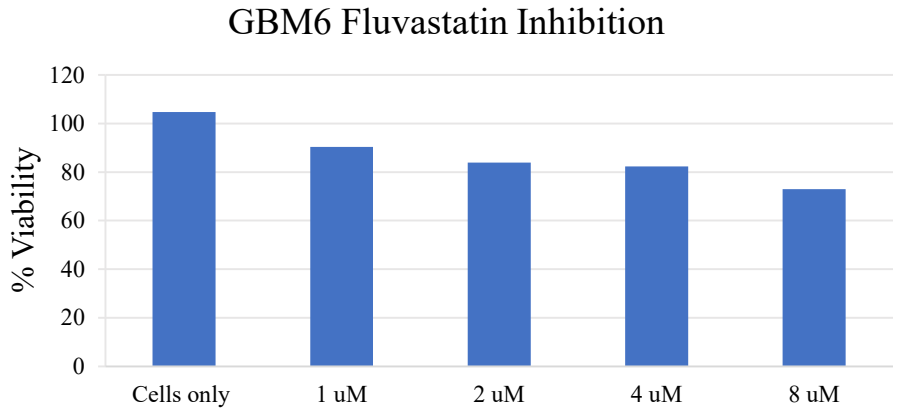
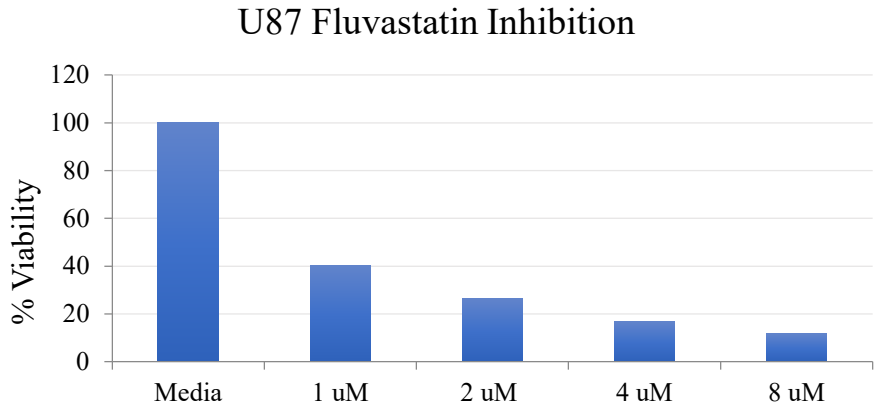
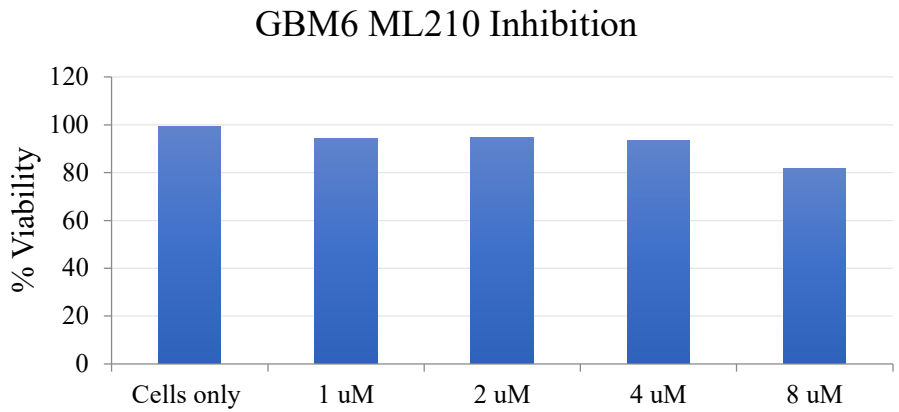
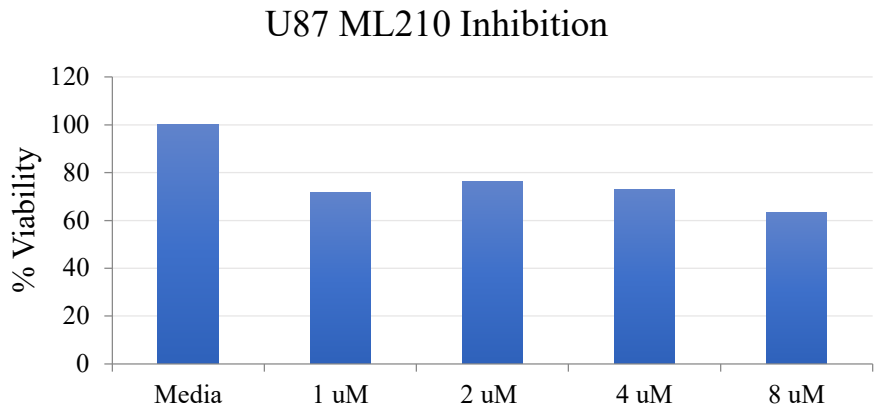
Preliminary Results









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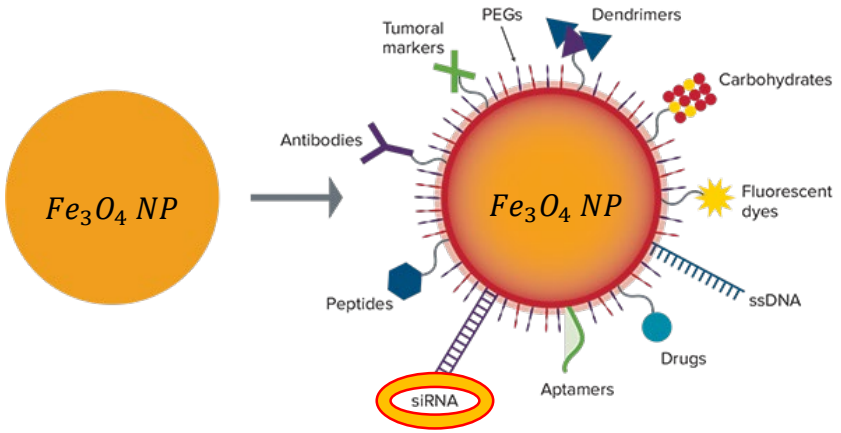
Goals for Further Investigation

- Incorporate radiotherapy
- Functionalization of siRNA with nanoparticle
- Transition in to in vivo setting



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Next Presentation

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