Evolving Prioritizations of *In Vivo* Research in Pharma During the COVID-19 pandemic

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RAPID RESPONSE BY LABORATORY ANIMAL RESEARCH INSTITUTIONS DURING THE COVID-19 PANDEMIC: LESSONS LEARNED

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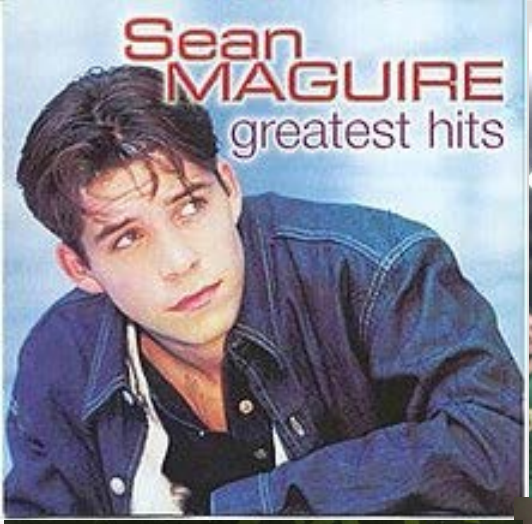
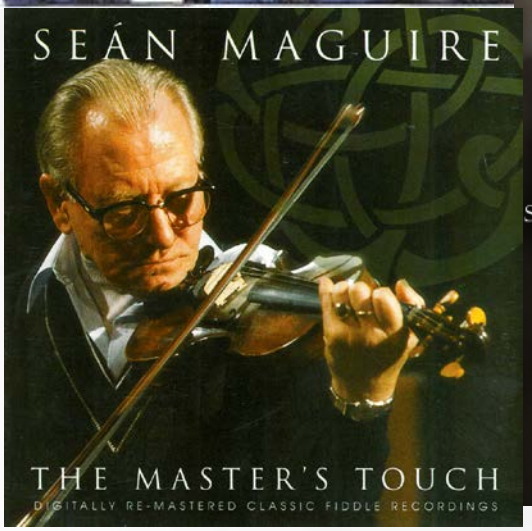
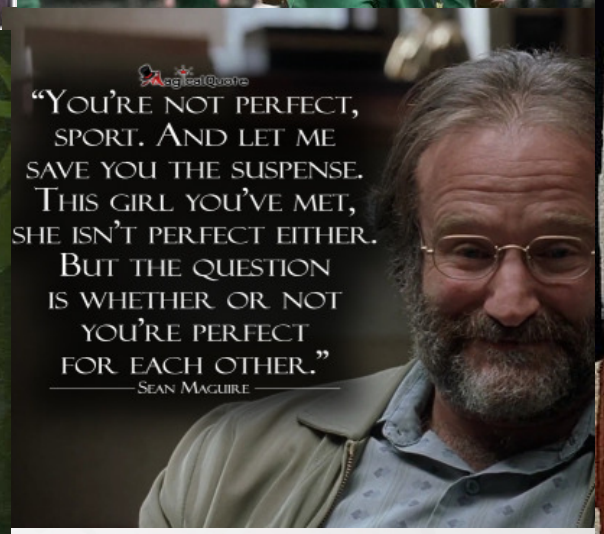
▶ MARCH 9-10, 2021

A Virtual Workshop







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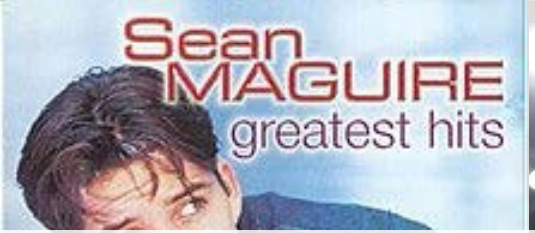


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Disclaimers and Caveats

- All views and opinions and errors are mine and not those of GSK.
- Intent is to share around my experiences, not fully recapitulate details on any given project or process.
- Anything insightful I say was influenced by my colleagues and friends at GSK, other Pharma (especially those on the IQ Consortium Pandemic response WG)s and elsewhere.

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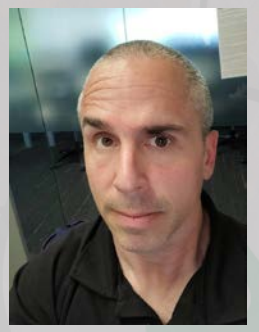
- All studies were conducted in accordance with the GSK Policy on the Care, Welfare and Treatment of Laboratory Animals and were reviewed the Institutional Animal Care and Use Committee either at GSK or by the ethical review process at the institution where the work was performed.

Challenges faced in Pharma Research Facilities are more similar than not to those encountered in academic settings.



A major difference is around project funding and associated timelines.

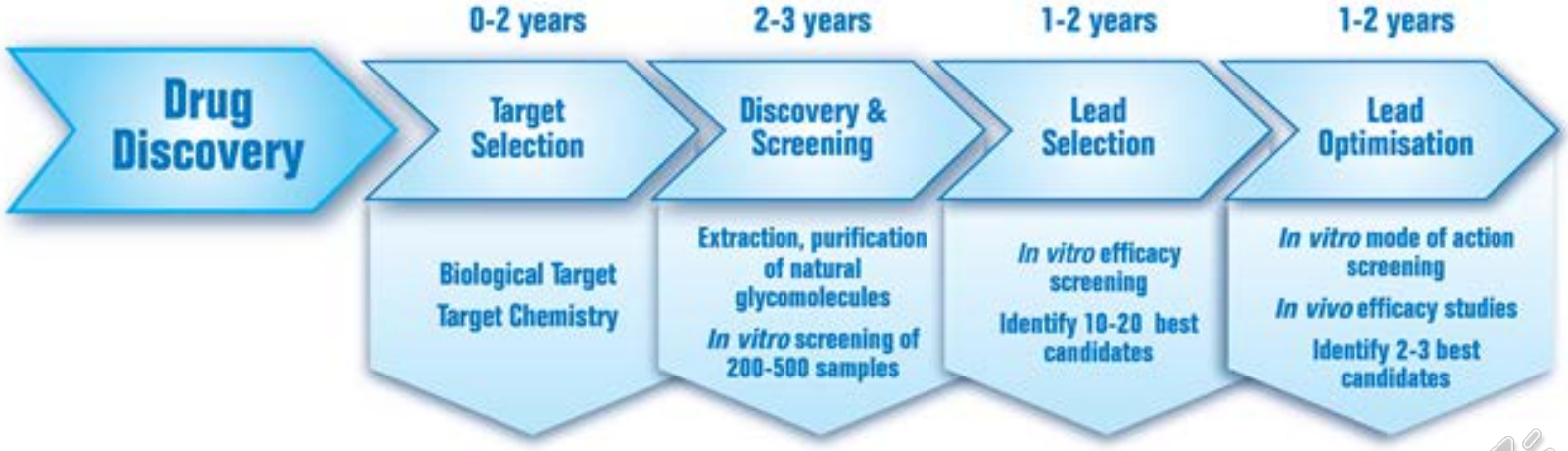
Drug Discovery
Process Overview

See Clinical Trials Overview chart for phase breakdown

	Target Discovery	Target Validation	Lead Compound Identification	Lead Compound Optimization	Preclinical Development	Clinical Trials
Average Length	1-3 years				1.5 years	6-7 years
Average Cost	$196 million				$122 million	$1-2.5 billion*
Goal(s)	Identification of a molecule involved in a disease ▸ Identify the target: a molecule integral to gene regulation or intracellular signaling ▸ Ensure the target is "druggable" and its activity can be modulated by another compound	▸ Validate initial hypothesis through gene knockdowns ▸ Test antibody interactions ▸ Modulate the drug's affinity to target by changing molecular structure	Generation of molecule(s) that can interact with the target previously identified ▸ Test drug mechanism of action ▸ Initial safety tests conducted in cell culture ▸ Test pharmacokinetics and pharmacodynamics	Compound modifications for increased effectiveness and safety ▸ Alter design of molecule to prevent off-target effects ▸ Optimize dosage and introduction route (oral, injection) ▸ Conduct tests for drug's uptake by 3D cell culture systems	Drug testing *in vivo* for side effects and safety ▸ Test drug in alternate cell lines, and *in vivo*: most commonly mouse and rat research models ▸ Plan for either small- or large-scale production if approved ▸ Document and mediate side effects	New drug approval by the FDA or EMA ▸ File IND to begin trials ▸ Includes three phases of human testing ▸ FDA conducts reviews and approvals after phase III ▸ Continued monitoring for dosage and safety

* This amount is highly dependent on spending associated with drugs that end up failing at some point in the trials

https://www.taconic.com/taconic-insights/quality/drug-development-process.html
https://www.allfordrugs.com/drug-discovery/



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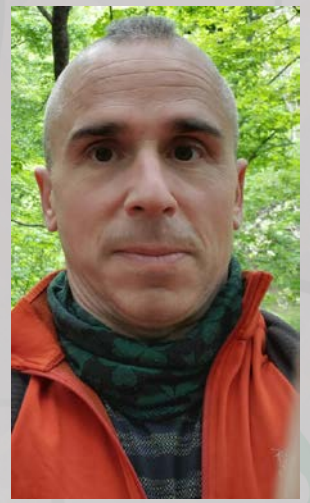
Prioritize in vivo work across projects/efforts/TA focus.

Initial Phase/ Lockdown

- continue
- stop
- start



Considerations and factors for making start/stop/continue decisions.

Meeting both the commitments and participation in the larger societal response to the pandemic as well as patient and program needs.

Evolving and maturation phase-

- Decision making for “Studies continue /stop/start”.
- maintain our commitment to the animals in our charge, the health of our animal care and research communities, and societal good.

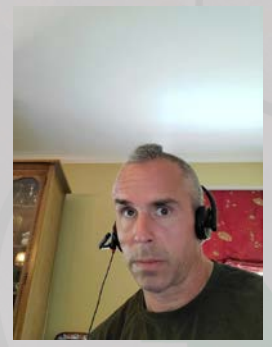
Considerations related to multiple:

- Sites
- Localities
- Governments
- Regulatory agencies

Due diligence for new and ongoing work.

- Internal
- External

In Closing……



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Thanks and hope to see you soon(ish)!!

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