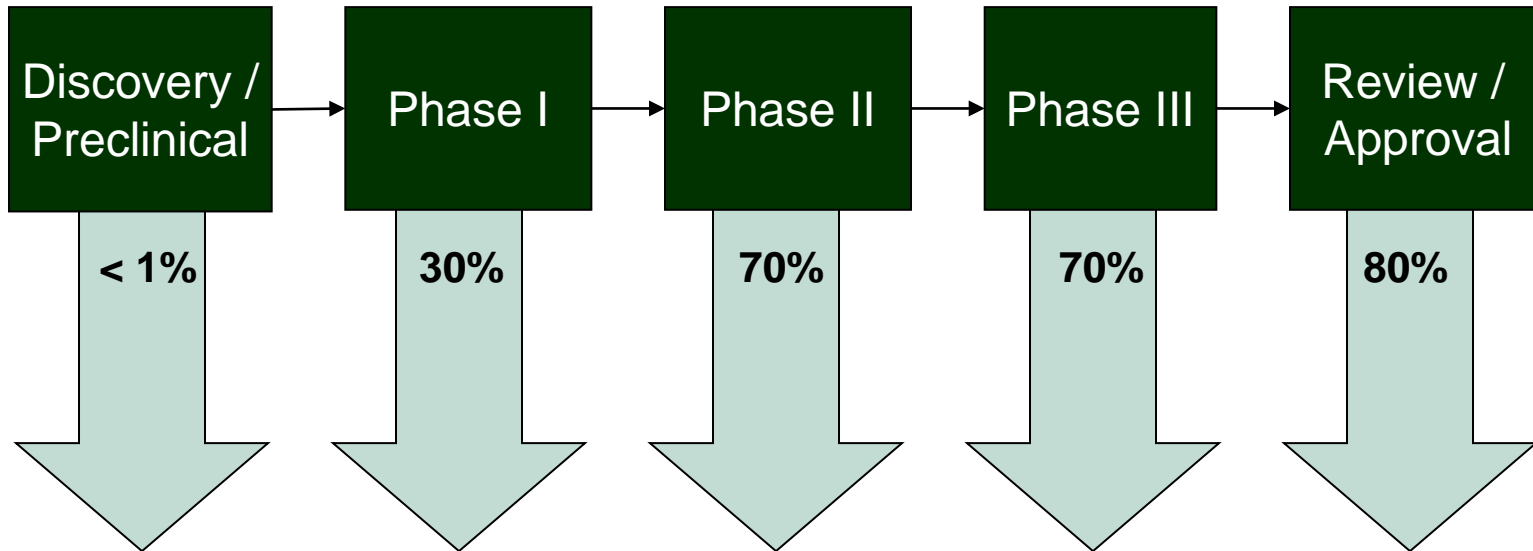


# Benchtop to Market: Introduction to Global Planning in Product Development

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# Drug Development Overview



Overall success rate: <10% for products entering Phase 1

Adapted from DiMasi et al. Journal of Health Economics 22(2003)

# Before you begin

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Goal: Define the market and competitors (if any) - does a market exist for your product?

- Strategies:
  - Know your markets:
    - Do other products exist in each country? Are the indications for use the same in each country? What dose forms are used in each country, is there a preference? *etc.*
  - Establish the global product development plan before embarking on extensive preclinical development

# Pharmacology

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Goal: Optimize preclinical Primary Pharmacology (“Proof of Concept”) studies

- Learn more about MOA and target
- Ensure data are of high quality and are acceptable globally (animal models, types of studies)
- Provide data to support First-in-Human trials (CTAs, INDs)
- Provide data to support commercialization

Adapted with permission from: W. Hill, Gap Strategies

# General Toxicology Program Considerations – I

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- Conducting toxicology and safety pharmacology studies is not a box-checking exercise to simply satisfy Regulators...If not designed, conducted, and/or interpreted correctly, preclinical studies can add considerable time and expense to a program
- Preclinical development is an expensive investment for a small/emerging company that requires:
  - A good plan/strategy that considers regulatory expectations (local, international) and the Company's objectives (scientific/medical and business)
  - Efficient and expedient implementation by experienced individuals
  - Interpretation and positioning of results by experts

# General Toxicology Program Considerations – II

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- The preclinical development plan will depend on:
  - Product type and similarity to existing agents (in given countries/areas) with known safety profiles
  - Proposed indication in humans and target population
  - Proposed route(s) and duration of administration
  - Use pattern considerations (*i.e.*, concomitant medications, adjuvant therapy)
- Studies should be designed to meet regulatory expectations, but include specific aspects, tailored to the drug under development, so include relevant animal species and have knowledge of expected toxicities

# General Toxicology Program Considerations – III

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- Get Help When Needed:
  - What can you expect for the toxicology of the drug? (published literature, U.S. Freedom of Information, E.U. EPARs, public information on approved drugs, *etc.*)
  - Regulatory guidance:
    - ICH, U.S. FDA, EU (EMA), *etc.*
  - Regulatory Agency consultations if required (*e.g.*, Pre-IND or Pre-CTA or Scientific Advice meetings)
  - Published commentaries, opinions, reports of scientific/committee meetings
  - Meetings, Conferences, Colleagues
  - “hired” help

# Chemistry, Manufacturing and Controls

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- Understand and plan from the beginning, from starting dose form to final dose form: it's about the Quality of the material
- Know what will be expected by Regulatory Authorities at different stages of development
  - Documentation, level of detail, tracking, process
  - Submission of information on manufacturing changes
- Do some short- and long-range strategic planning (consider: changes in manufacturers, changes in manufacturing countries, change in process, scale-up, accumulating data, costs, benefits)
- Guidances available: ICH, but also U.S. FDA, Canada, TGA, EMA, *etc.*

# Clinical Program Planning

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- Start designing at the research stage (preclinical proof of concept)
  - Indication, route of administration, patient population?
  - What will be an acceptable study design in the countries of interest (or potential future sites of trials)? (biomarkers, endpoints, evaluations, methods)
- Early in development: think about Phase I, II, and beyond
- Impact on the nonclinical toxicology studies
  - conducted by same route, in relevant and appropriate species
- Trial protocol for Phase I will be required by the time of the CTA or IND submission

# Regulatory Strategy

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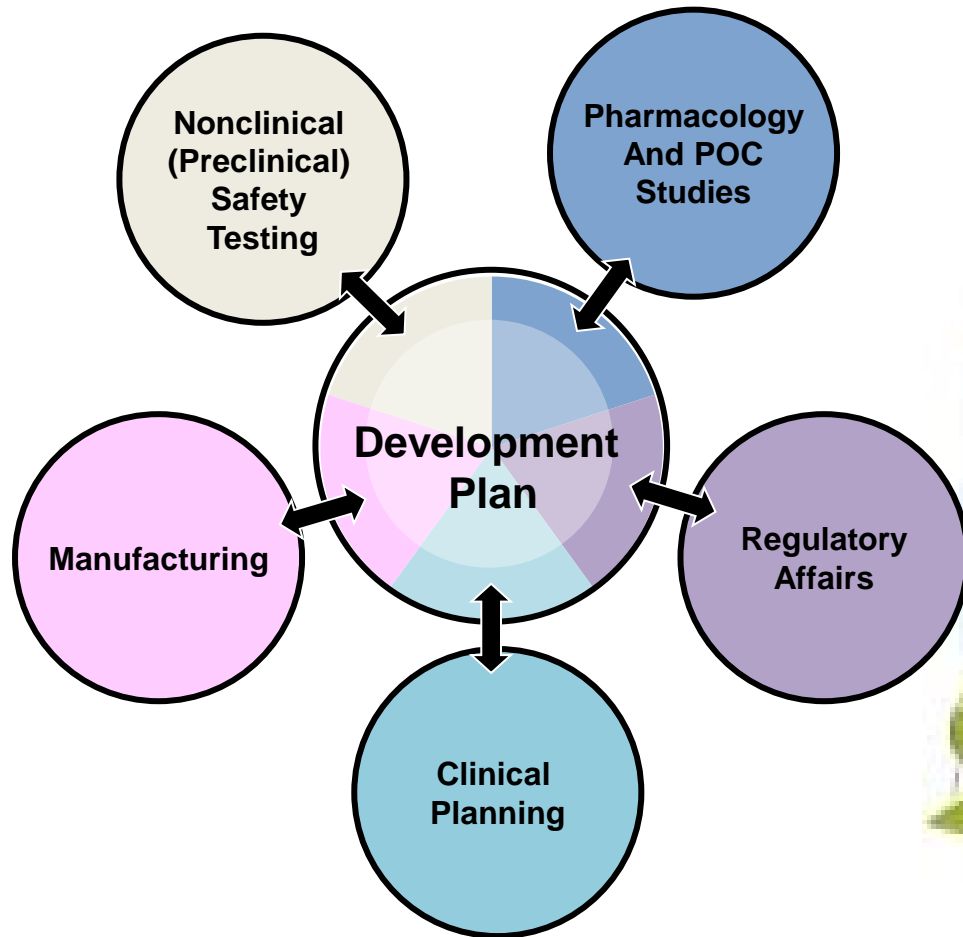
- Desired: a successful preclinical development program that results in a high quality regulatory submission(s) that anticipates the questions of the Regulator
- Develop a regulatory plan early
- From the outset, consider possible different regulatory jurisdictions, their submission requirements and expectations for documentation
- Understand the possible paths under different regulatory authorities (requirements, impact on program, burden of documentation/submissions): Pre-IND/Pre-CTA/Scientific Advice consultation? Orphan Drug? Fast Track? Accelerated Approval?

# Strategies for Success

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- Know the clinical environment and potential market for your drug
- Ensure that you understand the physiology of your targeted disease and compound; design the nonclinical POC studies accordingly
- Have a clinical plan (Phase I, II, and beyond) that will meet guidances and to support registration in different countries
- Co-ordinate Nonclinical, Clinical, and Manufacturing Programs
- Become “submission-ready”, even at the preclinical stage of development
- Present a high quality submission: avoid Regulatory “Red Flags” and address reviewers’ expectations (content, format, quality of data to support the proposed trial, *etc.*) – consider each regulatory agency
- Seek advice and guidance in all aspects of the program

# Management of Product Development



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**THANK YOU !**

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