Shufeng Zhou

Assoicate Dean

Department of Pharmaceutical Science

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Biography

- Dr. Shufeng Zhou is presently a Professor, Associate Dean of International Research, and Chair of the Department of Pharmaceutical Sciences, College of Pharmacy, University of South Florida, Tampa, Florida. Professor Zhou completed his clinical medical training in China in 1989 and obtained his PhD in 2001 from the School of Medicine, the University of Auckland, New Zealand. Since 2002, Dr Zhou has served as a faculty member for the National University of Singapore, Queensland University of Technology, Australia, and RMIT University, Australia.

Recent Publications

- Li YC, He SM, He ZX, Li M, Zhou SF et al. (2014) Plumbagin induces apoptotic and autophagic cell death through inhibition of the PI3K/Akt/mTOR pathway in human non-small cell lung cancer cells. Cancer Lett 344:239-259.

- Liang S, Zhou Y, Wang H, Qian Y, Ma D, et al.(2014) The effect of multiple single nucleotide polymorphisms in the folic Acid pathway genes on homocysteine metabolism. Biomed Res Int 560183.

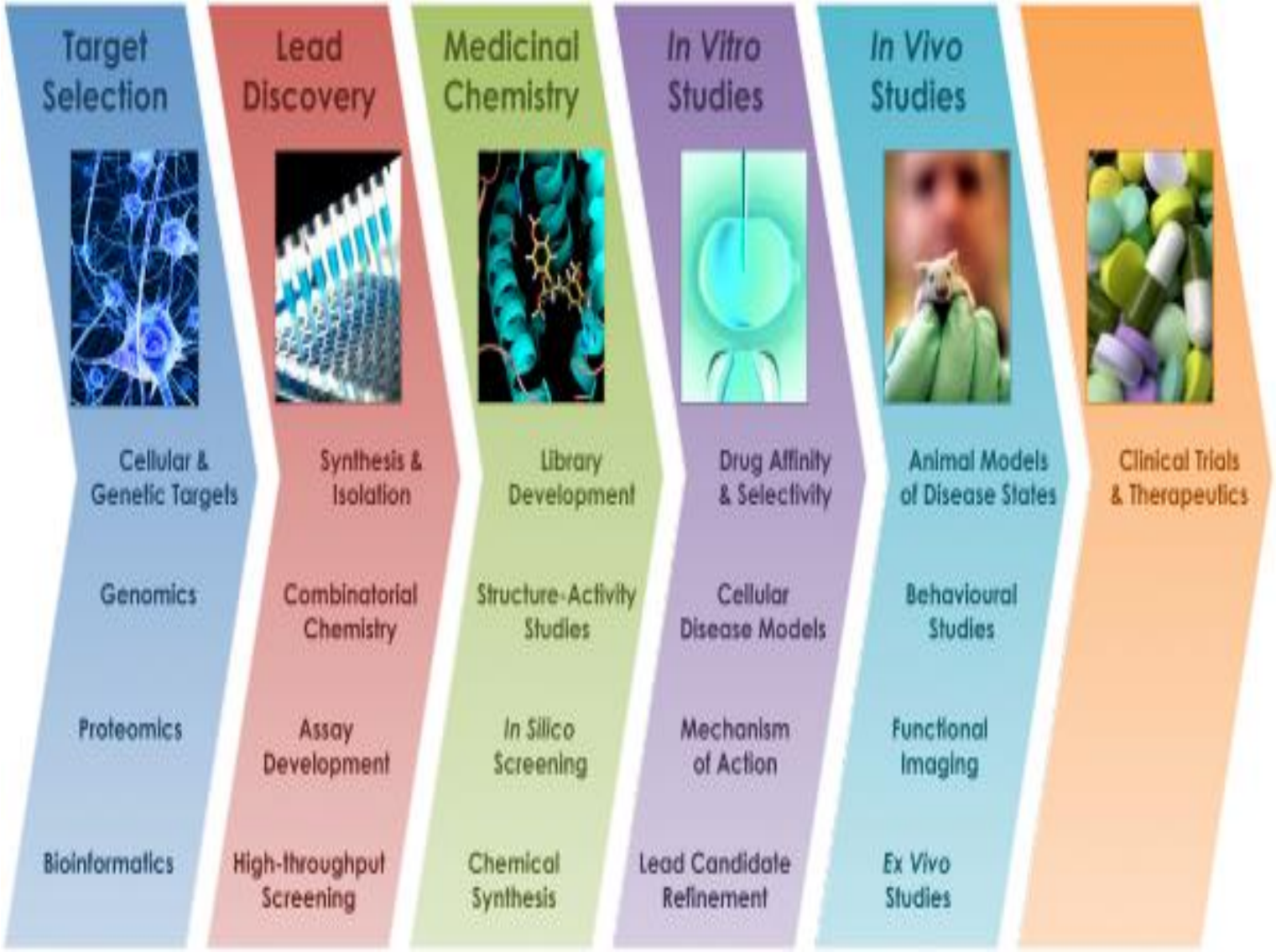
- Panguluri SK, Sneed KB, Pathak Y, Zhou S (2014) Editorial: current topics in pharmacogenomics. Recent Pat Biotechnol 8:109.

- Yin JJ, Sharma S, Shumyak SP, Wang ZX, Zhou ZW, et al. (2013) Synthesis and Biological Evaluation of Novel Folic Acid Receptor-Targeted, β-Cyclodextrin-Based Drug Complexes for Cancer Treatment. PLoS One 8:e62289.

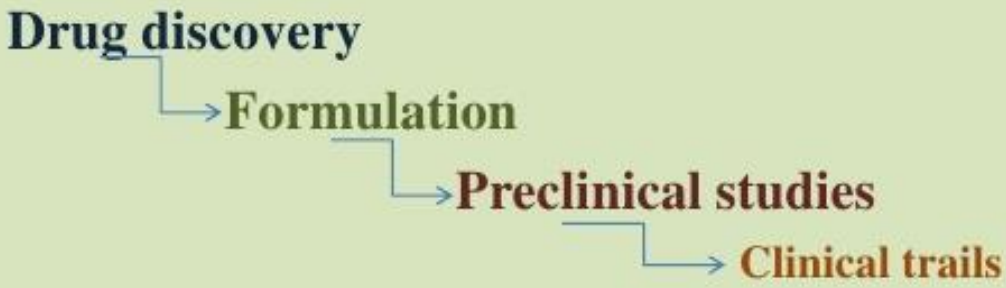
Drug Discovery

- The process of drug discovery involves the identification of lead and its target, synthesis, characterization, screening, and assays for therapeutic efficacy of lead.

- Average time required to bring a drug to the market range from 12-15 years at an average cost of $600-800 million.

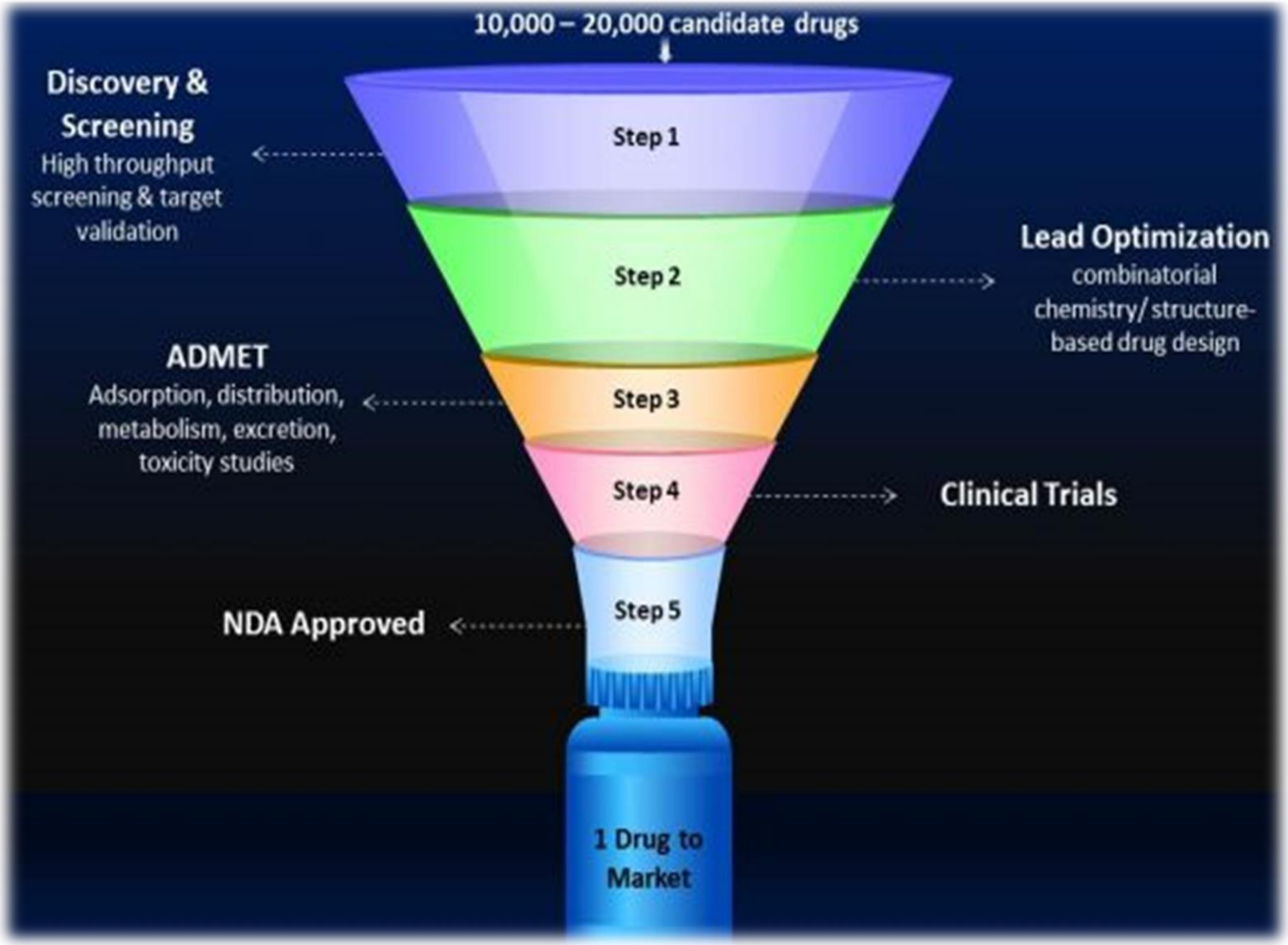

Target Selection
Lead Discovery
Medicinal Chemistry
In Vitro Studies
In Vivo Studies
Cellular & Genetic Targets
Genomics
Proteomics
Bioinformatics
Synthesis & Isolation
Combinatorial Chemistry
Assay Development
High-throughput Screening
Library Development
Structure-Activity Studies
In Silico Screening
Chemical Synthesis
Drug Affinity & Selectivity
Cellular Disease Models
Mechanism of Action
Lead Candidate Refinement
Animal Models of Disease States
Behavioural Studies
Functional Imaging
Ex Vivo Studies
Clinical Trials & Therapeutics

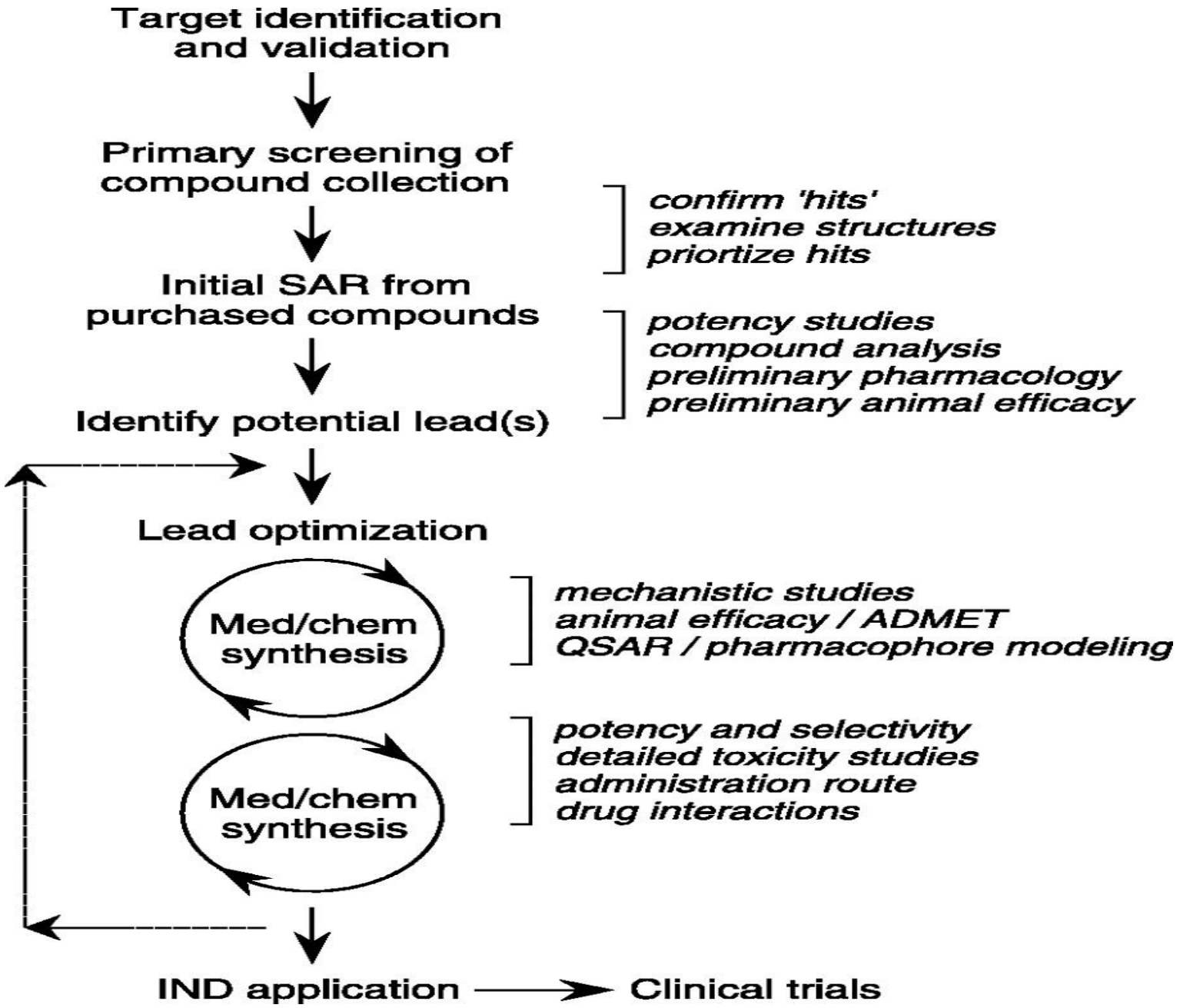
Stages in drug discovery



Any drug development process must proceed through several stages in order to produce a product that is **safe, efficacious,** and has passed all regulatory requirements.

Drug Discovery Process

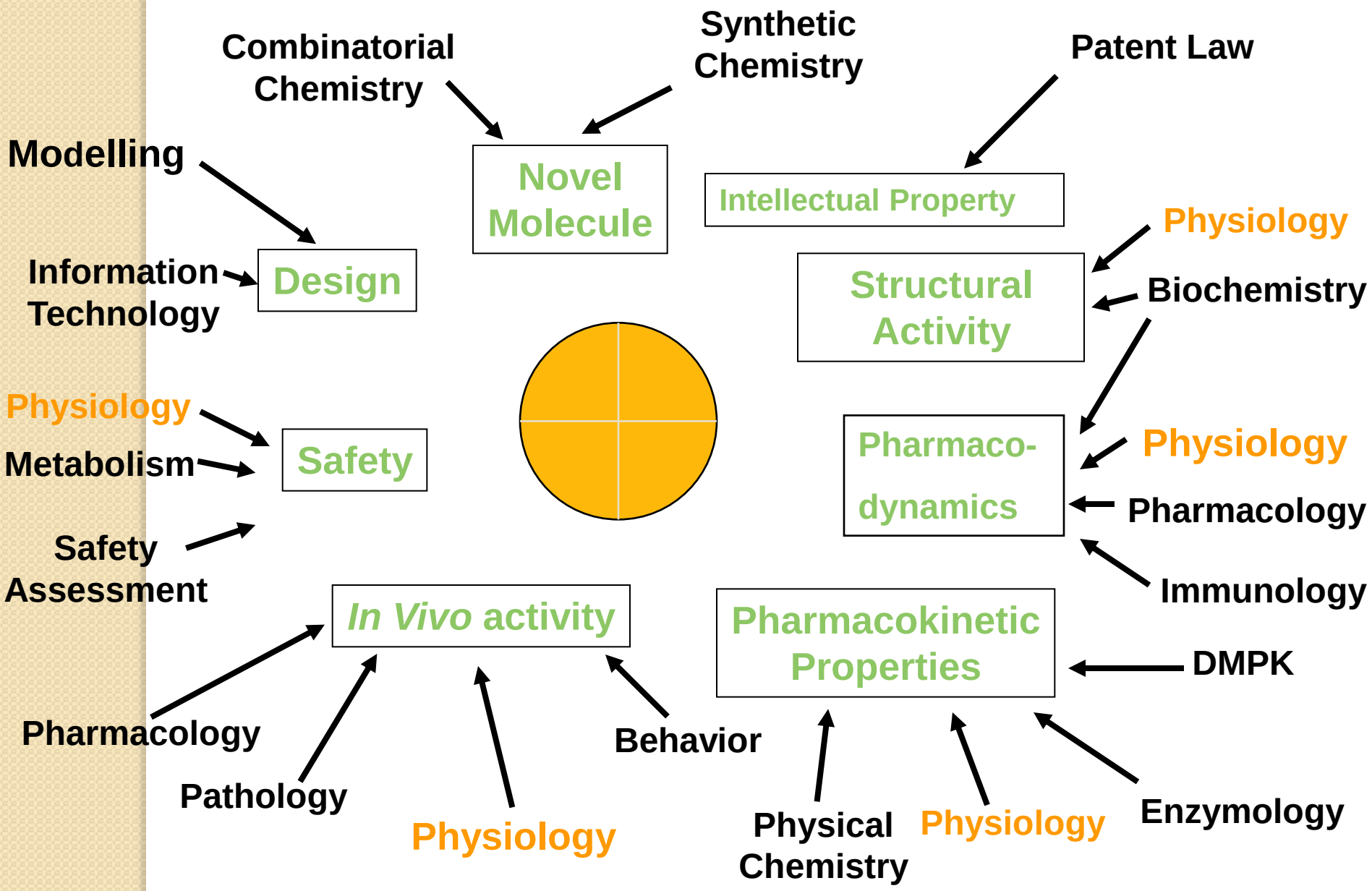



Target identification and validation
Primary screening of compound collection
confirm 'hits'
examine structures
priortize hits
Initial SAR from purchased compounds
potency studies
compound analysis
preliminary pharmacology
preliminary animal efficacy
Identify potential lead(s)
Lead optimization
Med/chem synthesis
mechanistic studies
animal efficacy / ADMET
QSAR / pharmacophore modeling
Med/chem synthesis
potency and selectivity
detailed toxicity studies
administration route
drug interactions
IND application
Clinical trials

Discovery

- Develop an assay to evaluate activity of compounds on the target
  - *in vitro* (e.g. enzyme assay)
  - *in vivo* (animal model or pharmacodynamic assay)
- Identify a lead compound
  - screen collection of compounds (“compound library”)
  - compound from published literature
  - screen Natural Products
  - structure-based design (“rational drug design”)
- Optimize to give a “proof-of-concept” molecule-one that shows efficacy in an animal disease model
- Optimize to give drug-like properties-pharmacokinetics, metabolism, off-target activities
- Safety assessment, Preclinical Candidate!!

Drug Discovery—Convergence of Disciplines



Signature

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Pharmacoepidemiology & Drug Safety Related Journals

- Advances in Pharmacoepidemiology & Drug Safety
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