

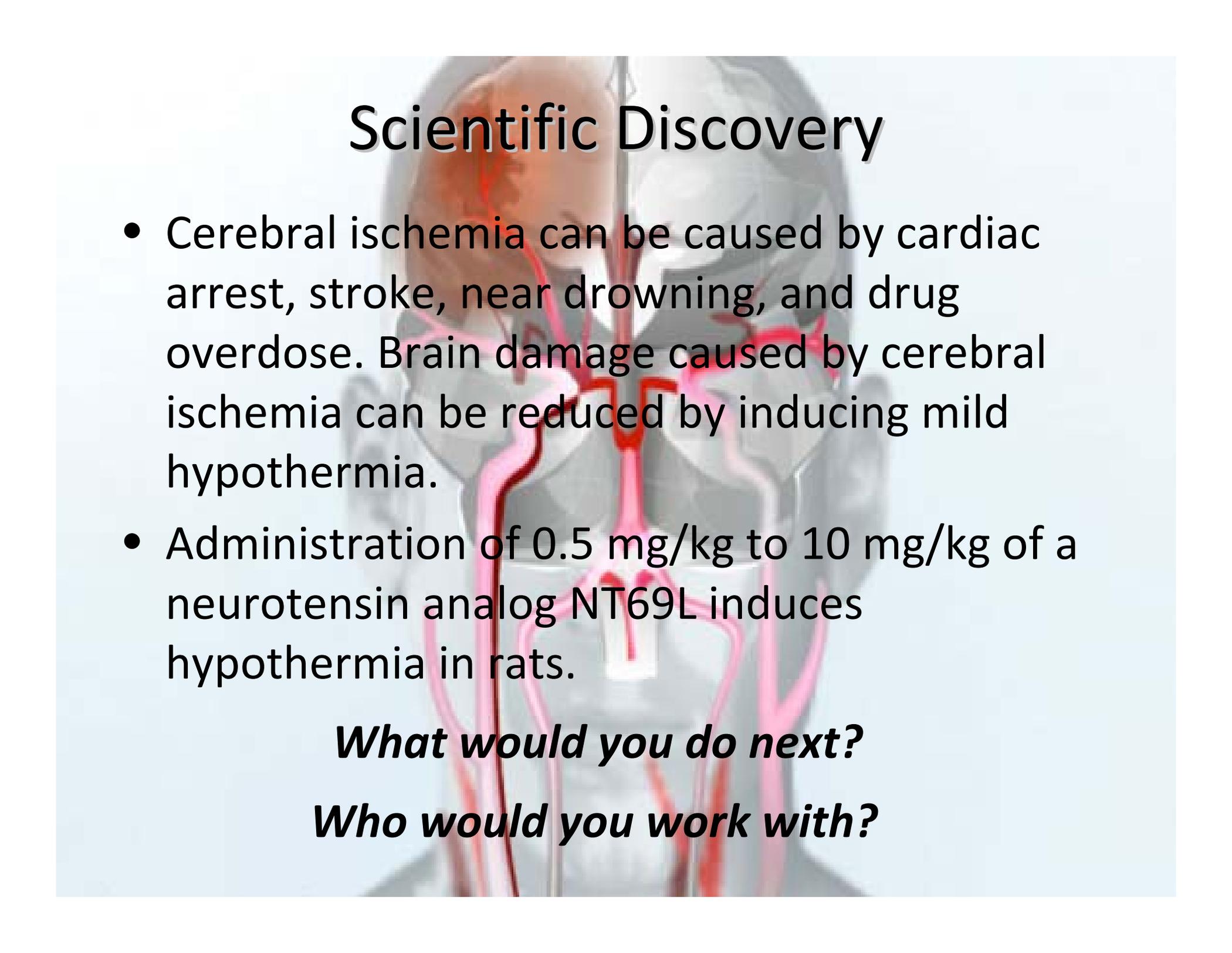
The Business Side of Science

Careers in Industry, Technology Transfer, and Intellectual Property



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Office of Graduate Education at the University of North Carolina at Chapel Hill

Scientific Discovery



- Cerebral ischemia can be caused by cardiac arrest, stroke, near drowning, and drug overdose. Brain damage caused by cerebral ischemia can be reduced by inducing mild hypothermia.
- Administration of 0.5 mg/kg to 10 mg/kg of a neurotensin analog NT69L induces hypothermia in rats.

What would you do next?

Who would you work with?

Marketing



- What are the current treatments to reduce brain damage due to cerebral ischemia?
- What is the global market? How many people suffer from cerebral ischemia annually?
- What is the product value? How much could you charge? Will Health reform impact value?
- Does this product provide a faster, better, or cheaper alternative to current products.
- How many years will it take to get to market? What will be the return on investment?

Intellectual Property

- Is there prior art?
- Are the compounds patented? Who owns the patent? What is the life of the patent?
- Can other compounds accomplish the same effect?
- What countries should the patent be filed?
- What claims can be made?
- When do you have sufficient data to file a patent?



Twenty Years

Drug for induction of hypothermia to treat cerebral ischemia after traumatic event

- No competition, but also no one was interested in taking a license
 - Technology was not yet proven in humans
 - But potential market is large and if compounds are successful, could be disruptive
- Inventor decided to try to build a startup around this idea - Hibernaid
- Completed Launch the Venture
- Hired a CEO –now a three person company
- Completed licensing from university
- Fundraising phase – voted most likely to get funding at SmartStart UNYTECH venture forum

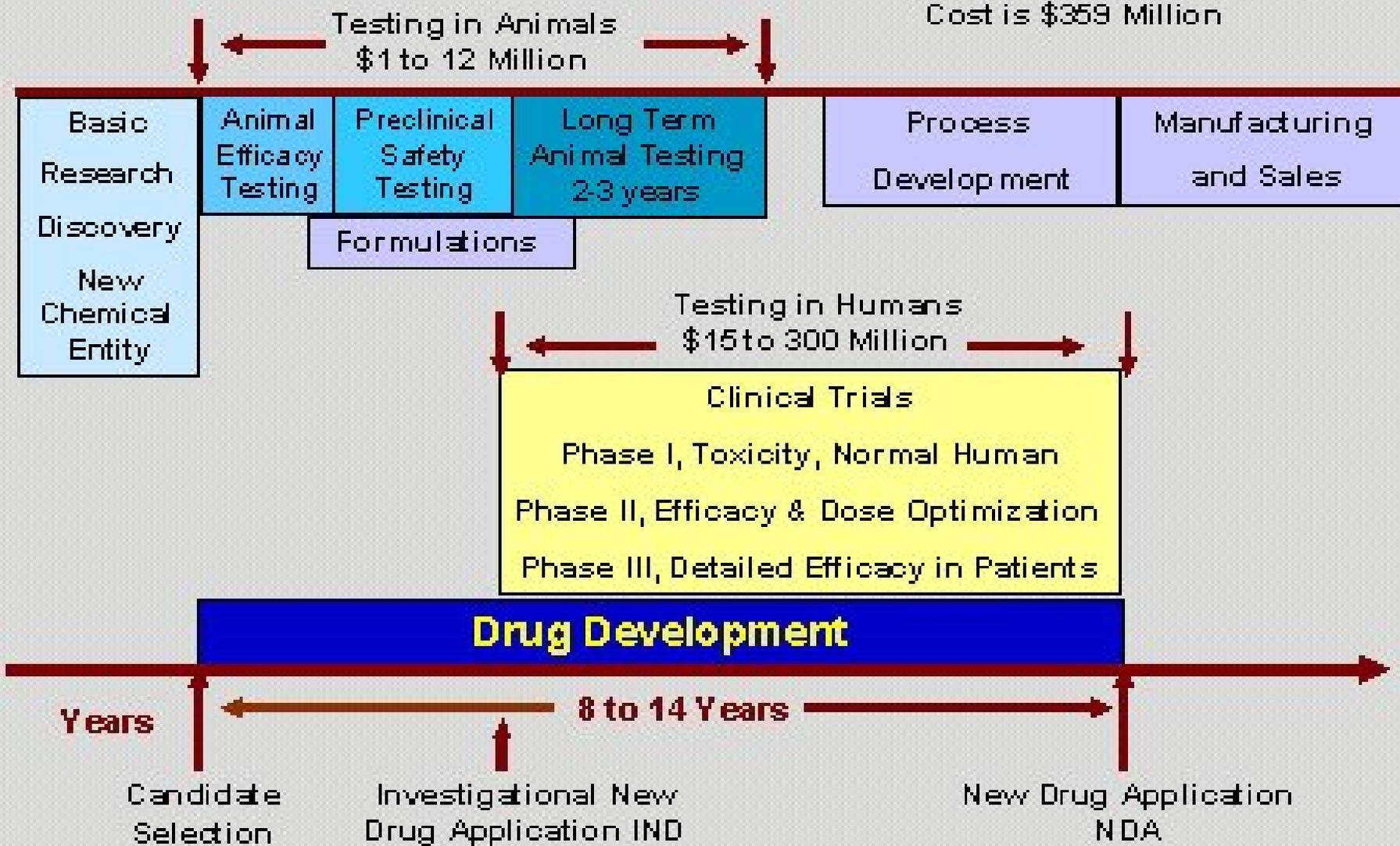
Coming Soon to Emergency Rooms: A Drug Cocktail to Chill the Body and Save the Brain: Inducing therapeutic hypothermia can prevent damage from oxygen deprivation in trauma patients



Drug Development Cycle

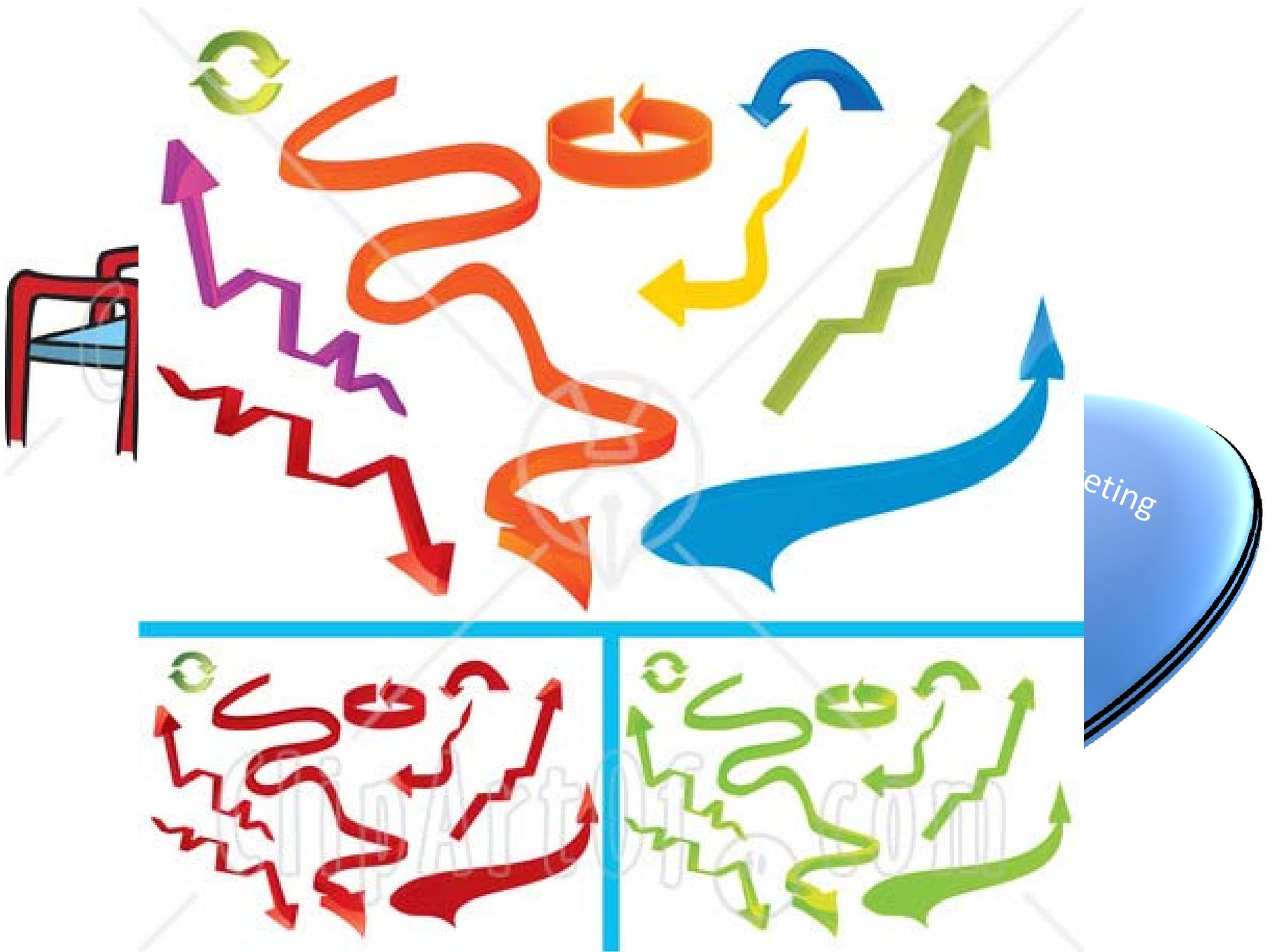
Average Time to Get Drug to Market Is Now 14 Years

Average Total Development Cost is \$359 Million



Industry	Technology Management	Intellectual Property
Research Scientist	Technology Transfer	Patent Lawyer
Clinical Trials Management	Business Development	Patent Agent
Regulatory Affairs	Entrepreneur	Patent Examiner
Marketing	Venture Capital	
Quality Assurance	Financial Analyst	
Quality Control		
Technical Sales		
Medical Science Liaison		
HR Recruiter		
Project Management		
Consultant		
Technical Training		
Technical Writing		





There are no ruby red slippers you can click together and land in industry



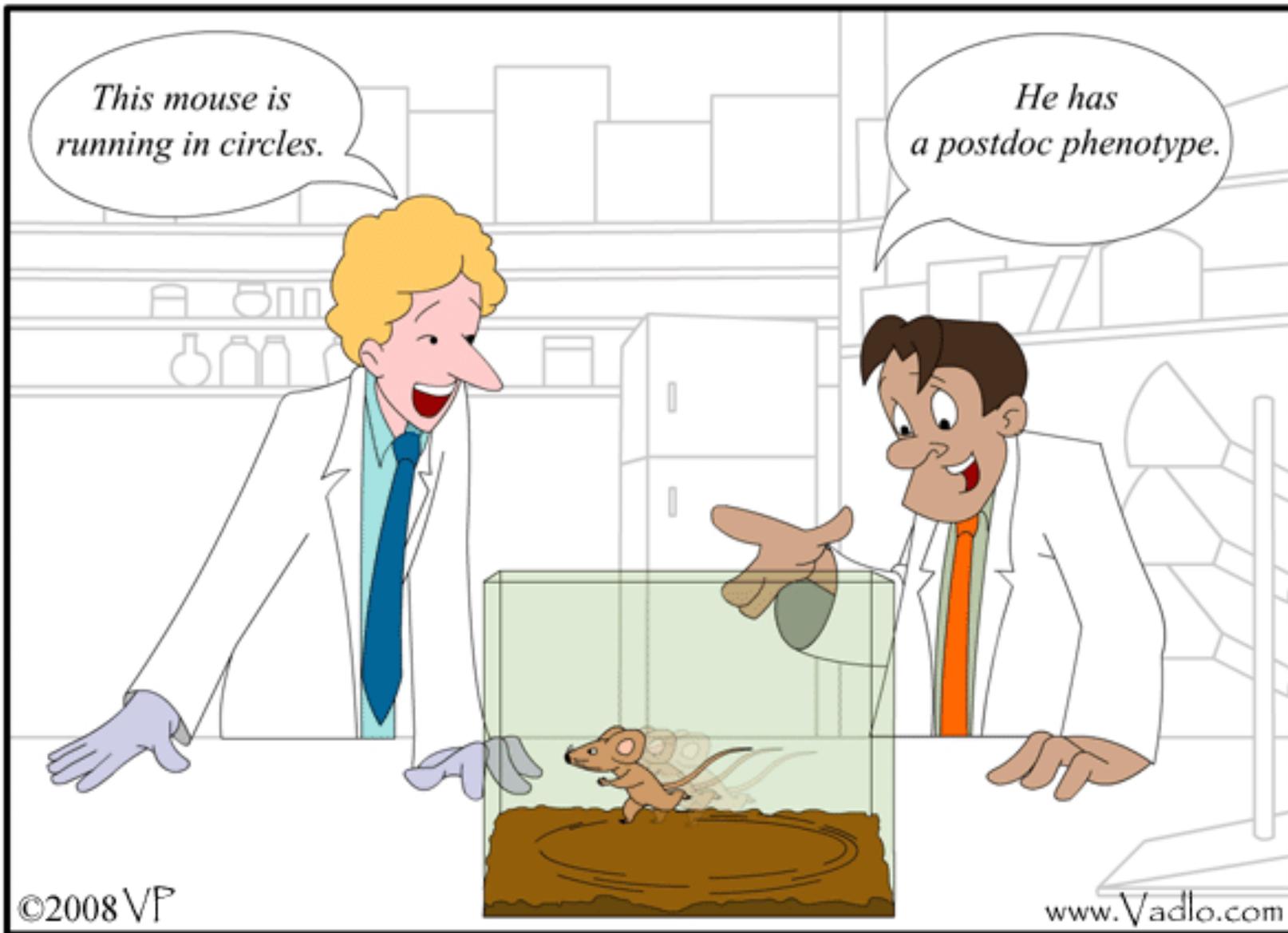
Publications
Letters of Recommendation
Research

*This mouse is
running in circles.*

*He has
a postdoc phenotype.*

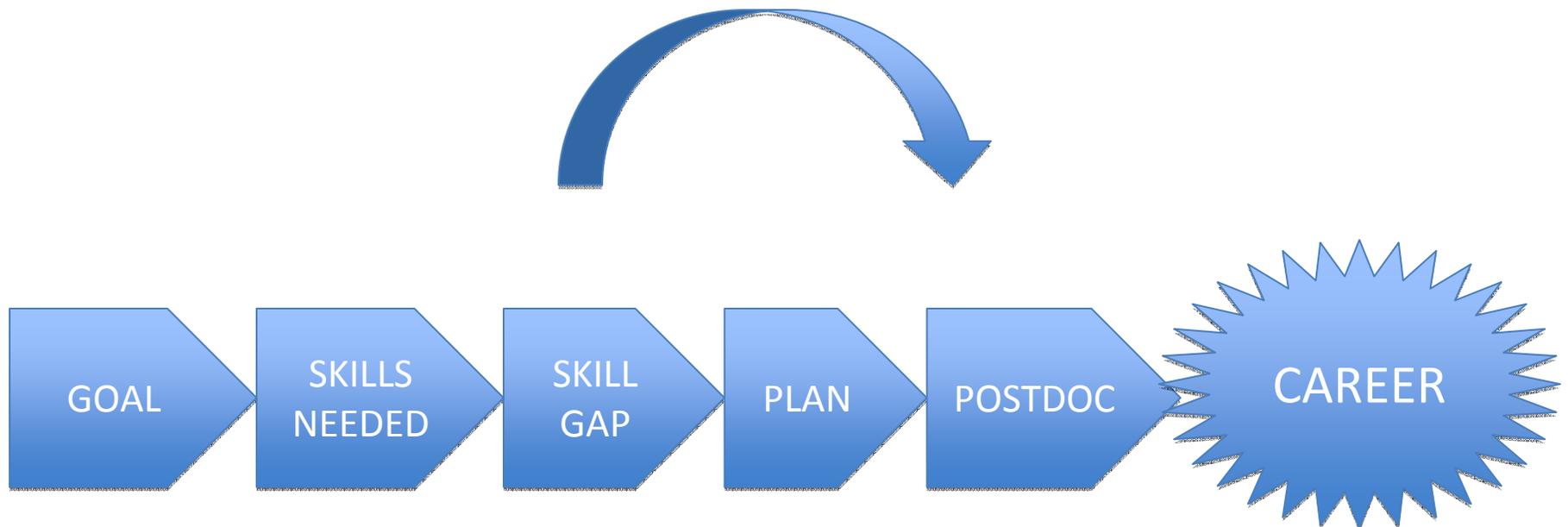
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Strategic Planning Map

NETWORK OF MENTORS/CAREER PROFESSIONALS



Choose a first career step

- Know Yourself – understand what your strengths and weaknesses are
- Research Career Options
- Look at Job Descriptions
- Conduct Informational Interviews
- Engage in career related activities
- Science Careers website
- OITE library and staff



Develop List of Skills Needed

- Review job advertisements
- Ask hiring managers of desired positions
- Apply for positions and seek feedback
- Interview current professionals about skills you need
- Get resumes of people that just got the job you wanted



Gain Skills

- Training through professional societies
- Certificate programs – GPP Handbook
- Network with chosen career professionals.
- Attend conferences related to career.
- Volunteer – everyone has a project they can't find time to get to.
- READ and become integrated into the language and culture of the chosen career.

NIH Top 20 Inventions (2009) – \$100M

- 1 Vaccines Based Upon Recombinant Papillomavirus Capsid Proteins Lowy et al. (NCI)
- 2 (Novel Protease Inhibitor for Treatment of Drug-Resistant HIV-1 Erickson et al. (NCI)
- 3 Monoclonal Antibody for Treatment of RSV Murphy et al. (NIAID)
- 4 Synthetic Thyrotropin as Adjuvant in Thyroid Cancer Wondisford et al. (NIDDK)
- 5 Proteasome Inhibitor for Treatment of Multiple Myeloma Gupta (NCI)
- 6 AIDS Drug ddi Mitsuya et al. (NCI)
- 7 Nutritional Supplement to Treat Macular Degeneration Ferris et al. (NEI)
- 8 Paclitaxel as a Cancer Treatment Wilson et al. (NCI)
- 9 Vaccinia Virus Vector Used in Veterinary Biologicals/Vaccines Moss et al. (NIAID)
- 10 Radioimmunotherapy for Non-Hodgkin's Lymphoma Gansow (NCI)
- 11 Serological Detection of Antibodies to HIV-1 Gallo et al. (NCI)
- 12 DNA Probe for Breast Cancer Diagnosis King et al. (NCI)
- 13 Genotyping of HIV Protease Gene Oroszlan et al. (NCI)
- 14 Norwalk Virus - IVD Product Green et al. (NIAID)
- 15 Paclitaxel-Eluting Coronary Stent System Kinsella et al. (NIA)
- 16 Diffusion Tensor Magnetic Resonance Imaging Basser et al. (NICHD)
- 17 Laser Capture Microdissection Liotta et al. (NCI)
- 18 Enhanced Magnetic Resonance Imaging Through Magnetization Transfer Balaban et al. (NHLBI)
- 19 Purified Transforming Growth Factor Beta (TGF-beta) Sporn et al. (NCI)
- 20 Neutrophil Chemotactic Factor (IL-8) Matsushima et al. (NCI)

TECHNICAL LICENSING ASSISTANT AT RICE UNIVERSITY (\$45K)

Education Required: Master's Degree in a physical science; experience may not be substituted for education

Education Preferred: PhD in chemistry or other physical science

Experience Required: No experience required

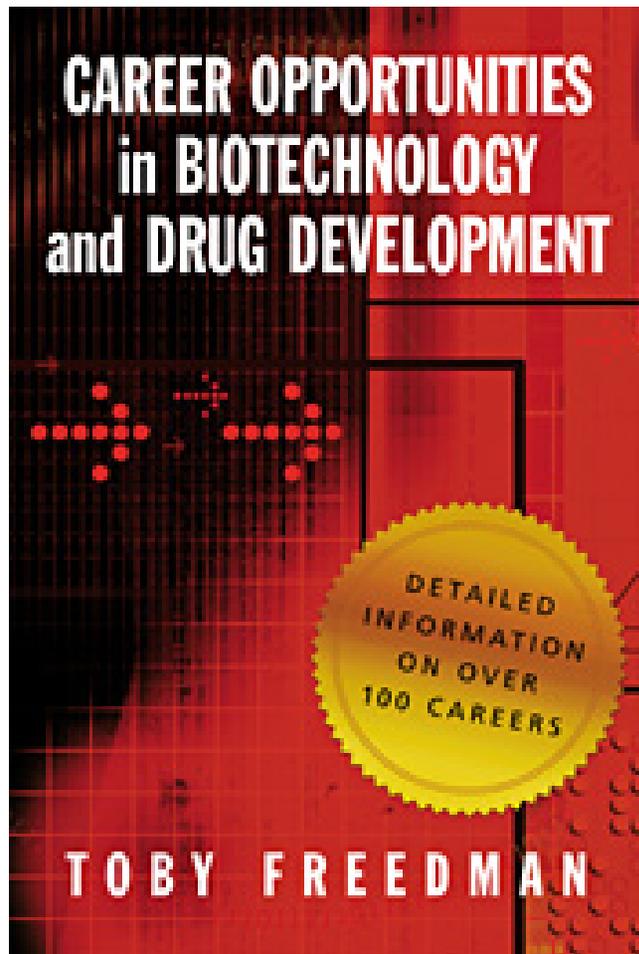
Experience Preferred: Two years of related experience in a technology licensing, academic technology transfer, or scientific research position.

Required skills:

- **Excellent verbal and written communication skills;**
- **Ability to communicate complex issues clearly and succinctly**
- **Excellent interpersonal skills**
- **Ability to work with faculty, staff, students, industrial contacts, and patent attorneys.**
- **Ability to multi-task and manage multiple projects simultaneously, meeting prescribed deadlines.**
- **Ability to conduct prior art and market research studies.**

Preferred skills:

- **Familiarity with rules and regulations of USPTO.**
- **Ability to draft and interpret legal documents.**



- Google search conferences in your specialty. The conference programs will list the major companies and speakers in your area.
- Search biospace.com to identify companies in your area.
- Look at NIH RePORTER for SBIR/STTR. You will find company names and email addresses of patent holders.
- Libraries have on line access to CorpTech, BioScan, Biotechnology Industry Database, Hoovers or recombinant Capital which allow you to create a most desirable companies list based upon location and research focus.

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