Building a scientific life

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HARD WORK BEATS TALENT WHEN TALENT DOESN'T WORK HARD.
NORMAL PERSON: I GUESS I SHOULDN'T DO THAT.

SCIENTIST: I WONDER IF THAT HAPPENS EVERY TIME.
“Now that desk looks better. Everything’s squared away, yessir, squaaaaaaared away.”
Long-term synapse loss induced by focal injury

Loss of Correlated Motor Neuron Activity during Synaptic Competition

Astrocytes Regulate Inhibitory Synapse Formation via Trk-Mediated Modulation of Postsynaptic GABA$_A$ Receptors

Mechanisms underlying autoimmune synaptic encephalitis leading to disorders of memory, behavior and cognition: insights from molecular, cellular and synaptic studies

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Drug development 101

- **Pre-discovery:** Basic research and screening
  - Tens of thousands of compounds

<table>
<thead>
<tr>
<th>Phase</th>
<th>3-6 Years</th>
<th>6-7 Years</th>
<th>0.5-2 Years</th>
<th>Indefinite</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>20-100</td>
<td>100-500</td>
<td>1,000-5,000</td>
<td>NDA submitted</td>
</tr>
<tr>
<td>FDA Review</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Scale-up to manufacturing</td>
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<tr>
<td>Phase IV/Ongoing research and monitoring</td>
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**Number of Volunteers**

- **Phase I:** 20-100
- **Phase II:** 100-500
- **Phase III:** 1,000-5,000

**One FDA-approved medicine**
Rapidly evolving scientific, technological, commercial and regulatory landscape

Science is Advancing
- The genetics of schizophrenia
- Biomarker development in AD
- New targets for Parkinson’s disease
- Neuroinflammation in psychiatric disease

Many Enabling Technologies
- Advances in medicinal chemistry
- Human brain imaging to define disease and monitor treatment response
- More sensitive clinical instruments

Stakeholders are Listening
- Decreased investment in Neuroscience by competitors emphasizes the challenge, but provides opportunity
- New opportunity for mood and depression in DSMV
- Regulators are open to new paths
- Governments and payers acknowledge the high disease burden and economic implications
Challenge: Link systemic pharmacology to defined brain circuitry and real world patient benefit

- **Endophenotype with mechanism-relevant deficit**
- **Vehicle for Operational Delivery**
- **Circuit-based mechanism of action**
- **Endpoint battery to interrogate deficits**
Programs to identify, attract, develop and retain the best scientific and clinical talent

Career Opportunities

Pfizer Neuroscience Careers

Colleagues from all over the world are drawn to Pfizer Neuroscience because of the challenging and often ground breaking work we do; our emphasis on innovation, and industry leadership. We know we can make a difference in the quality of life for the millions of individuals worldwide with neurologic and psychiatric disorders. We also understand that top talent is key to accomplishing this goal. Initiatives like our Investigator Program, post-doctoral and clinical fellowships, and Visiting Scholars Program are geared towards recruiting and retaining top talent while encouraging scientific innovation.

Different people. Different perspectives. One common commitment.
Pfizer is deeply committed to creating an environment where our colleagues can achieve success while contributing to the improved health of the world. Pfizer is consistently recognized as one of the world’s most admired companies. Much of our achievement comes from the importance we place on fulfilling our mission and values, as well as creating an environment that fosters the growth and development of our people. Learn more about Pfizer’s careers and benefits at our corporate career site.
Building a scientific life: Academia compared to industry

**Academia**
- Exploratory paradigm to research
- Identify new mechanisms; unexpected biology
- Interdisciplinary freedom
- Driven solo or in small groups
- Goal is the “yes”
- Passion for science

**Industry**
- Focused paradigm → new medicines
- Attach molecules to mechanisms that make it into man
- Organizational rigor, process heavy
- Multi-disciplinary large teams, fast pace
- Goal is the “no”
- Passion for science
Building a scientific life: Understand the job market
Building a scientific life: Understand the job market

814,000 direct jobs

1,022,000 indirect jobs

1,528,000 induced jobs

3,364,000 TOTAL JOBS

The biopharmaceutical industry supported 3.4 million jobs across the U.S. economy in 2011.
Building a scientific life: Understand the ecosystem

Key differentiators:
• Skill sets
• Risk tolerance
• Stability
• Hierarchy
• Opportunity for advancement

Source: PhRMA\textsuperscript{12}
### Building a scientific life: Map academic skill sets to entrepreneurship

<table>
<thead>
<tr>
<th>Academia</th>
<th>Business</th>
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</thead>
<tbody>
<tr>
<td>Idea, question, hypothesis</td>
<td>Invention, product, service, etc.</td>
</tr>
<tr>
<td>Define scientific cutting edge by reading literature</td>
<td>Identify social, political, market and economic trends</td>
</tr>
<tr>
<td>Write grants</td>
<td>Raise venture capital</td>
</tr>
<tr>
<td>Hire techs, students, postdocs</td>
<td>Identify and develop skilled workforce</td>
</tr>
<tr>
<td>Manage lab</td>
<td>Manage workforce</td>
</tr>
<tr>
<td>Design experiments</td>
<td>Design a strategy, business plan</td>
</tr>
<tr>
<td>Analyze and interpret data</td>
<td>Analyze and interpret business, market trends</td>
</tr>
<tr>
<td>Publish papers, give talks</td>
<td>Raise awareness, influence, advertise</td>
</tr>
<tr>
<td>Network</td>
<td>Network</td>
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Building a scientific life: Three things

**HARD WORK BEATS TALENT WHEN TALENT DOESN'T WORK HARD.**

belief-to-achieve.tumblr.com
How will you build your scientific life?
Drug development is risky and thus costly

- Average time to develop a new medicine = 10–15 yrs
- Average time on market before generic entry = 12.6* yrs

*For brand medicines with more than $100 million in annual sales in 2008 dollars, which account for 97% of sales of the brand medicines analyzed.

Sources: PhRMA; H. Grabowski, et al.
Investing in innovative treatments has had a tremendous health & economic benefit for society.

Net Impact:
+$18 investment returns $129 in savings
Ratio of $7 saved for every $1 invested

In-patient Savings: -$80
Office Visit Savings: -$24
Home Health Savings: -$12
Out-patient Savings: -$10
ER Savings: -$3

"The medical revolution over the last century appears to qualify, at least from an economic point of view . . . as the ‘greatest benefit to mankind.’ “

Yale economist William Mordhaus