The Role of IP in Funding New Medicines

Fact & Fiction

EHFG
October 6, 2017

Duane Schulthess
Managing Director
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What about this lottery ticket?

• New Lottery Ticket Costs $5
• Odds of Success 1 in 10
• Payoff for winning ticket $78 ... in 5 years
What about this lottery ticket?

• New Lottery Ticket Costs $5 mil
• Odds of Success 1 in 10
• Payoff for winning ticket $78 mil in 5 years

Welcome to the world of Biotechnology. This is an 11% ROI on a $50 mil portfolio.
Failure is Normal. IP Makes it Possible

Four Reasons Drugs Are Expensive, Of Which Two Are False
Jack Scannell, Forbes, Oct 13, 2015

“[Investors] need to believe there are decent odds that they will make a good return on investment. This is why firms have continued to invest in Alzheimer’s when . . . 244 experimental drugs were failures.”

IP is not about the winners, its about the many losers that make the winners possible
Investing in IP – What Works?

Radu Munteanu, UCSD, 2010  The biotechnology cluster in San Diego

• NIH $449 mil, primarily at Scripts and UCSD
• IPO $1 bil, VC $2.4 bil = $3.4 bil
Size of Initial Public Offering (IPO = Listing on a Stock Market) Best Indicator of Success

Table 1. Logit estimation of the Probability of Success

<table>
<thead>
<tr>
<th>Variable</th>
<th>Probability of success</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPO_amount</td>
<td>0.0713984 (0.0374142)*</td>
</tr>
<tr>
<td># of employees</td>
<td>0.0092208 (0.0035727)**</td>
</tr>
<tr>
<td>revenues</td>
<td>0.0170572* (0.0021912)*</td>
</tr>
<tr>
<td>UCSD_spinoff</td>
<td>-1.119023 (1.07791)</td>
</tr>
</tbody>
</table>

Note: Standard errors reported in parenthesis and an asterisk denotes significance at 5% level.

Radu Munteanu, UCSD, 2010
IP is a Legal Monopoly?
The PCSK9 Possibility

A potential new weapon against heart disease:
PCSK9 inhibitors (2015)

“PCSK9 is inhibited, the liver can efficiently metabolize LDL, lowering cholesterol levels in blood.”

December 16, 2015

“PCSK9 inhibitors [are] likely to increase and lead to multi-billion dollar annual sales for this class.”

Genetics: A gene of rare effect
A mutation that gives people rock-bottom cholesterol levels has led geneticists to what could be the next blockbuster heart drug.
The PCSK9 Reality – IP is No Guarantee of Profit

There’s a 15% relative reduction in cardiovascular risk…but investors were looking for something more over 20%. Insurance companies [would] have been happier to see something more like 25%.

Sprinkling rain on the PCSK9 parade
Analysts forecast that the PCSK9 inhibitor could reach the range of $2 billion to $4 billion in annual sales.

Last quarter, it brought in a meager $27 million.
The PCSK9 Reality – IP is No Guarantee of Profit

Forbes / Pharma & Healthcare

Statins Help Healthy People Lower Their 'Bad' Cholesterol

Study found taking them lowered risk of heart disease, death in those with high LDL levels

Now That Statins Are Cheap, More UK Patients Can Take Them

John LaMattina, CONTRIBUTOR

I cover news on drugs and R&D in the pharma industry. FULL BIO

Opinions expressed by Forbes Contributors are their own.
# Beating a Dead Horse - Sovaldi

1 in 5 risk of Liver Transplant ($739,100) annuitized over 10 years (NPV 5%)  

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 5 risk of Liver Transplant ($739,100) annuitized over 10 years (NPV 5%)</td>
<td>$90,749</td>
</tr>
<tr>
<td>Adjusted Treatment cost telaprevir, plus peginterferon and ribavirin (44% success rate)</td>
<td>$188,859</td>
</tr>
<tr>
<td><strong>Total Actual Cost of NOT Using Sovaldi (US)</strong></td>
<td><strong>$279,608</strong></td>
</tr>
</tbody>
</table>
Why Should We Care About Investors in IP?

2015 and 2016 Biotech M&A
$Mil USD

https://www.thepharmaletter.com/article/an-all-time-record-year-for-pharma-biotech-m-a
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