Taking Inventions from Lab to Market

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Robert MacWright, Ph.D., Esq.
Director, Technology Transfer Office
UMass Amherst
Have the Invention, Let’s Sell It!

- Hypotheticals:
  1. Extract from strawberries is heart-healthy, like resveratrol
  2. Friction-reducing sock spray
  3. Noise-cancelling earbuds
3 Companies, Ready for Sales!

1. Easy to make extract from bruised strawberries, made some in the lab!
2. Easy to make anti-friction spray, made some in the lab!
3. Easy to make noise-cancelling earbuds, made some in the lab!
“What Will You Do With My Money?”

• Every investor wants **profits**
• They invest to get you from a dream to profitable sales!
  
  • “Where are you now?”
  
  • “What will you do with my money?”
  
  • “Where will you be after my money is spent?”
What You Need to Raise Money

- Need to provide a “Sense of Reality”
  - Realistic financials, good profit potential
  - Staged plan for product development:
    - Define manufacturing protocols
    - Develop Scale-up plans
    - Establish Shelf life
    - Establish Quality control procedures
    - Develop Marketing & distribution plan
    - Test marketing
The “One Chance” Rule

- Each investor will talk with you ONCE
- Some “angel investors” will invest in fledgling companies with limited plans; but not if you can’t show realistic profit potential.
- For venture investors, if you meet with them about a half-baked plan, they will cross you off the list forever!
Lab Life Can Be Deceiving

- “I can make my strawberry extract for 3 cents per dose.”
- Strawberries for free from my local grocery store
- Cost is mainly for some ethanol to extract with, empty capsules, a jar
- Selling 30 capsules for $20, cost is $0.90, profit is $19.10!
The Commercial Reality

- Strawberries $800/metric ton
- Ethanol $900/metric ton
- Capsules $2000/million
- Bottles $0.38 ea. ($3800/10,000)
- Rent, heat, electricity
- Labor $10-15/hour
- Equipment: mixer, capsule filler, bottler, labeler, robots?
Where do you start?

Documents, documents, documents!
Investors will only know what you tell them, and they want to see your work!

- Commercially realistic cost calculations
- Market research basis for price point
- Supply chain
- Manufacturing protocols
- Shelf-life testing plan
- Quality control plan
You can’t calculate costs until you know how the product will be made!

An SOP is a checklist of baby steps

Specific quantities of reagents and materials

Keep track of time and materials

Test the SOP by following it
Contract Manufacture

- One way to get a handle on costs is to get a bid
- Batch manufacturers operate on a "cost plus" basis
- Manpower, overhead, amortization is built into the price
- Profits of $15-30% on the top
Batch vs. Continuous Process

- Batch processing problems:
  - Down-time to clean equipment
  - Constant measuring and pouring
  - Wasted product left behind
  - Batch-to-batch quality variations
  - Filling and packing operation can have long delays
Continuous Processing

• Constant feed of raw materials
• Constant outflow of finished product
• Equipment in continuous use, no cleaning, waste or downtime
• In sync with filling and packing operations
• Lower costs = higher profits!
Product Quality is Key to Profits

- Notorious example: Alli® weight loss pills (Orlistat)
- Blocks digestion of fats in food
- Several times taken off the market because some batches didn’t work!
  - “Manufacturing problems”
  - Counterfeiting
  - HUGE loss of $ and market confidence!
Gotta Have an ASSAY!

Strawberry Extract:
- Concentration of active ingredient
- Concentration of degradation products
- Appearance
- Moisture content
- Biological activity
A Test for Every Product!

**Sneaker Lube**
- Sock-covered brick incline slide test, standard application protocol
- Robotic slide repetition test

**Sound-cancelling Earbuds**
- Frequency response
- Rejection of test noise interference
- Physical examination
- Wire bend test, mechanical wear test
Stability/Shelf Life Testing

- **Long term**: samples at 25C, 60% humidity, test 0, 3, 6, 9, 12, 18, 24, 36, 72 months
- **Accelerated**: 40C, 75% humidity, test 0, 1, 2, 3, 6 months
- **Intermediate**: 30C, 65% humidity, test at same time as accelerated test, in case of big changes
If Stability is Poor, FIX IT!

- Use an amber bottle
- Add stabilizers (e.g., casein)
- Freeze-dry instead of liquid
- Add a desiccator to the bottle
- Purge with nitrogen
- Add “shake before using” instruction
- Use more durable plastic, thicker wire
Shipping & Distribution

- Will it survive 4 hours in a truck in Arizona sun? Minus 10F in Alaska?
  - Test expected extremes
  - If not stable, S&H gets VERY expensive
- Sale through distributors, retailers, direct to customer, or all of them?
- Store displays
- Getting and keeping “shelf space”
Balancing Price/Cost/Demand/Profits

- Shoe spray retail $7, 12 appl/can, each use lasts 6 months (6yrs/can)
  - 50% margin, 1M customers = $3.5M profits in 6 years, = $583K/yr

- Reformulate: retail $7, 12 appl/can, lasts 2 weeks (6 mos./can)
  - 70% margin, 1M customers = $4.9M profit in 6 mos., = $9.8M profit/yr!!

- Customer still gets unique product!
$40 retail, wire bend, earpiece wear test = 5 years typical use
- 40% margin, 1M customers = $16M/5 yrs = $3.2M profit/yr

Re-design: $35 retail, wire bend, earpiece wear test = 1.5 year use
- 50% margin, 1.2 M customers = $21/1.5 yr = $14M/yr profit!

Low price, more demand & hi profits!
Inventors Find This Hard to Do!

- I want customers to get the full benefit of my invention!
- But without profits there is no investment, and customers get no product at all!
- Cost/value/demand/profit balancing is done for every product you ever bought!
- Profits are what drive businesses!
So, What Will You Do With My $?

- Develop manufacturing protocols
- Complete scale-up design & testing
- Establish a supply chain & COGs
- Establish quality control assays
- Determine shelf-life/durability
- Design packaging, plan how to ship
- Optimize cost/value/demand/profit
- Model profits at target scale
- Establish physical plant, capital cost needs
Documentation Makes it REAL!

- EVERY step of the way, create SOPs, reports, budgets
- From these will spring your A-round pitch & offering document
- When investors do their “due diligence,” everything will mesh
- Provided you also tell them what you will do with THEIR money!
THANKS!

Bob MacWright
Director, Technology Transfer Office
UMass Amherst
macwright@umass.edu
www.umass.edu/TTO