A Start-up company to start your career

Professional Development Seminar

March 6, 2013

What is a start-up company?

- Small, just started
- Typically 1-5 years old
- Often no products, no sales
- Developing something totally new
- May, or may not be a market

What is a start-up company?

- Funding comes from different sources
  - Venture capital funding
  - Grants
  - Development money from a larger company
- Whole company is often not well developed

Why work in a start-up company?

- Tremendous adventure
  - You are starting something completely new
- Opportunity to be part of something as it grows
- Very strong focus
- Team work essential
  - Can have good and exciting colleagues

What do you do in a start-up company?

- Everything
  - Take out the garbage, clean the floors
- You do **not** do research
- You do do development
- All sorts of development work
  - Solve whatever problems need solving
- You typically own part of the company
  - Part of your compensation package

What are risks of a start-up company?

- Tremendous job insecurity
  - Funding may disappear in an instant
  - Technology, or marketing, may fail
  - Product may be too little too late
- Most start-up companies do fail
- You work very hard for relatively little pay

So you want a job in a start-up

- Could be most exciting thing you do
- Tremendous focus, comraderie
- Tremendous challenge
- Tremendous fun
- Fantastic experience for your cv
- You easily find another job if you have to

Why start a company?

- Want to have real impact
- Requirements too large for a university lab
- Development needs a large team of engineers
- Want to have success
- Want to make money

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- Want to make money → wrong!
- Only money makes money
- Founders do make money

Success of companies

- Technology push
- Market pull

Technology push

- New technology that is of great value
- Most common scenario
- Need to establish the market
- Do customers really want this?
- Much longer route to success

Market pull

- Technology that addresses current need
- Market already established
- Much more difficult to find
- Do customers really want this?
- Much shorter route to success

Success of companies

- Technology push
- Market pull

- Direction and focus of company almost always changes
- Must meet needs of the market

Entrepreneurship

- You have your idea → What is next

Entrepreneurship

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- Need to protect your idea

Intellectual property

- You need to protect your ideas
- Done through the patent process
- Harvard owns all IP
  - Except for undergrads
- Managed by OTD

Why file for IP?

- Essential for any start-up
- Can not raise money without IP
- Harvard files IP very quickly
  - Does not interfere with publication, talks

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- Can not raise money without IP
- Harvard files IP very quickly
  - Does not interfere with publication, talks
- BUT: filing IP costs money
- Roughly $100k per patent
- Harvard must recoup this money
- Must license patent → difficult balance

Who pays for IP?

- IP is licensed to start-up company
- Harvard is not a ‘for-profit’ business
- But still must recoup costs
- Harvard typically takes ~8% in equity
- Company also pays for patent costs, then royalty
- Choice of what to file is difficult
- Can not always get the exact balance

Beware of IP licensing

- IP is licensed to start-up company
- Start-ups like exclusive license in all fields
- Makes the company more valuable
- Essential for raising money
- Costs the company a lot of money
- Restricts further opportunities
- OTD can help with advice

Entrepreneurship

- You have your idea → What is next

- Need business development expert
- Most important person to work with you
- Most difficult person to find

Entrepreneurship

- You have your idea → What is next

- Need to raise money to pursue innovation

Cost of money

- Money costs you the company
- Investors earn money by owning the company
- Money comes in tranches
  - Need to reach milestones for each tranche
- The more money they invest, the more they will ultimately own

Sources of money

- Grants
  - Usually too slow
- Your pocket
  - Not enough
- Angel investors
  - Early stage investors

Sources of money

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- Angel investors
  - Early stage investors
- Venture capital
  - Mid-stage investors
- Hedge funds, large funds
  - Larger investors
- Co-development funds
  - Retain ownership
  - Lower risk; lower return
- Revenue
  - Usually much later

Examples

- Money comes in tranches
  - Need to reach milestones for each tranche
- Money costs the company
- Investors earn money by owning the company
- The more money they invest, the more they will ultimately own

Big problem: Valley of Death

- Early money
- Enough to establish basic concepts
- Very difficult to find
- Harvard has some sources for life sciences, not for others.

Rough estimates

- Angel funding
  - Typically take about 30%-50% of the company
- Venture Capital funding
  - Typically take about 50-70% of the company
- Typically save 10-15% for employees
- Remainder for founders: ~ 20-30%!!

Example: Super favorable raise

- Post value of the company: ~ $20 M
- VCs take 51%
- Raise ~ $10 M
  - Enough for 1.5 years, low spending
- Employees get ~ 20%
- Founders get ~ 30%
- Three founders, ~10% each
  - $ 2M!

Success!

- Successfully develop your technology
- But, no sales, no products, no income
- Need to develop the instrument, sales and marketing group

Series B raise

- Up round: Company now worth $40M
- But, you need $ 20 M for development
- Sell half the company
- Founder share now 5%, or $ 2M

Success!!

- You have a product
- You have a sales team
- But, you don’t have income
- Maybe you need to change directions
- You probably need to raise more money
- Founder shares decrease each round
  - Often diluted out completely

Why Raise any money?

- ‘Organic’ growth
  - Grants, your own funds
  - Sweat labor
  - Much slower to market
  - Much less development
  - Much slower growth
- Venture Capital funding
  - Give up some (a lot!) of the company for faster growth

Other contributors

- Consultant or employee
- Paid in cash and in equity
- Consultant:
  - Small number of shares

Employees

- Equity from employee pool
- Vests after some time
- Motivate performance, keep employees
- CEO: ~ 3% of the company
- Employees: ~ 0.1% of the company

Exit

- How VCs make money
- Take company public: IPO
- Sell to a larger company
- Keep running the company
- Often ties up employees for a year or two

RainDance™

Technologies

www.raindancetechnologies.com

RDT Corporate Offices

44 Hartwell Ave.

Lexington MA

Why start Raindance

- Harvard-developed technology
- Some ideas of practical uses
  - Technology push
- Development required large engineering team
- Engineering effort too large for academia

Founding RDT

- Founders:
  - Dave Weitz – lab at Harvard
  - Darren Link – post doc who developed technology
  - Jerome Bibette – former post doc with start-up experience; currently in Paris
  - Andrew Griffiths – pioneer in droplet-based biology; currently in Strasbourg

Raindance Technologies

- Traditional route to funding
- Angel funding to start
- Venture Capital funding
- Exit strategy?

Funding for RDT

- Angel funding
- Three years, $7.5M
- 15 employees
- No clear business strategy
- No management team, just engineers
- Product: general purpose lab-on-a-chip
- Angel investor took 70%
- Founders left with about 10-15%

Funding for RDT

- Series B investment
- VC funding
  - $35 M
- Hired CEO
- Focused business
  - Genomic selection
  - Simplest possible instrument

Genomic selection

- For 2nd generation sequencers
  - Can sequence ~100 MB
- Use only relevant region for sequencing
- Library of PCR primers for these regions
- Mix genomic target with single primer pair
- PCR to amplify desired amplicon

Funding for RDT

- Series C investment
- VC funding
  - $15 M
- Genomic selection
  - Still long time to market
  - Market needed validation → increased time
  - Market ultimately limited

Funding for RDT

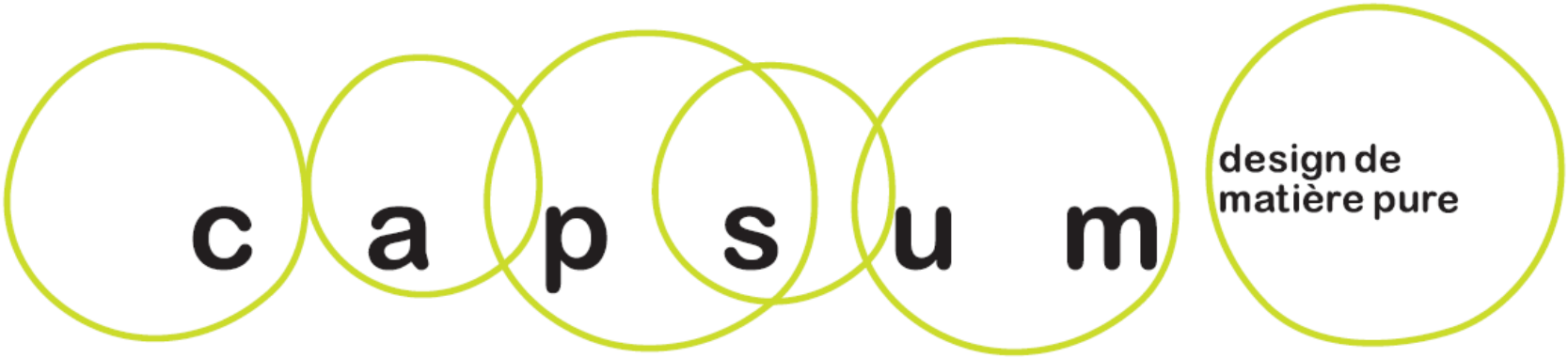
- Series D investment
- VC funding
  - $20 M
- Need to find next product
  - Digital PCR
- Fired CEO, leadership team
  - No vision for future

Funding for RDT

- New CEO
  - Banker
    - Little technical experience
    - No management experience
  - Could enunciate vision
- Exit strategy
  - Too expensive for buy out
  - Take the company public

Exit Strategy for RDT

- Total investment: ~$50M
- Additional investment ~$50M
- Total investment ~$100M
  - No big-selling product yet
  - No proven killer app
- Too expensive for another company to buy
- IPO?



Design of pure material for Food, Beverage, and Cosmetic

Capsum

- Different example
- Based on application developed in Harvard lab
- Encapsulation and release of actives
- Common for drug release

Founding team

- **David Weitz**
  - Mallinckrodt Professor of Physics and of Applied Physics, Harvard University
  - Director of Harvard's Materials Research and Engineering Center
  - Founder of Raindance Technologies (http://www.raindancetechnologies.com/)
  - 18 years working experience at Exxon Research and Engineering
  - 325 scientific papers, 30 patents

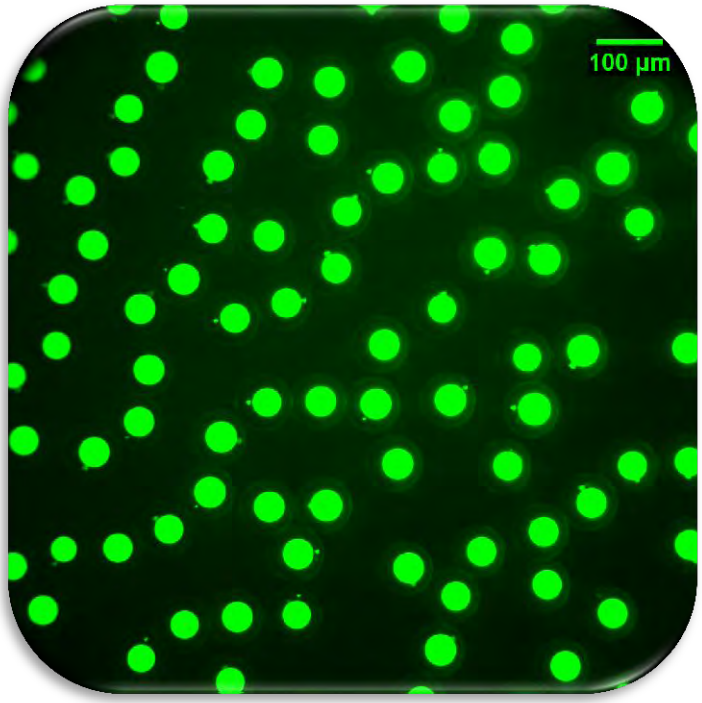
- **Jerome Bibette**
  - Professor of Physics at Ecole de Physique et Chimie Industrielles in Paris
  - Director Colloids and Divided Materials Laboratory at ESPCI
  - Co-founder of Raindance Technologies in 2004 and Ademtech in 2000

- **Sebastien Bardon**
  - PhD in Physics and MBA from MIT Sloan School
  - Led the early stages of the largest internal venture at Saint-Gobain (SGO)
  - Operational experience: team and project management, R&D, setup of a plant, marketing
  - Author of 25 patents and 16 scientific articles

Cosmetic : First commercial application

- **Encapsulation of active molecules for skin-care**

Capsum's polymersomes



⇨ **Amore Pacific is the leading cosmetic company in Korea**

⇨ **Significant reduction in bio-activity degradation after two months shelf storage**

Sales to start Capsum

- Done at peak of economic downturn
- Professional BD person took 6 months to raise 900k €

Capsum

- ‘Organic’ Growth
- Immediate sales: Amore Pacific
  - Market pull
- ~800k € / yr
- Government grants ~1M €
- Fund raising 800k €
- 20 employees
- Moved operations to Marseilles
- Total burn in 2.5 years: ~ 100k €
- Founders kept ~60% of the company

Commercial products

Commercialized products

Commercialized products

SKIN CAVIAR LIQUID LIFT

A New Generation of Lifting

Price: $500.00 | 50 ml. / 1.7 fl. oz.

View larger image

The Product | The Benefits | The Application | Perfect Partners

Skin Caviar Liquid Lift, an age defying serum joins the iconic Skin Caviar Collection. One drop helps to lift, firm and provide a long-lasting tensing effect to skin. Reflecting the heritage of our Skin Caviar Beads, the very essence of lifting, this modern day next generation formula contains scientific advancements that create this lifting phenomenon.

Past damage recedes as existing cells are rejuvenated, and new ones are super-charged, nourished and protected. Skin appears lifted and taut. Skin Caviar Liquid Lift epitomizes science and luxury the true nature of the Skin Caviar Collection.

Discover More

Quantity: 1

Exit for Capsum

- Several new products
- Many new products in pipeline
- Innovation for cosmetics
- Company is now a good acquisition target
- Exit will come in next few years

GnuBio

High-speed sequencing

Mike Weiner, John Boyce

GnuBio

- Chasing the $1000 genome
- Sequence full human genome in less than a day, less than $1000
- Team with other IP
  - ‘Social network’ of genomic data – database
  - Technology push
- Pitch evolved with VC presentation

Selling GnuBio

- Became sequencing company
  - Address the “applied” market
    - Huge potential market
- Market pull
- Generate a huge amount of ‘buzz’

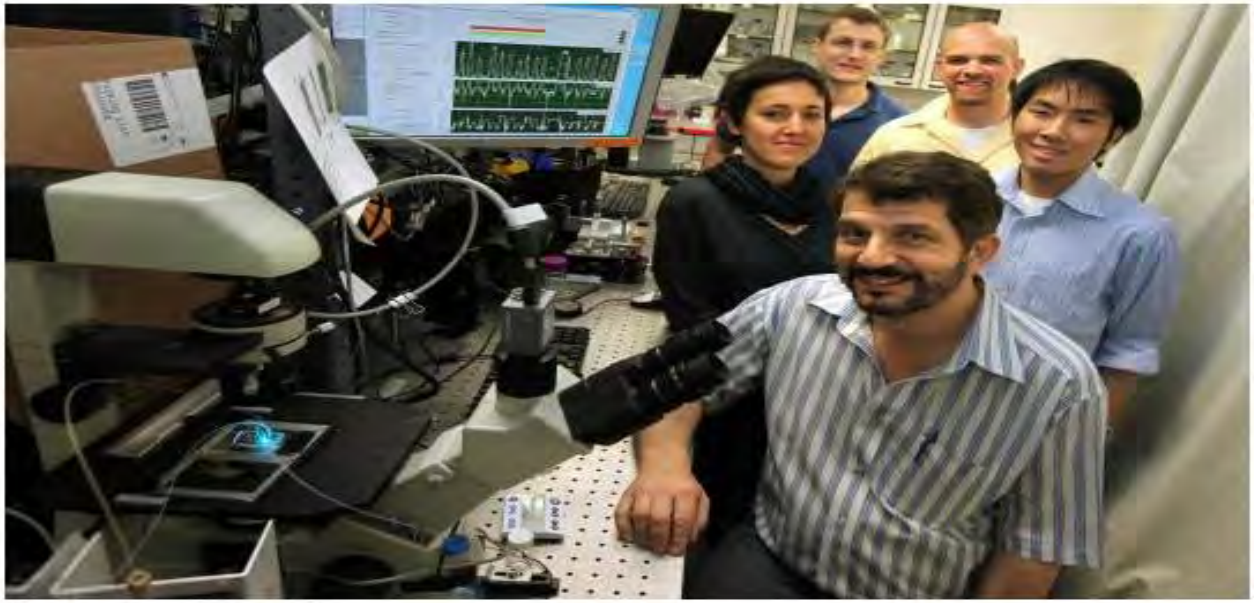
The Boston Globe

Weitz Announces the "$30 Genome"

HOME / YOUR TOWN - HYPERLOCAL NEWS / CAMBRIDGE

The Boston Globe

Start-up aims to sequence human genomes for $30, in just a few hours



(Pat Greenhouse/Globe Staff)

By Carolyn Y. Johnson
Globe Staff / June 7, 2010

Selling GnuBio

- Became sequencing company
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- Market pull
- Generate a huge amount of ‘buzz’
- Capture the ‘buzz’ and get funds
- First round from known investors

GnuBio

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    - Huge potential market
- Generate a huge amount of ‘buzz’
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Funding for GnuBio

- Money in tranches
  - First tranche of only $2.5 M
  - Second tranche in 8 months
    - Milestone based
- Second tranche was $6M
- Second round funding - $10M
  - Milestones ensured less dilution

Exit strategy for GnuBio

- Sales of instruments
- Clear vision of instrumentation
- Knowledge of needs
- Market push
  - Well-defined product
  - Known market
  - New ones identified

Exit strategy for GnuBio

- Beta instrument in 2 months
- First example of commercial success
- Should become acquisition target

Conclusions

- Why to join a start-up company
- Why to start a company
- How to start a company
- How to exit a start-up company

Thank you for your attention