Scaffolding Unlimited

Luis Mendez
Hala Altunji
Johnpaul Golinski
Sol Ezra

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Executive Summary

• Problem: tissue engineering is limited to 2D scaffolds.

• Objective: improve tissue engineering by creating a useful, biocompatible 3D scaffold.

• Innovation: create a 3D piece with electrospinning for the first time.

• Market: private research labs, hospitals, research universities.
  ▪ rapidly expanding billion dollar industry.
Background

What are stem cells?

• All-purpose, non-specific
• Differentiate at certain chemical signals
• Exist in human bone marrow, embryos, etc.
What are scaffolds?

- A matrix of nanofibers
- Structure stem cell growth
- mimic the body's connective tissue


[3]
Why electrospinning?

- makes fibers of a small diameter
- controls porosity
- gaps allow tissue to grow and bind
Innovation

• 3D scaffold
  o Improvement of Stem Cell research
• Reduce Development Time
• Productive facilities

Significance

• Used in stem cell research labs.
• Will impact hospitals that use this method of tissue regeneration.

Need

• 2-D mats create limitations, only used for skin, organ lining, etc.
Potential Impact

• Expands research parameters
• Result: advances stem cell research, tissue engineering, and regenerative processes in the body.
• Will give a new "dimension" to stem cell research.

Market

• Over 200 universities and research hospitals
• No account of private research labs
Market Analysis

- Estimated global market of $0.7 to $1 billion \cite{1}.
- Will target an estimated 10% of the market.

Projections:

- Ongoing stem cell research
- Market expected to grow
Competition

- Traditional electrospinning technique
- Produce mats of fibers

- Restricted niche—sell equipment only and not scaffolds.
Phase-1 Project Goals

- Research and analyze current method
- Develop new method
- Test Scaffolds
- Create a protocol
Proposed Plan

- Develop and perfect the technology through research
- Expand and publish our findings
- Sell the idea to hospitals and labs
  - Advertise through medical magazines, colleges, exhibitions, and hospital use
- Sell the technology through various means:
  - Customize scaffolds to the desired specifications
  - Sell the machine that makes the tissue
  - Rent out facilities for use
Phase-1 Evaluation Plan

- Method for creating scaffolds
- Examine consistency and porosity
  - 3-D structures already created
  - Protocol Method
  - Customizable Scaffolds
Scaffolding Unlimited

• Custom scaffolds
• Latest technology solutions for stem cell research
• Research comes first
• Environmentally conscious
Business Management Plan

• Corporation
  o Integrity, Honesty and Passion
  o Management Breakdown
  o Board of Advisors

• Scaffold Solutions.
  o Target customers
  o Sales Force
  o Warranty and Ordering help
Project Management

• Sales and Manufacturing
• Technology and Research
• Risks
  o Meeting Demand
  o Research results
## Financial Plan

**Break even Point:**
1 Year after Implementation

<table>
<thead>
<tr>
<th>Required Start-Up Funds</th>
<th>Amount</th>
<th>Total</th>
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<tbody>
<tr>
<td><strong>Fixed Assets</strong></td>
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<tr>
<td>Real Estate-Land</td>
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<td>Other Fixed Assets</td>
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<tr>
<td><strong>Total Fixed Assets</strong></td>
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<td><strong>Operating Capital</strong></td>
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<tr>
<td>Pre-Opening Salaries and Wages</td>
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<td>Prepaid Insurance Premiums</td>
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<td>Inventory</td>
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<td>Legal and Accounting Fees</td>
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<td>Advertising and Promotions</td>
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<td>Licenses</td>
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<td>Other Initial Start-Up Costs</td>
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<td>Working Capital (Cash On Hand)</td>
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<td><strong>Total Operating Capital</strong></td>
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<tr>
<td><strong>Total Required Funds</strong></td>
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<td><strong>$849,606</strong></td>
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Phase-1 IDS Budget

- Estimated total Cost: $6,000
  - Itemize budget needs for
    - Electrospinning Unit: $2,000
    - Polymers: $600
    - Analysis System: $400
    - Travel $500
    - Education and Training: $1,000
    - Stipend: $1,500
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<thead>
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<th>D</th>
<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
<th>Finish</th>
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<td>Begin Research</td>
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<td>Mon 5/23/11</td>
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<td>2</td>
<td>Design Scaffolding Machine</td>
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<td>Optimize Machine Results</td>
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<td>Minimize Machine Cost</td>
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<td>5</td>
<td>Purchase Laboratory</td>
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<td>Wed 5/16/12</td>
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<td>Pay for Laboratory</td>
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<td>7</td>
<td>Sell Scaffolding</td>
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<td>Expand Business</td>
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<td>9</td>
<td>Continue Sales and Growth</td>
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<td>Sat 1/2/16</td>
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Milestones and Deliverables

• Milestones:
  o Research completion: 1 year
  o Marketing initiation
  o Break even point: 2 years
  o Global expansion: 3 years

• Deliverables:
  o Final Design/pricing
References and Acknowledgements


