RUTGERS
THE STATE UNIVERSITY
OF NEW JERSEY

# From PhD to CEO; Starting a Biotech Company While Completing a PhD

Michael Johnson – CEO and Co-Founder, Visikol Inc.
PhD Candidate

# About me

- CEO and Co-Founder of Visikol Inc.
- National Science Foundation Fellow
- PhD Candidate – Department of Environmental Science

**Background**

- BS in Biology, Muhlenberg College 2011
- Interned at NASA Airborne Research 2011
- Pharmaceutical Packaging Analyst 2011 to 2012
- Teaching Assistant – Rutgers University 2012 to 2013
- Marketing Co-Op – Johnson & Johnson  2013 to 2015
- TEDxJNJ Co-Op – Johnson & Johnson 2015 to 2016

# Visikol Inc

- 4 full-time employees
- 5 part-time employees
- $500,000 in Venture Capital Funding
- $275,000 in NSF grant funding
- 1,000 sq ft lab space at CCIT
- 1 issued patent, 1 pending patent

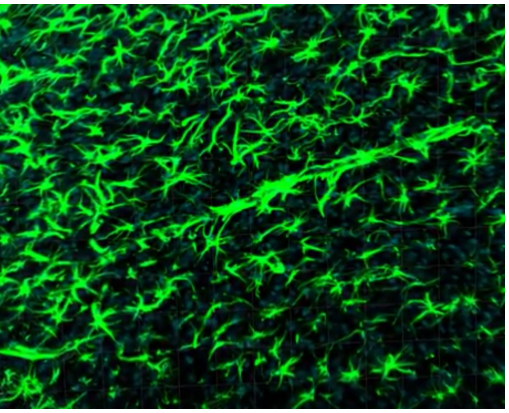
**Michael Johnson**
**CEO**

**Tom Villani**
**CSO**

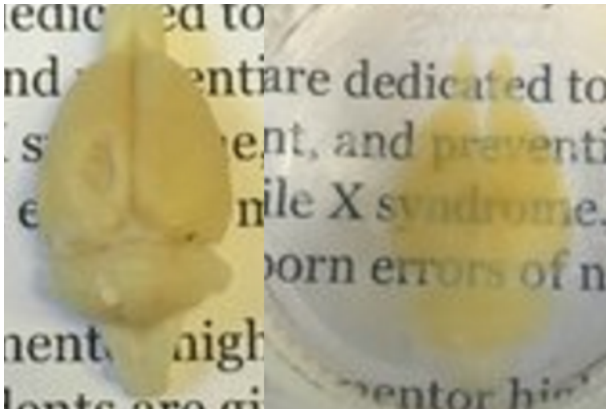
**Nick Crider**
**COO**

**Graeme Gardner**
**Director of Research**

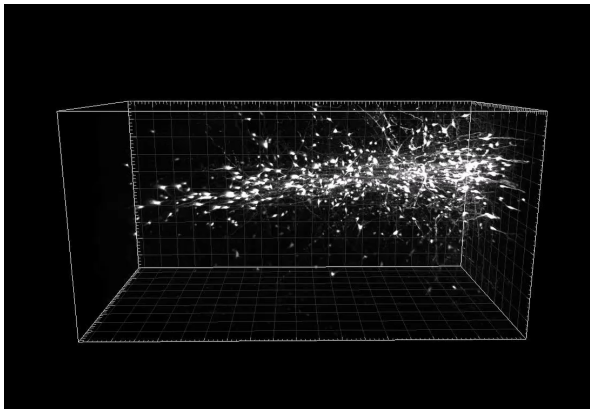
## Technology



Tissue Labeling



Tissue Clearing



3D Imaging

How did I create a company while working on my PhD and why?

DISCLAIMER – I had no intention of starting a company or becoming an entrepreneur when I started graduate school

Started graduate studies because I loved science and realized that to do *real* research I needed to get an advanced degree

**At the beginning:**
No idea where I wanted to go with my career

You are incredibly impressionable

Path for a PhD is long and largely undefined – during/after

You know few PhD's

## The Advisor

Most important decision you make is who your advisor will be

Important aspects of an advisor to me:

1) Autonomy

2) Diverse set of experiences

3) Mentorship and guidance

## My Advisor – Dr. A.J. Both

- Helped me identify funding
- Assisted me in developing a PhD project that would address my passion for applied science

- Suggested that I gain industry experience
    - 3 years of Co-Ops with Johnson & Johnson

- Encouraged me to pursue fields outside of my discipline
    - MBS classes (finance, accounting, marketing)
    - Consulting projects in Argentina
    - *Grants to grow algae in space*

# Algae Astronauts

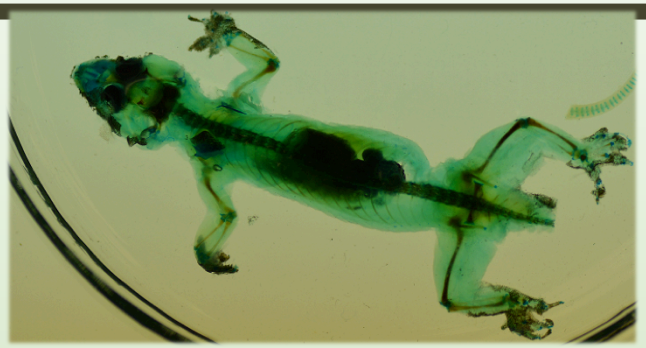
In 2014 I had the idea to send algae into space in a specially designed device to see if I could get them to produce more biofuel in space than they could on earth.

To conduct this project I needed a chemist to help out with algae processing and that is when my Visikol journey began.

Thomas Villani

# Visikol® Clears Biological Tissue

**Whole Gecko**



**Mouse Foot**

**Mouse Lung**

**Mouse Brain**

**Arabidopsis Leaf**

# Winter 2012

- Tom Villani invents Visikol® as a replacement to Chloral Hydrate for the visualization of botanical microscopy samples
- Tom files for a composition of matter patent through Rutgers University
- Tom and his college roommate Nick Crider launch Phytosys LLC to commercialize Visikol as a reagent for plant biology researchers
- Phytosys acquires the exclusive rights to Visikol® from Rutgers University

# 2013 to 2014

- Tom and Nick sell Visikol® as a reagent to over 150 plant biology researchers from around the world
- While the company is quite happy with their progress, selling a replacement to chloral hydrate is a small market
- When Tom invented Visikol® he knew it could be used to render animal tissues transparent, but the business case for this was not there yet

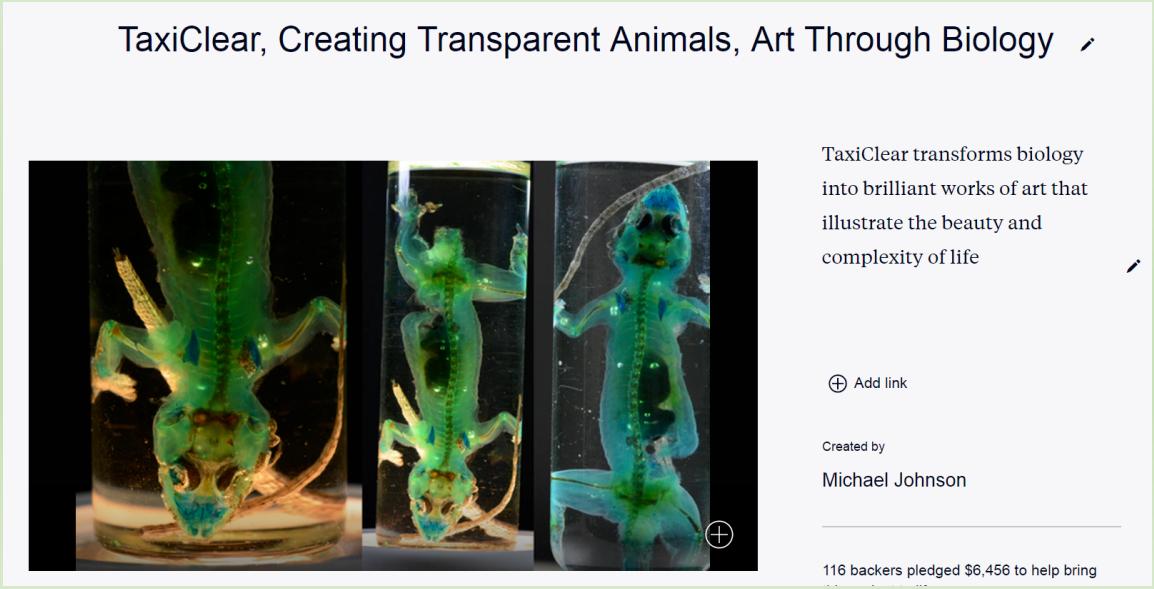
# 2014 – The Triumvirat

- When I met with Tom in 2014 to discuss sending algae into space we immediately hit it off
- I wanted to be part of what Tom and Nick were doing and jumped in right away
- I worked with Tom and Nick to quickly find out how to monetize and grow the Visikol® technology

# 2014 – The Shotgun Approach

- We looked into every single market to figure out where Visikol® could add value from taxidermy to embalming

- Eventually we came up with the two markets that would define our entire company: Toxicology and 3D Histology



# Visikol® TOX™ Platform - Toxicology

**Current Approach: 34 – 52 days**

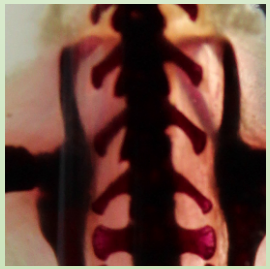
**Animal Growth, Reproduction, & Testing** — 20 – 31 days

**Skeletal Visualization** — 14 – 21 days

**VISIKOL Approach: 22 – 37 days**

**Animal Growth, Reproduction, & Testing** — 20 – 31 days

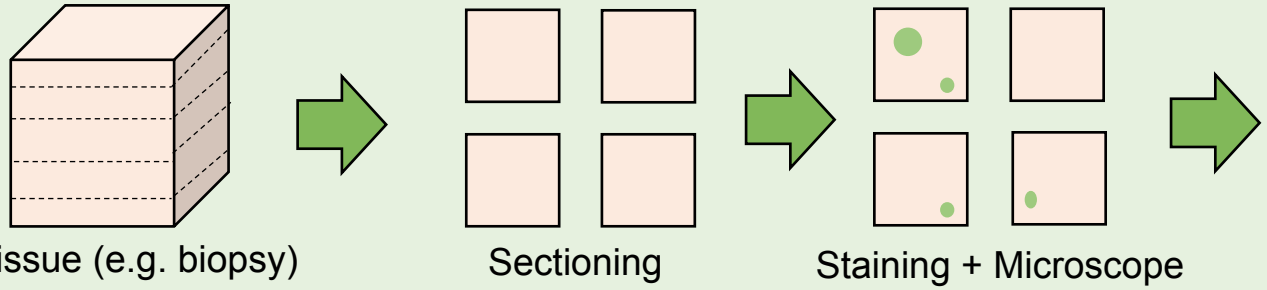
Skeletal Visualization — 2 – 6 days



- Skeletal visualization is the bottleneck of this process
- Visikol allows a CRO to increase throughput by 29-35%

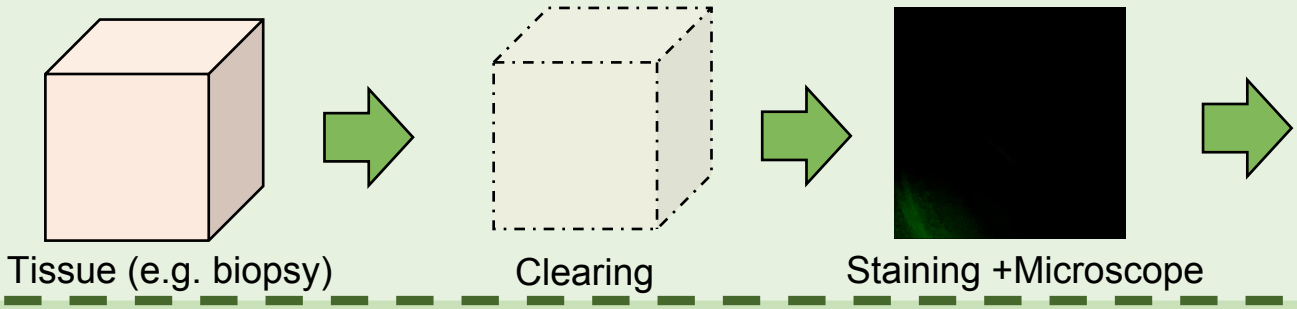
# Visikol® HISTO™ Platform – 3D Histology

## Traditional 2-D Histological Imaging




- < 1% of tissue analyzed
- >10% of the time cancer is misdiagnosed *

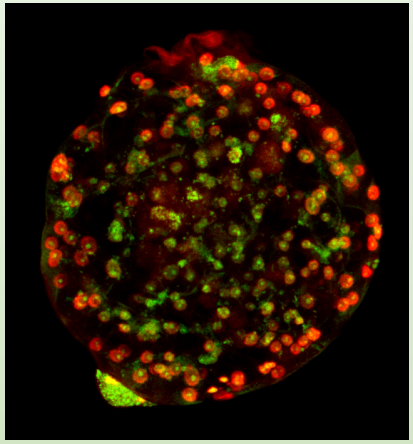
## Visikol-based 3-D Histological Imaging



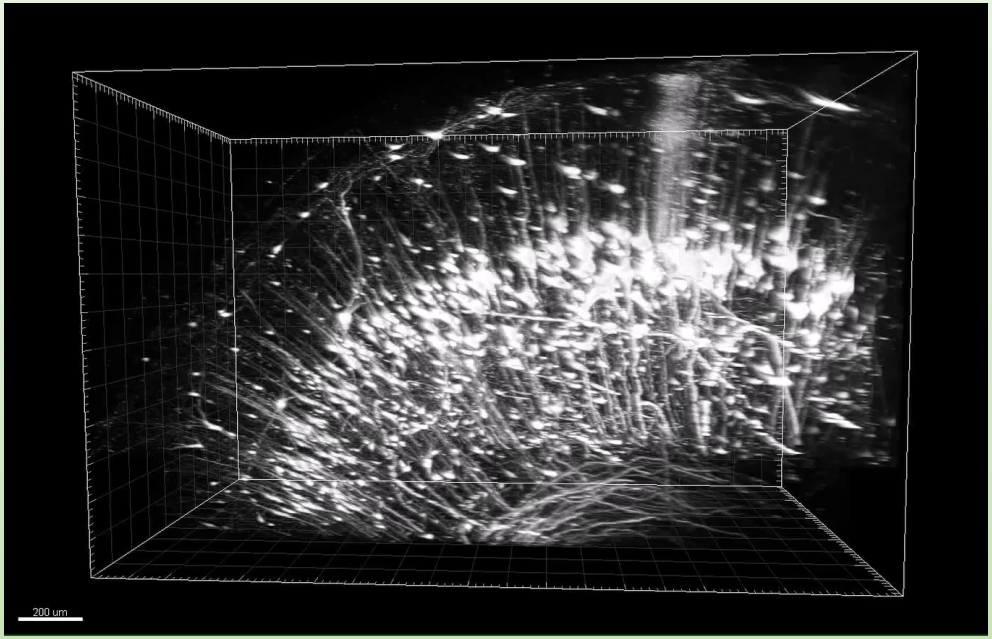

- 100% of tissue analyzed
- More accurate and complete picture of disease

*Berner, E. S. (Ed.). (2008). *Diagnostic Error: Is Overconfidence the Problem?*. Elsevier.

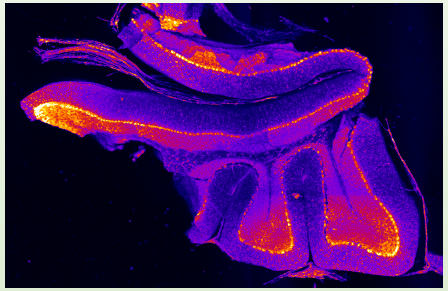
# 3D Histology – Visikol® HISTO™



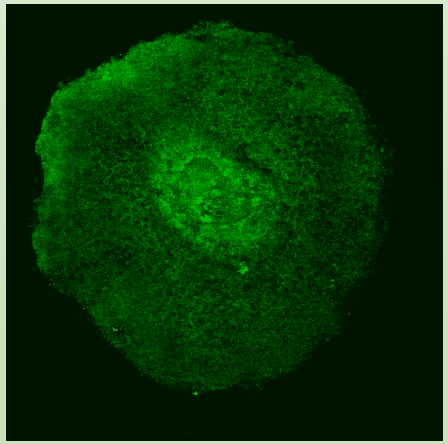
**Micro-tissue**




**Owl Brain Neurons**



**Mouse Cerebellum**



**Micro-tissue**

# 2015 – Creating a Business

By early 2015 we had figured out the following:

- Significant customer need for both of our technologies
- Large market for both of our technologies
- There were a lot of questions we needed to answer before we could commercialize these new technologies

We then started to craft a business plan to define our path forward and to get investor funding

We had the beginnings of a biotech business…

# February 24th 2016

- We secured $500,000 in VC funds and officially launched Visikol Inc
- Moved into our own lab at CCIT

# Where we are at and where we are going

300+ Visikol HISTO beta testers/customers

- Successful use with numerous tissues and labels
- 1 publication to date


Product suite of 8 Visikol HISTO reagents/kits

- Visikol HISTO clearing agents
- Visikol HISTO starter kit
- Visikol HISTO labeling buffers

3 companies pilot testing Visikol TOX

**Focused on providing researchers with more accurate and complete information from tissues and improving diagnostic imaging**

What is the purpose of getting a PhD?

A PhD is way of thinking

# Is the current paradigm for a PhD supporting this?

**Warning – gross over-generalization**

- 1-2 years of taking classes and rotating in labs
- 2 years of working on your PI's research projects
- 2 years of your PhD project

# What is this current paradigm preparing PhD's for?

# Path from Academia

! Warning – gross over-generalization !

| | Autonomy | Salary | Hours | Potential Impact | Experiences |
|---|---|---|---|---|---|
| Post –Doc in Academia | Variable | $45 to $60K | Variable | Variable | Limited |
| Job in Industry or Government | Minimal | $60 to $140K | 40-50 hrs | Low | Limited |
| Start-Up | Unlimited | Low | All of them | Huge | Unlimited |

# How do we better prepare PhD's?

1. **Exposure** – PhD's should be exposed to all options – many are limited by their PI's
    1. Seminars
    2. Co-ops
    3. Interdisciplinary projects/clubs

2. **Development Plans** – There should be a formalized process for tracking PhD development and progress
    1. Monthly 1 on 1 meetings
    2. Network building

3. **Interdisciplinary Projects** – Focus on doing work not related to ones PhD work
    1. Collaborations with different types of researchers
    2. Business case studies

# How was I able to do what I did?

1) Very supportive advisor who encouraged me to pursue many opportunities

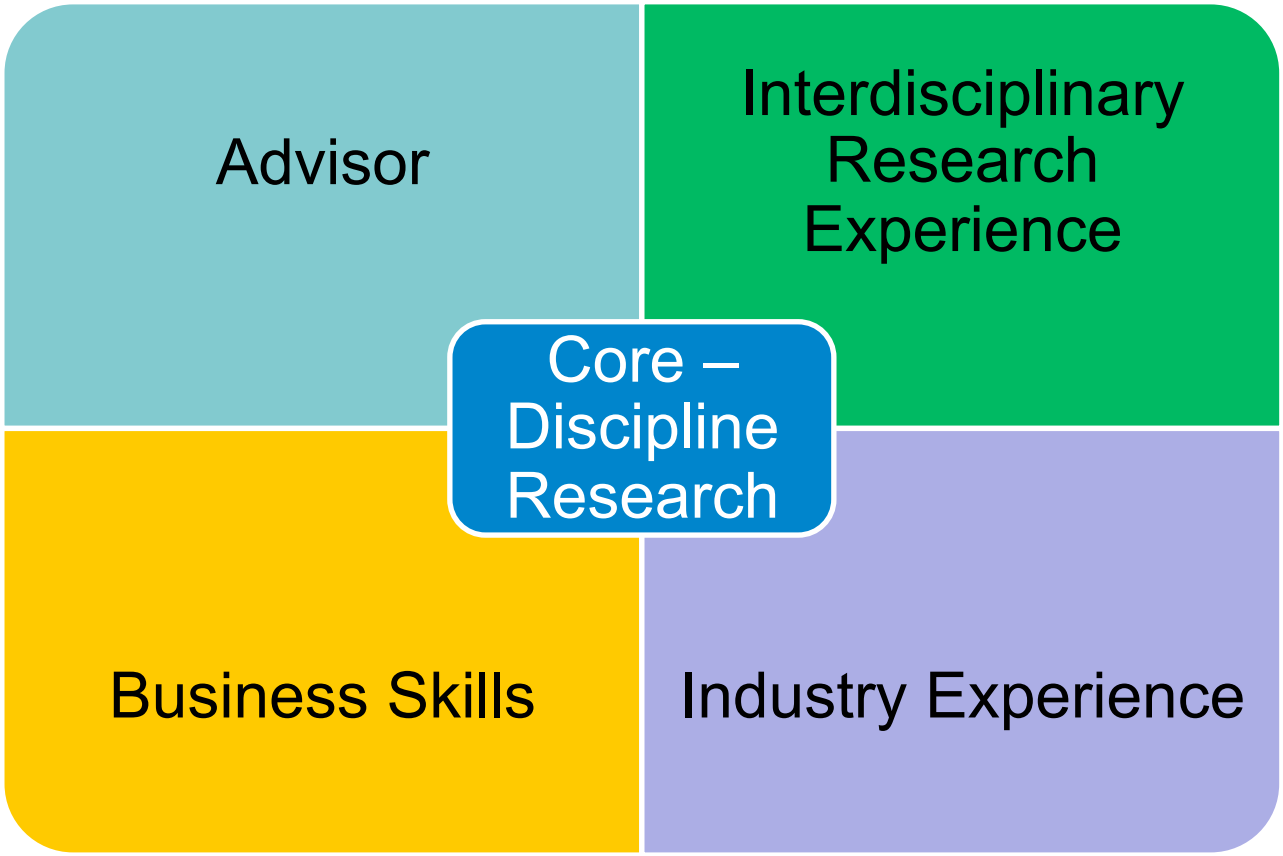
2) Developed industry skill set through experience at J&J

3) Understood business through MBS classes

4) Experience managing teams through interdisciplinary projects

5) Freedom to pursue Visikol through NSF IGERT Fellowship

# Summary – Key Components



# Thanks! – Questions?

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