

# Extremities / Unconference

## **Peter Lloyd Jones, PhD**

Assoc Dean of Design in Medicine at Jefferson

Exec Director MEDstudio @studioscientist

Co-founder Sabin + Jones [LabStudio](#)

[p.l.jones@lancaster.ac.uk](mailto:p.l.jones@lancaster.ac.uk)

[MEDstudio origin](#) film

[thestudioscientist.com](http://thestudioscientist.com)

CHEAD-UK annual conference

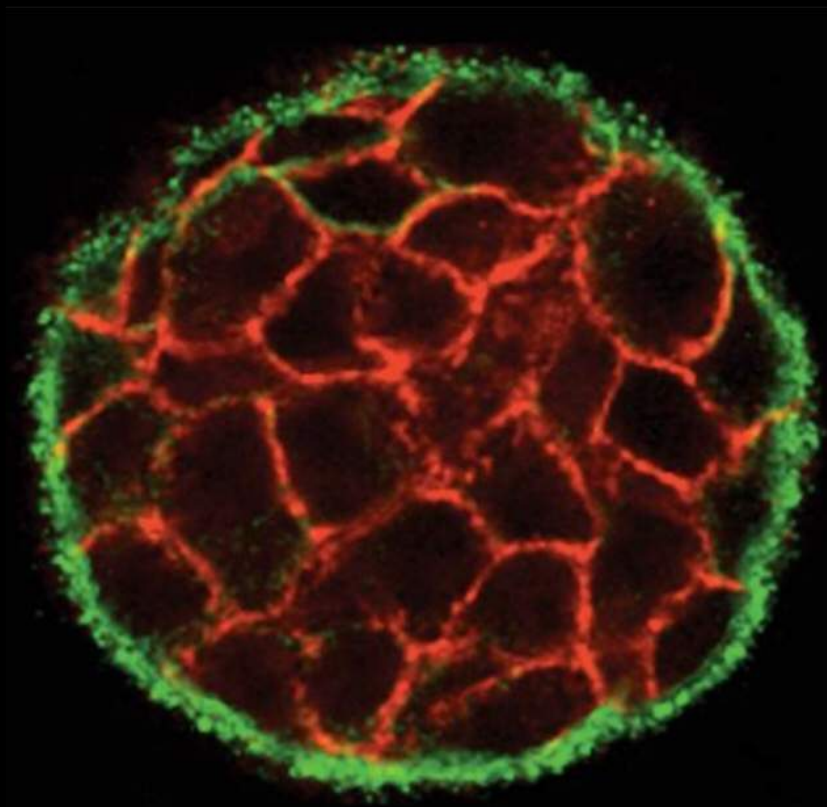
Sheffield Hallam University

March 28, 2019

# S U R V I V A L T H R O U G H D E S I G N

Human beings must be served and they are reached by design not only as ultimate consumers; in the process they must be won over as co-performers and working crew. Every step must be acceptable, understood, able and convincing, as to enlist the necessary cooperation, and the final solution must be appealing, both rationally and emotionally. It must be as comprehensive as possible to avoid manifold friction and collision, the range of individual responses must be foreseen

RICHARD NEUTRA (1954)





'About 1917, I decided that nature did not have separate, independently operating departments of physics, chemistry, biology, mathematics, ethics, etc. Nature did not call a department heads' meeting when I threw a green apple into the pond, with the department heads having to make a decision about how to handle this biological encounter with chemistry's water and the unauthorized use of the physics department's waves . . . nature probably had only one department and only one coordinate, omnirational, mensuration system'

**Buckminster Fuller**

Professor Emeritus & World Fellow in Residence for the Consortium of the University of Pennsylvania, 1972 - 1983

> 48 breaths per minute<

> Skin temperature: 37 degrees (normal)<

> Activity levels: moderate<

> Position: stable<

> Total sleep per day: 14h 15m<

> Number of daytime naps: 4<

> Number of feeds: 7<

> Average time between feeds: 2h 45m<

> Nappy changes: 8<

## **'You can track everything': the parents who digitise their babies' lives**



***Cause  
of  
Death:  
Big Data***





How experimental is this project?

# LabStudio: Methodology & Approach

Investigating **Dynamic Complex Systems**: Nonlinearity, Hierarchical Relationships

Importance of **Environmental Context**: Reciprocity, Context

## Shared Process

Filtering through and analyzing **Abundant Information**

Developing **Methodologies and Metrics** to translate from the qualitative to the quantitative

**Visualization** of data and ideas at multiple scales and media

## Shared Techniques

Using **Computation** to translate between modes of representation (e.g. visual to numerical or geometric)

Developing **Customized Digital Tools** to assist with process and automation



# LabStudio

---

home

exhibitions

Siggraph 2009

Ars Electronica

Siggraph 2008

Fiber @ F.U.E.L

Esther Klein Gallery

DHUB

research & design

special projects

personnel

news & events

publications

links

contact



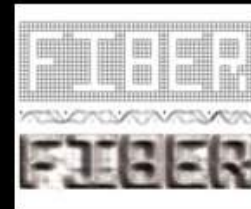
Siggraph 2009



Ars Electronica



Siggraph 2008



Fiber @ F.U.E.L



Esther Klein Gallery



DHUB

View an introductory video to **Labstudio's** work [here](#).

Peter Lloyd Jones lab, 2007

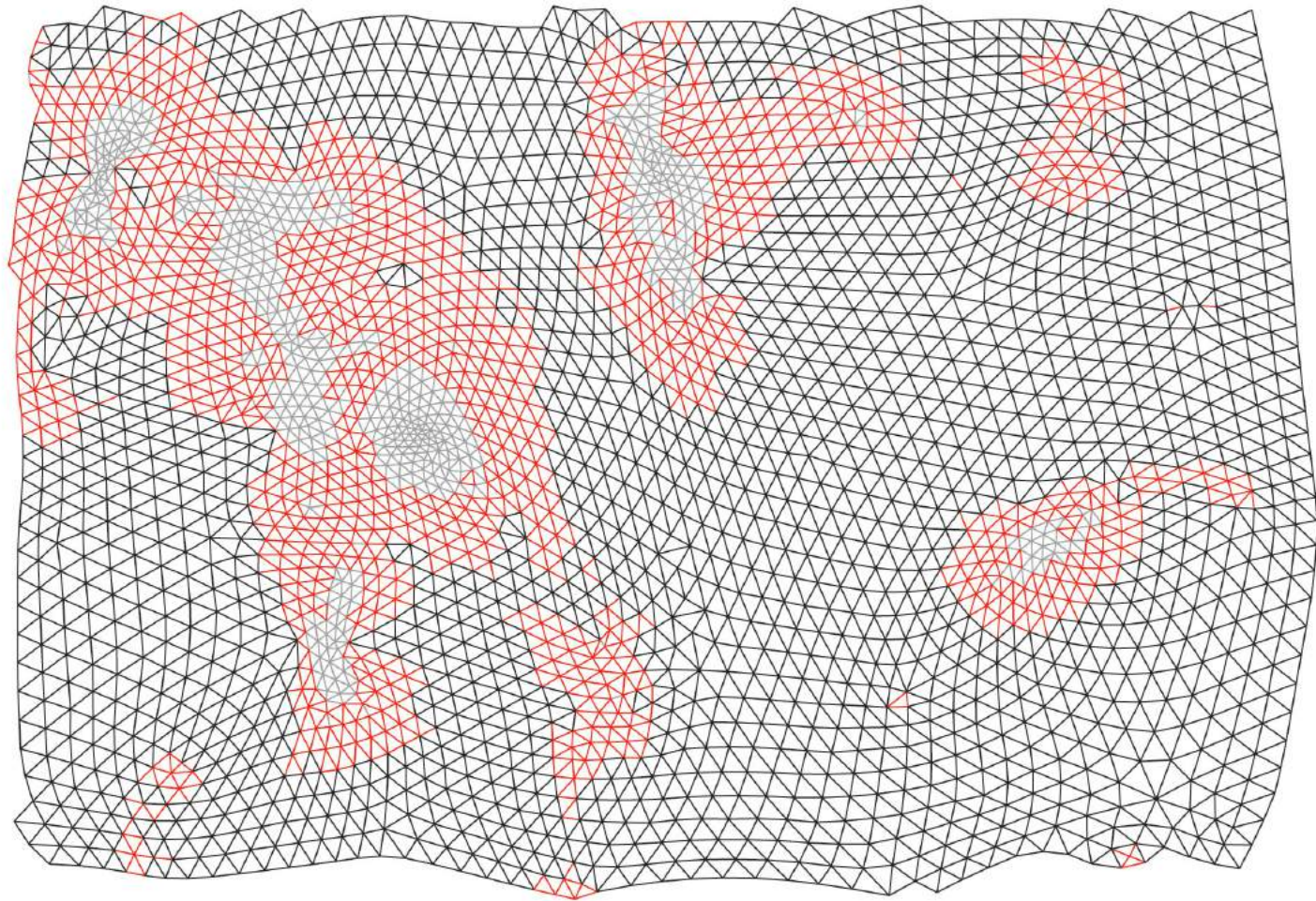


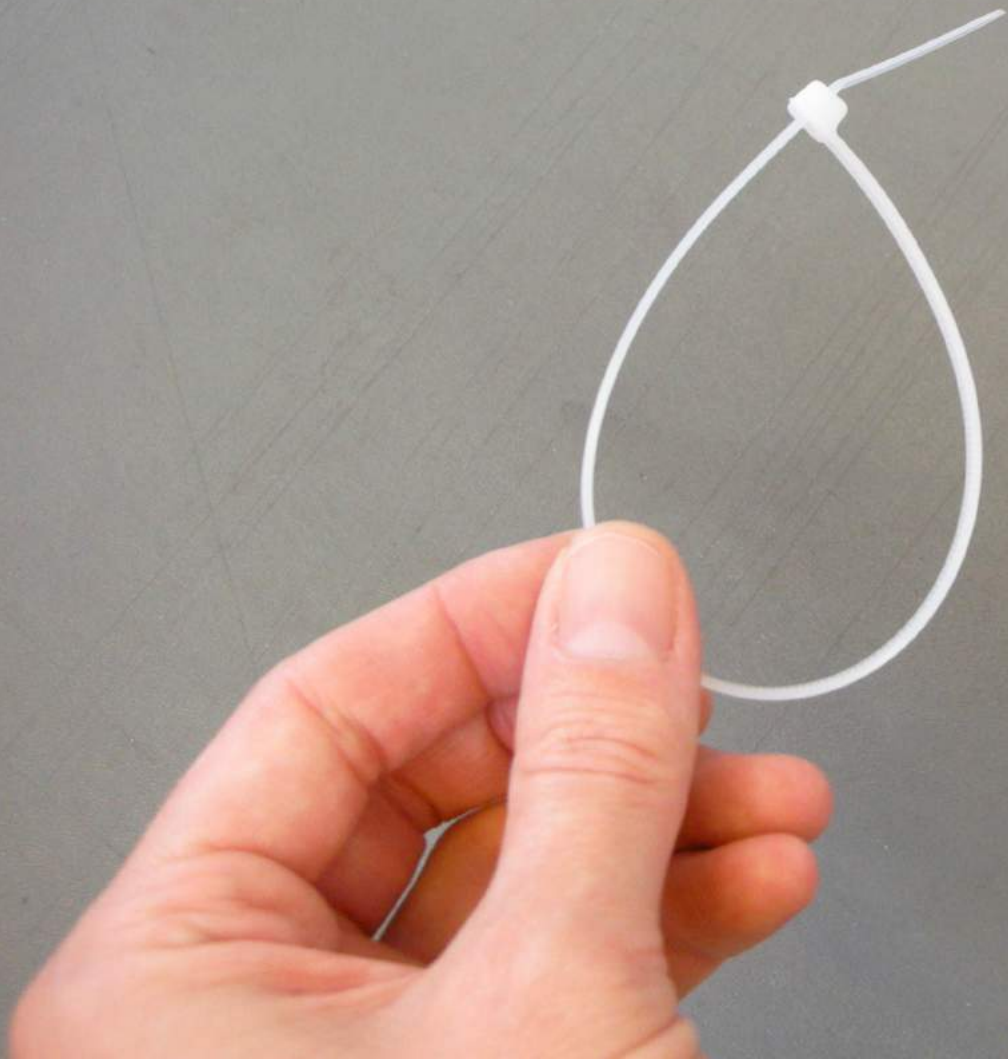
# NETWORKING



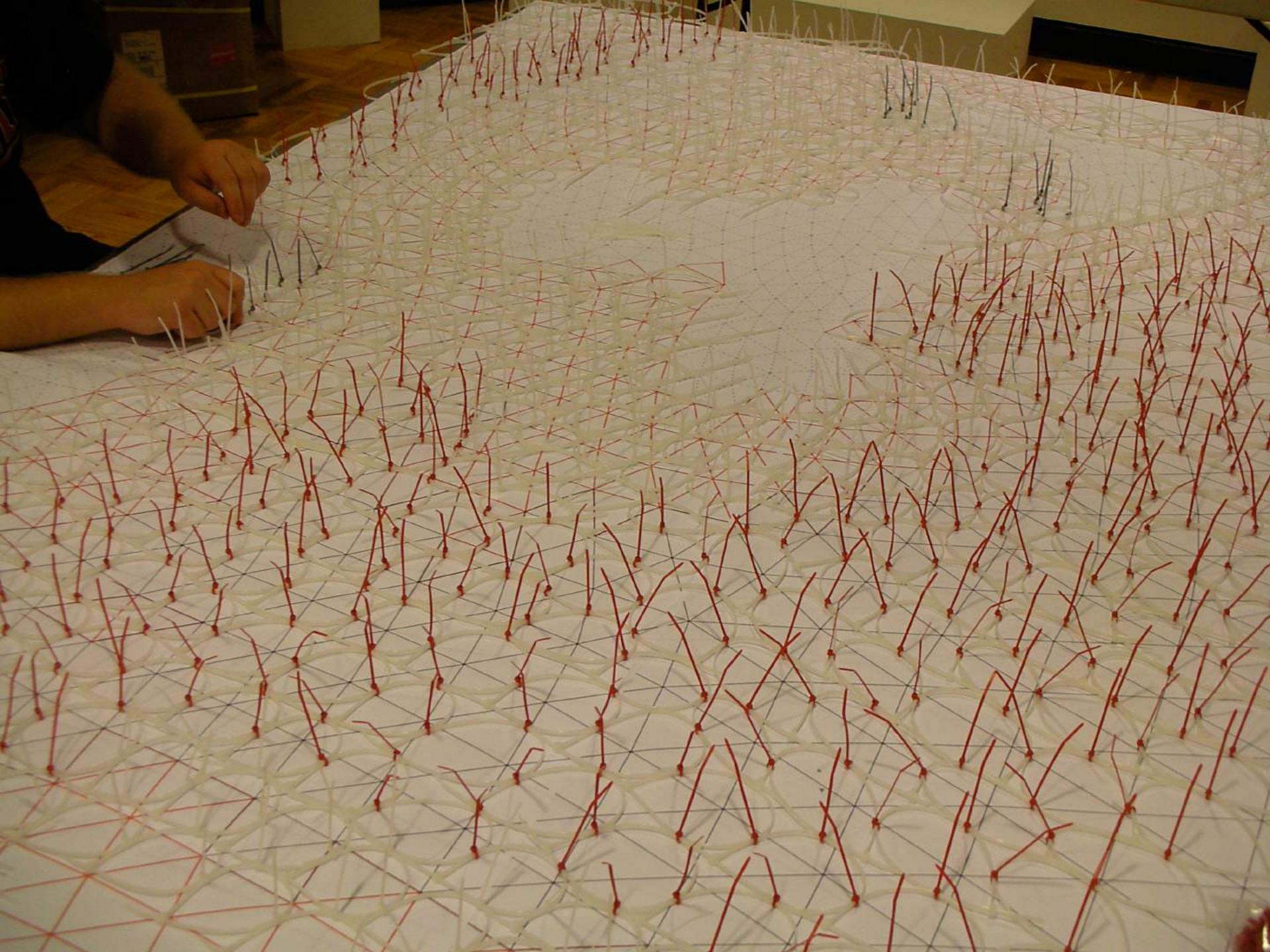
Lung Vascular Development



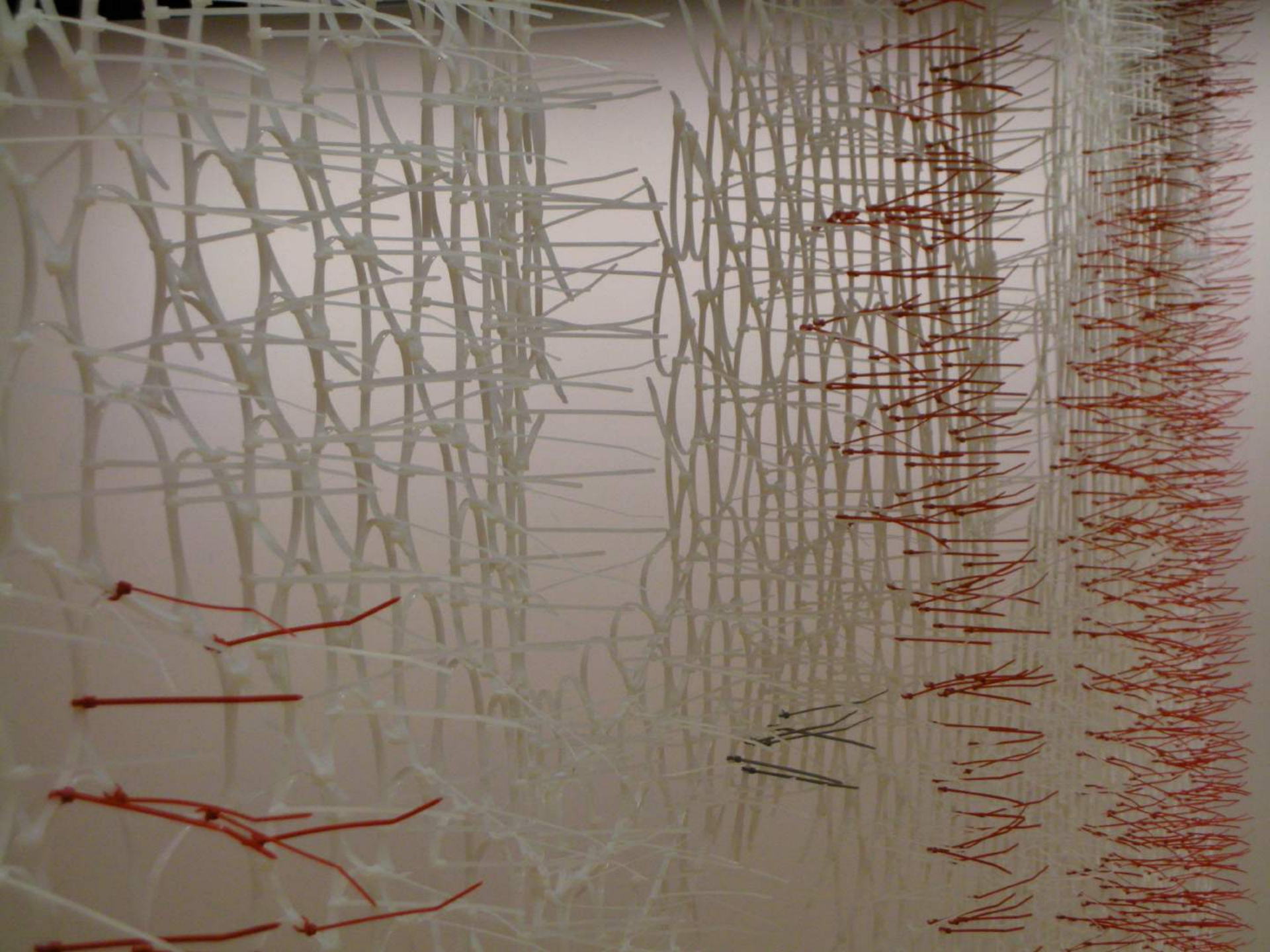


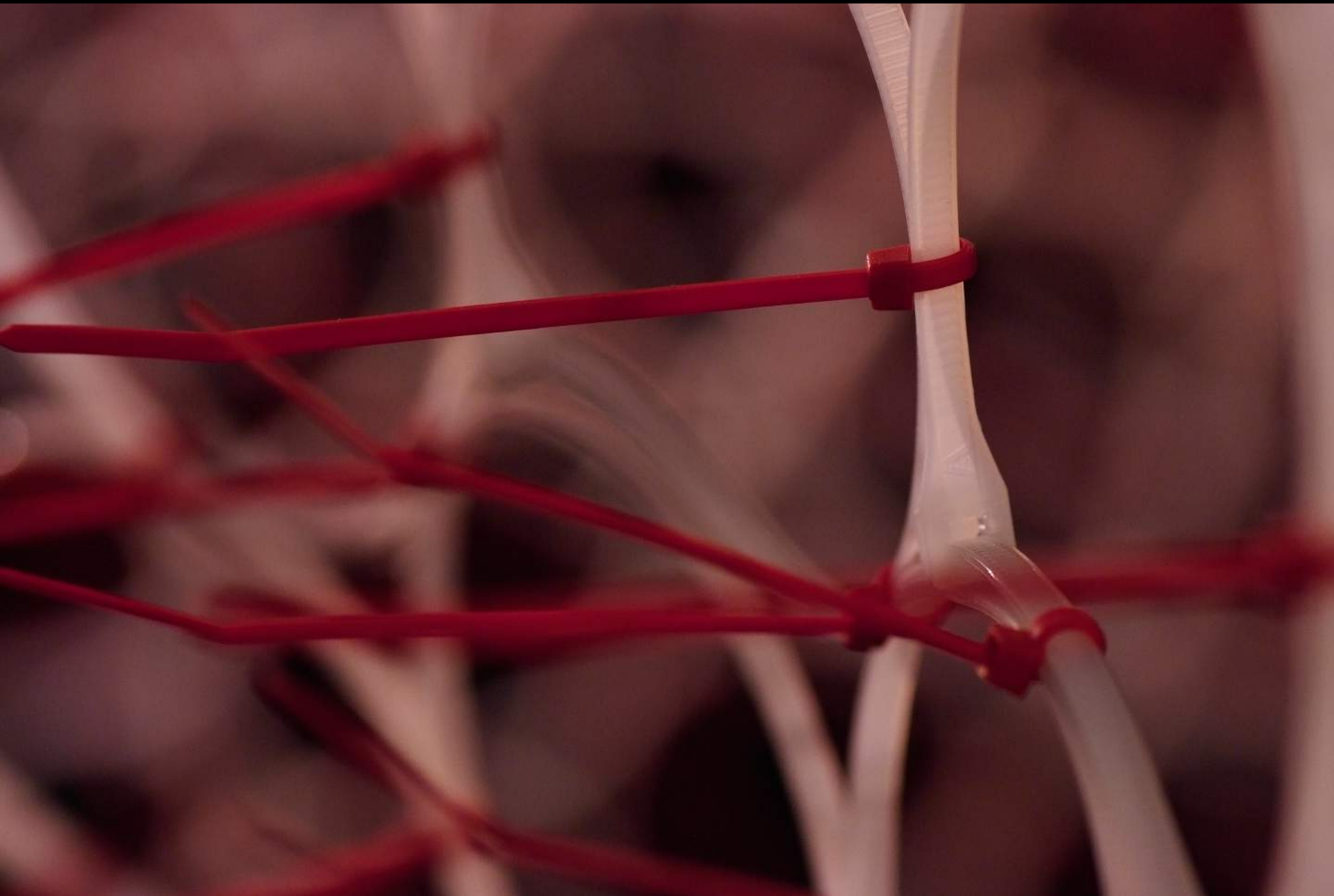










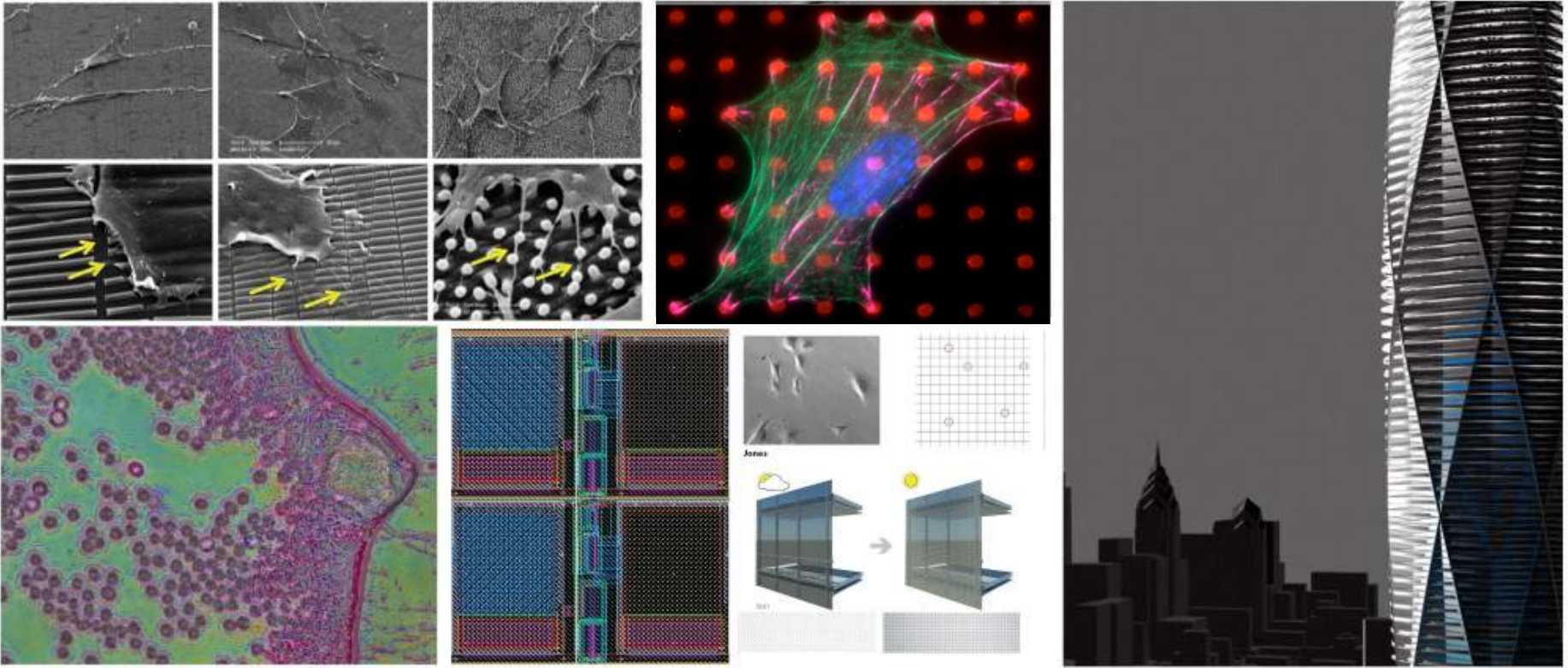






Branching Morphogenesis at Ars Electronica by Sabin+Jones LabStudio, 2009





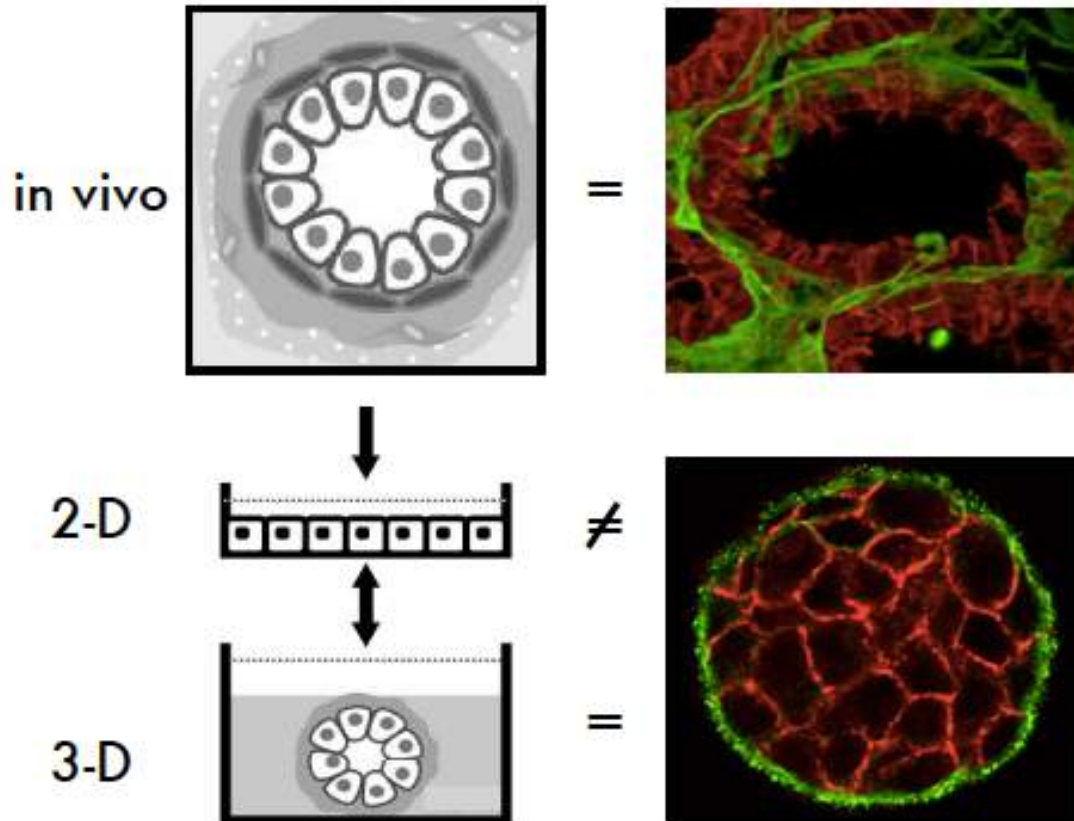
eSkin



eSKIN for the NSF by Sabin+Jones LabStudio, 2011



# 3-D Modeling of Normal Breast Morphogenesis



## Models

ELIASSON, Claes Models Are Real Survival Patterns  
 JONES, Peter Lloyd Context Messaging: Modeling Biological Form  
 BERNSTEIN, Charles Brief and Indeterminate Climpaes SHANE, David  
 Grahame Urban Lorenzetti circa 2007 BURNETT, D.  
 Graham Masters of the Universe FURJÁN, Helene  
 Cities of Complexity DESPOMMIER, Dickson Proof  
 of Concept SABIN, Jenny Body Blanket

BUCKHOUSE, James Friends and Strangers BENYAMIN, Jasmine  
 Analog Dreams SNOOKS, Roland Observations on the Algorithmic  
 Emergence of Character  
 Gerald Model Now Open  
 RUSSO, Rhett The  
 Models: The Widensitäten  
 STATES ARCHITECTS  
 Urbanism BALMOND,  
 DAVIES, Peter / RUY,  
 Catalytic Architectures: In Conversation  
 DWORKIN, Craig Hard Core/Soft  
 Focus/Middle Ground SPYROPOULOS, Theodore The Dirty Act of  
 Architecture ELGIN, Lindsay From One Many KASEMAN, Keith Working  
 Model MORE, Gregory Lines of Sight: Architecture and the Videogram  
 Model FELSEN, Martin Complex Populations SOLOMON, Joanthan D.  
 Seeing the City for the Trees MALÉ-ALEMANY, Marta Parametric  
 Constructions: An Exploration on Virtual Standardization COLOMINA,  
 Beatriz with BUCKLEY, Craig / FONTENOT, Anthony / GRAU, Urtzi /  
 HSIEH, Lisa / IMPERIALE, Alicia / KALLIPOLITI, Lydia / KAZI, Olympia  
 LOPEZ-PEREZ, Daniel / SUNWOO, Irene Models of Dissemination: The  
 Architecture of Little Magazines FENNEL, Kevin / LIU, Chia-hua  
 Requinte Ecologies KILIAN, Axel The Question of the Underlying Model  
 and Its Impact on Design DE LANDA, Manuel Possibility  
 Spaces ELLINGSEN, Eric (logos) Liao QUESTIONNAIRE  
 Models as Generative Processes RANDALL,  
 Lisa PERMETA, TOMLIN, Dana SORKIN,  
 Michael, TOMCZYK, Michael, MADE,  
 GRAAFLAND, Arie

60  
30  
90



Sabin+Jones LabStudio, 2009





Ground Substance by Sabin+Jones LabStudio, 2010



Digital Ceramics by Sabin+Jones LabStudio, 2010

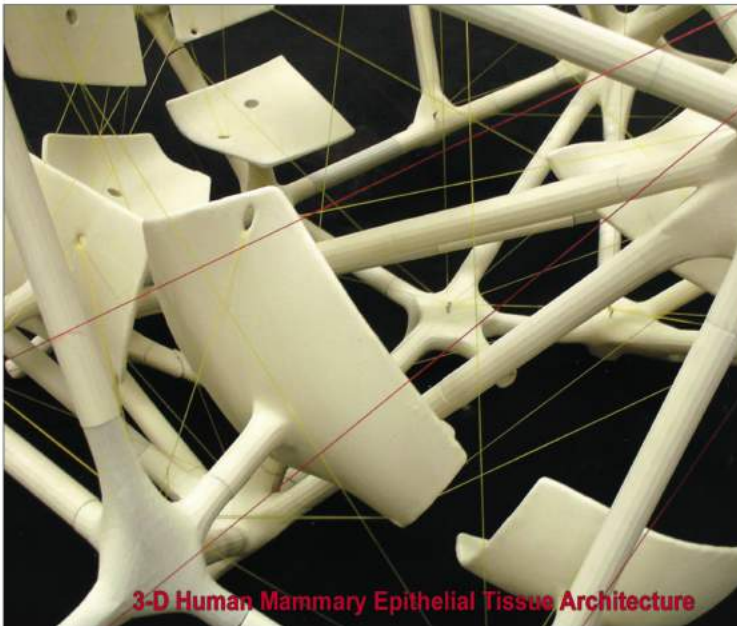


Official Journal of the American Society for Investigative Pathology

# The American Journal of **PATHOLOGY**

Cellular and Molecular Biology of Disease

ASP 2010  
Annual Meeting at  
Experimental Biology  
Life-Spanning Abstract  
Deadline: February 24, 2010



## Inside this Issue

**Review** – S100A4 and Metastasis: A Small Actor Playing Many Roles

**Commentary** – New Look at an Old Problem: Bacterial Superinfection after Influenza

*High-Resolution Ultrasound Imaging: A Novel Technique for the Noninvasive in Vivo Analysis of Endometriotic Lesion and Cyst Formation in Small Animal Models*

*Perforin-Independent Extracellular Granzyme B Activity Contributes to Abdominal Aortic Aneurysm*

February 2010 Volume 176, Number 2

[ajp.amjpathol.org](http://ajp.amjpathol.org)



Ground Substance & Branching Morphogenesis by Sabin+Jones LabStudio, 2009



# **MED**studio@JEFF

## 1st MD Design Research Center

18 SHERRY KIMMEL MEDICAL COLLEGE ALUMNI BULLETIN



### REDESIGNING **HEALTHCARE**

SKMC Program Fosters 'Out-of-the-Box'  
Approach to Medicine

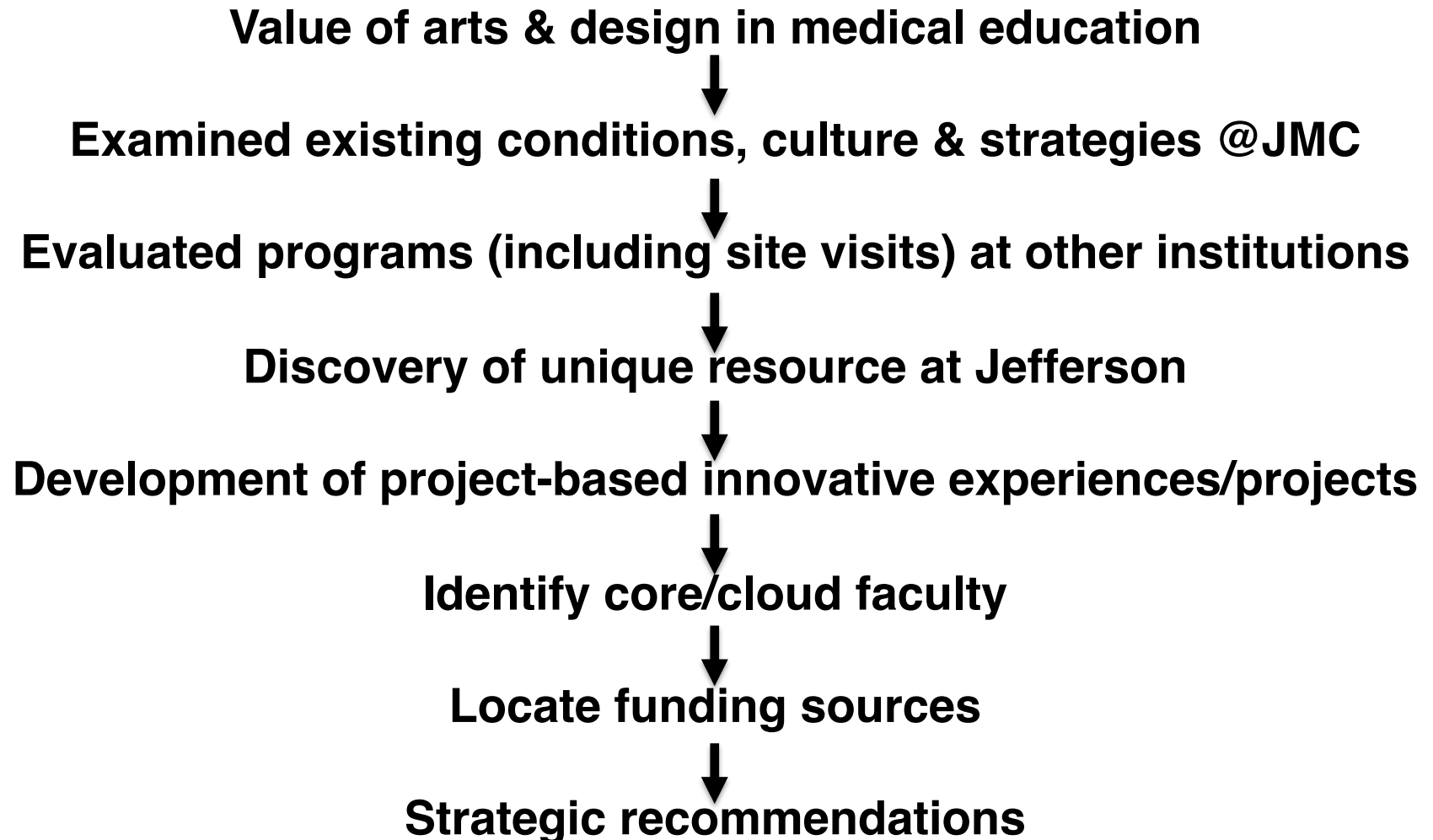
**Rooted in Extreme Collaborations @Labstudio.org**

**Non-traditional recruitment & training of MDs**

Exec Dir Peter Lloyd Jones, 2013-present

# Study timeline

CwiC-MEDs Program @Jefferson



# Reasons CwiC-MEDs Program @Jefferson

- **Poor Doctor-Patient Relationship:** Lack of communication
- **Decreased Patient Satisfaction**
- **Physician Burnout:** Emotional exhaustion  
De-personalization of patient  
Low sense of accomplishment  
Occurs in ~60% physicians &  
~50% 3<sup>rd</sup> year medical students

***Collectively, these & other factors lead to lack of patient care and loss of empathy***

# Other factors affecting empathy

CwiC-MEDs Program @Jefferson

**Time & financial pressures:** Divide between bureaucracy/ administrative duties versus attending to patient suffering

**Causes:** Managed care, high patient volume, diminished salaries, long work hours, personal financial pressure

**Clinical outcome:** Poor continuity of care, over-specialization, diminished status of 1° care doctors, emphasis on labs & tests

# Obstacles

CwiC-MEDs Program @Jefferson

- ***“Not at medical school to study other subjects”***
- ***“Find courses heavy-handed & condescending”***
- ***“Consider humanities to be soft & under-challenging”***
- ***“Don’t have sufficient structured time to study medical humanities”***



# Creating a unique program

## MEDstudio CwiC-MEDs Program @Jefferson

- **Innovation Space & Program** Applies Design thinking to promote Contextual, Critical & Creative Thinking

Dynamic **Post-Flexner Model** that teaches students to respond to patients' needs & rapid advances in **Digital Technologies & Design**

- Way of seeing the world that is **Humanistic, Holistic, Trans-disciplinary & Inspiring**

Rooted in Hands-On **Project-Based Experiences**

- **New Way** of seeing the world of **Medical Education, Research & Teaching** by harnessing the world-class resources at Jeff & our neighboring creative communities & institutions

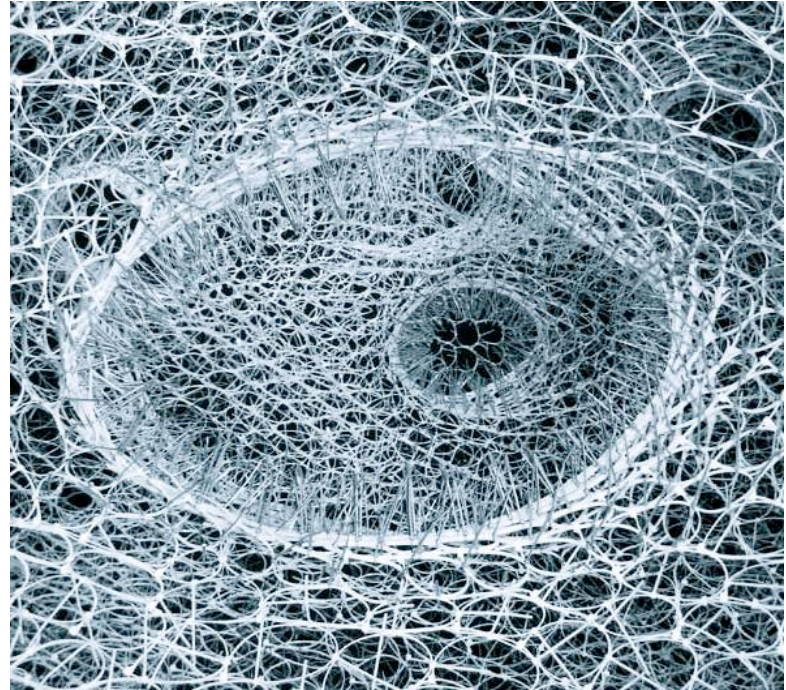
# Criteria for building a unique program at Jefferson

CwiC-MEDs Program @Jefferson

- **Academically serious**
- **Required**
- **Longitudinal**
- **Dedicated faculty**
- **Relevant to Medicine**
- **Project-based learning**

## Institutionally-validated

- **Awards/fellowships**
- **Degree accreditation**
- **Independent scholarship**
- **CwiC**



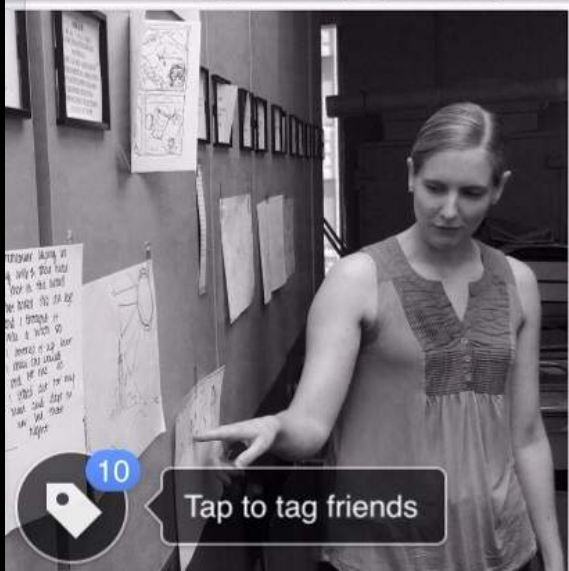
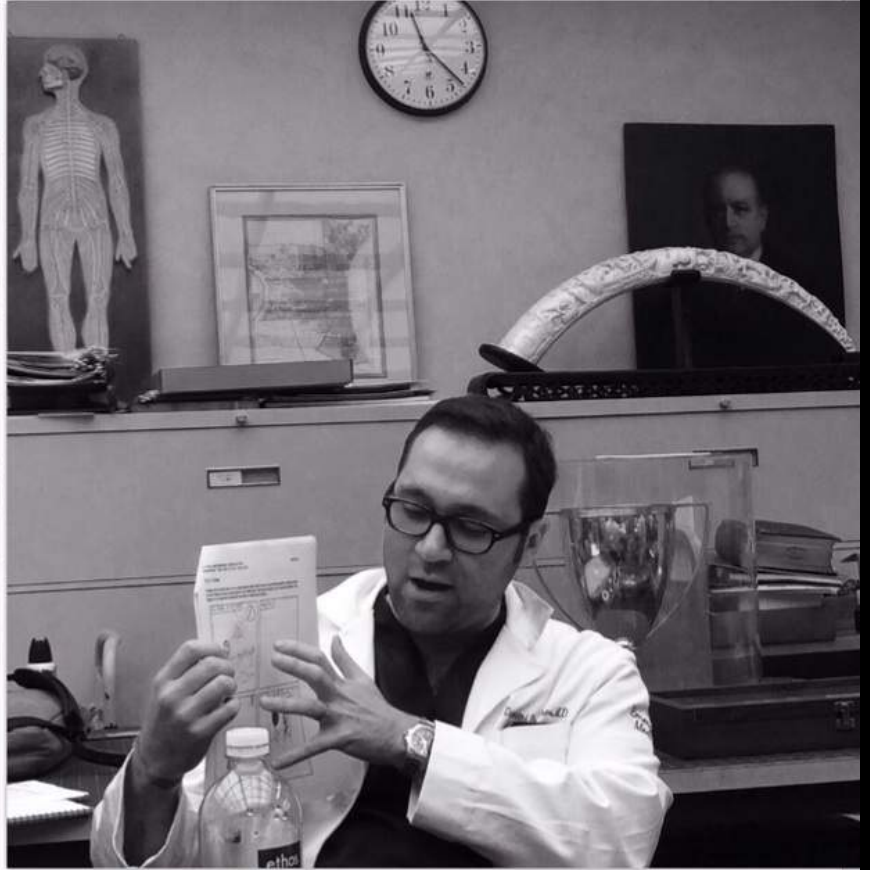


medstudioatjeff

🕒 30w









Pre-triage vs. Post-triage waiting ER

Misinformation

Patients don't understand  
don't understand pre-op instructions

"hierarchy of process"

Disjointed EMR

Attending/student relationship  
MINIMAL CONNECTION  
student-st

Online System  
Abstract

"What is going on?"

Lack of explain of process

"Why are you asking me the same questions?"  
"Who are you?"



DOWN  
MISTAKE

hospital (b...)







POST.CODE // Powers of Ten, Jones et al 2017





MEDstudio@JEFF's Graphic Medicine

## Chalkboard Chronicles + Hunger in Philadelphia

---

**An Apple a Day by Tom Judd launches MEDstudio@JEFF's GRAPHIC MEDICINE program at DesignPhiladelphia 2017 in support of Philabundance and Mural Arts Philadelphia's Porch Light program.**

Every day, artist Tom Judd will add his depiction of hunger to this chalkboard mural. Through collaboration with MEDstudio@JEFF, Mural Arts Philadelphia and Philabundance, Judd will create a mural that highlights this severe problem that affects the health of many Philadelphians, across all demographics.

MEDstudio@JEFF's Graphic Medicine program explores how visual narratives can communicate complex ideas among health care professionals, patients and the community. This practice transcends language barriers and other obstacles to build empathy and communication between all. This installment of Graphic Medicine investigated the way public mural-making can help us understand hunger in the Delaware Valley, a problem that affects so many yet remains largely invisible and misunderstood.

MEDstudio@JEFF is grateful for the support of the Jefferson University Office of the Provost.

**Help hungry people in our region by supporting Philabundance — just FOOD to \$1000 to donate \$10.**





[◀ PREV ARTICLE](#) | [THIS ISSUE](#) | [NEXT ARTICLE ▶](#)

[WEB EXCLUSIVES](#) | 17 APRIL 2018

## Annals Graphic Medicine - An Apple a Day **FREE**

*Michael Koerner, MS; Eliza Fredette, MS; Trudy A. Watt, MArch; Peter Lloyd Jones, PhD*

[Article, Author, and Disclosure Information](#)

**Full Article**

**Audio/Video**

**Comments**



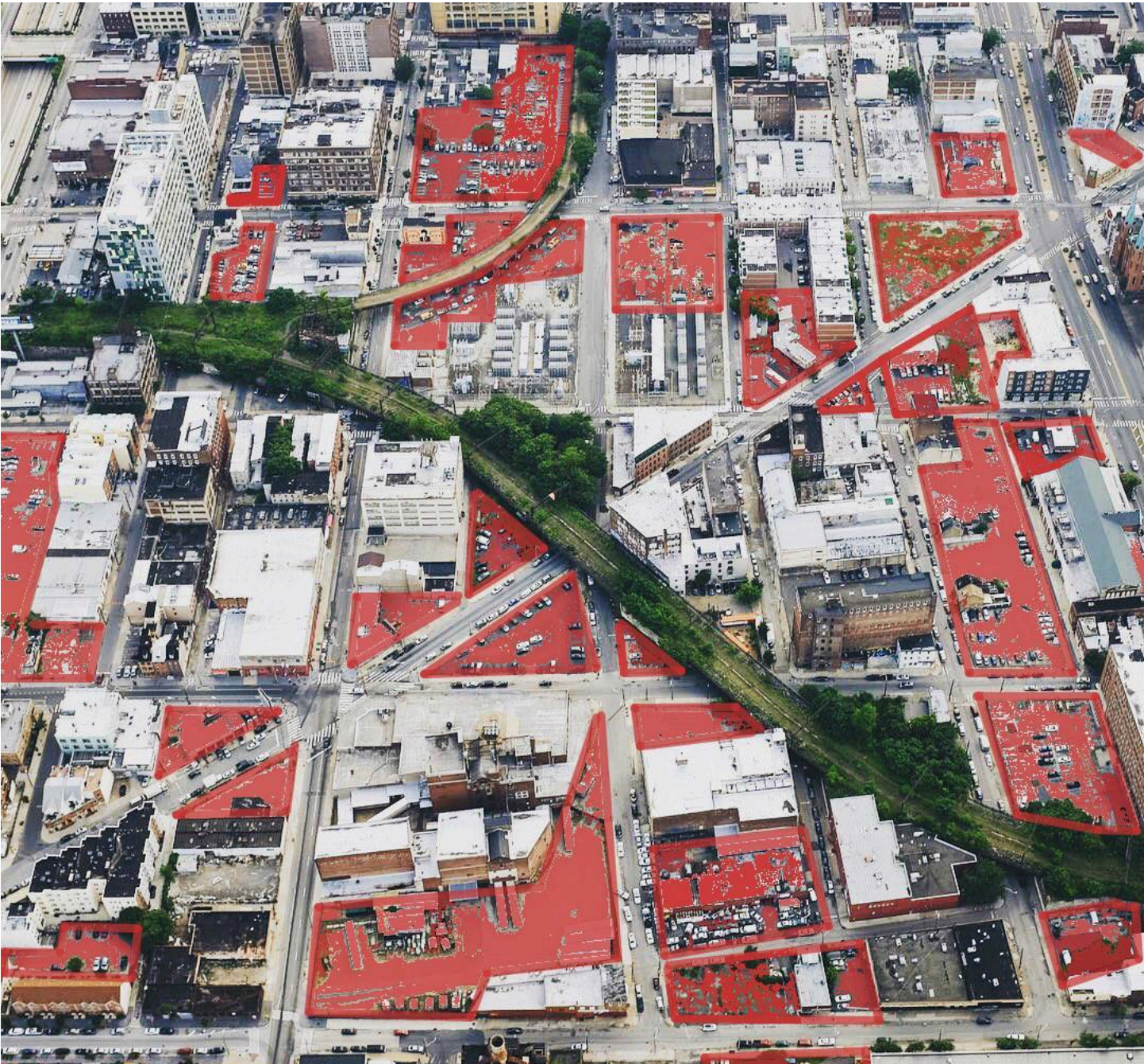
MORE ▾

### Annals Graphic Medicine - An Apple a Day (1:40)

This short, compelling video graphically illustrates the enormity of the problem of food insecurity.









# MEDstudio@JEFF

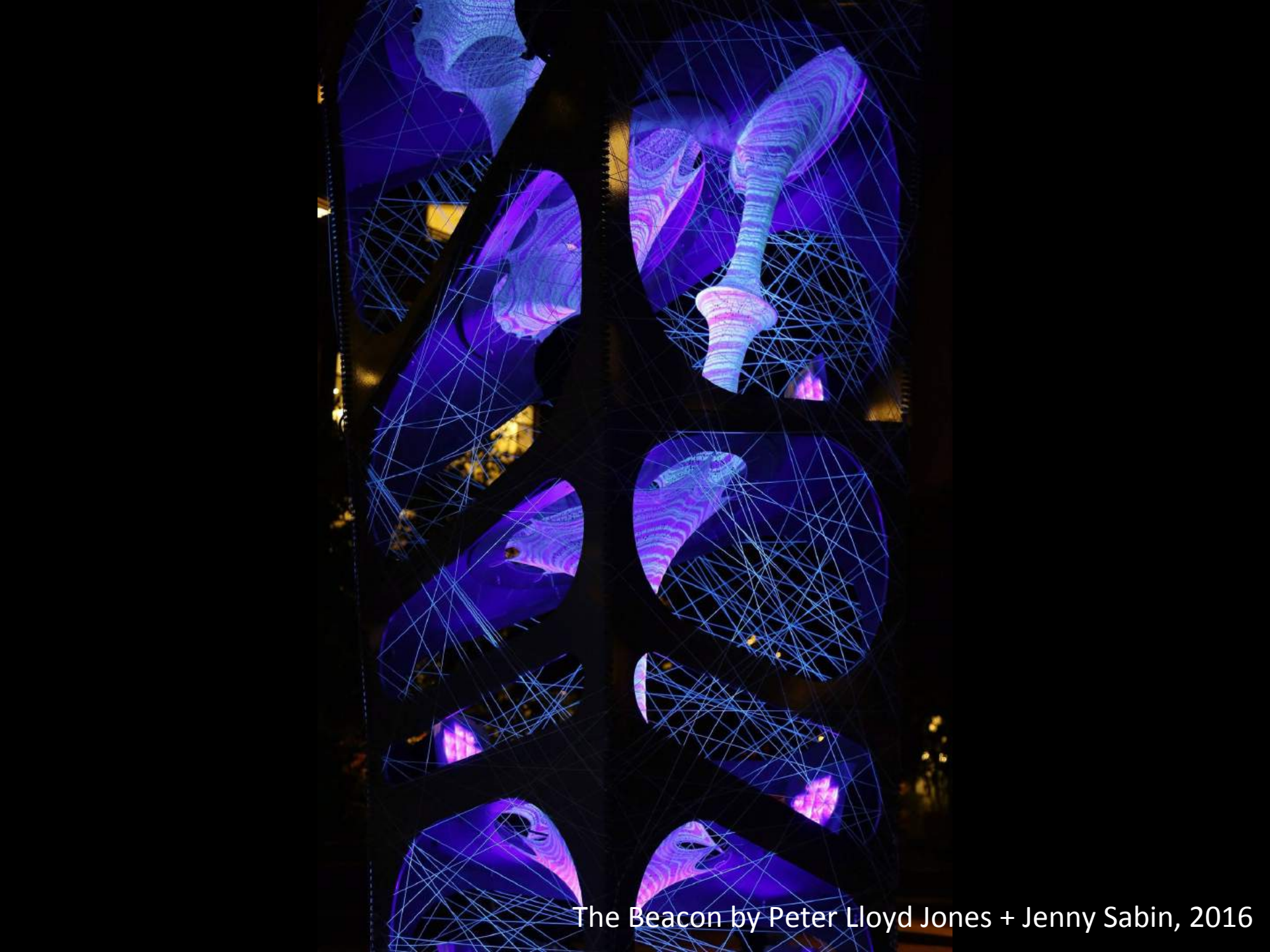
Design of Health + Human Dignity

Proud sponsor of the  
2017 Better Philadelphia  
Challenge and  
Edmund N. Bacon Awards  
honoring Theaster Gates



Photo by Cory Popp. The BEACON for Health + Wellness Futures for The Rail Park by MEDstudio and Jenny Sabin Studio @DesignPhiladelphia 2016





The Beacon by Peter Lloyd Jones + Jenny Sabin, 2016



Jenny Sabin @MOMA PS!







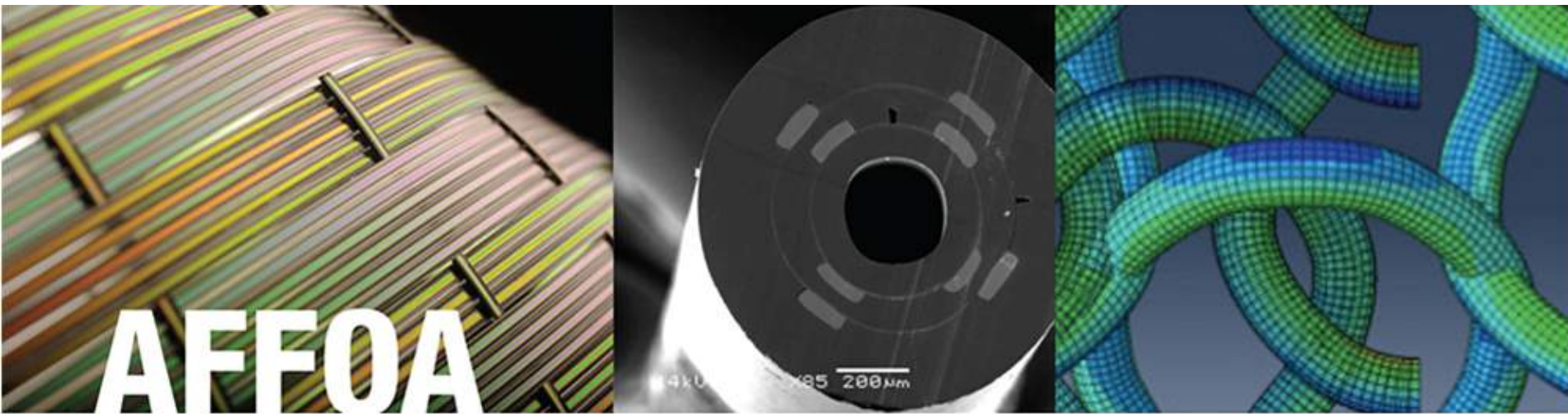


Peter Lloyd Jones + Genevieve Dion (designer + business partner):  
Perm collection at V&A



# MEDstudio at AFFOA

Co-develop & expand prototyping, clinical testing & use of textile-based prescriptive devices in broad populations, with emphasis on highly personalized approach to design & treatment



## AFFOA ADVANCED FUNCTIONAL FABRICS OF AMERICA

Revolutionary Fibers & Textiles Manufacturing Innovation Institute (RFT-MII)

**Target Areas** with Drexel (Dion): Neuromedicine (Bell), Patient safety (Miller) & Responsive Architectures (Carr)



# Operationalizing the FIN





*LabStudio: Design Research between Architecture and Biology* introduces the concept of the research design laboratory in which funded research and trans-disciplinary participants achieve radical advances in science, design, and applied architectural practice. The book demonstrates to natural scientists and architects alike new approaches to more traditional design studio and hypothesis-led research that are complementary, iterative, experimental, and reciprocal. These originate from studying 3-D tissue architecture in biology and generative design in architecture, creating philosophies and practices that are high-risk, nonlinear, and both hypothesis- and design-driven for often surprising results.

Authors Jenny E. Sabin, an architectural designer, and Peter Lloyd Jones, a spatial biologist, present case studies, prototypes, and exercises from their practice, *LabStudio*, illustrating in hundreds of color images a new model for seemingly unrelated, open-ended, data-, systems- and technology-driven methods that you can adopt for incredible results.

Jenny E. Sabin is an architectural designer whose work is at the forefront of a new direction for twenty-first-century architectural practice—one that investigates the intersections of architecture and science, and applies insights and theories from biology, emerging technologies, materials science, physics, fiber science, electrical and systems engineering, and mathematics to the design of adaptive material structures and spatial interventions.

Peter Lloyd Jones is a scientist, whose work in 3-D architectural biology has uncovered fundamental mechanisms in embryonic development and human disease. Jones's post-disciplinary research actively seeks and finds new solutions to complex problems in medicine and design by forging extreme collaborations between seemingly unrelated fields, including stem cell biology, biocomputation, fashion, smart textiles, aerospace, and architecture.

ARCHITECTURE / BIOLOGY / DESIGN RESEARCH

Cover image: Jenny E. Sabin

 **Routledge**  
Taylor & Francis Group  
[www.routledge.com](http://www.routledge.com)

Routledge titles are available as a Book online in a range of digital formats



 **ROUTLEDGE**

**LabStudio**

Jenny E. Sabin and Peter Lloyd Jones

# LabStudio

## Design Research between Architecture and Biology

Jenny E. Sabin and  
Peter Lloyd Jones

 **ROUTLEDGE**



# The Lancaster Care Charter

1 We propose to call the first condition "**Care of Complexity**"—to design-with-care being sensitive and responsive to the boundaries between human, post-human and non-human (i.e. artefacts, animals, nature), of momentary, local, global, virtual, temporal contexts, and the importance of valuing both the commonality and diversity in post-global, post-national, and post-individual contexts. In the environment of our digital society, productive and technological logics co-exist and balance, becoming second-nature. Through these reflections we perceive care as a new horizon to design.

2 The second condition is "**Care of the Project**." To design-with-care acknowledging that in the usage of the natural or artificial, a person enters a highly complex network of relationships with the material and immaterial; vice versa, through being used by a human, a non-human entity enters and embodies the complex network of relationships. This complex network of relationship has a positive value, it is a benefit to be developed, and not to be reduced or neglected. Society today has to face the challenge of breaking the dichotomy between human and non-human worlds, and build the multiple interfaces in between. To achieve this result, design must shift its existing paradigm and lead such a kind of fundamental shift in other disciplines. Design will have to renew itself into a meta-discipline by designing-with-care and

3 The third condition is "**Care of Relations**," which to design-with-care asserts that today we must repair, instead of cutting off, the relationship between people, things, environments, and ecology, not only to maintain a good balance, but also to emphasize the interdependence between these entities. The processes involved in industrial robotics development and the proliferation of the digital revolution are redefining extant labour and work/home location patterns. Huge swathes of the global population are changing from jobs with a fixed location towards a fluidity of home/work, identity and nationality that challenge our preconceptions of nationhood. Robotization, digitalization, and data-ization might relieve the need to care at intra-personal, interpersonal, and interdependent relational levels. But if we care-for-design what idiosyncratic qualities might grow out of the space...