



Dr. Gregory Weiss, Co-Founder

Dr. Reg Penner, Co-Founder

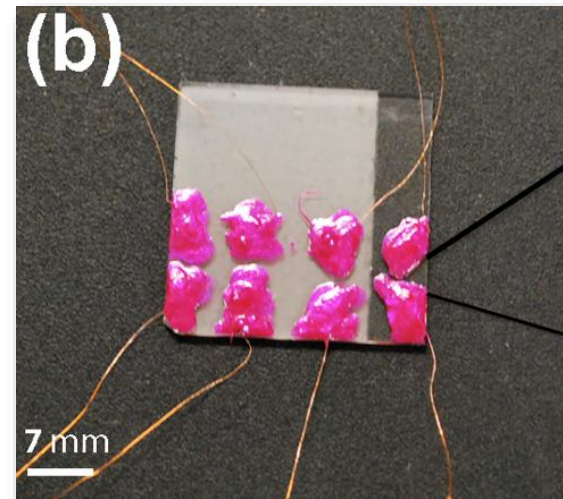
Reuben Richards, CEO (rrichards@phagotech.com)

PhageTech's Vision

Create effective, inexpensive, point-of-care diagnostics to disrupt and improve healthcare and patient outcomes using phage-based detection of diseases



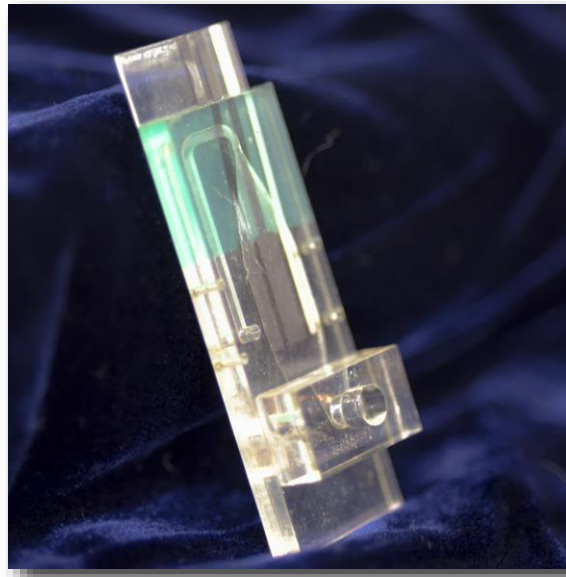
Transistor, 1950 @ Bell Labs



Phage sensor, 2006 @ UCI

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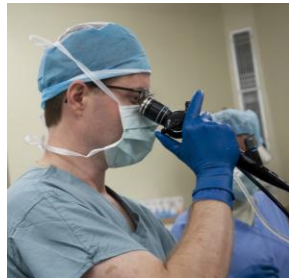


Phage sensor, 2017 @ PhageTech, Inc.

Disrupting Immunodiagnostics

Current Immunodiagnostics

- Late, slow, expensive
 - Tests ordered as a result of, and often testing for, the appearance of physical symptoms
 - Physical or macro level symptoms
 - Invasive
 - Fluid is collected, sent to a 3rd party lab, results take days
 - Antibody-based – long testing time and often requires refrigeration



PhageTech Vision

- Early detection, fast, low cost
 - Tests ordered as a screening tool
 - Molecular level detection
 - Non-invasive sample collection
 - Immediate results at the point of care
 - Bacteriophage-based – dry, enables portability and shelf stability of the device

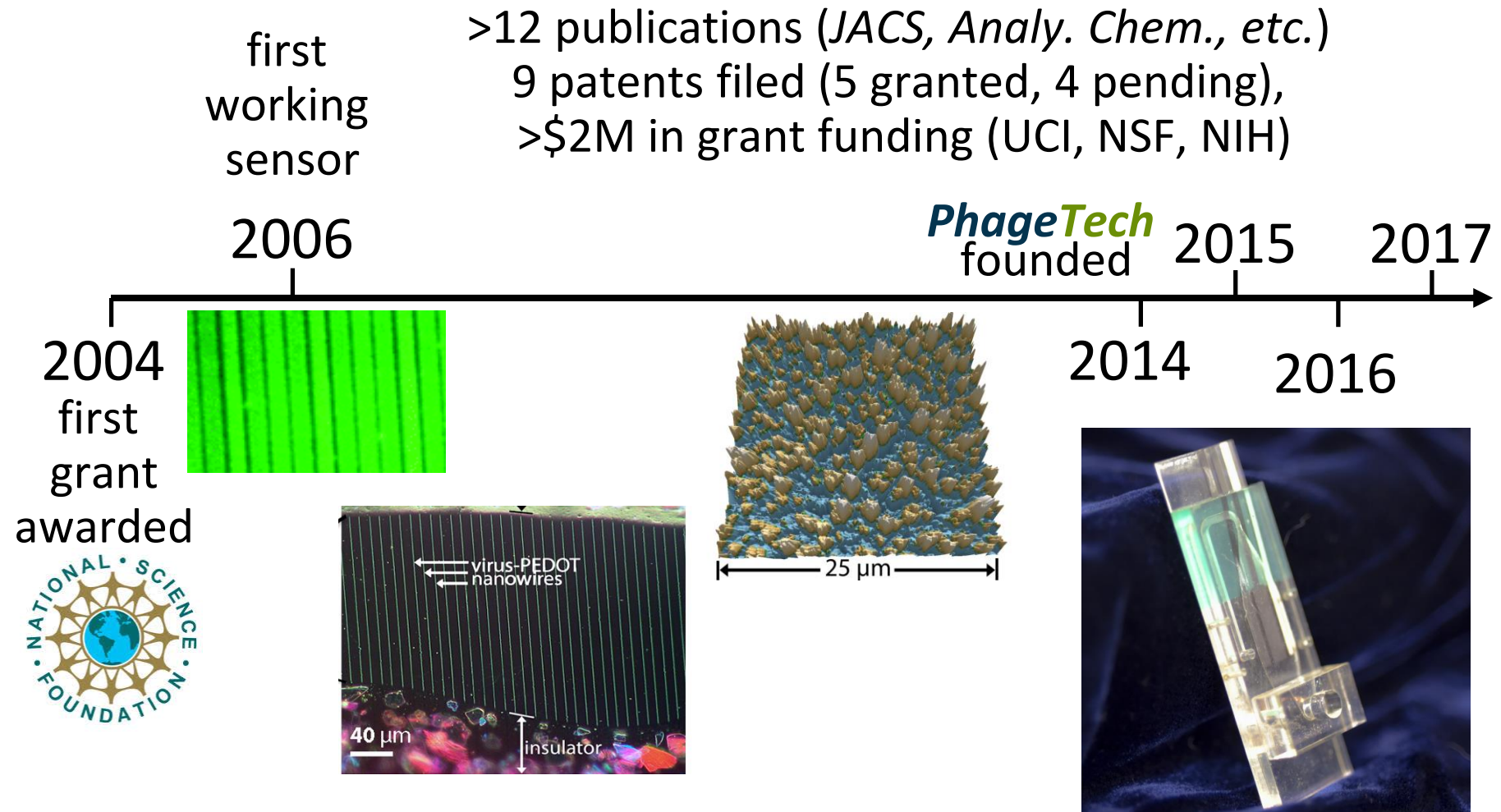


Current diagnostics based on antibodies

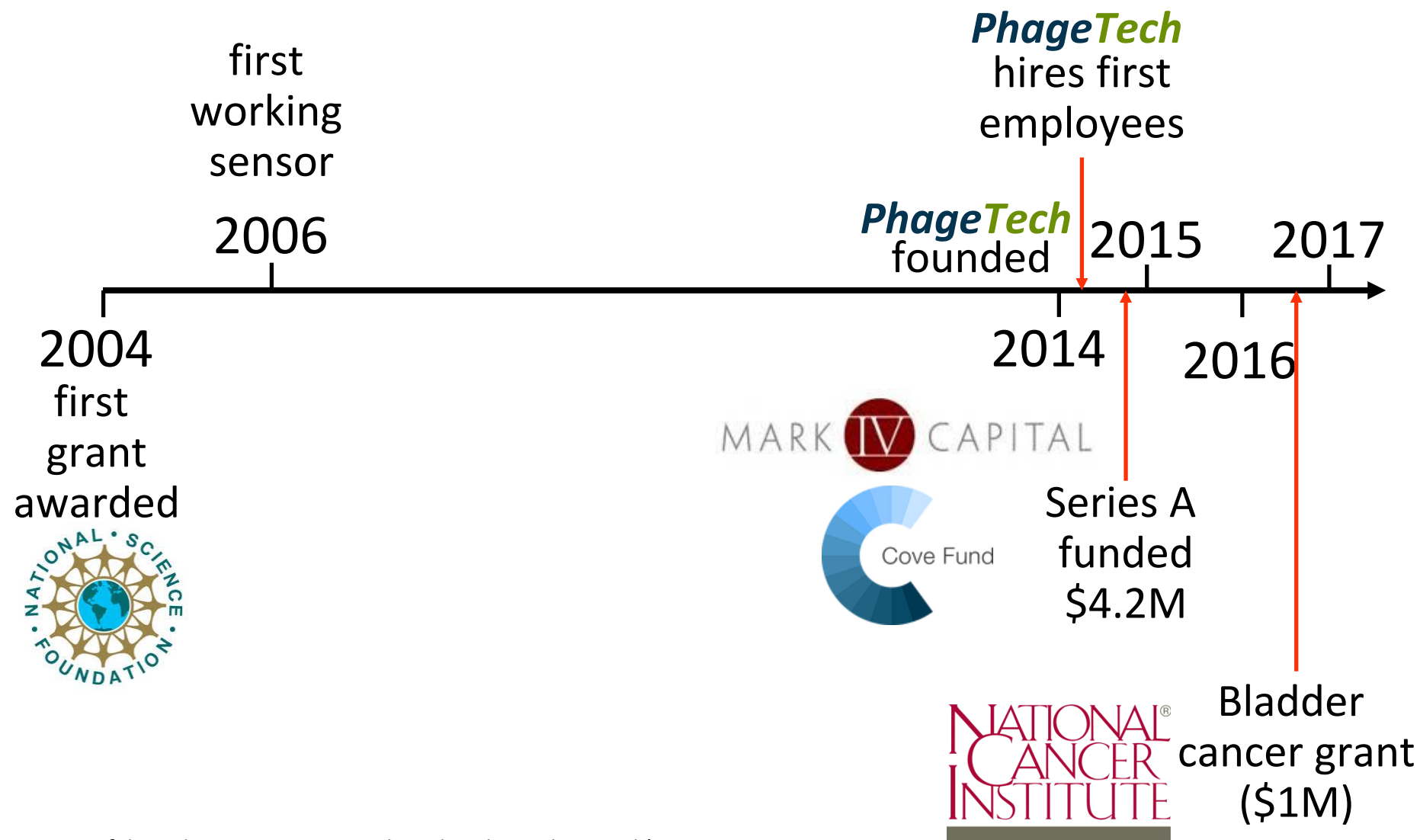
- Pitfalls of antibodies
 - Costs
 - Typically require refrigeration
 - Long development times
 - Difficult scaling
 - Lots of existing IP



Our History



Our History

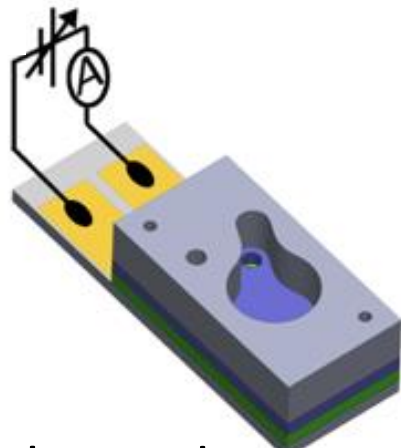


Goals Identified 2 Years Ago

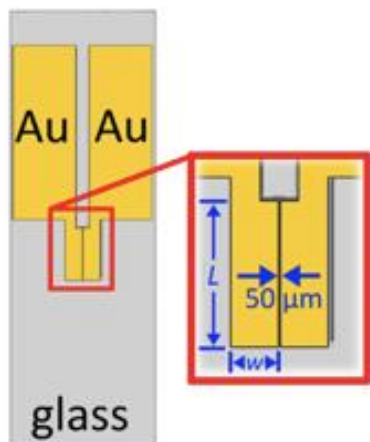
1. Prepare phage @ large scale with low batch-to-batch variability by statistical measurements
2. Low sensor to sensor variability
3. Dry storage of sensors
4. Measurements in urine
5. Address interfering substances found in urine

Our biosensor

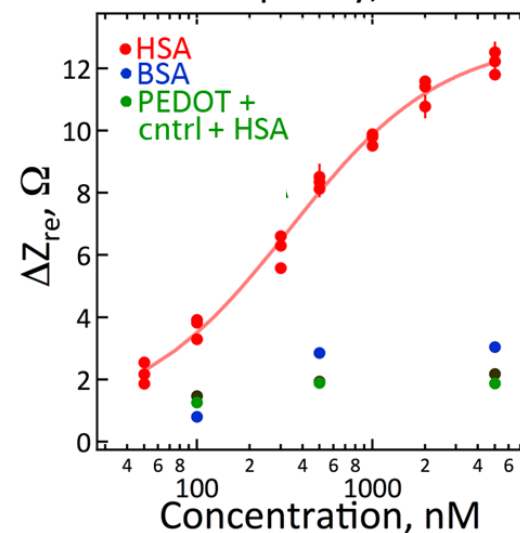
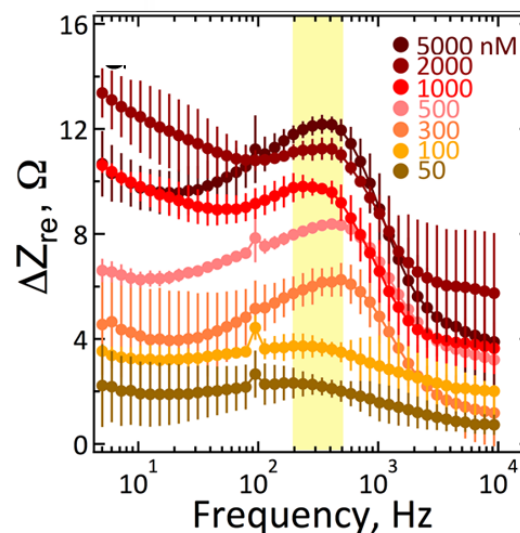
Biosensor in flow cell



Two electrode transducer



HSA detection with 21 sensors



Ogata, et al. *Analytical Chemistry*, 89 (2), pp 1373-1381. 2017.

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PhageTech Employees



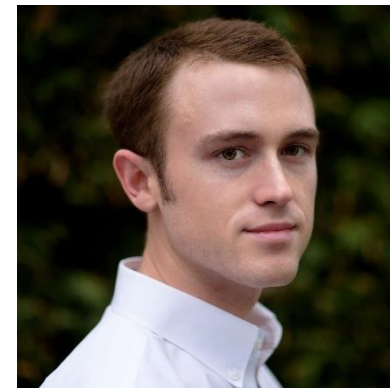
Reuben Richards, CEO,
Board Member



Phillip Tam, Ph.D.,
Senior Research
Scientist



Marie True,
Research Scientist



Jeffrey Briggs,
Research Associate



Kosuke Seki,
Research Associate

Members of the Board



Reuben Richards, CEO
Board Member



Paul Cate,
Board Chairman



Jack Van Berkel,
Board Member



Rich Henson, Board Member
Co-Founder



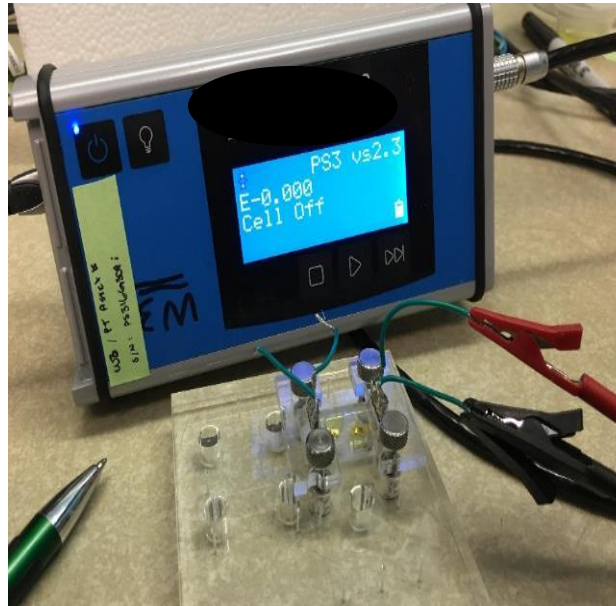
Gregory Weiss, Board Member
Co-Founder

Be part of this transformation

Conventional diagnosis



Now at **PhageTech**



The future with
PhageTech



Funding goals

- Current funding sufficient through FDA pre-submission and clinical trial
- Series B investment in first half of 2018 to fund:
 - Full FDA submission and next generation technology
 - Develop strategic partnerships
 - Fund marketing, distribution, and commercialization
- **Contact information:** rrichards@phagetech.com

Appendix

Capitalization

- Total of \$4.2m in investor funding raised
- September 2016: Grant received from the National Cancer Institute for ~\$1m over 3 years in collaboration with U.C. Irvine
 - From Peer Review:

*“..**extremely innovative** in that the unique technology incorporates a modified virus into an electronic circuit. Although the science is complex, the ultimate product is **an elegant and robust strategy** to monitor for bladder cancer recurrence. The investigators are **exceptional** with complementary expertise to carry out the proposed research... The phage and peptide ligands are robust and stable... This is **a major advantage** over other approaches that use antibodies...”*



Intellectual Property

- Selected listing of patents filed by UC Regents and licensed to PhageTech
 - 8,513,001 “Method and apparatus for target detection using electrode-bound viruses” Aug 2013
 - 8,525,237 “Electrically conductive polymer nanowires with incorporated viruses” Sept 2013
 - 8,986,655 “Compositions, Devices, and Methods related to Prostate-Specific Membrane Antigen” March 2015
 - 15/121,153 “Controlled Binding by Phage using Chemically Synthesized Wrappers” Filed February 2015 Pending
 - 15/287,489 “Pegylated Phage for Specific Molecular Recognition of heterogeneous surfaces, including Cancer Cells” Filed October 2016 Pending
 - 62/436,333 “Composite biosensor for Human Serum Albumin” File
- US Trademarks for PhageTech™ and BioConductor™
- Future Patent work planned by co-founders:
 - Biosensor enhancement patents
 - Production process trade secrets

Selected Advisory Board Members

- Dr. Howard Robin, Chief Technology Officer, Medical Director at Molecular Response. Board certified in anatomic and clinical pathology. Dr. Robin is a pathologist and former clinical laboratory medical director at Sharp Memorial Hospital and Pacific Rim Pathology Lab in San Diego, CA.
- Dr. Daniel P. Kolk , Senior Director Product Development, Hologic. 30 years experience with developing medical devices and securing FDA clearances. Hologic; DermTech Int; Gen-Probe; and NIH Post-Doctoral Fellow, UCSD School of Medicine
- Dr. Frank Chisari – Professor, Scripps Research Institute (retired) With Scripps since 1998 and most recently Professor and Head, Laboratory of Experimental Virology, Department of Immunology and Microbial Science.
- Dr. Jeffrey Yoshida - Director of urologic oncology at Hoag Family Cancer Institute. Dr. Yoshida is Board-certified in urology and has practiced as a urologic oncologist since 2004. Past Associate Clinical Professor, Urologic Oncology; city of Hope Cancer Center. He has authored eight publications on the subject of urological cancers and is an expert on robot-assisted radical prostatectomy.
- Dr. Paul DeRidder – Chief Medical Officer at Cold Genesys. Board-certified Urologist in private clinical practice for 22 years. Past Assistant Clinical Professor at UC Irvine Medical School. Past Chair of Urology at St. Joseph Hospital in Orange, CA and co-founder and Board member of Urotherapies, Inc.
- Dr. Andrew Perry – Founder and CEO of Perry Scientific (now Absorption Systems) is an in-vivo toxicology and pharmacokinetics testing company in San Diego, CA. Dr. Perry is an expert in the field of In-Vitro Diagnostics.