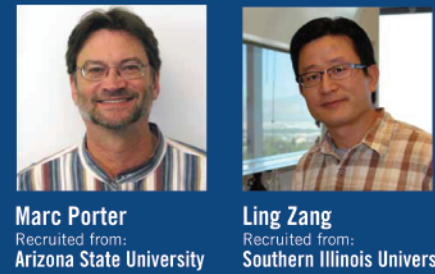


Nano-tech Biosensors

Team Overview

Nanotechnology "biosensors" detect materials in biological systems and the environment at ultra-low levels of concentration. The team aims to help detect diseases and environmental threats early, allowing for more cost-effective interventions.



Promising Research Projects

- Quick and affordable environmental **mercury detection**
- Sensing of dangerous chemicals, such as explosives, at ultra-low levels, allowing better protection against terrorism
- Highly sensitive "**immuno assays**" for **cancer** in bodily fluids, such as urine and blood
- Novel uses for spherical, cubic, and rod-shaped **gold nanoparticles** that are used in early detection of disease

Results So Far

- New hazardous chemical detection company: **Metallosensors**
- New explosives detection company: **Vaporsens**
- New invention disclosures: **19**
- New patent filings: **17**

Research Funding
Delivered to Utah
\$10.2
Million

Size of
Target Market
\$20.0
Billion

Nanoscopic and Biomedical Photonic Imaging

Team Overview

Human diseases invariably involve malfunction in cellular processing, often at spatial scales too fine to be observed under light microscopy. Recent technical advances will allow researchers to break through what were once believed to be insurmountable barriers in resolution, leading to discoveries that will fundamentally change the way medicine is practiced.



Promising Research Projects

- Small molecules that selectively disrupt key interactions in molecular pathways that cause cancer
- Novel fragment-based tools for selective chemical probes and drug discovery
- Monitoring and controlling brain activity with novel optical probes
- Using biologically-inspired design to improve detection and processing capabilities of chemical sensing devices, such as for detecting explosives
- Understanding the pathogenesis of infectious diseases by using high-resolution imaging to examine enveloped virus assembly in living cells
- Visualizing positions of key viral components within an envelope of a single virion, facilitating targeted drug development

Results So Far

- New invention disclosures: **3**
- New patent filings: **3**
- New research innovations company: **Protein Fusion Technologies**

Research Funding
Delivered to Utah
\$2.0
Million

Size of
Target Market
\$65
Billion

Micro & Nano Systems Integration

Team Overview

Micro and Nanosystems Integration and Packaging focuses on advanced system integration and packaging for complex micro and nanotechnology systems. It interfaces between nanodevices and the outside world.



Promising Research Projects

- Implantable devices for metabolic and neurological monitoring
- Increased solar-cell performance through advanced nanotechnology
- Nano and micro energy-harvesting, portable autonomous micro and nanosensor systems
- Micro air-quality systems monitoring for distributed environmental awareness
- Ultra-high efficiency photovoltaics via optical spectrum-separation
- Scalable nanomanufacturing for photovoltaics and display applications

Results So Far

- Invention disclosures: **15**
- Patents (filed or issued): **10**
- New companies: **PointSpectrum Corp.**

Research Funding
Delivered to Utah
\$14.5
Million

Size of
Target Market
\$12.0
Billion

Wireless Nanosystems

Team Overview

Devices at the nanoscale have power to do big things. The Wireless Nanosystems team is busy developing technologies that use small devices capable of communicating wirelessly. There is a wide range of applications for these devices, from medicine to biology to imaging.



Promising Research Projects

- **Wireless health devices** that monitor and alert health care givers
- "**Smart cap**" pill bottle that alerts and communicates with patients and medical staff, ensuring patients take the right medication at the right time
- Wireless **non-intrusive energy sensors** and power meters
- Wireless health monitoring **sensors for athletes** and others
- Technology that could help **restore partial vision** to the blind

Results So Far

- New company: **Utah Wireless Health Systems**
- New product prototype: **Motion sensor suit**
- New invention disclosures: **33**
- New patent filings: **19**

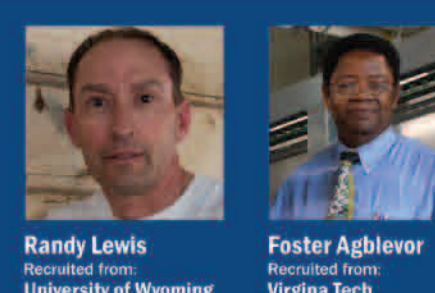
Research Funding
Delivered to Utah
\$10.3
Million

Size of
Target Market
\$56
Billion

Synthetic Bio-Manufacturing Center

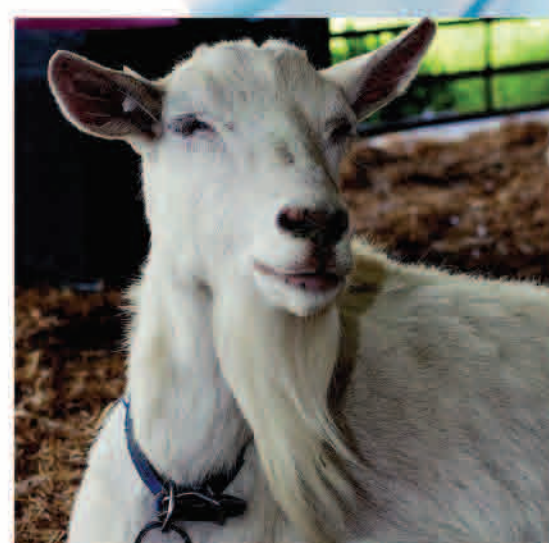
Team Overview

Randy Lewis and Foster Agblevor have joined the USTAR and Utah State University teams within the past year. They bring new expertise to the innovative work already being done by the College of Engineering, the College of Agriculture and the College of Science.



Spider Silk

- **Medical devices and equipment:** There are more than 100,000 ligament repair and replacement surgeries in the United States each year. Spider silk-based synthetic ligaments and sutures may one day play an important role in this market
- **Technical fabrics:** The exceptional flexibility, strength and weight of spider silk make it a potentially ideal material for products such as vehicular airbags and high-performance sports apparel



Bioplastics

Utah State University researchers in the Synthetic Bio-Manufacturing Center are scaling up bioplastic production to be cost-competitive with traditional plastic manufacturing.

- Bioplastics are biodegradable and can be used in the manufacture of:
 - Plastic bottles
 - Cosmetic containers
 - Paper coatings
 - Medical devices



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