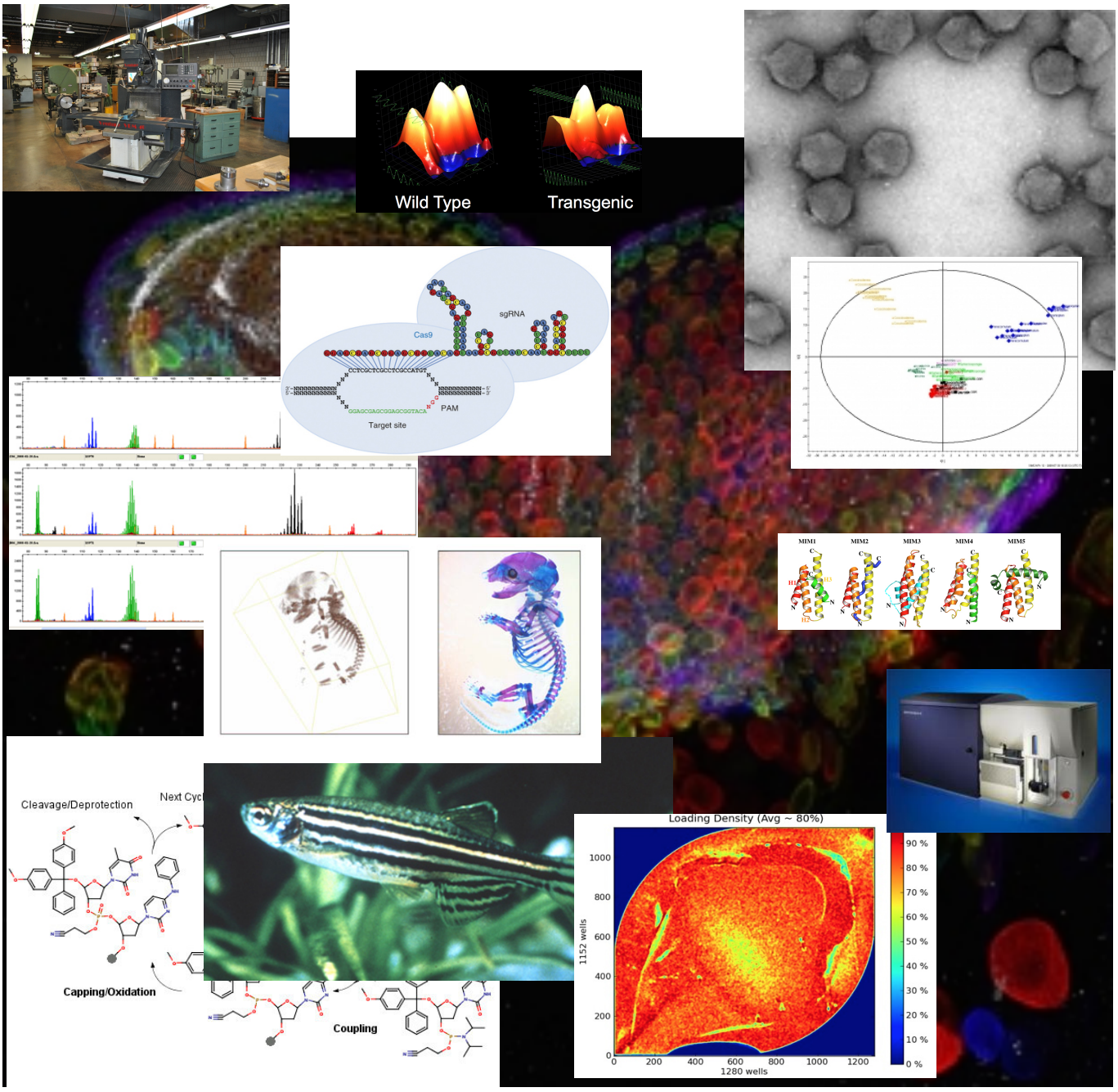
UNIVERSITY OF UTAH
SCHOOL OF MEDICINE

2013 Annual Report
HSC Cores



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Summary

The past year has seen changes in many of the positions in the University of Utah HSC core research facilities. Dr. Jerry Kaplan retired after many years of dedicated service in building the Cores. Drs. John Phillips and Andrew Weyrich assumed the responsibility for the overall management of the HSC Cores in February, 2013. Dr. Phillips runs the day-to-day Core operations and Dr. Weyrich manages overall Core activities. In addition to a change in Core leadership, the Core administrative manager, Ms. Janet Bassett, transferred to a new position with the Medical Student Affairs group in Nov. 2012. Mrs. Brenda Smith assumed the financial reporting and management of the Administrative Core.

After assuming leadership responsibility, Drs. Phillips and Weyrich required that each Core Director develop an annual report that describes all core activities. The FY13 annual report represents the first report for the HSC Core Facilities describing the current state of each of the sixteen individual Cores that are managed through a central administrative office. The plan is to annually document the state of each Core in a standardized format.

The FY13 annual report includes the following information for each core: personnel, equipment, usage, changes, and trends over the past fiscal year. As applicable there are listings of new equipment and/or new or enhanced services. Publications that have referenced the use of a particular Core or Cores are also listed. Information is presented for each Core as a separate section.

Time and effort by each of the Cores Faculty Advisory Committees is not listed here. However, every Core has an active advisory group that provides outstanding support and guidance. The HSC Core Oversight Committee should also be acknowledged for the role in governing the ongoing efforts to provide the faculty and staff of the University of Utah with an array of exceptional resources to enhance the productivity of all research.

Core Facilities Administration

Overview

The Core Facilities operate under central administration headed by Drs. Andrew Weyrich and John Phillips. They are assisted by Ms. Brenda Smith, Ms. Kristy Green and Mr. Jeffrey Ware. The Core Facility Administration office is responsible for personnel and financial affairs. It also provides service to the Irradiator. All of the Core facilities operate on a charge-back basis, although the percent recovery of operating expenses for each facility varies greatly The goal of the Cores is to make technology and expertise available to all faculty members and students.

Personnel

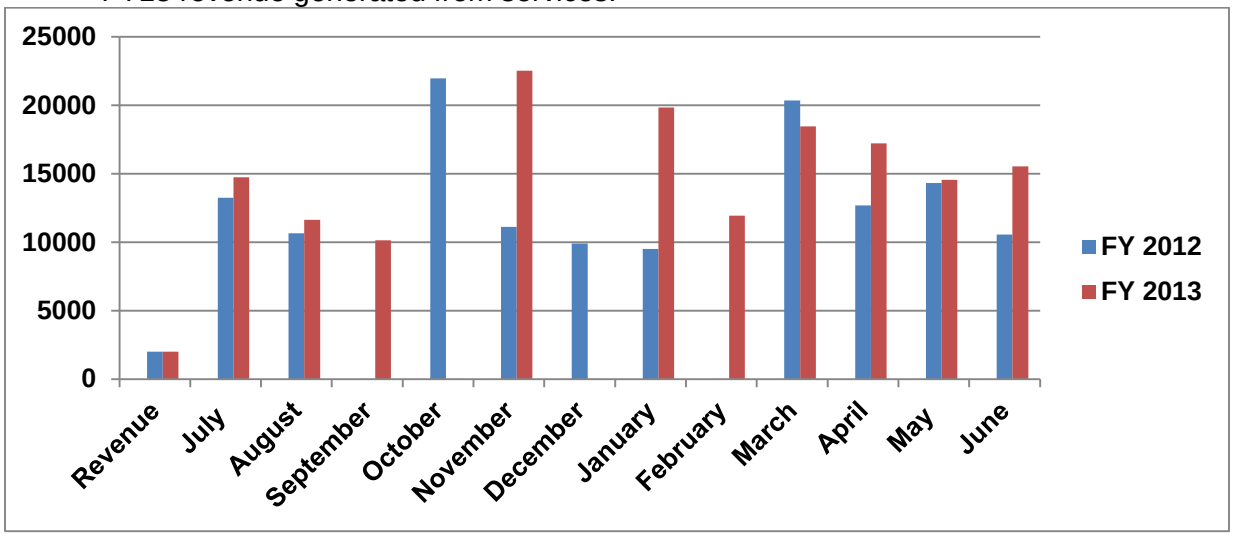
- Andrew Weyrich, Associate Dean for Basic and Translational Sciences
- John Phillips, Associate Director of the Core Resources
- Brenda Smith, Administrative Manager
- Kristy Green, Administrative Assistant
- Jeffrey Ware, Administrative Assistant

2013 Annual Update

- In FY12 the billing process took about 2 weeks to complete. In FY13, this process improved to 4 days due to cross training and the implementation of new billing process standards.
- The goals for the Core Administration Office for FY14 are to improve the billing process time to 3 business days, and to create an internal tracking system using File Maker Pro that will give real time balances of the budgets. A shadow system will track orders sent to the Business Office allowing Core Directors to view the balance of their activities immediately. The Directors will be able to access this tracking system simply by logging in and selecting to view either an Account Summary Report or a Detail Transaction Report.
- In FY13, the Core Administration Office successfully completed an audit.

Administration Revenue/Expenses

- VP of Research Support: $71,000
- Total FY13 revenue: $156,629
- Total FY12 revenue: $133,000 carry forward
- Total FY13 expenses: $290,406
- FY13 revenue generated from services:



Core Revenue

- The Cores Facilities budget for FY13 was approximately $5 million with an expense total of $4.9 million. $2.5 million of the expenses went to salaries and benefits and $2.4 million went to operating supplies and equipment.
- In FY13 the labs billed $3.2 million for services, an improvement from $2.9 million billed for services in FY12.

Advisory Board Committee

Last meeting date: January 28, 2013

- David Jones, Professor, HCI
- Joseph Yost, Professor, Neurobiology and Anatomy
- Mark Yandell, Professor, Human Genetics
- John Phillips, Associate Director of HSC Cores
- Dennis Winge, Professor, Hematology
- David Stillman, Professor, Pathology
- Wes Sundquist, Professor, Biochemistry
- Stephen Lessnick, Professor, Pediatric Hematology
- Jerry Kaplan, Emeritus Faculty, Pathology

Addendum

- Faculty Oversight Committee Guidelines

http://cores.utah.edu/wp-content/uploads/2015/09/Faculty-Advisory-Committee-Responsibilities-2.pdf

Cell Imaging Core Facility

Overview

The Cell Imaging Core Facility provides training and consultation on the use of confocal microscopy, widefield automated microscopy, two-photon, and software analysis tools for quantitative analysis of image data. The core facility has two Olympus FV1000 Spectral confocals, two Nikon A1 confocals and a BD Pathway Confocal Bioimager. A Nikon Ti automated microscope for live cell imaging has both Spinning Disk Confocal and Widefield capabilities. Automated microscopes with one of four different stage incubators are available (CO2, temperature, humidity) and also available for live cell imaging. Nikon Elements, Metamorph, Imaris and Volocity software are available for 2D and 3D analysis of image data.

Services

The training and equipment provided by the core is aimed at reducing the startup time and degree of expertise necessary for an individual user to design and execute experiments requiring microscopy and image processing.

Equipment

- Two Olympus FV1000 Confocal Microscopes
- Nikon A1 Confocal Microscope
- Nikon A1R Confocal Microscope
- Prairie Multi-Photon Confocal Microscope
- BD Pathway 855 High Throughput Imager
- Nikon Widefield/Spinning Disk Confocal Microscope
- Olympus CCD Widefield Microscope
- Olympus Metamorph Widefield Microscope
- EVOS FL Widefield Microscope
- Nikon Ti Automated Microscope

Personnel

- Christopher Rodesch, Director
- Michael J. Bridge, Research Associate

2013 Annual Update

New Equipment

- In April of 2012, the Cell Imaging Core Facility purchased a new Nikon Ti automated microscope for live cell imaging.
- In July of 2013, the Cell Imaging Core Facility added a Prairie Multi-photon confocal microscope.
- The Cell Imaging Core Facility submitted an NIH S-10 award application to purchase a Nikon AR1 Multi-Photon Confocal. The grant is currently under review.

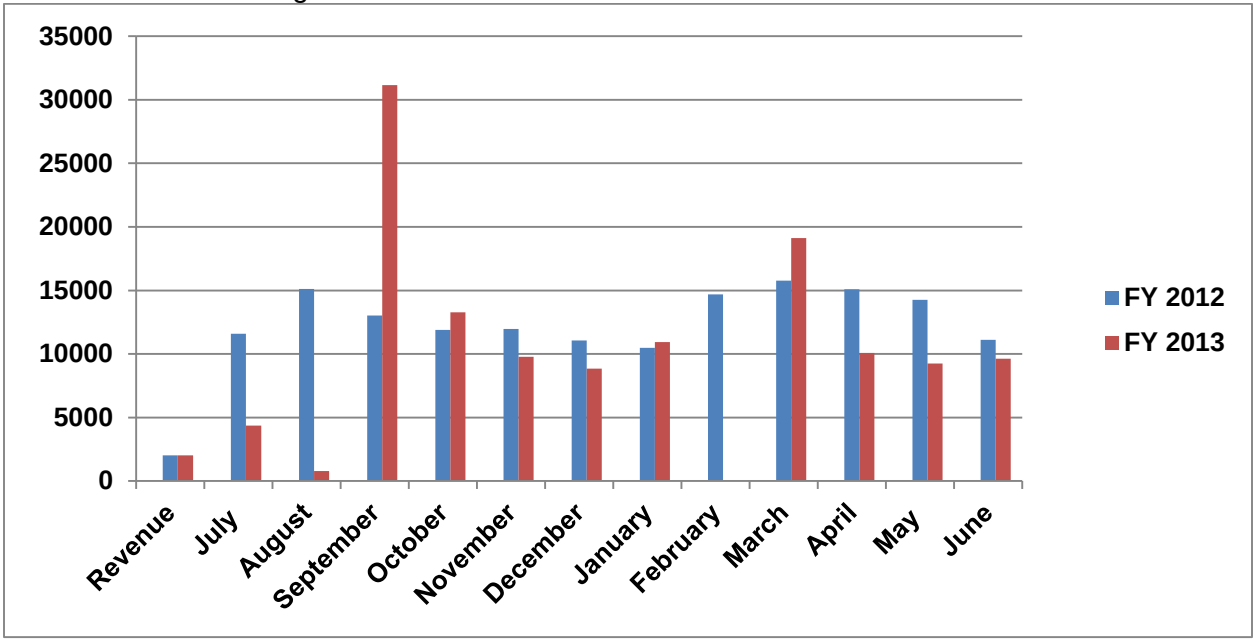
New Services

- Four new network stations have been available to patrons since January 2013. These stations enable patrons ready access to the core scheduler page.
- An EVOS automated widefield imager with color camera came online in June
- A Multi-photon Confocal from Prairie Technologies was installed July 25th

Revenue/Expenses

- VP of Research Support for *normal operating expenses*: $80,000
- Total FY13 revenue: $127,318
- Total FY13 *normal* expenses: $233,179
- VP of Research Support for a new Nikon Ti automated Microscope: $821,000

- FY13 revenue generated from services:



Advisory Board Committee

Last meeting date: August 7, 2013

- Gabrielle Kardon, Associate Professor, Human Genetics
- Kristen Kwan, Assistant Professor, Human Genetics
- Jody Rosenblatt, Assistant Professor, Oncological Sciences
- Josh Bonkowski, Associate Professor, Neurobiology and Anatomy
- Adam Douglas, Assistant Professor, Neurobiology and Anatomy
- Jason Sheperd, Assistant Professor, Neurobiology and Anatomy
- Matt Wachowiak, Associate Professor, Neurobiology and Anatomy

Addendum

- Faculty Oversight Committee Guidelines

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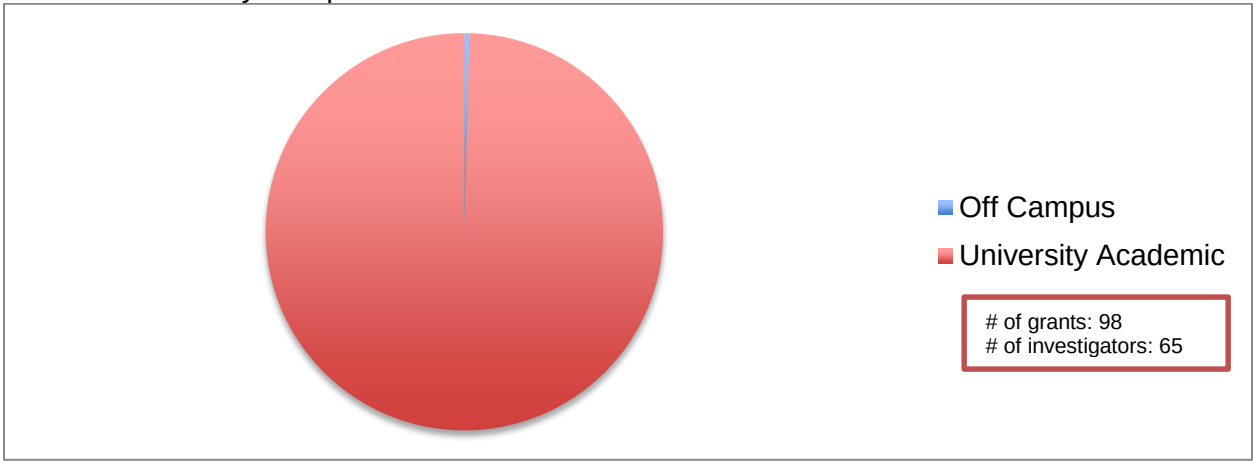
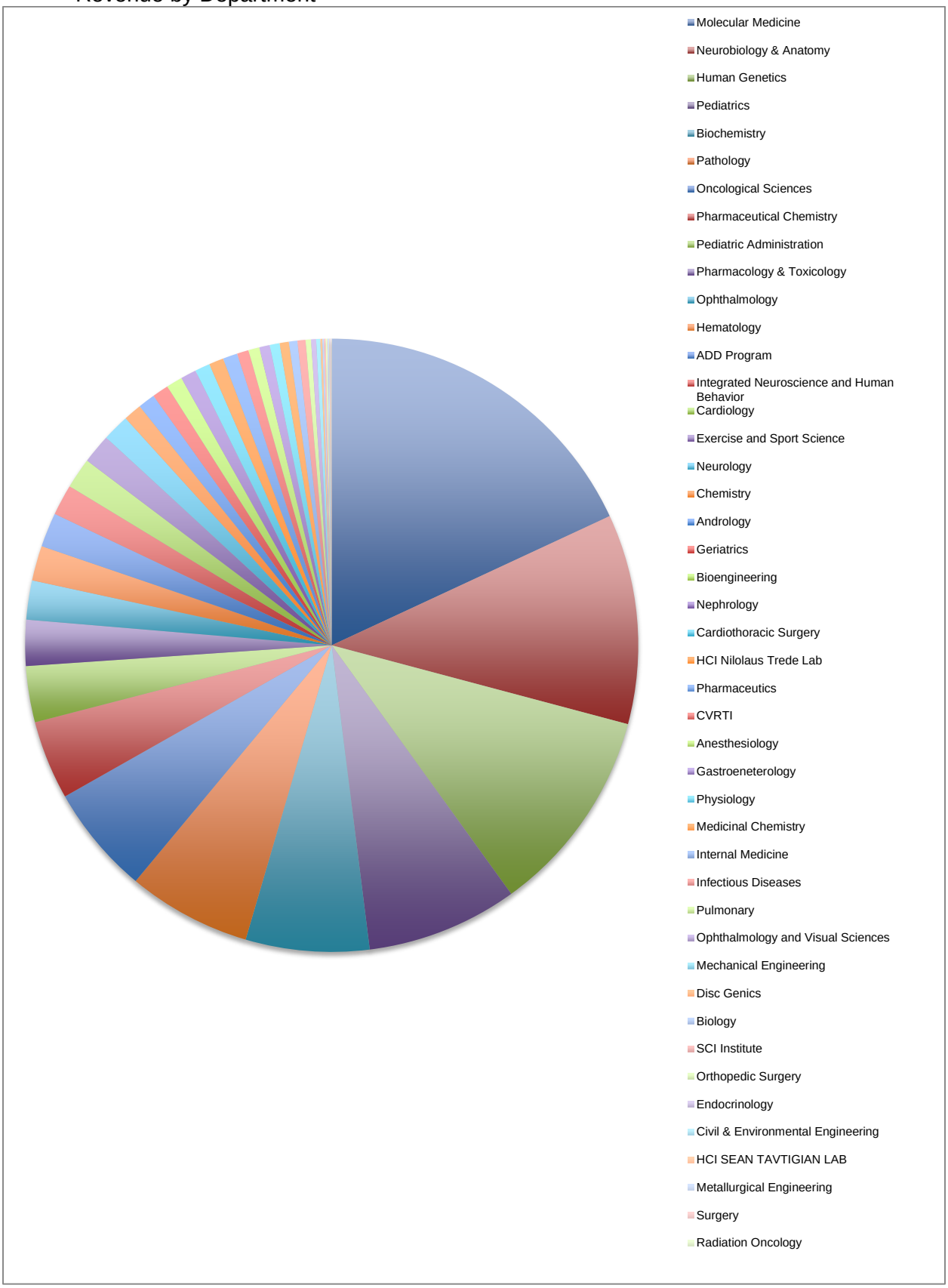
FY13 Scientific Impact

Research Support

- Revenue by Campus Affiliation



- Revenue by Department



- Top Users

1	Dean Li	NIH R01HL065648 NIH R01CA163970-01
2	Richard Dorsky	NIH R01MH092256
3	Gabrielle Kardon	NIH RO1HD053728-06
4	David Jones	NIH/NCI 5R01HD058506-03
5	Josh Bonkowsky	NIH K08DA024753-03
6	Jerry Kaplan	NIH R37HL26922-27
7	You Bae	NIH R01GM082866-02
8	Wesley I Sundquist	DHHS/NIH/NIAID R01 A151174
9	H. Joseph Yost	NIH 5U01HL098160-03

Publications

- Pan H, Sima M, Miller SC, Kopečková P, Yang J, Kopeček J. Efficiency of high molecular weight backbone degradable HPMA copolymer-prostaglandin E1 conjugate in promotion of bone formation in ovariectomized rats. Biomaterials. 2013 Sep; 34(27):6528-38.

Centralized Zebrafish Animal Resource (CZAR) Core Facility

Overview

The CZAR Core Facility provides state-of-the-art systems for housing, breeding, and performing experiments with zebrafish, an emerging vertebrate model system. It comprises 5000 fish tanks and redundant circulating water systems, and houses a large number of wildtype and mutant fish strains. It allows large genetic screens to be carried out as collaborations between multiple laboratories, and can provide animals and training for laboratories wishing to try pilot zebrafish experiments. Currently the facility is used by 12 large laboratories and supports an additional six to ten user groups.

Services

The CZAR Core Facility is responsible for the daily care and maintenance of the fish and aquatic systems. The facility provides the following services:

- Housing and maintaining zebrafish, monitoring their care, and establishing practices and providing oversight to ensure the safety and health of the animals
- Propagating wildtype lines and providing animals from these lines to investigators
- Providing laboratory bench space and supplies to perform experiments
- Providing shared-use equipment including 7-8 microinjection stations, bright field stereomicroscopes, and a fluorescence stereomicroscope
- Providing training to investigators
- Providing specialized centralized services performed by the permanent staff, such as sperm cryopreservation and storage

Equipment

- M205 FA Leica Microscope
- Zeiss Microscope
- Olympus Microscope
- Seven microinjection stations that each have a Harvard apparatus injector

Personnel

- Maurine Hobbs, Director
- Sharon Johnson, Senior Laboratory Specialist
- Benjamin Larsen, Technician

2013 Annual Update

New Equipment

- In October of 2012, the CZAR Core Facility purchased a M205 FA Leica Microscope
- In April of 2013, the Zeiss microscope was upgraded with an LED light source

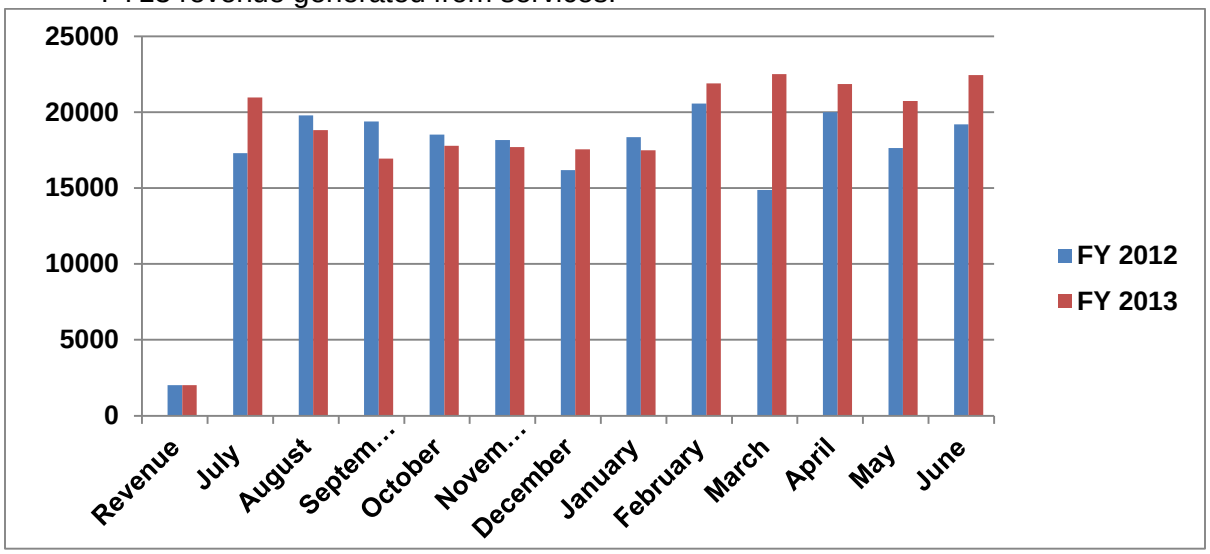
New Services

- Charges have increased for cryopreservation and storage of fish line sperm.

Revenue

- VP of Research Support: $107,000
- Total FY13 revenue: $236,820
- Total FY13 expenses: $383,656

- FY13 revenue generated from services:



Advisory Board Committee

Last meeting date: August 14, 2013

- David Jonah Grunwald, Professor, Human Genetics
- Joshua Bonkowski, Associate Professor, Neurobiology and Anatomy and Pediatrics
- Richard Dorsky, Associate Professor, Neurobiology and Anatomy
- Amnon Schlegel, Assistant Professor, Endocrinology, Metabolism and Diabetes
- Rodney Stewart, Assistant Professor, Oncological Sciences
- Jack Taylor, Director, Office of Comparative Medicine
- H. Joseph Yost, Professor, Neurobiology and Anatomy and Pediatrics

Addendum

- Faculty Oversight Committee Guidelines

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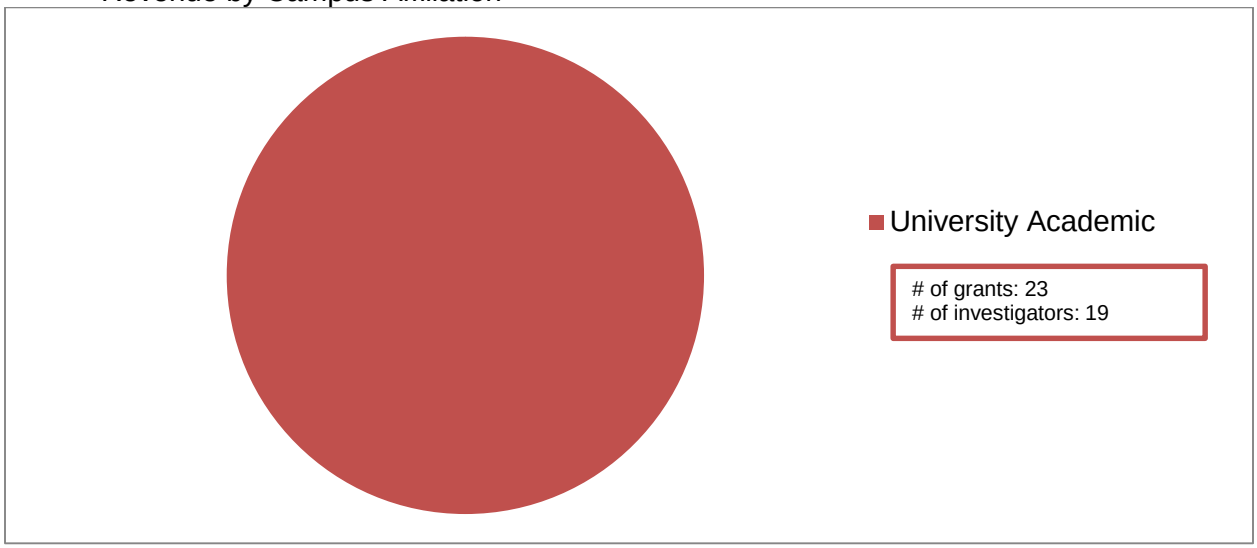
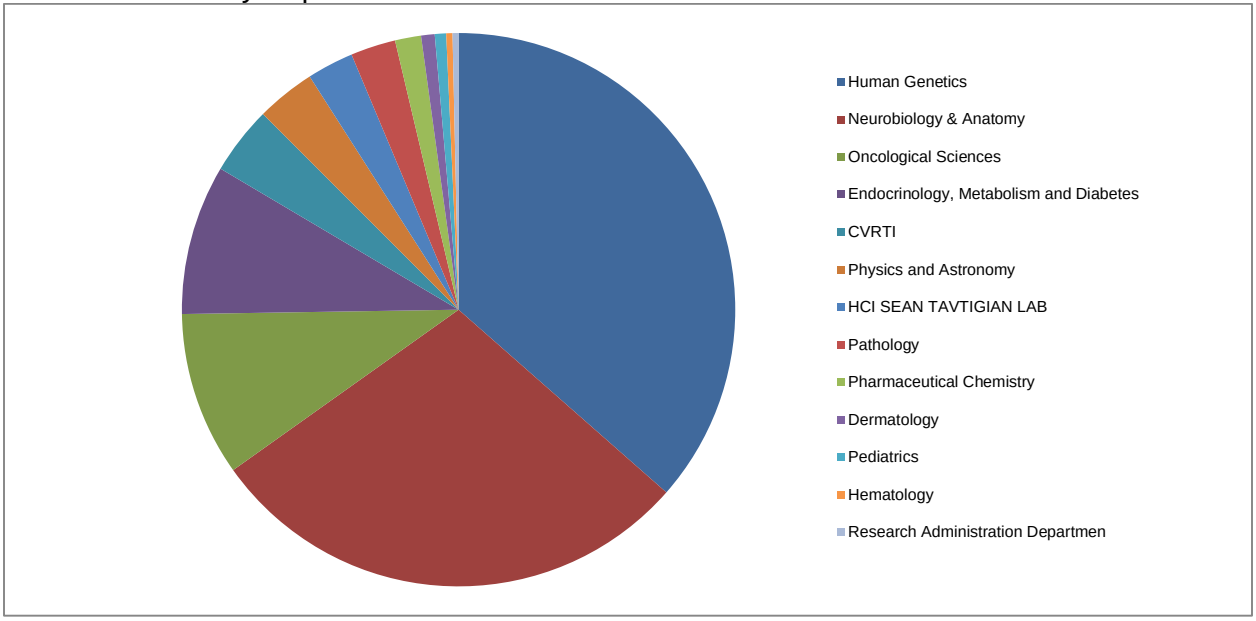
FY13 Scientific Impact

Research Support

- Revenue by Campus Affiliation



- Revenue by Department



- Top Users

1	H. Joseph Yost	NIH 5U01HL098160-03
2	David Grunwald	NIH R21HD073847-01
3	Richard Dorsky	NIH R01MH092256
4	Amnon Schlegel	NIH R01DK096710-01 NIH R01DK096710-01
5	Josh Bonkowsky	NIH K08DA024753-03
6	Monica Vetter	NIH R01EY012873-12
7	Kristin Kwan	University of Utah Foundation
8	Brad Cairns	NIH R01GM060415-10
9	Jody Rosenblatt	NIH R01GM102169-01
10	David Grainger	NIH 1R01EB011879-01A1

Publications

- Jurisch-Yaksi N, Rose AJ, Lu H, Raemaekers T, Munck S, Baatsen P, Baert V, Vermeire W, Scales SJ, Verleyen D, Vandepoel R, Tylzanowski P, Yaksi E, de Ravel T, Yost HJ, Froyen G, Arrington CB, Annaert W. Rer1p maintains ciliary length and signaling by regulating γ-secretase activity and Foxj1a levels. J Cell Biol. 2013 Mar; 200(6):709-20.

DNA/Peptide Synthesis Core Facility

Overview

The DNA / Peptide Synthesis Core Facility offers investigators a wide range of routine and specialty oligonucleotides as well as chemically synthesized peptides with purification available on all products, ranging from crude to HPLC pure. The DNA/Peptide Synthesis Core Facility also has the ability to incorporate a wide array of specialty modifications, including fluorophore-labeling and functional group derivatization via amnio-, thiol-, and modifications compatible with click chemistry. The facility strives for quick turnaround times with next day delivery on most items.

Services

- Routine and custom DNA synthesis
- Routine and custom RNA synthesis
- Routine and custom Peptide synthesis
- Peptide Purification

Equipment

- ABI 3900 DNA Synthesizer (2)
- ABI 394 DNA Synthesizer (3)
- ABI 433 Peptide Synthesizer
- ABI 433 Peptide Synthesizer
- Beckman Coulter System Gold 125P HPLC System
- Beckman Coulter System Gold 126 HPLC System
- Hewlett Packard Series 1100 HPLC system (2)
- Beckman Coulter DU800 Spectrophotometer
- BioTek Epoch Plate Reader Spectrophotometer

Personnel

- Mike Hanson, Director
- Scott Endicott, Research Associate
- Karen Freedman, Lab Specialist
- Jonathan Dorigatti, Lab Aide
- Francisco Samaniega, Lab Aide
- Amanda Jarvis, Lab Aide

2013 Annual Update

New Equipment

- The DNA/Peptide Core Facility did not obtain any additional equipment in 2013.

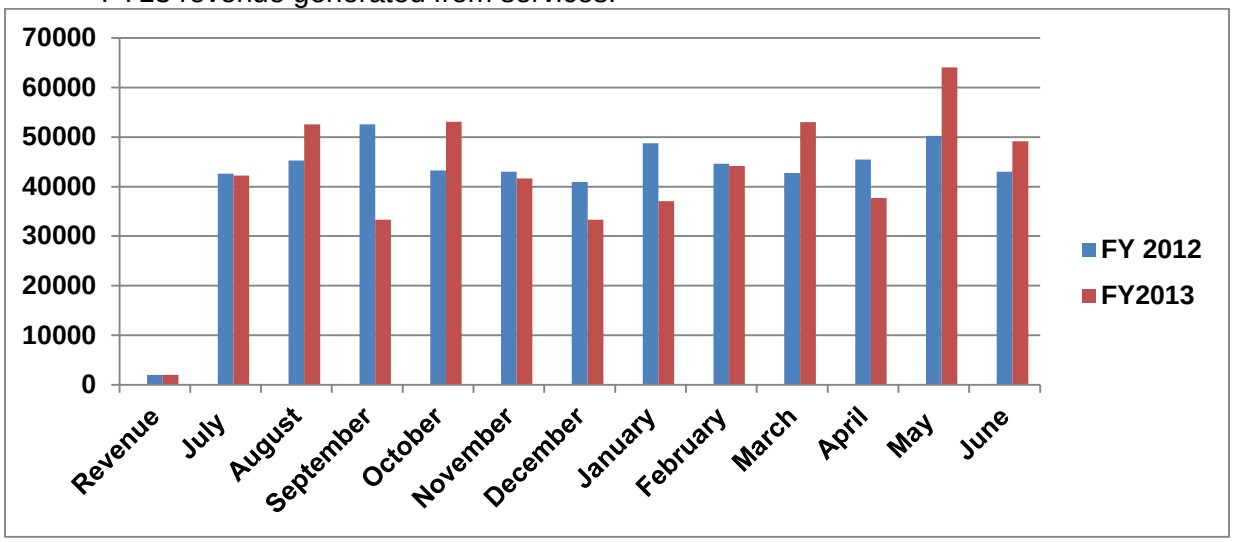
New Services

- The DNA/Peptide Core Facility did not implement any additional services in 2013.

Revenue

- VP of Research Support: $0
- Total FY13 revenue: $541,326
- Total FY13 expenses: $524,929

- FY13 revenue generated from services:



Advisory Board Committee

Last meeting date: February 28, 2013

- Eric Schmidt, Professor, College of Pharmacy
- Jen Heemstra, Assistant Professor, Chemistry
- John Weiss, Professor, Pathology

Addendum

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FY13 Scientific Impact

Research Support

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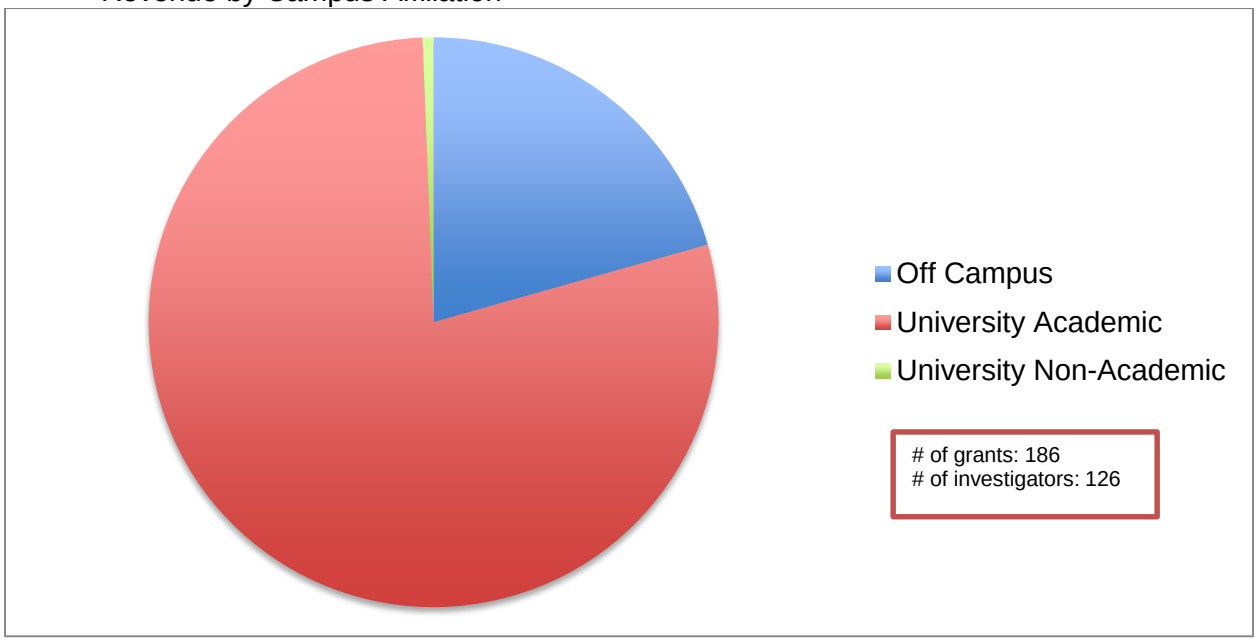
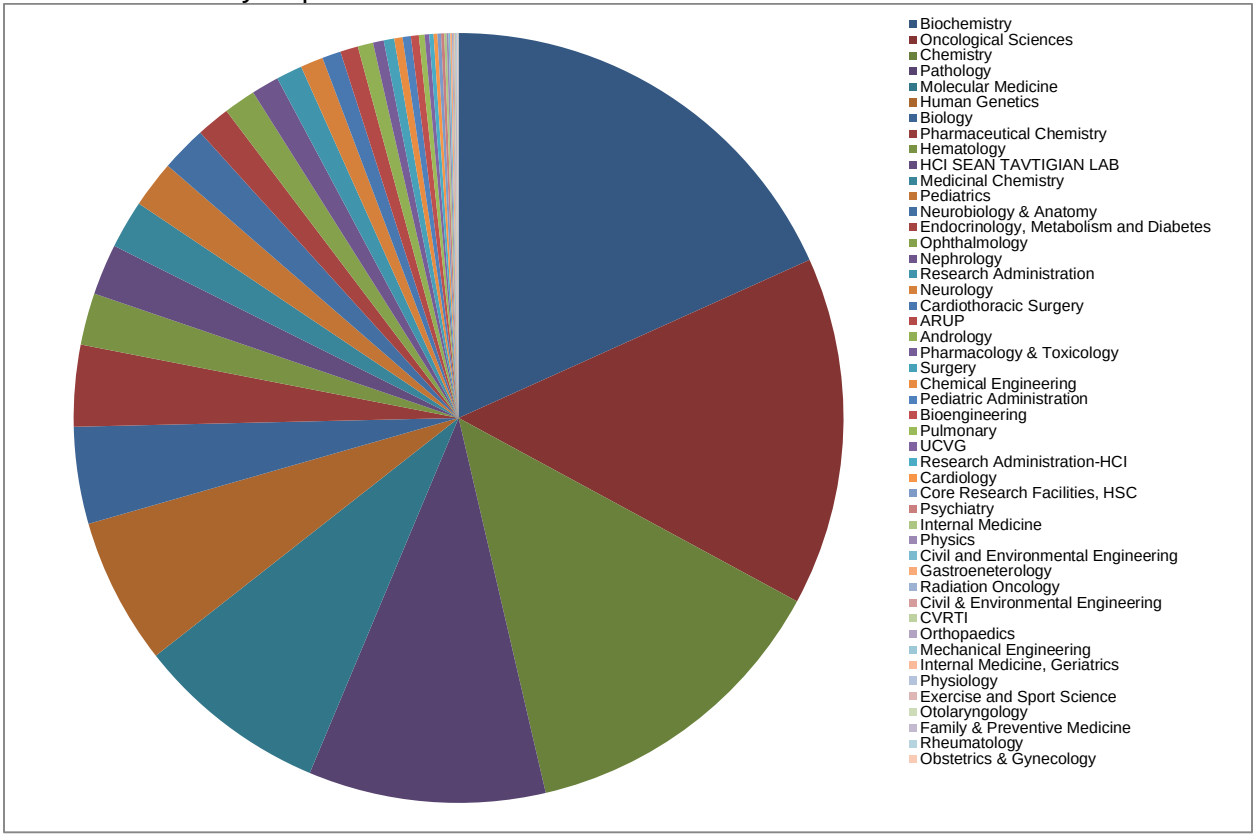


- Revenue by Department



- Top Users

1	BioFire Diagnostics	Off-Campus
2	Wesley Sundquist	NIH R01A151174 NIH 4R37A104505-11 NIH P50GM082545
3	Cynthia Burrows	NIH 1R03CA150067-01 NSF CHE1152533 NIH GM093099
4	Dean Li	NIH R01HL065648
5	Brad Cairns	NIH R01GM060415-10 NIH R01H0058506-01
6	Deborah Neklason	NIH 1R03CA150067-01
7	Dennis Winge	NIH R01ES003817-28
8	Jared Rutter	NSF R01GM087346 NIH R01GM094232-01
9	Christopher Hill	NIH P50GM082545 NIH 2R01GM059135
10	Brenda Bass	NIH 1DP10D008174-01

Publications

- Gowd KH, Blais KD, Elmslie KS, Steiner AM, Olivera BM, Bulaj G. Dissecting a role of evolutionary-conserved but noncritical disulfide bridges in cysteine-rich peptides using ω-conotoxin GVIA and its selenocysteine analogs. Biopolymers. 2012;98(3):212-23.
- Spiropulos NG, Heemstra JM. Templating effect in DNA proximity ligation enables use of non-bioorthogonal chemistry in biological fluids. Artif DNA PNA XNA. 2012 Jul 1;3(3):123-8.

- Sharma AK, Kent AD, Heemstra JM. Enzyme-linked small-molecule detection using split aptamer ligation. Anal Chem. 2012 Jul 17;84(14):6104-9.
- Poerschke RL, Franklin MR, Bild AH, Moos PJ. Major differences among chemopreventive organoselenocompounds in the sustained elevation of cytoprotective genes. J Biochem Mol Toxicol. 2012 Sep;26(9):344-53.
- Jin Q, Fleming AM, Burrows CJ, White HS. Unzipping kinetics of duplex DNA containing oxidized lesions in an α-hemolysin nanopore. J Am Chem Soc. 2012 Sep 12; 134(36):15091-102.
- Kumar GS, Chang W, Xie T, Patel A, Zhang Y, Wang GG, David G, Radhakrishnan I. Sequence requirements for combinatorial recognition of histone H3 by the MRG15 and Pf1 subunits of the Rpd3S/Sin3S corepressor complex. J Mol Biol. 2012 Sep 28;422(4):519-31.
- Safavi-Hemami H, Gorasia DG, Steiner AM, Williamson NA, Karas JA, Gajewiak J, Olivera BM, BulajG, Purcell AW. Modulation of conotoxin structure and function is achieved through a multienzyme complex in the venom glands of cone snails. J Biol Chem. 2012 Oct 5;287(41):34288-303.
- Ghanty U, Fostvedt E, Valenzuela R, Beal PA, Burrows CJ. Promiscuous 8-alkoxyadenosines in the guide strand of an siRNA: modulation of silencing efficacy and off-pathway protein binding. J Am Chem Soc. 2012 Oct 24;134(42):17643-52.
- Kuttan A, Bass BL. Mechanistic insights into editing-site specificity of ADARs. Proc Natl Acad Sci USA. 2012 Nov 27;109(48):E3295-304.
- Hone AJ, Scadden M, Gajewiak J, Christensen S, Lindstrom J, McIntosh JM. α-Conotoxin PeIA[S9H,V10A,E14N] potently and selectively blocks α6β2β3 versus α6β4 nicotinic acetylcholine receptors. Mol Pharmacol. 2012 Nov;82(5):972-82.
- Clapier CR, Cairns BR. Regulation of ISWI involves inhibitory modules antagonized by nucleosomal epitopes. Nature. 2012 Dec 13;492(7428):280-4.
- Schulze-Gahmen U, Upton H, Birnberg A, Bao K, Chou S, Krogan NJ, Zhou Q, Alber T. The AFF4 scaffold binds human P-TEFb adjacent to HIV Tat. Elife. 2013; 2:e00327.
- Chen X, Fleming AM, Muller JG Burrows CJ. Endonuclease and exonuclease activities on oligodeoxynucleotides containing spiroiminodihydantoin depend on the sequence context and the lesion stereochemistry. New J. Chem. 2013, Advance Article
- Park AH, Mann D, Error ME, Miller M, Firpo MA, Wang Y, Alder SC, Schleiss MR. Comparative analysis of detection methods for congenital cytomegalovirus infection in a Guinea pig model. JAMA Otolaryngol Head Neck Surg. 2013 Jan;139(1):82-6.
- Woessner DW, Lim CS. Disrupting BCR-ABL in combination with secondary leukemia-specific pathways in CML cells leads to enhanced apoptosis and decreased proliferation. Mol Pharm. 2013 Jan 7;10(1):270-7.
- Chou S, Upton H, Bao K, Schulze-Gahmen U, Samelson AJ, He N, Nowak A, Lu H, Krogan NJ, Zhou Q, Alber T. HIV-1 Tat recruits transcription elongation factors dispersed along a flexible AFF4 scaffold. Proc Natl Acad Sci USA. 2013 Jan 8;110(2):E123-31.
- Beumer KJ, Trautman JK, Mukherjee K, Carroll D. Donor DNA Utilization during Gene Targeting with Zinc-finger Nucleases. G3 (Bethesda). 2013 Mar.
- G-Quadruplex Folds of the Human Telomere Sequence Alter the Site Reactivity and Reaction Pathway of Guanine Oxidation Compared to Duplex DNA. Fleming AM, Burrows CJ. Chem Res Toxicol. 2013 Mar 13.
- Davis JR, Mossalam M, Lim CS. Controlled access of p53 to the nucleus regulates its proteasomal degradation by MDM2. Mol Pharm. 2013 Apr 1;10(4):1340-9.
- Reaz S, Mossalam M, Okal A, Lim CS. A single mutant, A276S of p53, turns the switch to apoptosis. Mol Pharm. 2013 Apr 1;10(4):1350-9.

- An N, Fleming AM, Burrows CJ. Interactions of the human telomere sequence with the nanocavity of the α-hemolysin ion channel reveal structure-dependent electrical signatures for hybrid folds. J Am Chem Soc. 2013 Jun 12;135(23):8562-70.
- Stanford SM, Krishnamurthy D, Kulkarni RA, Karver CE, Bruenger E, Walker LM, Ma CT, Chung TD, Sergienko E, Bottini N, Barrios AM. pCAP-based peptide substrates: The new tool in the box of tyrosine phosphatase assays. Methods. 2013 Jul 22.
- Ibarra-Soza JM, Morris AA, Jayalath P, Peacock H, Conrad WE, Donald MB, Kurth MJ, Beal PA. 7-Substituted 8-aza-7-deazaadenosines for modification of the siRNA major groove. Org Biomol Chem. 2012 Aug 28;10(32):6491-7.
- Beagley CT, Wolstenholme DR. Characterization and localization of mitochondrial DNA-encoded tRNAs and nuclear DNA-encoded tRNAs in the sea anemone Metridium senile. Curr Genet. 2013 Aug;59(3):139-52.
- Miller GD, Woessner DW, Sirch MJ, Lim CS. Multi-domain targeting of Bcr-Abl by disruption of oligomerization and tyrosine kinase inhibition: Towards Eradication Of Cml. Mol Pharm. 2013 Aug 5. [Epub ahead of print]

DNA Sequencing Core Facility

Overview

The DNA Sequencing and Genomics Core Facility provides DNA sequencing services and employs the latest technologies to generate high quality data with a fast turnaround and competitive prices. In support of DNA sequencing activities the facility utilizes state-of-the-art DNA sequencers and lab robotics such as the Ion Torrent PGM, the Qiagen Q24 Pyrosequencer and the Biomek FX for liquid handling needs. Data from standard DNA sequencing services are typically reported to customers within 24 hrs. Sample information can be submitted online and sequencing data files are also available online for download using a simple and secure interface.

Services

DNA Sequencing Services

- Standard DNA sequencing
- Primer walking on clones
- Mutation detection and resequencing custom projects
- Ion Torrent NGS sequencing
- Pyrosequencing

Robotics

- Biomek FX with Span-8 and 96 head

Other Services

- Lab consumables for sample submission
- Life Technologies freezer program

Equipment

Sequencers

- Ion Torrent PGM
- Ion Torrent Proton
- Qiagen Q24 Pyrosequencer
- Applied Biosystems 3730xl

Liquid Handler

- Biomek FX

Personnel

- Derek Warner, Director
- Michael Powers, Senior Laboratory Specialist
- Anna Adamson, Lab Specialist

2013 Annual Update

New Equipment

- In April 2013, the DNA Sequencing Core Facility purchased and installed an Ion Torrent Proton NGS Sequencer.

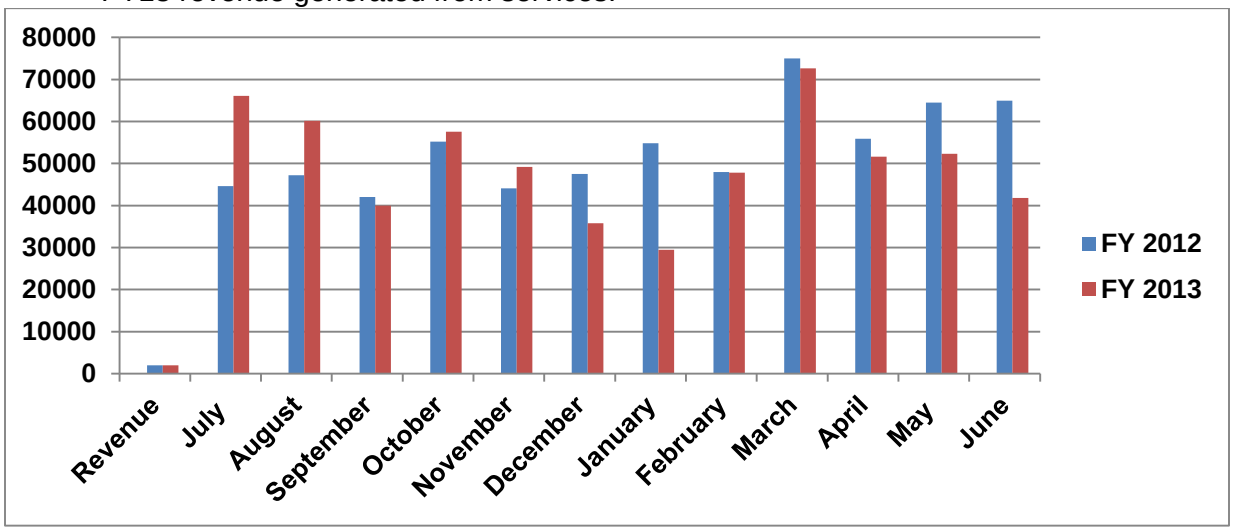
New Services

- Support for The Ion Torrent PGM is now available.
- Prices have been updated for sequencing supplies.
- Ion Torrent Proton is available on a limited basis while we finish training on and fully validating standard protocols. Then Exome sequencing and RNA Seq runs will be fully supported.

Revenue

- VP of Research Support: $0

- Total FY13 revenue: $604,317
- Total FY13 expenses: $596,236
- FY13 revenue generated from services:



Advisory Board Committee
Last meeting date: March 28, 2013

- Monica Vetter, Professor, Neurobiology & Anatomy
- Colin Dale, Associate Professor, Biology
- Robert Weiss, Professor, Human Genetics

Addendum

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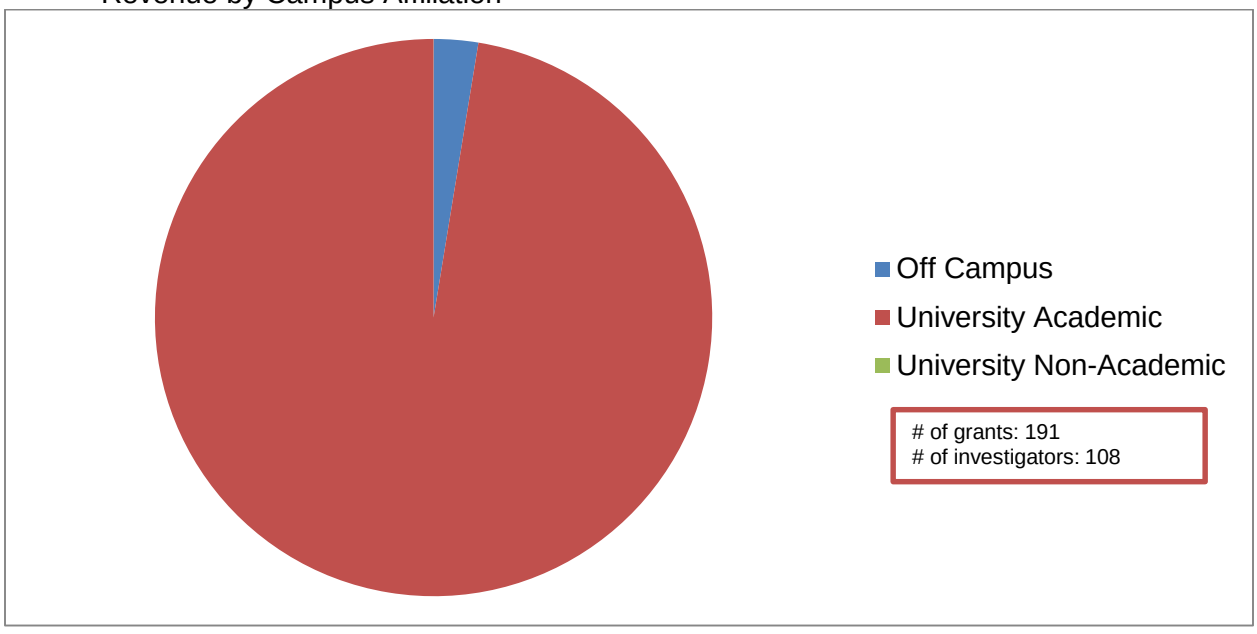
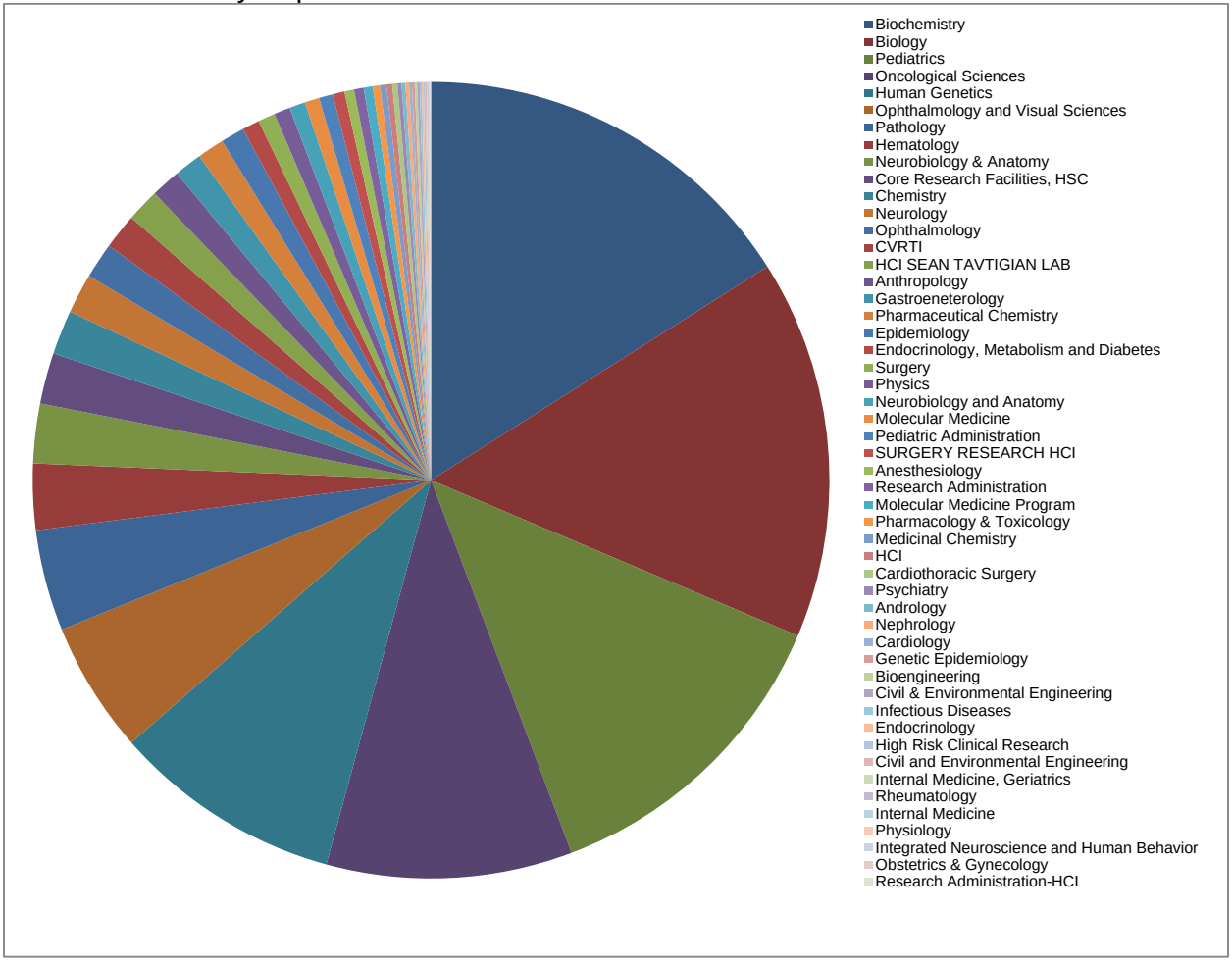
FY13 Scientific Impact
Research Support

- Revenue by Campus Affiliation



- Revenue by Department



- Top Users

1	Kathryn Swoboda	AHC Foundation
2	Meg DeAngelis	Aslam Foundation
3	Christopher Hill	NIH P50GM082545
4	Baldomero Olivera	NIH 5P01GM48677-20
5	John Parkinson	NIH R01GM019559-38
6	H. Joseph Yost	NIH 5U01HL098160-03
7	David Grunwald	NIH R21HD073847-01
8	Wesley Sundquist	NIH R01A151174
9	Taueret Laboratories	Off-Campus
10	Dennis Winge	NIH R01ES003817-28

Publications

- Ke X, McKnight RA, Caprau D, O'Grady S, Fu Q, Yu X, Callaway CW, Albertine KH, Lane RH. Fetal growth restriction alters transcription factor binding and epigenetic mechanisms of renal 11β-hydroxysteroid dehydrogenase type 2 in a sex-specific manner. Physiol. Genomics. 2011 Oct; 43(20) 1160-1169.
- Zinkhan EK, Fu Q, Wang Y, Yu X, Callaway CW, Segar JL, Scholz TD, McKnight RA, Joss-Moore L, Lane RH. Maternal Hyperglycemia Disrupts Histone 3 Lysine 36 Trimethylation of the IGF-1 Gene. J Nutr Metab. 2012; 2012:930364.

Drug Discovery Core Facility

Overview

The Drug Discovery Core Facility provides compound collections for screening. The core facility delivers low-cost and efficient access to chemical libraries for screening, to equipment for automation, and to synthetic chemistry support for the characterization and validation of compounds for potential use as therapeutics, diagnostics and biological tools.

Services

Commercial compound libraries for screening

- Chembridge 49K Diverset
- Microsource Spectrum Collection
- Kinase Inhibitor Library

Private Chemical Collections

- Department of Chemistry Library
- Ireland Natural Product Collection
- UUPCC
- CIT Fragment Library
- Spider Venom Collection

Equipment

- Matrix PlateMates (2)
- Biotek Synergy 4 Plate reader
- Biotek Plate Washer
- Tecan EVO MCA96 automated liquid handler

Personnel

- Bai Luo, Director

2013 Annual Update

New equipment:

- A Tecan EVO100 was purchased with a MCA384 automated liquid handler.
- A Tecan HPD300 digital dispenser was purchased.

New Services:

- Digital titration as follow up on hits is now available.
- Higher throughput for 384-well assays is now available.

Revenue/Expenses

- VP of Research Support: $60,000

Advisory Board Committee

Last meeting date: May 10, 2013

- Darrell Davis, Professor, College of Pharmacy
- Ryan Looper, Associate Professor, Chemistry Department
- Andrew Weyrich, Professor, Molecular Medicine
- Bryan Welm, Assistant Professor, Surgery
- Ryan Von Wagoner, Associate Professor, College of Pharmacy
- Jared Rutter, Professor, Department of Biochemistry

Addendum

- Faculty Oversight Committee Guidelines
  http://cores.utah.edu/wp-content/uploads/2015/09/Faculty-Advisory-Committee-Responsibilities-2.pdf

FY13 Scientific Impact

Research Support

- As this is a new core facility in FY13, there is no research revenue to report

Publications

- Basham KJ, Kieffer C, Shelton DN, Leonard CJ, Bhonde VR, Vankayalapati H, Milash B, Bearss DJ, Looper RE, Welm BE. Chemical genetic screen reveals a role for demosomal adhesion in mammary branching morphogenesis. J Biol Chem. 2013 Jan 25; 288(4):2261-70.
- Sandoval IT, Manos EJ, Van Wagoner RM, Delacruz RG, Edes K, Winge DR, Ireland CM, Jones DA. Juxtaposition of chemical and mutation-induced developmental defects in zebrafish reveal a copper-chelating activity for kalihinol f. Chem Biol. 2013 Jun 20; 20(6):753-63.
- Gligorich KM, Vaden RM, Shelton DN, Wang G, Matsen CB, Looper RE, Sigman MS, Welm BE. Development of a screen to identify selective small molecules active against patient-derived metastatic and chemoresistant breast cancer cells. Breast Cancer Res. 2013 Jul 23; 15(4):R58.

Electron Microscopy Core Facility

Overview

The Electron Microscopy (EM) Core Facility utilizes transmission electron microscopy (TEM) and electron microscopy (SEM) imaging to determine cellular structures, the morphology of biological macromolecules, the three-dimensional structure of a biological macromolecule, and the size and morphology of nanoparticles. The EM Core Facility also provides sample preparations.

Services

Clinical Services:

- Full and partial tissue biopsy thin sectioning

Research Services:

- Staff training on the TEMs, SEM, and microtomes
- Sections ("thick" and "thin") cut on microtome and ultramicrotome
- Record images on TEM or SEM microscopes
- Procedures for observing tissues and cellular specimens including embedding, drying, osmification and storage
- Procedures for observing particulate and macromolecular samples including staining, metal coating, drying, and cryogenic TEM

Equipment

- FEI Tecnai 12, transmission electron microscopes
- Two Hitachi 7100, transmission electron microscopes
- FEI Tecnai F20, transmission electron microscope
- Hitachi S-2460N, scanning electron microscope
- Leica UC6 and UCT and Reichert Ultracut E, ultramicrotomes
- Leica JUNG RM2055, microtome
- Two FEI Vitrobots, vitrification robots
- Two automatic tissue processors
- Laboratory microwave oven
- Sputter coater
- Glow discharger
- High-pressure freezer
- Freeze substitution machine
- Critical-point dryer

Personnel

- David Belnap, Director
- Nancy Chandler, Senior Laboratory Specialist
- Linda Nikolova, Senior Laboratory Specialist
- Jared Stratton, Technician
- Megan Kent, Technician
- Shiane Escobedo, Technician

2013 Annual Update

New Equipment

- JEOL 1400, installed beginning 19 Aug 2013.

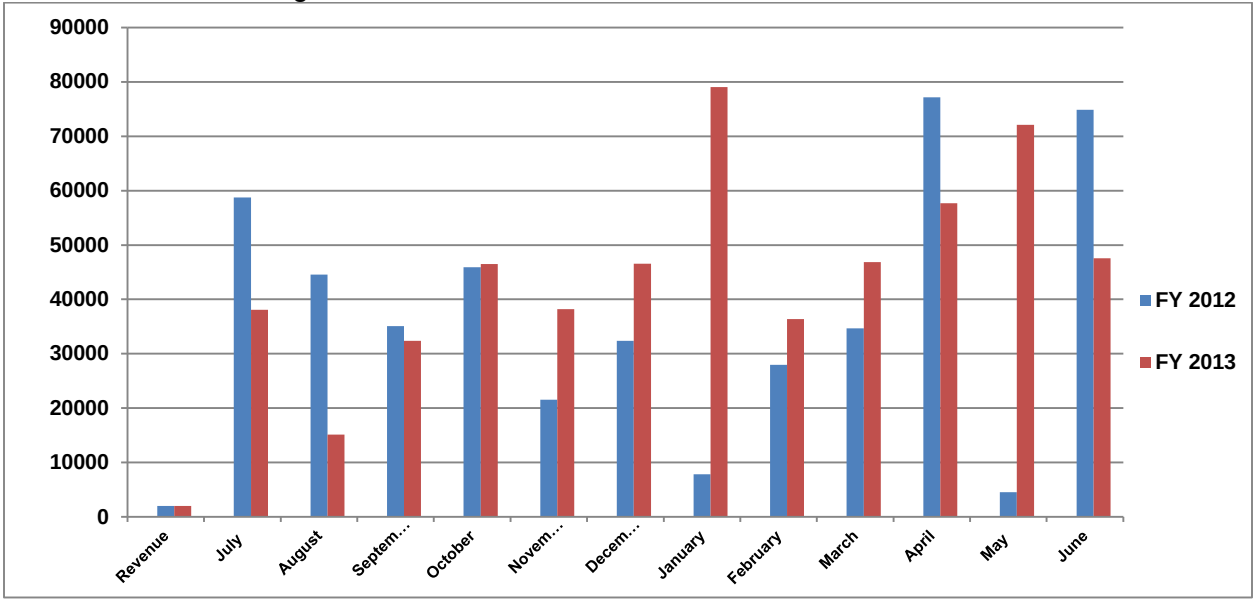
New Services

- In April of 2013, regular training was offered for specimen processing and microscope usage.

- The Electron Microscopy Core Facility is transitioning to the Sorenson Molecular Biotechnology Building (USTAR) this year.

Revenue/Expenses

- VP of Research Support: $130,000
- Total FY13 revenue: $555,468
- Total FY13 expenses: $596,460
- FY13 projected moving expenses of $100,00 to be paid in FY14
- FY13 revenue generated from services:



Advisory Board Committee

Last meeting date: Interactions throughout the year, particularly with Adam Frost

- Adam Frost, Assistant Professor, Department of Biochemistry
- Erik Jorgensen, Distinguished Professor, Department of Biology
- Mary Bronner, Professor, Department of Pathology

Addendum

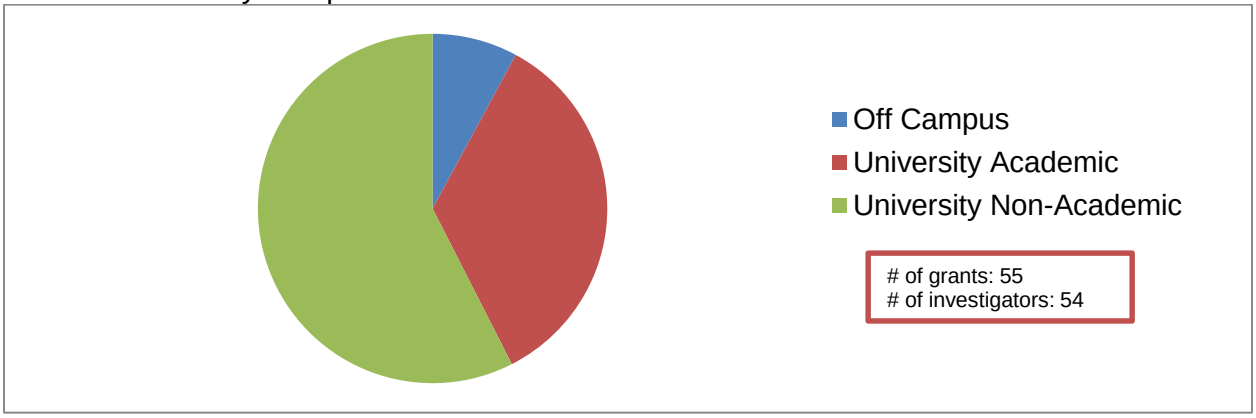
- Faculty Oversight Committee Guidelines

http://cores.utah.edu/wp-content/uploads/2015/09/Faculty-Advisory-Committee-Responsibilities-2.pdf

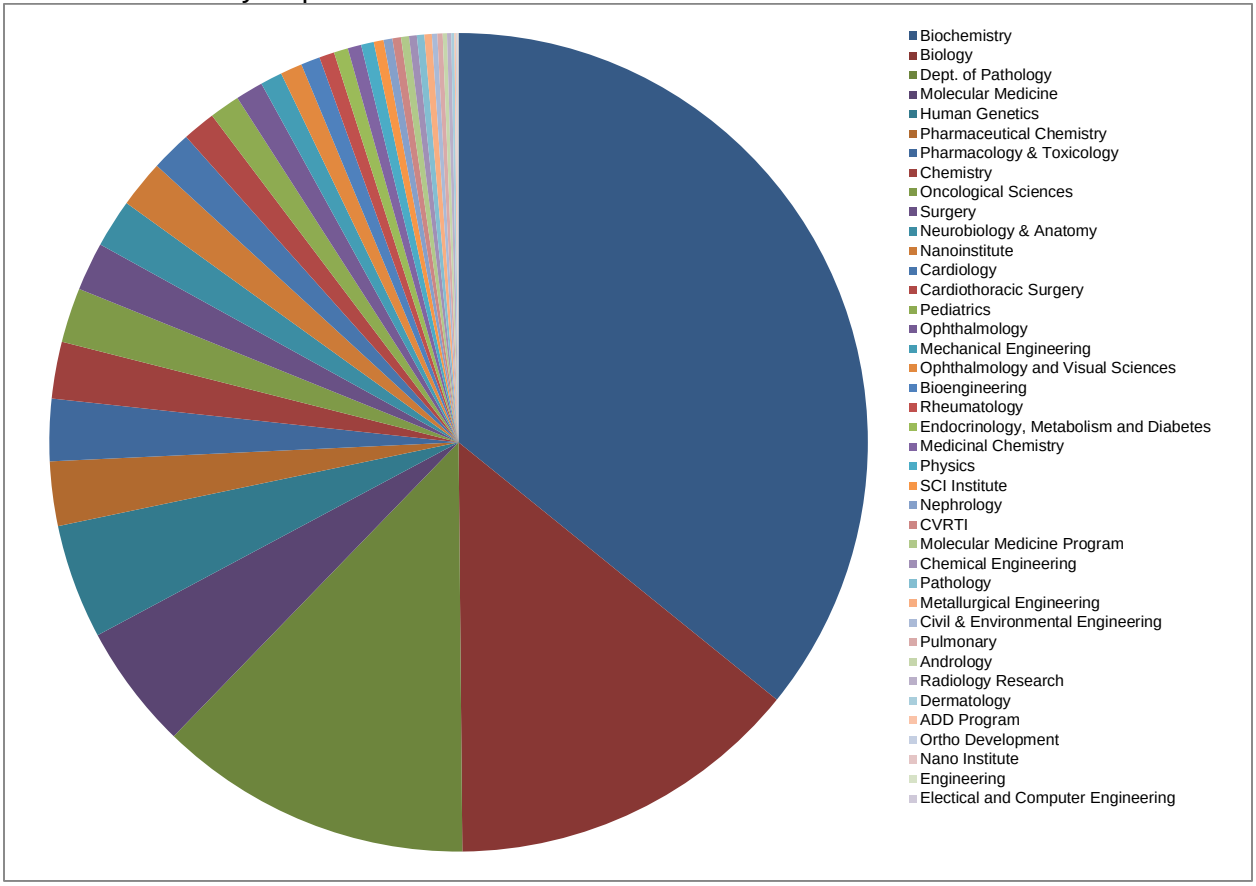
FY13 Scientific Impact

Research Support

- Revenue by Campus Affiliation



- Revenue by Department



- Top Users

1	ARUP	
2	Scripps	Off-Campus
3	Wesley Sundquist	DHHS/NIH/NIAID R01 A151174 NIH 4R37A104505-11
4	St. John's	Off-Campus
5	Dale Abel	NIH R01 HL108379-02
6	Agnes Ostafin	Amendment II LLC .10028425
7	Bryan Welm	R01CA140296-04
8	Wolfgang Baehr	NIH EY008123-24A1
9	Jody Rosenblatt	NIH R01GM102169-01
10	Ivor Benjamin	NIH DP10D006438-01

Publications

- Morita E, Sandrin V, McCullough J, Katsuyama A, Hamilton IB, Sundquist WI. ESCRT-III Protein Requirements for HIV-1 Budding. Cell Host Microbe. 2011; 9:235-242.
- Brandman O, Stewart-Ornstein J, Wong D, Larson A, Williams CC, Li GW, Zhou S, King D, Shen PS, Weibezahn J, Dunn JG, Rouskin S, Inada T, Frost A, Weissman JS. A Ribosome-Bound Quality Control Complex Triggers Degradation of Nascent Peptides and Signals Translation Stress. Cell. 2012; 151:1042-1054.
- Jiang H, Schwertz H, Schmid DI, Jones BB, Kriesel J, Martinez ML, Weyrich AS, Zimmerman GA, Kraiss LW. Different mechanisms preserve translation of programmed cell death 8 and JunB in virus-infected endothelial cells. Arterioscler Thromb Vasc Biol. 2012 Apr; 32(4):997-1004.

- Lin J, Cheng N, Hogle JM, Steven AC, Belnap DM. Conformational Shift of a Major Poliovirus Antigen Confirmed by Immuno-Cryogenic Electron Microscopy. J. Immunol. 2013; 191:884-891.
- Zhang R, Luo K, Yang J, Sima M, Sun Y, Janát-Amsbury MM, Kopeček J. Synthesis and evaluation of a backbone biodegradable multiblock HPMA copolymer nanocarrier for the systemic delivery of paclitaxel. J Control Release. 2013 Feb; 166(1):66-74.
- Pan H, Sima M, Miller SC, Kopečková P, Yang J, Kopeček J. Efficiency of high molecular weight backbone degradable HPMA copolymer-prostaglandin E1 conjugate in promotion of bone formation in ovariectomized rats. Biomaterials. 2013 Sep; 34(27):6528-38. Epub 2013 Jun 2.
- Lin CY, Javadi M, Belnap DM, Barrow J, Pitt WG. Ultrasound sensitive eLiposomes containing doxorubicin for drug targeting therapy. Nanomedicine: Nanotechnology, Biology and Medicine. 2013; in press.

Flow Cytometry Core Facility

Overview

The Flow Cytometry Core Facility offers quantitative, multiparameter fluorescence analysis and cell sorting services that assists over 80 internal investigators in addition to a subset of industry clients. The expertise and instrumentation to perform most flow cytometric assays that have been described in the literature are available within the expertise of the collective personnel and the physical resources of the Flow Cytometry Core Facility. The Flow Cytometry Core Facility is unique in the fact that it offers investigators the entire spectrum of cytometric experiment management, if desired, all the way from initial design consultation to the creation of graphics for publication.

Services

The assays offered by the facility range from routine cell cycle analysis and immunophenotyping to complex multi-laser applications and high speed cell sorting. Examples of the assays available include, but are not limited to the following:

- DNA content/cell cycle measurement
- Immunofluorescence analyses
- Characterization of cell populations based on scattered light intensity measurements and autofluorescence
- Cell sorting including viable, sterile cell sorting
- Intracellular calcium flux
- A range of apoptosis assays
- Fluorescence Resonance Energy Transfer (FRET)
- Nanoparticle characterization
- Bivariate and univariate chromosome analysis
- Receptor-ligand interactions
- Cell proliferation studies including BrdU incorporation and CFSE tracking
- Viability assays (membrane exclusion and metabolic viability)
- Various function assays including oxidative metabolism, neutrophil function (oxidative burst, phagocytosis) cytoplasmic pH, membrane potential
- Kinetic analyses
- Signal transduction pathway analyses (simultaneous assessment of multiple intracellular phosphorylated epitopes combined in complex multi-color assays)
- Sample preparation and staining

Consultation and training is provided in order to define projects in the early stages of development to make optimal and efficient use of flow cytometry. The staff will prepare samples including staining, data collection, quality control, data analysis/interpretation, and creation of graphics. Alternatively, if the investigator chooses, the facility will solely provide consultation on any of the above so that the research is entirely in the hands of the investigator.

Equipment

Sorters

- BD FACSAria
- Propel Labs Avalon

Analyzers

- BD FACSCanto
- Cytek DxP
- BD FACScan

Personnel

- James Marvin, Director
- Chris Leukel, Senior Laboratory Specialist

2013 Annual Update

New Equipment

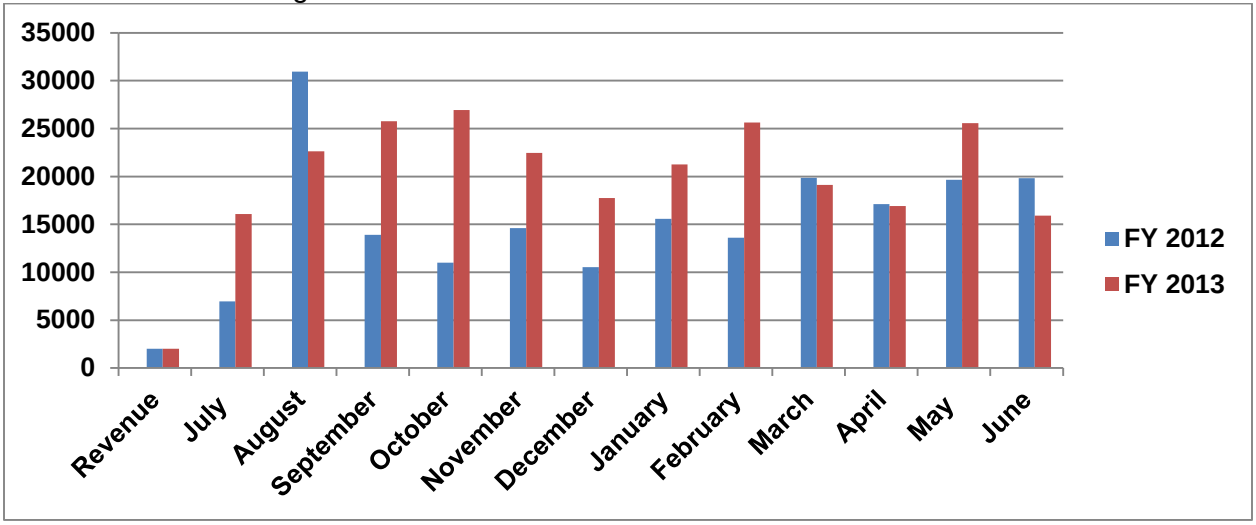
- In October of 2012, the Flow Cytometry Core Facility purchased the Propel Labs Avalon Sorter.
- In March of 2013, the Flow Cytometry Core Facility received an Internal Equipment Grant award to purchase a BD FACScan upgrade (Cytek DXP). The analyzer was installed in April.
- The Flow Cytometry Core Facility submitted an NIH S-10 award application to purchase an Imagestream Mark II, an analyzer that provides a crossover platform that enables high throughput quantitative fluorescent analysis while simultaneously providing an array of morphological and fluorescent localization information on a cell-by-cell basis. The grant is currently under review.

New Services

- As this is an instrumentation core facility, new services are more aptly focused on increased capacity. With the addition of the new cell sorter the core facility has doubled cell-sorting capacity.
- The DXP now offers additional lasers and color capacity that will allow more high end experimentation and greater flexibility between instruments.

Revenue/Expenses

- VP of Research Support: $0
- Total FY13 revenue: $225,986
- Total FY13 expenses: $221,048
- FY13 revenue generated from services:



Advisory Board Committee

Last meeting date: August 27, 2013

- Ryan O'Connell, Assistant Professor, Pathology
- Thomas O'Hare, Associate Professor, Hematology
- Gerald Spangrude, Professor, Hematology
- Bryan Welm, Assistant Professor, Oncological Sciences
- Matthew Williams, Assistant Professor, Pathology
- Charles Goolsby, Professor of Pathology, Northwestern University

Addendum

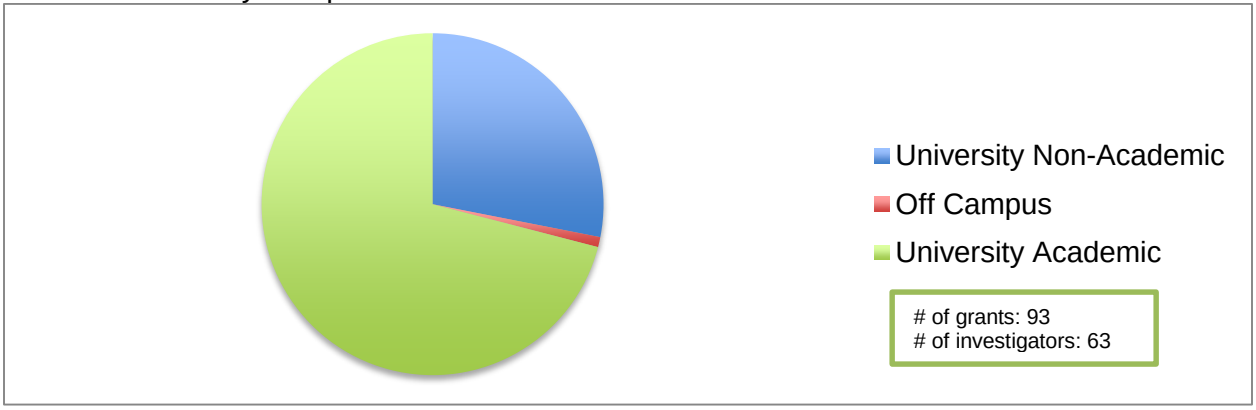
- Faculty Oversight Committee Guidelines

http://cores.utah.edu/wp-content/uploads/2015/09/Faculty-Advisory-Committee-Responsibilities-2.pdf

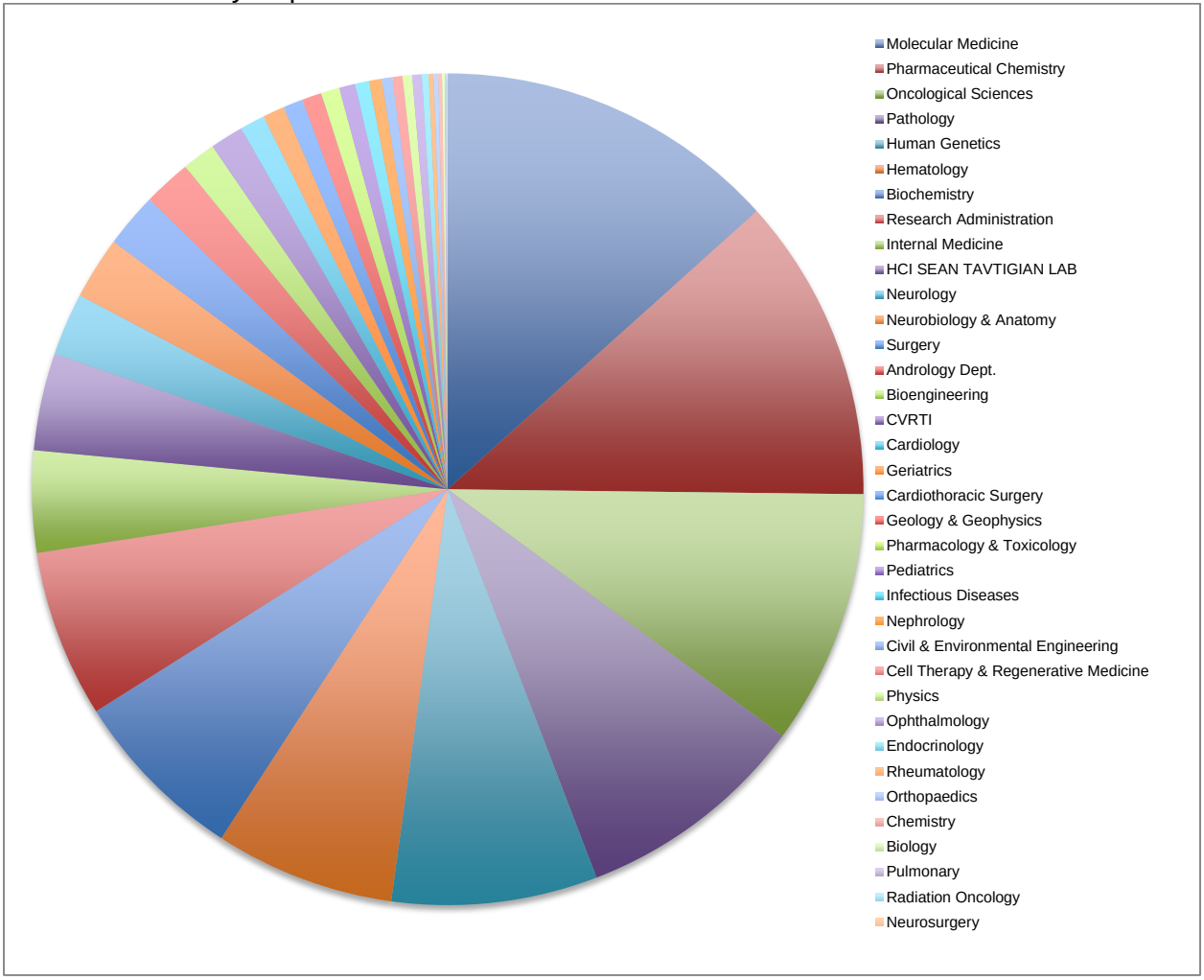
FY13 Scientific Impact

Research Support

- Revenue by Campus Affiliation



- Revenue by Department



- Top Users

1	ARUP	
2	Fenghuang Zhan	Leukemia & Lymphoma Society
3	Vicente Planelles	NIH R01 A1087508-02
4	Michael Deininger	Leukemia & Lymphoma Society
5	Sean Tavtigian	NIH R01CA155767-01A1
6	Wesley Sundquist	NIH P50GM082545 DHHS/NIH/NIAID R01 A151174
7	Andrew Weyrich	NIH 1U54HL112311-01 NIH 5R01H1066271
8	Carol Lim	NIH 5R01CA151847 NIH R01CA129528-01A1 NIH 1R01CA151849-01
9	Josef Prachal	Leukemia & Lymphoma Society
10	Gabrielle Kardon	March of Dimes NIH R01HD053728-06

Publications

- Maddox J, et al. Transcription factor Oct1 is a somatic and cancer stem cell determinant. PLoS genetics 8, 2012; e1003048.
- Lee Y, et al. Human erythropoietin gene delivery using an arginine-grafted bioreducible polymer system. Molecular therapy: the journal of the American Society of Gene Therapy. 2012 Jul; 20:1360.
- Lochhead RB, et al., Endothelial cells and fibroblasts amplify the arthritogenic type I IFN response in murine Lyme disease and are major sources of chemokines in Borrelia burgdorferi-infected joint tissue. Journal of immunology. 2012 Sep;189:2488.
- Constance JE, Woessner DW, Matissek KJ, Mossalam M, Lim CS. Enhanced and selective killing of chronic myelogenous leukemia cells with an engineered BCR-ABL binding protein and imatinib. Molecular pharmaceutics. 2012 Nov; 9:3318.
- Jones CF, et al. Cationic PAMAM dendrimers aggressively initiate blood clot formation. ACS nano. 2012 Nov; 6:9900.
- Davis JR, Mossalam M, Lim CS. Utilizing the estrogen receptor ligand-binding domain for controlled protein translocation to the insoluble fraction. Pharmaceutical research. 2012 Dec; 29:3455.
- Wee YS, Roundy KM, Weis JJ, Weis JH. Interferon-inducible transmembrane proteins of the innate immune response act as membrane organizers by influencing clathrin and v-ATPase localization and function. Innate immunity. 2012 Dec; 18:834.
- Huffaker TB, et al. Epistasis between microRNAs 155 and 146a during T cell-mediated antitumor immunity. Cell reports. 2012 Dec; 2:1697.
- Woessner DW, Lim CS. Disrupting BCR-ABL in combination with secondary leukemia-specific pathways in CML cells leads to enhanced apoptosis and decreased proliferation. Molecular pharmaceutics. 2013 Jan; 10:270.
- Pioli, PD, Dahlem TJ, Weis JJ, Weis JH. Deletion of snai2 and snai3 results in impaired physical development compounded by lymphocyte deficiency. PloS one 8. 2013; e69216.
- Manning J, et al. Vitamin C Promotes Maturation of T-Cells. Antioxidants & redox signaling, 2013 Feb.
- Hu R, Wallace J, Dahlem TJ, Grunwald DJ, O'Connell RM. Targeting human microRNA genes using engineered Tal-effector nucleases (TALENs). PloS one 8, e63074 (2013).

- Boehm D, et al., BET bromodomain-targeting compounds reactivate HIV from latency via a Tat-independent mechanism. Cell cycle. 2013 Feb; 12: 452.
- Debnath I, Roundy KM, Pioli PD, Weis JJ, Weis JH. Bone marrow-induced Mef2c deficiency delays B-cell development and alters the expression of key B-cell regulatory proteins. International immunology. 2013 Feb. 25:99.
- Gormley AJ, et al., Plasmonic photothermal therapy increases the tumor mass penetration of HPMA copolymers. Journal of controlled release: official journal of the Controlled Release Society. 2013 Mar; 166:130.
- Herd H, et al., Nanoparticle geometry and surface orientation influence mode of cellular uptake. ACS nano. 2013 Mar; 7:1961.
- Davis JR, Mossalam M, Lim CS. Controlled access of p53 to the nucleus regulates its proteasomal degradation by MDM2. Molecular pharmaceutics. 2013 Apr; 10:1340.
- Franks Z et al., Methicillin-resistant Staphylococcus aureus-induced thrombo-inflammatory response is reduced with timely antibiotic administration. Thrombosis and haemostasis. 2013 Apr; 109:684.
- Reaz S, Mossalam M, Okal A, Lim CS. A single mutant, A276S of p53, turns the switch to apoptosis. Molecular pharmaceutics. 2013 Apr; 10:1350.
- Florinas S, Nam HY, Kim SW. Enhanced siRNA delivery using a combination of an arginine-grafted bioreducible polymer, ultrasound, and microbubbles in cancer cells. Molecular pharmaceutics. 2013 May; 10:2021.
- Hu R, et al., MicroRNA-155 confers encephalogenic potential to Th17 cells by promoting effector gene expression. Journal of immunology. 2013 Jun; 190:5972.
- Donius LR, Handy JM, Weis JJ, Weis JH. Optimal germinal center B cell activation and T-dependent antibody responses require expression of the mouse complement receptor cr1. Journal of immunology. 2013 Jul; 191:434.
- Corbin AS, et al. KIT signaling governs differential sensitivity of mature and primitive CML progenitors to tyrosine kinase inhibitors. Cancer research. 2013 Jul.
- Eyob H, et al., Inhibition of ron kinase blocks conversion of micrometastases to overt metastases by boosting antitumor immunity. Cancer discovery. 2013 Jul; 3:751.
- Larson N, et al. Biodegradable multiblock poly(N-2-hydroxypropyl) methacrylamide gemcitabine and paclitaxel conjugates for ovarian cancer cell combination treatment. International journal of pharmaceutics. 2013 Jul.
- Constance JE, Despres SD, Nishida A, Lim CS. Selective targeting of c-Abl via a cryptic mitochondrial targeting signal activated by cellular redox status in leukemic and breast cancer cells. Pharmaceutical research. 2013 Aug; 29:2317.
- Miller GD, Woessner DW, Sirch MJ, Lim CS. Multi-Domain Targeting of Bcr-Abl by Disruption of Oligomerization and Tyrosine Kinase Inhibition: Towards Eradication of Cml. Molecular pharmaceutics, 2013 Aug.
- Moos PJ, et al. Transcriptional responses of human aortic endothelial cells to nanoconstructs used in biomedical applications. Molecular pharmaceutics. 2013 Aug; 10:3242.
- Larson N, Gormley A, Frazier N, Ghandehari H. Synergistic enhancement of cancer therapy using a combination of heat shock protein targeted HPMA copolymer-drug conjugates and gold nanorod induced hyperthermia. Journal of controlled release: official journal of the Controlled Release Society. 2013 Aug;170:41.

Genomics Core Facility

Overview

The Genomics Core Facility offers a variety of genetic analysis services including full service genotyping, from PCR setup through analysis, and assistance to researchers performing genotyping projects. The Genomics Core Facility has commercial and custom sets of fluorescently labeled microsatellite markers that can be used for whole genome linkage studies and fine mapping projects. Researchers can select genes or regions of interest and the core facility designs and optimizes the PCR primers, performs the initial PCR, runs the sequencing reactions, and analyzes the data using SoftGenetics Mutation Surveyor software.

Services

Fragment Analysis

- Full service genotyping from PCR setup through analysis
- Capillary Runs
- Microsatallite Instability
- Loss of Heterozygosity
- Multiplex Ligation Dependent Amplification

SNP Genotyping

- Taqman SNP Genotyping
- Illumina GoldenGate SNP Genotyping
- Whole-Genome Genotyping and Copy Number Variation Analysis
- Methylation Analysis
- Open Array Genotyping

DNA Sequencing

- Mutation Detection

Real Time PCR

- Gene Expression

Equipment

- One AB 7900HT systems
- Illumina BeadXpress Reader
- Illumina iScan
- Quantstudio 12k Flex Real-Time PCR System

Personnel

- Derek Warner, Director
- Michael Klein, Manager

2013 Annual Update

New Equipment

- In December 2012, the facility purchased a new centrifuge as well as a QuantStudio 12k Flex instrument to provide enhanced support for real-time PCR in 384-well format and to add Open Array format to the offerings of the core.

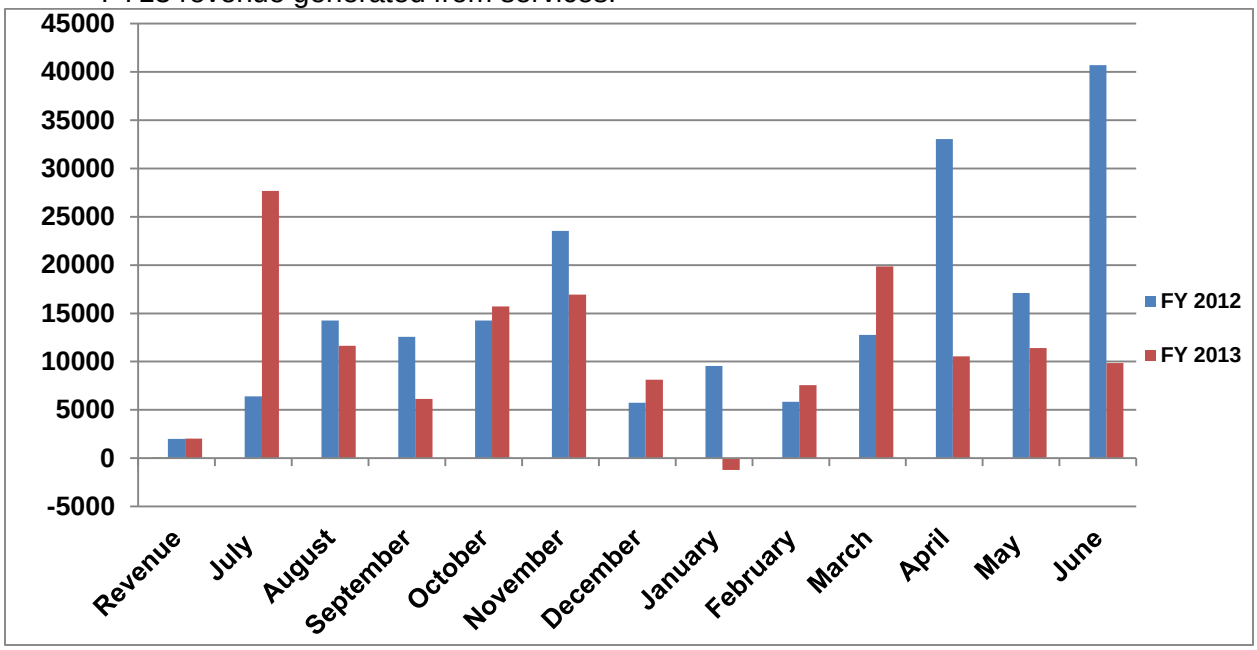
New Services

- Support for the QuantStudio 12k Flex is now available

Revenue/Expenses

- VP of Research Support: $0
- Total FY13 revenue: $144,223
- Total FY13 expenses: $94,934

- FY13 revenue generated from services:



Advisory Board Committee
Last meeting date: March 28, 2013

- Gerald Krueger, Professor, Dermatology
- Deborah Neklason, Research Associate Professor, Huntsman Cancer Institute
- Nicola Camp, Professor, Genetic Epidemiology

Addendum

- Faculty Oversight Committee Guidelines
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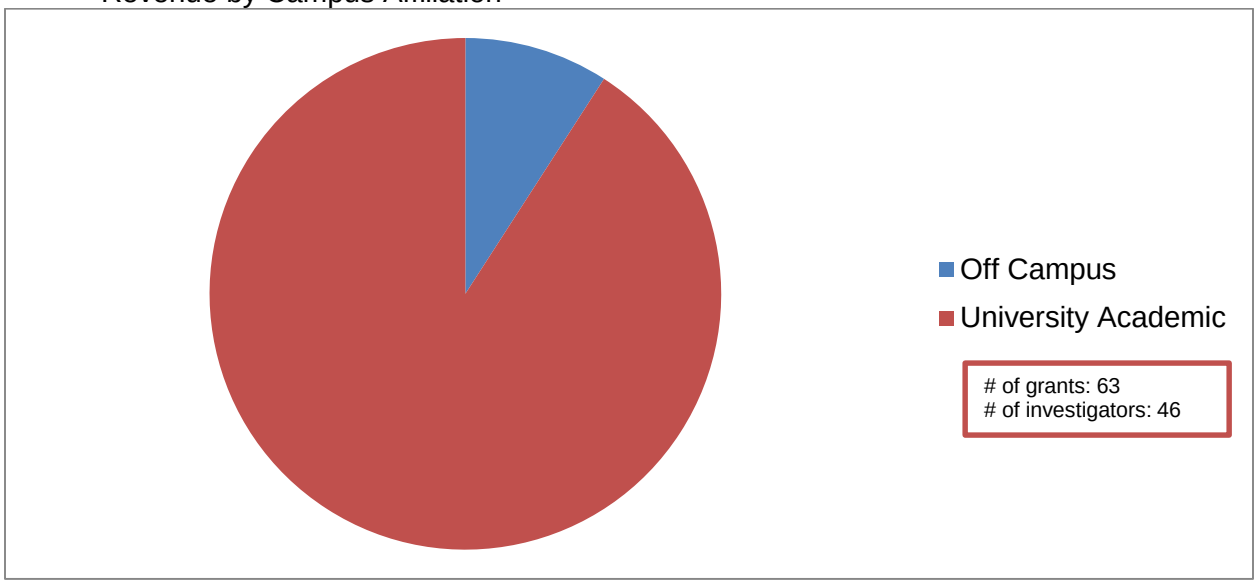
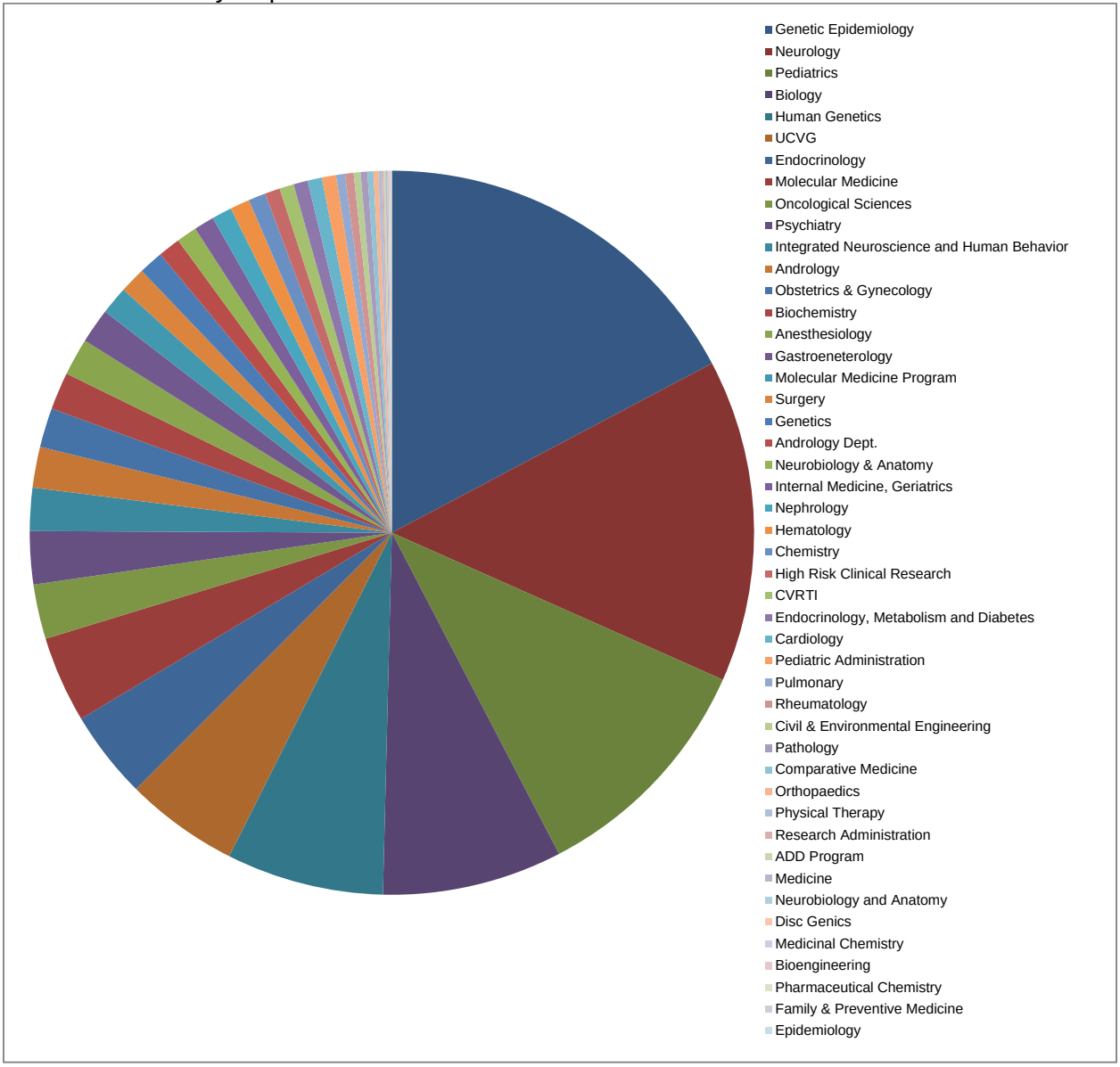
FY13 Scientific Impact
Research Support

- Revenue by Campus Affiliation



- Revenue by Department



- Top Users

1	Stefan Pulst	NIH R01NS033123-09A2
2	Nicola Camp	R01HD061821 AVON FOUNDATION
3	Steve Hunt	NIH R01HL090668 NIH 5R01DK093151-02
4	University of Arizona	Off-Campus
5	Don McClain	NIH R01DK081842-02
6	Cannon-Albright, Lisa	DOD W81XWH-11-1-0342
7	Grant Robinson	Off-Campus
8	Dale Abel	NIH R01 HL108379-02
9	Dana Carroll	NIH 2R01 GM078571-05
10	Robert Weiss	University of Illinois

Publications

- White AT, Light AR, Hughen RW, Vanhaitsma TA, Light KC. Differences in metabolite-detecting, adrenergic, and immune gene expression following moderate exercise in multiple sclerosis, CFS, and healthy controls. Psychosomatic Medicine. 2012; 74: 46-54.
- Light KC, White AT, Tadler S, Iacob E, Light AR. Genetics and Gene Expression Involving Stress and Distress Pathways in Fibromyalgia with and without Comorbid Chronic Fatigue Syndrome. Light Pain Res Treat. 2012; 2012:427869.
- Zinkhan EK, Fu Q, Wang Y, Yu X, Callaway CW, Segar JL, Scholz TD, McKnight RA, Joss-Moore L, Lane RH. Maternal Hyperglycemia Disrupts Histone 3 Lysine 36 Trimethylation of the IGF-1 Gene. J Nutr Metab. 2012; 2012:930364
- Light, AR, Bateman L, Jo D, Hughen RW, Vanhaitsma TA, White AT, Light KC. Gene expression alterations at baseline and following moderate exercise in patients with Chronic Fatigue Syndrome, and Fibromyalgia Syndrome. Light J Intern Med. 2012 Jan; 271(1): 64-81.
- Ishiwata T, Orosz A, Wang X, Mustafi SB, Pratt GW, Christians ES, Boudina S, Abel ED, Benjamin IJ. HSPB2 is dispensable for the cardiac hypertrophic response but reduces mitochondrial energetics following pressure overload in mice. PLoS One. 2013; 7(8):e42118.
- Lin Z, Torres JP, Ammon MA, Marett L, Teichert RW, Reilly CA, Kwan JC, Hughen RW, Flores M, Tianero MD, Peraud O, Cox JE, Light AR, Villaraza AJ, Haygood MG, Concepcion GP, Olivera BM, Schmidt EW. A bacterial source for mollusk pyrone polyketides. Chem Biol. 2013 Jan 24; 20(1):73-81.
- Limphong P, Zhang H, Christians E, Liu Q, Riedel M, Ivey K, Cheng P, Mitzelfelt K, Taylor G, Winge D, Srivastava D, Benjamin I. Modeling human protein aggregation cardiomyopathy using murine induced pluripotent stem cells. Stem Cells Transl Med. 2013 Mar; 2(3):161-6.

Machine Shop Core Facility

Overview

The Machine Shop Core Facility is equipped with a full complement of lathes, drills, mills, welders, grinders, and CNC systems, staffed by experienced machinists capable of turning an idea into reality. The Machine Shop machinists provide consultation to assist with the design process for products ranging from precise surgical instruments to large-scale testing equipment. The Machine Shop machinists are capable of fabricating and repairing devices and parts out of carbon-steel, stainless steel, brass, copper, and plastics as well as other materials depending on the requirements of design specifications.

Services

- Device Design/Engineering
- Milling
- Turning
- Drilling
- Grinding
- Soldering
- Welding of steel, aluminum and other types of fabrication
- Sawing
- Repair and Maintenance

Equipment

- CNC Mills
- Traditional Mills
- Lathes
- Grinders
- Welders
- Wood Working Equipment
- Planers
- Band Saws
- Table Saws
- Sharpening Equipment
- Polishing Equipment

Personnel

- Kent Bachus, Director
- Ed Kinder, Manager/Machinist
- Kim Slusser, Machinist
- Barry Evans, Engineer

2013 Annual Update

New Equipment

- The Machine Shop Core Facility acquired a used CNC Mill that has been refabricated, restored, and put into service.

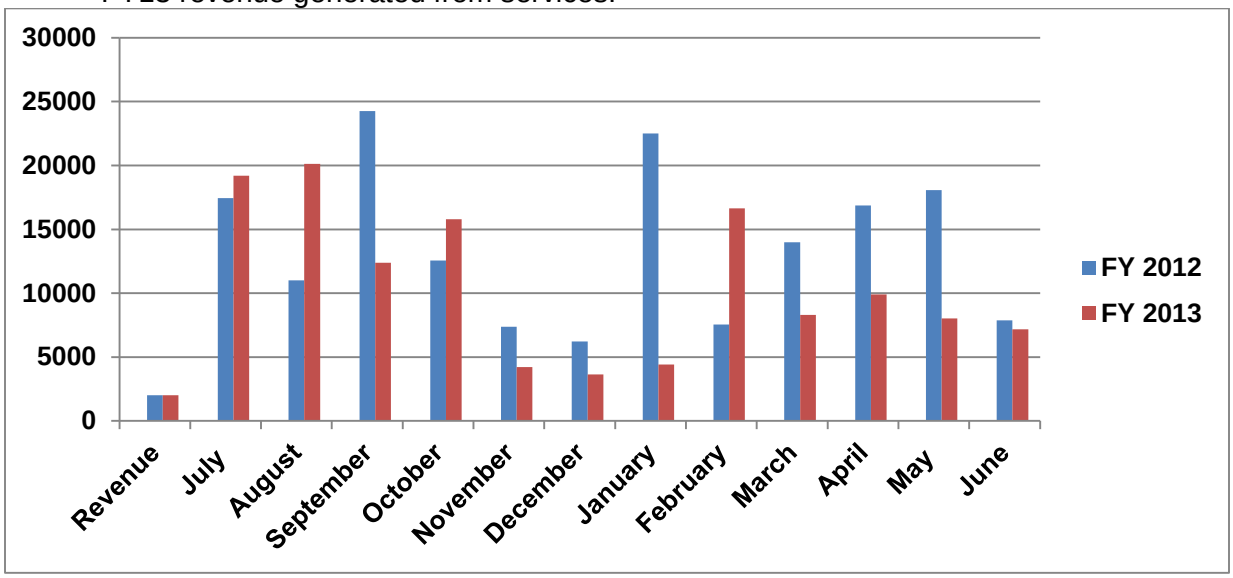
New Services

- The Machine Shop Core Facility now supplies improved plastic fabrication.

Revenue/Expenses

- VP of Research Support: $51,000
- Total FY13 revenue: $129,855
- Total FY13 expenses: $130,195

- Machine Shop began FY13 with a deficit balance of $38,000
- FY13 revenue generated from services:



Advisory Board Committee

- Pending

Addendum

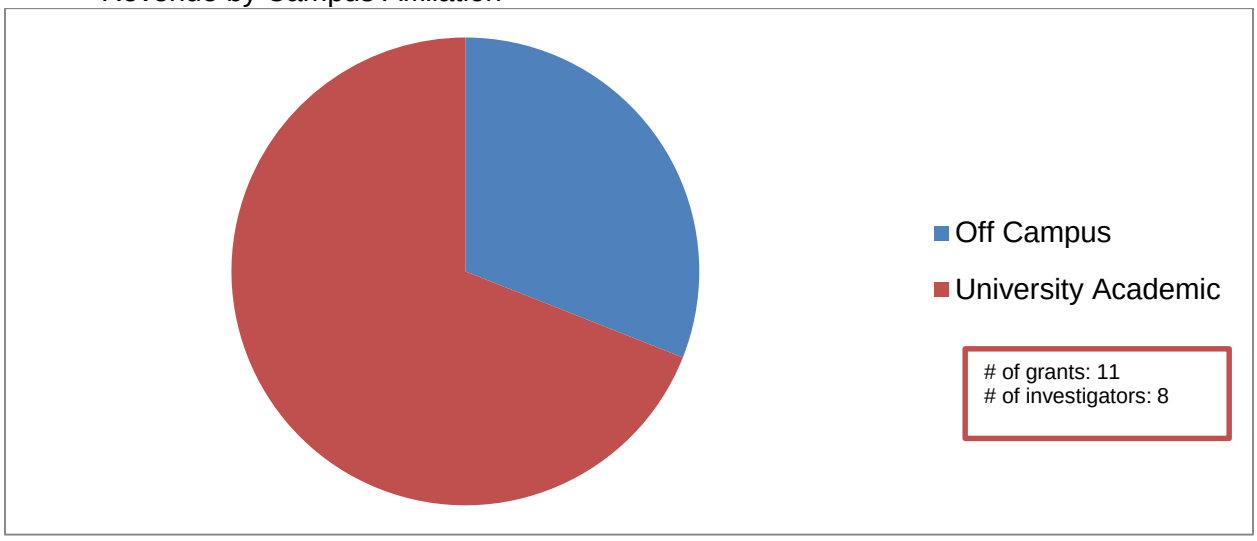
- Faculty Oversight Committee Guidelines

http://cores.utah.edu/wp-content/uploads/2015/09/Faculty-Advisory-Committee-Responsibilities-2.pdf

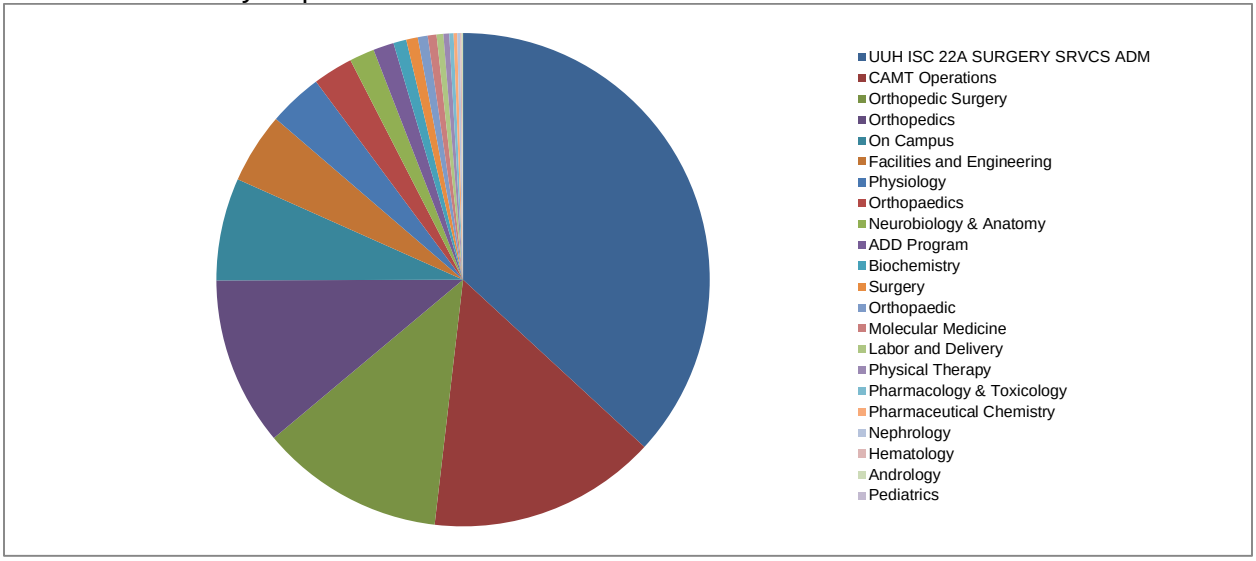
FY13 Scientific Impact

Research Support

- Revenue by Campus Affiliation



- Revenue by Department



- Top Users

1	Steve Andrues	University Hospital
2	Susan Hill	Off Campus
3	Steve Meisner	Off Campus
4	Myriad Genetics	Off Campus
5	Allison Sawyer	Off Campus
6	Brett Parkin	Off Campus
7	Ed Dudek	NIH 1R21NS079135-01
8	Jeff Parish	Off Campus
9	Kent Bachus	DJO Surgical
10	Steve White	NIH 5U01NS066991-03

Publications

- No publications that acknowledged the core were located from the last year.

Mass Spectrometry and Proteomics Core Facility

Overview

The Mass Spectrometry and Proteomics Core Facility is geared toward supporting proteomics research as well as providing basic mass spectrometry (MS) support for a broad range of research and sample types, such as polymers, natural products, small synthetic molecules, peptides, large intact proteins and nucleic acids. The facility is equipped with several high-performance mass spectrometers, including a state-of-the-art FTMS instrument (LTQ-FT; ThermoElectron), with nano-LC and nano-ESI ionization and a state-of-the-art Maldi/ToF/ToF instrument (UltrafleXtreme; Bruker Daltonics) with tissue-imaging capabilities. LC/MS/MS instruments in the lab are equipped with nano-LC, for ultimate sensitivity and chromatographic performance. The mission of this facility is to provide the highest quality mass spectrometry analyses for protein and other biomolecule investigations.

Services

A range of proteomics, FTMS, and general and tissue-imaging MS services are available. In addition, the facility periodically participates in an international proteomics proficiency evaluation conducted by the Association of Bimolecular Resource Facilities (ABRF) to ensure the competency of the facility compared with other leading proteomics laboratories for the structural analysis of proteins and peptides. The following services are provided to investigators:

Proteomics Services:

- Protein ID from SDS Gel
- Protein ID from Solution
- Protein ID from Complex Isolates in Solution and IP Pull-down Experiments
- Identification of Protein Modifications/Post-translational Modifications
- Intact Protein MW Analysis
- Peptide Screening with MS/MS (FTMS) and accurate mass de novo sequencing
- Disulfide Linkage Characterization
- Identification of Sulfur-containing peptides
- “Top-Down” and “Bottom-Up” Proteomics
- Protein Expression/Quantification Analysis
- Custom Database Searching

FTMS Services

- Accurate mass measurement-external calibration (Positive Ion)
- Accurate mass measurement-internal calibration (Positive Ion)
- Accurate mass measurement (Negative Ion)
- Peptide Sequencing with MS/MS and accurate mass de novo sequencing
- “Top-Down” Proteomics
- Identification of Sulfur-containing peptides
- High-resolution mass spectrometry (HR-MS) analysis

General MS Services

- ESI/MS
- ESI/MS/MS
- Nucleic Acids
- LC/MS
- LC/MS/MS
- Maldi/ToF/ToF
- Special Project/Method Development

Tissue-Imaging MS Services

- Cryostat Tissue Sectioning and Maldi Plate Setup

- Tissue Section Preparation and Setup
- Maldi/ToF Imaging of Tissue Sections
- Software Data Processing and Image Generation
- Software Data Processing and Image Generation-by User

Equipment

Mass Spectrometers

- LTQ-FT
- UltrafleXtreme
- LCQ-Deca
- Voyager DE-STR
- Quattro-II
- Q-ToF-II

HPLC Systems

- Two Eksigent 1D nanoLC systems
- One Eksigent 2D-Ultra system
- Two HP1100 systems
- One Shimadzu 10ADvp system
- Cryostat system
- One Leica CM1950 cryostat system

Personnel

- Chad Nelson, Director
- Krishna Parsawar, Assistant Director

2013 Annual Update

New Equipment

- The Mass Spectrometry and Proteomics Core Facility submitted an NIH S-10 award application to purchase an Orbitrap mass spectrometer. If awarded, the new mass spectrometer will replace two of the older instruments at the core facility and provide additional high-performance needs to 12 major users and 40-50 minor users annually. The grant is currently under review.
- In May of 2013, the Mass Spectrometry and Proteomics Core Facility received an Internal Equipment Grant award to purchase a cryostat to aid with tissue-imaging capabilities.

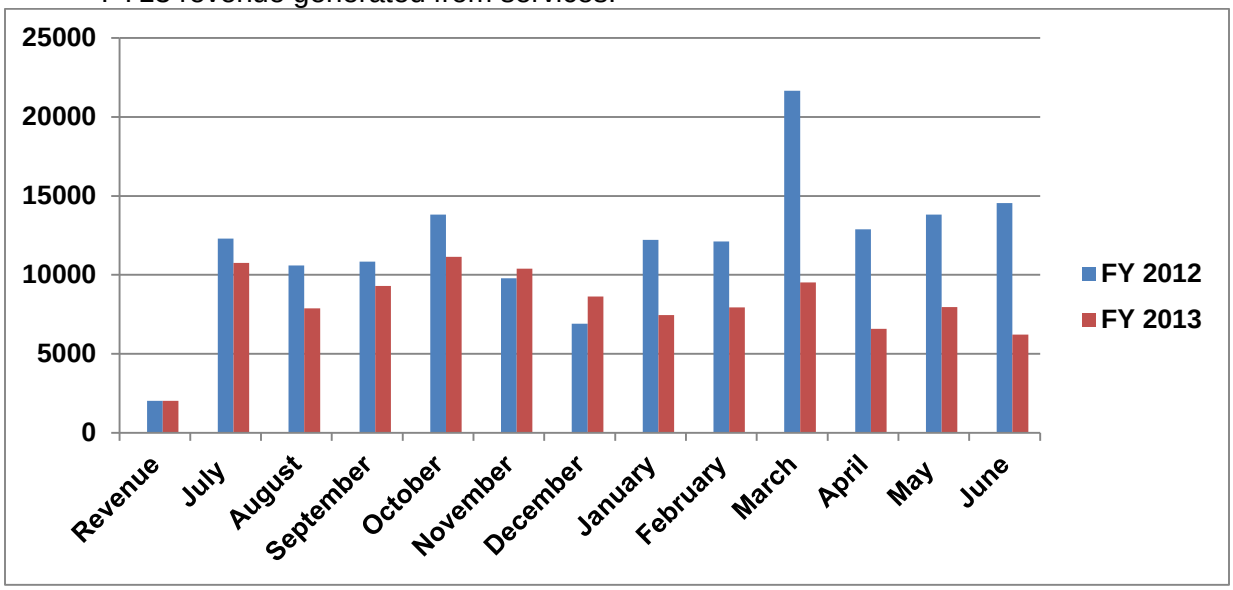
New Services

- New services performed by the facility include tissue sectioning and placement on target plates for tissue imaging.

Revenue/Expenses

- VP of Research Support: $122,500
- Total FY13 revenue: $103,780
- Total FY13 expenses: $268,341

- FY13 revenue generated from services:



Advisory Board Committee

Last meeting date: March 7, 2013

- Darrell Davis, Professor, College of Pharmacy
- Guy Zimmerman, Associate Chair, Internal Medicine
- Bradley Cairns, Professor, HCI

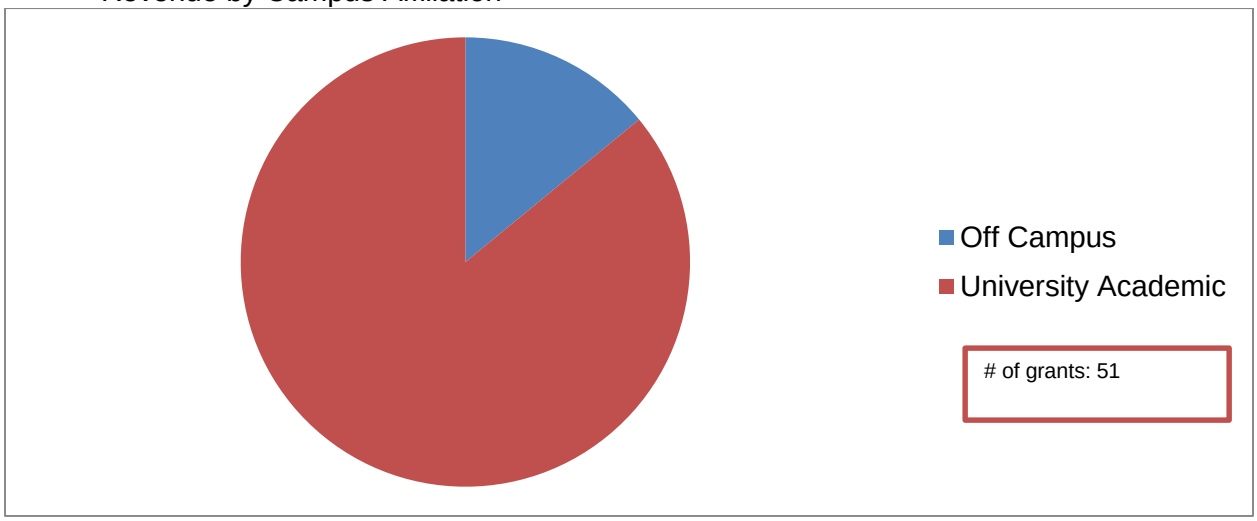
Addendum

- Faculty Oversight Committee Guidelines
  http://cores.utah.edu/wp-content/uploads/2015/09/Faculty-Advisory-Committee-Responsibilities-2.pdf

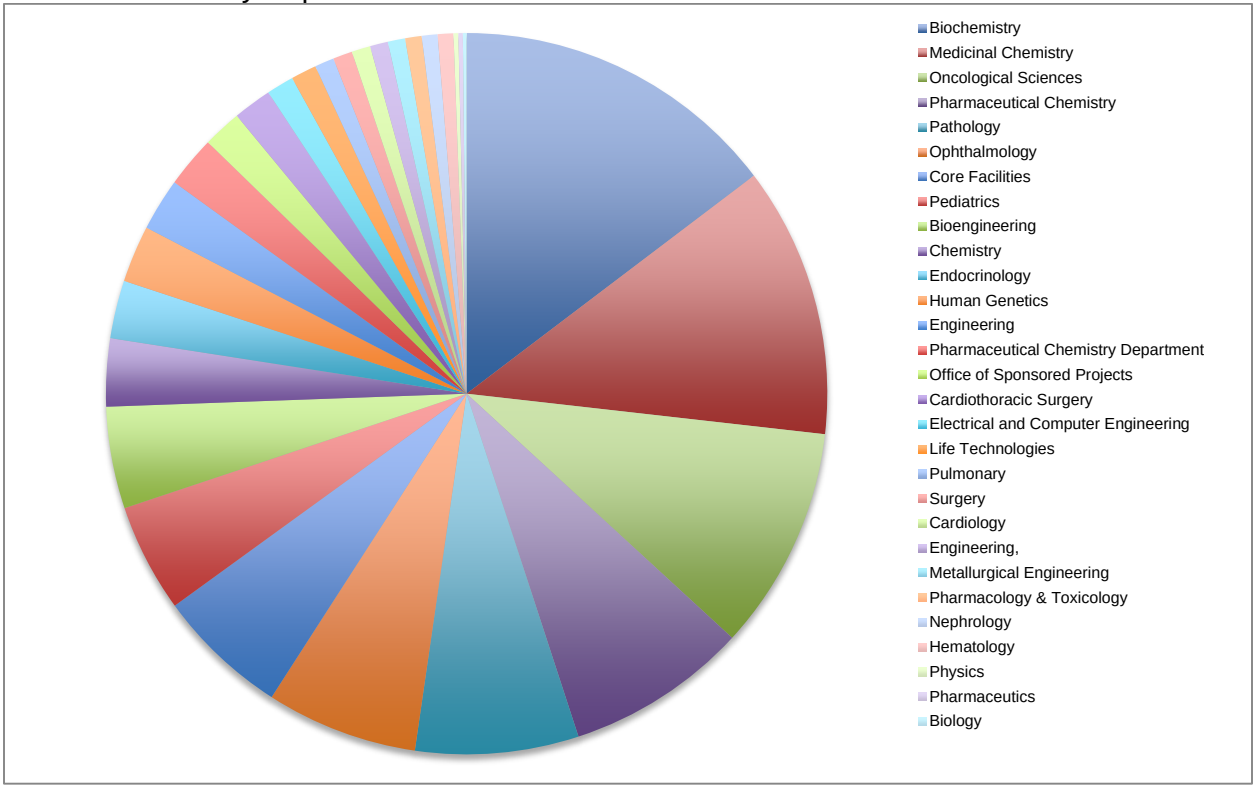
FY13 Scientific Impact

Research Support

- Revenue by Campus Affiliation



- Revenue by Department



- Top Users

1	Wes Sundquist	NIH R01 A151174
2	Jun Yang	NIH R01EY020853-02
3	Jindrich Kopecek	NIH R01CA132831-01
4	Patrick Kaiser	NIH R21A10719702
5	Jerry Kaplan/Diane Ward	NIH R37HL26922-27
6	Don McClain	NIH R01DK081842-02
7	Hari Vankayalapati	Off-Campus
8	David Vollmer	Off-Campus
9	Luis Sigal	Off-Campus
10	Paul Bernstein	R01EY011600-09

Publications

- No publications that acknowledged the core were located from the last year

Metabolic Phenotyping Core Facility

Overview

The Metabolic Phenotyping Core Facility offers several services to help investigators evaluate metabolic phenotypes in multiple model organisms. Services include mitochondrial bioenergetics (respirometry for tissue and isolated mitochondria, Seahorse XF24 for cells, isolated mitochondria and tissue slices), determination of whole animal energy expenditure using the Columbus Instruments Oxymax Lab Animal Monitoring System, determination of body composition by NMR, determination of circulating metabolite and hormone concentrations using the multiplexing technology (MAGPIX and Luminex 200), Body temperature measurements using telemetry (E-Mitter). The facility also offers services on more complex projects that require detailed in vivo metabolic phenotyping such as glucose and insulin tolerance tests and glucose clamps. In addition, the facility offers protocol consultation and data analysis as needed.

Services

- Mitochondrial Bioenergetics
- Metabolic chambers
- NMR
- Body temperature
- Biomarker quantification with the MAGPIX and Luminex 200.
- Multiplex assays
- Glucose and insulin tolerance tests
- Euglycemic-hyperinsulinemic clamps

Equipment

- Seahorse Flux (XF24) Analyzer
- Six Columbus Instruments metabolic chambers
- NMR
- E-Mitter
- Luminex MAGPIX
- Luminex 200 System

Personnel

- Sihem Boudina, Interim Director
- Shaobo Pei, Manager
- Robert Cooksey, Specialist
- Deborah Jones, Specialist

2013 Annual Update

New Equipment

- In June of 2013, the Metabolic Phenotyping Core Facility received via transfer The Luminex 200 Myltiplexing System that can do up to 100 analytes/well

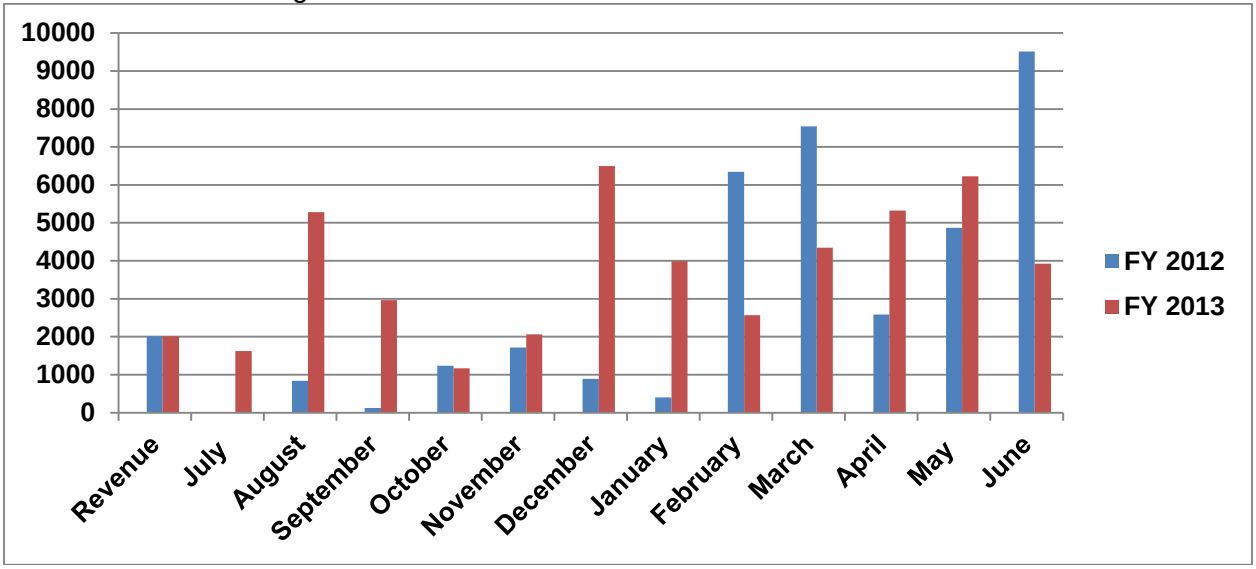
New Services

- The Metabolic Phenotyping Core can now offer remote body temperature and movement measurement in small rodents.

Revenue

- VP of Research Support: $71,500
- Total FY13 revenue: $45,982
- Total FY13 expenses: $130,205

- FY13 revenue generated from services:



Advisory Board Committee

Last meeting date: August 20, 2013

- Donald McClain, Professor, Endocrinology, Metabolism & Diabetes
- Jared Rutter, Professor, Biochemistry
- Carl Thummel, Professor, Human Genetics

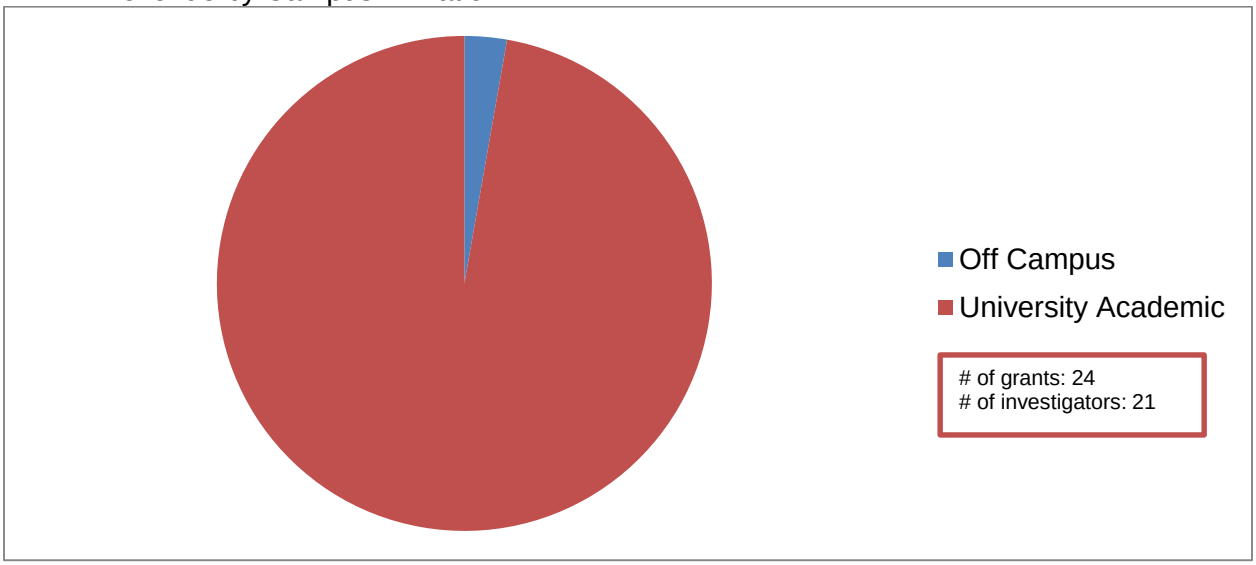
Addendum

- Faculty Oversight Committee Guidelines
  http://cores.utah.edu/wp-content/uploads/2015/09/Faculty-Advisory-Committee-Responsibilities-2.pdf

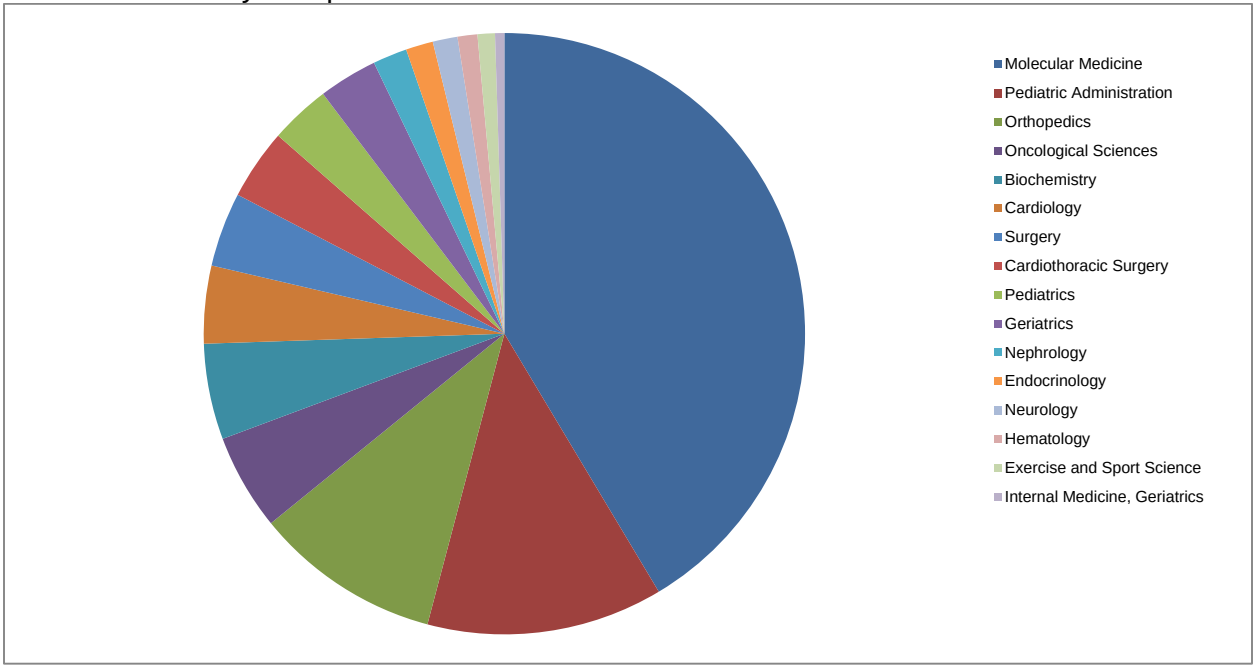
FY13 Scientific Impact

Research Support

- Revenue by Campus Affiliation



- Revenue by Campus Affiliation



- Top Users

1	Dean Li	NIH R01CA163970-01 NIH R01HL065648
2	Dale Abel	Benning Foundation
3	Sihem Boudina	NIH R37DK030534-29 NIH R01DK070947-06A1
4	Andy Weyrich	NIH 1U54HL112311-01
5	Jared Rutter	NSF R01GM087346 NIH R01GM094232-01
6	Kent Lai	NIH R01HD054744
7	Ivor Benjamin	Leducq Foundation
8	Melinda Angus-Hill	NIH RP01CA073992-12
9	Robert Eckel	Off-Campus
10	Amit Patel	Bio-Restorative Therapies

Publications

- Bricker DK, Taylor EB, Schell JC, Orsak T, Boutron A, Chen YC, Cox JE, Cardon CM, Van Vranken JG, Dephoure N, Redin C, Boudina S, Gygi SP, Brivet M, Thummel CS, Rutter J. A mitochondrial pyruvate carrier required for pyruvate uptake in yeast, Drosophila, and humans. Science. 2012 Jul 6; 337(6090): 96-100.
- Lee SH, Jouihan HA, Cooksey RC, Jones D, Kim HJ, Winge DR, McClain DA. Manganese supplementation protects against diet-induced diabetes in wild type mice by enhancing insulin secretion. Endocrinology. 2013 Mar;154(3):1029-38.
- Silva FJ, Holt D, Vargas V, Boudina S, Yockman J, Atkinson D, Grainger D, Revelo MP, Sherman W, Bull DA, Patel AN. Human Metabolically Active Brown Adipose Tissue Derived Stem Cells. *Stem Cells. 2013.* Submitted.

Metabolomics Core Facility

Overview

The Metabolomics Core provides analysis of metabolites found within a tissue, biological fluid, whole organism, culture or other biological source. Currently metabolomics is a comparative science; the core facility usually analyzes the differences found between biological samples that have been subjected to a treatment. This can be a genetic mutation, drug treatment, etc. Most analyses are relative: the core facility can only make judgments on individual metabolites such as comparing the relative amounts of succinate between a mutant and a wild type but not compare the levels of succinate and fumarate between the same group or between groups. No one method is fully capable of completely profiling the metabolome. To maximize the number of metabolites observed the core facility is equipped with three chemical analysis platforms, GC-MS, LC-MS and NMR.

Services

The Metabolomics Core's primary mission is the metabolomics profiling of biological samples including serum, urine, tissues, *Drosophila*, *C. elegans*, yeast and bacteria. The following metabolites can be analyzed from many biochemical pathways:

- Amino acids
- TCA cycle intermediates
- Organic acids including lactic acid and pyruvate
- Carbohydrates
- Nucleotides
- Lipids including sterols
- Di and tri peptides including glutathione

The Metabolomics Core processes every sample using two distinct but overlapping procedures, a targeted analysis and a non-targeted analysis. The targeted analysis is used to search every chromatogram for known metabolites. The non-targeted analysis uses data mining software to detect chromatographic peaks that are altered in two different conditions. This procedure is done with Principle Components Analysis (PCA) and Partial Least Squares-Discriminate Analysis (PLS-DA).

Equipment

Chemical Analysis Platforms:

- Waters GCT Premier gas chromatograph-mass spectrometer (GC-MS)
- Agilent 5973 gas chromatograph-quadrupole mass spectrometer (GC-MS)
- Agilent 6520 liquid chromatograph-quadrupole time of flight mass-spectrometer (LC-MS)
- Ionics EP10+ PE Sciex liquid chromatograph-triple quadrupole mass spectrometer (LC-MS)
- Varian 500 MHz NMR with data processed by the Chenomx software suite

Personnel

- James Cox, Director
- Ren Miao, Technician

2013 Annual Update

New Equipment

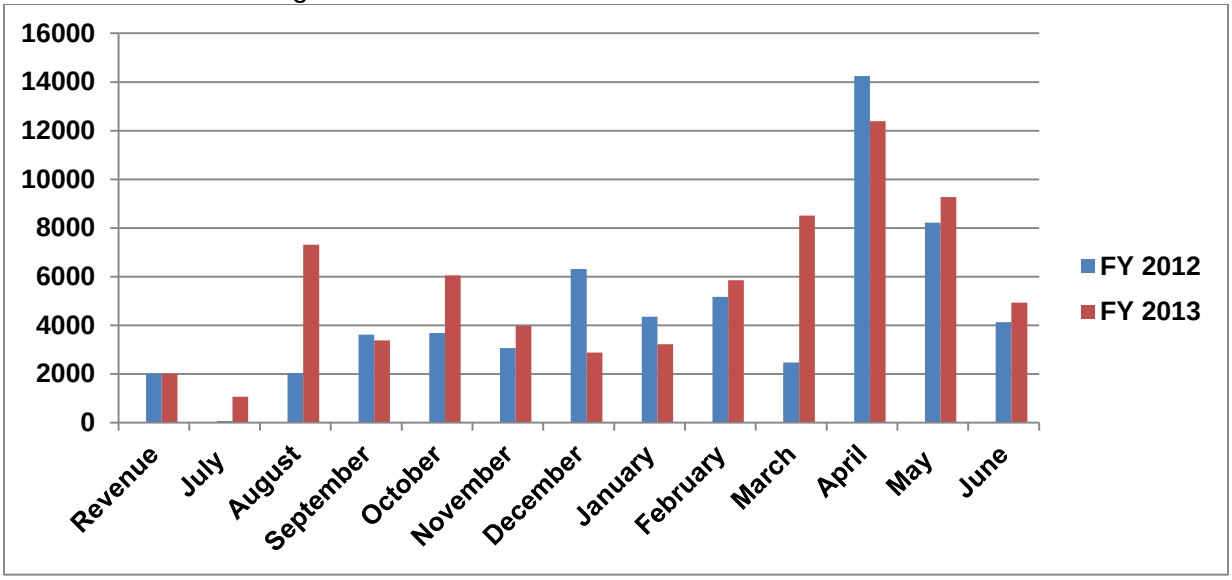
- The Metabolomics Core Facility received an NIH S-10 award to purchase an Agilent 6550 QTOF, which is a highly sensitive state of the art mass spectrometer. This grant was funded and the equipment is ordered.

New Services

- Full lipid profiling by LC-MS and stable isotope label flux analysis is in development.

Revenue

- VP of Research Support: $134,000
- Total FY13 revenue: $68,884
- Total FY13 expenses: $213,860
- FY13 revenue generated from services:



Advisory Board Committee

Last meeting date: February 20, 2013

- Dennis Winge, Professor, Hematology
- John Phillips, Research Associate Professor, Hematology
- Carl Thummel, Professor, Department of Human Genetics

Addendum

- Faculty Oversight Committee Guidelines
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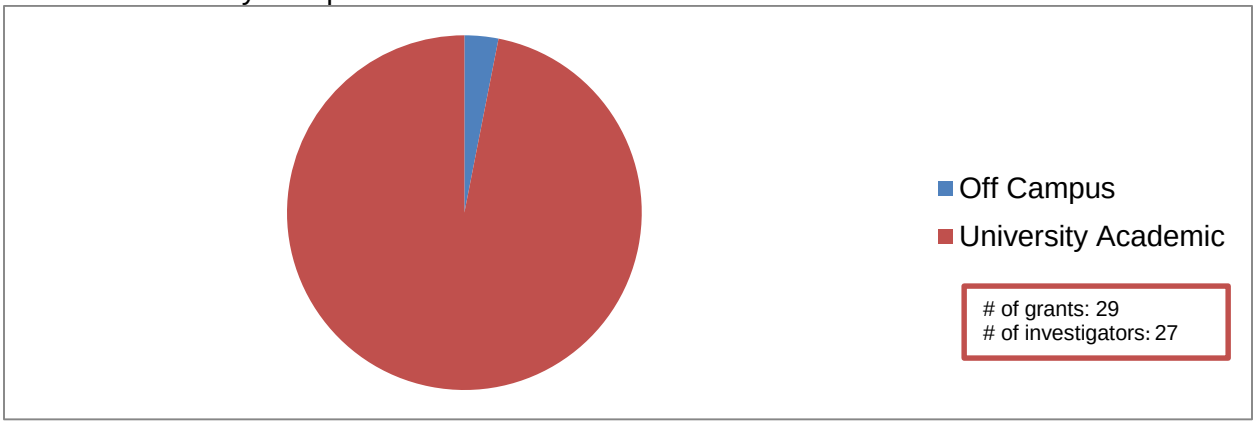
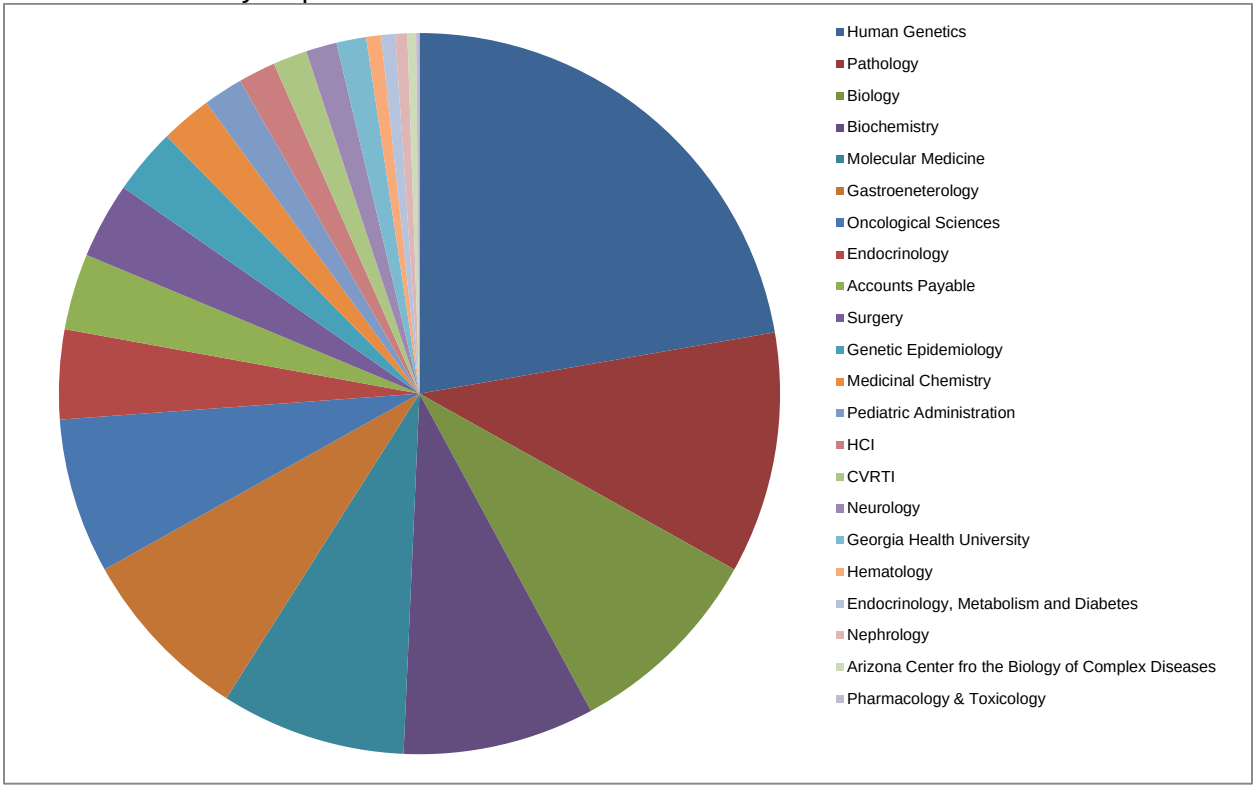
FY13 Scientific Impact

Research Support

- Revenue by Campus Affiliation



- Revenue by Department



- Top Users

1	Hugh Clement-Jewery	Off-Campus
2	Jerry Kaplan	NIH R37DK030534-29 NIH R01DK070947-06A1
3	Carl Thummel	NIH 5R01DK075607-07
4	Mary Jane O'Connor	Off-Campus
5	Jason Tennessen	NIH K99GM101341
6	Jared Rutter	NSF R01GM087346
7	Li Wang	NI R01DK080440-05
8	Dale Abel	NIH R01HL108379-02
9	Don McClain	NIH R01DK081842-02
10	Brian Welm	NIH/NCI 1R01CA143815-01

Publications

- Bricker DK, Taylor EB, Schell JC, Orsak T, Boutron A, Chen YC, Cox JE, Cardon CM, Van Vranken JG, Dephoure N, Redin C, Boudina S, Gygi SP, Brivet M, Thummel CS, Rutter J. A mitochondrial pyruvate carrier required for pyruvate uptake in yeast, Drosophila and humans. Science. 2012 Jul; 337(6090): 96-100.
- Ridges S, Joshi D, Heaton WL, Choi H, Eiring A, Batchelor L, Choudhry P, Manos EJ, Sofla H, Sanati A, Welborn S, Agarwal A, Spangrude G, Miles RR, Cox JE, Frazer JK, Deininger M, Balan K, Sigman M, Müschen M, Perova T, Johnson R, Montpellier B, Guidos CJ, Jones D, Trede NS. Zebrafish screen identifies novel compound with selective toxicity against leukemia. Blood. 2012 Jun; 119(24): 5621-31.

- Lin Z, Falkinham JO 3rd, Tawfik KA, Jeffs P, Bray B, Dubay G, Cox JE, Schmidt EW. Burkholdines from Burkholderia ambifaria: Antifungal Agents and Possible Virulence Factors. J Nat Prod. 2012 Sep 28; 75(9): 1518-23.
- McClain DA, Abuelgasim KA, Nouraie M, Salomon-Andonie J, Niu X, Miasnikova G, Polyakova LA, Sergueeva A, Okhotin DJ, Cherqaoui R, Okhotin D, Cox JE, Swierczek S, Song J, Simon MC, Huang J, Simcox JA, Yoon D, Prchal JT, Gordeuk VR. Decreased serum glucose and glycosylated hemoglobin levels in patients with Chuvash polycythemia: a role for HIF in glucose metabolism. J Mol Med (Berl). 2013 Jan; 91(1): 59-67.
- Lin Z, Torres JP, Ammon MA, Marett L, Teichert RW, Reilly CA, Kwan JC, Hughen RW, Flores M, Tianero MD, Peraud O, Cox JE, Light AR, Villaraza AJ, Haygood MG, Concepcion GP, Olivera BM, Schmidt EW. A bacterial source for mollusk pyrone polyketides. *Chem Biol.* 2013 Jan; 20(1): 73-81.
- Shibayama J, Taylor TG, Venable PW, Rhodes NL, Gil RB, Warren M, Wende AR, Abel ED, Cox JE, Zaitsev AV. Metabolic predictors and determinants of early electrical failure in ex-vivo canine model of long-duration ventricular fibrillation. *PLoS One*. 2013; 8(3): e57821.
- Huang J, Simcox J, Mitchell TC, Jones D, Cox J, Luo B, Cooksey RC, Boros LG, McClain DA. Iron regulates glucose homeostasis in liver and muscle via AMP-activated protein kinase in mice. *FASEB J.* 2013 Jul; 27(7): 2845-54.
- Kannan S, Muthusamy VR, Whitehead KJ, Wang L, Gomes AV, Litwin SE, Kensler TW, Abel ED, Hoidal JR, Rajasekaran NS. Nrf2 Deficiency Prevents Reductive Stress Induced Hypertrophic Cardiomyopathy. Cardiovasc Res. 2013 Jun 12. [Epub ahead of print]

Mutation Generation and Detection Core Facility

Overview

The Mutation Generation and Detection (MGD) Core specializes in providing customized TALEN DNA nucleases to induce targeted mutations in a genomic region of interest. TALEN DNA nucleases are a cutting edge technology for performing reverse genetic studies in multiple model systems, including Zebrafish, *Drosophila*, *C. elegans*, and mammalian tissue culture. The MGD Core Facility also provides customized TALE activator proteins for activation of expression of a gene of interest. The MGD Core Facility also offers services to identify induced mutations using High Resolution Melt Analysis (HRMA). Support from this core facility also includes hardware, reagents, and expert advice for optimizing and performing HRMA for the gene of interest.

Services

TALEN services

- TALEN plasmid pair design and construction
- 2X TALEN plasmid pair design and construction (same gene)
- 0.5X TALEN plasmid design and construction
- 5 or more TALEN plasmid pair design and construction
- 10 or more TALEN plasmid pair design and construction
- 15 or more TALEN plasmid pair design and construction
- Remake Failed TALEN to different exon in same target gene
- Different Destination Vector

High Resolution Melt Analysis

- BioFire LightScanner Access Fee
- HRMA PCR plates (10 pack)
- HRMA PCR sealing film (10 pack)
- Idaho Technology LightScanner MasterMix 100 rxns
- Idaho Technology LightScanner MasterMix 500 rxns
- Mineral Oil (500ml bottle)
- HRMA Training
- Help with optimization and analysis of HRMA assays

Equipment

- BioFire LightScanner
- 3X Eppendorf Mastercycler ProS
- Eppendorf Centrifuge 5430
- QWC Mercury Elite-AI Pro External Hard drive
- Illumina Eco

Personnel

- Timothy Dahlem, Director
- Kazukuki Hoshijima, Senior Research Associate (part time)

2013 Annual Update

New Equipment

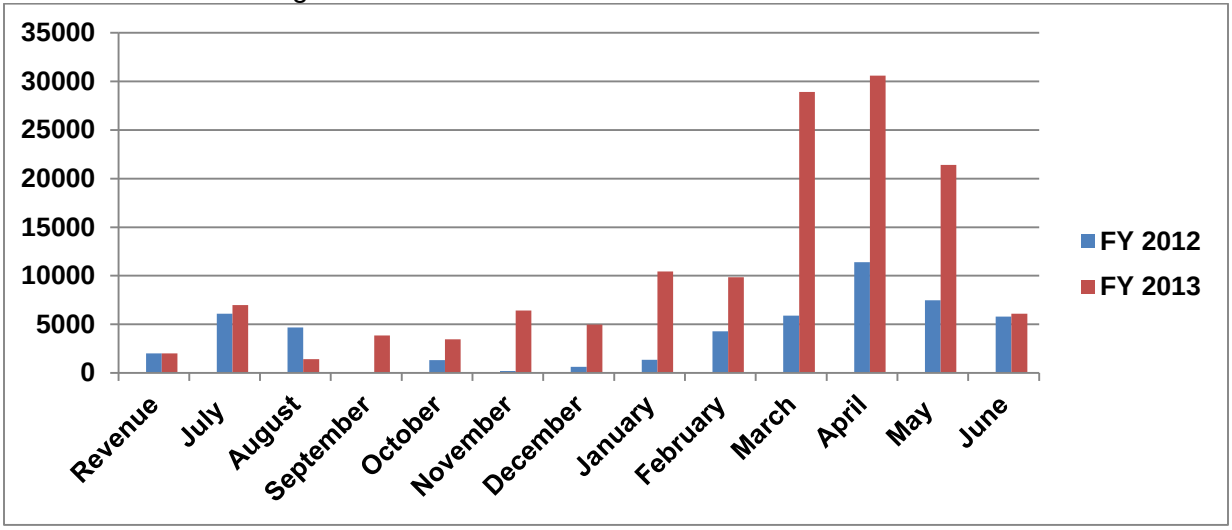
- FY13 is the first year for the MGD Core Facility operations; therefore all of the equipment is new.

New Services

- FY13 is the first year for the MGD Core Facility operations; therefore all of the services are new.

Revenue

- VP of Research Support: $0
- Total FY13 revenue: $134,468
- Total FY13 expenses: $104,905
- FY13 revenue generated from services:



Advisory Board Committee

Last meeting date: August 16, 2013

- David J. Grunwald, Professor, Department of Human Genetics
- Dana Carroll, Professor, Department of Biochemistry
- Ryan M. O'Connell, Assistant Professor, Department of Pathology
- Charles L. Murtaugh, Associate Professor, Department of Human Genetics

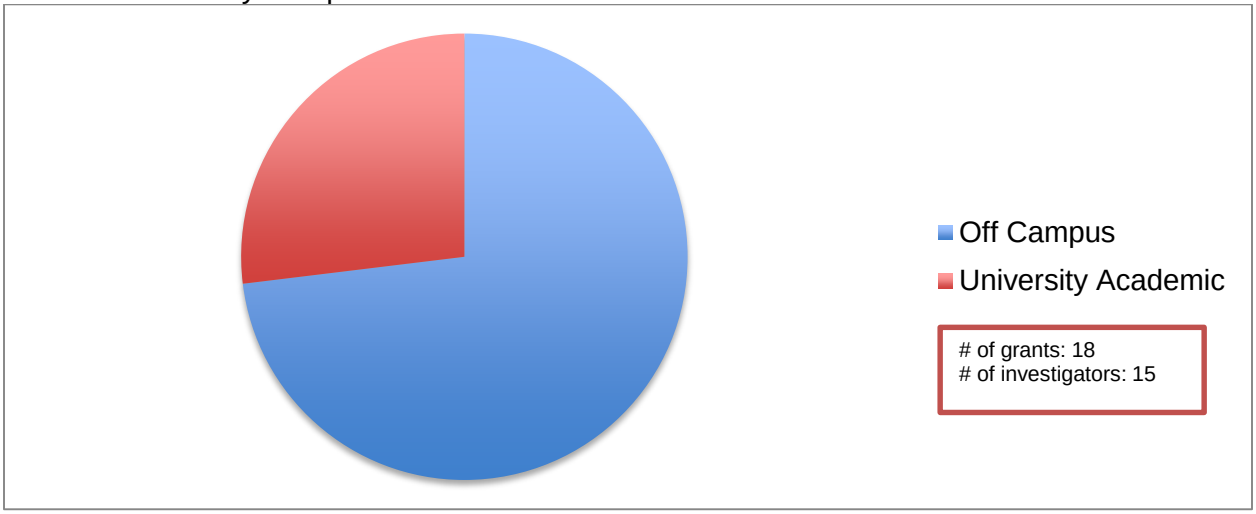
Addendum

- Faculty Oversight Committee Guidelines
  http://cores.utah.edu/wp-content/uploads/2015/09/Faculty-Advisory-Committee-Responsibilities-2.pdf

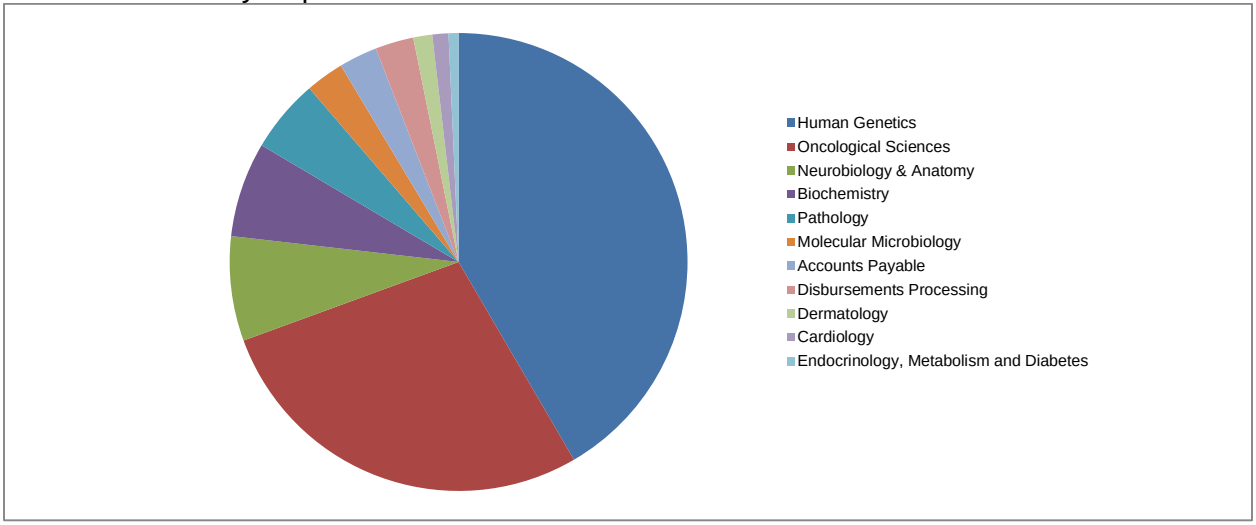
FY13 Scientific Impact

Research Support

- Revenue by Campus Affiliation



- Revenue by Department



- Top Users

1	Antonio Giraldez	Off-Campus
2	Tobias Raabe	Off-Campus
3	David Grunwald	NIH R21HDO73847-01
4	Leslie Vosshall	Off-Campus
5	Stephen Neuhauss	Off-Campus
6	Daniel Durocher	Off-Campus
7	David Langenau	Off-Campus
8	Sigrun Korsching	Off-Campus
9	Kevin Myles	Off-Campus
10	Alan Beggs	Off-Campus

Publications

- Bricker DK, Van Vranken JG, Beumer K, Dephoure N, Carroll D, Gygi SP, Rutter J, and Thummel CS. Identification and Functional Characterization of SDHAF4, a Novel Succinate Dehydrogenase Assembly Factor in Yeast and Drosophila. In Preparation. *Equal Contribution
- Beumer KJ, Trautman JK, Christian M, Dahlem TJ, Lake CM, Hawley RS, David J. Grunwald DJ, Voytas DF and Carroll D. Comparing ZFNs and TALENs for Gene Targeting in Drosophila. Accepted, Aug 2013.
- Xing L, Quist TS, Stevenson TJ, Dahlem TJ, Bonkowsky JL. Rapid and efficient zebrafish genotyping using PCR with high-resolution melt analysis. JoVE. July 2013. In Press.
- Hu R, Wallace J, Dahlem TJ, Grunwald DJ, O'Connell RM. Targeting Human MicroRNA Genes Using Engineered Tal-Effector Nucleases (TALENs). PLoS ONE. 2013; 8(5): e63074.
- Ota, S., Hisano, Y., Muraki, M., Hoshijima, K., Dahlem, T. J., Grunwald, D. J., Okada, Y. and Kawahara, A. Efficient identification of TALEN-mediated genome modifications using heteroduplex mobility assays. Genes to Cells. 2013; 18: 450–458.
- Dahlem TJ, Hoshijima K, Jurynec MJ, Gunther D, Starker CG, et al. Simple Methods for Generating and Detecting Locus-Specific Mutations Induced with TALENs in the Zebrafish Genome. PLoS Genet. 2012; 8(8): e1002861.

Nuclear Magnetic Resonance Core Facility

Overview

The Nuclear Magnetic Resonance (NMR) Core facilitates the structure determination of protein, nucleic acid, and natural products and provides analytical NMR services for the Health Sciences community. We have collaborations with research groups within several university departments. Three NMR spectrometers (400, 500, and 600 MHz instruments) are available to researchers in Utah. Through a special arrangement with the Davis and Sundquist research groups we also have access to state-of-art spectrometers (800 and 900 MHz instruments) in Colorado. NMR training or demonstration of NMR skills is required prior to scheduling and operating a NMR spectrometer. The NMR Core has several Linux workstations for offline data processing, analysis, and structure calculation. The staff has significant expertise in NMR spectroscopy of proteins, nucleic acids, and natural products.

Services

- NMR data collection and analysis
- NMR training for individuals and groups as well as formal courses in NMR spectroscopy

Equipment

- Varian Mercury 400 MHz NMR spectrometer
- Varian Inova 500 MHz NMR spectrometer
- Varian Inova 600 MHz NMR spectrometer with HCN cryogenic probe

Personnel

- Jack Skalicky, Director
- Dennis Edwards, Technician
- Jay Olsen, Technician

2013 Annual Update

New Equipment

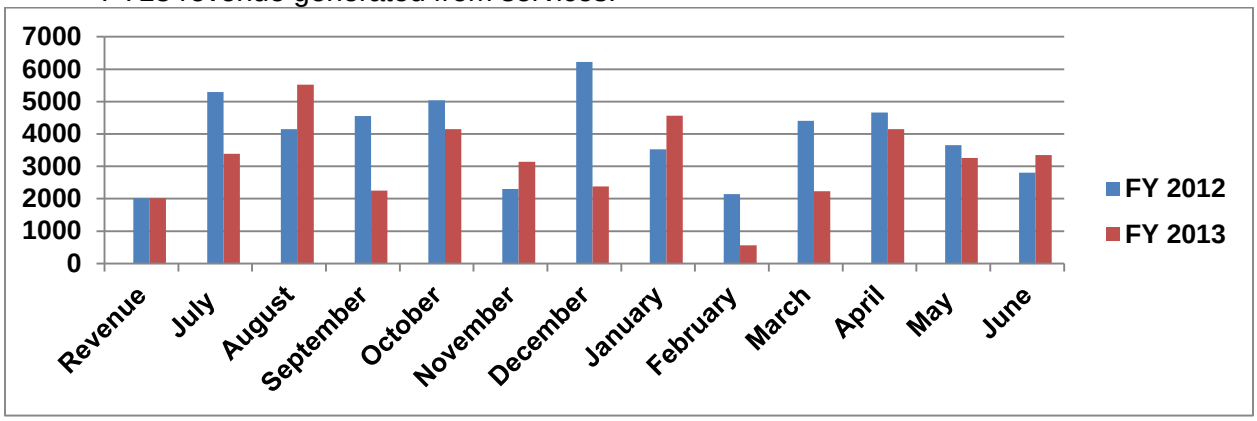
- The NMR Core Facility did not obtain any additional equipment in 2013.

New Services

- The NMR Core Facility did not implement any additional services in 2013.

Revenue

- VP of Research Support: $135,000
- Total FY13 revenue: $45,672
- Total FY13 expenses: $96,185
- NMR began FY13 with a deficit balance of $52,000
- FY13 revenue generated from services:



Advisory Board Committee
Last meeting date: April 2013

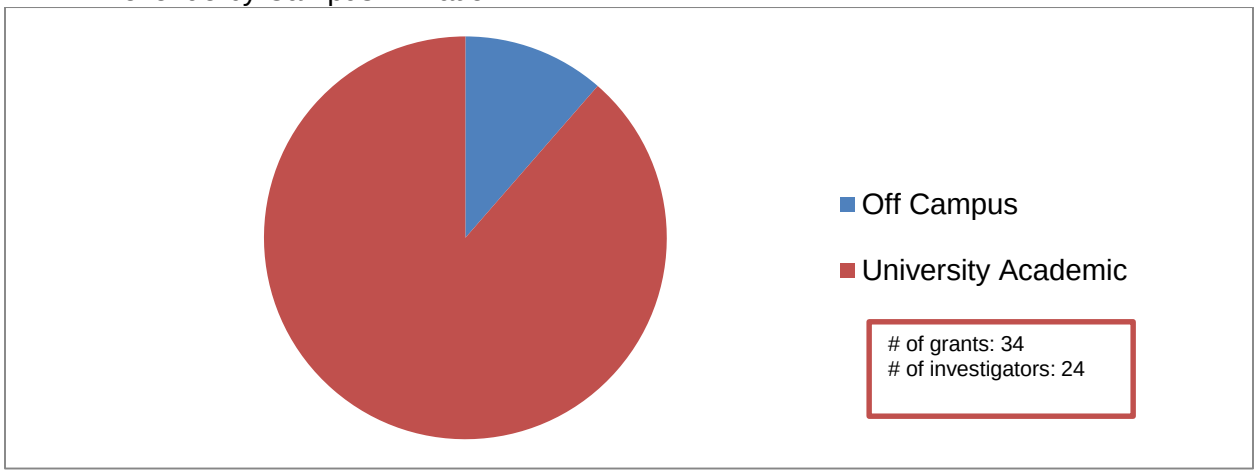
- Darrell Davis, Professor, College of Pharmacy
- Wes Sundquist, Professor, Department of Biochemistry
- Eric Schmidt, Professor, College of Pharmacy
- Ryan Van Wagoner, Associate Professor, College of Pharmacy

Addendum

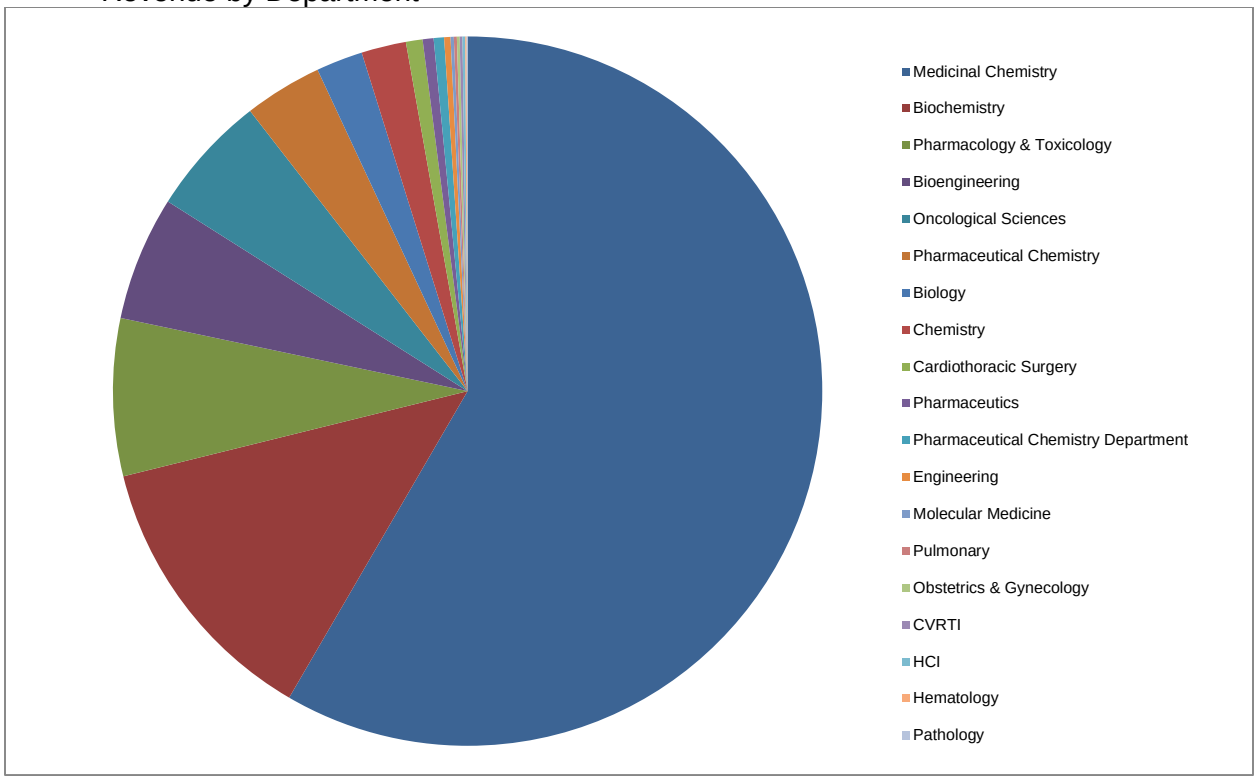
- Faculty Oversight Committee Guidelines
  http://cores.utah.edu/wp-content/uploads/2015/09/Faculty-Advisory-Committee-Responsibilities-2.pdf

FY13 Scientific Impact

- Revenue by Campus Affiliation



- Revenue by Department



- Top Users

1	Chris Ireland	NIH 5U01TW006671-09
2	Eric Schmidt	NSF 0957791 NIH GM092009
3	Kuberan Balagurunathan	NIH R01GM075168-01A1 VCU PT105889SC102422
4	Wesley Sundquist	NIH P50GM082545
5	Louis Barrows	NIH 5U01TW006671-09
6	Patrick Kiser	NIH R21A10719702
7	Russell Stewart	NSF DMR-090614
8	Ashok Bajji	Off-Campus
9	C. Dale Poulter	NIH R01GM025521-32
10	Amy Barrios	NIH DK080165

Publications

- Skalicky JJ, Arii J, Wenzel DM, Stubblefield WM, Katsuyama A, Uter NT, Bajorek M, Myszka DG, Sundquist WI., Interactions of the human LIP5 regulatory protein with endosomal sorting complexes required for transport. J Biol Chem. 2012 52, 43910-26. (This paper was selected by JBC editors as one of the best 22 papers, out of 4000, that were published in 2012; the paper was selected best in the Protein Structure and Folding affinity group)
- Lu Z, Harper MK, Pond CD, Barrows LR, Ireland CM, Van Wagoner RM. Thiazoline peptides and a tris-phenethyl urea from Didemnum molle with anti-HIV activity. J Nat Prod. 2012 75, 1436-40.
- Tianero, D, Donia, MS, Young TS, Schultz PG, Schmidt, E.W., Ribosomal route to small molecule diversity. J. Am. Chem. Soc. 2012 134, 418-425.
- McIntosh JA, Lin Z, Tianero MD, Schmidt EW., Aestuaramides, a Natural Library of Cyanobactin Cyclic Peptides Resulting from Isoprene-Derived Claisen Rearrangements. Chem Biol. 2013 Feb 22. [Epub ahead of print]

Small Animal Imaging Core Facility

Overview

The Small Animal Imaging Core Facility extends the benefits of modern diagnostic medical imaging systems to the studies of anatomy and physiology in small animals. The facility operates an MRI scanner, FMT scanner, and a CT/SPECT/PET scanner. The scanners are equipped with supporting and monitoring hardware that allows a wide variety of imaging experiments, including longitudinal studies, to be performed on live animals and specimens. Imaging scientists, full-time imaging personnel, and animal support technicians are available for technical consultation and experimental assistance.

Services

The Small Animal Imaging facility has a variety of modalities to choose from such as MRI, CT, PET, SPECT and Fluorescence imaging. Examples of scanning capabilities include the following:

7 Tesla small animal MRI system

- Diffusion-weighted or diffusion tensor imaging
- Relaxometry (T1, T2, T2*) mapping
- Perfusion MRI
- Functional MRI
- MR angiography
- Cardiac MRI
- NMR spectroscopy (localized and non-localized)
- Chemical shift imaging
- Parallel imaging techniques

CT scanners

- Automatic transition between modes and seamless coordination of CT, SPECT, and PET data
- System can be configured as an ultra-high resolution preclinical CT scanner; a high-resolution, high-sensitivity preclinical SPECT scanner; or as a dual modality preclinical SPECT/CT scanner.
- The Inveon 2-Head SPECT Module is designed to efficiently detect gamma rays ranging in energy from 30 keV to 250 keV, the SPECT system is ideal for use with most single photon-emitting radionuclides.
- Includes two Inveon Research Workplace workstations for multimodality image review, fusion, and analysis which CT, PET, SPECT, and MR data in DICOM and Siemens Inveon CT, PET, and SPECT formats, as well as raw data import.

FMT mouse system

- 4 channel excitation with near-infrared laser diodes at 635, 670, 745, and 785 nm, maximizing tissue penetration depth and permitting multiplexed analysis of biological pathways.
- System can configured as an ultra-high resolution preclinical CT scanner; a high-resolution, high-sensitivity preclinical SPECT scanner; or as a dual modality preclinical SPECT/CT scanner.

The Small Animal Imaging Core Facility also includes an Instrument Development Lab, which primarily provides infrastructure for the construction of custom RF coils. These are often necessary to optimize the data quality for a given MRI application. The facility also houses basic machining tools (including a Milling machine) for making experimental apparatus such as scanning platforms and stereo taxes.

Equipment

- 7 Tesla Bruker BioSpec MRI Scanner
- Inveon Multimodality System
- VISEN FMT 2500™ Fluorescence Molecular Tomography

Personnel

- Edward Hsu, Director
- Osama Abdullah, Imaging Specialist
- Brain Watson, Imaging Specialist

2013 Annual Update

New Equipment

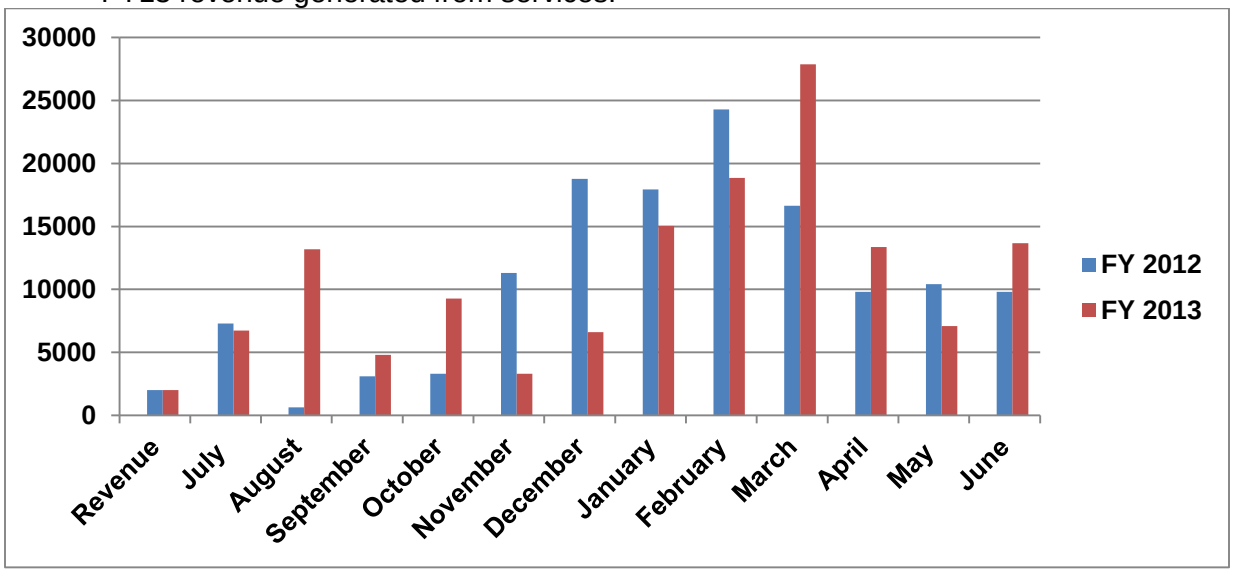
- The Small Animal Imaging Core Facility did not obtain any additional equipment in 2013.

New Services

- The relocation to the Sorenson Molecular Biotechnology Building has provided investigators with newly dedicated animal procedure and holding rooms. In addition, the new location will allow primate-imaging studies.
- The usage of the Small Animal Imaging Core Facility has been expanded to the Cancer Center.

Revenue

- VP of Research Support: $200,000 ($100,000 of that directly from V.P., T. Parks)
- Total FY13 revenue: $139,850
- Total FY13 expenses: $304,950
- FY13 revenue generated from services:



Advisory Board Committee

Last meeting date: March 29, 2013

- John Hoffman, Professor, HCI
- John Phillips, Research Associate Professor, Hematology
- Jack Taylor, Director, Office of Comparative Medicine
- Rob MacLeod, Professor, SCI
- Dennis Parker, Professor, Radiology Research
- Pat McAllister, Professor, Neurosurgery

Addendum

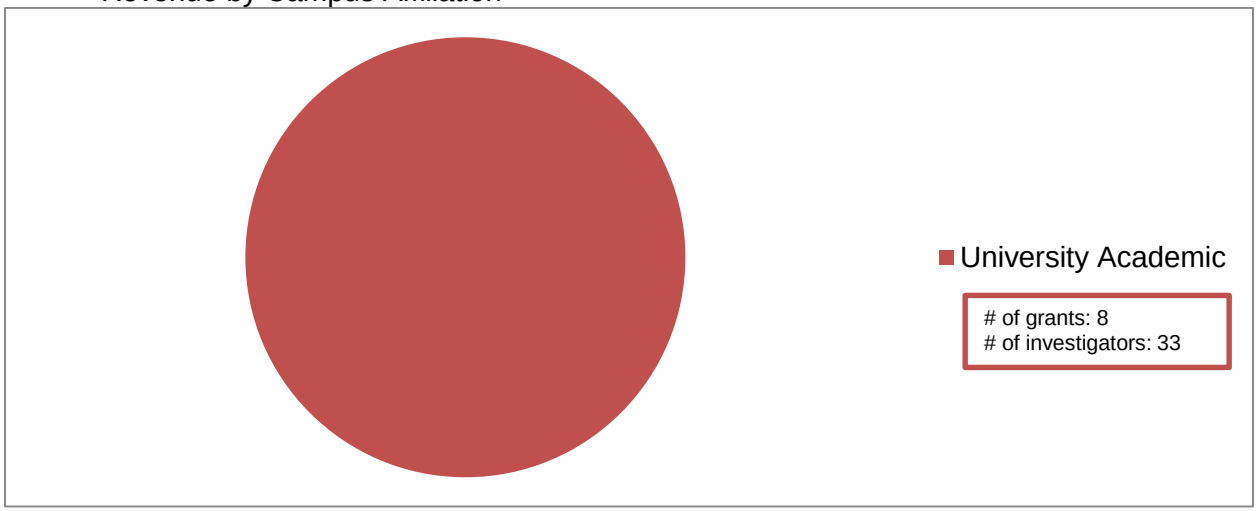
- Faculty Oversight Committee Guidelines

http://cores.utah.edu/wp-content/uploads/2015/09/Faculty-Advisory-Committee-Responsibilities-2.pdf

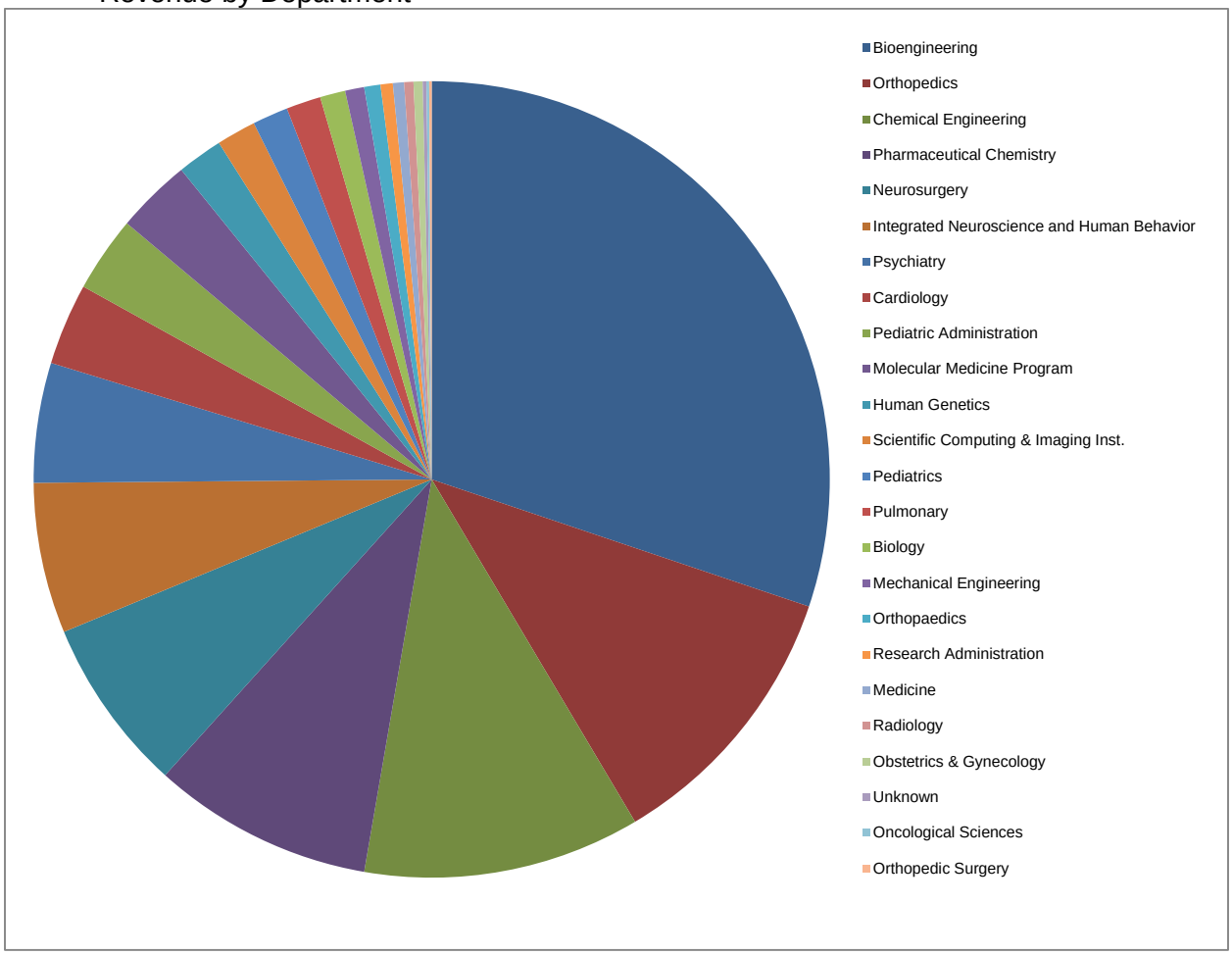
Scientific Impact

Research Support

- Revenue by Campus Affiliation



- Revenue by Department



- Top Users

1	Edward Hsu	NIH R01HL092055-02
2	Jindrich Kopecek	NIH R01CA132831-01 NIH GM095606
3	Dean Li	NIH R01HL065648
4	Patrick Kiser	NIH R21A10719702
5	Alana Welm	DOD W81XWH1210077
6	Sung Wan Kim	NIH R01DK085075-02
7	Julie Korenberg	NIH R01HD067731

Publications

- Gormley AJ, Larson N, Banisadr A, Robinson R, Frazier N, Ray A, Ghandehari H. Plasmonic photothermal therapy increases the tumor mass penetration of HPMA copolymers. J Control Release. 2013 Mar 10;166(2):130-8.
- Towner RA, Gillespie DL, Schwager A, Saunders DG, Smith N, Njoku CE, Krysiak RS 3rd, Larabee C, Iqbal H, Floyd RA, Bourne DW, Abdullah O, Hsu EW, Jensen RL. Regression of glioma tumor growth in F98 and U87 rat glioma models by the Nitrone OKN-007. Neuro Oncol. 2013 Mar;15(3):330-40.
- Won YW, McGinn AN, Lee M, Nam K, Bull DA, Kim SW. Post-translational regulation of a hypoxia-responsive VEGF plasmid for the treatment of myocardial ischemia. Biomaterials. 2013 Aug;34(26):6229-38.
- Welsh CL, Dibella EV, Adluru G, Hsu EW. Model-based reconstruction of undersampled diffusion tensor k-space data. Magn Reson Med. 2013 Aug;70(2):429-40.
- Botfield H, Gonzalez AM, Abdullah O, Skjolding AD, Berry M, McAllister II JP, Logan A. Decorin prevents the development of juvenile communicating Hydrocephalus. Brain (in press).
- Zinkhan EK, MD, Lang BY, MD, Yu B, Wang Y, Jiang C, Fitzhugh M, Dahl M, Campbell MS, Fung C, MD, Malleske D, MD, Albertine KH, Joss-Moore L, Lane RH. Maternal Tobacco Smoke Increased Visceral Adiposity and Serum Corticosterone Levels in Adult Male Rat Offspring. Submitted to Journal of Pediatrics
- Abdullah O, Gomez AD, Merchant S, Stedham O, Heidinger MM, Poelzing S, Hsu E. Empirical Investigation of Perfusion Effects on MR Cardiac Diffusion Measurements. Submitted to JMRI.
- Cory C, Li D. Vitamin D Stabilizes the Endothelium and Suppresses a Hereditary Stroke Syndrome. In preparation.
- Bogdanova O, Abdullah O, Kanekar S, Prescot AP, Renshaw PF. Neurochemical alterations in frontal cortex of the rat after long term hypobaric hypoxia. In preparation.
- Nagarajan N, et al. Hyperconnective cortico-striatal circuitry drives grooming behavior in Hoxb8 mouse model of OCD. In preparation.
- Abdullah OM, Drakos SG, Kfoury AG, Stehlik J, Selzman CH, Reid BB, Diakos NA, Brunisholz K, Verma DR, Wever-Pinzon O, Myrick C, Li DY, Hsu EW. Characterization of Failing Human Hearts via Diffusion Tensor Imaging: an Ex-Vivo Study with Histological Correlation. In preparation.

Small Animal Ultrasound Core Facility

Overview

The Small Animal Ultrasound Core Facility is capable of ultrasound imaging mice, rats, and other animal models with excellent spatial and temporal resolution. The Small Animal Ultrasound Core Facility has two state-of-the-art VisualSonics 2100 ultrasound machines, and probes that cover the spectrum from 9-70 MHz (standard human clinical ultrasound covers the spectrum from 2.5-12 MHz). These machines are capable of real-time 2D imaging as well as a full spectrum of Doppler techniques (pulsed-wave, color, tissue, power). One of the two machines is also capable of 3D imaging and contrast imaging (both targeted and non-targeted). Software is available for advanced image analysis of cardiac mechanics with speckle tracking that allows analysis of strain and strain rate. These tools allow near histologic resolution imaging of live animals, and are well suited to challenging applications such as the resolving the rapid heart rates of mice, or the microscopic size and function of early and mid-gestation embryos, and everything in between.

Services

The core facility has capability for anesthesia and monitoring of mice and rats, and will support training laboratory personnel in the design of protocols and the use of the equipment for acquiring images. An off-line image analysis station is also available for later review and analysis of studies.

- Ultrasound imaging access
- Training in use of equipment
- Experiment design and assistance with protocol optimization
- Off-line image review and analysis

Equipment

- Two VisualSonics 2100 ultrasound machines

Personnel

- Kevin Whitehead, Director
- Kandis Carter, Technician
- Tiehua Chen, Technician

2013 Annual Update

New Equipment

- FY13 is the first year for the Small Animal Ultrasound Core Facility operations; therefore all of the equipment is new.

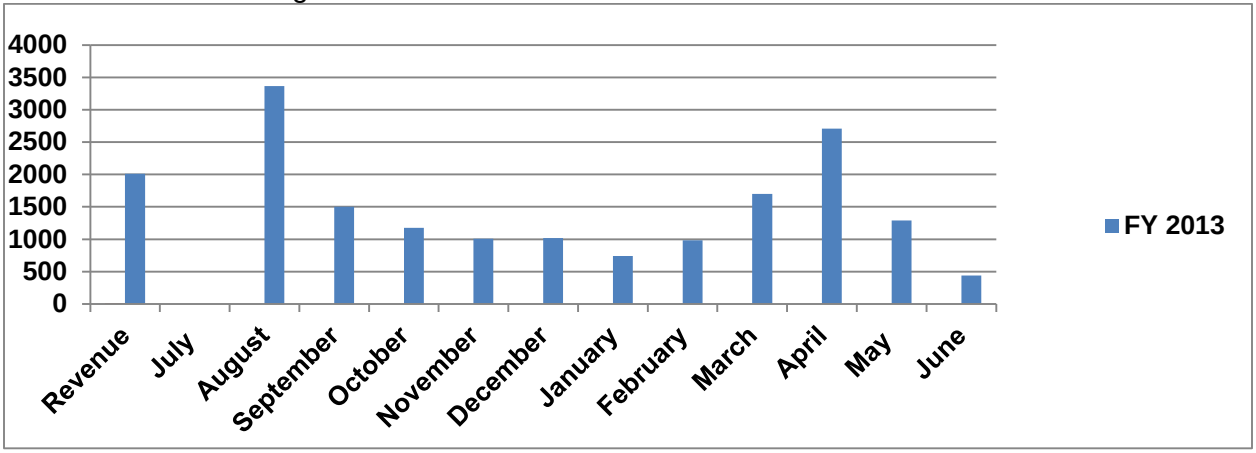
New Services

- FY13 is the first year for the Small Animal Ultrasound Core Facility operations; therefore all of the services are new.

Revenue

- VP of Research Support: $20,000
- Total FY13 revenue: $15,927
- Total FY13 expenses: $20,890

- FY13 revenue generated from services:



Advisory Board Committee:
Last meeting date: April 15, 2013

- Andy Weyrich, Associate Dean for Basic and Translational Sciences
- Craig Selzman, Associate Professor, Cardiothoracic Surgery
- Brent Wilson, Assistant Professor, Cardiology

Addendum

- Faculty Oversight Committee Guidelines
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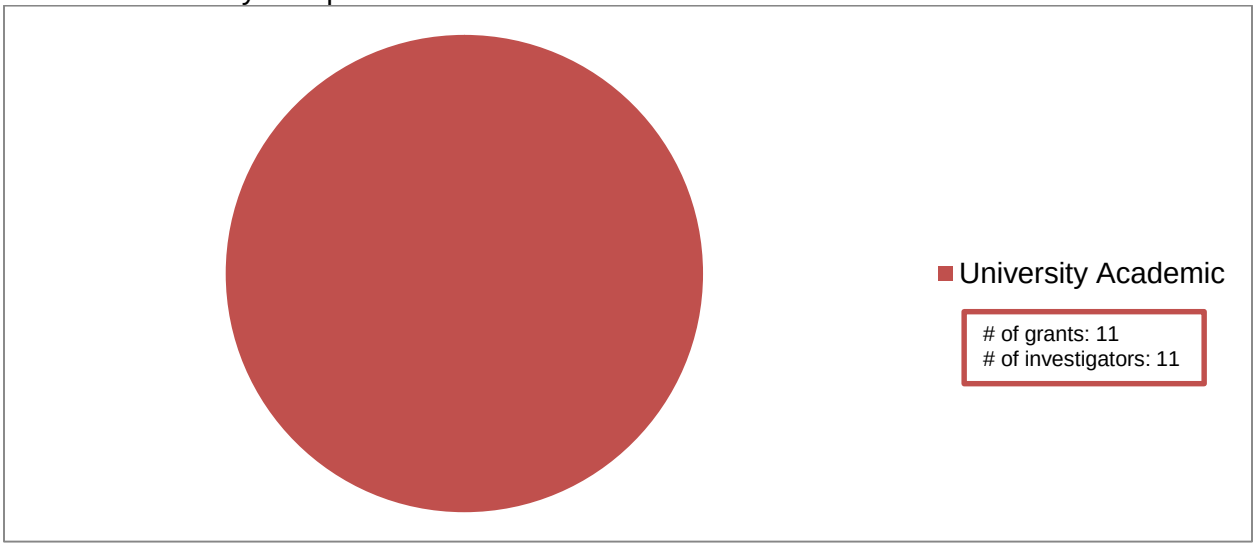
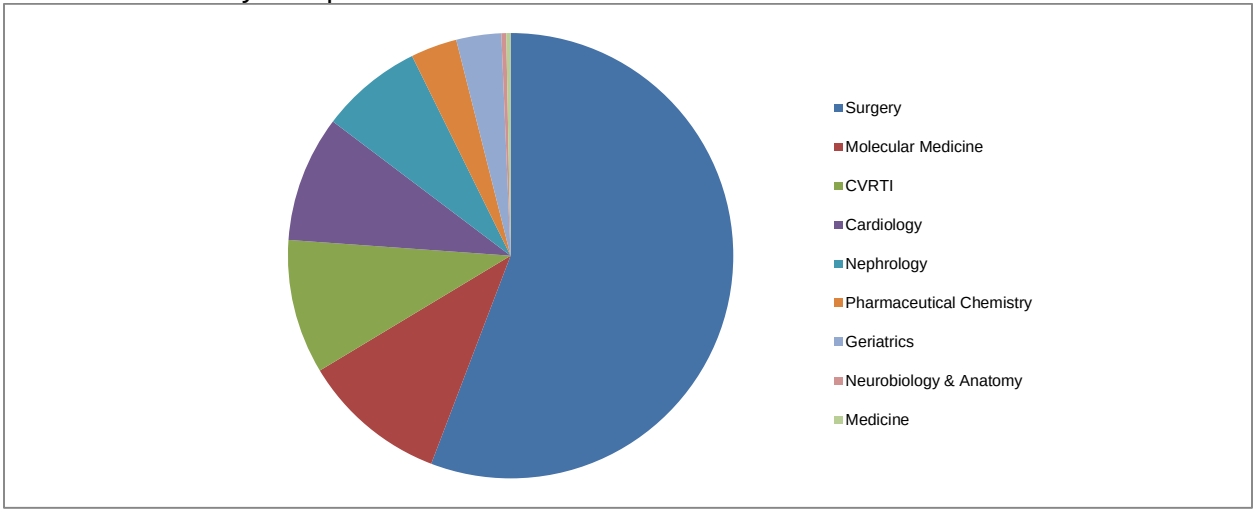
FY13 Scientific Impact
Research Support

- Revenue by Campus Affiliation



- Revenue by Campus Affiliation



- Top Users

1	Craig Selzman	NIH R01HL089592-03
2	Sarah Franklin	NIH 4R00HL107674-03
3	Dale Abel	NIH R01HL108379-02
4	Ivor Benjamin	NIH DP10D006438-01
5	Alfred Cheung	NIH 5R01HL067646
6	Anthony Donato	NIH R01AG040297-02
7	Tianxin Yang	NIH R01DK079162-01A2
8	Sung Wan Kim	NIH R01DK085075-02
9	Kevin Whitehead	NIH R01NS075168
10	Yukio Saijoh	NIH R01HD066121-01

Publications

- As this is the first year for the core, no manuscripts that acknowledge the core have been published.