Research *Forward*

Cincinnati Children's

A Publication from CCRF Research Administration

Novel Lung Imaging Research Launched

A novel lung imaging technique that does not use ionizing radiation is now under study at Cincinnati Children's. In December, 2014, the first pediatric patients completed imaging studies with the new technique which uses hyperpolarized-gas MRI for lung imaging. These studies are being conducted in the Center for Pulmonary Imaging Research (CPIR). Jason Woods, PhD, who directs the CPIR, is providing the leadership for the projects. Dr. Woods is one of the world's leading experts on hyperpolarized-gas MRI and the use of such gas MRI to measure regional lung function, microstructure and physiology, with more than seventeen years' experience with this technique. The Center for Pulmonary Imaging Research is a multidisciplinary research and training program at the intersection of pulmonary medicine and radiology. Key collaborators working with Dr. Woods on these projects are Zackary Cleveland, PhD, Laura Walkup, PhD, Robert Fleck, MD, JP Clancy, MD, and Kai Ruppert, PhD. The lab also includes several graduate students and post-doctoral research associates.

The studies are conducted using MRI (magnetic resonance imaging) and helium or xenon gas that has been treated to be slightly magnetic (also called hyperpolarized). Study participants breathe a small breath of the hyperpolarized gas, either helium (HHe) or xenon (HXe) during the imaging procedure. The resulting images from hyperpolarized-gas MRI

Jason Woods, PhD congratulates the first volunteer, Patrick Eigele

allow detailed visualization of lung ventilation, can allow measurements of alveolar-airspace size, and have the potential to improve diagnosis and potentially allow the development of new, better treatments for lung disease. For patients with chronic or progressive diseases who need repeated imaging to monitor their care, hyperpolarized-gas MRI clearly presents a safer alternative. The hyperpolarized gases don't have any taste or smell and have been well tolerated by volunteers. Because hyperpolarized gases are not approved drugs by the FDA (Food and Drug Administration), the studies are conducted under an FDA approved protocol (IND).

Hyperpolarized gas imaging has had a strong safety profile, with very few transient side effects. The image quality is quite remarkable, allowing researchers to obtain detail down to the alveolar level.

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IN THIS ISSUE:

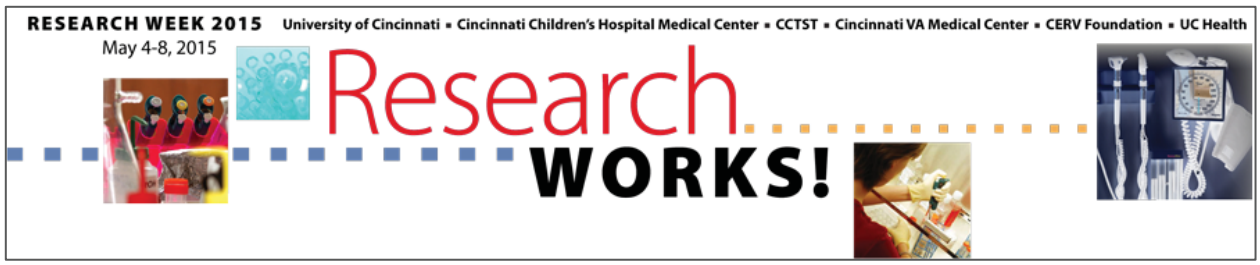
Spring 2015

Research Week Call for Abstracts & Posters

Jointly sponsored by UC, UC Health, CCHMC and the VA, Research Week (May 4-8, 2015) is a major showcase of our biomedical and health-related research. We are celebrating the work you are doing to improve the health of our community, the country and the world. Whether your focus is on the molecular mechanisms of disease, social determinants of health or medical device innovation, presenting your research provides an opportunity for discussion and interaction with investigators from across the whole campus and the region. We invite you to showcase your research at one of our poster sessions. Areas of focus during the week include:

i) Research that engages our community, or that works with our community to improve our region's health status
ii) Technological innovation and entrepreneurial activities pushing the frontiers of science and research
iii) The science of teaching health professionals
iv) Research conducted by medical residents and fellows
v) Health research conducted by medical students and doctoral students in any discipline
vi) Research at the interface with patient care, including performance improvement research and clinical inquiry

To be included in Research Week, you must submit either a brief 250 word abstract or a digital image of your proposed poster. If you submit an abstract, you will be expected to use a poster format for presenting your work.



You may submit work that has not yet been presented, or work that has been presented any time in the past 12 months, using the **Poster and Abstract Submission Portal.**

Please indicate which category your work fits. It is possible that we may move your poster to another session if we consider it to be more appropriate. If your submission is for a technology innovation and you wish to demonstrate prototypes or similar, please provide details with your submission so that we can have tables and power available if needed.

You may submit work any time up until 5 PM March 13. We expect to accommodate most requests to participate. However, previous events have experienced high demand and we may need to limit contributions, so we encourage early submission.

If your work is accepted for presentation, you will be notified by April 3. You will be required to print your own poster. Posters should be no larger than 4x6 feet. More detailed instructions will be provided with acceptance. A full schedule of events is available here. Questions? Please **contact** Brieanne Sheehan.

Now Enrolling

Biomedical Informatics Launches New PhD Program

Cincinnati Children's and the University of Cincinnati are teaming up to offer Ohio's first PhD-level program in biomedical informatics starting in Fall 2015. Together, the two institutions are aiming to educate the next generation of biomedical data scientists so that the academic healthcare enterprise can make better use of biomedical information and technology for new discoveries, innovative science, and improved healthcare.

The amount of data and sophistication of technology continues to increase at an accelerated pace, which has firmly placed biomedical research into the "big data" era. As biomedical research continues its transition to a data-driven discipline, academic biomedical institutions are now undergoing transformative changes in how research is conducted.

"This data avalanche has only just started reshaping biomedical research and health care delivery. We want to be at the forefront of this paradigm shift," says Jarek Meller, PhD, who has spearheaded efforts to develop the program. Meller is now associate chair for education in the department.

Informatics has become a central component of both clinical and translational research and the healthcare infrastructure as well as a necessary skill for many laboratory investigations. This has increased the demand for researchers and health professionals trained in data science.

Specialists in biomedical informatics are developing new ways to better understand the processes of many diseases so that we can more effectively diagnose, treat, and prevent these disorders. This work includes new data analysis methods and the development and application of novel technologies in many areas, including cancer, heart disease, psychiatric disorders, asthma, and rare disorders.

"This new PhD program in biomedical informatics will offer students an opportunity to engage in cutting-edge research while being embedded in one of the premier healthcare centers in the nation," says Peter White, PhD, chair of the Division of Biomedical Informatics at Cincinnati Children's and also chair of UC's new Department of Biomedical Informatics.

The program trains students in theory and applications of informatics and biomedical data science, ranging from the study of molecules to individuals to populations. The PhD program's curriculum reflects the interdisciplinary nature of data-driven biomedical sciences and takes advantage of the Department's strong and diverse faculty, staff, and research expertise. The course requirements are minimal, giving students plenty of opportunity to choose electives and start their research career as early as possible.

Three leading institutions—the UC College of Medicine, Cincinnati Children's, and the UC College of Engineering and Applied Sciences—are partnering to create this and other graduate-level programs in biomedical informatics.
Applications for the PhD program are currently being accepted for the Fall of 2015. More information can be found at the department's website.

Conference on Reproducible Research Practices

UC Libraries Presents: A Workshop By Center For Open Science

UC Libraries is excited to bring the Center of Open Science to UC for a workshop on reproducible research practices. This workshop would benefit all data generators, especially graduate students and junior faculty. This 3-hour workshop will focus on factors that contribute to low levels of reproducibility, and simple, practical steps researchers can easily take to increase the reproducibility of their work. Please bring your own laptop to participate. Come for all or part of the workshop. Light refreshments will be provided by the Center for Open Science.

March 11th 1pm – 4 pm in HSL electronic classroom; March 12th 1pm – 4 pm in 480 Langsam Library
RSVP: https://www.surveymonkey.com/s/UCCenterOpenScience

Novel Lung Imaging Research *(continued from Page 1)*

Initial studies have involved a normal healthy pediatric population. Now, volunteers with cystic fibrosis are becoming involved with the imaging research. Dr. Woods and his team are preparing to expand the projects to include imaging with other pediatric patient populations: children who may need lung transplantation or who have had transplant, children who have other rare lung diseases, and children with bronchopulmonary dysplasia (BPD).

Dr. Woods and the Study Team (Left to right: Laurie Vanderah, BSN, OCTR; Erin Brockman, CRC III, IRC; Colleen Murphy, Consultant, OCTR; Beth Decker, BSN, Pulmonary Medicine; Jason Woods, PhD; JP Clancy, MD, Pulmonary Medicine; Leslie Korbee, Consultant, OCTR)

The Center at Cincinnati Children's is one of only three centers in the US which are studying pediatric lung disease with hyperpolarized gas. The other institutions exploring this new technique are the University of Virginia and University of Wisconsin.

Spotlight on Biomedical Informatics Services, Support for Researchers

The first of a two-part article.

As both the amount of data and the sophistication of technology continue to increase at an accelerated pace, biomedical research is now firmly in the "big data" era. Cincinnati Children's and the University of Cincinnati Academic Health Center joined forces in 2014 to create a new, cross-institutional Department of Biomedical Informatics (BMI).

Along with its academic research mission, BMI provides a variety of computational resources, services and support to researchers affiliated with both Cincinnati Children's and UC. The goal is to help researchers take full advantage of new data analysis methods and the development and application of novel technologies.

A series of two articles will outline several of the biomedical informatics core and collaborative services, with links to further information. Complete details can be found on our Research IT Core Services website.

Core Informatics Services

The Department focuses on computational approaches to problems in biomedical research. At Cincinnati Children's, we maintain state-of-the-art computational infrastructures and analytical and technical services that are available on a shared basis to researchers.

We provide both clinical research support and basic research support. In the realm of clinical research, we design and develop web sites, electronic data collection systems and other resources to support studies. Our clinical and translational research support brochure provides an introduction to our clinical research services. For basic research, we offer electronic lab notebook software, bioinformatics support, and customized application development. Our basic research support brochure provides an introduction to our basic research services.

Software

BMI offers centralized administration of many software packages, including:

- Statistical packages (e.g., SAS, Matlab, SUDAAN, GraphPad Prism, JMP, SigmaPlot)
- BTM (Biomaterial Tracking & Management) biobanking software
- Bioinformatics research software (e.g., GeneSpringTM; GCG, Affymetrix MicroArray Suite, Vector NTI, DNAStar, MacVector, Ingenuity, Golden Helix)
- Other general software (e.g., Adobe Acrobat, Adobe Photoshop Elements, Adobe LifeCycle Designer, CERF, Filemaker Pro)

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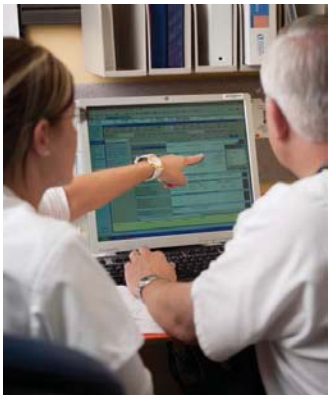
BMI Services, Support *(continued)*

Hardware



Informatics services BMI offers relative to hardware include:

- Servers running Windows and Linux operating systems for production, testing and development environments as well as to provide backup and redundant services
- High performance computing resources capable of parallel computation
- A petabyte-scale storage facility with offsite backups
- Highly redundant core network for data exchange
- Dedicated MySQL, MS SQL, Oracle and PostreSQL database clusters
- A Citrix VDI farm of Microsoft Windows servers and workstations
- Dedicated redundant web servers
- Online collaborative tools to facilitate data sharing such as SharePoint or Xythos.
- Centralized identity management services providing streamlined access to local investigators as well as external collaborators
- Basic developer tools (*e.g., compilers, debuggers, graphical development environments*) and parallel computing software

Server integrity: CCHMC Information Services maintains 7 x 24 x 365 data center operations with operators continually onsite. All servers are backed up with daily incremental backups, weekly full backups, and monthly offsite vaults as needed. In the event of a power outage, the data center relies on a redundant power system, distributed power distribution units, and a number of backup generators.

Collaborative Data Services

A comprehensive suite of data services are available, including:

Research Data Warehouse & Honest Broker Service: BMI supports an Honest Broker service, which allows the creation of an integrated patient record using data from CCHMC's clinical information systems as well as select research systems. This information is de-identified and access is made available through the Research Data Warehouse, which consists of a suite of software applications as well as a core data repository that is intended to support translational research. The warehouse contains much of the data that are stored in CCHMC's electronic health record, including demographics, diagnoses, procedures, laboratory results, medication orders, vital signs and allergies. The warehouse is also linked to the institutional biorepository, which allows investigators to include sample-related metadata in their search queries.

The warehouse is primarily used for cohort identification, allowing users to perform an enterprise-wide search on a limited data repository to determine the existence of a set of patients meeting certain inclusion or exclusion criteria.

Once a cohort has been identified, investigators at Cincinnati Children's are able to work with the Honest Broker service to obtain the data needed to complete their research as specified in their Institutional Review Board (IRB) protocol. Investigators can also work with the Honest Broker service directly to obtain the data they need to complete their research study.

The research data warehouse is also used to support Cincinnati Children's participation in several distributed data sharing networks. Data from the warehouse is transformed into the appropriate data model and terminology standards and then exposed in a way that preserves privacy and allows queries for aggregate counts or summary statistics to be broadcast from approved investigators to all network participants.

The queries are executed against the data and then the results are sent back to the originating investigator, rapidly lowering the time needed to identify cohorts or validate hypotheses among large, diverse patient populations spread among multiple care centers.

Clinical, Translational, and Health Services Research Support: Through our core services and faculty labs, BMI supports the data collection, transformation, reporting and visualization needs of research projects, including multi-center clinical research studies, research data registries and project-specific datamarts, and learning networks. We support studies using REDCap and a number of custom-developed solutions tailored to the specific needs of the investigator and their research team.

Due to high demand, data service provision is prioritized especially for academic collaboration, supported and sustainable projects, and strategic initiatives.

For complete details, visit BMI's Research IT Core Services website.

Dates and Deadlines

NIH Grant Deadlines May 25, 2015 through August 15, 2015 (CYCLE II)

Activity Code	Program Description	SPO Due Date	CYCLE II Due Date
P Series *New, renewal, resubmission, revision*	**Program Project Grants and Center Grants**	May 18	May 25
G07, G08, G11, G12, G13, G20, R10, R24, S06, S11, S21, S22, SC1, SC2, SC3, UG1, U10, S06, U19, U2C, U41, U42, U45, U54, U56 *New, renewal, resubmission, revision*	**Other Activity Codes**	May 18	May 25
R18/U18 **R25** *New, renewal, resubmission, revision*	**Research Demonstration Education Projects**	May 18	May 25
C06/UC6 *New, renewal, resubmission, revision*	**Construction Grants**	May 18	May 25
T Series **D Series** *New, renewal, resubmission, revision*	***Institutional*** **National Research Service Awards** **Other Training Grants**	May 18	May 25
R01 *New*	**Research Grants**	May 29	June 5
U01 *New*	**Research Grants – Cooperative Agreements**	May 29	June 5
K Series *New*	**Research Career Development**	June 5	June 12
R03, R21, R33, R21/R33, R34, R36 *New*	**Other Research Grants**	June 8	June 16
R15 *New, renewal, resubmission, revision*	**Academic Research Enhancement Award (AREA)**	June 18	June 25
R01 *renewal, resubmission, revision*	**Research Grants**	June 29	July 6
U01 *renewal, resubmission, revision*	**Research Grants – Cooperative Agreements**	June 29	July 6
K Series *renewal, resubmission, revision*	**Research Career Development**	July 6	July 13
R03, R21, R33, R21/R33, R34, R36 *renewal, resubmission, revision*	**Other Research Grants**	July 9	July 16
R41, R42 **R43, R44, U43, U44** *New, renewal, resubmission, revision*	**Small Business Technology Transfer (STTR)** **Small Business Innovation Research (SBIR)**	July 29	August 5
F Series Fellowships *New, renewal, resubmission*	***Individual*** **National Research Service Awards (Standard)**	August 3	August 10
R13, U13 *New, renewal, resubmission, revision*	**Conference Grants and Conference Cooperative Agreements**	August 5	August 12
F31 Diversity Fellowships *New, renewal, resubmission*	***Individual*** **Predoctoral (F31) Fellowships to Promote Diversity in Health-Related Research**	August 6	August 13

*** Deadlines Falling on weekends or holidays move to the next business day*

Register Now for the Genomics & Ethics Conference on March 12-13

Please plan to attend the March 12–13, 2015 conference ***Genomics and Ethics in Research and Medical Decision-Making,*** featuring empirical and conceptual investigations into the ethical aspects of genetics and genomics in diverse research, community, and clinical domains in biomedicine.

To be held at the UC Kingsgate Marriott Conference Center, the event will provide a forum for discussing the intersection of genetics/genomics and ethics, including genomic medicine, community engagement, return of research and clinical results, challenges of biobanks in research, commercialization of genomics research, and consent in medical research and clinical settings.

Keynote speakers are Gail Jarvik, MD, PhD, head of the division of medical genetics at the University of Washington School of Medicine, and Barbara Koenig, PhD, professor, Institute for Health & Aging, University of California, San Francisco. Dr. Jarvik holds The Arno G. Motulsky Endowed Chair in Medicine and is joint professor of medicine and genome sciences. Dr. Koenig is co-principal investigator of the Translational Genomics & Ethics Center at UCSF.

The most recent preliminary agenda is available here, which now includes a Day 2 session on genomic data security and compliance by Angel Pizarro, MSE, of the Scientific and Research Computing division of Amazon Web Services.

Please register online. Cost is $150 ($175 after March 1, 2015) and includes conference materials, a participant reception and meals. A limited number of seats are available for full-time students ($75). Continuing education credit will be offered.

Conference objectives:
1. Describe the ethical issues in applying genomics to diverse clinical and research domains
2. Apply concepts of community engagement to informed consent and return of results
3. Identify critical issues in the commercialization of genomics

Event co-sponsors are the UC Center for Clinical and Translational Science and Training (CCTST) and Ethics Center of CCHMC.

More details are available on the conference homepage. For questions about online registration and continuing education credit, email the Cincinnati Children's CME office or call 513-636-6732. For other questions regarding the conference, email Bettie Durant or call 513-803-2610.

Professional Development

Cracking the Code for Clinical Trial Recruitment (ACRP Webinar)
Wednesday, March 18th; Noon – 1:30pm; R5093 (ORCRA Conference Room); ELM Registration

- -

Core Clinical Research Training
Tuesday, April 21st - Thursday, April 23rd; 8:00am – 12:30pm; ELM Registration

- -

Informed Consent Role-Play
Thursday, May 7th; 9:00am – 11:30; ELM Registration; S10.130

- -

Clinical Research Orientation *(Part of Clinical Research Boot Camp)*
Monday, May 11th - Tuesday, May 12th; 8:00am – Noon; ELM Registration

- -

ePAS – IRB Submissions *(Part of Clinical Research Boot Camp)*
Wednesday, May 13th; 8:00am – Noon; ELM Registration

- -

Clinical Research Skills Training *(Part of Clinical Research Boot Camp)*
Thursday, May 14th; 8:00am – Noon; ELM Registration

- -

Clinical Research Phlebotomy Training *(Optional Part of Clinical Research Boot Camp)*
Thursday, May 14th; 12:30pm – 5:00pm; ELM Registration

- -

EPIC Research Registration *(Part of Clinical Research Boot Camp)*
Friday, May 15th; 8:00am – 2:00pm; ELM Registration

Details about each of the above programs are available via the ORCRA Training Catalog or by inquiry to ORCRAEducation@cchmc.org

Save the Date - Human Subject Protection Conference plus More!

Human Subject Protection: Takin' Care of Business
October 1-2, 2015
Northern Kentucky Convention Center

Join us Thursday and Friday, October 1-2, for our annual human subject protection conference. This year's conference offers a new second day of programming, featuring sessions by Public Responsibility in Medicine & Research (PRIM&R).

With even more content and conversation on critical issues in human subject protection, this year's event is a can't miss! **Topics include:**

- Informed consent simplification
- GCP compliance for sites
- Technology's impact on research
- Importance of clinical research
- And more!

On Friday, PRIM&R will present a new second day of learning, covering advanced topics relevant to regulations and overcoming challenging issues in human subjects protections. Participants will learn practical strategies applicable to core topics in research ethics and human subjects protections.

Even more: On Saturday, October 3, a SOCRA Certified Clinical Research Professional (CCRP) exam will be held at Cincinnati Children's Hospital Medical Center. Registration and details are through SOCRA. Visit **SOCRA's website** for more information.

It's AAHRPP Reacccreditation Time (*again*)!

A cornerstone of CCHMC's ability to conduct the highest quality research is our Human Research Protection Program led by ORCRA and our accreditation by AAHRPP. An important aspect of seeking and maintaining AAHRPP accreditation is the acknowledgement that while CCHMC's Human Research Protection Program (HRPP) is led by ORCRA, **the activity of protecting research participants is a shared responsibility between all members of the research community** - investigators, coordinators, sponsors, administration, and the IRB. Achieving and maintaining AAHRPP accreditation confirms the continued strength of our program, our commitment to continuous quality improvement and verifies that the research conducted by CCHMC investigators occurs in a culture of concern for research participants. Further, AAHRPP accreditation is a tangible demonstration to the public that CCHMC continues to exceed the minimal legal requirements for protecting research participants and aspires to the highest standards of ethical conduct and research integrity.

Cincinnati Children's Hospital is well along the process of applying for and securing its second reaccreditation from AAHRPP. CCHMC's HRPP involves contributions from many areas that impact our research enterprise. As such, AAHRPP will be meeting with many of these areas when they begin their site inspection mid-April. You will be notified if you/your study has been selected for inclusion in the AAHRPP site inspection.

Trivia Corner

1) What percentage of Americans take vitamin supplements?

2) What percentage of Americans has been on a diet in the last year?

3) What percent of Americans has dessert after dinner? (hint: it was 24% in 1986)

4) What percentage of snacks are consumed with or instead of a main meal?

5) Calorie counts on menus have an effect on what percentage of women? (hint: it is 29% for men)

Answers:
1) 71%
2) 41%
3) 12%
4) 40%
5) 42%

FDA Focus / NIH News

On January 27th, a long-awaited proposal by several members of the House of Representatives was released to speed the translation of research into medicine. This initiative, known as "21st Centure Cures" has the intent of streamlining research at the FDA as well as at the NIH.

This draft bill addresses other initiatives pertaining to FDA programs, such as making it easier for patients for whom standard treatments have failed to obtain access to experimental therapies aw well as an initiative to incorporate patient feedback in the FDA's approval process. A controversial measure also included in the draft guidance would allow for longer market exclusivity for rare disease treatments and other much-needed products.

Other items in the draft include increasing funding for the NIH's National Center for Advancing Translational Sciences (NCATS) and increasing funding for the NIH Common Fund for initiatives that span multiple NIH institutes.

* * * * *

Separately, the FDA is exploring setting up master protocols that can run continuously to help cut down on clinical trial waste. Such "master protocols" would evaluate numerous investigational products simultaneously as well as over time. The trial would not shut down, allowing for faster evaluation and comparison of therapies.

Transitioning to a New CRC

If transitioning from or to a (new) research team, consider these suggestions (adapted from a *Journal of Clinical Research Best Practices* article) to easy the transition and minimize disruption to the study:

1) Create a transition plan, including identifying members of the "transition team".
2) Evaluate the workload and revisit the delegation log showing who does what.
3) Identify a temporary or permanent replacement CRC.
4) Assign a mentor to assist the temporary/new CRC.
5) Identify necessary resources essential to the success of the CRC, including essential contacts and services.
6) Verify the state of the current study records / materials.
7) Consider requesting an internal quality review from the Research Compliance Office to confirm the soundness of the study records and learn of items needing attention.
8) Train the CRC (consider ORCRA-offered classes)
9) Conduct exit interview, documenting any reminders, watch-outs, and upcoming calendar items/events.
10) Meet regularly with the CRC, especially during onboarding.

Evaluating Clinical Research Studies

The Cincinnati Chapter of the Association for Clinical Research Professionals (ACRP) invites you to attend their upcoming educational chapter event on Thursday, March 12 from 5:30-7:30. Mindy Muenich, from Huron Consulting Group, will discuss the processes involved in properly evaluating clinical research studies.

Location:
Firehouse Grill
4785 Lake Forest Drive, Blue Ash
Register for this event here. Cost is $20 for ACRP members or $25 for non-members.

Feasibility Review Committees

A recent Tufts study assessed the impact of having committee reviews of study design feasibility. The goal of such efforts is to remove non-core work (study procedures/data collection that neither supports primary or secondary endpoints nor satisfies regulatory requirements).

Unnecessary procedures were subsequently removed, enabling faster patient enrollment and reduced budgets.

They found that reviewed studies realized reductions in both protocol complexity as well as number of amendments. The simpler protocols also led to fewer delays during study review and implementation.

A further recommendation from this study is to have team members from different functions and areas review the protocol. This increases the likelihood of discovering costly mistakes and fixing them early in the process, often before the protocol is finalized.

Texting to Enhance Enrollment

According to a case study published in Applied Clinical Trials, a clinical research facility experimented with texting as a means of accelerating patient enrollment in a vaccine trial.

The response rate to the texts was five times that of email! The article stated studies showing that while only 22% of emails are read, over 90% of text messages are.

Consider talking to your IRB resource and the OCTR Marketing team about this.

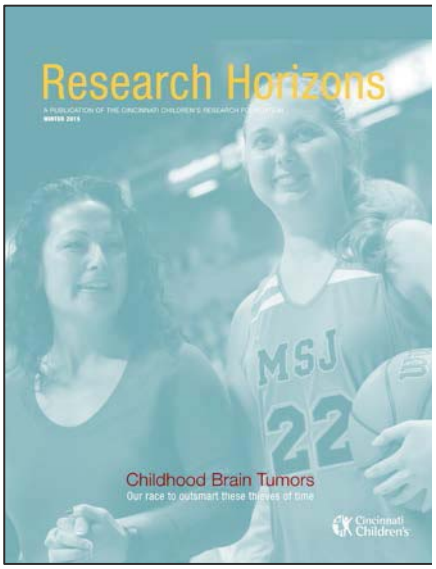
Highlights from *Research Horizons*

***Research Horizons* magazine focuses on childhood brain tumors**
The Winter 2015 issue of *Research Horizons* reports on how investigators at Cincinnati Children's are racing to outsmart these thieves of time.

Nothing ordinary about it
For our Cancer and Blood Diseases Institute, limited thinking is off-limits.

Knowing the enemy
Researchers gain ground in understanding deadly tumors, but not fast enough for their liking.

Eyes on the prize
Staking careers on a cure for a killer tumor that has eluded science for 40 years.

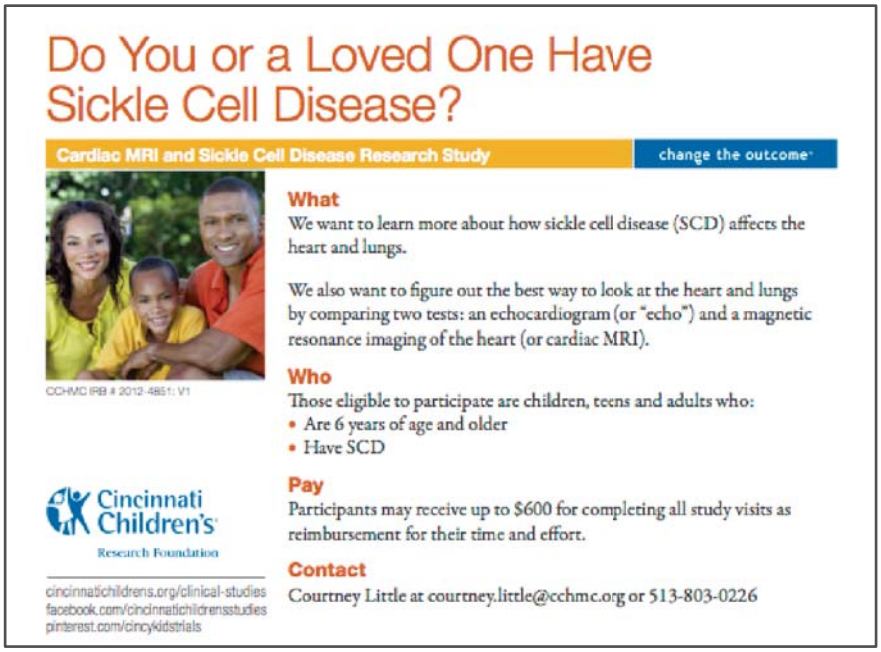


One-two punch could knock out cancer relapse
Breakthrough research finds a lasting cancer-fighter in a common antidepressant.

Imaging changes the game for brain tumor surgery
Doctors use precise technology, unmatched skill — and a strong sense of what makes us human.

A better way to blast tumors
Proton therapy will revolutionize treatment and research of childhood tumors.

Now Enrolling



Send comments, story ideas or questions to:

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Welcome Spring!

Bloom where you are planted!

Cincinnati Children's