Cystic Fibrosis Center of Excellence

Volume 7, Issue 3 December 2017

Inside this issue:

Dear friends, patients, families, and colleagues,

Welcome to the December 2017 issue of the Cystic Fibrosis Center of Excellence newsletter. We hope this finds you well.

As always, there is a lot going on in the CF world in Atlanta. Over the past few months, we have welcomed several new faculty members to our program, both at Emory and at Georgia Tech. This includes Drs. Marvin Whitely, Neha Garg, and Steve Diggle at Georgia Tech, and Drs. Joshua Chandler, Sam Molina, and Bill Wuest at Emory. Some of these new faculty members were introduced in the September 2017 e-newsletter. As we continue to build our research team, it is important to reflect upon the outstanding level of commitment that we have enjoyed from our principal institutions, Emory, Children's Healthcare of Atlanta, and Georgia Tech, since our Center opened in 2010. Please note that this does not include ongoing support in the form of cost-sharing for over-the-cap salaries, and does not include support for the recruitment of physicians who do not spend major effort on research.

- From the Children's Healthcare of Atlanta Research Trust, toward faculty startups: $11,979,450
- From Emory and the Woodruff Health Sciences Center, toward faculty startups: $9,445,996
- From Georgia Tech and Georgia State University, toward faculty startups: $8,508,367
- From the Children's Healthcare of Atlanta Research Trust, for CF-AIR operations: $1,828,566
- From the Children's Healthcare of Atlanta Research Trust, for pilot grants: $1,350,000

TOTAL institutional commitment to CF research, since 2010: $33,112,379

This level of institutional support has enabled us to grow the CF research team substantially since our Center started in 2010. We look forward to celebrating this commitment at an event being planned for early summer, 2018.

The ***CF@LANTA*** team had great representation at the North American CF Conference in Indianapolis, IN, November 2-4, 2017. Our researchers presented 32 abstracts plus 2 Symposium presentations. In addition, Dr. Kathryn Oliver (postdoctoral fellow in the Sorscher lab at Emory) received the award for best poster as Junior Investigator in the Basic Science Category (see Brags page 5). The ***CF@LANTA*** research team also met for a great group dinner in Indianapolis, attended by about 30.

Congratulations are due to Dr. Rabin Tirouvanziam for his appointment to the Clinical Research Grant review panel for the CF Foundation, starting this month. I also am happy to report several new CFF basic research grants to our researchers were funded following the April 2017 submission cycle. Included in that group is an award for a collaboration between the McCarty and Goldberg groups at Emory and the García group at Georgia Tech, to develop new approaches targeting bacterial infections in the lungs of our CF patients.

Finally, the team met this week for a "Strategize and Socialize" session followed by potluck dinner. The meeting was quite successful, and leftovers were delivered to the Atlanta Mission's Shepherd House, one of the larger homeless shelters in Atlanta. Thanks to everyone for supporting that effort.

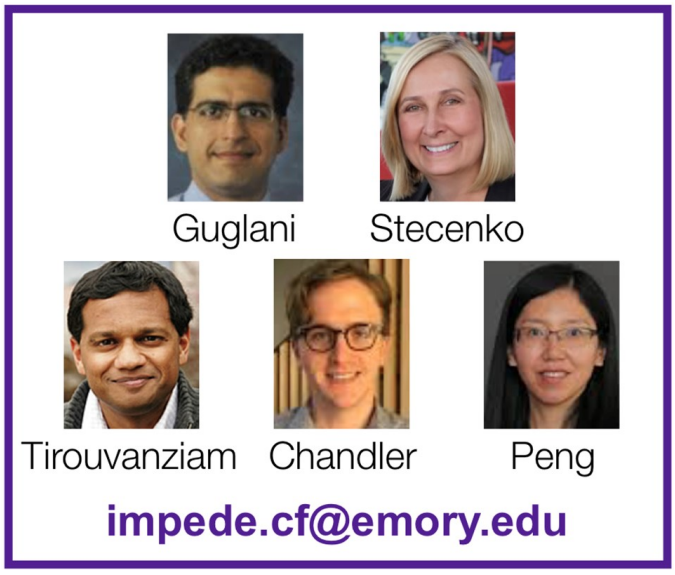
Best wishes for the upcoming holiday season,
Nael A. McCarty, PhD, ***CF@LANTA***

Center for Cystic Fibrosis and Airways Disease Research
Advancing Wellness in Patients Through Research

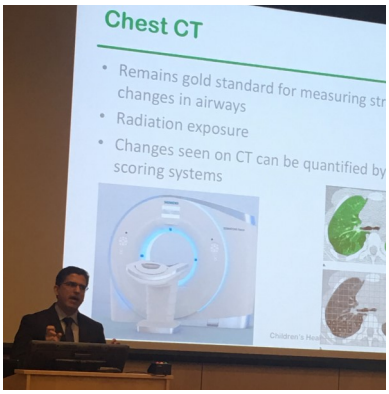
IMPEDE-CF: A New Emory Initiative to Monitor and Treat Early Lung Disease in Young Children with Cystic Fibrosis

Infants and toddlers with CF tend to develop early onset inflammation of the airways before they become symptomatic or develop any changes on their annual chest radiographs. However, many of these changes may be detected at a later stage when they have become irreversible. Hence the best strategy would be to utilize ongoing regular screening to identify those infants and young children who show early signs of lung disease and provide aggressive interventions to help revert those early changes before their lung disease progresses to fully established bronchiectasis.

To advance toward this goal, we are launching the **I**ntegrated **M**onitoring **P**latform of **E**arly **D**isease **E**vents in **CF** (IMPEDE-CF), focusing on our local cohort of CF infants at Emory [see team picture], complementing ongoing efforts with Australian and Dutch partnering sites. This will help to develop a tri-partite consortium with Australian and Dutch partners focusing on multicenter studies of early CF pathogenesis. The main aim of the IMPEDE-CF study is to establish a CF infant and young children research cohort at Emory with full support from families. Infants are a very vulnerable population, and special care needs to be taken to ensure that this research can be accomplished in a safe manner.



The study will begin enrollment of patients from the Emory CF Clinic in early 2018 and the initial age group for enrollment will be 0-6 years. Our team will collect clinical data, lung function data (using lung clearance index measurements), and data on lung structural changes (using chest computed tomography scans at ages 2, 4 and 6 years), airway samples (using the induced sputum technique and bronchoscopy at age 2 years), as well as blood samples at annual visits. We plan to share the results of this study with parents through an interactive website that will provide de-identified outcomes data.



Dr. Guglani at the recent information session

An information session was conducted for the families of young children with CF on November 6th 2017 at Emory. This event was attended by several parents who expressed interest in the study and interacted with the researchers and clinicians over light refreshments later in the evening. At this session, our visiting colleagues from Netherlands talked about their experience with an early CF lung disease surveillance program that has been going on for several years. The Emory team also presented its plan for launching the IMPEDE-CF study in early 2018.

The entire IMPEDE-CF information session can be viewed at: https://goo.gl/13PhRS
For more details, please email our study team at: impede.cf@emory.edu

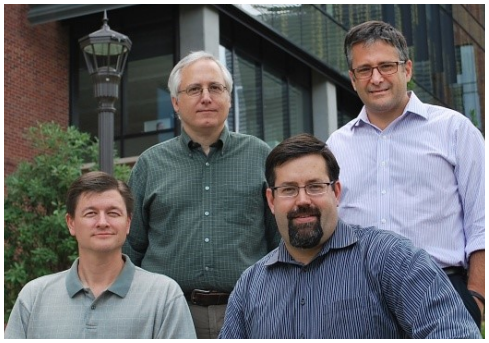
~submitted by Lokesh Guglani, MD & Rabin Tirouvanziam, PhD

CF Analytics Core

The Metabolomics sub-core of the CF Analytics Core is hosted at Georgia Institute of Technology's Systems Mass Spectrometry Core (SyMSC) and is under the direction of Facundo Fernández, PhD and David Gaul, PhD. We provide high-resolution global metabolomics/lipidomics assays to support high-throughput analysis with broad coverage of dietary, host-specific, microbiome-derived, and environmental chemicals. Targeted, quantitative metabolomics assays are also being development for specific metabolite families to further explore individual pathways related to disease phenotype and disease progression. Our facility utilizes state-of-the-art ultra-performance liquid chromatography coupled to a Q ExactiveTM HF mass spectrometer (ThermoFisher Scientific) to analyze complex biological samples.

Recently, the core completed a pilot study investigating the serum profile of CF-associated liver disease (CFLD) patients with samples from Dr. Jay Freeman. CFLD affects about 30% of CF patients, and follows lung disease and transplantation complications as the third leading cause of death in CF patients. There currently is no "gold standard test" in CFLD diagnosis, and frequently CFLD is diagnosed late corresponding with appearance of clinical symptoms associated with advanced hepatobiliary system damage. The cohort contained normal, steatosis, and cirrhosis patients, and the serum was broadly analyzed to detect polar and non-polar analytes. The dataset contained hundreds of features that were useful in an unsupervised principal component analysis model to distinguish between two of the patient groups. This small study demonstrated not only the presence of potential beneficial metabolic signatures for classification but also a dataset containing possible insights into CFLD progression.

~submitted by Facundo Fernandez, PhD & David Gaul, PhD



SyMSC Team

Experimental Models Support Core

The Experimental Models Support Core supplies investigators throughout the Atlanta Metro region with the gold standard in lung research, human primary lung cells. We are able to provide human primary nasal, tracheal, bronchial, and fibroblast cells by working closely with both industrial partners and academic centers that, with proper patient consent, provide access to tissues. Since we began operations in early 2016, we've isolated cells from at least 50 different tissue samples. We've implemented the latest state-of-the-art techniques for growth and expansion of primary cells to enable deeper and more robust scientific inquiry by our associated investigators. We've also held a handful of informative seminars aimed at educating about our services as well as the methods used and the possibilities of our efforts so that everyone can take advantage of this resource. Our Core personnel are available for consultation on experimental design, data interpretation, and general questions. We also offer personal training opportunities to students and fellows who would like to take advantage of the Core's services for their research and have taught at least 5 trainees on how to work with primary cells. If you are interested in working with the Core for your next project, we are here to help. Contact either Mike Koval (mhkoval@emory.edu) or Sam Molina (s.a.molina@emory.edu) with your questions and requests. Lionel Watkins rounds out the team as research specialist.

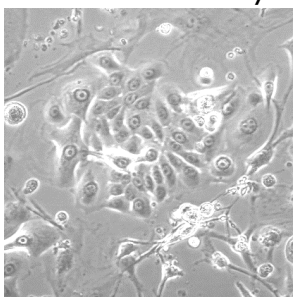
EMSC Team

~submitted by Sam Molina, PhD

Clinical & Translational Core

It has been an exciting quarter for the ***CF@LANTA*** Research Development Program's Clinical and Translational Core (CTC). Under the leadership of Dr. Arlene Stecenko, Director, and Dr. Randy Hunt, Associate Director, the mission of CTC is to provide logistical and consultative services to the larger research community in the support of CF-centered translational and clinical research. This takes the form of research design consultation, research subject recruitment, sample collection and storage, and clinical data management and analysis. The CTC is currently supporting nearly 30 investigators in over 20 active investigator-initiated CF research projects. CTC services over the last year have aided in the submission of multiple grant proposals to the National Institutes of Health as well as the CF Foundation, yielded several published manuscripts, and assisted research efforts that produced no less than seven abstracts presented at the 2017 North American CF Conference this past November.

The CTC is also expanding its operations in a number of ways to better support the research mission of ***CF@LANTA***. An exceptional feature of the Core is its ability to connect robust clinical data with individual research samples. Streamlining these services, the CTC staff have just finished transitioning all of this clinical research data into REDCap. REDCap is a web-based database, which allows real-time data entry and validation. This data warehouse will aid in the efficient management and processing of future clinical data for our CF research community.



A sample of nasal epithelial cells taken from a CF research volunteer. These cells can be expanded in a Petri dish for further investigations allowing researchers to explore possible new therapeutics in CF.

The CTC is also working closely with the Experimental Models Support Core (EMC) to expand the availability of human primary cells (cells that come directly from human subjects) to CF researchers. Human primary cell investigation has become a critical component of CF research discovery, including developing and testing new CF therapies. Nasal epithelial cell collections have been obtained from more than 27 individuals (both healthy and CF subjects, bearing many different CF mutations). The CTC and EMC are also expanding our collection of human lung primary cells and now have collections from healthy volunteers as wells as lung cells from volunteers with CF and other non-CF lung diseases.

Fast Facts:

- Over 660 CF patients in the Emory+Children's CF Center
  - More than 80% provide samples to the CTC
  - 52% are adults
  - 11% are non-white
- Over 10,000 aliquots of human samples
  - ~ 2,000 bacteria samples
  - ~ 3,800 sputum samples
  - ~ 1,500 blood samples

Finally, the CTC is greatly escalating its support of CF microbiological research. In collaborations with Drs. Joanna Goldberg, Marvin Whiteley, Sam Brown, Neha Garg, and Stephen Diggle among others, the Core is exploring new techniques to collect and process sputum cultures and other microbiological samples. This work is poised to support researchers exploring the complex microbiome in CF. Expansion of these efforts will be supported by a full-time dedicated research coordinator solely for microbiological collection and processing.

In addition to continuing to expand the Core's support for CF research through the aforementioned efforts, there are many other ventures planned for the near future. These include expanding subject recruitment, incorporating dynamic glucose monitoring into sample collection, and continuing tailored prospective specimen collection.

~submitted by Randy Hunt, MD

A sample of *Pseudomonas aeruginosa* grown in a Petri dish for isolation. *Pseudomonas* is a common bacterium in CF lungs and many therapies are aimed at controlling *Pseudomonas* infection in CF. The CTC is expanding its collection and processing of bacteria important in CF such as *Pseudomonas*.

RDP Fellows

The first cohort of ***CF@LANTA*** RDP Fellowship just graduated from the program in June 2017. The predoctoral fellow, Brandon Stauffer, received his PhD from Emory's Molecular and Systems Pharmacology Training Program; Dr. Stauffer as taken on a Postdoctoral Fellowship in Clinical Genetics at the Mount Sinai Health System in NYC. The postdoctoral fellow, Dr. Samuel Molina, obtained a position as Instructor in Emory's Department of Medicine, Division of Pulmonary, Allergy, Critical Care and Sleep Medicine (see September 2017 newsletter for more information on Dr. Molina).

We solicited applications for the next cohort of RDP Fellows. Working with the CFF, we expanded the number of trainees to support. We also made a greater effort to reach out to our colleagues beyond Emory; information on the application process was provided to the graduate school and postdoctoral offices at Emory, Georgia Tech, and University of Georgia. These applications were received by Dr. Teresa Gauthier and evaluated by outside reviewers.

We are delighted to introduce the new RDP Fellows, who started in July 2017:

- Sheyda Azimi, PhD: postdoctoral fellow in the Diggle Lab at Georgia Tech
- Ashley Cross: Microbiology and Molecular Genetics Program graduate student in the Goldberg Lab at Emory
- Camilla Margaroli: Immunology and Molecular Pathogenesis Program graduate student in the Tirouvanziam Lab at Emory

Information on the new RDP fellows will be in a future newsletter.

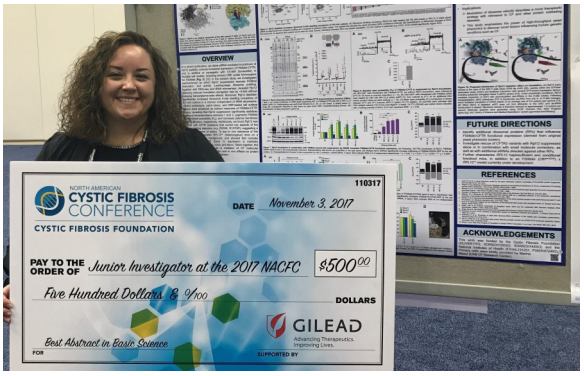
~submitted by Joanna Goldberg, PhD

Recent CF-AIR Publications

Recent publications by CF-AIR members can be viewed online here:
http://www.pedsresearch.org/uploads/blog/doc/2017-12CF-AIRNewsletterPubs.pdf

CF-AIR Brags

- Bill Wuest, PhD named 2017 recipient of the ACS Infectious Diseases Young Investigator Award: more details here
- Kathryn Oliver, PhD, postdoctoral fellow in the Sorscher lab at Emory, received the award for best poster as Junior Investigator in the Basic Science Category
- We are happy to announce that Dr. Dawn Simon, Associate Professor of Pediatrics, was recognized at the recent Dept. of Pediatrics Annual Faculty Awards ceremony. Dr. Simon was presented the Dr. Joe Snitzer Master Clinician Award, recognizing excellent clinical expertise and judgement. Dr. Simon takes care of many of our pediatric CF patients when admitted to Egleston Hospital. We are so blessed to have physicians like Dr. Simon on our team. Congrats, Dawn!



CF-AIR Workshop

This year the CF-AIR Workshop started having several sessions at Georgia Tech; in addition to the usual Emory location. Many thanks to Ashley Cross for facilitating the schedule for the past year and a half. Camilla Margaroli will take on this responsibility starting in January 2018.

See below photos from the Workshop this fall, including the recent "Strategize and Socialize" session.

Events for Researchers

Each month there are several opportunities for CF-AIR researchers to get together to discuss their work.

- CF-AIR Faculty and Trainees Research (CF-TR):
  On the first Tuesday of the month, faculty chalk talks on either the overall work in their lab, or on a grant proposal planned for submission soon. On the third Tuesday of the month trainee chalk talks discussing planned manuscripts or fellowship proposals. Meet at noon in various rooms in ECC and HSRB, check the calendar.
- CF-AIR Workshop:
  A weekly Wednesday meeting for research-in-progress and journal club presentations. Meet at 4:00 pm in ECC 302.
- CF Scholars Meetings:
  A monthly program for CF Scholars, Friday afternoons, see website schedule.

More information and current schedules can be found on
www.pedsresearch.org/research/centers/cf-air/seminars-workshops/
and
www.pedsresearch.org/research/centers/cf-air/cf-center-of-excellence/education-outreach/cf-scholars-program/

Sign up for the CF-AIR Weekly Digest to hear about all events of interest to researchers, just email kmurra5@emory.edu

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Clinics:

Children's Healthcare of Atlanta
CF Care Center:
Children's at North Druid Hills
1605 Chantilly Drive NE
Atlanta, GA 30324
404-785-2000

Children's at Scottish Rite
Cystic Fibrosis Affiliate Program
5455 Meridian Mark Road, Suite 200
Atlanta GA 30342
404-785-2898

Emory Adult CF Clinic: 404-778-7929

Website:

www.pedsresearch.org/research/centers/cf-air

If you are interested in supporting our research and outreach programs please visit: www.pedsresearch.org/research/centers/cf-air/donors-visitors/

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The Emory+Children's Cystic Fibrosis Center of Excellence

Center for Cystic Fibrosis and Airways Disease Research
Advancing Wellness in Patients Through Research