

PARTNERSHIP FOR
clean competition

Research

Insider



FALL 2019 | ISSUE NO. 8 | CLEANCOMPETITION.ORG

IN THIS ISSUE

Alternative Matrices Field Trials - Letting the Athlete Voice Lead Innovation
Scientific Updates - Optical Resonators, Iso-Mass-Spectrometry, and SESAME
Abstract Submission Deadlines for Major Conferences
USADA Symposium Update - 4th Larry D. Bowers Award Winner



3 GRANT DEADLINE

4 BREATH TRIAL FEATURE

6 RFP OPPORTUNITY

7 PROJECT UPDATES

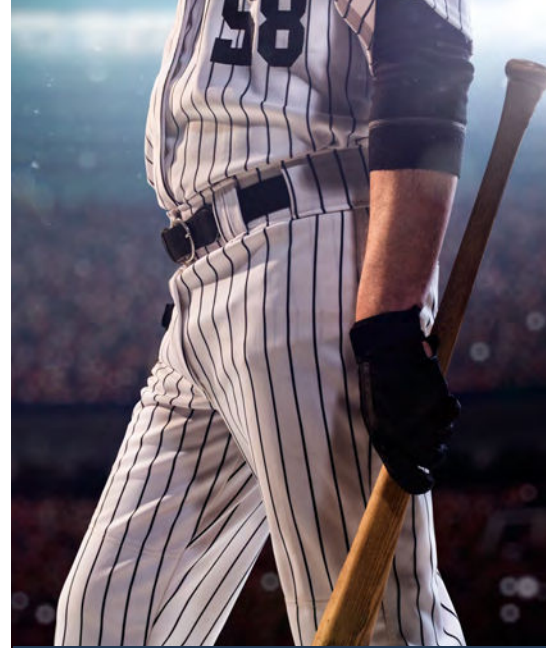
8 AWARDS + ACCOLADES

10 PODCAST

11 USADA SYMPOSIUM

12 ABSTRACT DEADLINES

13 IMPORTANT DATES & OPPORTUNITIES



Alternative Matrices Field Trial with Athletes



Dr. Judith Su - SPIE 2020 Calendar



Prof. Cowan - Larry D. Bowers Award Recipient

PARTNERSHIP FOR
clean competition



**YOU HAVE
SCIENCE.
WE HAVE
MONEY.**

LET'S TRADE.

PRE-APPLICATIONS DUE NOV. 1, 2019

CLEANCOMPETITION.ORG TO APPLY

ATHLETE INSPIRED Innovation

INCLUDING THE VOICE OF THE PCC'S MOST IMPORTANT STAKEHOLDER IN THE SCIENTIFIC PROCESS.

Discovering innovative ways to collect athlete samples has been a PCC priority since 2008. While blood and urine testing aren't going anywhere, alternative matrices like oral fluid (OF) and exhaled breath (EB) offer an easy, less expensive option for in-competition sample collection.

And both scientists and athletes are on board.

In late 2018, the PCC invited real-world stakeholders in the anti-doping process to help shape the future of collections. And it was really, really helpful. While we knew that DCOs from PCC Member Comprehensive Drug Testing, Inc (CDT) were eager to give us feedback on new technology - including devices that captured athlete samples in the form of exhaled breath and another that captures oral fluid - we weren't sure if athletes themselves (in this case, Minor League Baseball players) would be interested. After all, it involved volunteering to provide not one, but THREE different samples (arguably, the most invasive and uncomfortable part of the job).

It turns out that athletes were pretty gung-ho about being part of the process, and being given a voice on issues that impact them directly. Even if that means providing a few extra samples. And more than 500 MiLB athletes stepped up to the plate.

The Team:

The PCC assembled a trial team consisting of sample collection experts from CDT, scientific oversight from both USADA and anti-doping scientists at the WADA-Accredited Sports Medicine Research and Testing Lab (SMRTL) in Salt Lake City, and trial administration support from MLB. The collected samples were analyzed by the team at SMRTL.

WHY FIELD TRIALS?

The goal of executing field trials with real athletes was twofold:

1. Compare the benefits of breath testing to those of oral fluid and urine collections.
2. Examine athlete ease of use and acceptance of the devices.

ATHLETE INSPIRED Innovation

The Study:

521 Participating athletes and staff from MiLB teams volunteered to provide samples using three different collection methods:

Urine (control method): You know the drill, but in this case, collection was unsupervised as the study results were completely anonymous.

Oral Fluid: Placing a collection pad under the tongue of the subject until enough saliva has accumulated.

Exhaled Breath: Exhaling naturally into a device that catches breath on a filter membrane.

Athletes and DCOs were then asked to rate their experience with each collection method, while the samples from all participants were sent to SMRTL for analysis.

Results

Efficiency:

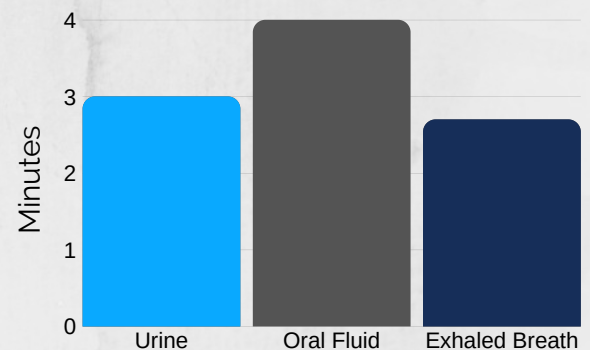
EB was the quickest collection method, followed by urine and OF. While Oral fluid was predicted to perform more quickly than urine collection, the study team believes that variables such as dry mouth may have slowed the process. Additionally, the urine collection process may have been quicker than a real-world scenario due to the fact that the volunteers were prepared for the testing.

Athlete/DCO Adoption:

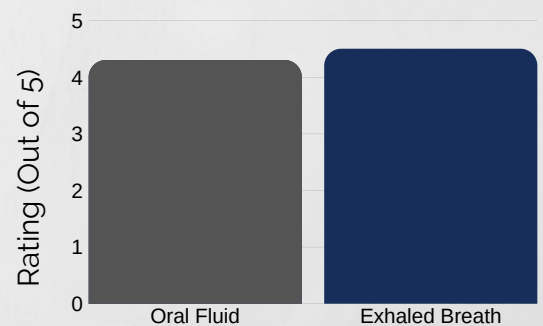
Both OF and EB received very high ratings from athletes and DCOs, with EB being favored. The technologies were considered simple to use and minimally invasive – a boon for all stakeholders.

Conclusion:

While testing of these alternative matrices requires some additional development, their potential to complement blood and urine collection is clear. Furthermore, the willingness of athletes to participate in the scientific process has spurred a second PCC investigation – for dried blood spots, which is currently underway! The PCC believes the future of drug testing in sport will be faster, easier, and less expensive as a result of these important trials. Interested in learning more? Visit <http://bit.ly/breathtrial> to read the full report.



Elapsed Time of Collection*



Collection Process Rating (Athletes)*

RFP

CALL FOR APPLICATIONS

The PCC seeks an analytical approach to precisely measure percent glycated hemoglobin (HbA1C) fraction at the single Red Blood Cell (RBC) level from whole-blood samples.

**INTERESTED PARTIES SHOULD CONTACT
MPEARLMUTTER@CLEANCOMPETITION.ORG BY OCTOBER 31, 2019**

A SELECTION OF SCIENTIFIC UPDATES

OPTICAL RESONATORS

Dr. Judith Su, Ph.D., University of Arizona

Dr. Su's team demonstrated the feasibility of using microtoroid optical resonator sensing technology for ultra-sensitive and rapid detection of hCG in urine. In particular they were able to demonstrate one femtomolar detection of hCG in artificial urine as well as measure femtomolar concentrations of hCG in the urine of pregnant women in different trimesters of pregnancy in under 30 seconds. The method's limit of detection is more than a thousand times more sensitive than standard mass spectrometry. Unlike other techniques, which may require involved sample preparation, Dr. Su's sensor can work directly with urine samples with minimal handling. The team anticipates the technology will enable a non-invasive, sensitive, and rapid means to detect hCG and other PEDs in the clinic or by the track. Dr. Su's PCC research has spurred further research looking at cancer biomarkers in human samples, including urine, and she was featured in the 2020 SPIE Women in Optics planner which highlights "women who are making a difference through their work and other contributions to the fields of science, optics, and engineering."

Read the resulting article in Analytical Chemistry: <https://bit.ly/2OV0Yif>

Get in touch with Dr. Su: <https://bit.ly/2BiQlrV> or judy@optics.arizona.edu

ION MASS SPEC

Dr. Richard Yost and Dr. Alison Levy, University of Florida

Dr. Yost and Dr. Levy at the University of Florida sought to determine the potential of ion mobility mass spectrometry to improve the separation of isomeric steroid species that are challenging to resolve using current analysis methods. The team successfully used LC-IM-MS to separate 16 steroids, which compose 6 isomeric groups, in under 6 minutes. While the approach is limited by concentration, which may preclude this method from practical application for anti-doping testing at this time, the research provided proof of concept for ion mobility spectrometry to enhance the separation of isomeric exogenous and endogenous anabolic androgenic steroids, which cannot be separated by mass spectrometry alone. This research has spurred additional work into fundamental ideas involving anabolic steroids and their separation where concentration would not be a limiting factor, including the analyses of 25-Hydroxyvitamin D.

Get in touch with Dr. Yost: ryost@chem.ufl.edu

A SELECTION OF SCIENTIFIC UPDATES

SESAME

Dr. O.J. Pozo, Ph.D., Dr. J. A. Pascual, Ph.D., Dr. R de la Torre, Ph.D., and Ms. E. Olesti, BSc, IMIM Institut de Recerca Hospital del Mar

Under the project title "SESAME" (Screening Emerging Stimulants by Analytical and Metabolic Evaluations) Dr. Pozo and the IMIM team sought to develop an LC-MS/MS method for the quantification of new psychoactive substances (NPS) and their urinary evaluation in humans for doping control analysis. Results from SESAME provide useful and straightforward information which may improve the efficiency of the doping control community to screen for new and emerging stimulants. Additionally, the study provided information about the requirements of evaluating the pharmacology and metabolism of additional NPS.

Dr. Pozo identified two highlights of the project's impact:

1. The urinary concentration of the parent drug after the administration of some NPS (e.g. mephedrone, 2C-E) might be below the WADA established MRPL. In these cases, either the determination of a more abundant metabolite or the decrease of the MRPL is advised.
2. The urinary concentration of the parent drug after the administration of some NPS (e.g. methylone) exceeds up to 100 fold the established MRPL. That opens the door to report a AAF in an in-competition sample resulting from an administration out of competition.

Results regarding the main metabolites for mephedrone are being used to control the use of this NPS by some agencies and laboratories. A manuscript detailing the study has been submitted for publication, and preliminary results were presented at the 2018 TIAFT conference in Ghent, Belgium.

Get in touch with Dr. Pozo: opozoeimim.es

DRIED BLOOD SPOT CARDS

The PCC, alongside partners from MLB, SMRTL, and Drug Free Sport International will be conducting field trials of new blood sampling technology with MiLB players late October. The results of the trial, which is currently underway, will be disseminated early 2020. We encourage you to stay connected via our Youtube and Twitter channels.

AWARDS AND ACCOLADES

ANALYTICAL SCIENTIST POWER LIST



John Yates, Ph.D.

Ernest W. Hahn Professor,
The Scripps Research Institute.
PCC SAB Member

Dr. Yates has been on the PCC's Scientific Advisory Board since 2008, where his invaluable expertise is put to use reviewing PCC grant applications and helping to evolve the PCC's impact.

Exciting recent advance: We are making great progress towards developing methods for 3Dproteomics and the application of these methods to studies of Alzheimer's disease and cancer.

Eureka moment: We were working on an integrated LC/LC method 25 years ago that combined strong cation exchange and reversed phase particles in the same column. There was an "oh wow" moment when we flowed the 80 percent acetonitrile buffer across and column and observed that peptides were retained on the SCX phase.



Richard Yost, Ph.D.

Professor & Head of Analytical Chemistry,
University of Florida.
PCC Grant Recipient

You may remember Dr. Yost from page 7 of this newsletter, where his cutting edge method for steroid detection is summarized..

The future: When I started at the University of Florida some 40 years ago, MS was not a widely accepted technique. Organic chemists used it to confirm they had synthesized the correct compound, natural product chemists used it to find novel compounds in a given organism, and physicists and physical chemists used it for fundamentals. Today, MS may well be the dominant technique in our field, and there's no indication it's slowing down!

AWARDS AND ACCOLADES

COPENHAGEN TRAVEL GRANT AWARDEES

Two incredible scientists have been awarded a PCC travel grant to study anti-doping at the 5th biannual "Doping and Human Exercise Performance" Symposium offered by the Department of Nutrition, Exercise and Sport Sciences (NEXSKU) at the University of Copenhagen. The symposium, held November 11-15 2019, will feature experts on a variety of topics from omics strategies to hematology. It will be followed by a two day hands-on course for Ph.D. students to apply their knowledge practically with a range of experiments. For more info visit <http://bit.ly/copenhagenAD>



Eleonora Amante

Ph.D. Student

Università degli Studi di Torino
Dipartimento di Chimica

I am very enthusiastic to attend the course! In particular, I am looking forward to learning more about the -omics sciences applied to anti-doping and about the new frontiers in steroids' abuse detection. Furthermore, I hope this experience will open the door to new research collaborations.



Manish Sharma

Ph.D. Research Scholar

National Institute of Pharmaceutical
Education and Research (NIPER)

By attending this course I will have an opportunity to gain knowledge of advanced and promising methods of biomarker detection and other highly sensitive approaches to detect GH and other doping agents including EPO Biosimilars, stimulators of GH secretion releasing hormones, novel erythropoiesis-stimulating agents, masking agents (plasma volume expanders), and blood transfusion, which will help me fine-tune my Ph.D. research and inspire my future projects.

PARTNERSHIP FOR
clean competition

Presents the

**ANTI-
DOPING
POD-
CAST**



Streaming Every Other Tuesday

IT'S HARD TO KEEP UP WITH DEVELOPMENTS IN THE ANTI-DOPING WORLD.

WE'VE MADE IT EASIER.

Featuring the athletes, scientists, policy makers, sports leagues, attorneys, and other clean sport champions who are driving change, disrupting technology, and identifying how we as a community could be doing better.

Listen and Share:



Want to sponsor or be a guest of the Anti-Doping Podcast? Great Choice. Contact Jenna Celmer via Jcelmer@cleancompetition.org.

USADA SYMPOSIUM

TOKYO 2019

Committed to furthering scientific innovation in advance of the 2020 Olympic and Paralympic Games and beyond, the U.S. Anti-Doping Agency (USADA) hosted the 18th Annual USADA Symposium on Anti-Doping Science on October 5-7 in Tokyo, Japan. USADA and partner the Japan Anti-Doping Agency (JADA) welcomed 98 invited attendees from more than 30 countries.

This year's symposium focused on the theme "Emerging Drugs and Technologies," recognizing that state-of-the-art technology and innovative solutions remain critical to upholding clean sport, counteracting athletes' attempts to evade detection, and conducting credible anti-doping programs.

Professor David Cowan Honored



The 4th Annual Larry D. Bowers award was granted to Prof. Cowan in honor of his professional achievements in anti-doping research, technological innovation, and laboratory administration, including co-founding the WADA-Accredited Drug Control Centre in London, which he directed for nearly 30 years. Prof. Cowan led all anti-doping activities for the 2012 Olympic & Paralympic Games in London and assisted with the preparation of the laboratories for the 2016 Olympic Games in Rio and the 2018 Winter Games in PyeongChang. Over the course of his 40-year career, Professor Cowan advanced anti-doping science by publishing extensively in the field of pharmaceutical analysis, with a particular focus on the detection and quantification of drugs and their metabolites in complex body fluids. He has played an especially important role in the development of tests for growth hormone and IGF-I, as well as a new biomarker approach for identifying abuse of hGH in sport. Congratulations, David!

Larry D. Bowers Award for Excellence in Anti-Doping Science

Presented by the U.S. Anti-Doping Agency

Nomination submissions for the 2020 award are due by
March 2, 2020

.....
Learn more and submit your nominations at:

www.USADA.org/excellence-anti-doping-science-award

EVENTS & OPPORTUNITIES

CALL FOR PAPERS/ABSTRACTS



American College of Sports Medicine

67th Annual Meeting. May 26 – 30, 2020
San Francisco, California

SCIENTIFIC ABSTRACTS AND CLINICAL CASE PAPER SUBMISSION

Due November 4, 2019
<https://www.acsm.org/annual-meeting/present/>



American Society for Mass Spectrometry

68th Annual Meeting. May 31 – June 4, 2020
Houston, Texas

AWARD NOMINATIONS

Due November 30, 2019
<https://www.asms.org/about-asms-awards>

ABSTRACT SUBMISSIONS

Due February 3, 2020
<https://www.asms.org/conferences/annual-conference/abstracts>



APA Experimental Biology

68th Annual Meeting. May 31 – June 4, 2020
Houston, Texas

ON-TIME ABSTRACTS

Due November 14, 2019

LAST CHANCE ABSTRACTS & SCIENTIFIC OUTREACH ACTIVITY POSTERS

Due January 30, 2020
<http://bit.ly/APSabstracts>



American Society of Hematology

61st Annual Meeting. December 7-10, 2019
Orange County Convention Center (OCCC),
Orlando, FL

LATE-BREAKING ABSTRACT SUBMISSIONS

Due October 29, 2019
<http://bit.ly/hemalate>

**Have an upcoming deadline you would like the PCC to promote?
Reach out to Jenna Celmer at Jcelmer@cleancompetition.org**

EVENTS & OPPORTUNITIES

LabXchange at Harvard University: Call for Beta Testers

LabXchange allows users to remix and share content to support differentiated, personalized learning. The content library contains high-quality digital resources from universities and scientific organizations worldwide - including interactive lab simulations, videos, assessments, and more. Users can combine this content with their own materials to create customized learning pathways. As well as facilitating content creation and remixing, LabXchange connects learners, educators and researchers through social features such as private classes, discussion forums, and the ability to mentor or be mentored. By providing tools that foster hybrid learning, LabXchange allows users to engage in design, iteration, and problem-solving, while supporting individual exploration.

To Beta Test: <http://bit.ly/labxbetatest>

Site: <https://about.labxchange.org/>

PCC Grant Application Survey

In an effort to provide an optimal grant application experience the PCC will be reaching out to past applicants with an online survey. The survey will take no longer than 10 minutes to complete and will address the entire application process, from initial awareness of PCC opportunities to award decision.

We encourage you to look for the survey in your email in November and participate to help us ensure a smooth application process.

Thank you for helping to make the PCC better.

The Analytical Scientist Innovation Awards 2019 - Due October 24, 2019

The goal? To highlight the latest and greatest technology, instrumentation and software making waves throughout the analytical science community.

To enter/nominate email matthew.hallam@texasrepublishing.com (subject line: 2019 Innovation Awards) and include: Name of innovation, Launch date (must be after October 31, 2018), Brief description (10 words), Detailed description (50-150 words), Potential impact (50-150 words), One image (if applicable).

UPCOMING Dates

 PARTNERSHIP FOR
clean competition

Nov. 1, 2019

**2019 ROUND THREE
PRE-APPLICATIONS DUE**



Nov. 5-7, 2019

**WORLD CONFERENCE ON
DOPING IN SPORT**

 UNIVERSITY OF
COPENHAGEN

Nov. 11-15, 2019

**DOPING + HUMAN EXERCISE
PERFORMANCE SYMPOSIUM**

 PARTNERSHIP FOR
clean competition

Dec. 1, 2019

**2019 ROUND THREE
FULL APPLICATIONS DUE**

 PARTNERSHIP FOR
clean competition

Mar. 1, 2020

**2020 ROUND ONE
PRE-APPLICATIONS DUE**

GET IN TOUCH:

Michael Pearlmutter
Executive Director

mpearlmutter@cleancompetition.org

Jenna Celmer
Director of Communications
jcelfer@cleancompetition.org

CleanCompetition.org



/PCCantidoping