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# Research Insider

WINTER 2020 | ISSUE NO. 9 | CLEANCOMPETITION.ORG

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# IN THIS ISSUE



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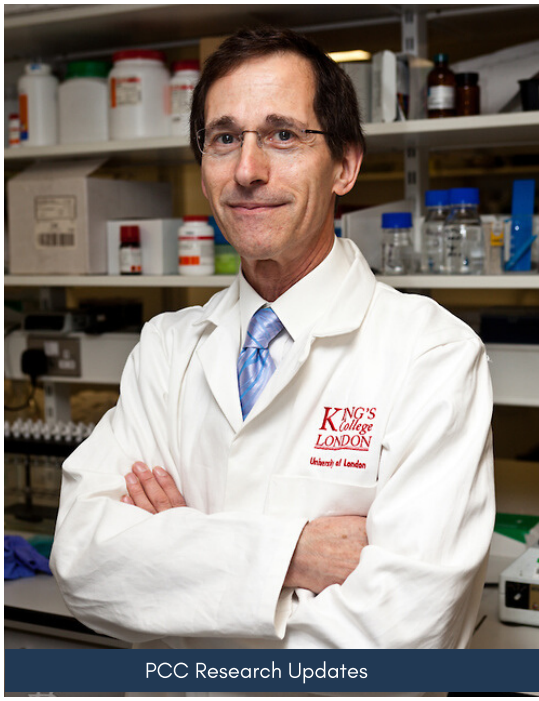
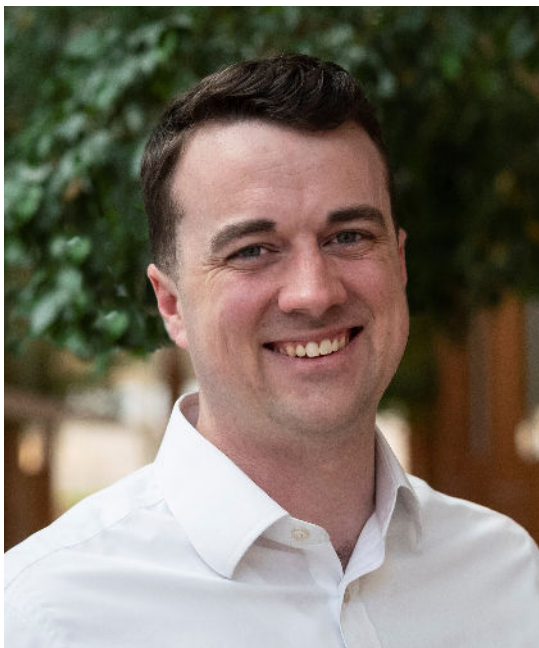
38th Annual Manfred Donike Workshop




PCC Research Updates



New PCC Director of Communications, David Kumbroch

# MANFRED DONIKE WORKSHOP 2020

2020 marks the 38th iteration of the Manfred Donike Workshop, held annually in Cologne, Germany.

**The second week of February is an exciting time for the anti-doping community. The Manfred Donike Workshop brings together a prestigious group of international anti-doping researchers to share their work and improve sports drug testing knowledge throughout the community. The PCC was honored to be a part of the conference for the third time.**

**Who is Manfred Donike?**

Dr. Manfred Donike was a German biochemist and anti-doping analysis expert credited with spurring modern drug testing in sport. The chemist and cyclist developed one of the earliest sports laboratories for research in doping issues ahead of the 1972 Munich Olympics. Additionally, Donike and technicians from the Institute for Biochemistry at the German Sport University in Cologne administered testing at the 1983 Pan-American Games through the use of a portable laboratory. The testing produced 19 positives, not including the multiple athletes that withdrew from their events in order to avoid testing. According to IOC President Thomas Bach, Donike "brought the fight against doping into popular consciousness." Dr. Donike died in 1995 at the age of 61.

**This year's topics included:**

- Steroid Analysis and Steroid Profiling
- Metabolism and Pharmacokinetics of Doping Agents
- Detection of Peptide Hormones
- Blood Analysis / Blood Passport
- Alternative Matrices (e.g. dried blood spots, hair, saliva)
- Derivatization Techniques
- Immunological Methods in Doping Analysis
- Developments in Sample Preparation
- Mass Spectrometry
- Other Technical / Analytical Improvements
- Quality Management / ISO 17025 Accreditation / Ring Tests
- Nutritional Supplements and Hormones
- Organization of Major Events
- Miscellaneous

## WANT TO LEARN MORE?

An overview of this year's workshop will be provided in a special edition of *Drug Testing and Analysis*.

Past years: 2019, 2018

Continued on next page...

# MANFRED DONIKE WORKSHOP 2020

The event is hosted by Dr. Mario Thevis, head of the Center for Preventive Doping Research and Vice President of Research at the German Sport University Cologne. Dr. Thevis is one of the PCC's most frequently funded researchers. He is also Editor-in-Chief of Drug Testing & Analysis, which publishes an annual volume featuring research presented during the Workshop (See previous page). We reached out to Dr. Thevis to ask some questions about the conference:

**What's the purpose of the Manfred Donike Workshop?**
The event offers a venue for anti-doping scientists to present recent advances in sports drug testing and supports both the formal scientific as well as the informal practical exchange between the anti-doping laboratories. The workshop strengthens global anti-doping efforts ranging from early-stage research to validated and routinely applied test methods.

The Manfred Donike Workshop on Doping Analysis has existed since 1983 when a total of 19 individuals attended the first edition. Since then, it has been annually conducted with a growing number of attendees, reaching up to 170 participants in 2020.

**Are there any moments in the past that stand out as highlights to you?**
There are certainly quite a few of those - ranging from early versions of today's steroid profile, the identification of doping agents in human urine resulting from conversions of natural and/or permitted substances, and their differentiation from their prohibited analogs to first and second-generation test methods for recombinant erythropoietins. Additionally, the quantum leap of improvements in detection strategies for anabolic steroids, peptide hormone detection strategies, analytical approaches for the detection of gene doping, and case reports on worldwide first adverse analytical findings (AAFs) of new doping agents. The motivation of anti-doping scientists to optimize the analytical capabilities in order to provide best-possible information in situations of AAFs has proven vital to a continuous, fair, and adequate result management.

**What were you most looking forward to this time around?**
A lot of excellent research is being conducted on various fronts. New methodologies tackling the challenges of doping using drugs that naturally occur (e.g. testosterone, EPO, growth hormone, insulins, etc.) as well as blood transfusions are particularly exciting, but also today's options to move from established conventional doping control test samples (i.e. blood and urine) to minimally or even non-invasive collected specimens such as dried blood spots (DBS) or exhaled breath is thrilling. The available analytical sensitivity has allowed for researchers to consider such matrices despite the limited volumes. Athletes have been in support of these alternatives, which will not substitute for regular routine doping controls based on whole blood, serum, or urine. Finally, it is of substantial importance and interest to continue identifying sample manipulation and, equally important, situations of inadvertent doping and how to provide the required analytical data to corroborate those.

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# ANTI-DOPING POD-CAST

## KEEPING UP WITH DEVELOPMENTS IN THE ANTI-DOPING WORLD

## NEW EPISODES EVERY OTHER TUESDAY

Featuring 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.

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# A SELECTION OF SCIENTIFIC UPDATES

## IGF-1 TOP-DOWN METHOD

**Dr. David Cowan, King's College London**

The method for measuring IGF-1, for both the biomarker approach for proving the administration of human growth hormone and also for longitudinal monitoring of individual athletes as part of the WADA athlete biological passport, has now been simplified. This new blood test is called the top-down, or intact, method and is more rapid than the bottom-up, or digestion-dependent, method. Used together, these methods can provide complementary information on any unusual sample. The PCC funded the development of a detailed standard operating procedure that allows all laboratories to perform the blood test the same way. The PCC also funded the development of a blood sample that could be sent out to all laboratories so that all of them could get the same results from the same sample. Inter-laboratory studies for both methods, also funded by the PCC, have shown similar results in terms of precision (getting the same answer every time in every lab), and the latest study also shows good accuracy (getting the right answer). The results from the new top-down method have just been accepted for publication in *Analytical Chemistry*.

**Get in touch with Dr. Cowan:** david.a.cowan@kcl.ac.uk

## IMPROVED STEROID ISOMER SEPARATION USING ION MOBILITY-MASS SPECTROMETRY

**Dr. Christopher Chouinard, Florida Institute of Technology**

In just under a year, Dr. Christopher Chouinard and his team have demonstrated the first application of ozone-induced cleavage of endocyclic C=C double bonds in order to separate steroid isomers utilizing ion mobility-mass spectrometry. Steroids have proven quite difficult to separate with ion mobility due to their structural inflexibility and faint differences in atomic arrangement. This study concludes that solution-phase ozonolysis provides a cost-effective and simple alternative for IM separation of testosterone and epitestosterone. Isomers that were previously quite difficult to separate now have a collision cross section difference of about 10%. The team is exploring ways to improve the efficiency of this reaction by performing ozonolysis in the gas-phase prior to IM separation.
Furthermore, Dr. Chouinard and his team have also observed UV-induced addition products that arise due to solvent interactions, and they have begun to look at other simple UV-catalyzed reactions that may be of analytical utility. They hypothesize that these reactions will enable high throughput and a more responsive method of testing.

**Read the resulting article in the Journal of the American Society for Mass Spectrometry:**
https://bit.ly/317jTKH
**Get in touch with Dr. Chouinard:** cchouinard@fit.edu

# A SELECTION OF SCIENTIFIC UPDATES

## PERFORMANCE HEMATOLOGY WORKING GROUP

**Dr. Michael Sawka , Georgia Institute of Technology**

The PCC Performance Hematology Working Group (PHWG) goal is to develop strategies to identify athletes employing blood doping (Autologous or Homologous Transfusion, Erythropoiesis Stimulating Agents). PHWG members are Steve Elliott, Mike Sawka, Larry Silverman (PCC SAB); Dan Eichner and Geoff Miller (SMRTL); Ashley Chi (Duke), James Cox (Univ. Utah); John Higgins (Mass General Hospital); Merav Socolovsky (UMASS Medical Center); Jacob Bejder, Rasmus Bro and Nikolai Nordsborg (Univ. Copenhagen). Primary emphasis is directed towards evaluating single cell red blood cell (RBC) age biomarker patterns with techniques such as machine learning. Recently, a Request for Proposals for single cell hemoglobin A1C measurements resulted in numerous submissions with funding awards in progress. A series of teleconferences and a meeting in Boston (December 2019) coordinated support for several collaborative microgrants and larger human studies. Studies are currently underway and updates will be provided in a future newsletter.

**Get in touch with Dr. Sawka:** mike.n.sawka@gmail.com

## ERFE AS A BIOMARKER OF EPO ABUSE

**Dr. Gaetano Cairo, University of Milan**

Erythroferrone (ERFE)is a recently discovered hormone produced by red blood cell progenitors in the bone marrow in response to erythropoietin (EPO). By suppressing hepcidin expression in the liver, ERFE contributes to increased dietary iron absorption and recycling of stored iron necessary to sustain red blood cell production. We show that in healthy humans receiving exogenous EPO, (according to a protocol used by athletes to evade doping controls) ERFE increases even in response to administration of very low EPO doses. Therefore, ERFE, which can be easily and reliably analyzed in small amounts of serum samples, has potential as a marker for assessing EPO abuse in athletes. It may be particularly helpful for the detection of small EPO quantities, which are likely to go undetected.

**Read the resulting article in Haematologica:** https://bit.ly/2v3iNnr
**Get in touch with Dr. Cairo:** gaetano.cairo@unimi.it

# A SELECTION OF SCIENTIFIC UPDATES

## REFERENCE MATERIALS WORKING GROUP

Researchers in anti-doping often discover different metabolite biomarkers that make prohibited substances easier to detect, are more insightful, and can identify drugs in the body for longer periods after ingestion. For these new markers to gain any traction in the field, it's imperative that scientists have access to authentic samples or consistent reference materials. More often than not, these reference materials aren't commercially available and must be synthesized in labs.

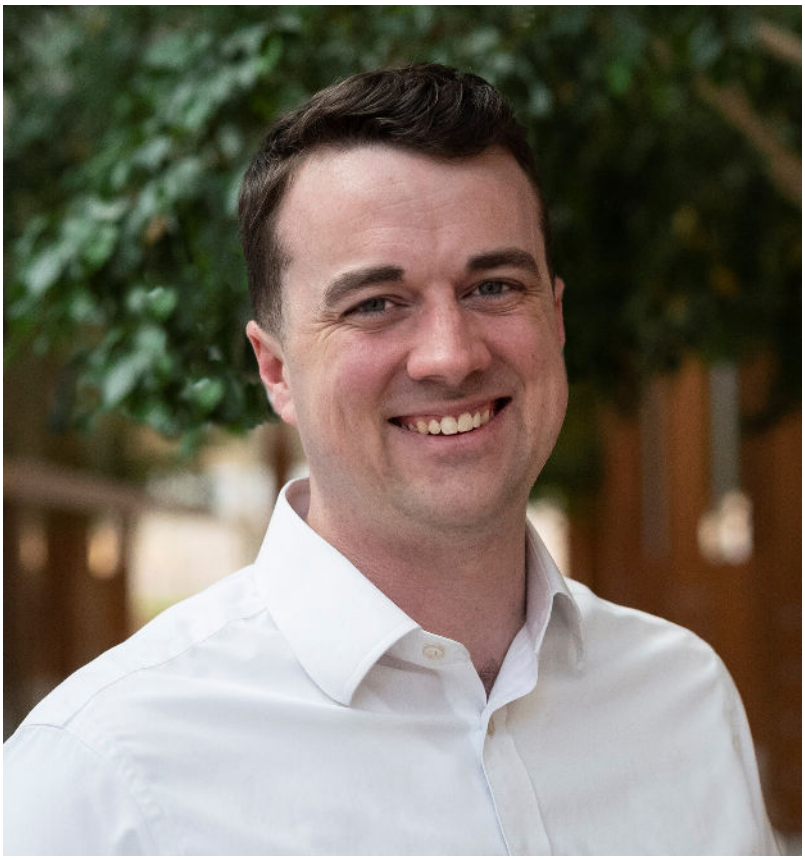
The Reference Materials Working Group (RMWG) is being formed to identify the need, produce, distribute and monitor these certified reference materials that are critical to the confirmation analyses conducted by the ~30 WADA-accredited laboratories globally. Without certified reference standards, important confirmation analyses may be halted or delayed. The current reference material landscape is fragmented with a significant risk of any sort of standard becoming obsolete. It's imperative that reference materials are available at a reasonable cost to the laboratories. The RMWG is represented by Dr. Fedoruk and Dr. Dalton from the PCC SAB and has representation from the US labs, current suppliers, and global anti-doping partners.

The first goal of the RMWG is to conduct a gap analysis of the current supply of materials and the demand of the field. Identifying immediate demand has already been completed, but there is much work to do. The RMWG encourages those with technical expertise to apply directly for PCC grant funds to produce materials or to establish direct contact with specific suppliers to coordinate production. The Sports Medicine Research and Testing Laboratory (SMRTL) has agreed to reserve storage for PCC-produced reference materials in their new laboratory facilities.

The PCC is currently proceeding with funding the production of a number of urgent reference materials. These materials will be available online for distribution to WADA-accredited labs upon request. The PCC will monitor the supply of reference materials to make the process easy, timely, and affordable, but also to develop better inventory management so no labs are waiting for extended periods of time to get their materials.

If you have any questions about the RMWG or PCC-produced reference materials, please email Michael Pearlmutter at mpearlmutter@cleancompetition.org.

# NEW STAFF



## DAVID KUMBROCH
## DIRECTOR OF COMMUNICATIONS

**What drew you to the PCC?**
I enjoy working in a science-first environment, and the Partnership for Clean Competition gave me a chance to continue interacting first-hand with scientists, facilitating their research. As a huge sports fan, it's an honor to help protect clean athletes who compete the right way, and to get the chance to support that mission from the science side of the equation fits me perfectly.

**Tell us a little bit about your background.**
After graduating from the University of Alabama (Roll Tide), I moved to Huntsville and worked as a journalist in television news for seven years. When the time came to move on from news, I went to the HudsonAlpha Institute for Biotechnology to serve in a communications role. HudsonAlpha researches genetics and genomics, and it was an incredible learning experience to be around some of the brightest minds in a field full of discovery.

**Give us a fun fact about yourself.**
I will watch people compete in just about anything. I binged all of *Blown Away* on Netflix in a few days; it's about competitive glassblowing. *The King of Kong* is about setting the world Donkey Kong record, and it's easily my favorite movie. I'm also a huge Cloud 9 fan across pretty much every e-sport. That's all in addition to watching the Crimson Tide, of course.

**Welcome to the team, David!**

**Get in touch:** dkumbroch@cleancompetition.org

# EVENTS & OPPORTUNITIES

## CALL FOR PAPERS/ABSTRACTS

### The International Association of Forensic Toxicologists

**58th Annual Meeting**

Oct. 31 – Nov. 5, 2020

Cape Town, South Africa

**ABSTRACT SUBMISSION**

Opens March 1, Due May 1, 2020

https://tiaft2020.co.za/welcome/

### American College of Sports Medicine

**67th Annual Meeting**

May 26-30, 2020

San Francisco, California

**LATE BREAKING SUBMISSIONS & SPORTS MEDICINE FELLOW SUBMISSIONS**

Due Noon PST March 2, 2020

https://www.acsm.org/annual-meeting/present

**Have an upcoming deadline you would like the PCC to promote? Reach out to Nic Dartoozos at ndartoozos@cleancompetition.org.**

# UPCOMING DATES

| | |
|---|---|
| Mar. 1, 2020 | **2020 ROUND ONE PRE-APPLICATIONS DUE** |
| Mar. 16, 2020 | **INADO WORKSHOP** |
| Mar. 17-18, 2020 | **WADA ANNUAL SYMPOSIUM** |
| Mar. 29-Apr. 3, 2020 | **MSACL 12TH ANNUAL CONFERENCE** |
| Apr. 1, 2020 | **2020 ROUND ONE FULL APPLICATIONS DUE** |
| Apr. 4-7, 2020 | **2020 EXPERIMENTAL BIOLOGY CONFERENCE** |
| Apr. 19-24, 2020 | **SPORTACCORD 2020 BEIJING** |
| May 31-Jun. 4, 2020 | **68TH ASMS CONFERENCE ON MASS SPECTROMETRY AND ALLIED TOPICS** |

## GET IN TOUCH: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