



An Interview
with Dr. Mario
Thevis. P. 2



Latest from the
Lab
P. 6

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Research Insider

What's Inside

—○—
An Interview with Dr. Mario Thevis
P. 2

—○—
Micro-Grants: A Valuable Funding Mechanism
P. 3

—○—
PCC Funding Overview 2014-15
P. 4

—○—
Congratulations Corner
P. 5

—○—
Latest from the Lab: Dried Blood Spots
P. 6

—○—
Upcoming Dates
P. 6

From the Desk of the ED

2016 is a big year for the PCC.
The thing is, it's going to get even bigger.

I've been privileged to work with the PCC for more than two years now, funding researchers who merge science and sport to protect clean athletes. There has never been a more exciting time to be involved with the PCC. One of our research projects just won a prestigious award, the results of several of our studies have



been recently published, the PCC was just granted a provisional patent, and we've secured a new sponsor. And these are just a few examples of a whole new wave of innovation in the anti-doping realm. The PCC is continuing to fund incredible scientists in 2016, and 2016 looks like a banner year for grants, micro-grants (see inside for more details on this new program), and fellowships. I'm also pleased to announce the expansion of the PCC team, as we welcomed our new Stakeholder Engagement Manager, Jenna Celmer. Jenna will be dedicated to making PCC research more accessible to our stakeholders and to increasing researchers' visibility. We hope you'll stay connected with the PCC as we continue to announce exciting advancements in the field of anti-doping, and I hope to see all of you at our 2017 PCC Conference.

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Researcher Spotlight: Dr. Mario Thevis

Dr. Thevis, (PhD, GTFCh) the anti-doping scientist and professor from Germany, speaks with the PCC about his Mildronate study, choosing the anti-doping discipline, and what's next on his radar.



What got you started in anti-doping research?

I was a third year chemistry student at the University of Aachen when I started a student job in pesticide residue analysis, which triggered my interest in analytical chemistry. As I was also a sports science student at the time, I took advantage of an opportunity to combine my interest in both sport and chemistry through pursuing a PhD in anti-doping research under the supervision of Professor Schänzer.

How did you first engage with the PCC?

When the PCC initiative was started in 2008, it was greatly appreciated among anti-doping scientists. Historically, funding opportunities have been limited for this specialized field of research. My team and I had been actively looking for organizations such as the PCC that could be partners and sponsors of our anti-doping efforts. We're happy to report several successful applications thus far.

What intrigued you about Mildronate? What prompted research into the substance?

Mildronate (or Meldonium) was found in the possession of athletes about 10 years ago. Since then the substance's relevance to doping controls has been questioned sporadically, but information remained scarce. In 2013/2014, testing procedures applied to routine doping control samples indicated the presence of a compound in substantial abundance in a series of urine specimens. As the compound could interfere with the measurement of other known analytes my team investigated further. The compound turned out to be Meldonium, and with the use of improved instrumental testing options, monitoring was facilitated and followed by explicit testing.

Can you tell us a bit about the scientific process of your research?

Mildronate is of low molecular mass and due to its composition and structure, a rather polar analyte. These properties are not ideal when using common testing methods, which rely heavily upon chromatographic-mass spectrometric approaches. However, my team was able to modify a routine test method and establish a dedicated confirmatory assay by using an in-house synthesized stable isotope-labeled internal standard hydrophilic interaction liquid chromatography (HILIC) coupled with high resolution/high accuracy tandem mass spectrometry. This combination was important as the internal standard compensated for a number of potential issues arising from the peculiar analytical properties of Meldonium, while HILIC enabled the required chromatographic separation required to accurately determine the compound's molecular mass and that of its diagnostic product ions. Overall, an unequivocal identification of Meldonium was achieved.

You found Mildronate positives in 2.2% of samples studied. Were the results what you expected to find?

I was surprised to see this prevalence. It was considerably higher than I expected.

Researcher Spotlight: Dr. Mario Thevis (Contd.)

What are your thoughts on the PCC Micro-Grant program that was used to fund the Mildronate study?

In my opinion, the PCC Micro-Grant program is extremely valuable. To render doping controls effectively and timely, anti-doping research requires not only conventional funding programs (which are undisputedly of great importance) but also a tool that allows reacting faster and enables the rapid production of information vital for handling imminent issues.

Which anti-doping projects will you be pursuing next?

Quite a few activities are planned, such as expanding doping control sampling options (e.g. by utilizing alternative matrices such as dried blood spots), and improving test methods to enhance the coverage of both established doping agents and emerging drugs.

What would you consider your proudest scientific accomplishment?

I would not have a definite answer to this question. There have been a few situations wherein we were told doping analysis related problems could not be solved using analytical chemistry. However, eventually we were able to prove quite the opposite.

Why should a young scientist consider the field of anti-doping research?

It is an enormously dynamic field of research. Many questions raised in this arena are related to other disciplines (e.g. toxicology, forensics, clinical chemistry, etc.), but necessitate a different angle and approach to provide the information relevant to sports drug testing. The enormous interdisciplinary aspect offers great opportunities for scientific exchange and cooperation; probably more pronounced than in most other fields of applied research.

Dr. Thevis is a Professor for Preventive Doping Research and Vice-President of Research at the German Sport University Cologne's Institute of Biochemistry / Center for Preventive Doping Research.

His research on Mildronate can be found at <http://onlinelibrary.wiley.com/enhanced/doi/10.1002/dta.1788>

Micro-Grants

The quickest funding mechanism available to anti-doping researchers.

Dr. Thevis' research on Mildronate made headlines due to its real world impact on the athletic sphere. What most people don't know is that the study was part of our micro-grant program: a unique, ultra-efficient funding mechanism initiated by the PCC in 2014. Research eligible for a micro-grant requires less than \$75,000 and fewer than six months of study. Often, the PCC is able to fund micro-grant requests in a matter of weeks, which is much faster than traditional grant cycles. The efficiency inherent in the program enables quick access to information, ameliorating testing and policy making organizations' abilities to keep up with the fast-paced realities of performance enhancement. The preliminary information gleaned from a micro-grant project may also be used to enhance applications for formal grant funding.

PCC Funding Overview 2014-2015

The PCC aims to protect clean sport through targeted grants and our funding history for the past two years tells that story. In 2016 and beyond, the PCC hopes to fund even more research which improves testing methodology and influences decision making for international sporting authorities on a global scale.

Upcoming areas of focus for PCC funded research include alternative specimens and collection methods, as well as increased detection windows. Please take a look at the PCC website for a full list of research priorities.

As well, the PCC hopes to increase the number of micro-grants it awards in order to respond to the immediate needs of the anti-doping field. Our working groups, also unique in the field, have been wildly successful in demonstrating an unprecedented collaboration of technology, expertise, and scientific discipline.

Finally, the PCC fellowship program is a focus in 2016 as an area of expansion, as we hope to continue growing the field of anti-doping experts worldwide.

PCC FUNDING IN 2014/2015

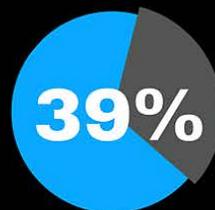
\$6,399,404

AWARDED IN USD

88 → **34** or **39%**

APPLICATIONS
RECEIVED

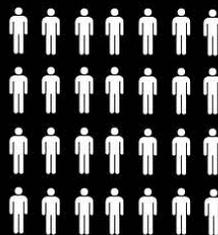
PROJECTS
FUNDED



APPLICATIONS
REPRESENTED
15 COUNTRIES

PROJECTS FROM NINE COUNTRIES AWARDED FUNDING

FUNDING DISTRIBUTED ACROSS 5 CATEGORIES



28

RESEARCHERS (AND
THEIR TEAMS)
FUNDED, INCLUDING
ONE FELLOW

6
TYPES OF
PROJECTS
FUNDED

22 Original Submissions

4 Micro-Grants

3 Resubmissions

2 Working Groups

2 PCC/WADA Joint Fund

1 Fellowship

Congratulations Corner

Like proud parents, the PCC loves to boast about the accomplishments of its stakeholders. Here is a sampling of this quarter's achievements.

Young Researchers Recognized

The PCC, as part of the Environmental and Exercise Physiology (EEP) section of the American Physiological Association (APS), recognized outstanding examples of experimental research this March in San Diego. Awards were presented to graduate students and fellows investigating the detection of performance enhancing drugs and/or procedures or impact of training/environmental stress on hematological profiles.



Predoctoral Research Award presented to Hannah Spaulding from Iowa State University



Postdoctoral Research Award presented to Daniel Machin from University of Utah

Researchers are encouraged to apply for next year's awards via the APS website:
<http://www.the-aps.org/mm/awards/sections/eep#PartBeg>

Submission Acceptance

The PCC is excited to announce the selection of our symposium, **“Blood doping: Physiology, Pharmacology and Detection Challenges”** at the American Physiological Association's Annual Experimental Biology Expo.

The expo will be held April 22-26, 2017 in Chicago, IL.

SAB Member Honored



Dr. Michael Sawka, Ph.D. was the recipient of the distinguished **2016 EEP Honor Award.**

The award recognizes significant contributions to the advancement of environmental, exercise, or thermal physiology. Well deserved, Dr. Sawka!

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#beyondresearch

Latest from the Lab

Dried Blood Spot Testing on Track to Improve PED Detection



Using dried blood spots as a means to test athletes for PEDs could change the game for athletes and sports organizations alike. Finger prick collection methods are less invasive for athletes while being cheaper to administer, meaning more athletes can be tested in less time with less hassle. The PCC is currently funding a number of projects on the technology and the early results are promising. For example, Dr. Jack Henion is working on a project to develop and validate methods for the use of dried blood spot (DBS) collection cards for the bioanalysis of five classes of drugs, including opioids, THC, stimulants, beta blockers, and steroids. Dr. Henion's team is also developing a novel dried plasma spot (DPS) card which can provide micro plasma samples from finger prick blood without the need for centrifugation or other laboratory techniques for producing plasma. Both DBS and DPS cards offer an easier means of in-competition or out-of-competition sample collection coupled with simpler and more cost effective shipping and transport to the laboratory for analysis.

Upcoming Dates

Board of Governors Meeting	June 28, 2016
2016 Round Two Pre-Applications Due	July 1, 2016
2016 Round Two Full Applications Due	August 1, 2016
2017 PCC Conference in NYC	April 10-12, 2017

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