

Solving Problems for the Greater Good

One year on – and just as judges deliberate over the winner for 2016 – we speak with the exceptional runners up from the 2015 Humanity in Science Award.

By Joanna Cummings

The Humanity in Science Award – a collaboration between Phenomenex and The Analytical Scientist – recognizes breakthroughs in analytical science that have the potential to improve human lives. In 2015, Peter H. Seeberger and Andreas Seidel-Morgenstern won top prize (read about their project here: tas.txp.to/0216/HISA2015), but they were in excellent company; the judges commended three other teams for their exceptional contribution to the field. Twelve months on (and just ahead of the announcement of the 2016 winners next month), we find out what those teams have been doing since – and ask why ‘humanity’ is such a fundamental part of what they do.



CE Specialists: Serge Rudaz & Julie Schappler

Remind us of your project...

Serge Rudaz: Our project focused on the development of a low-cost capillary electrophoresis (CE) system for counterfeit medicine evaluation in emerging countries. We believe that CE is the perfect technique for emerging countries because it's cost effective, there is no solvent constriction, and it's quite easy to manage. So here at the University of Geneva, in collaboration with the School of Engineering of Fribourg, we have tried to develop a very low cost, very robust prototype, dedicated to counterfeit analysis. Pharmelp – a non-profit association – helped us to build eight prototypes that were sent to Africa and Cambodia to demonstrate that CE is an effective tool for detecting counterfeit medicine. We are also trying to develop very simple methods for analytics as well as e-support to help people with CE, as it is not a well-known technique.

How important is it for your work to have a positive impact?

SR: We are pharmacists, so we believe that quality in a substance is a human right. For us, the most important aspect is not that a particular compound is copied, but the level of quality control – and we should be helping emerging countries develop their own quality control. Liquid chromatography and other regular techniques are really expensive. In Africa, they have money to buy one instrument – but the problem is the maintenance, solvent costs and so on. With CE, they can have it for a lifetime. We have had success with the prototypes, for example, we already have four PhD theses in capillary electrophoresis in Senegal. We think that as occidental pharmacists, it's our responsibility to give solutions to people and colleagues in emerging countries in this particular field.

It is interesting for us in the lab to have a project that is more people-oriented or global health-oriented. We want to propose problems that can be solved on a smaller scale in terms of tech and larger scale in terms of importance. Also, a lot of students want to develop their skills in a humanitarian context.

Where is your project one year on?

Julie Schappler: After the award, we had lots of ideas, but we needed to make them concrete, so with a team of experts, we worked on the device from a technical point of view, to enhance and improve some of the parts. We also needed to handle specific issues in Africa; for example, there are problems with data integration that make it difficult to identify the location of counterfeit drugs. We're working on a smartphone kind of device that allows us to integrate 'regular people' into the project, so patients themselves can help to tackle counterfeit drugs.

SR: We are now collaborating with the EPFL, a very important engineering school in Switzerland, to miniaturize the detection. We believe there is still room for improvement regarding the technique. We are working with Masters students here in Geneva on methodological development and also have two PhD theses in Africa regarding the use of CE as a tool for drug quality control for natural medicine – plant extracts and so on. We have also a very good relationship with the University of Geneva and the Rector is really interested by our projects. However, it's difficult for us to redevelop a completely new device because it's not our core business. We would like to push the project forward with an open-source device that can be built with very low cost components. Essentially, we want our project to involve citizen science or at least large-scale collaboration so that it can move forward to meet our initial goals.

What kind of support have you had from the analytical community?

SR: Many of our colleagues have been really interested in supporting the project. Now, we really need support in the countries themselves now; education is really important in that regard.

How has the Humanity in Science Award helped?

JS: Going for an award has been a good way of disseminating information and talking about our projects – especially those not at the fundamental or high expert level.

SR: Author reach is really important for this kind of project. It's really difficult to publish in Science or the Journal of Chromatography, so it's really helpful to have the support of The Analytical Scientist.

Serge Rudaz & Julie Schappler, (School of Pharmaceutical Sciences, University of Geneva), “Low-cost analytical device based on capillary electrophoresis (CE) for counterfeit drug detection and sub-standard drug quality control.” Read the full nomination here: tas.txp.to/0216/Rudaz

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