

The Chain Reaction

Humanitarian Solutions Worldwide

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Ways To Help AIDSfreeAFRICA

BY DR. ELLEN ENGELSON AND DR. ROLANDE HODEL

AIDSfreeAFRICA was established in 2005 by a group of chemists and has been working in Cameroon, West Africa, since then. Initial efforts were to consult with pharmaceutical start-ups to promote production of critical drugs in generic, cost-efficient form by Cameroonians. Dr. Hodel, the Founder and CEO of AIDSfreeAFRICA consulted with seven companies over almost 10 years. Unfortunately, infrastructure in Cameroon did not support long-term success of those efforts. However, the need still exists and AIDSfreeAFRICA remains dedicated to ensuring access to quality drugs.

In the ensuing years, additional needs have been identified. These include improved STEM (Science, Technology, Engineering and Math) education in high schools and colleges, many of which are currently without equipped laboratories. AIDSfreeAFRICA works to provide text books and laboratory equipment with training by chemists from abroad. Malaria is a huge problem in this equatorial country. AIDSfreeAFRICA's Malaria Free Zone (MFZ) project provides education and installation of used bed nets in windows and doors for malaria prevention. The recent donation of a fluorescent microscope to the organization has provided the means to more sensitively and specifically diagnose malaria and its individual plasmodium species.

AIDSfreeAFRICA has two current goals – to expand the diagnostic laboratory to include measurement of HIV viral load via PCR, and to establish a quality control laboratory for pharmaceuticals. Space has been provided and some equipment has been obtained through donations. More equipment and chemicals are still needed to complete these goals.

What you can do?

- Donate equipment and chemicals that are no longer needed in your laboratory
- Train Cameroonians to use the equipment you donate
- Donate money for the purchase of equipment and chemicals
- Join our Board of Directors

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Our Mission

Chemists Without Borders solves humanitarian problems by mobilizing the resources and expertise of the global chemistry community and its networks.

Our Vision

A global support network of volunteers providing mentoring, information and advice to ensure every person, everywhere, has affordable, consistent and persistent access to:

- Essential medicines and vaccines
- Sufficient safe water
- A sustainable energy supply
- Education in green chemistry and business which people can apply in their daily lives and teach to others
- Safe processes in work environments where chemical hazards exist
- Emergency support, including essential supplies and technology

Chemists Without Borders is a registered 501(c)(3) with the Internal Revenue Service. EIN: 14-1984379

For more information, please visit www.AIDSfreeAFRICA.org or contact Ellen Engelson, Volunteer Coordinator, at eseaidsfreeafrica@gmail.com.

Chemists Without Borders at the Third International Conference for Women in Science Network

BY MARIA-STELLA PORTELLI

As we like to say, the power is in the network. Therefore, we accepted the invitation to participate in the 3rd International Conference for Women in Science Network in Cairo, Egypt, with open arms and great enthusiasm. This initiative, which focused on innovation, entrepreneurship and science diplomacy for sustainable development, was organised by Women in Science Without Borders (WISWB) and the Arab Science and Technology Foundation (ASTF).



The conference provided researchers from all over the world with a platform to present their research. Moreover, the pre-conference workshop, as well as informal discussions, allowed participants (the majority being women living in African and Arab countries) to share challenges, solutions, and success stories. On behalf of our organisation, I have shared Chem-

ists Without Borders' story during the pre-conference workshop, as an example of science diplomacy.

Personally, I was impressed by the sheer number of brilliant researchers who are active and engaged in their respective fields, despite cultural and economic challenges. For instance, a research lab which does not have

enough funding to acquire state of the art equipment still needs to produce the expected high quality publishable science. This said, the attitude I witnessed during the conference was one of finding solutions rather than focusing on the challenges.

Science excellence, albeit essential, is not the only requisite for a successful career; the importance of soft skills was emphasized throughout the conference. An example of this is the ability to effectively communicate science. Apart from engaging the public and fellow scientists, science communication assists the transition from journal to magazine, potentially



Photo credit: Arab Science and Technology Foundation

attracting funding and opportunities for collaboration across and within fields. Indeed, the added value of transdisciplinary collaborations was evident. Shifting from science, technology, engineering, and maths (STEM) to also include the arts (STEAM) is becoming increasingly common. Moreover, this transdisciplinary approach inadvertently also leads to collaborations across nations and continents where researchers can go beyond research, create value, and contribute to societies. Other interesting points discussed were brain drain, retention of women at higher positions, the importance of role models, and the lack of space for younger scientists as decision makers.

Being surrounded by so many inspiring people who created an atmosphere of support and encouragement was a humbling and stimulating experience. With this newfound energy, I can see for

myself how powerful the network can truly be.

The International Younger Chemists Network: Shaping the Future of Chemistry

BY DR. FRANCO CABRERIZO



The International Younger Chemists Network (IYCN) is an organization that aims to connect chemists who are in the early stages of their career, including but not limited to graduate school, postdoctoral associates, chemists within five years of their terminal degree, and chemists newly transitioning into the field.

Our core objective is to reach like-minded scientists globally and create a platform for scientific exchange. With a focus on building a worldwide network, we strive to spread scientific knowledge, mentorship, and encourage a passion for chemistry.

IYCN was officially launched at the 49th IUPAC General Assembly in São Paulo, Brazil, in July 2017, where a Memorandum of Understanding (MoU) between IYCN and IUPAC Representatives was signed. IYCN is led by a Chair and Vice-Chair who are elected at the IUPAC World Chemistry Congress by representatives from various countries. Comprising the Executive Board are five steering committees working actively in the fields of Governance, Conference Presence, Public Outreach, Finance, and Social Media.

Although quite young, IYCN has promoted several key activities. IYCN's current efforts include collaborations with various international societies such as the Société Chimique de France (French Chemical Society), Gesellschaft Deutscher Chemiker (German Chemical Society), Association of Greek Chemists, Royal Australian Chemical Institute, American Chemical Society (ACS) Younger Chemists Committee, and others to organize symposia and host networking events at international conferences.

For example, a symposium and networking session was hosted during the IUPAC World Chemistry Congress in Brazil (2017). This was the first official IYCN meeting at an IUPAC conference and it was highly relevant because it allowed young chemists to learn from leaders in the field about green chemistry practices and intellectual property rights, two extremely important topics. IYCN's other activities include sponsorships in partnership with other international organizations for young students mainly from under-represented countries to attend different international conferences and meetings. This led to IYCN's co-organizing and co-sponsoring Best Undergraduate Poster Presentation Awards during international meetings, particularly with the Nigeria International Chapter of the ACS.



IYCN Executive Board and Committee Members at the European Chemical Sciences Congress in Liverpool, UK in September 2018

Future activities planned include a full-day symposium organized at the upcoming IUPAC World Chemistry Congresses in 2019 in Paris, France. IYCN is working closely with IUPAC and the French Chemical Society to provide professional development and

networking events for young chemists during IUPAC 2019. We also hope to continue co-sponsoring exchange programs for chemists from underrepresented countries. Knowing that these exchanges can be costly and challenging for some early-career chemists, we plan to provide virtual platforms for our General Assembly and to connect with the other young chemists.

As young chemists in a global society, we see it as our duty to educate and expand the knowledge of international younger chemists, and to ensure that all of the voices of our peers can be heard. Chemists are often restricted by borders. We hope that the IYCN working closely with both academic and international NGOs such as Chemists Without Borders (CWB), can erase these borders in chemists' minds and help to bring young people from all over the world together by using chemistry as a common language.

IYCN membership is open to any chemist under the age of 35 or someone who is five years from their terminal degree or postdoctoral appointment. Importantly, you don't need to have any formal affiliation with a national younger chemists group to join. In fact, not all countries have such a group and we are keen to reach out to these people as a priority. Our goal is to support all younger chemists throughout the world. Every chemist needs support and a network; if you are interested in getting involved I would urge you to reach us at IYCN@IUPAC.org, join our mailing list by visiting www.iycnglobal.com, and follow us on Facebook (@[IYCN.global](https://www.facebook.com/IYCN.global)) or Twitter (@[IntlYoungerChem](https://twitter.com/IntlYoungerChem)). We are constantly looking for highly motivated people to help drive this organization forward in multiple ways. Everybody is welcome to join and work together with us!

AIDSfreeAFRICA Announces a Ten Session Podcast

BY DR. ROLANDE HODEL



You can click on the link below or find it wherever you get your podcasts from. Please be sure to click subscribe to get all of the podcasts as they come out.

<http://aidsfreeafrica.libsyn.com>

Enjoy,
Dr. Rolande Hodel

Chemists Without Borders to be Featured at Spring Symposium

BY RONDA GROSSE

Representatives from Chemists Without Borders have been invited to present at a Tripartite Symposium, co-organized by the Spectroscopy Society of Pittsburgh, the Society of Analytical Chemists of Pittsburgh, and the Pittsburgh section of the American Chemical Society. This meeting will be held on Saturday, May 18, from 8:30 am - 1:00 pm at Carlow University in Pittsburgh, PA. More information can be found at <http://www.ssp-pgh.org/lectures-symposia/>. Please join us if you can! The following topics will be discussed.

Chemists Without Borders: Past, Present and Future

Bego Gerber

Hear the remarkable story of some remarkable people making a remarkable difference. What are the foundations of Chemists Without Borders? Why does it exist? How does it work? Why does it matter? Who is affected? What have we learned? Where do we all fit in? What is possible?

Applying Chemistry to Solve Problems in the Developing World

Ronda Grosse, Rolande Hodel, Marya Lieberman, Julian Tyson

Chemists Without Borders is a non-profit organization, comprised primarily of volunteer chemists, with the mission of solving humanitarian problems by mobilizing the resources and expertise of the global chemistry community and its networks. Work to date has involved clean water initiatives, science education in developing countries, and inexpensive tests for analysis of medicines. This presentation will review projects aimed at improving living conditions in South Asia, including measuring heavy metal concentrations in the Bangladesh food supply and renewable energy options for affordable housing in India. Projects in Africa include development of paper analytical devices to provide high quality chemical analysis of pharmaceutical samples and prevent falsified or substandard medications. Recent work in Kenya will be shared. Additionally, AIDSfreeAFRICA has set up a laboratory in Cameroon for drug testing. The status of these initiatives, technical progress, and ongoing opportunities and challenges will be discussed.

Studying Abroad in Chemistry: An Opportunity for Undergraduate Chemistry Researchers to have an International Impact in Chemical Education

Bakarr Kanu

Developing undergraduate research through service learning is a high impact practice that can greatly influence student engagement and success. In this project, a team of scientists has been working to develop inexpensive microchemistry kits to facilitate Chemistry Education in West Africa. Since 2015, several undergraduate STEM majors have engaged in research with the nonprofit organization, Chemists Without Borders, to enhance chemistry education in Sierra Leone. The ultimate goal has been to provide chemistry laboratory kits to high school and first-year university students' in Sierra Leone by training teachers to use the kits in their classrooms. In addition to standard labs that will help students understand basic chemical concepts, most of the STEM experiments developed for this project will focus on the application of chemistry towards practical knowledge relevant to the lives of ordinary Sierra Leoneans. Currently, we have assembled 15-lab activity kits ready for use in Sierra Leone. To implement this project, we developed a study abroad class at Winston-Salem State University (WSSU) and we expect to offer this class in spring 2019. Students enrolled in this course will have the opportunity to travel to Sierra Leone and conduct a workshop to train teachers who will in turn use the kits in their classrooms. In addition, they will have an opportunity to learn about the politics, history, and culture of Sierra Leone. Upon implementation of this project, we anticipate the kits to service between 200-500 teachers and students, covering approximately 50 schools in Sierra Leone annually. Our hope is that once this project is executed successfully, it will be expanded to other English-speaking countries. We anticipate this service learning research project will attract students from underrepresented groups and influence their engagement in STEM activities at WSSU and the broader community of scientists.

Chemists Without Borders Arsenic Project Development: Confronting the largest mass poisoning of a population in history by providing clean water in Bangladesh

Steven Chambreau

Back in the 1970s, in an attempt to provide hygienic drinking water in Bangladesh, the United Nations International Children's Emergency Fund (UNICEF) and other aid agencies began installing millions of tube wells in Bangladesh villages as an alternative source of drinking water to contaminated surface water supplies. The program, which continued through the 1980s, was an early success. Instances of cholera, microbe-caused diarrhea, and other diseases dropped dramatically. But no one thought to analyze water for trace and ultra-trace impurities, and soon the good news turned bad. By the early 1990s, villagers began breaking out with skin disorders and experiencing fatigue symptoms of arsenicosis from drinking the water. Arsenic poisoning in drinking water in Bangladesh has been identified as one of the world's greatest humanitarian disasters, with the World Health Organization characterizing the situation as "largest mass poisoning of a population in history." Out of 150 million people in Bangladesh, 35-77 million people are at risk from arsenic contamination of water. It is estimated that between 1-5 million children are at risk of death by arsenicosis, or arsenic poisoning, by 2030. Many countries with arsenic-contaminated groundwater do not face the same catastrophic outcomes as in Bangladesh, in part due to inaction on the part of the Bangladesh government. Clearly there are no simple, easily implemented solutions that would provide "arsenic-free" water in sufficient quantities to meet the requirements of communities in rural Bangladesh for drinking, cooking and irrigation of crops (particularly rice). Chemists Without Borders works to remedy this. The Arsenic Project in Bangladesh will be described from its inception and how the project has evolved into the work that is currently underway today, involving arsenic education, arsenic testing of wells and the development of alternative drinking sources in Bangladesh.

Support Chemists Without Borders!

Please support our work by making a generous donation.

Chemists Without Borders is a 501(c)(3) non-profit corporation registered with the Internal Revenue Service.

All donations are tax-deductible as permitted by law.



You can make a donation at <https://chemistswithoutborders.org/support-us.php>.