Strengthening synthetic biology capacity in Kenya through bioinformatics training

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The Idea

The power of synthetic biology comes in part from the computational tools used for the design up novel biosystems. As such, bioinformatics knowledge is key to harnessing the full power of the field, and building long-term capacity.

As part of this project, we will develop and deliver a novel synthetic biology module, which will be incorporated as part of an 8-day bioinformatics course being delivered in Nairobi, Kenya in November 2015.

Who We Are

Richard Smith-Unna (rds45@cam.ac.uk) – Richard is a PhD student in Plant Sciences at Cambridge University. Richard's expertise in both bioinformatics and plant science makes him ideal to lead the development and delivery of the course materials.

Vicky Schneider (Vicky.Schneider@tgac.ac.uk) – Vicky leads the 361° Division and is part of the Senior Management Team at TGAC in Norwich. She has extensive experience in developing and delivering world class bioinformatics training programmes. She will help develop the course materials and training programme.

Jelena Aleksic (jelena@trendinafrica.org) – Jelena is the Director of Bioinformatics at TReND in Africa (http://trendinafrica.org/), the charity organising the Kenya bioinformatics course. She is the main course organiser.

Richard Pilling (richard.b.pilling@intel.com) – Richard is the Director of Big Data and Analytics at Intel. He will be participating in the course delivery and adding a big data analytics perspective to the course syllabus.

Implementation

Course materials focusing on computational approaches in plant synthetic biology will be developed in collaboration by the team members. These will then be included as a module to be delivered as part of an 8-day bioinformatics course running at the icipe institute, in Nairobi, Kenya. The course will start on the 30th November, and will include 20 students from all across the African Continent.

The course is an ongoing collaboration between TReND in Africa and icipe, and ran for 5 days last year. The previous course materials are available here: **https://github.com/jelena121/NGS_analysis_icipe**

The OpenPlant funding would enable us to extend the length of the course and include a plant synthetic biology component.

Benefits and outcomes

There is an interdisciplinary team from Cambridge and Norwich working on developing course content focused on computational aspects of plant synthetic biology. Any course materials developed through this project would be shared on GitHub and also actively disseminated through social media.

As a follow-up from the course, we also support the course alumni in running their own workshops and outreach. Specifically, we have a group attending from the University of Bingham in Nigeria who are planning to deliver a bioinformatics workshop at their own university using the open source course materials after attending the course. We also have trainers from Sierra Leone who run a Raspberry Pi based bioinformatics lab, who hope to incorporate the training materials into their future workshops.

Beyond this, most of the course attendees are themselves lecturers at African universities, meaning that the course materials will be widely disseminated, and that the impact of the course is much broader than just the original 20 applicants. We therefore believe that this course would lead to greater awareness of the possibilities of synthetic biology across the African continent.

Budget

Money received for the course costs so far from other funders:
$10,000 (~£6300) from the icipe institute.
£7000 from Planet Earth Institute

Course budget:
£3000 – 6x instructor airplane tickets to Nairobi
£3000 – 5x student tickets from Abuja for University of Bingham participants
£9900 – full board accommodation on campus for instructors and students
£1400 – 3x travel scholarships for students from low income backgrounds

The icipe institute is also providing a free computer lab, lecture rooms and internet access to host the course.