

How science works in Africa

Tackling malaria in Kenya

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Shaha

“For the common man, research is just a matter of mixing chemicals in a test tube, but modern science requires technology that is not available in most African labs.” Alom Shaha meets Dr Alexis Nzila, a senior research scientist based in Kenya, to hear about the challenges of doing science in Africa.

I met Alexis in 2006, when I was asked to make a film about him to celebrate his being awarded the Royal Society Pfizer Award for “an outstanding, innovative contribution to biological science, including basic medical science, which contributes significantly to capacity building in Africa.” Making the film gave me the opportunity to get to know a remarkable man and provided me with an insight into how science works, or often doesn’t, in Africa.



Alexis chose to specialise in malaria research because it is one of the biggest problems facing Africa today – it kills more than a million Africans a year. Malaria also makes hundreds of millions of Africans sick, which impacts on the economic well-being of the continent.

Drug resistance

One of the big problems with malaria is that the parasite which causes the illness has a remarkable ability to quickly select for resistance against the drugs we use. So, it is important to understand how the parasite develops resistance to existing drugs and to identify alternatives which work in different ways.

Alexis decided to look into a family of drugs called antifolates. These block the synthesis of folate molecules, which are essential for cell multiplication. Alexis explained that, “Highly dividing cells, such as cancer and the malaria parasite, rely heavily upon the availability of folates for growth. So, inhibiting the availability of folates is an effective way to stop

these cells multiplying. Since malaria causes illness by the growth of parasites within our red blood cells, antifolate drugs offer an effective weapon against malaria.”



The blood-sucking mosquito transmits the malaria parasite from person to person.

One of Alexis’ main contributions to science has been to improve our understanding of how the malaria parasite develops resistance to a drug called Fansidar. He did this by developing “simple ways of tracking and predicting resistance”. Whilst he was innovative in his experimental approach, Alexis based his work on existing research in the field of cancer, where there was already a lot of work done on folate biochemistry. Through this work, Alexis came up with a method to increase the efficacy of Fansidar by combining it with another drug, Probenicid. He tested his ideas in vitro and human trials have since shown that he was right.

Alexis’ work exemplifies the way in which scientists build on prior knowledge and come up with and test their own hypotheses. However, perhaps a more important aspect of Alexis’ story is that it provides us with a valuable insight into the challenges faced by anyone wishing to be a scientist in Africa.

Lack of funding

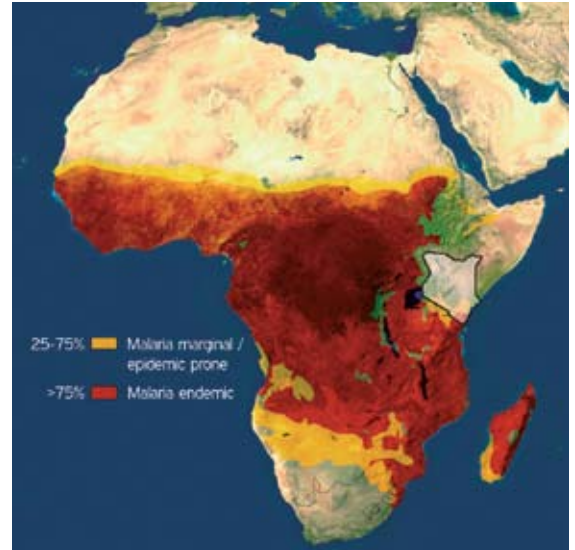
Alexis and his team are just some of the African scientists who have shown that internationally recognised science can be done from within Africa. But he is all too aware of the difficulties his fellow African scientists face, mostly due to a lack of funding – African countries spend on average 0.3% of their GDPs on research and development, compared with 1.8% in EU countries and over 2.6% in the US and Japan.

Universities in most of Africa simply do not have the resources to turn out well-trained scientists;

young scientists are forced to travel abroad to complete their training. Often, they do not return, for reasons that Alexis understands: “Scientists who leave Africa cannot be blamed... they get frustrated trying to do science here and give up and move to the west... there are better opportunities to follow a successful and rewarding scientific career in Europe or the US.”

A commitment to a continent

Alexis is committed to staying in Africa because he wants his work to make a direct difference to the



Leah Mwai, research student in Alexis' lab.



Alexis (right) discusses problems with local doctors while family members tend a young patient.



Nursing a young malaria victim in a Kenyan hospital.

lives of his fellow Africans; he feels the best way to do that is to be based in Africa.

Alexis believes firmly that “there will not be lasting solutions to malaria without a strong contribution from African scientists. Controlling malaria is not simply a matter of distributing bed nets and medication. It also requires planning and research so we can predict what the situation may be like in 5 or 10 years from now. To tackle malaria at a national level, governments need scientific evidence to make effective policy decisions. Without strong research groups, government programmes for malaria control cannot work.”

Alexis has already made an invaluable contribution. His research promises cheap new drugs that may save millions from the ravages of malaria. Dr Kevin Marsh, director of the KEMRI research laboratory in Kilifi, says, “It is not an exaggeration to say that Dr Nzila’s work is by far the most innovative in the area of defining possible new approaches to anti-malarial drugs to come out of Africa in the last ten years.”

Results from Alexis’ work have also been used to inform government policy. Dr Willis Ahkwale, Head of the Kenyan Government’s Division of Malaria Control told me, “Scientists like Alexis are essential to malaria control in Africa, his work has helped us to evaluate whether our drug policy is working. It is crucial that we can keep scientists of Alexis’ calibre in Africa.”

Alexis has every intention of staying in Africa. However, it will take more than good intentions to ensure that Alexis and other talented African scientists remain in Africa; simply put, the biggest problem in doing science in Africa, like so many of the other problems in that troubled continent, is a lack of funding.

Alom Shaba is a science teacher and film maker, based in London.

Look here!

You can watch Alom’s film about Alexis’ work at: <http://www.vimeo.com/6607065>