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News Highlights

Dealing with Sickle Cell Disease

ICTP Senior Associate discusses his advances toward treating SCD

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On Wednesday 25 September in the Oppenheimer Meeting Room of the Leonardo Building, ICTP Senior Associate Pius Mpiana Tshimankinda will discuss his concerted efforts and achievements in reducing the devastating effects of a genetic disease ravaging tens of thousands of children throughout his home country, the Democratic Republic of Congo. The presentation, "Biophysics of medicinal plants and sickle cell disease," is part of a series of talks by ICTP's Applied Physics section and will start at 15:30 pm.

Image of ICTP Senior Associate Pius Mpiana Tshimankinda

The hundreds of thousands inflicted with sickle cell disease (SCD) worldwide contract the blood disorder while still a fetus. When born, their red blood cells take on a crescent moon-like shape and die off more quickly than healthy, circular red blood cells. With fewer red blood cells, SCD often leads to sickle cell anemia (SCA), the disease that claimed two of Tshimankinda's brothers' lives and that Tshimankinda has dedicated his career to studying.

In 2010, 57 percent of newborns with SCA were born in the Democratic Republic of Congo, India or Nigeria. Although there is no cure, those with SCA can lead relatively regular lives as long as they eat plenty of healthy food, drink 8 to 10 glasses of water a day and avoid infections, like the flu--a lifestyle that is difficult to achieve for many in developing countries.

Therefore, Tshimankinda and his team at the University of Kinshasa are researching various methods on how to relieve individuals from the disease's symptoms like dizziness, jaundice and shortness of breath. He and his team have isolated specific molecules, like betulinic and oleonolic acid, from various plants and found that these molecules can induce an anti-sickling behavior of red blood cells, thus reducing the effects of SCA.

They have found noted success with medicinal plant extracts from plants indigenous to the Democratic Republic of Congo and therefore inexpensive to obtain and transport.

"Ultimately, I would like it if we could transform these molecules into some form of drug that people with sickle cell anemia could then take," Tshimankinda says. "We hope to interact with pharmaceutical companies to eventually make this possibility a reality."

Tshimankinda holds the patent "In vitro anti-sickling activity of betulinic acid, oleonolic acid and their derivatives" and was awarded the Diploma and medal of scientific merit of the Democratic Republic of Congo in 2010, the African Prize for Liberty and Development in 2009 and the Diploma of Honor and Merit as Best Congolese Professor in 2008.