Press Release

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World Malaria Day 2014: Saving lives with UV light

Heraeus supplies UV lamps for the synthesis of the malaria treatment drug artemisinin

In Africa, a child dies of malaria every minute. More than 200 million people contract the tropical disease every year. The problem: There is a lack of drugs to treat all of the patients. In particular, the important active ingredient artemisinin is not naturally growing quickly enough. Heraeus UV lamps can save lives in this situation as ultraviolet light is needed for an important step in the process of synthetic artemisinin production. The World Health Organization (WHO) pins its hopes on artemisinin as it strives to stop the spread of malaria by 2015. To raise awareness of malaria as a global health and development issue, the WHO has organised the World Malaria Day since 2007. This year, the event will take place on 25 April.

At the moment, artemisinin is extracted from the medicinal plant "Artemisia annua". The natural production process takes more than one year. Far too long to cover the world's demand for malaria treatment drugs, especially as not enough plants are harvested. Science and technology have made decisive progress in the synthetic production of the drug. In an innovative manufacturing process, the ingredient is synthesized cost-efficiently in large quantities in a fermentation process with subsequent photochemical reaction.

Close cooperation was decisive

Heraeus Noblelight supports the synthesis of artemisinin with specialty UV light sources. "The agent can be produced in large amounts in a photochemical process," explains Dr Angelika Roth-Fölsch, Head of the Application Competence Center at Heraeus Noblelight. "Within an important process step of the synthesis, intensive UV light is needed to trigger a photochemical conversion process of molecules with the addition of oxygen. In this process, our UV lamps are used in special reactors."

These special UV systems for photochemical reactions are made by Peschl Ultraviolett GmbH. Managing director Alexander Peschl is convinced that the close cooperation with Heraeus was decisive to achieve this: "We produce systems for preparative photochemistry, both pilot and industrial size. For this, we use the specialty light sources specifically developed by Heraeus which give us unique advantages as regards implementation. Projects such as the artemisinin project can only be carried out with the expertise and know-how of the Heraeus experts." With some success, as in the mean time the UV reactors are used to efficiently and economically produce large quantities of the precious malaria drug. This will soon make it possible to cover about half of the global demand and provide the medicine to the sick people.

The example shows how Heraeus can specifically tailor UV lamps to an application. Application Competence Centers around the world are available for this. At these centers, technical feasibility of specialty light sources is investigated in most varied applications and solutions for individual processes are determined jointly with the customer. "We know UV light very well. We develop and optimise special UV lamps and systems for the most varied areas of application," Dr Angelika Roth-Fölsch knows from experience, because ultraviolet light is very high-energy radiation which can be used in many ways for biological and chemical processes. For example, UV light can be used for the environmentally friendly disinfection of drinking water, air and yoghurt cups.

Background: Malaria is on the rise

Malaria is an infectious disease which is wide-spread in the tropics and subtropics. It is caused by monocellular malaria parasites which are carried exclusively by anopheles mosquitos. The infection rate is especially high in Africa, south of the Sahara, where the mosquito lives particularly long and prefers to bite humans. Therefore, more than 90% of deaths caused by malaria occur in Africa. The initial symptoms such as fever, headache, shivering and nausea may be very mild and are not always immediately associated with malaria. If, however, the disease is not treated within 24 hours, it may become very serious and it can even lead to death depending on the the type of parasite.

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Images:

Image 1: Heraues UV Medium Pressure Lamp (Heraeus Noblelight GmbH)

Image 2: UV system for preparative photochemistry (Peschl Ultraviolett GmbH)