

# A novel genetic typing approach reveals focal transmission of the bacteria that cause the flesh-eating disease

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Buruli ulcer is an infectious disease afflicting thousands of children every year. The difficult-to-cure disease, which is caused by bacteria, occurs in tropical or subtropical climate zones and results in open sores and deformities. For the last two years, the international research consortium Stop Buruli has been collaborating in projects to research this forgotten and insidious disease.

An international team of researchers at the Swiss Tropical and Public Health Institute, Switzerland, the Noguchi Memorial Institute for Medical Research, Ghana, and the University of Melbourne, Australia have used latest high throughput DNA sequencing technology and developed a new, highly discriminatory DNA typing method to complement traditional epidemiological information.

'These results are leading to new insights into the mysterious mode of transmission behind Buruli ulcer, and will ultimately help to prevent the disease,' said Professor Gerd Pluschke from the Swiss TPH. 'Our findings confirm that Buruli ulcer is focally transmitted and suggest that improved case detection and early treatment combined with infection control interventions could reduce the spread of the disease.'

The findings, published July 20 in the open-access journal *PLoS Neglected [Tropical Diseases](#)*, show that [bacterial strains](#) from Buruli ulcer-endemic regions that were previously considered identical can in fact be

distinguished from each other through detection of subtle differences in their genomic [DNA sequences](#). The developed genetic fingerprinting method allowed the researches to observe for the first time that *M. ulcerans* strains have a very focal pattern of distribution, suggesting that Buruli ulcer is not contracted by contact with contaminated water from the local rivers as previously thought.

The authors suggest that chronic Buruli ulcer lesions are a possible reservoir of *M. ulcerans*. While direct human-to-human transmission seems to be rare, *M. ulcerans* may spread from open Buruli ulcers into a currently unknown environmental reservoir, possibly insects. Subsequent infection of individuals living in the same settlements from this reservoir would explain the observed local clustering of genetic variants of the pathogen.

Further micro-epidemiological studies making use of this new DNA fingerprinting of isolates are now expected to help further unravel the enigma of *M. ulcerans* transmission. This could significantly contribute to the control of the disease.

## **About Buruli ulcer**

The third most common mycobacterial disease, Buruli ulcer is a necrotizing skin disease that affects mostly children and youth in West Africa, but is also found in Australia, Asia and Latin America. The mode of transmission of *M. ulcerans* is poorly understood, in part because standard molecular typing methods lacked so far the resolution required for detailed micro-epidemiological analyses. Buruli ulcer is associated with slow-flowing rivers and swampy regions and it has been commonly assumed that transmission is associated with trauma of the skin followed by infection from a water-associated environmental source.

Provided by Swiss Tropical & Public Health Institute

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