The unexpected relatives of smallpox

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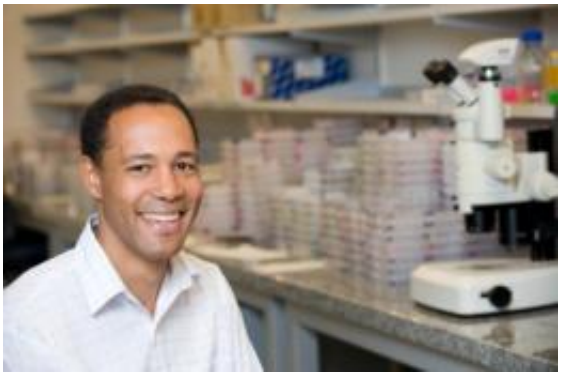

Dr. Fasseli Coulibaly

(PhysOrg.com) -- A protein shared by the simple viruses that infect single-cell organisms, and their highly complex counterparts that affect mammals, could hold to the key to understanding and ultimately neutralising the deadly pox family of viruses.

In research published today in *PLoS Pathogens* Dr. Fasseli Coulibaly, of Monash University's Department of Biochemistry and Molecular Biology, and Dr. Alok Mitra from the University of Auckland, have discovered that a protein, D13, is common to poxvirus and viruses infecting bacteria.

Dr. Coulibaly said the discovery was important from both evolutionary and public health perspectives.

"Being common to both families of viruses means D13 may have existed in its current form for billions of years. These viruses have been on separate development paths for a long time."

"These long-distance evolutionary links are difficult to find and can only be discovered using technology like X-ray crystallography using the Australian Synchrotron," said Dr. Coulibaly

Dr. Coulibaly said the discovery should lead to a better understanding of the poxvirus family.

"Given the common element, we can use what's been discovered about much simpler forms of viruses that contain D13, to better understand poxviruses. It's a Rosetta Stone for poxvirus."

Smallpox, the best known of the human poxviruses has been eradicated and only two official, highly secure stocks remain, meaning a small risk of deliberate release. However, other forms of pox infect animals and have the potential to jump species to humans.

"We've discovered how D13 plays its key role in the development of vaccinia, the weakened form of smallpox," said Dr. Coulibaly.

"Potentially, this means we can develop drugs that target D13 and so block the formation of poxvirus.

"As D13 is common to all poxviruses, the potential exists to develop anti-viral drugs that are effective against a whole family of viruses, similar to effect of antibiotics on bacterial infections."

Dr. Coulibaly and his team plan to further develop and test D13 inhibitors as a potential basis for antiviral medication.

Provided by Monash University