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## Panton-valentine leukocidin does not exist as a coupled molecule: LukS-PV subunit becomes active leukocytolytic toxin following phosphorylative activation by LukF-PV subunit

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**P**anton-Valentine leukocidin (PVL) is one of the numerous toxins secreted by *Staphylococcus aureus*. It has long been established that the pro-toxin subunits of PVL (LukS-PV and LukF-PV, also called S and F subunits respectively) are inert to human leukocytes. Previous publications elsewhere showed the active (leukocytolytic) toxin was formed via coupling of S subunit to F subunit following sequential binding of S and F subunits on leukocyte surfaces. In the current study, combined evidences from bioinformatics, cell-based assays, mass spectrometry, isoelectric point (pI), native and denaturing protein gels reveal that: i) the active leukocytolytic toxin is induced by phosphorylative activation of S subunit by F subunit, ii) establishment of the leukocytolytic principle does not require the sequential binding on leukocyte surface by S subunit ahead of F subunit, and iii) no nascent molecule different from LukS-PV is formed. Dephosphorylation of LukF-PV subunit led to abrogation of PVL-induced leukocytolysis. This phenomenon is only possible *in-vitro* as phosphorylation underpins most physiological processes including digestion, respiration, and locomotion. To proffer therapeutic solution to this rapidly mortifying syndrome, we further show that monoclonal antibodies against LukF-PV subunit prevented PVL-induced leukocytolysis and could be used *in-vivo* against PVL-induced leukocytolysis.

## **Biography**

Charles Okolie completed his PhD from the University of Nottingham. He is currently a faculty member at Landmark University, a private university in Omu-Aran, Kwara State, Nigeria. He is also the Principal Investigator of the Human Microbiome Project in Nigeria (HMP-Nigeria), a research partnership between Landmark University and the Nigerian Institute of Medical Research (NIMR), Yaba, Lagos State. He has published numerous papers in reputed journals and served as reviewer for several journals.

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