Game Changers

WHAT'S IN A NAME? DECIPHERING THE TAXONOMY OF BACTERIA, FUNGI AND PARASITES CAUSING INFECTION

JE Moore[1], BC Millar[1]

[1] Laboratory for Disinfection and Pathogen Elimination Studies, NI Public Health Laboratory, Belfast City Hospital, Belfast, BT9 7AD

Microbial taxonomy, encompassing bacteria, fungi and parasites, is becoming more and more complicated, largely due to the application of newly emerging molecular methods, including whole genome sequencing. Presently, the List of Prokaryotic Names with Standing in Nomenclature lists 30,808 species from 4,954 genera.[1] In addition to this, there are a further 9,006 species from 2,196 genera, which are not validly published names.[1] Classification of these organisms has relied on phenotypic diversity, small subunit ribosomal RNA and more recently, genome-based classification.[2] Whilst only a small proportion of these organisms have ever caused human infection, it is daunting for the physician and surgeon to have an appreciation of (i) where these organisms are positioned taxonomically, (ii) how they are relate to each other and (iii) any recent modifications to their name. More recently, employment of improved molecular tools allows for the reclassification and splitting of established genera into new bacterial genera, with new names, which has the potential to cause confusion amongst doctors using the conventional name. An example of this is the Gram-positive anaerobe, *Clostridium difficile*, which was reclassified and renamed as *Clostridioides difficile* in 2016.[3] Other examples of recent bacterial nomenclature revisions include *Mycobacterium abscessus* to *Mycobacteroides abscessus*, *Enterobacter aerogenes* to *Klebsiella aerogenes* and *Ochrobactrum anthropi* to *Brucella anthropi.* For a full list of bacterial taxonomical revisions, please see Prinzi and Moore.[4]

A freely available online tool, LifeMap,[5] (https://lifemap-ncbi.univ-lyon1.fr/) is available for interrogation, which allows the reader the opportunity to input a microbial name of interest, utilising zooming and panning tools to determine where the organism of interest is positioned taxonomically, as well as describing the most up-to-date taxonomical name (Figure 1). Employment of such a tool may aid in a better understanding of microbial taxonomy of infection-causing pathogens and an improved lexicon aiding better communication amongst physicians/surgeons and scientists.

REFERENCES:

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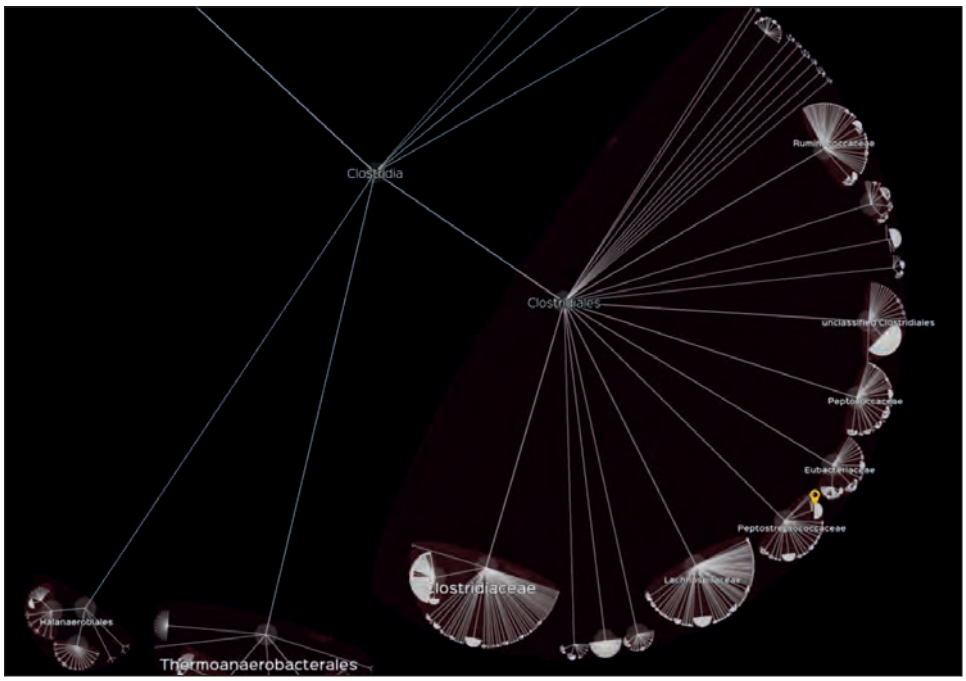

Figure 1:
Description of the taxonomical lineage of *Clostridioides* (*Clostridium*) *difficile* ( ), as displayed by LifeMap (NCBI version).[5]