今日北醫 TMU Today e Paper

本校醫學系微免學科蘇慶華講座教授發表榮登《自然》（Nature）國際期刊

臺北醫學大學醫學系微免學科蘇慶華講座教授發表之「The 'obligate diploid' Candida albicans forms mating-competent haploids」論文，於 2013 年 2 月刊登於國際期刊《Nature》。

蘇慶華講座教授指出，白色念珠菌（Candida albicans）一百年來都被認為是絕對的二倍體（obligate diploid），且為無性世代的酵母菌。平時存在於正常人的口腔、皮膚、消化道、陰道等黏膜組織和臟器中，人的免疫力下降時會造成伺機性的感染，若進入到血液感染則致死率高達 50%，所以在真菌疾病中甚為重要。

本次發表論文透過國際的合作，探討白色念珠菌遺傳學的變化，經過特殊藥物的處理之下，白色念珠菌會有高頻率的 white-opaque 表現型轉換。進而分離菌株，並利用分子試驗的方式進行佐證，發現了白色念珠菌的單倍體菌株。【圖：蘇慶華教授】

這些單倍體菌株有些會自動變成二倍體菌株，有些則不會，原因尚待證明。而另一個重要的發現是所分離出來的單倍體菌株可以進行交配。因此在此研究中，構建了穩定的單倍體菌株與多個 auxotrophies 菌株，將有助於這個重要的病原菌的分子及遺傳分析。

【原文摘錄】：

The 'obligate diploid' Candida albicans forms mating-competent haploids

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Abstract

Candida albicans, the most prevalent human fungal pathogen, is considered to be an obligate diploid that carries recessive lethal mutations throughout the genome. Here we demonstrate that C. albicans has a viable haploid state that can be derived from diploid cells under in vitro

and in vivo conditions, and that seems to arise through a concerted chromosome loss mechanism.

Haploids undergo morphogenetic changes like those of diploids, including the yeast – hyphal transition, chlamydospore formation and a white-opaque switch that facilitates mating. Haploid opaque cells of opposite mating type mate efficiently to regenerate the diploid form, restoring heterozygosity and fitness.

Homozygous diploids arise spontaneously by auto-diploidization, and both haploids and auto-diploids show a similar reduction in fitness, in vitro and in vivo, relative to heterozygous diploids, indicating that homozygous cell types are transient in mixed populations. Finally, we constructed stable haploid strains with multiple auxotrophies that will facilitate molecular and genetic analyses of this important pathogen.（文/研究發展處）