Rechargeable, Long-Term Antifungal Denture Material

Candida-associated denture stomatitis (CADS) is a common, recurrent disease in denture wearers and can lead to other oral health problems, systemic infections, compromised quality of life, and even death. Currently, there are no effective treatment strategies to control CADS, and the reinfection rate is high, particularly in the elderly and those who are medically or immunocompromised. Drs. Sun, Cao, and Sun have invented a rechargeable, “click-on/click-off” antifungal technology to control CADS.

Small amounts of functional monomers containing acidic groups are copolymerized with denture resin monomers in the curing step without negatively affecting the physical or mechanical properties of the resulting resins. The new functional groups in the denture resins act as a “rechargeable battery” to bind and then slowly release antifungal drugs for a long period of time (weeks to months). The drugs could be “quenched” (washed out) by treating with a quenching solution if infections are cleared. If needed, the same or different classes of drugs can be recharged to the quenched denture material to regenerate the antifungal effect. This feature of drug switching can potentially enhance antifungal potency and/or minimize the risk of microbial resistance.

The new denture materials can activate or terminate antifungal drug treatment based on clinical needs. The rechargeable feature will allow switching to more potent/effective drugs to enhance antifungal potency and/or minimize the risk of fungal resistance, leading to a personalized therapeutic strategy for CADS and related diseases.