Researchers from University of Arizona, College of Medicine provide details of new studies and findings in the area of diabetes
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Researchers detail in 'Novel use of platelet-rich plasma to augment curative diabetic foot surgery,' new data in diabetes. "Autologous platelet-rich plasma (PRP) may enhance wound healing through the formation of a platelet plug that provides both hemostasis and the secretion of biologically active proteins, including growth factors such as platelet-derived growth factor, transforming growth factor (TGF)-β, TGF-β2, and epidermal growth factor. The release of these growth factors into the wound may create an environment more conducive to tissue repair and could accelerate postoperative wound healing," researchers in the United States report (see also ).

"To our knowledge, there are no reports of combining the use of PRP with curative diabetic foot surgery. This article provides a summary of the literature regarding PRP and wound healing and presents a case of a 49-year-old man with diabetes and a three-month history of a deep, nonhealing plantar hallux wound in which PRP was combined with a first metatarsophalangeal joint arthroplasty," wrote C.L. Scimeca and colleagues, University of Arizona, College of Medicine. The researchers concluded: "Through the use of the PRP and bioengineered tissue to supplement curative diabetic foot surgery, the patient healed uneventfully at seven weeks."

Current study results from the report, "Thermodynamic stability and folding kinetics of the major G-quadruplex and its loop isomers formed in the nuclease hypersensitive element in the human c-Myc promoter: effect of loops and flanking segments on the stability of parallel-stranded intramolecular G-quadruplexes," have been published. "Overexpression of the c-Myc proto-oncogene is associated with a broad spectrum of human cancers. Nuclease hypersensitivity element III(1) (NHE III(1)) of the c-Myc promoter can form transcriptionally active and silenced forms, and the formation of DNA G-quadruplex structures has been shown to be critical for c-Myc transcriptional silencing," scientists writing in the journal Biochemistry report (see also ).

"The major G-quadruplex formed in c-Myc NHE III(1) is a mixture of four loop isomers, which have all been shown to be biologically relevant to c-Myc transcriptional control. In this study, we performed a thorough thermodynamic and kinetic study of the four c-Myc loop isomers in a K(+) solution. The four loop isomers all form parallel-stranded G-quadruplexes with short loop lengths. While the parallel-stranded G-quadruplex has been known to favor short loop lengths, our results show that the difference in thermodynamic and kinetic properties of the four loop isomers, and hence between the parallel G-quadruplexes with similar loop lengths, is more significant than previously recognized. At 20 mM K(+), the average difference in the T(m) values between the most stable loop isomer 14/23 and the least stable loop isomer 11/20 is more than 10 °C. In addition, the capping structures formed by the extended flanking segments are shown to contribute to a stabilization of 2-3 °C in T(m) for the c-Myc promoter G-quadruplex," wrote E. Hatzakis and colleagues, University of Arizona, College of Pharmacy.

The researchers concluded: "Understanding the intrinsic thermodynamic stability and kinetic properties of the c-Myc G-quadruplex loop isomers can aid in our understanding of their biological roles and drug targeting."

Hatzakis and colleagues published their study in Biochemistry (Thermodynamic stability and folding kinetics of the major G-quadruplex and its loop isomers formed in the nuclease hypersensitive element in the human c-Myc promoter: effect of loops and flanking segments on the stability of parallel-stranded intramolecular G-quadruplexes. Biochemistry, 2010;49(43):9152-60). Additional information can be obtained by contacting E. Hatzakis, The University of Arizona, College of Pharmacy, 1703 East Mabel Street, Tucson, AZ 85721 USA. The publisher of the journal Biochemistry can be contacted at: Springer, 233 Spring Street, New York, NY 10013, USA.

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