

## **An AFM Approach of RBC Micro and Nanoscale Topographic Features During Storage**

**Authors :** K. Santacruz-Gomez, E. Silva-Campa, S. Álvarez-García, V. Mata-Haro, D. Soto-Puebla, M. Pedroza-Montero

**Abstract :** Blood gamma irradiation is the only available method to prevent transfusion-associated graft versus host disease (TA-GVHD). However, when blood is irradiated, determine blood shelf time is crucial. Non-irradiated blood has a self-time from 21 to 35 days when is preserved with an anticoagulated solution and stored at 4°C. During their storage, red blood cells (RBC) undergo a series of biochemical, biomechanical and molecular changes involving what is known as storage lesion (SL). SL include loss of structural integrity of RBC, a decrease of 2,3-diphosphatidylglyceric acid levels, and an increase of both ion potassium concentration and hemoglobin (Hb). On the other hand, Atomic force Microscopy (AFM) represents a versatile tool for a nano-scale high-resolution topographic analysis in biological systems. In order to evaluate SL in irradiated and non-irradiated blood, RBC topography and morphometric parameters were obtained from an AFM XE-BIO system. Cell viability was followed using flow cytometry. Our results showed that early markers as nanoscale roughness, allow us to evaluate blood quality since another perspective.

**Keywords :** AFM, blood  $\gamma$ -irradiation, roughness, storage lesion

**Conference Title :** ICNN 2014 : International Conference on Nanotechnology and Nanomedicine

**Conference Location :** Venice, Italy

**Conference Dates :** August 14-15, 2014