

Effect of Taxol and EGTA on Apoptosis of Platelets in Human and 13-Lined Ground Squirrels

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Platelet transfusions are clinically important, but platelets can only be stored for 7 days at room temperature due to microbial contamination. Human platelets stored in the cold undergo apoptosis and are rapidly cleared from circulation post-transfusion. The platelets of hibernating mammals, such as 13-lined ground squirrels (*Ictidomys tridecemlineatus*), remain in circulation after storage at 4°C, making this organism a novel animal model for cold storage of platelets. Chilled ground squirrel platelets assume a rod-shape, which can be stimulated by a chemotherapeutic drug called Taxol. Human platelets stored with the calcium chelator EGTA were resistant to cold storage. Human and ground squirrel platelets were stored at room temperature and at 4°C with and without Taxol or EGTA for 7 days. Human platelets showed increased expression of apoptotic markers when stored in the cold, which were decreased by EGTA but not Taxol. Ground squirrel platelets that were stored in the cold showed lower levels of apoptosis when compared to platelets stored at room temperature, Taxol and EGTA did not have an effect. Finally, Fluorescence Resonance Energy Transfer (FRET) will be used in squirrel platelets to measure GPIIb/IIIa protein clustering which is known to trigger apoptosis in human platelets stored in the cold.