

12<sup>th</sup> World

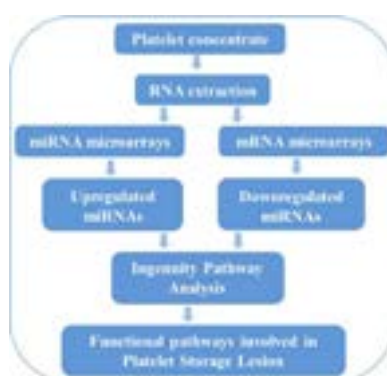
# HEMATOLOGISTS CONGRESS

March 15-16, 2018 | London, UK

## Study of miRNAs and mRNAs in stored platelets identifies the potential functional pathways relevant to platelet storage lesions

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Under blood bank storage conditions platelets undergo physiological changes leading to storage lesions that affect platelet quality. Since small noncoding microRNAs (miRNAs) are posttranslational regulators of cellular mRNA expression, we envisioned that miRNA targeting of mRNAs cause perturbations in stored platelet processes and affect their quality. In this report, differential miRNA and mRNA microarray data on day 0, day 5 and day 9 stored human platelet samples were analyzed. The analysis identified 7 upregulated miRNAs (miR-320b, miR-1-3p, miR-214-3p, miR-197-3p, miR-129-5p, miR-183-5p and miR-292b-5p) that are known to regulate 35 mRNAs. The analysis further identified 68 differentially expressed miRNAs common to day 5 and day 9 of storage (p-value < 0.05). Ingenuity Pathway Analysis (IPA) based search for mRNAs that are potentially regulated by these miRNAs identified 17 mRNAs involved in platelet activation, 28 mRNAs associated with platelet aggregation, 12 mRNAs affecting platelet binding and 9 mRNAs involved in adhesion as well as 27 mRNAs implicated in cellular apoptosis. The IPA also assisted in identifying top 5 signaling pathways and network functions of platelets in storage. The results clearly identify the potential of miRNAs in regulating platelet functions relevant to the storage lesions and provide a basis for further experimental verification.



**Figure 1:** Methodology used for profiling and analysis of miRNAs and mRNAs in stored platelets.

### Recent Publications

1. Dahiya N, Sarachana T, Kulkarni S, Wood Iii WH, Zhang Y, Becker K G, Wang B D and Atreya C D (2017) miR-570 interacts with mitochondrial ATPase subunit g (ATP5L) encoding mRNA in stored platelets. Platelets 28(1):74-81.

### Biography

Neetu Dahiya has expertise in understanding cellular gene regulation by small noncoding RNAs such as microRNAs (miRNAs). Her recent work is focused on the changes in expression of both miRNAs and mRNAs in platelets during storage. Some of these studies already identified miRNA:mRNA interactions that demonstrate the role of miRNAs in platelet biology during ex vivo storage and the results and concepts have been published in peer-reviewed journals.

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