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Multispectral Imaging of Healthy and Diseased Red Blood Cells using Confocal Microscopy

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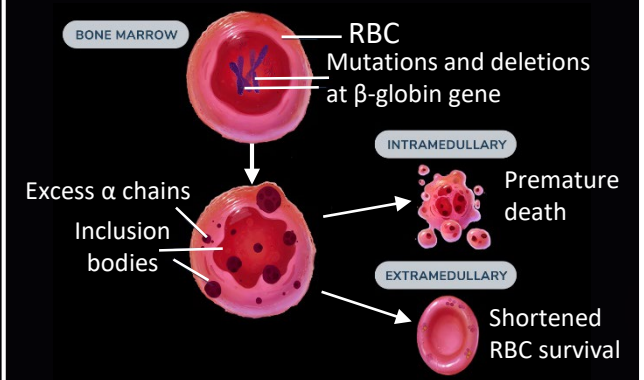
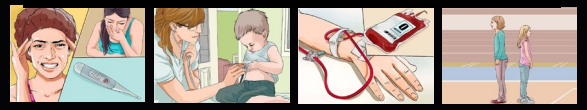
ABSTRACT

Red blood cells (RBCs) transport oxygen through the body. In thalassemia (Thal) RBCs have a shortened life expectancy: globin chains that form hemoglobin are not properly synthesized.

INTRODUCTION

In α-Thal, a defective synthesis of β-globin subunit produces an accumulation of toxic α-globin aggregates.

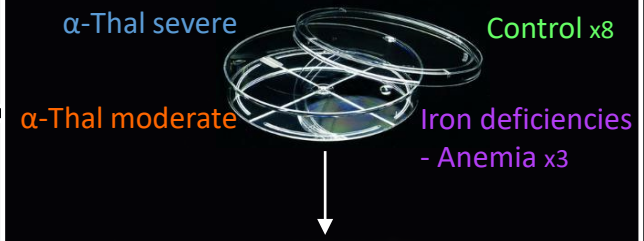


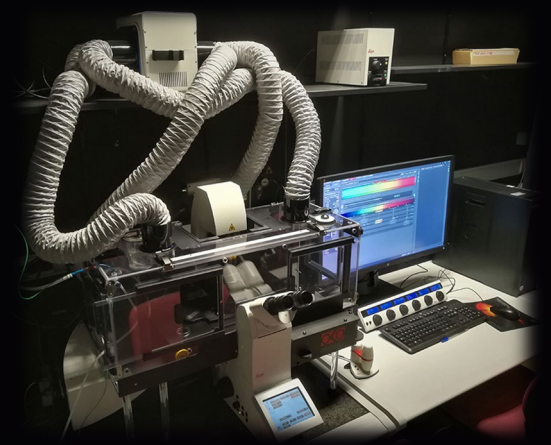


1.5 million – Men|Women – Mediterranean

METHODS

Blood samples +EDTA of 17 pediatric patients (12 ♂ - 5 ♀) were loaded to adherent Petris'

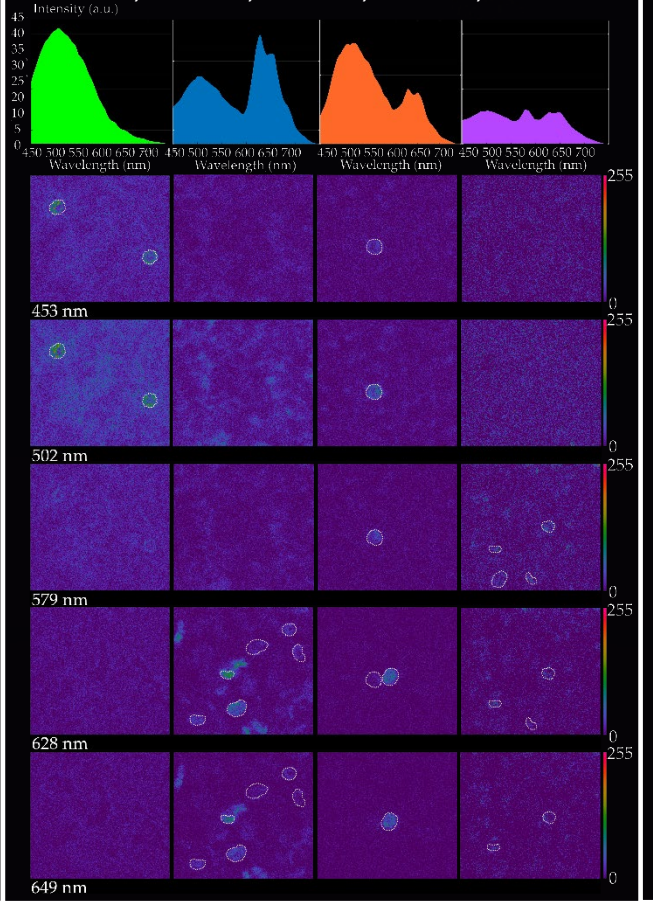




Confocal laser spectral imaging was performed on a Leica TCS SP8 STED 3x. Samples were excited at λ = 405 nm.

RESULTS

RBCs autofluorescence was collected at λ = 453 nm, 502 nm, 579 nm, 628 nm, 649 nm.



CONCLUSIONS

Intensities at λ = 502 nm, 628 nm, 649 nm are different between control and diseased individuals (α-Thal or Iron-deficiency anemia) and between different degrees of severity in α-Thal.