BlastenBlaster – An Interactive Learning Program for Haematology Cell Differentiation

Category: Hemostasis, transfusion medicine, vascular, laboratory medicine, benign hematology

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INTRODUCTION

Accurate blood cell differentiation is vital for clinical practice, but traditional textbook images offer limited value due to lack of morphological variety. BlastenBlaster was developed as a gamified web tool to enhance haematologists and biomedical scientists' practical cell identification skills through interactive learning and competition.

METHODS

BlastenBlaster was programmed in JavaScript, HTML, and CSS, with two learning modes: open practice with randomized cell images and instant feedback, and a competitive game mode with timed rounds and leaderboard. The dataset consisted of anonymized expert-verified cell images. Typing accuracy and training effects were analysed using binomial models.

RESULTS

Among 19,172 attempts across 2,503 cells (median 7 guesses per cell, 916 cells per user), cell types such as basophilic erythroblasts, monocytes, and metamyelocytes were most often misclassified. Confusion clusters emerged by plotting guessed versus true cell types. Training significantly improved typing accuracy, with odds ratio 1.42 per 10-level increase (p<0.0001) and even greater gains for the nine most challenging cell types (OR 1.50). User surveys demonstrated high satisfaction and perceived learning benefit.
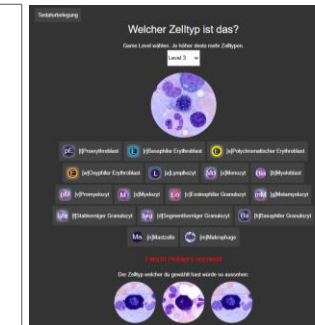
CONCLUSION

BlastenBlaster improves cell typing accuracy and user engagement through gamified learning. Its practical design supports both exam preparation and clinical skill development in haematology and may be integrated into broader training programs.
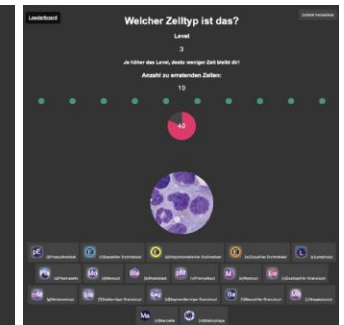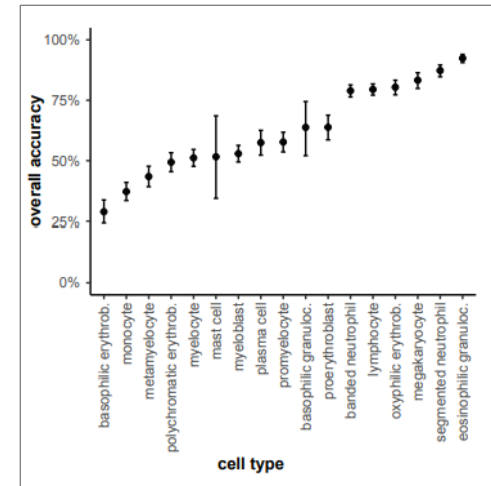
BLASTENBLASTER HOMEPAGE
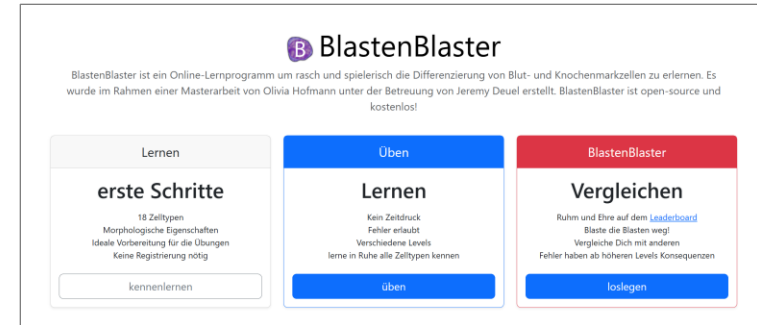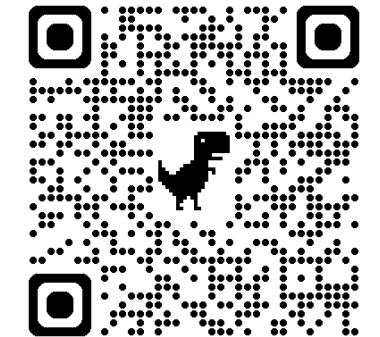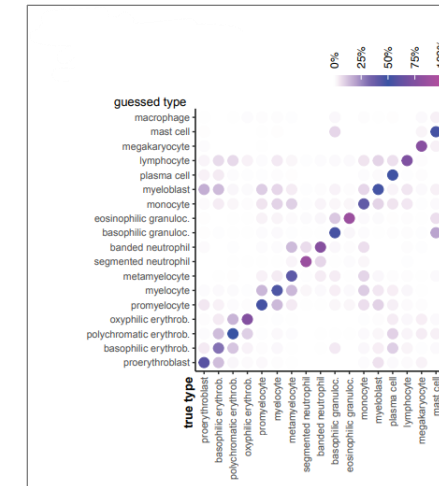

OPEN PRACTICE MODE

"BLASTENBLASTER"

OVERALL ACCURACY OF ALL LEARNERS

CONFUSION MATRIX

www.blastenblaster.com