

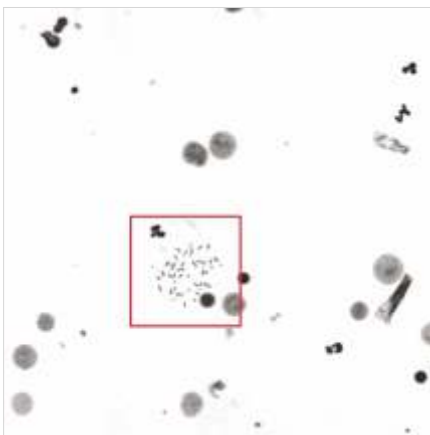
Cytogenetics

Intelligent Karyotyping Workflow



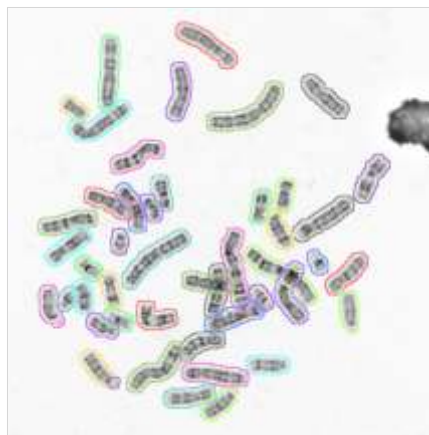
METAPHASE FINDING

- Fully automated capture of metaphase chromosomes with Metafer.
- Unattended high-volume imaging of up to 800 slides.
- Manual image capture with one-click for additional details.
- Support of human and non-human chromosomes and most common banding techniques.



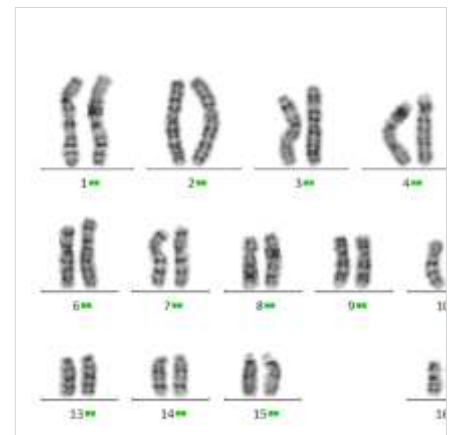
CHROMOSOME SEPARATION

- Separation in Ikaros is based on **Deep Neural Networks (DNNs)**, an advance in artificial intelligence.
- DNN-based proposal for the individual chromosomes as separate objects to help users separate clusters faster.
- Colored contour lines and brush tool for easy manual separation.



KARYOGRAM ASSIGNMENT

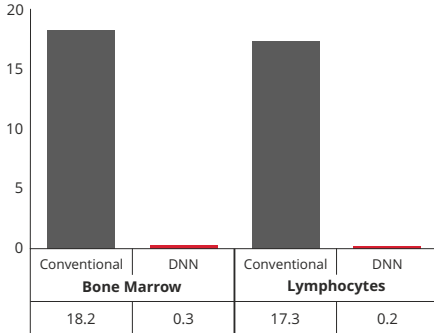
- Ikaros also uses **Deep Neural Networks (DNNs)** for karyogram assignment.
- Karyogram proposals ready for expert review. Colored squares indicate software-calculated chromosome assignment probabilities.
- Manual shifting, swapping, rotating, etc. for quick manual operations.





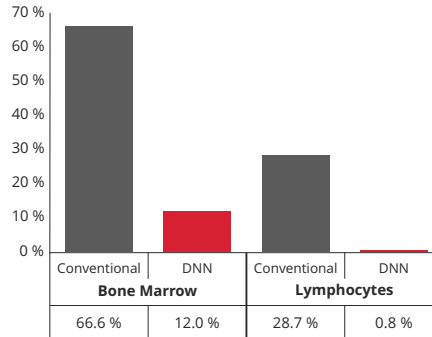
CHROMOSOME SEPARATION

Number of Manual Operations



KARYOGRAM ASSIGNMENT

Error Rates per Metaphase



We experienced a time gain of up to 50 % in the karyotype analysis of bone marrow metaphases. This enormous gain in efficiency allows us to keep pace with the ever-increasing workload in times of shortage of personnel resources.

Prof. Claudia Haferlach

MD from MLL (Münchner Leukämielabor GmbH, Germany)
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Diagrams above:

Mean number of manual operations by the user for 10 metaphase cells either derived from bone marrow or lymphocytes analyzed with the conventional (grey) and the DNN-based algorithm (red) in Ikaros.

Mean error rates for chromosome assignment per metaphase in Ikaros using the conventional (grey) and the DNN-based algorithm (red) for ~ 100,000 bone marrow and ~ 150,000 lymphocyte metaphases.

The new DNN-based algorithms showed significant improvements in the proposed chromosome separation and assignment.

The described functions refer to the following software versions: **Ikaros 6.3** | **Metafer 4.3**

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The presented solutions are application-specific adaptations of the Ikaros and Metafer software. It is possible that further adaptations to specific specimen conditions are necessary.

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