

The human factor in determining FISH biomarkers

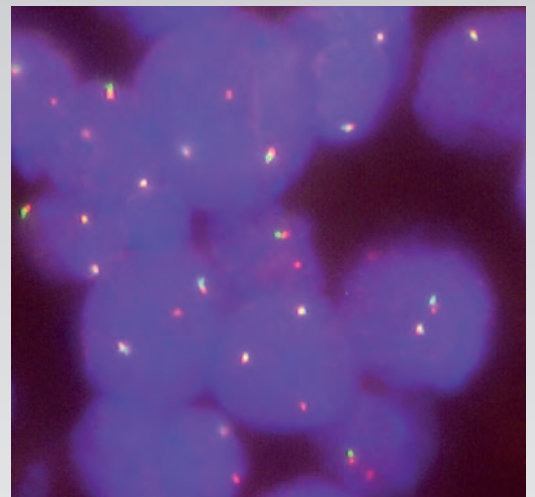
# TIRED?



*Tired of tedious FISH counting in the dark room?*

*Help is in sight! **AutoMax** promises to ease the pain by automated FISH analyses.*

**Interested to learn more?**



## What is **AutoMax**?

- **AutoMax** is completely novel system for automated FISH counting
- It is not related to other existing systems and its technology was developed newly from scratch
- **AutoMax** is a proprietary system of bioMcom, a German SME specializing on bio-math and bio-stats for biomarkers from molecular pathology

What you will **not** get from **AutoMax**:

- **AutoMax** is not a one-fit-all system, but will be adapted to your specific technology configuration
- **AutoMax** is not interactive but supports your work in a batch-wise processing (more about further down)

### **Historical remark:**

After a couple of experiences with image analysis in a completely different area, bioMcon hired a specialist in mathematical image analysis for tackling the FISH analysis problem. Many experts at this time said that this amounts to a mission-impossible task. Still the team of bioMcon ventured this project, based on long-standing experience with molecular pathology biomarkers. With the aid of renowned pathology companies and a university pathology, the program matured over the years to its present stage.

## **CHALLENGE TAKEN BY AutoMax**

- Systems for computerized reading of FISH images usually require high quality multi-stack images for valid processing.
- For the clinical routine this may lead to an actual slower process than performed by the common manual processing.
- **AutoMax** takes the challenge to base the automatic analysis on a much lower quality standard.
- **AutoMax** bases the analysis on regular single-stack images as they arise by routine in the lab documentation.
- **AutoMax** fits to the standard workflow of molecular pathology.

The high sensitivity to reliably recognizing also weak signals is the backbone of the AutoMax system. Dr. Schildhaus, Professor of Pathology at the University of Göttingen (Germany) notes: *„It is amazing how AutoMax can detect also very weak signals, which are hardly discernible by the human observer.“* This strength of AutoMax allows for analyzing images with lower quality.

# AutoMax + User Interface

## AMUI

### Strong Partner for Utilizing AutoMax

- Submit FISH-images to AutoMax for analysis through the Internet (AMUI order manager)
- Will send a note to you when AutoMax is ready (Order Manager)
- AutoMax results can be easily reviewed and modified with a strong review tool (Review Manager)
- All customized documents for archiving are generated (Review Manager)

## AutoMax

### Advanced FISH Analysis Software

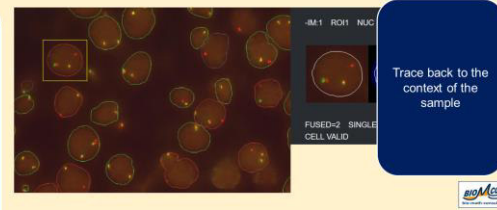
- Employs newly developed advanced image analysis software for automating the FISH analysis
- Fits to every pathology lab - no need for special lab hardware or software
- Needs only single-stack regular color photos for valid results
- Saves work time and enhances quality
- No need for costly investments

## AMUI

## AutoMax

## AMUI

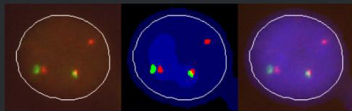
## AutoMax



Each single cell is displayed with Original, AutoMax Result and Original with Nucleus Background

-IM:1 ROI1 NUC SIGNAL:pos COUNT:YES

17 POS



AutoMax assessment  
Positive

Pathologist assessment  
 Positive  
 Negative  
 Not valid

FUSED=2 SINGLE\_GREEN=0 SINGLE\_RED=1  
CELL VALID

Display of all recognized nuclei and signals with AutoMax assessment

## AMUI

## AutoMax



-IM:3 ROI3 NUC SIGNAL:pos COUNT:NO

178 AGG



AutoMax assessment  
Not valid

Pathologist assessment  
 Positive  
 Negative  
 Not valid

FUSED=3 SINGLE\_GREEN=1 SINGLE\_RED=2  
CELL NOT VALID: possibly more than one nucleus

Assessment whether the cell may be counted

Trace back

## AMUI

## AutoMax

Automax pathology summary (BB01) / 2.5.2019

Positive cells per ROI

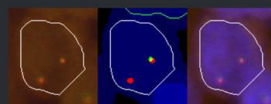
	Automax	Pathologist
ROI 1	0 / 14 = 0% -	0 / 14 = 0% -
ROI 2	1 / 15 = 7% -	0 / 15 = 0% -
ROI 3	0 / 18 = 0% -	0 / 18 = 0% -
TOTAL	1 / 47 = 2%	0 / 47 = 0%

Assessment by pathologist



-IM:2 ROI2 NUC SIGNAL:pos COUNT:YES

66 POS



AutoMax assessment  
Positive

Pathologist assessment  
 Positive  
 Negative  
 Not valid

FUSED=1 SINGLE\_GREEN=0 SINGLE\_RED=1  
CELL VALID

AutoMax assessment can be overwritten by the pathologist  
Overall summary automatically updated

**AutoMax** represents the serious attempt to revolutionize the FISH-analysis for molecular pathology biomarkers. All ingredients from mathematical image analysis, artifact recognition, and self-learning are developed and ready for a practical try. Professor Schildhaus notes: „*I think that, if developed in the right way, AutoMax can make a significant contribution to reduce the necessary time for FISH analysis while improving at the same time standardization and validity*“.

## Interested in a try?

- You send us some examples of images that you want to automatically analyze
- We calibrate the program to deal with images done with your technology

If you are content with the result we may start a project...

**Phase 1:** Interactive customizing of **AutoMax** towards your wishes (output format, file specifications, etc)

**Phase 2:** You receive an user access to the **AutoMax** online analysis portal

**Phase 3:** The practical work can start:

(a) Upload of images to an order manager

(b) receive a note next day, with a link where you may download the results

## AutoMax brings you back into the light!

AutoMax by

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