Workshop

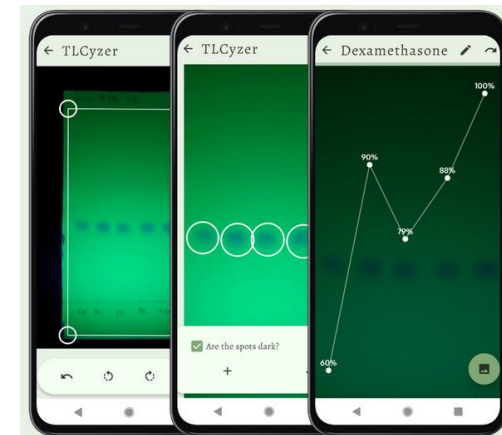# Drug lifecycle control in Subsaharan Africa

From production to responsible safe disposal and elimination in wastewater treatment plants

(Med4Africa)

Faculty of Science
Pharmaceutical Institute

Universitätsbund
Tübingen e. V.

Quantitative evaluation of thin-layer chromatographic analyses using an open-source smartphone app ("TLCyzer")
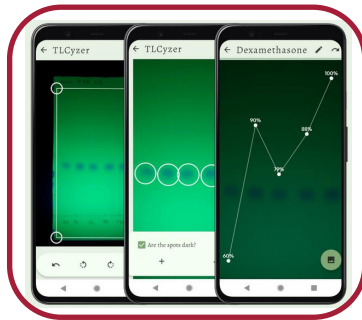
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① What is the TLCyzer?

② How does the TLCyzer work?

③ How to use the TLCyzer?

Problem

So far no simple, low-cost screening tools for **quantitative** analysis of pharmaceutical products; still requires (expensive) HPLC or HPTLC

sampling procedure

sample preparation (GPHF minilab)

qualitative + semi-quantitative analysis

compendial analysis (quantitative)
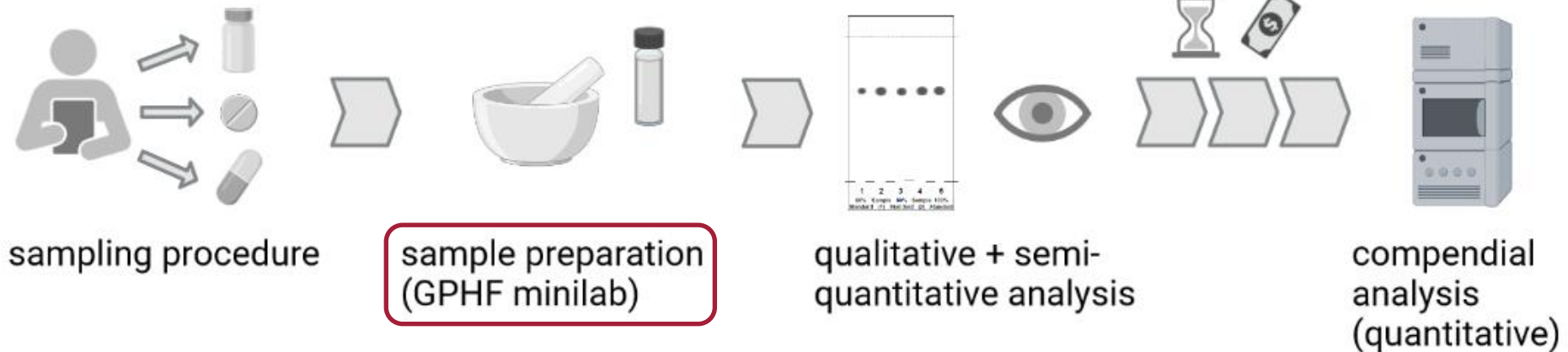
HPLC = high-performance liquid chromatography
HPTLC = high-performance thin-layer chromatography
GPHF = Global Pharma Health Fund e.V.

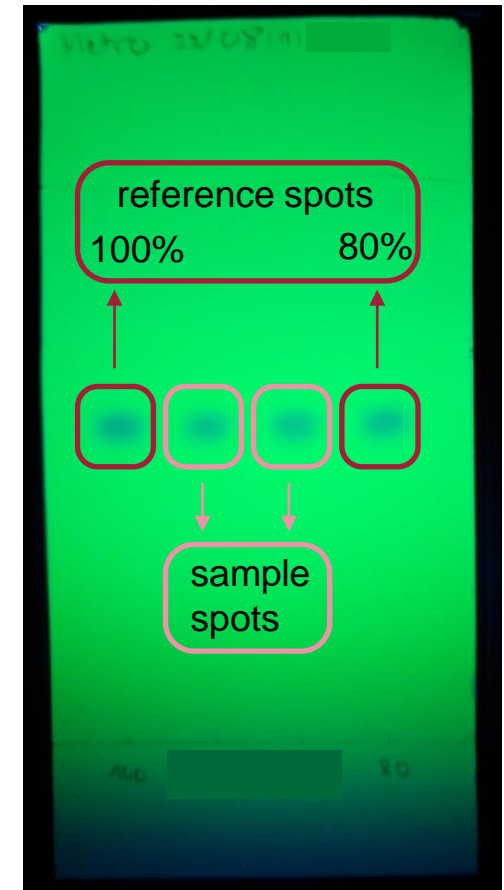created with BioRender.com

What is the GPHF Minilab?

Developed and distributed by *Global Pharma Health Fund* and Merck KGaA

Screening tool for qualitative and semi-quantitative analysis of APIs

reference spots
100%   80%

sample spots

Based on thin-layer chromatography

API = active pharmaceutical ingredient

Quantification of API amounts on TLC plates??

All the spots look the same… right?

Please guess if the API content of the sample is above or below 80% in this picture?

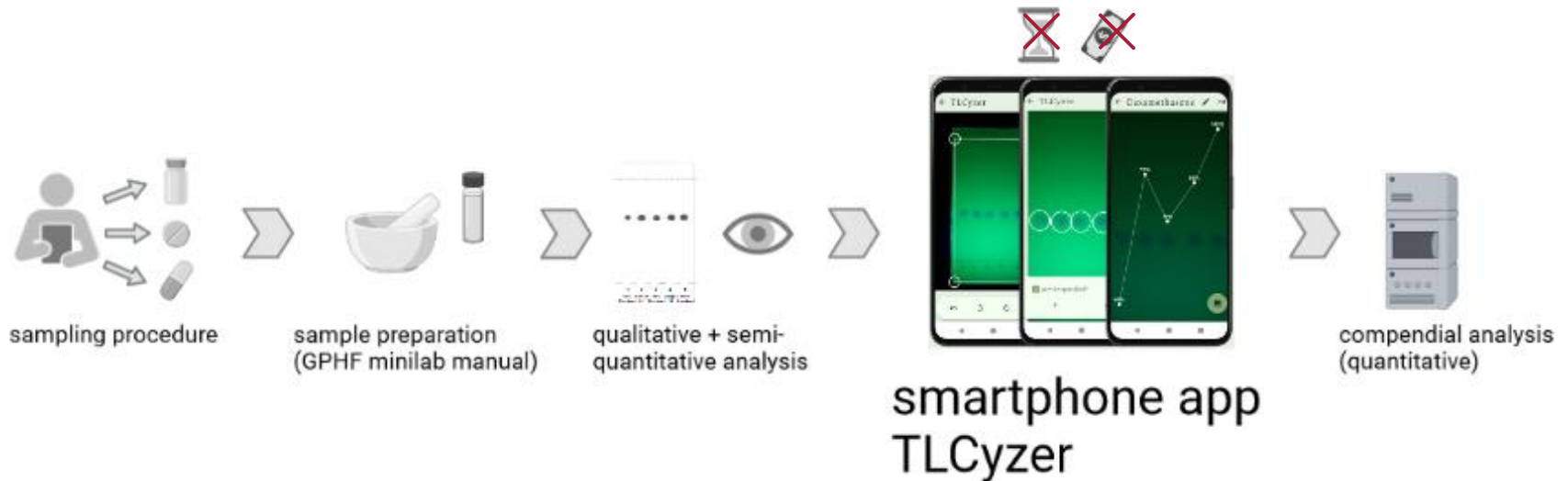# The TLCyzer assists in (semi)-quantitative analysis of TLC plates

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Problem So far quantitative analysis of pharmaceutical products in a low-resource setting proves to be difficult

TLCyzer Free smartphone app for improved accuracy of (semi)-quantitative analysis of API amount using GPHF Minilab

sampling procedure → sample preparation (GPHF minilab manual) → qualitative + semi-quantitative analysis → smartphone app TLCyzer → compendial analysis (quantitative)

created with BioRender.com

How does it work?

1. **Identification** of spots
2. Measurement of spot **intensity**
3. **Comparison** of sample and reference spots

3-step process

Preparing the TLC plate according to the GPHF Minilab

Taking a picture of TLC plate inside a wooden box under UV illumination

Analysing the picture with the TLCyzer application

**Live demonstration
of the TLCyzer**

Julia Gabel - Quantitative evaluation of thin-layer chromatographic analyses in medicine quality screening using an open-source smartphone app

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Practical exercise

Please come together in groups of 3-4 → each group should have at least one **android** smartphone

install the TLCyzer application

go to a black wooden box an take a picture of the TLC plate

analyse the TLC plate with the TLCyzer application

How to install the TLCyzer: Search for „TLCyzer app" in the Google play and install it on the smartphone

Please fill in your feedback in the provided form. This helps greatly for improvement of the app! – Thank you!

Thank you!

…for your attention and your feedback about the TLCyzer

scientific reports

OPEN **An open-source smartphone app for the quantitative evaluation of thin-layer chromatographic analyses in medicine quality screening**

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