Standardization of sandwich-structured Cu-glass substrates embedded in a flexible diode laser-plasma interface for the detection of cholesterol

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Formula symbols

$$\begin{split} \Psi-\text{Laser fluence} \\ U_{\text{Plasma}}-\text{Applied Voltage of the Flexible Microtube Plasma} \\ \phi_{\text{Helium}}-\text{Helium gas flow of the Flexible Microtube Plasma} \end{split}$$

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Figure S1. Calibration curve of the laser diode current I to applied laser power P using gauge head "Coherent LMP2" and a power meter "Coherent FieldMaster GS", guided through optics. The intersection with the abscissa indicates the threshold of the diode laser.



Figure S2. White light interferometry to investigate laser craters. Coated copper-glass substrates were shot with a power density of 15.66 W/mm² for 10 s. *Upper image*: 2D view, *lower image*: 3D plot.



Figure S3. White light interferometry to investigate laser craters. Coated copper-glass substrates were shot with a power density of 15.66 W/mm² for 10 s, *10 times. Upper image:* 2D view, *lower image:* 3D plot.



Figure S4. Ion intensity of propazine after laser desorption and plasma ionization on standardized copper-glass substrates for in total 6 minutes. The laser fluence is increased from 3,34 W/mm² to 15.66W/mm² after 5 minutes of desorption to prove lower laser powers of 3.34 W/mm² are not suitable for calibration. Parameters: $U_{Plasma} = 1.60 \text{ kV}$, $\phi_{Helium} = 43.6 \text{ sccm}$, $m_{Propazine} = 50 \text{ ng}$ (*m/z* 230, $[M+H]^+$) on copper-glass substrates.



Figure S5. Calibration curve of cholesterol after laser desorption and plasma ionization on standardized copper-glass substrates. Time integrated area of ion intensity, averaged over triplicates, is shown for different absolute masses of cholesterol. Linear dynamic range is three magnitudes, while reaching a detection limit of 0.46 ng. Parameters: $\Psi = 15.66 \text{ W/mm}^2$, $U_{\text{Plasma}} = 1.60 \text{ kV}$, $\phi_{\text{Helium}} = 43.0 \text{ sccm}$ on copper-glass substrates.



Figure S6. Mass Spectrum of propazine (protonated molecule), with laser desorption and plasma ionization on standardized copperglass substrates. Ion insensity is shown for 0.5 µg of propazine, with laser desorption and plasma ionization on standardized copperglass substrates. Parameters: $\Psi = 15.66 \text{ W/mm}^2$, $m_{\text{Propazine}} = 0.5 \mu \text{g}$, $U_{\text{Plasma}} = 1.60 \text{ kV}$, $\phi_{\text{Helium}} = 42.6 \text{ sccm}$ on copper-glass substrates.



Figure S7. Calibration curve of propazine after laser desorption and plasma ionization on standardized copper-glass substrates. Time integrated area of ion intensity, averaged over triplicates, is shown for different absolute masses of propazine. Linear dynamic range is also three magnitudes, while reaching a detection limit of 0.14 ng. Parameters: $\Psi = 15.66 \text{ W/mm}^2$, $U_{\text{Plasma}} = 1.60 \text{ kV}$, $\phi_{\text{Helium}} = 43.0 \text{ sccm}$ on copper-glass substrates.



Figure S8. Comparison of calibration curves of standard cholesterol (Figure SI-5) and cholesterol in blood plasma (1:100 diluted in ChCl₃) after laser desorption and plasma ionization on standardized copper-glass substrates. Time integrated area of ion intensity, averaged over triplicates, is shown for different absolute masses of cholesterol. Parameters: $\Psi = 15.66 \text{ W/mm}^2$, $U_{Plasma} = 1.40 \text{ kV}$, $\phi_{Helium} = 43.6 \text{ sccm}$ on copper-glass substrates.