

Einladung zum GDCh-Colloquium des Ortsverbandes Hannover

Das Colloquium findet um 17c.t. im [Dr.-Oetker Hörsaal \(Raum 007, Geb. 2504\)](#) der Leibniz Universität Hannover, [Physikalische Chemie, Callinstraße 3A](#), 30167 Hannover statt.

21.05.2026 **Dr. Max von Witzleben**,
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Refractive Index as a Design Parameter: From Tissue Engineering to AI-Enabled Imaging

Advances in additive tissue manufacturing enable the combination of increasingly complex architectures with a growing range of biomaterials and cell types. This is particularly relevant at tissue interfaces, where distinct functional regions converge. However, this tight integration complicates the analysis of such constructs to the extent that their design is increasingly dictated by the limitations of available analytical methods rather than by the underlying biological question.

Label-free microscopy could perform this analysis in principle, but it reaches its penetration depth limit in living tissue. Accordingly, research on tissue clearing has intensified in recent years, though largely on fixed samples. Through targeted refractive index matching, tissue becomes optically transparent for defined wavelengths, enabling full three-dimensional characterization. However, the resulting high-dimensional datasets exceed the capacity of classical analysis pipelines. AI-based methods are therefore gaining traction and replacing conventional staining approaches.

This presentation delineates a research objective encompassing two of the three levels of the resulting pipeline: the development of refractive-index-matched bioinks, and the adaptation and calibration of artificial intelligence models utilized for analysis — with the objective of facilitating continuous, non-destructive characterization of tissue equivalents.

Prof. Dr. Jens-Uwe Grabow
Vorsitz OV Hannover

Vor dem Colloquium findet ab ca. 16 c.t. eine ‚Kaffeerunde‘ mit dem Vortragenden in der [Bibliothek des Instituts für Physikalische Chemie, Callinstraße 3A](#) statt.