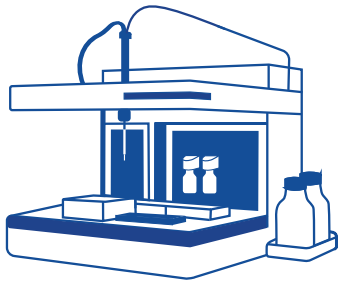
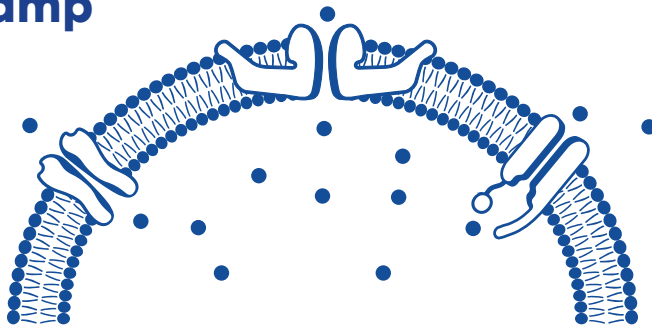


Two new paths
to patch clamp



Patchliner^e



Patchliner^m

Nanion User Meeting 2026

Munich, Germany

I Science, Workshops, Networking I

Nanion User Meeting 2026 Agenda

Dates: October 20-21, 2026

Venue: Ganghoferstraße 66b, 80339 München

Tuesday, October 20

09:45 - 12:00 h CEST

User instrument Workshops (Registration required)

11:45 - 13:00 h CEST

Registration & welcome bites

13:00 - 13:15 h CEST

Niels Fertig (Nanion Technologies)

Welcome words

13:15 - 13:35 h CEST

David Colameo (University of Zurich)

Functional phenotyping of ALS variants using iPSC-derived motor neurons and high-throughput electrophysiology

13:35 - 13:55 h CEST

Nurcan Inci Kavum (University of Liège)

Pharmacology of hNa_v1.4 variants using automated and manual patch clamp

13:55 - 14:10 h CEST

Michael George (Nanion Technologies)

From automation to interaction: Rethinking patch clamp workflows

14:10 - 14:20 h CEST

Poster flash talks (x2, 3 min each)

14:20 - 14:35 h CEST

Short break

14:35 - 15:20 h CEST

Instrument demos - Rotation 1

15:20 - 16:05 h CEST

Instrument demos - Rotation 2

16:05 - 16:20 h CEST

Short break

16:20 - 16:40 h CEST

Jan Behrends (University of Freiburg)

A different game with the same toy: trapping as opposed to translocation in single molecule discrimination with biological nanopores

16:40 - 17:00 h CEST

Claudia Steinem (University of Göttingen)

One is easy, many are hard: The challenge of multi-channel ion trace analysis

17:00 - 17:20 h CEST

Ben Bruce (University of St Andrews)

Using the Orbit mini to study mechanisms of doxorubicin-induced cardiotoxicity

17:20 - 17:30 h CEST

Poster flash talks (x2, 3 min each)

17:30 - 18:45 h CEST

Posters & networking

19:00 - 23:00 h CEST

Dinner hosted by Nanion Technologies

Wednesday, October 21

08:30 - 09:00 h CEST

Coffee & tea

09:00 - 09:20 h CEST

Yuanzhao (Nick) Cao (The University of Queensland)

Glycaemic variability drives cardiomyocyte dysfunction and susceptibility to ischaemic injury in diabetes

09:20 - 09:40 h CEST

Chai-Ann Ng (Victor Chang Research Institute)

Heart of discovery: Scaling variant interpretation with automated patch clamp

09:40 - 10:00 h CEST

Marta Lemme (Nanion Technologies)

FLEXcyte 96 for next-generation cardiac models: From primates to 3D

10:00 - 10:20 h CEST

Isabelle Deschênes (The Ohio State University)

Location, location, location: β -Adrenergic control of Na_v1.5

10:20 - 10:40 h CEST

Olivier Gires (Ludwig Maximilian University of Munich)

Understanding local invasion in carcinomas

10:40 - 11:10 h CEST

Coffee break

11:10 - 11:30 h CEST

Adam Hyman (GSK)

Utilising SURFER to discover tools for SLC transporter early drug discovery

11:30 - 11:50 h CEST

Lukas Schulz (University of Würzburg)

Forgotten plant growth regulators: TIBA, morphactins and PIN-mediated auxin transport

11:50 - 12:10 h CEST

Maria Barthmes (Nanion Technologies)

A voyage through the cell: The history of SSME in organellar transport

12:10 - 13:15 h CEST

Lunch

13:15 - 13:35 h CEST

Ute Hellmich (Friedrich Schiller University Jena)

Lipid regulation of TRP channels: More than meets the eye

13:35 - 13:55 h CEST

Bastien Masson (Oria Bioscience)

From LYSO-Prep™ to MITO-Prep™: native & ready-to-use organelles for pharmacology

13:55 - 14:05 h CEST

Manuel Paina (Axxam)

Game changers: From tradition to innovation

14:05 - 14:15 h CEST

Alessandro Cerchiara (University of Bari)

Integrating virtual screening and automated patch clamp for tackling KCNA1- and KCNA2-related neurological disorders

14:15 - 14:35 h CEST

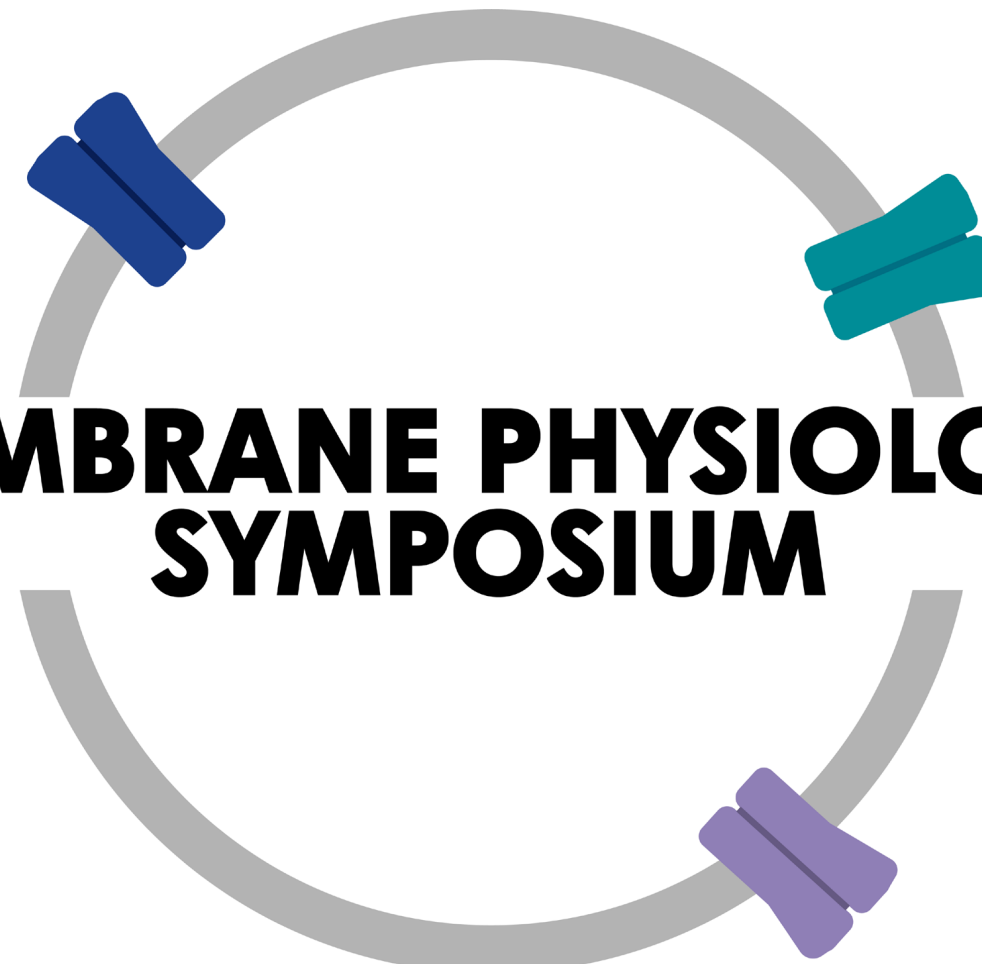
Giovanni Mann (King's College London)

Roadblock for clinical translation: importance of physiological O₂ for screening of therapeutics in live cell models *in vitro*

14:35 - 14:45 h CEST

Elena Dragicevic (Nanion Technologies)

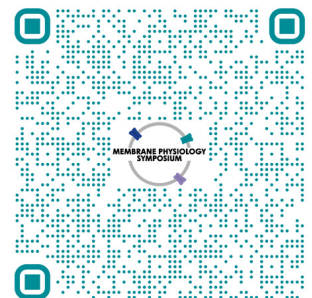
Closing words

A large, light gray circular outline representing a cell membrane. Three stylized protein channels are embedded in the membrane: a blue one at the top left, a teal one at the top right, and a purple one at the bottom right. Each protein is depicted as two parallel, slightly curved bars.

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Questions Contact:
Brian.Camillo@nanion.com



Niels Fertig
Nanon Technologies

Welcome words

For over two decades, Nanion Technologies has been a leader in providing diverse solutions for electrophysiologists worldwide. Our innovative work in ion channel APC electrophysiology, cell viability and contraction monitoring, and electrogenic transporter research supports high-throughput capabilities. Niels Fertig will highlight our significant milestones and achievements from the past year, showcasing our ongoing efforts to advance electrophysiology and support groundbreaking research.

Session 1: Advancing functional electrophysiology Chair: Ali Obergrussberger (Director of Scientific Sales and Customer Engagement)

David Colameo
University of Zurich

Functional phenotyping of ALS variants using iPSC-derived motor neurons and high-throughput electrophysiology

Mutations in SOD1, C9orf72, and TDP43 are common causes of familial amyotrophic lateral sclerosis (ALS), yet it is unclear whether they disturb motor neuron function in the same way. We combined high-density microelectrode arrays, which follow network activity over development, with high-throughput automated patch-clamp, which resolves single-cell ion channel activity, in iPSC-derived motor neurons from patient lines. Each variant showed a distinct network phenotype, from hypoactivity to stage-dependent hyperexcitability, with variant-specific sodium and potassium channel differences. ALS excitability phenotypes therefore depend on variant and time point, and high-throughput electrophysiology can disentangle them at scale.



Nurcan Inci Kavum
University of Liège

Pharmacology of hNa_v1.4 variants using automated and manual patch clamp

Paramyotonia congenita (PMC) is a skeletal muscle disorder marked by impaired hNa_v1.4 inactivation and cold-induced stiffness. Current therapies like mexiletine have limited efficacy, yet comparative in vitro drug studies remain lacking. Here, we used manual and automated patch clamping to profile five Nav blockers across wild-type and mutant (R1448H, L1436P) hNa_v1.4 HEK293 lines. High-throughput screening using automated patch clamp demonstrated various responses across different variants and compounds, highlighting that these compounds possess varying binding affinities depending on the channel's functional state. Our manual and automated patch clamp were very consistent with each other.

Michael George
Nanon Technologies

From automation to interaction: Rethinking patch clamp workflows

Twenty years ago, the Patchliner set a new benchmark as a fully automated patch clamp system capable of recording from up to eight cells simultaneously. Since then, it has become a trusted workhorse across academia and industry - supporting everything from routine cardiac safety assays to intricate biophysical investigations of voltage-gated ion channels and heat activation of TRP channels. Now, two decades later, the Patchliner is undergoing a major transformation. With groundbreaking enhancements in assay versatility, hardware design, and software performance, this next-generation Patchliner redefines what is possible in automated electrophysiology, signifying a new era of precision, efficiency, and discovery.



October 20

14:35 - 17:30 CEST

Instrument demos

- Two rotations, 45 min each
- **Where:** Nanion HQ labs, ground floor
- **Start time:** 14:35 h
- **End time:** 16:05 h



Session 2: Nanopore sensing and ion channel mechanisms Chair: Conrad Weichbrodt (Senior Scientist / Product Manager Orbit systems)



Jan Behrends
University of Freiburg

A different game with the same toy: trapping as opposed to translocation in single molecule discrimination with biological nanopores

In the literature on biological nanopores, the event giving rise to a discriminatory current signal is most often called "translocation". I here argue that, for free peptide fragments and short oligonucleotides, the underlying mechanism is trapping. The signal reflects the conformations and interactions explored by the analyte while inside the pore, rather than directed movement through it. Translocation or return to the origin may occur as the final escape, but neither is responsible for the discriminatory signal. Experimental and theoretical evidence will be discussed, alongside unpublished results and applications to medically relevant peptide discrimination.

Claudia Steinem
University of Göttingen

One is easy, many are hard: The challenge of multi-channel ion trace analysis

Voltage-clamp recordings provide critical insights into membrane permeation, yet some information remains hidden. This talk presents two examples of advanced ion channel analysis. First, we examine the antimicrobial peptide Lugdunin, exploring the mechanism by which this cyclic peptide destabilizes bacterial membranes. Second, we address the challenge of channel cooperativity. While channels are often viewed as autonomous, evidence suggests they form clusters that influence each other's gating. Because these interactions often result in aggregated signals rather than single-channel traces, I will briefly discuss how mathematical modelling can help decode this cooperativity from the total current flux.



Ben Bruce
University of St Andrews

Using the Orbit mini to study mechanisms of doxorubicin-induced cardiotoxicity

A common side effect of the anti-cancer drug doxorubicin is cardiotoxicity leading to heart failure. Ca^{2+} leakage from the sarcoplasmic reticulum (SR) is a hallmark of heart failure. Our recent data suggest that Mitsugumin 23 (MG23) is a Ca^{2+} leak channel. Using the Orbit mini, we have incorporated human MG23 channels solubilised from HEK293 cells using Styrene-Maleic Acid Lipid Particles (SMALPs) into a lipid bilayer, to investigate how doxorubicin modulates MG23 channel function. We show that doxorubicin increases MG23 activity and causes increased frequency of synchronised gating. This highlights MG23 as a potential new therapeutic target to combat doxorubicin-induced cardiotoxicity.

Session 3: Cellular function and disease mechanisms Chair: Elena Dragicevic (Global Head of Marketing)



Yuanzhao (Nick) Cao
The University of Queensland

Glycaemic variability drives cardiomyocyte dysfunction and susceptibility to ischaemic injury in diabetes

Cardiovascular risk in diabetes is not fully explained by conventional risk factors or chronic hyperglycaemia. Using *in vivo* models, human cardiomyocytes and patient plasma assays, we show that glycaemic variability has distinct, deleterious effects compared with sustained hyperglycaemia. Repeated glucose fluctuations impair cardiomyocyte function and increase susceptibility to ischaemic injury. Plasma from patients with diabetes also reproduces measurable cardiomyocyte dysfunction. Together, these studies establish translational platforms for studying diabetes-associated cardiac vulnerability and evaluating potential therapeutic strategies.

Chai-Ann Ng

Victor Chang Research Institute

Heart of discovery: Scaling variant interpretation with automated patch clamp

Automated patch clamp has transformed rare disease variant interpretation by enabling large-scale measurement of ion channel function that meets ClinGen requirements for functional evidence. These calibrated, high-throughput patch-clamp data have helped reclassify uncertain cardiac gene variants as likely pathogenic, improving diagnosis of conditions such as KCNH2-long QT syndrome and SCN5A-Brugada syndrome. This calibrated approach has now been extended to neuronal channelopathies involving SCN1A, CACNA1A and KCNQ2.



Marta Lemme
Nanon Technologies

FLEXcyte 96 for next-generation cardiac models: From primates to 3D

FLEXcyte 96 is a versatile platform for measuring contractile function across cardiac models. Its flexible membranes enable auxotonic contraction and promote cardiomyocyte maturation. To further expand its applications, we evaluated contractility in 2D primate iPSC-derived cardiomyocytes, which exhibited a longer contraction peak duration than human iPSC-CMs. Finally, we successfully assessed both contractility and compound responses in ready-to-use 3D cardiac organoids. Together, these results demonstrate the versatility of FLEXcyte 96 across human and primate 2D models as well as 3D cardiac organoids, providing a single platform for functional assessment.

Isabelle Deschênes

The Ohio State University

Location, location, location: β -Adrenergic control of $\text{Na}_v1.5$

β -adrenergic signaling dynamically regulates $\text{Na}_v1.5$ to adapt cardiac excitability to increased sympathetic demand. Here, we identify a 14-3-3-dependent pathway linking PKA signaling to $\text{Na}_v1.5$ regulation. PKA stimulation increased sodium current, whereas disruption of 14-3-3 or mutation of $\text{Na}_v1.5$ -S460 abolished this response. Macropatch recordings revealed that this regulation is restricted to the intercalated disc. CRISPR-engineered S460A hiPSC-cardiomyocytes confirmed this mechanism. Together, our studies define a novel pathway linking β -adrenergic signaling, $\text{Na}_v1.5$ modulation, cardiac excitability, and arrhythmia susceptibility, offering a promising framework for targeted anti-arrhythmic interventions.



October 21

10:20 - 12:10 CEST



Olivier Gires

Ludwig Maximilian University of Munich

Understanding local invasion in carcinomas

Cancer remains a life-threatening disease despite considerable advances in therapeutic modalities. Major challenges are the formation of local recurrences, local and distant metastases. We focus on the earliest steps of tumor cell dissemination with an emphasis on functions of the therapeutic target EGFR in head and neck cancers (HNSCC). We combine functional assays with next-generation sequencing to uncover molecular aspects of EGFR-mediated local invasion. In this context, we have used the AtlaZ system to reliably monitor and quantify effects of EGFR ligands on proliferation and cell-cell adhesion. Time-resolved online measurements have uncovered invasion-relevant features of Laminin332/EGFR signaling using AtlaZ.

Session 4: Membrane transport mechanisms and pharmacology Chair: Cecilia George (Global Head of SURFE²R Sales / Senior Scientist)



Adam Hyman

GSK

Utilising SURFE²R to discover tools for SLC transporter early drug discovery

Solute carrier (SLC) transporters are tractable, disease-linked, yet underexplored drug targets, and regulatory guidance requires assessment of SLC-mediated drug-drug interactions. For the transporter anSLC, limited tool compounds and assay-readiness challenges hindered progression into Lead Discovery. We evaluated FLIPR, imaging, mass spectrometry, and electrophysiology approaches, and developed a label-free SURFE²R assay that enabled direct measurement of transporter activity. The assay confirmed FLIPR hits, supported hit expansion, and informed a screening cascade in which SURFE²R became a key orthogonal assay for compound progression.

Lukas Schulz

University of Würzburg

Forgotten plant growth regulators: TIBA, morphactins and PIN-mediated auxin transport

Auxins are phytohormones that regulate plant growth and development. Their effects depend on establishing local auxin minima and maxima, largely controlled by PIN-FORMED (PIN) auxin efflux carriers. The importance of auxins in plants has led to the development of synthetic auxins and auxin transport inhibitors, now widely used as herbicides. Among these are TIBA and Morphactins, developed in the 1950s and 1960s, whose precise modes of action remain elusive. Here, I show that these historically established auxin transport inhibitors directly target PIN proteins and investigate the molecular mechanisms underlying their inhibitory activity using the SURFE²R system from Nanion.



Maria Barthmes

Nanon Technologies

A voyage through the cell: The history of SSME in organellar transport

Much of a eukaryotic cell's membrane lies in organelles, whose transporters and channels control ion homeostasis, energy conversion and nutrient recycling. This talk takes the audience on a voyage through the cell and two decades of solid-supported membrane electrophysiology (SSME). It begins with SERCA in the sarcoplasmic and endoplasmic reticulum, continues through mitochondria, synaptic vesicles and plant vacuoles, and ends at the lysosome, where measurements on native organelles are paving the way toward drug discovery. Along the way, the talk highlights how advances in sample preparation and instrumentation shaped what could be measured.

Session 5: Functional approaches to therapeutic discovery Chair: Markus Rapedius (Senior Scientist / Product Manager Chips APC)



Ute Hellmich

Friedrich Schiller University Jena

Lipid regulation of TRP channels: More than meets the eye

Cells rely on membrane receptors to detect and integrate diverse environmental signals. Ligands such as small molecules, peptides or ions trigger conformational changes that regulate downstream signalling cascades. This classic, 3D-centric view is challenged by the finding that nearly half of the human proteome is predicted to be intrinsically disordered. Many membrane receptors, including most Transient Receptor Potential (TRP) channels, contain large intrinsically disordered regions (IDRs) whose dynamic nature has severely hampered structural characterization. Therefore, the contribution of IDRs to signal sensing remains poorly understood and the structural dimensions of TRP channels are notoriously underestimated. Here, using an integrated structural biology approach, we show that disordered channel regions contribute to multipartite signalling networks of plasma membrane and lysosomal TRP ion channels and play crucial roles in lipid-dependent functional regulation. This work thus provides a conceptual blueprint how complex membrane receptors are regulated by structural disorder.

Bastien Masson

Oria Bioscience

From LYSO-Prep™ to MITO-Prep™: native & ready-to-use organelles for pharmacology

Intracellular ion channels and transporters remain hard drug targets, as their native membranes are difficult to access at scale with reproducible recording quality. Purified organelles address these targets directly in their native membrane environment. With LYSO-Prep™, optimized preparation and recording conditions enable automated patch clamp recordings of TMEM175, TRPML1 and TPC2, with concentration-response curves for reference modulators across temperatures. We extend the approach to mitochondria with MITO-Prep™, giving direct access to the inner membrane for electrophysiological and SSM-based readouts on targets such as ANT and MCU. Mitochondria now join lysosomes as substrates for routine pharmacology.



Manuel Paina

Axxam

Game changers: From tradition to innovation

Automated platforms have transformed patch-clamp electrophysiology, opening the door to new applications. The first game changer is light: optogenetic tools enable optical stimulation in a 384-well format. The second is going under the plasma membrane: recordings from intracellular organelles, particularly lysosomes, enable compound profiling of therapeutic targets. The third is smarter assay development: multi-hole recording chips improve robustness and throughput while reducing development time and costs. This presentation will highlight how these innovations are transforming patch-clamp into a versatile platform for drug discovery and ion channel research.

Alessandro Cerchiara

University of Bari

Integrating virtual screening and automated patch clamp for tackling KCNA1- and KCNA2-related neurological disorders

Variants in KCNA1 and KCNA2 (loss- or gain-of-function [LoF/GoF], or mixed) cause rare neurological disorders, including developmental and epileptic encephalopathies. Since current antiseizure treatments lack efficacy and 4-aminopyridine is the only precision option for some GoF patients, novel $K_v1.1/1.2$ modulators need to be developed.



14:15 - 14:35 CEST



Cells *in vivo* experience physiological oxygen levels, yet standard culture conditions are hyperoxic. We have characterised how long-term adaptation to physiological O₂ alters endothelial redox signalling, revealing selective changes in NRF2 target genes, increased nitric oxide bioavailability and enhanced SERCA activity that protects against calcium overload. We recently reported that NO-stimulated potassium channel activity is markedly enhanced under physiological O₂ levels. Ongoing studies examine redox and metallomic responses. We encourage a paradigm shift in cell culture research to improve translation of therapeutic screening *in vitro* to disease pathology *in vivo*.

[illegible]

Board #1. "An integrated drug repurposing pipeline combining *in silico* and automated electrophysiological screening for the identification of ClC-5 Cl⁻/H⁺ antiporter modulators"

Presenter: Antonio Vittorio Buono (University of Bari) - **Flash talk**

Board #2. "A medium-throughput organelle-based toolbox to interrogate diverse drug targets across therapeutic areas"

Presenter: Marine Moutia (Oria Bioscience)

Board #3. "Carbamate-based Cannabinoids uncover a conserved lipid-sensing pocket in nociceptive TRPA1 and TRPV1 Channels"

Presenter: Tala Amawi (The Hebrew University of Jerusalem) - **Flash talk**

Board #4. "Modulation of ionic currents in AC16 Human cardiomyocytes and hERG tail currents by a Klotho activator"

Presenter: Annamaria Di Turi (University of Bari)

Board #5. "Advancing sperm-specific ion channels as contraceptive targets"

Presenter: Valentin Teuber (University of Münster) - **Flash talk**

Board #6. "From ion-channel kinetics to the channelome: A standardized platform for comprehensive electrophysiology"

Presenter: Rajnish Ranjan (EPFL) - **Flash talk**

Board #7. "Development and characterization of non-human primate iPSC-Derived ventricular cardiomyocytes for high-throughput safety pharmacology screening"

Presenter: Antoinette Krainz (Ncardia)

Board #8. "A multi-platform strategy for comprehensive functional characterisation of EAAT2 (SLC1A2)"

Presenter: Adriana Bizior (Sygnature Discovery)

**We welcome your feedback.
How are you enjoying the meeting?**



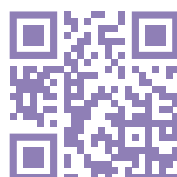
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