

Editorial

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Julia Gross and Gregor Fuhrmann

Extracellular vesicles – new formats and old research questions

Meet the researcher

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A few questions to Prof Dr Kenneth W. Witwer, Johns Hopkins University

Kenneth W. Witwer is an associate professor of molecular and comparative pathobiology and neurology at the Johns Hopkins University School of Medicine in Baltimore, Maryland, United States. He received his PhD from Johns Hopkins University School of Medicine in 2010. In 2011, Ken joined the faculty at Johns Hopkins, and he assumed a tenure-track position in 2012. His research focusses on EVs and RNA in HIV disease of the central nervous system. Ken has served as Secretary General of ISEV.

News from the Society

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Kerstin Menck

Results of the first GSEV survey in Germany

Research on extracellular vesicles is on the rise, world-wide and also in Germany. This report summarizes the main findings of the first online survey that was conducted by the German Society for Extracellular Vesicles (GSEV). The eleven questions were aimed at identifying research topics of interest and ideas for future developments of GSEV.

NeW Research Centre

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Gregor Fuhrmann

Inauguration Research Centre „New Bioactive Compounds“ at the Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

Research on extracellular vesicles is on the rise, world-wide and also in Germany. This report summarizes the main findings of the first online survey that was conducted by the German Society for Extracellular Vesicles (GSEV). The eleven questions were aimed at identifying research topics of interest and ideas for future developments of GSEV.

Meeting Report

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Andreu Matamoros-Angles, Santra Brenna, Karen Lahme, Fabian Braun, Maura Dandri, Berta Puig

The Hamburg EV community: A present reality with a promising future

On April 13-14th, 2023, more than 50 researchers located in Hamburg, mainly working at the University Medical Center Hamburg-Eppendorf (UKE), met to present research projects focusing on extracellular vesicles (EVs). The meeting was supported by State Research Funding (LFF-FV74: Mechanisms of cell communication in Infection; Speaker Maura Dandri, UKE), which aims to develop existing and promising research areas further. This meeting certainly surpassed all expectations: what was first organized as a tentative get-together between a dozen EV scientists, soon revealed the existence of a much broader and strong EV community with more than 50 basic researchers and clinicians currently active in Hamburg. This first UKE-EV meeting created a platform to share experiences, projects, and protocols and mainly discuss future requirements to create a consolidated structure and network in Hamburg, enabling state-of-the-art EV research.

Loic Auderset, Anna Antoniou

Characterization of extracellular vesicles derived from mouse primary neurons

It is now clear that the specific composition of extracellular vesicles (EV) is largely determined by the type and developmental or biological state of their donor cells. Careful characterization of EV secretion is therefore important for understanding their functions in specific contexts. Here, we assess neuronal EV secretion, using mouse primary cortical and hippocampal neurons and at two developmental stages. Our proteomics data further shows the presence of widely reported EV proteins such as CD81, Alix and TSG101, and the absence of the commonly used EV marker CD63. Moreover, neuron-derived EVs were significantly enriched in neuronal-enriched proteins, including specific synaptic proteins. Overall, this data provides an initial framework for the isolation of EVs from primary neurons that could be beneficial for specific studies of neuron-derived EVs.

EVs in Wnt signaling

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Allegra Angenendt, Katharina Maria Richter, Kerstin Menck

Extracellular vesicles and Wnt signaling: New implications for cancer research

Extracellular vesicles (EVs) have emerged as important players in intercellular communication, capable of transferring signaling molecules between cells and altering their behavior and function. More and more studies reveal an association of factors of the Wnt pathway with EVs. A tight and coordinated regulation of Wnt signaling is essential for maintaining tissue homeostasis, and dysregulation has been associated with several diseases, including cancer. The influence of Wnt signaling on EV biogenesis has revealed a new mechanism by which Wnt proteins can regulate the creation of a favorable tumor microenvironment promoting the growth and survival of cancer cells. This review summarizes our current understanding of the connections between EVs and Wnt signaling and discusses their relevance in human cancer.

Minireview

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Kirsten A. Wunderlich

Shining light on extracellular vesicles

The present review presents the current knowledge on extracellular vesicle biology in the retina, a highly structured part of the central nervous system that is at the same time easily accessible. Numbers of publications in the field are rapidly rising, but most studies focus on extracellular vesicles as biomarkers for retinal diseases or as putative therapeutic targets. However, rather little has been done so far to elucidate the physiological functions of EVs in the retina. Even though it is clear that all the characteristic functions of EVs such as cell-cell communication, waste removal, extracellular matrix turnover, immune modulation etc. are of extreme importance in retinal tissue with its enormous metabolic turn-over and the need to orchestrate broad adaptation to different conditions such as light and dark with as little disturbance of the light path as possible.

Secretion of EVs

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Henrike Tietz and Julia Christina Gross

Kinesin-mediated transport in the secretion of extracellular vesicles

The secretion of small extracellular vesicles (EVs) plays a crucial role in intercellular communication and cellular homeostasis. However, there are still many unanswered questions regarding the transport processes within the endosomal system that lead to the generation and secretion of small EVs. This review will specifically address the transport of endocytic vesicles throughout the cell and the involvement of motor proteins, particularly kinesins, in the transport of endosomal compartments destined for the secretion of EVs.