

# **COLLOQUIA IN PHYSIOLOGY AND VASCULAR BIOLOGY**

Venue: Medical University Vienna, Center for Physiology and Pharmacology,  
Institute of Physiology, SchwarzschanierstraÙe 17, 1090 Vienna,

"Big Lecture Hall Physiology"

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Friday 18.03.2016 15:00 s.t. **Rienk Nieuwland** (host: J. Schmid)

Academic Medical Center (AMC)  
Laboratory for Experimental Clinical Chemistry  
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## ***"The past, presence and future of extracellular vesicles"***

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**Rienk Nieuwland (email: [r.nieuwland@amc.uva.nl](mailto:r.nieuwland@amc.uva.nl))**

Abstract:

Extracellular vesicles such as microparticles and exosomes are common and widely distributed, and are now thought to have a multitude of functions in health and disease. Evidence is accumulating that vesicles in human body fluids are involved in protection, intercellular communication, and disease development and progression. Furthermore, vesicles potentially behold an entirely new level of clinical relevant information for diagnosis and monitoring of therapy.

We have an interest in tissue factor (TF), and have shown that body fluids such as saliva of healthy subjects contain vesicles exposing coagulant TF. Because such vesicles are absent in the blood, we hypothesize that "licking a wound" facilitates blood clotting and wound healing. In patients suffering from meningococcal septic shock or cancer, however, coagulant TF-exposing vesicles can be present within the peripheral blood, and such "blood-borne" vesicles are thought to contribute to development of bleeding and thrombosis.

Furthermore, we have worked on improved isolation and detection of (single) vesicles. With regard to isolation, rediscovery of size exclusion chromatography has increased the general awareness that a decent isolation procedure is essential to reduce the risk of artefacts. Similarly, detection of single vesicles is often more difficult than anticipated. Because detection of both rare (biomarker) and common (reference ranges) vesicles requires comparison of results between instruments and institutes, we have compared, tested and selected reference materials, are developing novel reference materials and software, and have initiated an international standardization study to compare vesicle measurements between instruments and institutes.

Taken together, a whole new research field is now evolving rapidly, and an introduction to and overview of vesicles will be provided, with emphasis on our research.

