

Novel tool for monitoring nitrite and/or nitric oxide continuously in real time for drug discovery applications

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Measurement of nitric oxide (NO) or a suitable index marker such as nitrite could potentially be useful in drug discovery for the treatment and diagnosis of various vascular diseases.

Because of the enormous potential of nitric oxide delivery for treatment of cardiovascular diseases, several new classes of drugs have been under investigation, although with the exception of inhaled NO, few have been approved for clinical use.

Nitrite has recently been found to generate nitric oxide under conditions of ischemia or hypoxia. Research into the biology of the nitrite anion may impact a wide range of vascular diseases, such as stroke, acute myocardial infarction, cardiac arrest, sepsis, or other diseases. As nitrite begins to be evaluated for its therapeutic impact on these diseases in clinical trials, it may be important to obtain frequent or continuous measurements of NO or nitrite levels in real time in order to optimize such therapies. In addition, if nitrite therapy becomes successful in these trials, it may become necessary to provide clinicians with tools to monitor the effect of such therapy in real time.

This presentation summarizes currently available methods for measuring nitric oxide and nitrite, along with the advantages and disadvantages of each, including a novel method for real-time, continuous measurement of plasma nitrite from blood. The specificity of such measurements can be optimized by evaluating the concentration, kinetics, and location of the signal, which will allow researchers and clinicians to understand the origins of the NO signal, or to perform differential diagnoses.

Biography

James H. Silver completed his Ph.D and postdoctoral studies at the University of Wisconsin-Madison in Chemical Engineering. He has worked in several small start-up companies in addition to spending 8 years at Johnson & Johnson. He is currently founder and President of Silver Medical, Inc., a company dedicated to the real-time monitoring of nitrite for research and clinical applications. He has published 17 papers in reputed journals and has 9 issued patents.