# SOLVO MRP5 VESICULAR TRANSPORT ASSAY

**Multidrug Resistance Protein 5 (MRP5, ABCC5)** is an ABC transporter ubiquitously expressed in human tissues. The protein is expressed in **smooth muscle cells** of the human genitourinary tract, in epithelial cells of ureter and urethra and in **blood vessels**.

In the **brain**, MRP5 is found in astrocytes and in pyramidal neurons. It routes to the apical membrane of brain capillary endothelial cells.

In the **placenta**, MRP5 is expressed in the basal membrane of syncytiotrophoblasts and in and around fetal vessels.

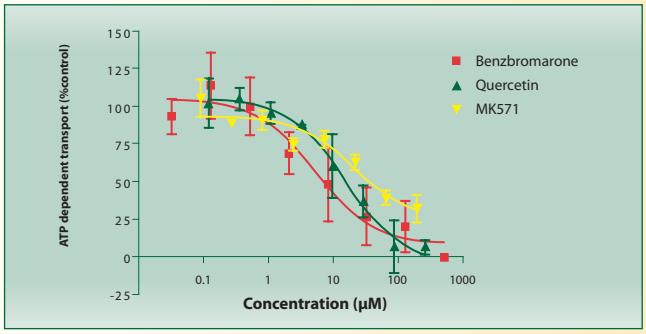
In the **heart**, MRP5 is expressed in cardiomyocytes, endothelial cells and smooth muscle cells.

The **endogenous substrates** of MRP5 are cyclic nucleoside monophosphates, such as **cAMP** and **cGMP**. Therefore, MRP5 may play a role in the regulation of signal transduction by transporting these second messengers out of the cells. As MRP5 is present in blood vessels, inhibition of cGMP transport can elongate the duration of vasodilatation, making MRP5 a target in conditions like **hypertonia, angina pectoris, congestive heart failure, acute pulmonary edema** and **erectile dysfunction.**

ABC transport proteins mediate transport of substrates against a concentration gradient, and the energy for this transport is derived from a vanadate-sensitive ATP-hydrolysis, which is coupled to substrate translocation. One of the simplest methods invented to detect the substrate translocation is the vesicular transport assay.

The standard Vesicular Transport assay is an indirect inhibitory-type assay, and is performed with cold test compounds. It provides information on any interaction between the ABC transporter and the test drug that would affect the transport of the reporter substrate (radioactive compound). In this assay the transport of a known substrate - the reporter substrate - is measured in the presence of the test drug. Values are presented on a relative scale with 100% defined as transport in the absence of the test compound (no inhibition), and 0% defined as transport measured in the absence of ATP (no transporter activity). $IC_{50}$ is defined as the concentration required to inhibit the transport of the reporter substrate by 50%.

SOLVO's protocol for measuring vesicular transport on **mammalian cell membranes** expressing MRP5 utilizes **$^3$H-cGMP** as substrate. These MRP5 expressing HEK293 cells were first described by the lab of Dr. Piet Borst (Wijnholds *et al.* PNAS 2000;**97**:7478-7481.)




ATP dependent MRP5 mediated transport of $^3$H-cGMP at different concentrations of various test compounds.

MRP5 Vesicular Transport Assay is either available as a product (SB-MRP5-HEK293-VT membrane preparation) for in house screening or as a Fee-For-Service-Screening performed in the SOLVO Screening Laboratory.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