

Novel coating of catheter-based cardiac devices

Stent implantation and balloon angioplasty constitute the most commonly used interventional coronary procedures in cardiovascular medicine. A central problem is the consecutive re-narrowing of the previously opened vessel area due to excessive formation of scar tissue. A narrowing of more than 50% of the vessel diameter is called restenosis, which occurs in 15-20% of patients using contemporary balloon and stent technologies.

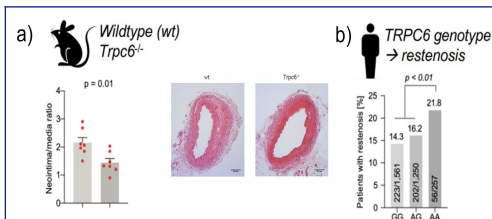


Preventing in-stent-restenosis by inhibiting TRPC6

Coating catheter-based cardiovascular devices with TRPC6 inhibitors is a promising strategy to prevent restenosis by blocking proliferation and migration of vascular smooth muscle cells.

REFERENCES:

- Wierer et al., 2021, European Heart Journal



a) $Trpc6^{-/-}$ mice present reduced formation of scar tissue compared to wild-type mice after wire injury in femoral arteries b) Homozygous carriers of a common genetic variant associated with elevated TRPC6 expression are at increased risk of restenosis after coronary stenting.

IP RIGHTS

Nationalization phase in EP and US

2022

CHALLENGE

Compounds such as the chemotherapy drug paclitaxel or the immunosuppressant rapamycin are used to coat stents and balloons. They all have an anti-proliferative effect on the vascular cells, e.g. vascular smooth muscle cells, but a non-specific inhibitory effects on proliferation on surrounding cells including endothelial cells. In addition, migration is also a pathophysiological process that is inadequately represented by coatings in use but a prerequisite for scar tissue formation.

INNOVATION

To detect key drivers of vascular remodelling and to develop new strategies for prevention and therapy of restenosis, high-accuracy proteomic measurement of single femoral arteries in mice after wire-induced injury was used to identify the classical transient receptor potential channel 6 (TRPC6) as a protein driving restenosis formation. Expression of TRPC6 is only increased in vessels in early acute phases of vascular injury. Local application of TRPC6 inhibitors on coronary devices therefore facilitates a specific therapeutic application on injured vascular tissue and prevents formation of scar tissue.

01 Basic principles observed 02 Technology concept formulated 03 Experimental proof of concept 04 Technology validated in lab 05 Technology validated in relevant environment 06 Technology demonstrated in relevant environment 07 System prototype demonstrated in operational environment 08 System complete and qualified

TRL 08

TRL 07

TRL 06

TRL 05

TRL 04

TRL 03

TRL 02

TRL 01

Technology Readiness Level (TRL)



BayPAT

Innovation from Research & Science – BayPAT markets inventions on behalf of the Bavarian universities and universities of applied sciences.

An invention of Klinikum rechts der Isar der TU München



Klinikum rechts der Isar
Technische Universität München

As one of the largest technology transfer offices in Germany, BayPAT evaluates and commercializes innovations from 28 research institutions. With our extensive experience and expertise in patenting and licensing technologies and our comprehensive range of services, we are your partner of choice. For more information visit www.baypat.de

Bayerische Patentallianz GmbH
Dr. Nicola Hoesch
nhoesch@baypat.de
+49 (0)89 5480177-29
Prinzregentenstr. 52
80538 München

