

Press Release

MaRVis Technologies GmbH achieves proof-of-concept for novel medical devices in magnetic resonance imaging – guided treatments

June 24th, 2010 – MaRVis Technologies GmbH, Aachen (Germany) has achieved proof-of-concept for its novel platform technology for medical devices (guidewires, catheters, etc.) to be used in magnetic resonance imaging (MRI) – guided treatments. So far adequate devices have not yet been available. MaRVis has created first-in-class technology and product prototypes for application in radiology, neuroradiology, cardiology and interventional tumor therapy.

MaRVis Technologies GmbH, a venture capital backed German medical technology company, has achieved proof-of-concept for its novel platform technology for medical devices (e.g. guidewires and catheters) to be used in magnetic resonance imaging (MRI) – guided treatments. Today MRI is extensively applied for diagnostic purposes to deliver high resolution images of soft tissue in the human body, e.g. of the brain, organs, blood vessels or tumors. MRI avoids X-ray burden and use of contrast agents and is superior to X-ray imaging for radiological interventions in respect of details of soft tissue images and additional physiological information which can be obtained in MRI.

Application of MRI to interventional treatments has been limited so far to the use of short cannulae and needles as other currently available commercial medical devices are not compatible with MRI. Guidewires contain long metal wires which lead to electric conductivity and heating in MRI so that the patient and the physician are endangered. Similarly, catheters usually contain a metal braid. Removal of the metal wires or braids from the devices leads to mechanically highly insufficient instruments. Recent attempts to solve this material problem have not yet delivered useful tools, neither in terms of mechanical characteristics nor of MRI visualization.

The new MaRVis technology offers first-in-class flexibility and a powerful platform for the design of a large number of individual medical devices. MaRVis guidewires and catheters are built from glass fiber – epoxy resin basic building blocks («MaRVis rods») of which several are arranged in a multi-composite design by embedding in an envelope polymer or in the catheter wall, resp. The epoxy resin contains metal particles as MRI and/or X-ray markers. During development, the focus has been laid on integration of good material characteristics on the one hand and adaptable MRI visualization on the other hand.

A series of guidewire prototypes has been successfully tested for mechanical and imaging characteristics. The mechanical properties of a commercial gold-standard guidewire have been met by the MaRVis guidewire. The MRI-guidewires are strong insulators, thus ruling out electrical conductivity and induced heating risks. MRI signal strength and width can be flexibly adjusted and varied.

Visualization has been extensively tested in MRI and X-ray in steady-state and flow phantoms and animal trials. Final in vivo proof-of-concept for interventional procedures has been achieved by demonstrating catheterization of the renal artery in a pig under MRI visualization. Handling of the guidewire prototypes has been rated by radiologists to be comparable to that of the reference guidewire. Time periods required to perform the various interventions in angiography were almost identical for the commercial benchmark guidewire and the novel MarVis guidewire prototype.

Dr. Klaus Duering, CEO of MarVis Technologies GmbH, commented: „We are proud to have achieved the strategic goal of proof-of-concept for our novel integrated platform with a series of MRI-guidewire prototypes within only two years of process and product development from the scratch. The results demonstrate the strong power of this platform technology. Discussions with expert physicians have confirmed the strong interest of the medical community in our new products – enabling MRI-guided interventional treatments physicians are looking for to realize for a long time already.“ The company also develops a catheter prototype and carries out further technology improvements and extensions. Basic manufacturing processes have been developed which allow rapid transfer to industrial scale and final product design and testing. Dr. Duering explains: „We are convinced that within about three years the first product could reach the market. Our strategy is partnering with a global medical device company for a straightforward move to integrated system development, clinical testing and final product approval.“ MarVis has created a key prerequisite for routine realization of MRI-guided interventions in radiology, neuroradiology, cardiology and interventional tumor treatment.

About MarVis Technologies GmbH

MarVis Technologies GmbH is a medical device company owning a proprietary platform technology which allows visualization of medical devices in interventional treatments guided by magnetic resonance imaging (MRI). Proof-of-concept has validated its commercial applicability. A strategic cooperation with the established medical devices industry shall lead to commercialization of the platform technology and a broad range of proprietary medical devices.

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