Image Guided Interventions: What an Interventionalist Wants

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R01EB012031, R01CA194533, R41CA183327, R21EB020283

What does an interventionalist want?

- To know the past, the present, and the future of a disease state in a specific patient
- To navigate through the body atraumatically and autonomously
- To provide treatments to target organs and tissues without off-target side effects

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 - Physio-anatomic Atlases, Deep Learning, Radiogenomics, Multimodality Imaging, Portable Imaging
- To navigate through the body atraumatically and autonomously
 - Robotics, Device Engineering, Materials Science, Omnicompatible Devices for Multimodality Interventions
- To provide treatments to target organs and tissues without off-target side effects
 - Physico-chemical Actuation, HIFU, Chemofiltration, Theranostics









New ZSFG XMR Suite – Opens 2018





ZSFG XMR: Biplane Angio & 3T MRI











Fiorella et al, JNIS 2014

Bringing MRI to the Interventional Suite: Need Devices Compatible with X-Ray and MRI





Emergency Stroke Treatment Now							
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Symptom	911	In-field	Transport	MD	Imaging	Treatment	
Recognition	Call	Triage	to ED	Evaluation	Studies	Plan	
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Selective Ophthalmic Artery IA Chemotherapy







PET-MR Zr⁸⁹ Iron Oxide Nanoparticles











Catheter Navigation at 1.5T



Navigation into left renal artery



Lillaney et al, Radiology 2016

Navigation into left renal artery











Imaging and Drug Delivery Using **Theranostic Nanoparticles**



Janib et al. Adv Drug Delivery Reviews, 2010







MR Guided HIFU BBBD: Spatial Accuracy

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