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Image-Guided Hydrodynamic Gene Delivery

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Gene delivery by rapid injection of a large volume of DNA solution into a blood vessel, commonly called hydrodynamic gene delivery, has become a common method for gene therapy studies in rodents. In this presentation, I will focus on our recent work aiming at establishment of an image-guided hydrodynamic procedure for gene delivery in humans. Our study employed swine as an animal model and the procedure developed includes image-guided insertion of a balloon catheter into the selected blood vessel of the targeted organ from the jugular vein and hydrodynamic injection of plasmid DNA in saline. The talk will cover the rationale of our approach, the effectiveness of procedure for gene delivery to liver and muscle, and the impact of the procedure on physiological functions and serum chemistry of the animals. The results will be discussed with respect to potential applications of the hydrodynamic gene delivery to human gene therapy.