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Tracer-incorporated X-ray imaging of biofluid flow phenomena SUNG YONG JUNG, SUNGSOOK AHN, SANG JOON LEE, POSTECH, POSTECH TEAM — Particle-traced X-ray imaging technologies have been developed by combining the merits of the X-ray radiography and particle image velocimetry (PIV) technique. The developed X-ray imaging technology has strong potential in the noninvasive analysis of various flows such as non-transparent fluid flows or fluids flowing in opaque conduits. In this study, tracer-incorporated X-ray imaging technology was developed. In addition, new- concepted tracer particles were designed for in vitro and in vivo X-ray imaging analysis of various biofluids. As tracer particles in X-ray image, X-ray contrast enhancer Iopamidol was encapsulated into bio-compatible polymeric chitosan microparticles and gold nanoparticles with high X-ray absorption efficiency were directly incorporated into cells. The Iopamidol-incorporated polymeric microparticles were successfully applied for in vivo blood flow measurement in a rat. The gold nanoparticles were selectively incorporated into cancer cells, by which cancer cells can be detected in situ. The developed X-ray imaging technology would have a great potential in biomedical applications such as in situ analysis of blood flow and cancer detection.

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