Radiation therapy remains a cornerstone of modern cancer management, but is often limited by long-term adverse effects such as radiation-induced fibrosis (RIF). Presently, no effective therapy for RIF is available. This thesis reports a novel approach to prevent RIF by intraperitoneal administration of chitosan/DsiRNA nanoparticles targeting TNF α knockdown in murine peritoneal macrophages.

**Front cover illustration.** In vivo detection of chitosan/Cy5 labeled siRNA nanoparticles in mice.