

## 세미나 초록

성명	이도현
소속	오송첨단의료산업진흥재단 비임상지원센터
발표 주제	Biomedical Research using Advanced Animal Models
발표 내용	<p>Recent advances in biomedical research have highlighted the limitations of classical animal models, which primarily reproduce disease symptoms without fully reflecting the underlying mechanisms. In contrast, advanced animal models are designed to closely mimic human diseases by incorporating not only phenotypic manifestations but also etiological factors, disease progression, and therapeutic responses. These models enable a more comprehensive understanding of human pathophysiology and significantly improve the translational value of preclinical studies.</p> <p>Our institute outlines the development and application of advanced animal models, with a particular focus on non-human primates such as the common marmoset (<i>Callithrix jacchus</i>). Due to their genetic, physiological, and immunological similarities to humans, as well as their small size, rapid reproduction, and suitability for genetic manipulation, marmosets represent a highly efficient platform for modeling complex human diseases. Advanced approaches including genetically engineered models (e.g., CRISPR-Cas9), humanized models, behavioral models (e.g., self-administration addiction models), and multifactorial models integrating gene-environment interactions are discussed.</p> <p>The utility of advanced animal models is presented in diverse research domains, including neuroscience (e.g., Parkin's Disease), infectious diseases (e.g., monkeypox), pharmacogenomics, and monoclonal antibody pharmacokinetics/pharmacodynamics (PK/PD). Cutting-edge imaging modalities such as MRI, PET-CT, and functional connectivity analyses provide critical insights into disease mechanisms and treatment responses. Additionally, advances in reproductive technologies (e.g., IVF, embryo transfer, and laparoscopic ovum pick-up) and genome analysis methods, including machine learning-based correction of chimerism, have further enhanced the feasibility and precision of transgenic marmoset models.</p> <p>Finally, the integration of these advanced animal models within specialized infrastructures, such as the ABL-3 facility at KBIOHEALTH®, supports high-level biosafety research and accelerates the development of vaccines, therapeutics, and medical devices. Overall, advanced animal models, particularly those based on non-human primates, represent a powerful and indispensable tool for bridging the gap between basic research and clinical application.</p>