UTokyo Amgen Scholars Program 2027

Host Laboratory and Research Topic

Name of Faculty Member	Horacio CABRAL, Professor
Name of Graduate School / Institute	Graduate School of Engineering
Research Topic & Description	Development of Polymeric Nanocarriers for Targeted Gene Editing Applications We aim to develop polymeric nanocarriers for targeted delivery of gene-editing tools. The primary goal is to design nanocarriers capable of encapsulating and delivering CRISPR/Cas9 components to target cells, facilitating precise gene editing. The project will explore the synthesis, functionalization, and characterization of polymeric nanocarriers, focusing on PEG-based systems. The student will gain hands-on experience in nanoparticle formulation, functionalization with targeting ligands, and optimization for high gene-editing tool encapsulation efficiency and controlled release. The research will also involve testing the developed nanocarriers in vitro, using relevant cell lines to assess their gene-editing efficiency. These experiments will include cellular uptake studies, followed by an evaluation of gene-editing outcomes using molecular biology techniques such as PCR and fluorescence assays. By the end of the project, the student will have contributed to the development of polymeric nanocarriers for gene editing applications, with potential implications for therapeutic development.
Academic Requirements & Expectations	**1) Field(s) of Study** Biomaterials **2) Knowledge/ Skill/ Proficiency** Basic proficiency in molecular biology, nanoparticle formulation, cell culture, and data analysis. Familiarity with gene-editing/mRNA delivery and experience with laboratory techniques like PCR, DLS, and fluorescence microscopy. **3) Academic Background and Research Experience** A background in materials engineering, chemical engineering biotechnology, biomedical engineering, pharmacy, chemistry, or a related life sciences field. Prior experience in nanotechnology, drug delivery systems, molecular biology techniques, or gene editing projects will be advantageous.
Website & Relevant Information	Home Page: https://bmc.t.u-tokyo.ac.jp X: https://x.com/Cabral_Lab
Campus / Location	Hongo/ Yayoi
Area of Research	Bioengineering Molecular, Cell and Developmental Biology Biotechnology