

Division of Frontier Engineering	Research field	Biomechanical Engineering	Lab. ID FE08
Laboratory web site	https://biomech.w3.kanazawa-u.ac.jp/index-en.html		
Research subjects			
<p>The human ear, along with the human eye, is an important sensory organ working as an interface between humans and information in the outside world. Interestingly, the auditory system shows highly mechanical behavior from the earhole to the inner ear, such as the vibration of the tympanic membrane, the motion of the ossicles in the middle ear, the active stretching motion of the outer hair cells in the cochlea and the conformational changes of the motor protein "prestin." Research interests of the laboratory encompass many aspects of "hearing." To elucidate the mechanics of hearing and to contribute to the clinical treatment of hearing disorders, our efforts are focused on the development of computer simulation models, biomicromachines and diagnostic devices, as well as on molecular-level analyses by atomic force microscopy (AFM), molecular biology, bioengineering and genetic engineering.</p>			
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
<p>In the laboratory, research meeting is regularly held and we discuss the progress of each theme and try to solve problems found in the research. Through this meeting, students can enhance their skills to summarize and present their own research and can learn what the scientific discussion is. A journal club, in which a new scientific paper is introduced by a lab member, is also regularly held to understand the current trends in the field of research. Research is basically assigned to each individual student; however, students engaged in related research, consulting with each other as they advance their research.</p>			
Daily life in the laboratory, etc.			
<p>Since many research themes in the laboratory is related with medicine, we are conducting collaborative research with audiologists and doctors in otolaryngology and neurosurgery. There are, therefore, opportunities to attend medical conferences and to discuss with medical doctors and paramedical personnel. One of the characteristics in our laboratory is that students can have experiences in different types of research with various methods in one laboratory. Furthermore, the laboratory encourages students to go aboard, i.e., students have chances to attend not only domestic conferences but also international conferences and/or internships.</p>			
Message or comments by the laboratory faculty staffs			
<p>In our laboratory, we mainly focus on research related to the "mechanics of hearing", based on disciplines such as dynamics, acoustic engineering and biomedical engineering. Performing hearing tests on adults is straight forward because you can ask if they can hear a sound or not. However this is not the case with infants. If they have some trouble hearing, how can we find out what the problem is? The research interests of our laboratory encompass both basic research into hearing mechanics and the application of our findings in the development of hearing diagnostic devices and biomicromachine such as the development of a diagnostic system for newborn hearing screening, the numerical analysis of the hearing organ at the nanoscale level, the structural analysis of molecular motor expressed in the plasma membrane by atomic force microscopy and the development of an implantable drug delivery system for the treatment of hereditary hearing loss.</p>			
Laboratory mail address	Michio Murakoshi <murakoshi *at* staff.kanazawa-u.ac.jp>		