UNIVERSIDAD DE CHILE

TOKYO MEDICAL AND DENTAL UNIVERSITY TMDU

UCh-TMDU
Joint Symposium

Tuesday, November 8, 2022 | 6:30-9:30

(Chile time: Monday, November 7, 2022 | 18:30-21:30)

PROGRAM & ABSTRACT BOOK

Hosted by Tokyo Medical and Dental University Institute of Global Affairs (jd@ml.tmd.ac.jp)

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Abstract

Title: Surgical oncology to elucidate molecular and immunological mechanisms for clinical application in hepato-biliary-pancreatic cancer

Shinji Tanaka, MD, PhD, FACS

Professor
Department of Molecular Oncology

Tokyo Medical and Dental University

Biodata

1988 Cum laude (MD), Faculty of Medicine, Kyushu University
1988-1990 Resident, Department of Surgery II, Kyushu University Hospital, Hiroshima Red Cross Hospital
1990-1993 Doctor Course (PhD), Graduate School of Medicine, Kyushu University
1993-1994 Assistant Professor of Virology, Kyushu University
1994-1996 Research Fellow (FACS), Massachusetts General Hospital and Harvard Medical School
1996-1999 Assistant Professor of Surgery, Medical Institute of Bioregulation, Kyushu University
1999-2004 Assistant Professor of Surgery, Graduate School of Medical Sciences, Kyushu University
2004-2005 Surgical Staff, Department of Gastroenterological Surgery, National Kyushu Cancer Center
2005-2006 Assistant Professor, Hepato-Biliary-Pancreatic Surgery, Tokyo Medical and Dental University
2006-2014 Associate Professor, Hepato-Biliary-Pancreatic Surgery, Tokyo Medical and Dental University
2014-date Professor, Molecular Oncology, Graduate School, Tokyo Medical and Dental University
2019-date Senior Program Officer, RCSS (concurrently), Japan Society for the Promotion of Science

Abstract

Diversity is one of the hallmarks of malignancies. Current technological innovations such as next-generation sequencing and bioinformatic methodology have been developed to reveal the diversity, and the remarkable progression of cancer genome analysis is highly expected to be applied to precision medicine. In Japan, the cancer gene panel test (2019) and liquid biopsy (2021) were covered by insurance, and we are now entering a paradigm shift with the dawn of the era of genomic medicine. Hepato-biliary-pancreatic cancer has diverse backgrounds such as metabolic and immunological abnormalities, and various data analyses such as genomics, epigenomics, transcriptomics, metabolomics and proteomics using clinical specimens and integrated analysis of detailed clinicopathological information have been promoted. The closed association between genomic/epigenomic aberrations and immune abnormalities should be noted to identify novel biomarkers for treatment of hepato-biliary-pancreatic cancer. At the same time as these developments in genome analysis technology, remarkable innovations in genome editing technology including CRISPR/Cas9 system are accelerating, and the race to develop the gene editing application is heating up. The integration of comprehensive genome editing and barcode sequencing technologies has led to the development of in vivo screening methods, and multiple genome editing methods that simultaneously introduce multiple genomic aberrations have made it possible to reproduce the pathology of each case individually. In this lecture, we would like to introduce the latest biomarker research and have a lively discussion on what it can bring to the treatment of hepato-biliary-pancreatic cancer.

Title: Identifying molecular biomarkers for target therapy resistance in breast and gallbladder cancer

(Name) Katherine Marcelain, D. V. M., Ph.D.

(Position) Associate Professor
(Department) Department of Basic and Clinical Oncology

(University) Faculty of Medicine, University of Chile

Biodata & Abstract

Academic biography summary
Doctor in Veterinary Medicine (D.V.M.), Universidad de Chile (1998); Ph.D. in Biomedical Sciences, Faculty of Medicine, Universidad de Chile) (2003). Postdoctoral Fellow at SUNY (Stony Brook, New York, USA) (2003-2006).

Associate Professor and Deputy Director of the Department of Basic and Clinical Oncology, at the Faculty of Medicine, Universidad de Chile (current).

Research and academic interests
Dr. Marcelain leads the Laboratory of Cancer Genomics, where two main lines of research are carried out: 1) DNA damage and maintenance of genomic integrity, and 2) Precision medicine in oncology. Author of 50 scientific publications, and more than 90 meeting presentations. She has directed dozens Undergraduate, Master and PhD Thesis. Currently, she is part of large Multidisciplinary Projects: one National ("Landscape of clinically actionable cancer genes: towards precision oncology in Chile ", a joint effort with biomedical researchers, clinical oncologists, pathologists, surgeons, and biomedical law and ethical specialists); and two multinational projects from the Cancer Research Network of the United States and Latin America (US-LACRN); and from the Horizon 2020 Program, of the European Economic Community. She has also experience in leading translational and R&D projects, with public and industry financing, and technology transfer to Public institutions (Ministry of Health, Instituto de Salud Pública). She actively participates in outreach activities, as well as in specialists working groups as requested by the Ministry of Health of Chile and the National Health Fund.

Her current interest lies in the search and validation of molecular changes involved with genomic instability and resistance to targeted therapies. Specific lines of research focus on: 1) the study of epigenetic factors in the generation of genomic instability and tumor evolution, using cell line models and genomic databases in breast cancer; 2) Identification of biomarker mutations of response to targeted therapies in samples from patients with incidental gallbladder cancer; 3) Molecular classification of patients with stage IV colorectal cancer; 4) Identification of mutations and other molecular changes related to the response to targeted therapies in tumors and liquid biopsy of patients with advanced breast cancer.

Title: Intestinal mucosal immunity imbalance in Inflammatory Bowel Disease

(Name) Marcela Hermoso, Ph.D.

(Position) Professor
(Department) Institute of Biomedical Sciences

(University) Faculty of Medicine, University of Chile

Biodata & Abstract

Academic biography summary
B.S., Biochemistry, Universidad de Buenos Aires, Argentina (1989); PhD, Biological Sciences, Physiology, P. Universidad Católica de Chile, Chile (1997); Postdoctoral Fellow, Cell Physiology, University of Nevada, Reno, U.S.A, (1999-2000); Postdoctoral Fellow, Innate Immunity, cell signaling; National Institutes of Environmental Health Sciences, N.I.H., U.S.A. (2004).

Assistant Professor, Institute of Biomedical Sciences, Faculty of Medicine, Universidad de Chile, Santiago, Chile (2000-2007);
Associate Professor, Institute of Biomedical Sciences, Faculty of Medicine, Universidad de Chile, Santiago, Chile. (2007-2017)
Full Professor (Immunology), Institute of Biomedical Sciences, Faculty of Medicine, Universidad de Chile, Santiago, Chile (2017-present); Professor, Department of Gastroenterology and Hepatology, University Medical Center Groningen (UMCG), Groningen, The Netherlands (2022-present).

Research and academic interests
Dr. Hermoso has extensive experience in the study of innate immunity and mucosal immunology, such as pathogen recognition receptor detection, signaling and inflammatory mediators. Her current research focuses on both Inflammatory Bowel Disease (IBD) and colorectal cancer. Her research has been funded by institutional grants UMCG and UChile, FONDECYT (National fund from Science and Technology), FONDEF (Fund for the Promotion of Scientific and Technological Development) and International Cooperation Programs from ANID (National Research and Development Agency of Chile), and Cancer Foundation of Thailand. She closely collaborates with gastroenterologists and colorectal surgeons, as well as medical microbiologists inside and outside the Institution, to perform translational research for the benefit of IBD patients. Her major interest includes the elucidation of mechanisms involved in IBD pathogenesis and characterizing regulatory networks controlling innate immune and inflammatory mediators expression as biomarkers. She is also interested in characterizing factors involved in the intestinal microenvironment contribution to epithelial healing, local corticoids production and intestinal homeostasis.

Title: *Porphyromonas gingivalis* impairs glucose uptake in skeletal muscle associated with altering gut microbiota

(Name) Sayaka Katagiri

(Position) Associate Professor
(Department) Periodontology

(University) Tokyo Medical and Dental University

Biodata

1997-2003: D.D.S.,
Faculty of Dentistry, Tokyo Medical and Dental University (TMDU), Tokyo, Japan
2004-2008: Ph.D.
Department of Periodontology, Faculty of Dentistry, TMDU, Tokyo, Japan
2008-2011: Clinical Staff in Department of Periodontology, Tokyo Medical and Dental University Hospital
2011-2012: Assisstant Professor in Department of Periodontology, TMDU
2012-2014: Postdoctral research fellow in Vascular Cell Biology, Joslin Diabetes Center, Harvard Medical School
2014-2020: Assisstant Professor in Department of Periodontology, TMDU
2020-2021: Junior Assisstant Professor in Department of Periodontology, TMDU
2021- : Associate Professor in Department of Periodontology, TMDU

Abstract

I. Object: Skeletal muscles have a high metabolic capacity, which play key roles in glucose metabolism. The purpose of this study was to clarify the relationship between periodontal bacterial infection and skeletal muscle metabolic dysfunction.

II. Materials & Methods: The relationship between periodontal disease and metabolic syndrome was evaluated by measuring IgG antibody titers to periodontopathic bacteria in metabolic syndrome patients. C57BL/6J mice (8 weeks old) were fed High-fat diet 32. We orally administered 10^8 CFU sonicated *Porphyromonas gingivalis* (Pg) in 100 μL of saline (HFPg) or saline only (HFco). The suspension was given twice per week for 6 weeks.

III. Results: We found that anti-Pg antibody titers positively correlated with intramuscular adipose tissue content (IMAC), fasting blood glucose, and HOMA-IR in metabolic syndrome patients. HFPg mice had impaired glucose tolerance, insulin resistance, and higher IMAC compared to HFco mice. The soleus muscle in HFPg mice exhibited fat infiltration and lower glucose uptake with higher Tnfa expression and lower insulin signaling than in HFco mice. Gene set enrichment analysis showed that TNFα signaling via NFκB gene set was enriched in the soleus muscle of HFPg mice. Moreover, TNF-α also decreased glucose uptake in C2C12 myoblast cells in vitro. Based on 16S rRNA sequencing, Pg administration altered the gut microbiome, particularly by decreasing the abundance of genus *Turicibacter*. Microbial network of the gut microbiome was dramatically changed by Pg administration.

IV. Conclusion: Our findings suggest that infection with Pg is a risk factor for metabolic syndrome and skeletal muscle metabolic dysfunction via gut microbiome alteration.

Title: Lung injury during ventilatory support

(Name) Rodrigo Cornejo, M.D.

(Position) Professor
(Department) Department of Internal Medicine, Intensive Care Section

(University) Faculty of Medicine, University of Chile

Biodata & Abstract

Academic biography summary.
M.D., School of Medicine, Universidad de Chile (1998); Specialist in Internal Medicine, Universidad de Chile (2002), Specialist in Intensive Care Medicine, Universidad Católica de Chile (2005), M.B.A. (Master and Business Administration, Faculty of Economics and Business, Universidad de Chile) (2015).

Research and academic interests.
Dr. Cornejo es Full Professor of Medicine; he is full-time clinical scholar at the Universidad de Chile and national and international reference in the field of Intensive Care Medicine with demonstrable track record as an academic leader and head of teaching management undergraduate in the School of Medicine and in the training of Specialists in Internal Medicine and Specialists in Intensive Care Medicine for Adults.

He is an active clinical researcher, responsible for current competitive projects, member of evaluation panels of projects of the national system and articulator of teams of clinical research. Currently Dr Cornejo conducts projects focused on P-SILI (patient self-inflicted lung injury) and two multicenter studies about the treatment of severe ARDS (acute respiratory distress syndrome) related to prone positioning and ECMO (extracorporeal membrane oxygenation).

He has extensive professional experience as Head of the Critical Care Unit of the Hospital Clínico Universidad de Chile, the most complex unit in the country in its scope (dates, 2008 – 2010 and 2015 – 2022), and also served Medical Director of the University Hospital (2010 – 2014).

Title: The challenges and future in critical care research in the pandemic era

(Name) Kenji Wakabayashi

(Position) Professor
(Department) Intensive Care Medicine

(University) Tokyo Medical and Dental University

Biodata

Professor Kenji Wakabayashi is a Professor and Head of the Department of Intensive Care Medicine (ICM) at TMDU. Professor Wakabayashi was originally trained as a pediatrician in Japan before moving to Imperial College London where he fulfilled PhD. He re-joined TMDU in 2013 for developing a global leadership program at TMDU and then has been working at the Department of ICM since 2015.

Supported by the Japan Society for the Promotion of Science, Japan Agency for Medical Research and Development, Great Britain Sasakawa Foundation and other industry grants, Professor Wakabayashi has established a unique translational research laboratory in the field of critical care medicine at TMDU and his group investigates the roles and mechanisms of extracellular veisicles in critical illness such as acute respiaroty failure and acute liver failure.

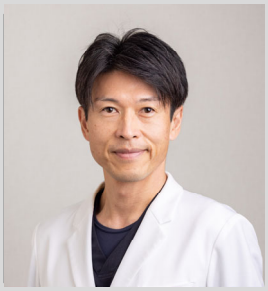
Since the beginning of the COVID-19 pandemic, he devoted himself to reform the TMDU Hospital for treating both COVID and non-COVID patients. The TMDU Hospital has treated the biggest number of severe COVID-19 patients in Tokyo.

Abstract

More than 6.5 million deaths are attributed to COVID-19 and the pandemic still negatively influences our society including healthcare system since its initial report in the yearend of 2019. The main pathophysiology of severe COVID-19 has been known as acute respiratory distress syndrome (ARDS), which is clinically characterized by acute hypoxemia due to pulmonary edema. Although the disease concept of ARDS was originally proposed in 1967, specific pharmacological therapy has not yet been well established.

COVID-19 has brought innumerable challenges to us. In the early stage, we had to set up the COVID ward and to prepare for the potential shortage of medical resources including mechanical ventilators. In the mid- and long-term, we realized the necessity for overhauling our research infrastructure to develop novel therapeutic strategies for COVID-19. In this presentation, I would like to discuss our experience and prospects of pandemic research at TMDU, from the viewpoint of a clinician scientist in critical care.

Title: Oral frailty and oral hypofunction



(Name) Koichiro Matsuo

(Position) Professor
(Department) Oral Health Sciences for Community Welfare

(University) Tokyo Medical and Dental University

Biodata

Dr. Matsuo earned both D.D.S. and Ph.D. degrees from Tokyo Medical and Dental University, Tokyo, Japan. He joined the Department of Physical Medicine and Rehabilitation, Johns Hopkins University as a post-doctoral research fellow and an assistant professor for 6 years (2005-08). He was back to Japan in 2008, and appointed to current position in 2021.

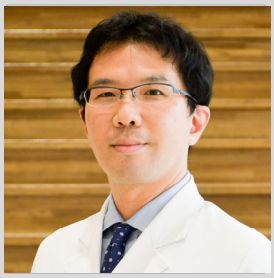
His clinical interests include geriatric dentistry for frail elderly individuals having physical disabilities, systemic diseases, and/or feeding difficulties. His recent research has focused on oral health and oral frailty in older individuals and fundamental understanding of physiology and pathophysiology of mastication and swallowing.

Abstract

Eating is one of essential human digestive function but also the joy of living left till the end of our life. Thus, supporting proper oral health and eating function would lead to longer healthy life for older individuals in super aged society. Recent studies widely report the association between oral health and nutritional status or systemic frailty. Since the mouth is the entrance of nutrition, deterioration of oral function may cause deviated nutrition or malnutrition and eventually lead to frailty or declined ADL.

Japanese Society of Gerodontology has proposed “oral hypofunction” which is defined as several deteriorated oral symptoms and signs (Minakuchi S et al., 2018). Oral hypofunction consists of deteriorated seven oral functions that can be measured quantitatively with specific devices. By quantitatively measuring sub-symptoms of oral function, deterioration of oral function can be found in early timings and be recovered by the early intervention. Recent large cohort studies have reported the association of oral frailty or oral hypofunction and physical frailty in older individuals. Our recent studies also show that comprehensive intervention program combined oral health and nutrition improve oral hypofunction in community dwelling older adults. However, further studies of the intervention on oral frailty or oral hypofunction will be warranted.

Title: Human intestinal organoids for regenerative medicine applications



(Name) Tomohiro Mizutani, M.D., Ph.D.

(Position) Junior Associate Professor
(Department) Department of Gastroenterology and Hepatology

(University) Tokyo Medical and Dental University (TMDU)

Biodata

EDUCATION
1999-2005 Tokyo Medical and Dental University School of Medicine M.D.
2009-2012 Tokyo Medical and Dental University Graduate School Ph.D.
POSITION
2005- Residency program, Asahi General Hospital
2007- Clinical Fellow Department of Gastroenterology, Asahi General Hospital
2008- Clinical Fellow Department of Gastroenterology, Tsuchiura Kyodo Hospital
2012- Postdoctoral Research Fellow, Tokyo Medical and Dental University
2015- Assistant professor, Tokyo Medical and Dental University
Department of Gastroenterology and Hepatology
2016- Postdoctoral Fellow, Hans Clevers Lab, Hubrecht Institute
2020- Assistant professor, Tokyo Medical and Dental University
Department of Gastroenterology and Hepatology
2022- Junior Associate Professor, Tokyo Medical and Dental University
Department of Gastroenterology and Hepatology

Abstract

Inflammatory bowel disease (IBD), such as ulcerative colitis and Crohn's disease, is a disease that is characterized by idiopathic mucosal inflammation along the gastrointestinal tract. The treatment of IBD has dramatically improved in the past decade, mainly due to the unprecedent clinical effect of biologic agents, such as anti-TNF-α antibodies. However, there are cases of refractory ulcers and of difficulty in treatment due to the persistence of inflammation that do not achieve long-term remission. In addition, in cases that require extensive small bowel resection, patients suffer from a decline in quality of life due to "Short bowel syndrome". For such patients who do not achieve mucosal healing with conventional therapy, we are attempting to develop regenerative medicine using “organoids”, an intestinal stem cell culture method.

First, we would like to present a regenerative medicine to promote mucosal healing through transplantation of IBD patient-derived intestinal epithelial organoids. Next, we also show an attempt to regenerate intestinal tissue from human iPS cell-derived intetinal organoids (HIOs) for future translational applications.

Title: Basic, clinical and translational research on immune mechanisms underlying gut-liver-brain axis in gastrointestinal and liver diseases

(Name) Caroll Beltrán, Ph.D.

(Position) Assistant Professor
(Department) Department of Internal Medicine, Gastroenterology Section

(University) Faculty of Medicine, University of Chile

Biodata & Abstract

Academic biography summary.
Pharmacist, Universidad de Concepción, Chile(1998); Ph.D., Biomedical Sciences (2010); Postdoctoral Fellow (Neurogastroenterology), University of Cork, APC Microbiome, Ireland (2011-2012)

Assistant Professor, Faculty of Medicine, Universidad de Chile.

Research and academic interests.
Dr. Beltrán research interests focus on the cellular and molecular mechanisms involved in disorders of the brain-gut axis, particularly in the irritable bowel syndrome. Her work in the Laboratory of Immunogastroenterology also includes the study of microbiomes and immune response in liver disease, specially non alcoholic fatty lever and hepatocarcinoma. She actively contributes to the teaching of undergraduate, graduate and medical residents, and she is mentoring several students of the JDP.

Title: Germline AIOLOS variants causing immunodeficiency

Motoi Yamashita

Adjunct Lecturer
Department of Pediatrics and Developmental Biology
Graduate School of Medical and Dental Sciences

Tokyo Medical and Dental University

Biodata

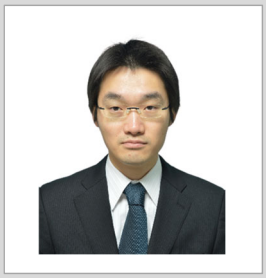
Education
2004 – 2010: Tokyo Medical and Dental University, School of Medicine (M.D.)
2014 – 2019: Tokyo Medical and Dental University, Graduate School of Medical and Dental Science (Ph.D.)

Work experience
2022 – present: RIKEN, Center for Integrative Medical Sciences
2018 – present: Tokyo Medical and Dental University, Department of Pediatrics and Developmental Biology
2013 – 2014: Tokyo Medical and Dental University Hospital, Pediatric residency program
2010 – 2012: Tokyo Medical and Dental University Hospital, Residency program

Abstract

AIOLOS is a transcription factor that plays roles in lymphocyte differentiation. AIOLOS belongs to Ikaros zinc finger (IKZF) family of proteins. Among five proteins in IKZF family, germline variants in IKAROS and HELIOS have been reported as the causes of human inborn errors of immunity (IEI). We identified and reported two heterozygous missense AIOLOS variants in the patients with immunodeficiencies affecting adaptive immunity, making the reports as the first descriptions of AIOLOS deficiency. Heterozygous AIOLOS^{G159R} variant was identified in a family of patients with B cell deficiency, susceptibility to Epstein-Barr virus infection and B cell lymphoma. Another heterozygous AIOLOS^{N160S} was identified in a family of patients with the susceptibility to *Pneumocystis jirovecii* pneumonia, marked hypogammaglobulinemia, and chronic lymphocytic leukemia. Both AIOLOS variants lost DNA-binding ability to its consensus binding sequence *in vitro*, suggesting these are loss-of-function variants. The mouse models harboring the patients' AIOLOS variant (Aiolos^{G158R} and Aiolos^{N159S} in mice) were generated. Both Aiolos^{G158R} and Aiolos^{N159S} knock-in mice recapitulated the immune abnormalities observed in the patients. In Aiolos^{G158R} mutant mice, genome-wide binding pattern of Ikaros as well as Aiolos were altered. Dysregulated genes in Aiolos^{G158R} mutant pre-B cells were predominantly genes regulated by Ikaros. Transcriptional activities of IKAROS was impaired in the presence of AIOLOS^{G159R} *in vitro*. These observations suggested AIOLOS^{G159R} exerts its pathogenicity by impairing function of IKAROS via formation of heterodimers. AIOLOS is therefore a novel disease-causing gene in human IEI.

Title: LRBA is essential for urinary concentration and body water homeostasis



Fumiaki Ando

Assistant Professor
Department of Nephrology

Tokyo Medical and Dental University

Biodata

After graduating from TMDU in 2008, he accumulated five years of clinical experience as a physician. He started his research career in 2013 and received a PhD in 2017. He is currently an Assistant Professor at the Department of Nephrology at TMDU. One of the goals of his research is to elucidate the molecular mechanisms of urinary concentration for the development of novel anti-aquaretic drugs.

Education:
2013-2017 Ph.D. Tokyo Medical and Dental University (TMDU), Tokyo, Japan
2002-2008 M.D. Tokyo Medical and Dental University (TMDU), Tokyo, Japan
Work History:
7/2012-present Department of Nephrology, Tokyo Medical and Dental University (TMDU), Tokyo, Japan
4/2010-6/2012 Department of Nephrology, Tokyo Metropolitan Tama Medical Center, Tokyo, Japan
4/2008-3/2010 Resident, Tsuchiura Kyodo General Hospital, Ibaraki, Japan

Abstract

Congenital nephrogenic diabetes insipidus (NDI) is characterized by an inability to concentrate urine in the kidney. A large urine output not only reduces the patients' quality of life, but also puts them to risk of life-threatening dehydration. Urine concentration and body water balance are tightly regulated by antidiuretic hormone, vasopressin. Vasopressin binds to vasopressin type2 receptor (V2R) in renal collecting ducts and increases cAMP production and protein kinase A (PKA) activity. PKA then enhances water reabsorption through phosphorylation of AQP2 water channels. Loss-of-function mutations in V2R lead to renal unresponsiveness to vasopressin and cause congenital NDI. So far, conventional approaches aiming at elevating cAMP levels independent of V2R as a treatment option of NDI have failed to yield new effective therapies.

A-kinase anchoring proteins (AKAPs) regulate intracellular distribution and substrate specificity of PKA. We focused on the inhibition of AKAPs binding to PKA and found that AKAPs-PKA disruptors activated PKA and AQP2 to the same extent as vasopressin. Dissociation of AKAPs-PKA interactions is a potential novel strategy to activate AQP2 independently of vasopressin.

To date, over 50 functionally distinct AKAP proteins have been identified. However, it has remained unknown which AKAP is involved in AQP2 phosphorylation. We used PKA activators as novel screening tools to uncover PKA substrates whose phosphorylation levels were nearly perfectly correlated with those of AQP2. The leading candidate in this assay proved to be an AKAP termed lipopolysaccharide-responsive and beige-like anchor protein (LRBA). We found that LRBA colocalized with AQP2 *in vivo*, and *Lrba* knockout mice displayed polyuric phenotype with severely impaired AQP2 phosphorylation. Furthermore, the LRBA–PKA interaction rather than other AKAP–PKA interactions was specifically dissociated by AKAPs–PKA disruptors. The LRBA–PKA interaction is a promising drug target for the development of anti-aquaretics.

Title: Mechanisms of renal damage and progression of cardiovascular disease

(Name) Luis Michea M.D.,Ph.D.

(Position) Associate Professor
(Department) Institute of Biomedical Sciences

(University) Faculty of Medicine, University of Chile

Biodata & Abstract

Academic biography summary.
M.D., School of Medicine, Universidad de Chile.
Santiago, Chile (1990); Ph.D. in Biomedical Sciences, Faculty of Medicine, Universidad de Chile (1995); Visiting Scientist, National Institutes of Health, NHLBI, Laboratory of Kidney and Electrolyte Metabolism. Bethesda Maryland. U.S.A. (1998-2000).

Assistant Professor of Physiology, Faculty of Medicine, Universidad Los Andes, Santiago, Chile (2001-2006).
Assistant Professor; Research and Biotechnology Director, Faculty of Medicine, Universidad de Chile (2007-2011)
Associate Professor, Faculty of Medicine, Universidad de Chile (2009 – up to now); Academic Director, Faculty of Medicine, Universidad de Chile (2018 – 2022).

Research and academic interests.
The focus of Dr. Michea's research is on the role of immune cells in hypertension and hypertension target organ damage and the diagnosis of acute kidney injury (AKI) using new biomarkers, along with mechanisms of treatment of AKI. He has an active role as an undergraduate and postgraduate professor for medical students, nephrologists, and undergraduate students of other healthcare professions. He has developed an active role in the Chilean National Science Funding System as a member of study groups (Biology and Medicine) and as Study Group member, Study Group Coordinator, and National Council member. He is an active member of several national and international scientific societies in the area of physiology, hypertension, and nephrology. He has served as the President of the Chilean Society of Hypertension and he has been an academic consultant and collaborator of the Chilean Ministry of Health (MINSAL) in the design of clinical guidelines for the treatment of patients with hypertension and for the treatment of patients with chronic renal failure. He has been an academic consultant and collaborator of the HEARTS initiative in Chile since 2016.