

**TAMPERE CENTER FOR CHILD, ADOLESCENT
AND MATERNAL HEALTH RESEARCH**

ANNUAL REPORT



Photo: Jonne Renvall

2023

ACTIVITIES

- In 2023 the research center organized its' first symposium, where young researchers gave presentations and at the end of the day participants had a chance to socialize. The second symposium was organized in January 2024.
- In 2023, TamCAM organized the first advanced studies seminar for medical students. The second seminar started January 2024.
- In November 2023, we welcomed the children of our staff to explore the activities of our research center on the national Children's Day at Work.

VISIBILITY

- In 2023, TamCAM renewed its' websites and published a presentation video. The video can be found on our websites mainpage ([or by clicking this link that opens the video in Panopto](#)).
- In 2023, TamCAM's PIs and researchers raised several themes and engaged in public discussion on topics such as: development of youth identity, opportunities of the virtual world to reduce phobias (e.g., fear of needles) and current challenges in children's health, such as obesity, sedentary lifestyles, and mental health issues.
- The center's leading investigators and other researchers were interviewed in different Finnish media, for example: [Aamulehti 1/23](#), [Yle 2/23](#), [Lääkärilehti 2/23](#), [Aamulehti 2/23](#), [Aamulehti 10/23](#), [Yle 11/23](#).
- Some of our principal investigators were also interviewed in podcasts and radio, for example: [Wilma-Cast 9/23](#) ; [Radiosun 9/23](#).



KEY PERFORMANCE INDICATORS

All publications (peer-reviewed)	151 (129)
JUFO 3 (%)	27 (21%)
JUFO 2 (%)	24 (19%)
Open Access %	94 %
International joint publications %	65 %
Total sum of grant money awarded	3 424 776 €
PhD degrees completed	6

RESEARCH HIGHLIGHTS

In 2023, TamCAM has set out to produce data that will increase the scientific evidence and new ways to improve the health of our target population. Some research highlights of 2023 include:

- The production and publication of two article series on the efficacy and prioritization of interventions for low-birth-weight prevention. The first one was published in the Lancet in May 2023 and the second one in American Journal of Clinical Nutrition, June 2023.
After the publication of these article series, the organization of a series on advocacy events (in Bangladesh, Kenya, Senegal, and Peru) on the prevention of preterm birth and low birth weight. The events attracted a lot of national and international attention. The results of these and other Global Health Group activities were published in numerous JUFO-3 class publications. (1-13)
- Publication of a comprehensive study in Finland investigating the hereditary risk factors of pre-eclampsia revealed that this pregnancy complication shares many predisposing factors with hypertension. Therefore, women affected by pre-eclampsia should pay particular attention to lifestyle choices to prevent hypertension and other cardiovascular diseases. (14)
- The development of a large neuron-glia-vasculature model to predict the contributions of neuronal and glial cells in the BOLD fMRI signal that can be measured from humans. We predict that glial cells make a larger contribution than has previously been thought. This finding may change the practices of how and what will be interpreted from the BOLD fMRI signal in humans. Thousands of studies are published every year using the fMRI technique. (15)
- Analysis of altogether 32 studies for neuron-glia interactions in network models. We designed a systematic approach to present the interaction schemes in neuron-astrocyte network models. They also provided recommendations and guidelines for future development of such models. (16)
- Publication of a zebrafish model for the most common leukemia in children (ETV6:RUNX1). The double mutant fishes' leukemia incidence grew from 2% to 7% (Cdkn2a/b) and 15% (Pax5).
- Publication of an article about school closures and their impact on mental health during the COVID-19 pandemic. The results showed that daily stress symptoms and moderate/severe anxiety were higher among those exposed to school or class closure. Further, the longer the closure, the more stress symptoms, and anxiety. (17)
- Finding that SARS-CoV-2 transmission risk was greatest in indoor settings where singing and exercising occur. Further investigation of the host (index case and contact), viral (variants and subvariants), and setting-specific (ventilation, occupancy, and contact patterns) factors modifying the transmission risks is needed.
- Discovering that public health measures during the pandemic resulted in substantial reduction in pneumonia burden in all age-groups, likely due to reduced transmission of respiratory bacteria and viruses. After response measures were relaxed, however, pneumonia rates increased and temporarily surged above pre-pandemic levels in children. (18)
- Establishing a research training partnership with Huang Vuong Hospital (HVH), that is the largest maternity hospital in Vietnam, and where the infection control is a challenge. The purpose of this program is to strengthen HVH clinical research activities and to provide a variety of collaborate opportunities to promote broadening of HVH research capacity.
- Finding that fatty liver is very common in overweight children and is associated with factors such as male gender, puberty, and disturbances in sugar metabolism. In addition, pointing out that the reference values of laboratory tests used in screening for pediatric fatty liver should be critically evaluated. (19,20)
- Finding that celiac disease continues to increase in prevalence in Finland, with its prevalence in the population reaching up to 2,4% (21)
- Publishing the results of the effects of using guided deep breathing exercises in a Virtual Natural Environment virtual reality to reduce stress during pediatric treatment. The results show the strong potential of using deep breathing exercises in virtual natural environments for addressing treatment anxiety related to invasive pediatric procedures. (22-23)
- Publishing the first results of a study of major importance regarding treatment of gender dysphoria in minors and young adults, debunking commonly reinforced myths about the mental health impact of medical gender reassignment and underlining the importance of arranging for appropriate mental health care for these patients. (25)



Photo: Jonne Renvall

EXPLOITATION ACTIVITIES



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- Development of the [CellRemorph toolkit](#) to select smaller parts of cell morphologies, transform cell morphologies into different formats, and slice morphologies into segments of equal volumes or surface areas. CellRemorph provides novel functionality that facilitates the creation of realistic astrocyte morphologies for different types of morphologically detailed simulations elucidating the role of astrocytes both in health and disease. (24)
- Development of computational models for schizophrenia research. In particular, we published a biochemically detailed model of GABAB-receptor activation (<https://github.com/tuomomm/GABAB>) and a network model for exploring mechanisms of prepulse inhibition (https://github.com/DRPC1996/Modeling_PPI).
- Furthermore, CNS Group is developing spiking neuronal network simulator, NEST, to include also neuron astrocyte networks (<https://github.com/nest/nest-simulator/releases/tag/v3.6>).
- Receipt of the best doctoral dissertation at MET faculty in 2023 –award (Bireshwar Sinha)
- Receipt of the best doctoral publication at MET faculty in 2023 –award (Per Ashorn and others).
- Marja-Leena Linne was invited to give a talk in FENS (Federation of European Neuroscience Societies) Regional meeting in Algarve, Portugal, May 2023.
- Marja-Leena Linne contributed to the final evaluation of the 10-year EU FET Flagship Human Brain Project (HBP).
- Per Ashorn was invited to join the Strategic and Technical Advisory Group of Experts (STAGE) at the World Health Organization. STAGE advises the Director General of the WHO on maternal and child health related topics. The selection is for the years 2023-2025.
- NEDIS group's project together with EDU at Tampere University and CEA at University of Helsinki "Schooling, teaching and well-being of the school community during the COVID-19 pandemic in Finland" was financed by the Ministry of Education and Culture. It brought and is continuously bringing scientific knowledge on the impact of the COVID-19 pandemic on schoolchildren, teachers, principals and other professionals working at school as well as practices and teaching at school. The Ministry has used the results during the pandemic for instructing schools and legislators. The report has now been published and is available on Trepo from the following link: <https://trepo.tuni.fi/handle/10024/155454>
- Sauli Palmu started as the principal investigator representing Finland in global leukemia research, CHIP-AML22. Read more: <https://www.duodecimlehti.fi/duo17904>
- Sauli Palmu was an editor in the new Pediatrics textbook published in 2023.
- Riittakerttu Kaltiala was invited to give numerous international lectures in the field of gender dysphoria in children and adolescents.

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