

TAMPERE CENTER FOR CHILD, ADOLESCENT AND  
MATERNAL HEALTH RESEARCH

# ANNUAL REPORT



2021

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# TAMPERE CENTER FOR CHILD, ADOLESCENT AND MATERNAL HEALTH RESEARCH



## BACKGROUND OF THE RESEARCH CENTER

Tampere Center for Child, Adolescent and Maternal Health Research (TamCAM) is a population-group based research center that strives to advance the health and wellbeing of human beings from the womb to adulthood.

TamCAM builds on a premise of the importance of maternal, fetal, childhood and adolescent health and wellbeing on the entire life-course and brings together multiple methods, materials and approaches, and looks holistically at both somatic and mental health in the target populations.

The overarching goal of TamCAM Research Center is to produce new research data for the health benefit of families and to support decision-makers in formulating effective health policies.



<https://research.tuni.fi/tamcam/>



@TamCAM\_TAU

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# ABOUT TAMCAM

TamCAM brings together eleven research groups from the faculties of Medicine and Health Technology (MET) and Social Sciences (SOC) of Tampere University.

Currently, further 21 affiliated docents from **Tampere University Hospital** (pediatrics, child psychiatry, adolescent psychiatry, and gynecology and obstetrics units) and emeritus professors from **Tampere University**, as well as two Academy Research Fellows conduct research at the center.

The research center hosts a monthly research seminar since September 2021 to inform about the center's approach and research aims, as well as to promote synergies and discussion among students, clinical personnel and investigators from the areas of interest of TamCAM.

## OUR RESEARCH GROUPS:









- Child and adolescent health promotion
- Pediatric hematology and oncology
- Paediatric Early Phase Clinical Trials Unit – PeeTU
- Child psychiatry
- Adolescent psychiatry
- Research on Children's and Adolescents' Health Promotion – NEDIS
- Obstetrics and clinical genetics
- Virology
- Computational neuroscience
- Epidemiology
- Global health



# FOCUS AREAS

The multidisciplinary nature of TamCAM offers a unique opportunity to combine biomedical, clinical, epidemiological and social research methods, materials and approaches to advance the physical and mental wellbeing in the target population, in Finland and globally.

TamCAM research center brings together study groups from various disciplines to tackle the following scientific issues amid vulnerable periods of life during fetal period, childhood, adolescence, and pregnancy:

 <p>FOCUS AREAS TamCAM</p>	 <p>Characterization of the impact of adverse peri- and postnatal exposures on child and adolescent health</p>	1
	 <p>Cutting edge development of novel therapies and vaccines for children</p>	2
	 <p>Biology and therapy of selected childhood diseases: type 1 diabetes, leukemia, celiac disease</p>	3
	 <p>Neurological and neuropsychiatric disturbances in childhood: development of high-technology to increase treatment adherence</p>	4
	 <p>Environmental and inherited factors that contribute to eating disorders or obesity in young people</p>	5
	 <p>Body image, identity and well-being among adolescents in the contemporary society</p>	6
	 <p>Pregnancy complications: impact on maternal and newborn health</p>	7

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# RESEARCH HIGHLIGHTS

## SOME RESEARCH HIGHLIGHTS OF 2021 INCLUDE:

In 2021, TamCAM has set out to produce data that will increase the scientific evidence and new ways to improve the health of our target population.

- Contribution to the first human trial in the process of developing a vaccine for the prevention of type 1 diabetes.
- Contribution to the first human trial evaluating possible preventive effect of exposure to environmental microbial diversity on allergic diseases.
- Identification of research priorities for the advancement of sexual, reproductive, maternal, newborn, child, and adolescent health in humanitarian settings.
- Finding that maternal postnatal depression among low-birth-weight babies can be markedly reduced in low-income settings by the use of the so-called Kangaroo Mother Care (KMC).
- Finding that the incidence of pregnancy associated stroke is increasing, stressing the importance of careful pregnancy surveillance and risk factor management, particularly in older expectant mothers and extending to puerperium.
- Identification of novel genetic risk loci for polycystic ovary syndrome, which is a most common cause of anovulatory infertility.
- Development of novel models for neuron-glia interactions in the cerebral cortex (both humans and rodents).
- Analysis of cellular and synaptic mechanisms behind spontaneous cortical activity in rodents.
- Development of a monitoring protocol for second-generation antipsychotic medications in child psychiatric patients.
- Observation that Covid-19 school closures increased health complaints and loneliness among 7-9. graders' in distance teaching, due to inaccessibility of teachers, digital problems and lack of timetables and sufficient support.
- Characterization of treatment resistant leukemia cells by single cell sequencing, and identification of novel targeted agents that block aberrant transcriptional programs leading to leukemia cell death.
- Studies evaluating the mechanisms and efficacy of drug treatments of persistent enterovirus infection in cell models.





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# EXPLOITATION OF RESEARCH FINDINGS

- In 2021, several researchers of the center participated in the writing and editing of medical textbooks and other clinical guidelines.
- The ADELE ecosystem project patented and commercialized an immunomodulatory extract which is based on rich microbial communities of forest soil (Reconnecting Nature™).
- The newly published Current Care Guidelines on pregnancy hypertension and pre-eclampsia recommend the initiation of low-dose acetylsalicylic acid therapy for those at risk of pre-eclampsia.
- Based on a clinical trial conducted in the Paediatric Early Phase Clinical Trials Unit, a Finnish innovation Injeq IQ-Tip® received CE certification. With this device the needle tip detects cerebrospinal fluid while performing a lumbar puncture.
- Development of digital Infant and family psychiatric services for Tampere University Hospital (TaysHuoma-service).
- The results of the school surveys on COVID-19 and its effects on schools, learning and wellbeing were delivered to the Ministry of Education and Culture which has used them when formulating legislation and in instructing schools to cope with the pandemic.
- Provision of computational open access tools for optimization of cortical neuronal network models and analysis of cortical network activity.
- Drafting of guidelines for developing and presenting computational models of synaptic plasticity and learning, with emphasis on FAIR principles.
- Development of method for the three-dimensional imaging of small intestine biopsies (X-ray-based micro-CT) to improve the diagnosing of celiac disease.

# VISIBILITY

TamCAM's PIs have engaged actively in public discussion on topics such as current situation of child and adolescent psychiatric services, violent behaviors during adolescence, new tendencies in the diagnosis and treatment of celiac disease and development of a diabetes vaccine.

The center's leading investigators have been interviewed to give their expert opinion in different printed (Aamulehti, Ilkka-Pohjalainen, Satakunnan kansa, Open Science, Mediuutiset, Duodecim, Helsingin Sanomat, Lääkärilehti, YLE) and digital media (Aamu-TV) in 2021.

During the Covid-19 outbreak, several TamCAM PIs have been involved in research and public debate about the SARS-COV-2 virus, its epidemiology, spreading mechanism and effects on students' health during school closures. The results of these investigations have been used in public decision making at ministry-level.

TamCAM investigators have given numerous lectures and talks in different conferences and forums.

## KEY PERFORMANCE INDICATORS:

- Number of publications: 144 (date of extraction: 17.12.2021)
- Number (%) in Jufo category 3: 10 (6,9%)
- Number (%) in Jufo category 2: 22 (15,3%)
- Number (%) internationally coauthored: 82 (56,9%)
- Number (%) open access: 112 (77,8%)
- Total number of international grants (decisions made in 2021): 6
- Total number of national grants (decisions made in 2021): 31
- Total sum of grant money awarded (decisions in 2021): 2 565 745 €
- Completed PhD degrees: 8 (TAU) and 2 (HY)
- Completed MSc degrees: 2
- Completed advanced studies for medical students: 11



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# NETWORKS AND INTERNATIONALITY



TamCAM has strong links to Tampere University Hospital, the city of Tampere, PirSOTE, Finnish Institute for Health and Welfare (THL), FINPEDMED and multiple research groups at TAU, other Finnish universities and internationally.

In 2021, TamCAM research groups had active collaborations in numerous Nordic, European, North American, African and Asian universities and institutes.

Besides bilateral research collaborations, TamCAM PIs serve in responsible roles in international research networks.

Furthermore, the research groups of the center take part in numerous nation-wide and international research projects and consortiums, such as the ADELE ecosystem project, ALLTogether leukemia study, DIPP, E3 project, EBRAINS, EHEN project, FinnGen, FINNPEC, HEDIMED, ITCC Consortium, LAKANA trial, MSOP-PRE, nPOD study and TEDDY study.



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# PRINCIPAL INVESTIGATORS

**DIRECTOR**



**PER ASHORN**

GLOBAL HEALTH

**VICE DIRECTOR**



**HANNELE LAIVUORI**

OBSTETRICS AND  
CLINICAL GENETICS



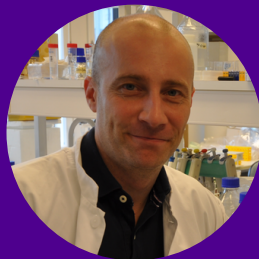
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ADOLESCENT PSYCHIATRY



**KAIJA PUURA**

CHILD PSYCHIATRY



**KALLE KURPPA**

CHILD AND ADOLESCENT  
HEALTH PROMOTION



**HEIKKI HYÖTY**

VIROLOGY



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**MARJA-LEENA LINNE**

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EPIDEMIOLOGY



**ARJA RIMPELÄ**

RESEARCH ON CHILD  
AND ADOLESCENT  
HEALTH PROMOTION



**OLLI LOHI**

PEDIATRIC HEMATOLOGY  
AND ONCOLOGY



# IN 2021, TAMCAM WAS FUNDED BY:



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MINISTRY OF  
EDUCATION AND CULTURE  
FINLAND



JANE AND AATOS  
ERKKO FOUNDATION



Human Brain Project



EBRAINS



EET  
FLAGSHIPS



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European Institute for  
Theoretical Neuroscience



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SOCIAL AFFAIRS AND HEALTH



LASTEN SYÖPÄSÄÄTIÖ VÄRE

#ERA PerMed



PIRKANMAAN  
SAIRAANHOITOPIIRI  
Yhdessä terveyttä



Tays  
tukisäätiö



Tays  
Tampere University Hospital



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