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### Action Innocence: More than 25 years of fighting for the protection of children in the digital world

Founded in 1999, Action Innocence is a foundation that has devoted itself for over 25 years to the protection of children and adolescents against the dangers of the digital world. Under the leadership of Tiziana Bellucci, director general, it continues to pursue this mission with an approach that is adapted to technological developments and the new challenges they pose.

#### An essential mission in a constantly evolving digital world

At the beginning, Action Innocence focused mainly on fighting against pedocriminality on the Internet. With the development of digital technologies, from the first chats and blogs to social media and artificial intelligence, the foundation has broadened its scope in order to take on today's new challenges related to our hyperconnected society.



Currently, the foundation's commitment is organised in three main axes. Firstly, fighting against online pedocriminality, and the consumption of pedopornographic files in particular, in collaboration with Association DIS NO and the authorities. Secondly, promoting healthy and balanced screen habits among children and adolescents. And thirdly, encouraging responsible and safe digital practices through prevention programmes targeting youth, parents, and professionals.

A key principle for Action Innocence is its educative, non-judgemental and benevolent approach. Rather than prohibiting or demonising screen use, the foundation advocates for accompanying children from a young age onwards in order to help them develop safe and

mindful digital habits. This approach includes awareness work with families to provide them with the tools needed to help them guide and structure their children's digital practices.

#### An innovative collaboration with The Sense

For several years, Action Innocence has pondered over the impact that screens may have on the sensory development of children. It is from this perspective that an innovative partnership was created with The Sense.

The purpose of this collaboration is to better understand how digital tools and content can both stimulate the senses through new experiences but also reduce, indeed sometimes prevent their development or exploration. Early exposure to screens can interfere with the sensory awakening that is essential to children's development. A comment made by Micah Murray, Scientific and Academic Director of The Sense, particularly struck Tiziana Bellucci and further strengthened the relevance of this collaboration: "The senses are the scaffolding of what we are and what we will become."

This promising and stimulating partnership has already resulted in the launch of a common call to projects whose goal is to analyse the evolution of practices within families in the digital era, particularly with respect to children's sensory and cognitive development.

Combining scientific expertise with field experience, this collaboration opens new perspectives to provide families with support as they face the new challenges posed by digital technology, while placing children and their development at the heart of our concerns.





## MaRaVal: An association's commitment to rare diseases

Created in August 2017, MaRaVal is an association dedicated to helping people affected by rare diseases. Founded by Christine de Kalbermatten, a pharmacist by training and a mother directly concerned by the topic, the association has opted from the start for a professionalized approach in order to provide structured and efficient support to patients and their close relatives.

### Better understanding rare diseases



A disease is considered rare when it affects less than one person out of 2,000. We talk about ultra-rare diseases when the prevalence is one person out of 100,000. While they are little known, these pathologies do concern a large number of people, mostly children.

MaRaVal thus plays an essential role in the understanding and awareness of rare diseases, through a two-pronged approach. The first covers the support brought to patients and their relatives through guidance, personalised care, and actions aiming to break out of isolation. The second covers the coordination and training of

various actors in the field: patients, caregivers, health professionals and social workers, faculty members, and social insurance agents.

Through its activities devoted to raising awareness, MaRaVal helps patients and their families better navigate the health and insurance systems while promoting a better recognition of rare diseases within society.

Thanks to the mandate granted by the Canton of Valais, MaRaVal plays a key role in providing support and training while raising awareness about rare diseases. The association implements resources intended to compensate for the gaps that are often identified by families and professionals.

A recent example of this commitment was the "What is a rare disease for you?" [C'est quoi pour toi une maladie rare?] event organised on February 26th at the Sierre library and media-centre. The date wasn't chosen randomly: indeed, the month of February unavoidably refers to February 29th, a rare date that perfectly symbolizes the very theme of rare diseases. The purpose of this event was to raise public awareness through various activities, among which a digital graffiti workshop accessible to everyone, including people with disabilities.

### A precious collaboration with The Sense

The partnership between MaRaVal and The Sense opens even broader perspectives. Bringing together actors from the associative, academic, hospital and HES worlds, this collaboration inspires an all-encompassing and pragmatic research approach for rare diseases.

"The Sense is a creative and innovative center that generates ideas and concrete outcomes. Yet, for advances to be truly useful, it is also essential to take the patients' voices into account," points out Christine de Kalbermatten.

Combining scientific expertise with the reality of the field, this synergy provides research that is relevant, efficient, and aimed toward applicable solutions. This approach is the perfect illustration of MaRaVal's mission: transforming research into concrete action to improve the everyday lives of people affected by rare diseases.



# News



## Looking back at the inauguration of the new facilities at the Swiss BioMotion Lab

On September 20th, 2024, the Swiss Biomotion Lab inaugurated its new facilities, reinforcing its expertise in the research and therapy of musculoskeletal pathologies. Co-directed by Dr. Julien Favre and Prof. Brigitte Jolles-Haeberli, the lab now boasts cutting-edge equipment, including a tiltable treadmill paired with an immersive screen to recreate realistic walking conditions. As part of this inauguration, the lab hosted an open-house day as well as a conference presenting the current

advances in osteoarthritis treatment, the ultimate goal being the gradual integration of biomechanics into personalised medicine.

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## Joint Meeting Swiss-Korean Life Science Initiative

On October 30, 2024, the CHUV hosted the Joint Meeting Swiss-Korean Life Science Initiative, bringing together researchers, academic institutions, and government representatives from Switzerland and Korea. Organised in cooperation with the Science and Technology Office Seoul, the event highlighted funding and scientific collaboration opportunities in the fields of life sciences and medical technology. After the opening speech by Pr. Micah Murray, Scientific and Academic Director of the Sense Innovation and Research Center, various experts presented grant and academic exchange programmes. Then, researchers showcased their innovative projects through a series of dynamic pitches. The event concluded with a presentation of the Swiss-Korean Innovation week 2025, marking a new step in strengthening scientific partnerships between the two countries.



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# News



## The Relevance of Brain Oscillations

On December 11th, 2024, the University of Lausanne hosted the “Oscillatory Brain Waves: Mechanisms, Functions, and Clinical Perspectives” symposium, co-organized by Pr. David Pascussi and his team. The event gathered over 150 participants and eight researchers in order to explore brain waves from a multidisciplinary perspective combining fundamental neurosciences and clinical applications. A collaboration between the UNIL, the University of Padua, and The Sense, the symposium focused on methodological advances in EEGs, innovative brain function models, and the importance of personalised approaches in neurosciences. The day further reinforced scientific exchanges while opening new perspectives in the study of brain waves.

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## Pizza & Science: Recap of a Rewarding 2nd Edition

On November 22 2024, the second edition of Pizza & Science took place at the Lausanne University Hospital (CHUV), gathering around twenty participants in a relaxed and friendly atmosphere. Designed for young researchers, this event provides a platform for interdisciplinary exchange and collaboration. Primarily aimed at PhD students and post-doctoral researchers, but open to all members of The Sense, it allows researchers to present their research activities in an accessible manner. During this edition, hosted by Maxwell Arulraj and Noah Richert from the AppiTech Lab - Human-Centered AI team led by Antoine Widmer, participants explored innovative advances in virtual reality (VR), while sharing ideas and perspectives over a slice of pizza.



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# News



## Graham Jamieson's Symposium : Interoceptive Predictive Coding & Hypnotic Suggestion Response

On December 5 2024, The Sense hosted a symposium at the CHUV (Lausanne University Hospital). This event, attended by around fifteen participants, featured Dr. Graham Jamieson, a globally recognized figure in neuroscience and a leading expert in hypnosis. The symposium, titled "Interoceptive Predictive Coding & Hypnotic Suggestion Response" delved into innovative perspectives on altered states of consciousness.

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## Workshop The Sense & Vibra Nova

On January 20 2025, The Sense and Vibra Nova organized a collaborative workshop filled with insightful discussions on haptics and its applications. This meeting, centered on innovation, highlighted promising perspectives for the research and development of this groundbreaking technology.

Vibra Nova specializes in advanced haptic technologies. The company stands out by developing ultrasonic solutions that provide precise tactile feedback without direct physical contact. These technologies pave the way for revolutionary applications across various sectors, such as industry, healthcare, and education.



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# Inside The Sense

The “Devices & Data” focus area centers on the development of innovative sensors and advanced data analysis. Spotlight on the Data Sciences unit, led by Professor Henning Müller. Two PhD candidates share their backgrounds and research: Margaux Roulet, affiliated with the Neuro-Otology unit, and Nina Rimorini, from the Pain Interoception unit. Let's find out more about them.



## Data Sciences Unit

Henning Müller leads the MedGIFT group on medical multimodal data analysis. The group's research focuses on building decision support tools using medical data in the forms of images, signals, texts and structured data. Using machine learning predictions, classifications and segmentations can be made in the data.

The tools are used on data from radiology, ophthalmology and increasingly histopathology using strong computer infrastructures and mainly deep learning.

Interpretability and explainability of the machine learning outcomes are another strong focus of the group.

## Henning Müller

Henning Müller is a renowned expert in medical IT and artificial intelligence applied to health data. After studying medical informatics, he pursued a PhD in computer vision, specialising in image analysis and medical signals processing.

His professional path took him to the United States, before joining the University of Geneva's Faculty of Medicine, where he expanded his collaborations with clinical teams. Since 2007, he has been a professor at HES-SO Valais-Wallis within the Institute of Computer Science while remaining affiliated with the University of Geneva to maintain close ties with clinicians.



A member of the Sense's Direction Committee, Henning Müller heads one of the three strategic axes and contributes to several projects transversely. His expertise covers multimodal medical data analysis, with imaging and physiological signals such as EEG in particular. He has also contributed to research pertaining to hand prosthetics, electromyography and sensory feedback, exploring innovations intended to benefit patients.

In Sierre, Henning Müller is in charge of a unit dedicated to the management and analysis of health data, which comprises nearly 40 coworkers (professors, researchers, interns, and external experts). His team works in close collaboration with the leading Swiss hospitals, including CHUV, HUG, Valais Hospital and various institutions in Bern.

Since 2020, Henning Müller has also joined the National Research Council of the SNF, where he participates in defining research policies on a federal level. His commitment aims to promote the integration of advanced technologies in the medical field, creating bridges between technological research and clinical needs.



# Inside The Sense

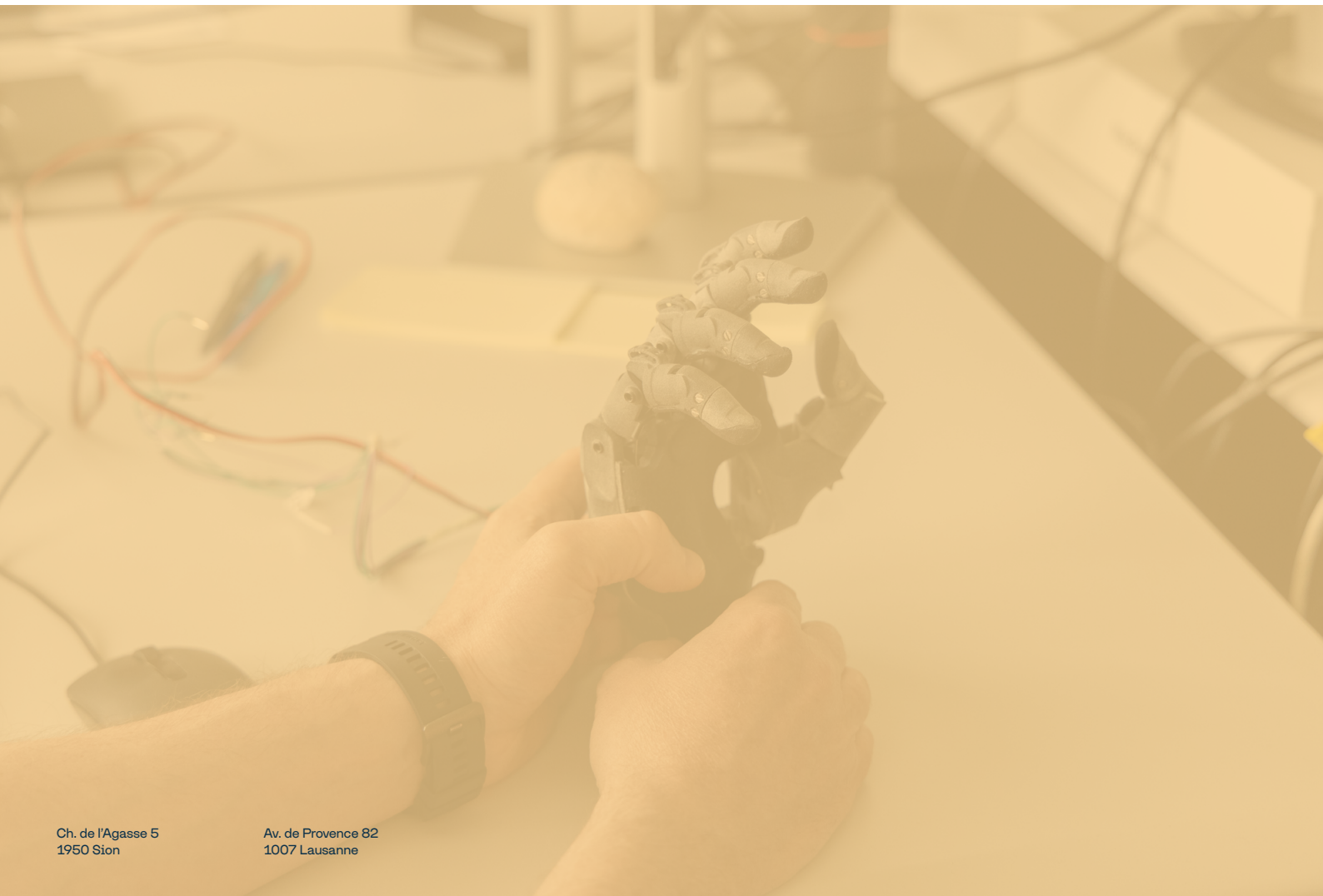
## Current Studies

Henning Müller is conducting several research programmes at the junction between artificial intelligence, medical data analysis and neurosciences. His work is part of several substantial projects funded by national and European organisations.

He is currently involved in a project funded by the Hasler Foundation regarding explainable artificial intelligence applied to multiple sclerosis, in connection with the topics covered by The Sense. Additionally, he is participating in Hereditary, a European project exploring interactions between the gut microbiome and neurodegenerative diseases such as Parkinson's and multiple sclerosis. This project mobilizes 17 European partners and relies on the analysis of complex and heterogeneous data, among which high-resolution retinal imaging. The objective is to identify early biomarkers and better understand the evolution of these pathologies with an affordable method to allow for screening and early detection.

At the same time, Henning Müller has been contributing to several oncology projects, notably histopathological image analysis on a large scale. He also collaborates with Valais Hospital for the purpose of optimising patient rehabilitation strategies, integrating artificial intelligence into treatment prediction and adaptation.

Lastly, Henning Müller has been playing a key role in an extensive 40-million-euro European project involving 37 partners, whose aim is to develop a platform to securely share medical data for research purposes.





# Interview with PhD students

Two PhD students present their background and research work: Margaux Roulet, associated with the Neuro-Otology Unit, and Nina Rimorini, from the Pain Interoception Unit. Let's discover more about them and their work.

## Can you introduce yourself and tell us about your career?



Margaux Roulet

My name is Margaux Roulet and I'm a neurosciences PhD student at the Faculty of biology and medicine, collaborating with the CHUV and The Sense. After receiving my EPFL diploma in Life Sciences engineering, I specialised in biomedical engineering and specifically acquired a solid knowledge in the fields of neurotechnologies, signal processing and computational neurosciences. My academic and industrial experience has further fuelled my interest in translational clinical research. I did my master's thesis research within the NeuroRestore Centre, where I contributed to the development of an approach combining rehabilitation robotics and spinal cord stimulation to restore movement for people who had suffered from spinal cord injuries. I then joined Neurosoft Bioelectronics, a startup that is a spinoff of the EPFL's LSBI, as an R&D engineer, where I worked on the development, verification and validation of soft, flexible brain interfaces for the purpose of an early study on human beings conducted in August 2023. This immersion confirmed my wish to pursue a career in academic research, and my PhD is a continuance of the work I have thus far accomplished.



Nina Rimorini

My name is Nina Rimorini, I'm a PhD student with The Sense for four months. I started my studies with a bachelor's degree in biology before opting for a specialisation in medical biology, with a subspecialisation in neurosciences – a domain that had always captivated me. After working for a year and a half as researcher in various clinical projects, I decided to embark on a PhD research project.

## Can you tell us more about your research project?



Margaux Roulet

I'm currently working on the development of a surface prosthesis – a soft implant intended to be placed directly on the brain's surface. The goal is to allow the restoration of hearing capabilities thanks to targeted electrical stimulation of the auditory cortex. This neuroprosthesis is meant for patients who suffer from hearing disorders and cannot benefit from existing solutions. It also aims to reproduce a more natural auditory perception, integrating complex sounds such as music and conversations in noisy environments – a known limitation of current prosthetics.



Nina Rimorini

My project focuses on mental imagery decoding. My objective is to better understand how mental imagery is generated and modulated in the human brain. For this purpose, the team with which I work records the brain activity of healthy volunteers during controlled imagination exercises, using visual and auditory stimuli such as images representing a family or a forest. Combining these real images with machine-learning algorithms, with my colleagues we seek to identify the similarities between brain activity when seeing an image and when imagining it. The goal is to understand how mental images are created. Using classification techniques based on machine learning, we also hope to succeed in breaking down specific categories of mental imagery such as the ones related to family, friends, or nature. This approach allows for the study of the spatiotemporal pattern of such mental images. In the end, the research's findings could improve behavioural therapies that use mental imagery, such as hypnosis, and in particular with respect to mental imagery rescripting in therapeutic contexts such as that of nightmare disorders.

## What do you think is the added value of being a PhD student at Sense?



Margaux Roulet

My collaboration with The Sense allows me among other things to benefit from the expert knowledge of clinicians as well as a direct immersion in clinical environments, in particular when using EEG and other neurodiagnostic technologies.



Nina Rimorini

As far as I'm concerned, part of the added value of being a PhD student within The Sense rests with the collaborative approach. Working side by side with professionals that have a wide variety of skills enhances my experience and gives me access to expert knowledge that I didn't necessarily have to begin with, especially with respect to my research project. The Sense also provides me with invaluable support regarding funding and networking, other aspects that are also essential to the development of my projects.



# Interview

## Nathalie Blanchy | Financial Manager

### Can you tell us about your activities within The Sense?

**Nathalie Blanchy:** My job within The Sense is that of administrator and coordinator. My main mission is to make sure that the Sense can function as smoothly as possible with respect to its finances. For this purpose, I work in close collaboration with Olivier Lorentz, the Sense's Executive Director, on aspects related to accounting, cash management, finances and management control. Given that the Sense's founding institutions – CHUV, UNIL, and HES-SO Valais-Wallis – have distinct ways of functioning, I regularly correspond with Micah Murray, the Sense's Scientific & Academic Director, for questions related to the CHUV and UNIL.

My office is located in Lausanne, at Avenue Provence 82., which gives me the possibility to frequently meet with the PhD students, students, and PIs who also come to work there. It's a true pleasure, as it allows me to put a face to a name (or an invoice!) and gain concrete insight into the projects in progress. Sometimes, I also have the opportunity to bring my support to Sibylle Menal, the organisation's executive assistant, by responding to some of our researchers' highly diverse requests.



### Can you describe your typical day?

**Nathalie Blanchy:** I mainly work in front of a screen (or preferably two!). I check that the invoices that we've received are correctly addressed and comply with the institutions' respective criteria. Then I forward these invoices to the different accounting offices within the Sense's founding institutions and make sure that they are paid in a timely manner. This requires my being methodical and tenacious. In order to make sure not to forget anything, I write down practically everything on a "to do" list that I follow up on every Thursday, the day dedicated to The Sense in my work schedule. This may appear off-putting, but it is fiendishly effective. My work is different depending on whether it is the beginning or the end of the year.

At the beginning of the year, I work on the year-end closing of the previous year. It is an intense period (which is also conducive to the apparition of a few grey hairs), as ensuring the traceability and proper recording of all the invoices throughout the different institutions can be quite a challenge sometimes. The time dedicated to the closing allows for a retrospective look at the past year and a reflection on what could be improved, a topic for exchanges within the support team, which notably lead to a presentation to the Council (the Sense's advisory boards) which oversees our Innovation and Research Center.

At the end of the year, I prepare the following year's budget, in close collaboration with the support team. It's an exciting moment, as it gives me the opportunity to envision the coming year and therefore actively contribute to the Sense's evolution.

### What is your perspective on the Sense's evolution since its inception?

**Nathalie Blanchy:** Seven years have passed since the ideation of The Sense. It's already been quite a journey! Thanks to the outstanding networks of our two directors — our Scientific & Academic Director and our Executive Director — as

well as the support of the Management Committee and the PIs, The Sense has gained recognition far beyond Switzerland.

Obviously, answering this question I am influenced by the bias of my own position. From my point of view, the Sense's evolution involves a perpetuation of the Center. To do so, it is essential to increase its visibility in order to optimise funding. This requires in-depth reflection regarding basic notions of positioning for the Center as well as the strategic promotion of its research work. The ideal course of action would be to constantly highlight the major discoveries which allow us to better understand human behaviour and sensory functions.



# Sensory Awakening

## "Spiral aftereffect" Illusion

[Find more illusions on Michael Bach's website](#)

### What to do & see

Gaze at the center of the rotating spiral for about 20 seconds, then look elsewhere. You will notice that whatever you look at now appears swirling. Don't worry, it won't stick ;-), this sensation will go away after a few seconds.

You can start/stop and adjust the speeds of the 3 parts of the spiral with the controls at top right.

Gazing at the spiral for a longer time will increase the duration of the aftereffect, leveling out at  $\approx 30$  s. Holding the gaze steady at the center (don't over-concentrate, "let it hang") also increases the effect.

### Comment

The basic phenomenon is called "motion aftereffect", which I have described in more detail here. I added the present page because many observers find this three-part spiral more compelling. The spiralling aftereffect was first described by Joseph Plateau (1801–1883) in 1849. The variation into 3 regions was, to my knowledge, developed by the magician Jerry Andrus.

### References

- Plateau J (1849) Bull Acad Roy Sci B A Belg 16:254–260  
 Wade NJ, Heller D (2003) Visual motion illusions, eye movements, and the search for objectivity. J Hist Neurosci 12:376–395



# Support us we develop the projects of tomorrow

for our well-being and the well-being of future generations



#### WHY SUPPORT THE SENSE?

The Sense works on the senses to try to improve the trajectory of life. By supporting The Sense, you contribute to its ambition to have an impact not only on people's health but also on prevention and public health.

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Where innovation comes to life

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