

# Secondment with the Center for Evolutionary Hologenomics at the University of Copenhagen in Denmark

## Introduction

In my experience, temporary assignments or secondments can be really cool for secondees and host institutions. You get to expand your knowledge, develop new skills, and gain valuable experience working with professionals in a new environment. Likewise, host institutions get fresh perspectives that can develop new and improved work practices. It is a win-win situation for everyone.

UCPH Campus where CEH is located



In September 2023, the Gopalakrishnan Group in the Center for Evolutionary Hologenomics (CEH) at the University of Copenhagen (UCPH) started its secondment program as part of the EU-funded [FindingPheno](#) project. As a machine-learning researcher in the de Polavieja group at the Champalimaud Foundation in Portugal and a partner at [FindingPheno](#), I am excited to be participating in a three-month secondment at UCPH in 2023 and 2024.

Due to the COVID-19 pandemic and changes in work formats, we now have more opportunities to work online and onsite. [FindingPheno](#) secondees, including women, young parents, PhD students, and others who for one reason or another might be tethered to their homes and institutions now have the chance to supplement online training with shorter in-person secondments, which is amazing! My secondment plan consists of three stages:

- *initial* one-month onsite – collaboration in Denmark with UCPH partners
- *interim* one-month online – collaboration from Portugal with assigned tasks, regular feedback sessions, and participation in specific CEH meetings
- *concluding* one-month onsite – collaboration in Denmark with UCPH partners

## Was the secondment structure and experience right for me?

I recently had the amazing opportunity to spend a month on secondment at UCPH. It was a major milestone in my professional journey. While I was there, I had the chance to share some of my knowledge of machine learning with the wonderful researchers at UCPH. Even better, I got to partner with some incredible Principal Investigators (PIs) and Early Career researchers at [CEH](#), as well as PIs at the [Department of Mathematical Sciences](#) (particularly the [Section for Statistics and Probability Theory](#)). Through these collaborations, I was able to learn many new things that I cannot wait to apply to my research moving forward.

While at UCPH, I had the opportunity to nurture meaningful relationships with project partners and lay the foundation for my secondment. I was also able to conduct productive in-person meetings with UCPH researchers I am collaborating with on a project deliverable due in February 2024. The deliverable focuses on causal discovery, and [Professor Helle Sørensen](#) and [Associate Professor Bo Markussen](#) from the Department of Mathematical Sciences introduced me to two interesting techniques relevant to the deliverable: *invariant causal prediction* and *functional data analysis*.

## New techniques learned

**Invariant Causal Prediction**, is a powerful technique used by researchers in situations where data arises under different environments. Several researchers in [Population and Statistical Genetics in the Gopalakrishnan Group](#) ([Moiz Shervani](#), [Jazmín Madrigal](#) and [Franceen Eshun-Wilson](#)) and I formed a study group to explore this technique. We are using it to analyse the salmon dataset provided by UCPH partner [Morten Tønsberg Limborg](#) and researcher [Jaelle Brealey](#) from the EU-funded project [HoloFood](#) (a sister project to [FindingPheno](#)). This dataset involves fish in different experimental conditions, making it an ideal test case for Invariant Causal Prediction.

**Functional Data Analysis** is a statistical method that lets you model data as a smooth function. It works particularly well if there is a natural ordering like time or space. Helle and Bo had the brilliant idea to apply this approach to transcriptomics data by considering the order of genes on the genome. This helped us analyse gene expression dynamics from a different angle. It also provided an interesting avenue for dimensionality reduction, which will be essential if we use invariant causal prediction.

## Some key considerations from my secondment

I was fortunate to be able to attend some fascinating research lectures, covering topics in and around my study area. I also had great in-person meetings and one-on-one chats. Whether it was waiting for the kettle to boil or figuring out how to use the projector, these small moments of shared experience helped me get to know my peers, in an organic way that does not quite happen online

It is easy to fall into a routine within your lab or defined space. However, stepping out of your comfort zone and showing interest in what your peers are working on can lead to new opportunities. Being invited to attend lectures or having quick chats with colleagues about the challenges you are facing can help you step outside of your bubble and explore new ideas and perspectives.

### - The importance of evolution

During my time at the [Centre for Evolutionary Hologenomics](#), I had many discussions about evolution, which made me realise its importance in biology. It reminded me that biology is always changing and not fixed. Moreover, it helped me understand the significance of combining biological knowledge with computational analysis. A few colleagues and I were curious know if there is a biological reason for genes located close to each other to behave similarly. This may help us validate the functional data analysis we were working on. Initially, we could not find an obvious reason for this, but after a fascinating discussion with [Associate Professor Antton Alberdi](#), we discovered there could be evolutionary pressures that result in genes with similar functions being located near each other.

### - Amazing food

#### Reffen and surroundings



Copenhagen is a captivating city that offers a multitude of culinary experiences for food enthusiasts like me. One of my favourite places to go is Reffen, an outdoor street food market that also serves as a co-creation space. Located by the Copenhagen harbor, it offers food options for everyone in the family.

During a retreat with CEH researchers, we took a day trip from Copenhagen to the beautiful countryside, including places like Hvalsø. [Associate Professor Morten Limborg](#) took us hiking and team building, which was a great experience. We ended the day with a visit to a farm that promotes sustainable agriculture. This farm supplies the world-famous Michelin-starred restaurant, Noma based in Denmark.

Along the Hvalsø hike



## Concluding thoughts

During my secondment to Copenhagen with the [CEH](#) research team and [Department for Mathematical Sciences](#), I had a valuable experience. The first month went exceptionally well, and I think it was a great example of how a secondment can lead to mutual benefits for both parties involved. I hope that by sharing my experience, it will inspire other academic-led projects to implement more flexible secondments in the future.

I am grateful for the warm welcome I received from many people at UCPH, who played a crucial role in making my secondment a success. I want to thank everyone who supported me, but I would like to give a big shout-out to [Special Consultant and Project Manager Marie Sorivelle](#), who organised everything related to my stay. I would also like to thank [Associate Professors Shyam Gopalakrishnan](#) and [Morten Limborg](#) for hosting me in their labs. I am looking forward to continuing my online and onsite secondment and further developing our relationship during [FindingPheno](#).

## Secondment made possible with

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**FindingPheno**

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