

Name of the MSC Fellow: Blaž Cugmas

Nationality: Slovene

Host organisation: University of Latvia

Country of the Host: Latvia

Project Acronym: DogSPEC

Project start and end date: 22/8/2017 – 13/4/2020

Type of MSC action, H2020: IF

Using PPG on a dog:



Erythema measurements on dogs:



Your story:

Project objectives and research field:

Opposite from human medicine, biophotonic techniques (cameras, pulse oximeters, infra-red thermometers, etc.) remain rarely exploited for the health of animals. In our MSCA IF project, we wanted to address some of the clinical challenges in veterinary medicine by applying biophotonic techniques.

a) Due to extensive pigmentation and hairiness, a pulse oximeter, which monitors heart rate and blood oxygen saturation, is routinely placed solely on the tongue. This approach is feasible only for unconscious dogs and cats, e.g., during surgical procedures. Therefore, we investigated several other measurement sites (legs, tail) that could be tolerated by conscious animals.

b) Atopic dermatitis is a common canine inflammatory and pruritic skin disease associated with an allergy. The monitoring of skin erythema over time is an essential diagnostic tool. Currently, the erythema assessment is done subjectively by visual estimation. Therefore, we developed and tested a few optical devices for assessing canine skin objectively.

c) We reviewed the existing work on biophotonics in veterinary medicine. We additionally proposed some of the challenges, which could be solved by biophotonics.

Tell us why your topic is important and/ or how it brings to advancement in your research field:

- a) Our project is the first one, which addressed biophotonics in veterinary medicine systematically. With the dissemination of the project results, we promoted the combination of both fields among biophotonic and veterinary community. This gives us hope that in the future, more research groups will explore the potential of biophotonics in veterinary medicine, which can lead to better veterinary medicine and animal health.
- b) We have created an interdisciplinary team (engineers, physicists, research and clinical veterinarians) to address some of the veterinary challenges by biophotonics.
- c) Regarding the research, we identified a few other measurement sites (on legs, tail) for the pulse oximeter placement that could be tolerated by conscious animals (DOI: 10.1088/1361-6579/aaf433). Additionally, we proposed an affordable and accessible optical system with a smartphone and dermatoscope, which can make erythema severity estimations objective, thus leading to better management of allergic dogs (DOI: major paper has been submitted for publication, conference paper: 10.1117/12.2544664).

What are the benefits of participating in a MSC action?

MSCA gave me an opportunity to work in a new research team. What is more, I could network more and meet a lot of important people in the field. That opened new opportunities for future collaborations. Finally, I could try some new ideas, which are considered too risky for regular research grants.

Did you encounter any challenges during application/ implementation and did you get any help?

In the beginning, we had a few challenges in disseminating the project results. Since the research combination is entirely new, our work seemed very technical for the veterinary audience. On the other hand, veterinary topics were often considered inappropriate for human biophotonic journals.

Why did you choose a widening country as a Host? What was the reason that convinced you? What is making you professionally happy here?

I opted for the host in Latvia since our work and future plans were the most compatible. When I started working here, I got a lot of support and consequently, many opportunities for testing new research hypotheses. I also met many important and extraordinary researchers during my MSC programme.

Would you recommend others to apply? What useful advice/ tips can you give them?

Of course, MSCA IF is a great opportunity to advance the career.