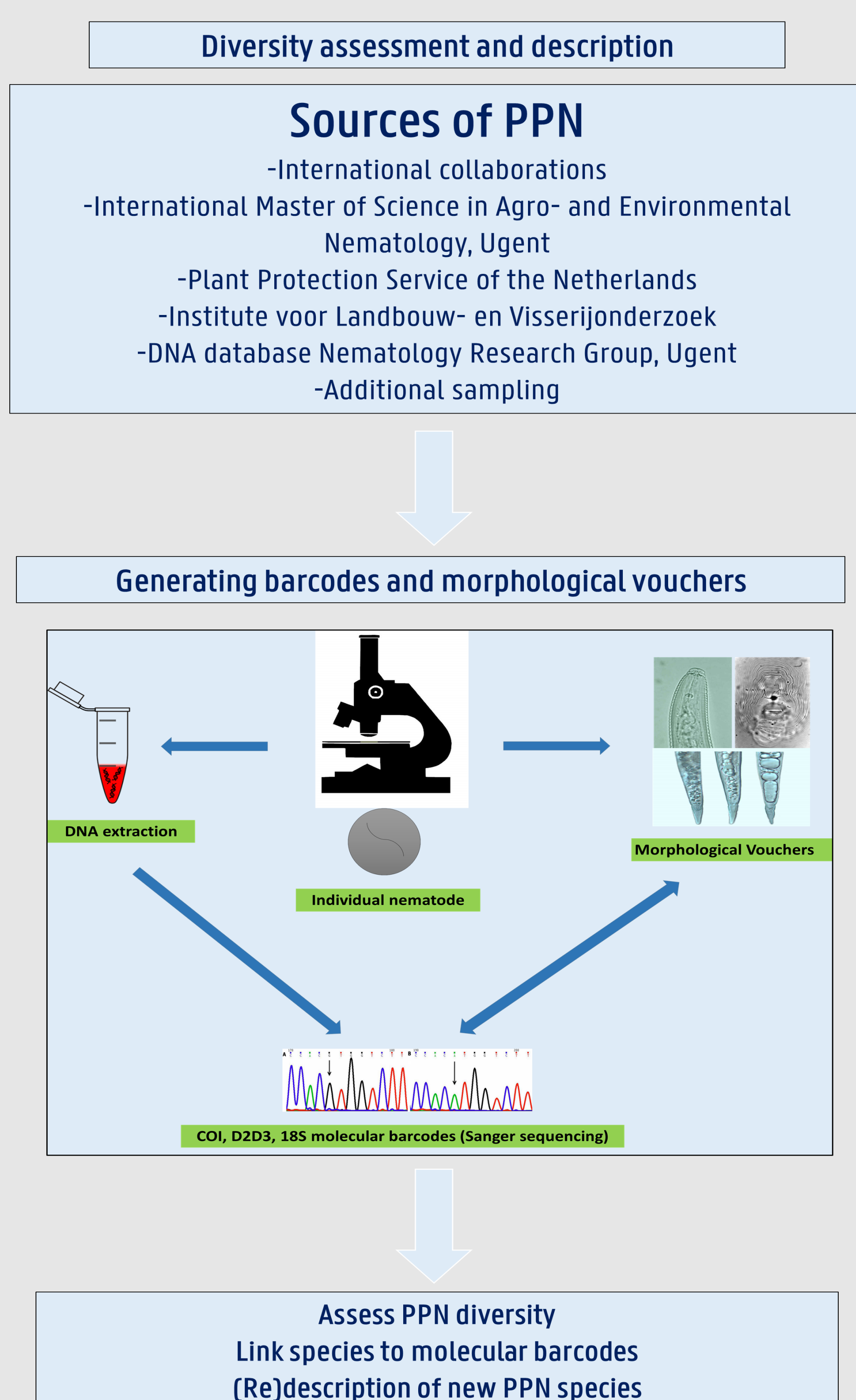


## NEMATOLOGY RESEARCH UNIT

Phougeishangbam Rolish Singh<sup>1</sup>, Ildephonse Niragire<sup>1</sup>, Beatrice Kashando<sup>1</sup>, Merlin K. Rumbarar<sup>1</sup>, Huu Tien Nguyen<sup>1</sup>, Marjolein Couvreur<sup>1</sup>, Wilfrida Decraemer<sup>1</sup>, Gerrit Karsen<sup>1,2</sup> and Wim Bert<sup>1</sup>  
<sup>1</sup>Nematology Research Unit, Department of Biology, University of Ghent, KL Ledeganckstraat 35, 9000 Gent, Belgium; <sup>2</sup>National Plant Protection Organization, Wageningen, the Netherlands.

# TAXONOMY AND BARCODING OF PLANT-PARASITIC NEMATODES

Many Plant-Parasitic Nematodes (PPN) around the world still remain undescribed and their diversity and Biology uncovered. Efficient management of PPN in crop fields requires their correct identification till species level. In combination with their morphological studies, molecular diagnostics of the PPN using rDNA markers have been popular. Recently, mitochondrial DNA markers specially the COI sequences have been gaining interest as they appear to provide more promising DNA barcodes for diagnostics. The following steps were carried out in this research to study diversity of PPN around the world and for generation of important sequence information of PPN for use as barcodes.

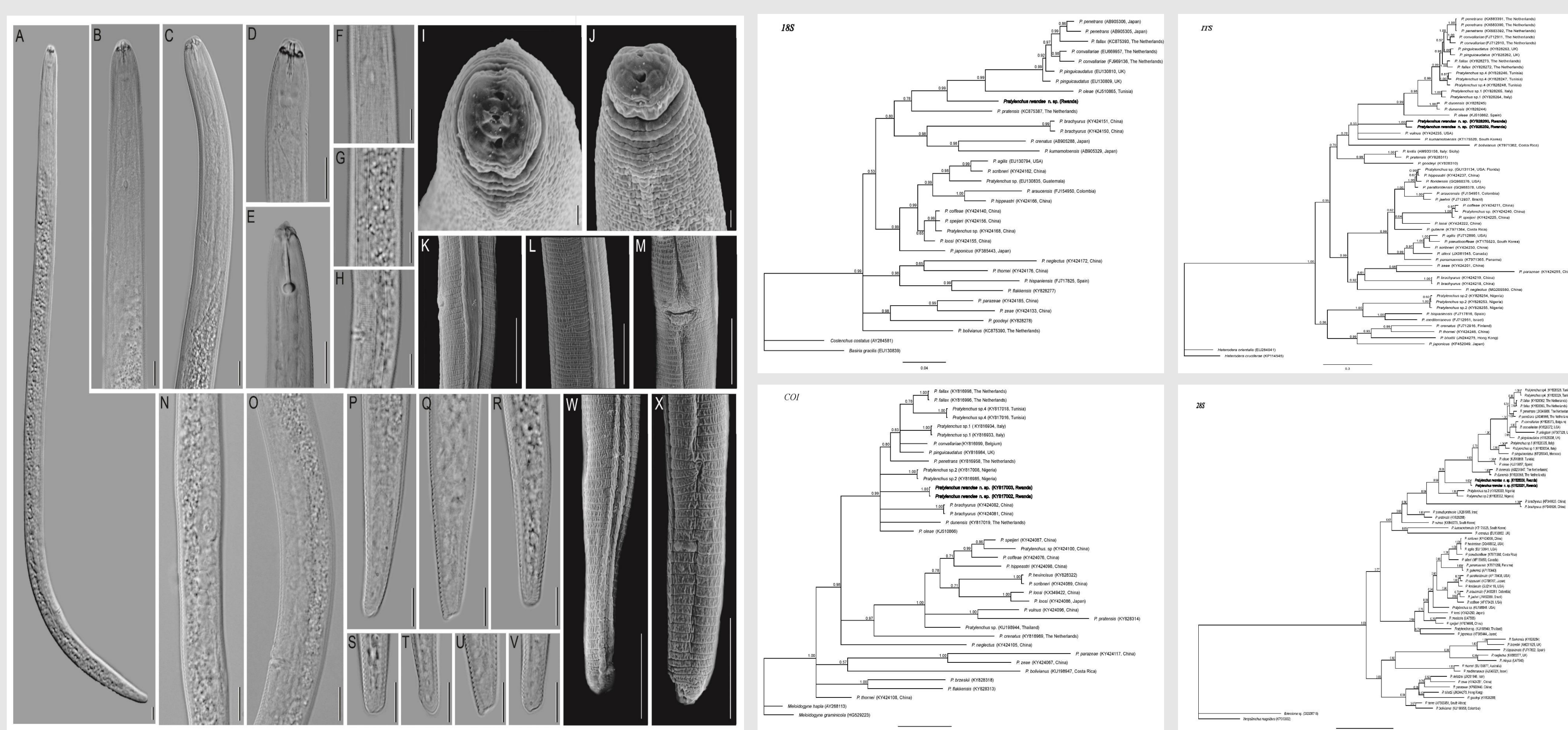


### Preliminary Results:

- Exploratory study of the diversity of PPN in different crop fields from four countries in 2018 resulted in a detection of some new plant-parasitic species along with first reports of several PPN species in these countries.
- Several new molecular sequence information of important PPN species have also been produced in this study: 17 COI, 21 D2D3, 12 ITS, 1 Nad5 and 1 18S new sequences.

Country	No. of soil samples	Associated crops	First record of PPN	New species of PPN	Sequence generated
Belgium	32	Banana, exotic herbs	<i>Meloidogybe incognita</i>	<i>Pratylenchus</i> n. sp., <i>Rotylenchus</i> n. sp., <i>Helicotylenchus</i> n. sp.	9 COI, 8 D2D3, 4 ITS, 1 Nad5
Indonesia	8	Banana, rice	<i>Criconebella</i> sp., <i>Ditylenchus</i> sp., <i>Tylenchorhynchus</i> sp. <i>Tylenchorhynchus agri</i> , <i>Rotylenchulus</i> sp., <i>Globodera</i> sp., <i>Meloidogyne</i> sp., <i>Helicotylenchus</i> sp.	<i>Hoplolaimus</i> n. sp., Unknown cystoid nematode	3 COI, 9 D2D3, 2 ITS
Rwanda	10	Potato, maize	<i>Meloidogyne hapla</i> , <i>Meloidogyne incognita</i> , <i>Rotylenchulus macrosoma</i>	<i>Pratylenchus rwandae</i>	1 COI, 1 D2D3, 1 ITS, 1 18S
Tanzania	12	Sugarcane	<i>Rotylenchulus parvus</i> , <i>Scutellonema conicephalum</i> , <i>Tylenchorhynchus ventrosignatus</i> , <i>Tylenchorhynchus crassicaudatus</i> , <i>Aphelenchus</i> sp., <i>Ditylenchus</i> sp.	-	4 COI, 3 D2D3, 5 ITS

- Example of comprehensive taxonomical description linked to molecular barcodes: Morphological and molecular characterization of *Pratylenchus rwandae* found parasitizing on maize in Rwanda (Singh *et al.*, 2018)



### Conclusions:

- New and first records of PPN associated with important crop plants are discovered.
- Work on generating potential DNA barcodes for easy PPN diagnostics are actively being carried out with special focus on COI mtDNA.
- In this study, about 50% of the PPN sequences originating from outside of Europe do not correspond to a known sequence in GenBank. Thus, linking comprehensive taxonomical "traditional" information to molecular barcodes is essential.

### Contact

Phougeishangbamrolish.singh@ugent.be  
 www.ugent.be

- Universiteit Gent
- @ugent
- Ghent University