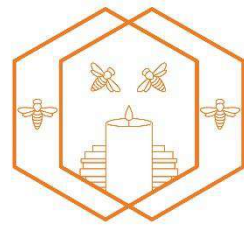




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The BeeBiome Data Portal: a web-based resource to facilitate bee microbiome studies by making data findable, accessible and reusable

Benjamin Dainat¹, Philipp Engel², Vincent Doublet³

- 1) Agroscope, Swiss Bee Research Centre, CH-3003 Bern, Switzerland
- 2) University of Lausanne, Switzerland
- 3) University of Ulm, Germany



APIMONDIA | Montréal,
8-12 September
2019

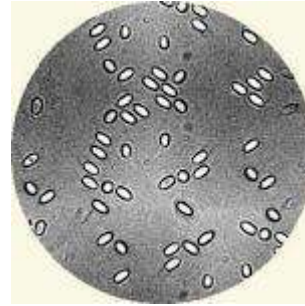
11.9.2019



MICROBIOME



Bacteria
=
Bacteriome



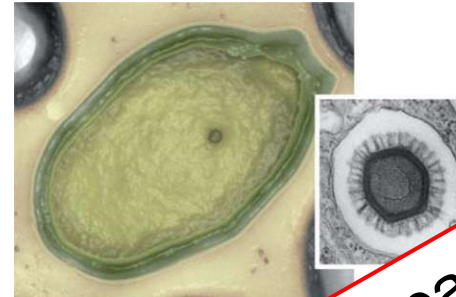
Fungi
=
fungome



algae



protists

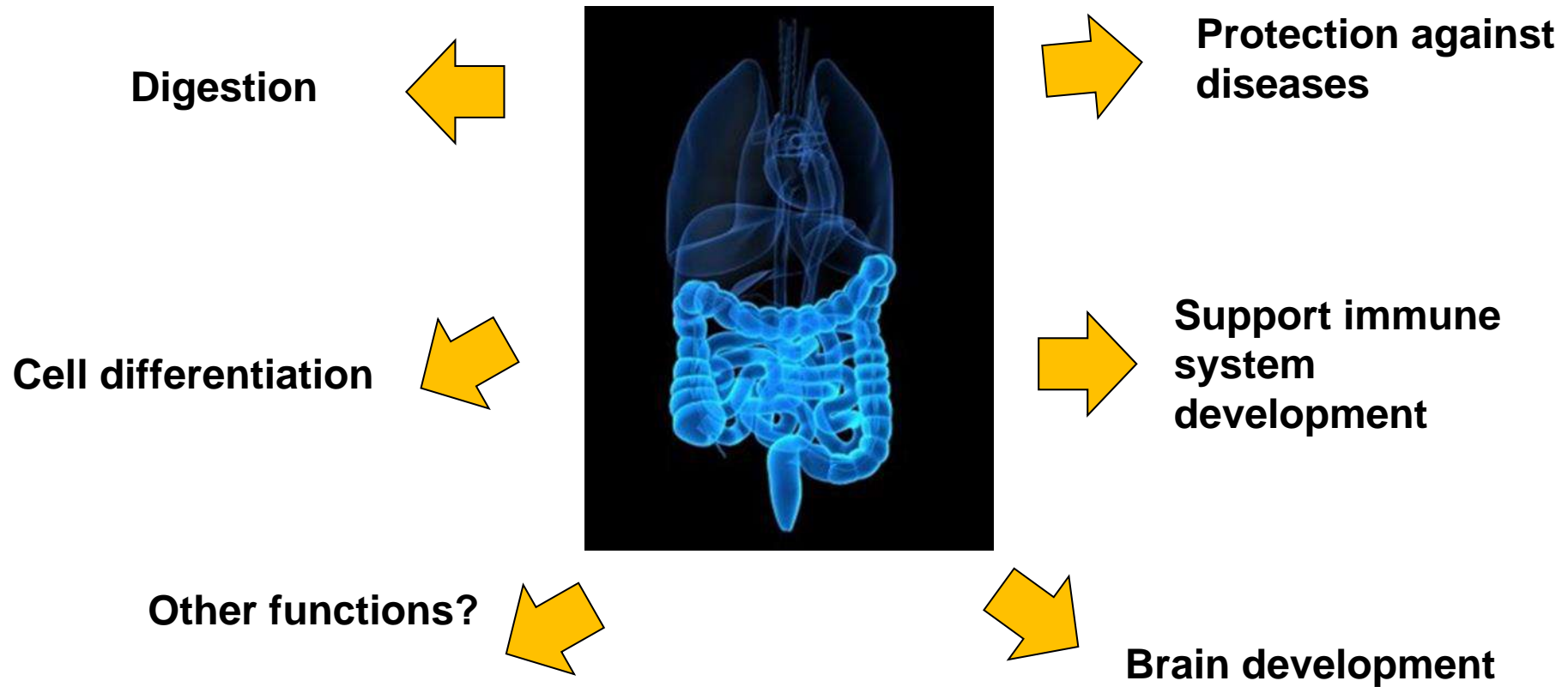


Viruses

No matter if parasitic,
mutalistic, or commensal
symbionts!

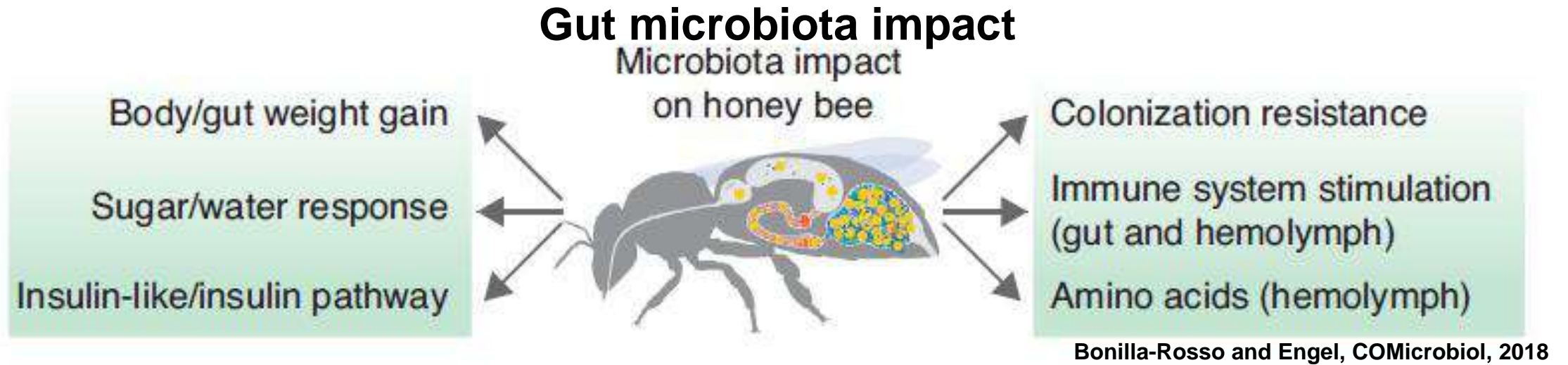


Microbiota functions in humans





And in honey bees?



- Digestion, nutrient provisioning, neutralization dietary toxins,
- host health



Problems in bee microbiome research

- Diversity of data formats, of repositories, of associated metadata making it difficult to search for sequences
- Cross-study analysis difficult
- Metagenomics seqs: no off-the-shelf bioinformatic analysis to get results
- No possibilities to track changes in microbiomes across time and space
- No place to centralize bee microbiome information (known microbes, terminology, taxonomy, all available sequence dataset)





The Beebiome consortium:

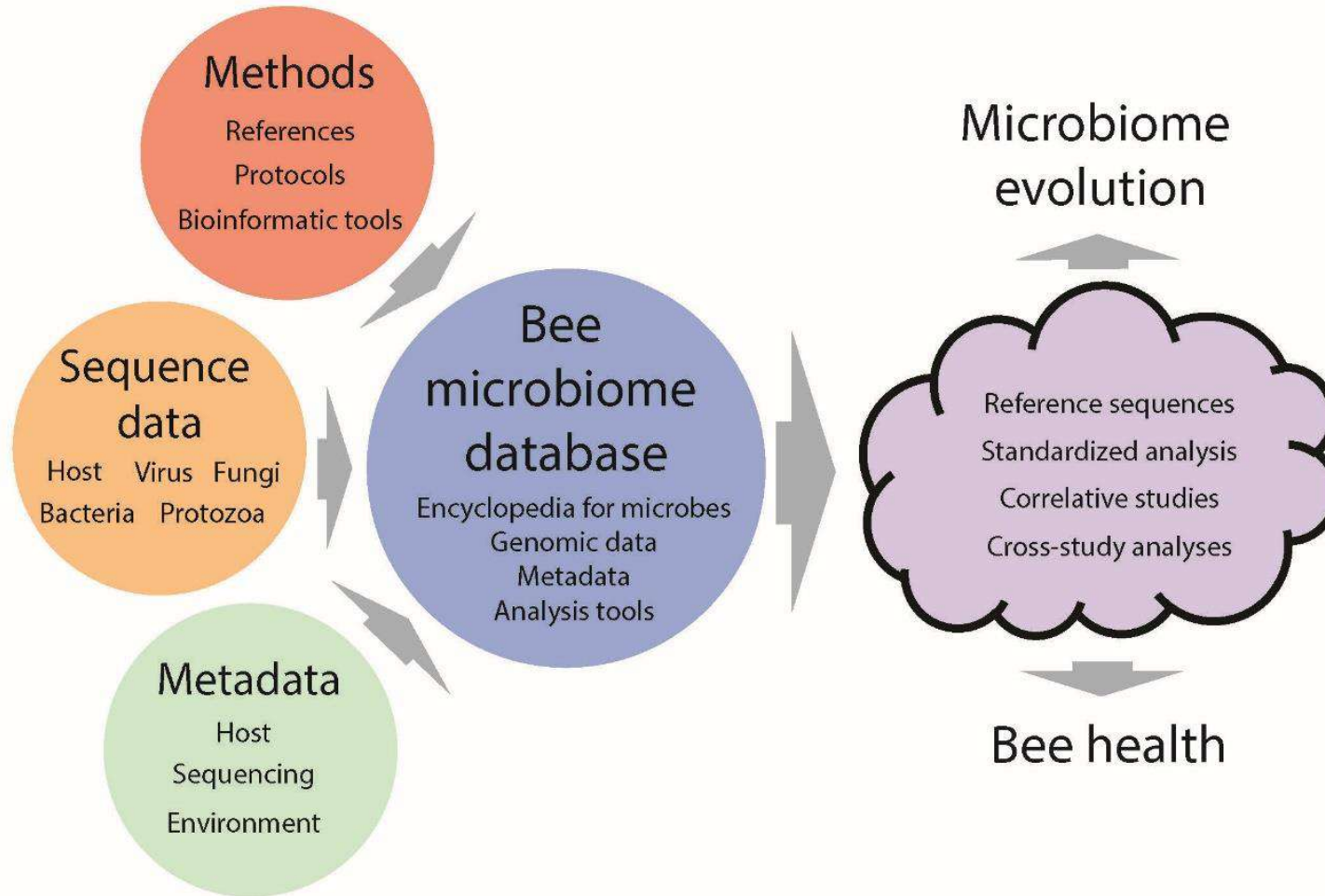


- Founded in 2014
- 40 members
- Our website
<https://wp.unil.ch/beebiome/>

Informal network of researchers with common interests



The consortium's aims





White paper publication summarizing our aims






(2016)

MINIREVIEW



The Bee Microbiome: Impact on Bee Health and Model for Evolution and Ecology of Host-Microbe Interactions

Philipp Engel,^a Waldan K. Kwong,^{b,c} Quinn McFrederick,^d Kirk E. Anderson,^e Seth Michael Barribeau,^f James Angus Chandler,^{g*} R. Scott Cornman,^h Jacques Dainat,ⁱ  Joachim R. de Miranda,^j Vincent Doublet,^{k,l} Olivier Emery,^a Jay D. Evans,^m Laurent Farinelli,ⁿ Michelle L. Flenniken,^o Fredrik Granberg,^p Juris A. Grasis,^q Laurent Gauthier,^{a,b} Juliette Hayer,^r Hauke Koch,^{c,s} Sarah Kocher,^t Vincent G. Martinson,^u Nancy Moran,^c Monica Munoz-Torres,^v Irene Newton,^w Robert J. Paxton,^{k,l} Eli Powell,^c Ben M. Sadd,^x Paul Schmid-Hempel,^y Regula Schmid-Hempel,^y  Se Jin Song,^z Ryan S. Schwarz,^m Dennis vanEngelsdorp,^{aa}  Benjamin Dainat^{ab,ac}



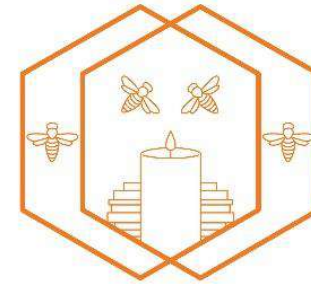
Which kind of questions the Beebiome Data portal will allow to answer to?

- How can I compare the gut microbiota of different bees?
- Is this virus present in other bee species?
- How can I diagnose all microbes at once in my sample?
- How can I check evolution over time and space of the microbiome composition at a country scale? Continent scale?



How are we working towards our aims?

By seeking funding:
Seed funding granted in 2019 by



Eva Crane Trust

By developing an online data-portal

With open access



By collaborating: University of Lausanne, Evolutionary Bioninformatics,
Prof Robinson-Rechavi



What happens now ?

- A programmer started to develop the dataportal in Sep. 2019
- Establishing contact with European Bioinformatic Institute EMBL-EBI  to facilitate mirroring of their seqs archive to our data portal
- We will look whether «Data generators» in our consortium and in the scientific community can help by sharing their metadata to flow in the portal
- We need to keep looking for funding



To summarize

We want to shift from a difficult microbiome research context



to an improved microbiome research context

OPEN
ACCESS



**Beebiome
Data
portal**



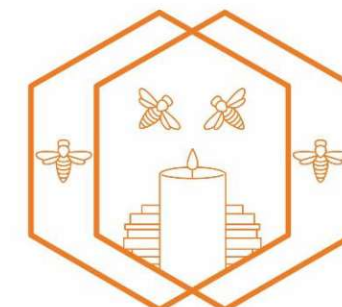


Thank you for your attention!

BeeBiome consortium <https://wp.unil.ch/beebiome/>

Twitter: @BeeMicrobiome

Thank you to the Eva Crane Trust for funding



Eva Crane Trust

Stay tuned for the next development of the Beebiome dataportal !