

Do bacteria and protozoa communicate with oxylipins?

At least their lipoxygenases are associated with multicellularity (what? yes!) and cross-kingdom pathogenicity



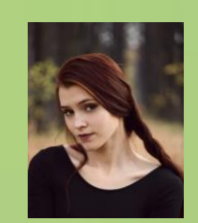
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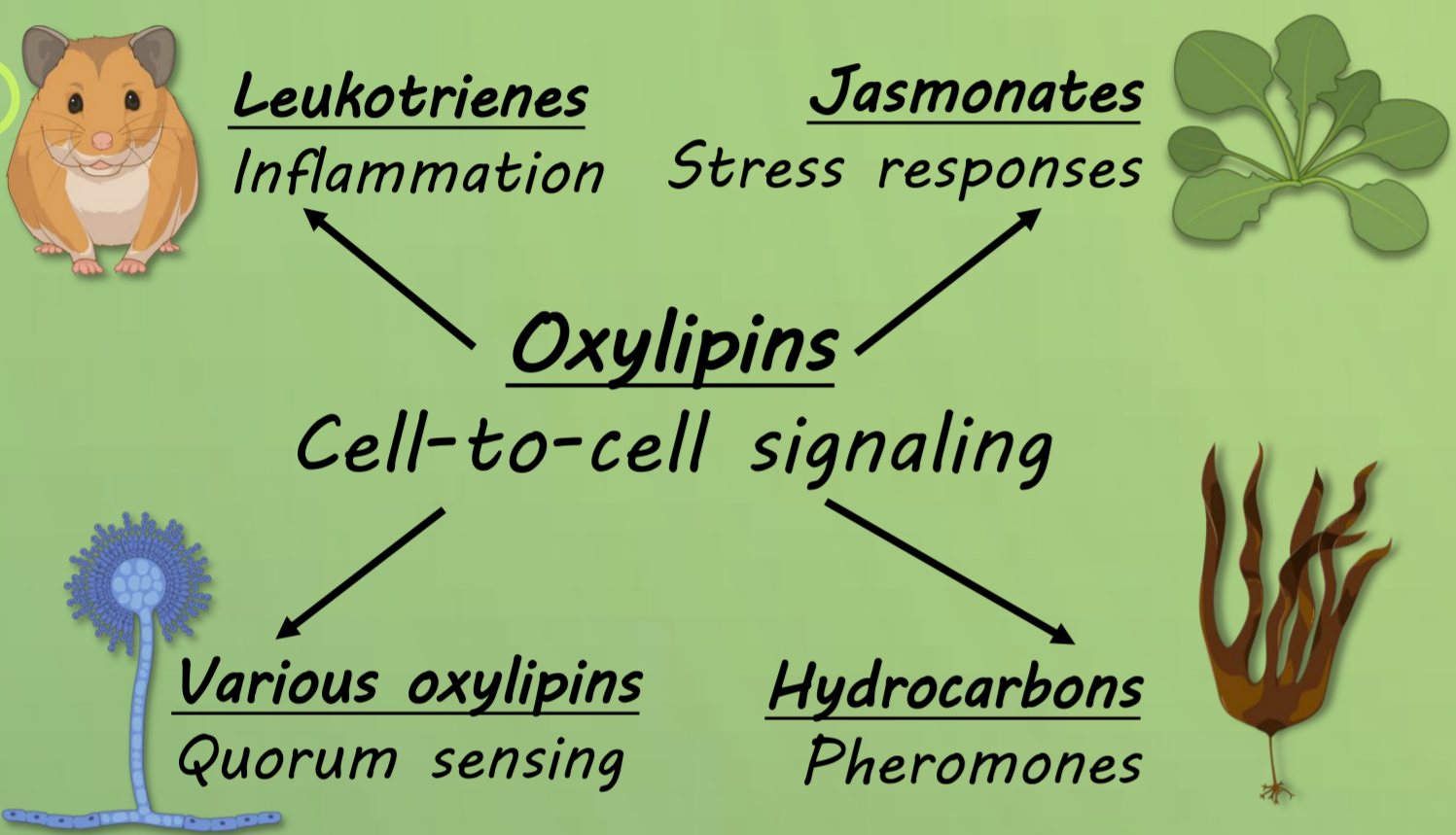


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Illustrated by
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Oxylipins are universal cell-to-cell signals across all multicellular eukaryotes



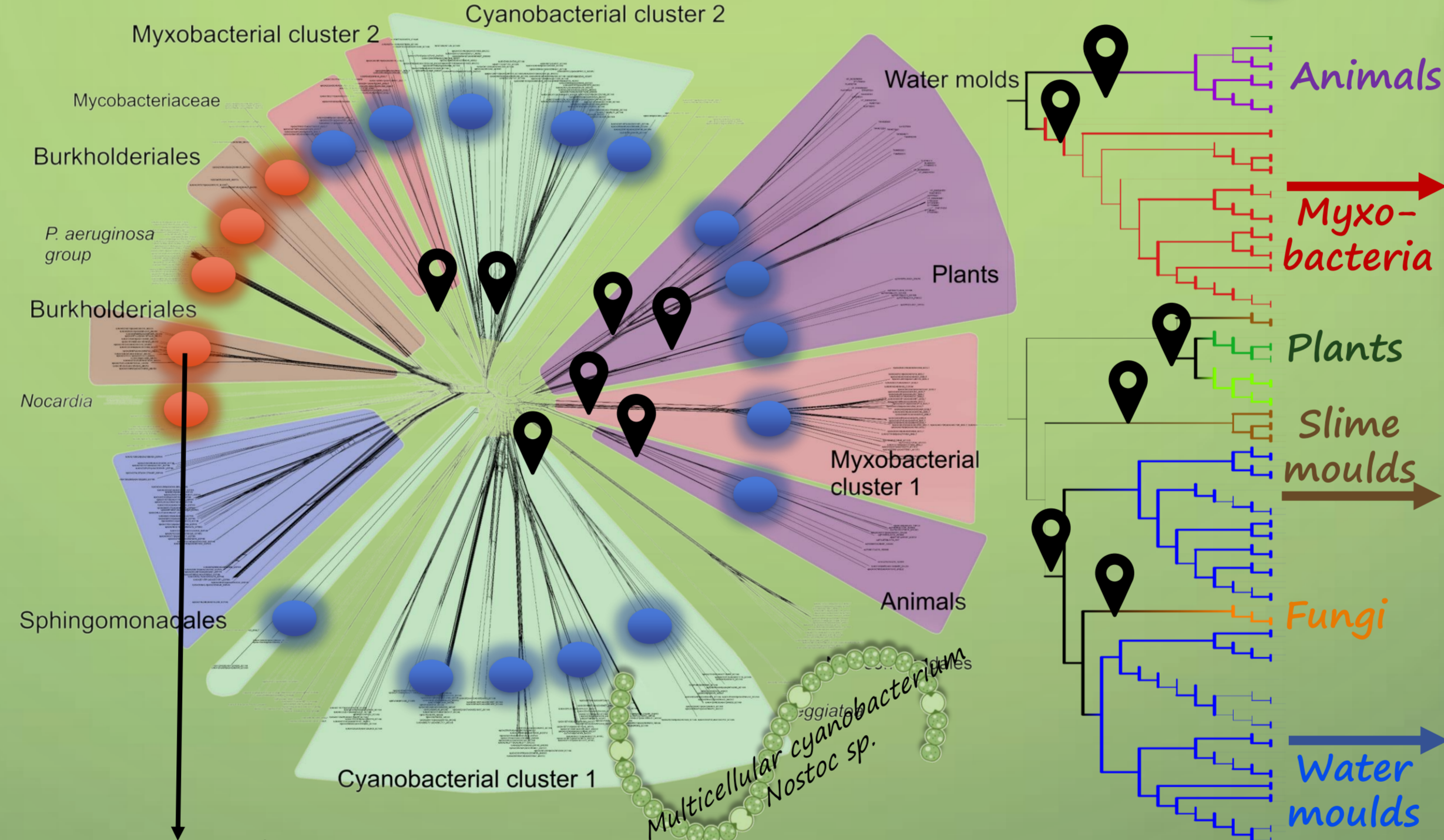
All oxylipins mentioned above are synthesized with the aid of **lipoxygenase (LOX)** enzyme. It is very conserved across animals, plants, algae and fungi

☹️ We know almost nothing about oxylipin functions in bacteria and protozoa

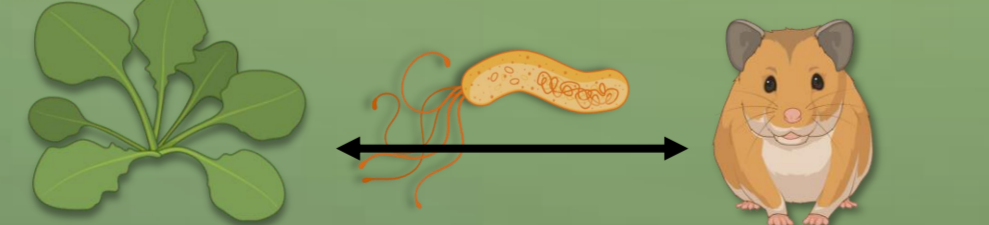
😊 But conserved lipoxygenases are a fair chance to "track" their evolution and functions by bioinformatic methods.
We have done it.

Our phylogenetic and statistical research was based on UniProt and NCBI data

Two associations on one phylogenetic network: **multicellularity** (blue dot) and **virulence** (red dot)



Pathogenic bacteria showing cross-kingdom pathogenicity



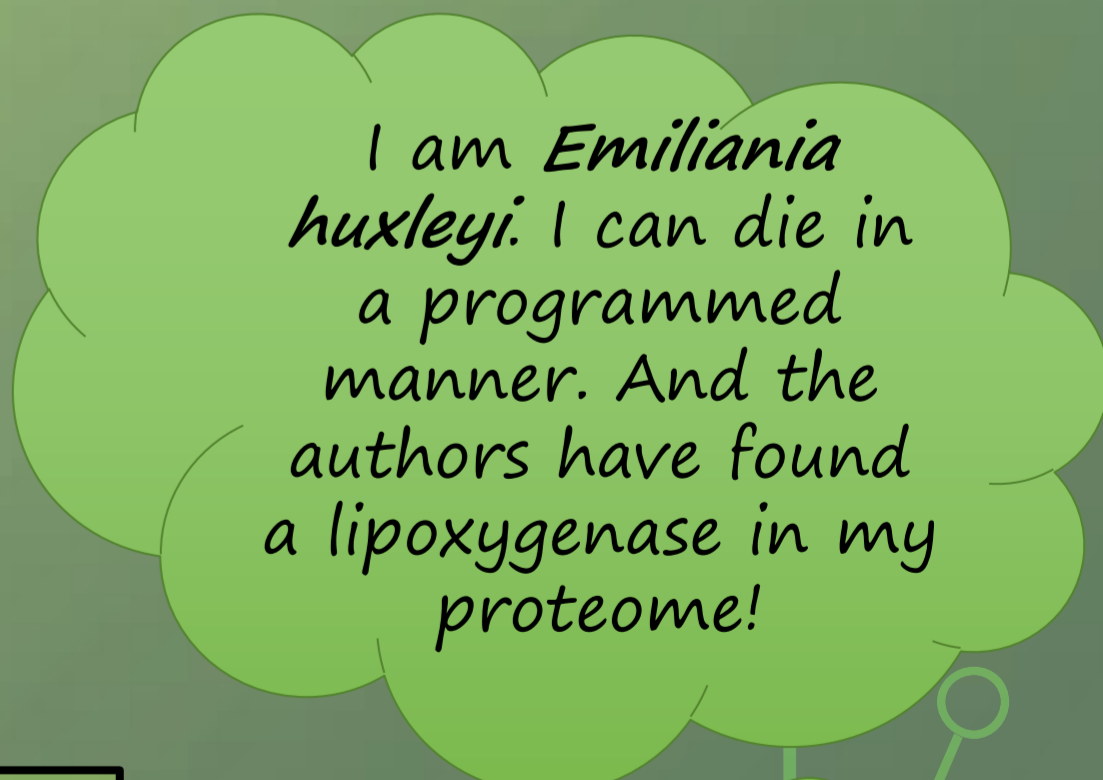
Oxylipins could provide cross-kingdom pathogenicity in bacteria

Lipoxygenases originated in bacteria
Their acquisition accompanied emergences of multicellularity (📍) (even in primitive forms)

Oxylipins could have contributed to the origin of multicellularity

Possible bacterial origin of LOXs and their association with multicellular bacterial taxa are strikingly similar to the evolutionary pattern of programmed cell death proteins, such as metacaspases (Nick Lane (2008), DOI: 10.1038/453583a)

This correlation works even in difficult cases!



Read our article!
DOI: 10.1134/50006297920090059

New publication is coming soon!

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