

BCCM/UCL, a public collection to preserve *ex-situ* cyanobacterial strains, including their marine diversity

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Conference 'Centre Interuniversitaire de Biologie Marine' (CIBIM)

A) BCCM-ULC culture collection of cyanobacteria

B) *Ex-situ* preservation of marine biodiversity

2 examples:

- blue-green travelers on loggerhead turtles' carapaces
- type strains of new marine taxa

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A) BCCM-ULC culture collection of cyanobacteria

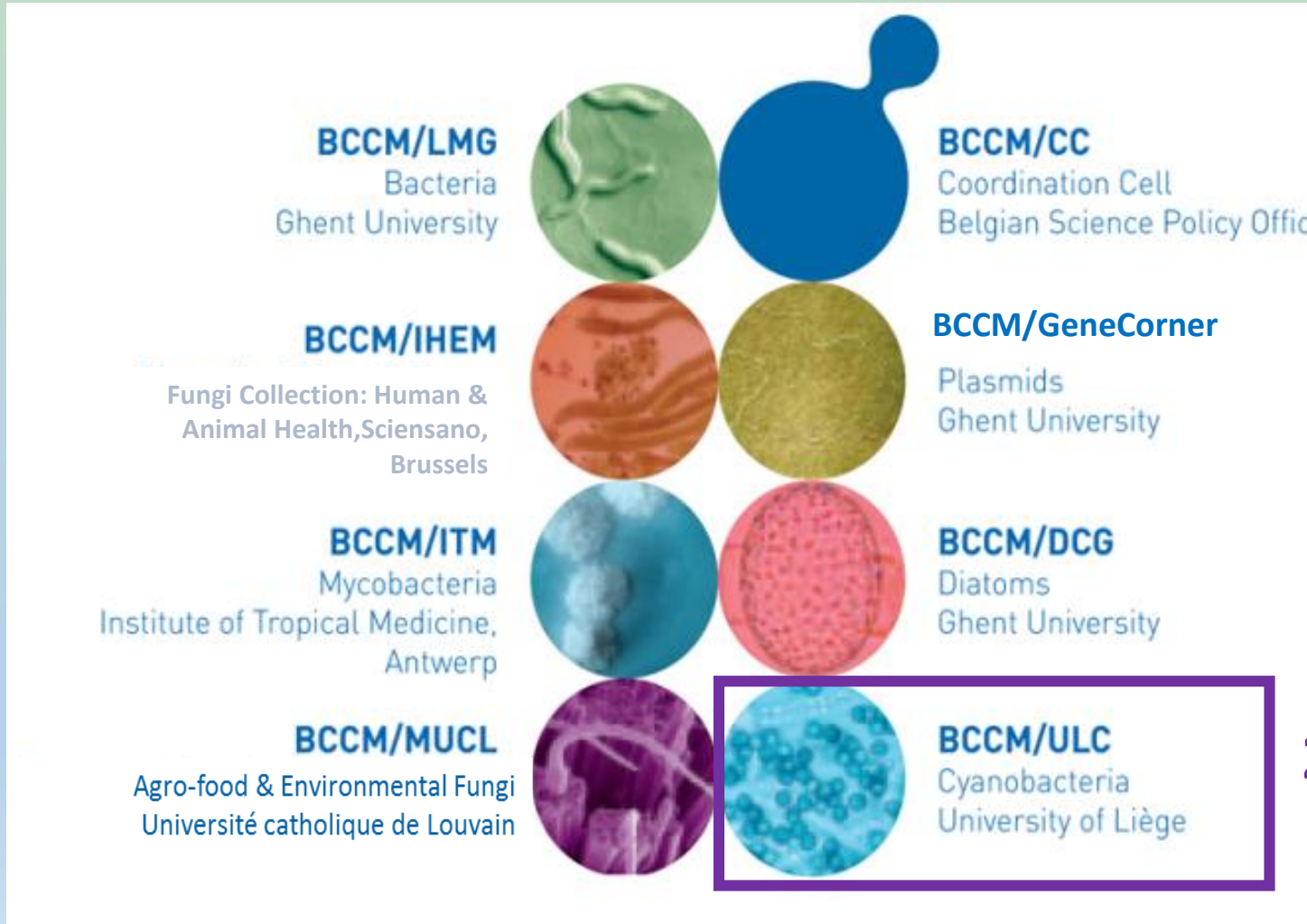
B) *Ex-situ* preservation of marine biodiversity

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A) The BCCM Consortium

7 decentralised culture collections, coordinated by a Central team at the Belgian Science Policy Office



<https://bccm.belspo.be/>

2011



Culture collections are important because

« we publish and then, we move labs, we change jobs,
or we perish »

**Therefore, important biological material and related
information might be lost forever.**

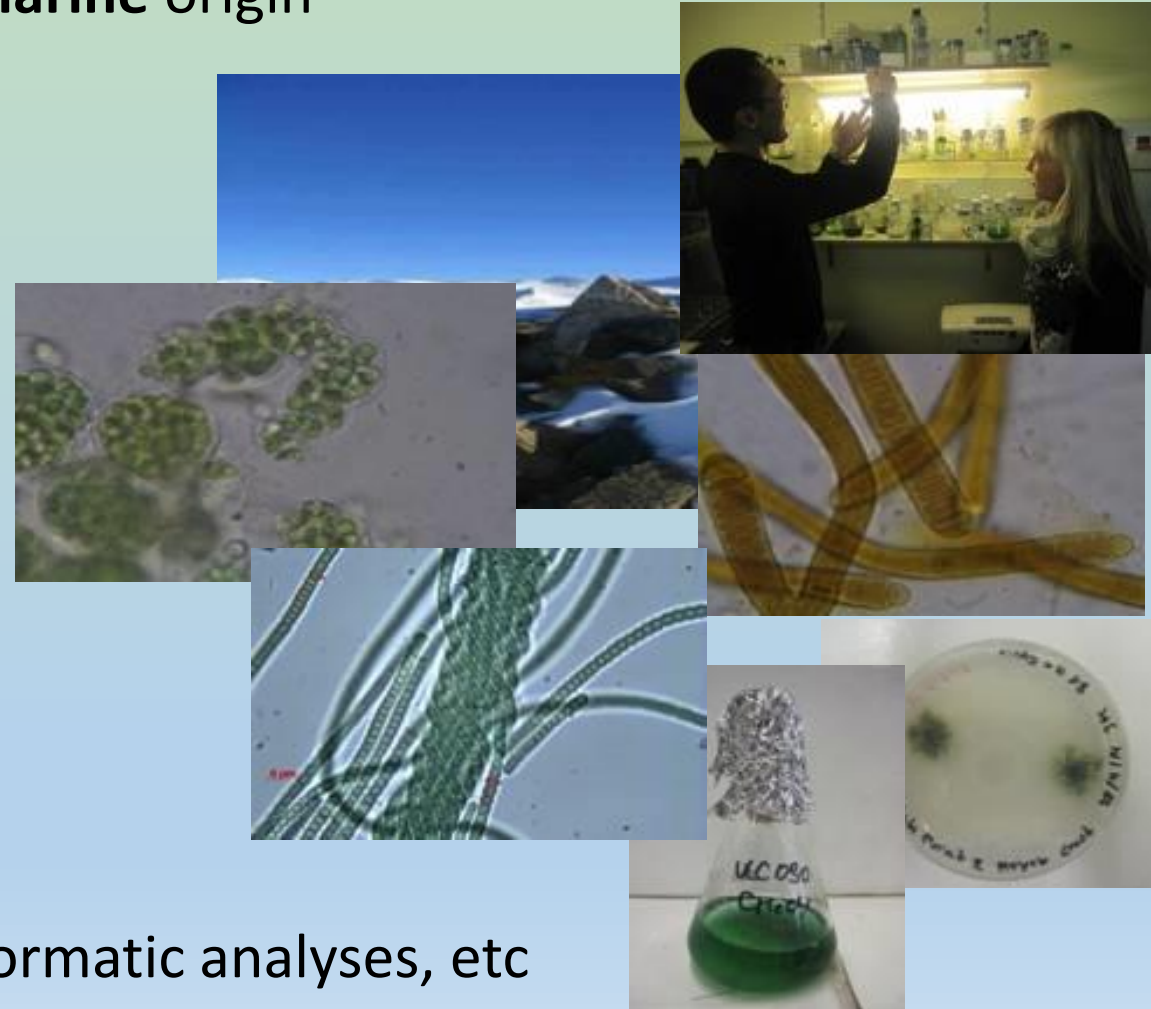
Hi Annick,

Unfortunately I don't have them either in the move to _____h about
five years ago I think they did not move over.

Sorry about that...

BCCM/ULC public collection of cyanobacteria

- > 400 unicyanobacterial strains, of which 85 of **marine** origin
- **ISO 9001** certification for deposit, safe deposit, and distribution services
- **Geographic focus** : cyanobacteria from a large variety of biotopes
- **Taxonomic focus** : obtain type strains, representative biodiversity, biotechnologically interesting strains, ...
- **Paid services** like trainings, identifications, bioinformatic analyses, etc



Diversity of BCCM/ULC strains

Identification of strains by **morphology** and **molecular characterization** (**16S rRNA and ITS sequencing**)

53 genera

More than 90 OTUs (99% 16S rRNA similarity)

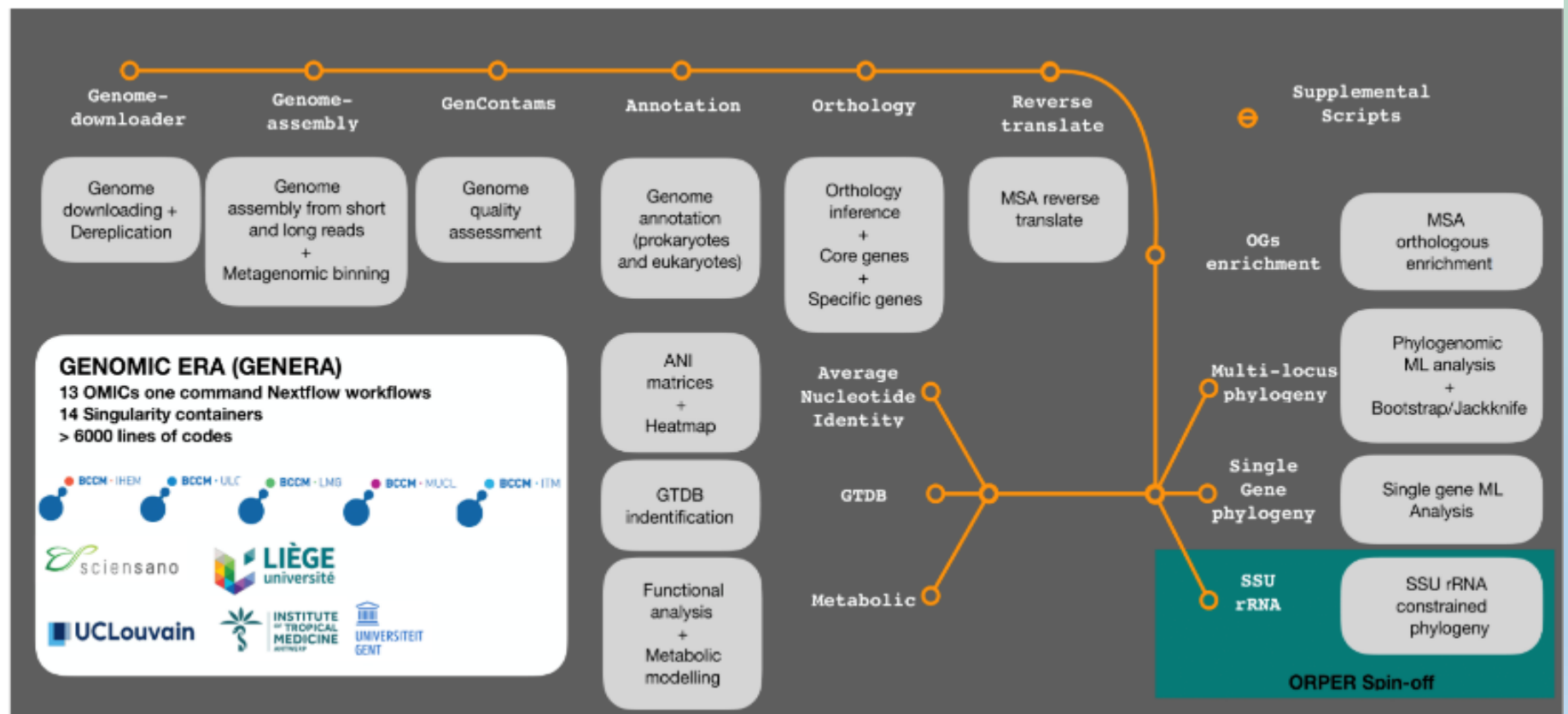
12 genomes in progress

22 cyanobacterial 'type' (reference) strains

GEN-ERA workflows for genome sequencing

Unified and reproducible workflows for research in microbial genomics
Nextflow workflows are launched by a **single command** and based on **Singularity** containers to increase reproducibility

Collaboration:
Prof. Denis Baurain
InBios-Phylogenomics



<https://github.com/Lcornet/GENERA>

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2 examples:

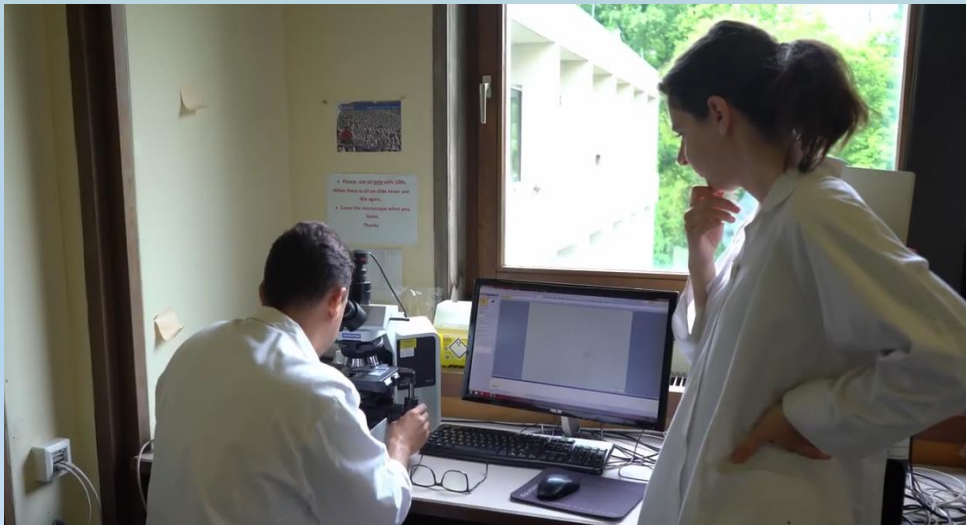
- blue-green travelers on loggerhead turtles' carapaces
- type strains of new marine taxa



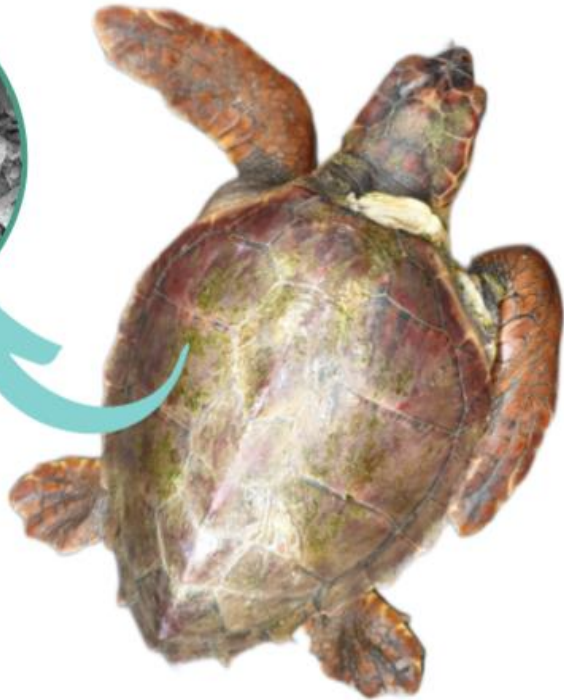
B) Ex-situ preservation of marine biodiversity

BLUE-GREEN TRAVELERS: CULTIVATION OF CYANOBACTERIA ASSOCIATED WITH SEA TURTLES

2-month training of Lucija Kanjer, Zagreb University, Croatia



SEM of biofilm sample

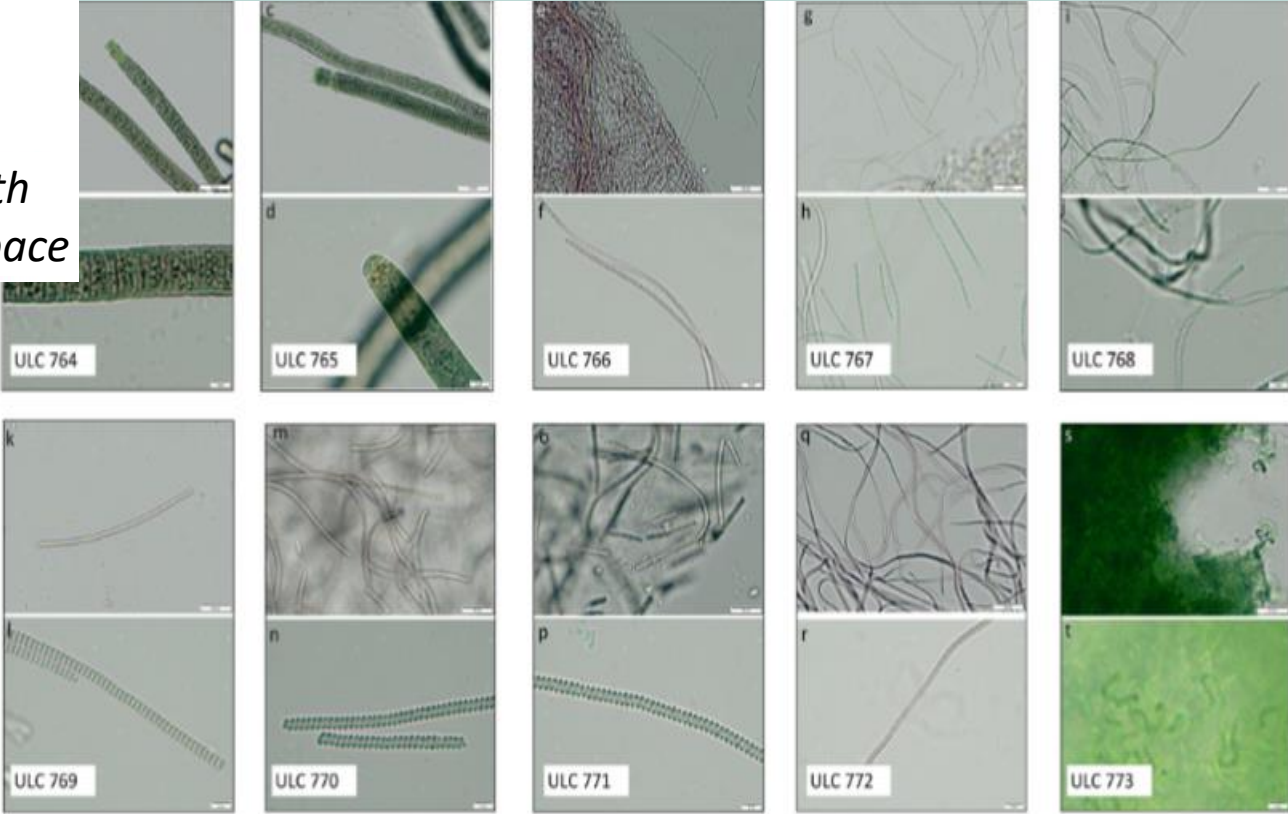


Loggerhead sea turtle with green biofilm on its carapace

- 10 isolated cyanobacterial strains
- morphological characterisation
- deposited into Public Collection BCCM/ULC of cyanobacterial strains (Liège, Belgium)
- isolated 16S-ITS sequences
- strain ULC772 (Cy015) had the genetic potential for microcystin production

BLUE-GREEN TRAVELERS: CULTIVATION OF CYANOBACTERIA ASSOCIATED WITH SEA TURTLES

Microphotographs of strains isolated



ULC 773	<i>Leptolyngbya</i> sp.
ULC 772	<i>Leptolyngbya</i> sp.
ULC 771	<i>Spirulina</i> sp.
ULC 770	<i>Spirulina</i> sp.
ULC 769	<i>Spirulina</i> sp.
ULC 768	<i>Leptolyngbya</i> sp.
ULC 767	<i>Leptolyngbya</i> sp.
ULC 766	<i>Pseudanabaena</i> sp.
ULC 765	<i>Lyngbya</i> sp.
ULC 764	<i>Lyngbya</i> sp.

B) Ex-situ preservation of marine biodiversity

TYPE STRAINS OF NEW MARINE TAXA

Ophiophycus aerugineus

Leptochromothrix engenei

Leptochromothrix valpauliae

Capilliphycus guerandensis

Johannesbaptistia floridana

Tigrinifilum gueradense

Tigrinifilum floridanum

Vermifilum ionodolium

Affixifilum floridanum



Prof. Dail Haywood
Laughinghouse,



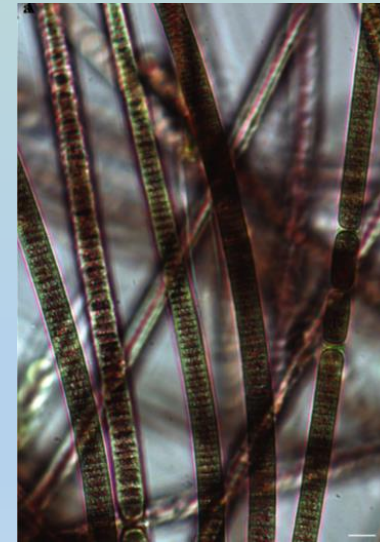
Dr David E.
Berthold,
University of
Florida, USA



Tigrinifilum floridanum gen. et sp. nov.
Scale bar: 50 μm (Berthold et al. 2022)



Johannesbaptistia floridana sp. nov.
Scale bar: 20 μm (Berthold et al. 2020)



Affixifilum floridanum gen. et sp. nov.
Scale bar: 10 μm (Lefler et al. 2021)



Thanks for your attention!

Dr Annick Wilmotte (awilmotte@uliege.be)

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