



## **Water - The Greatest Global Challenge**

ATWARM International Conference 2013  
May 14th - 16th 2013 | Dublin City University



# **Session 2:**

# **Water & Wastewater Treatment**

Michael Larkin



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### SPEAKERS:

Joe Higgins, Veolia Water Ireland

***Technical development priorities in water Industry***

Darragh Hobbs, Queen's University Belfast

***Phosphorus removal & recovery***

Ciprian Briciu, Dublin City University

***Faecal matter sensor development – marine & freshwater***

Carlo Pozza, University of Duisburg-Essen

***Microalgae and nutrient removal in wastewater***

Yoann Glocheux, Queen's University Belfast

***Arsenic removal using dolomites/laterite***



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# **Shining a light in the “black box”**

# Water - The Greatest Global Challenge

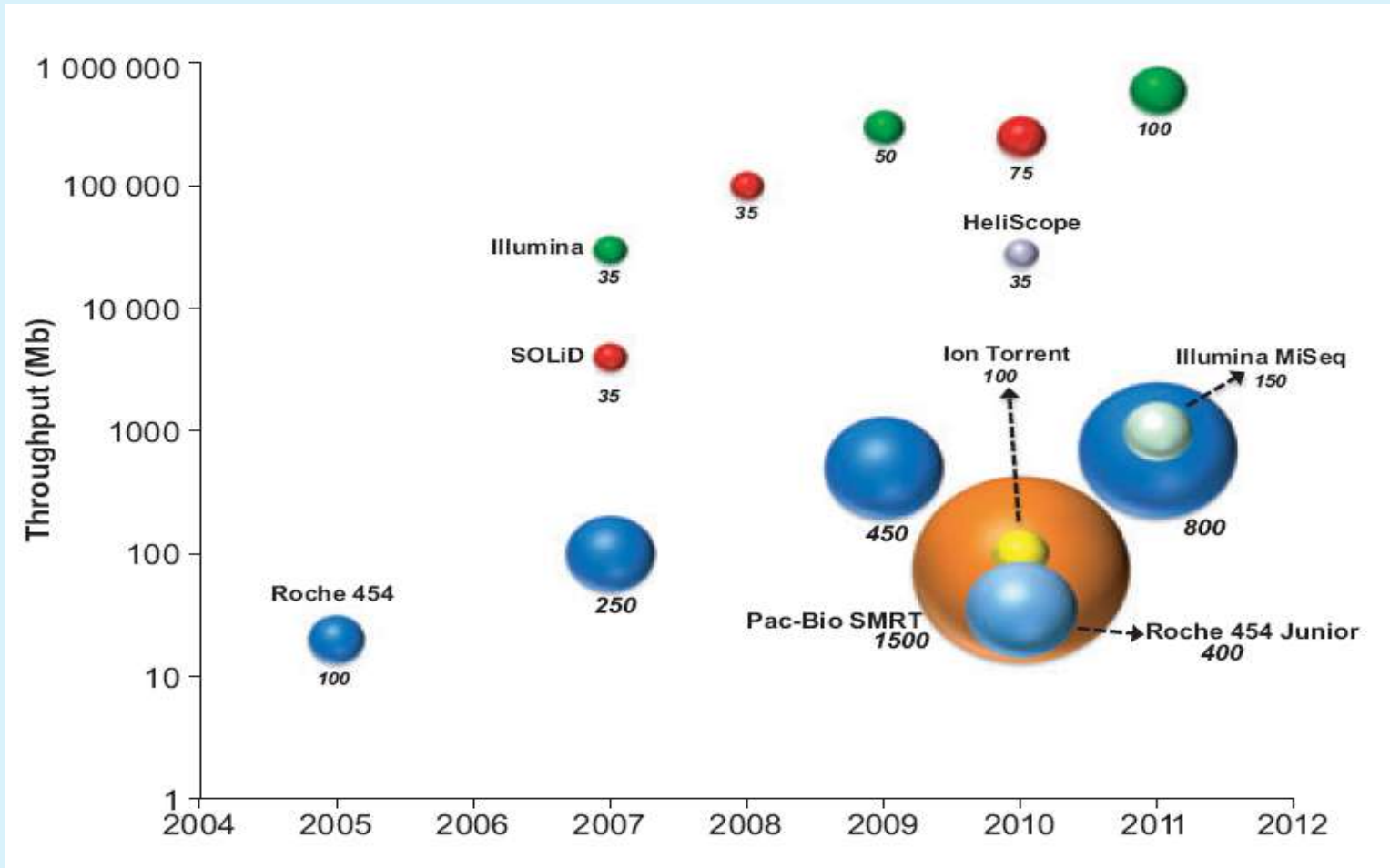
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## The BLACK Box

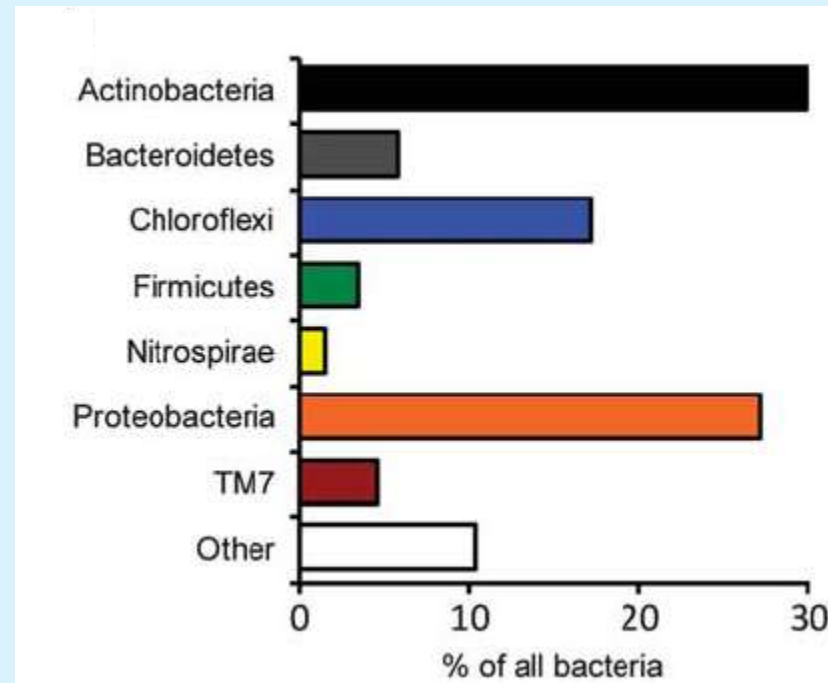
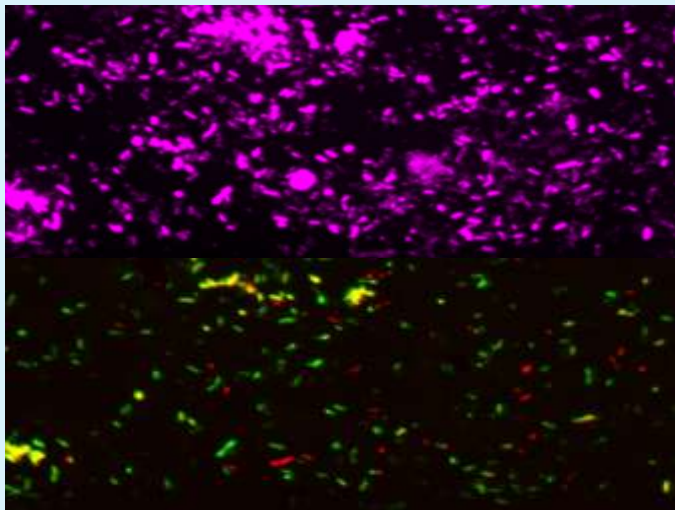


# The power of sequencing technologies



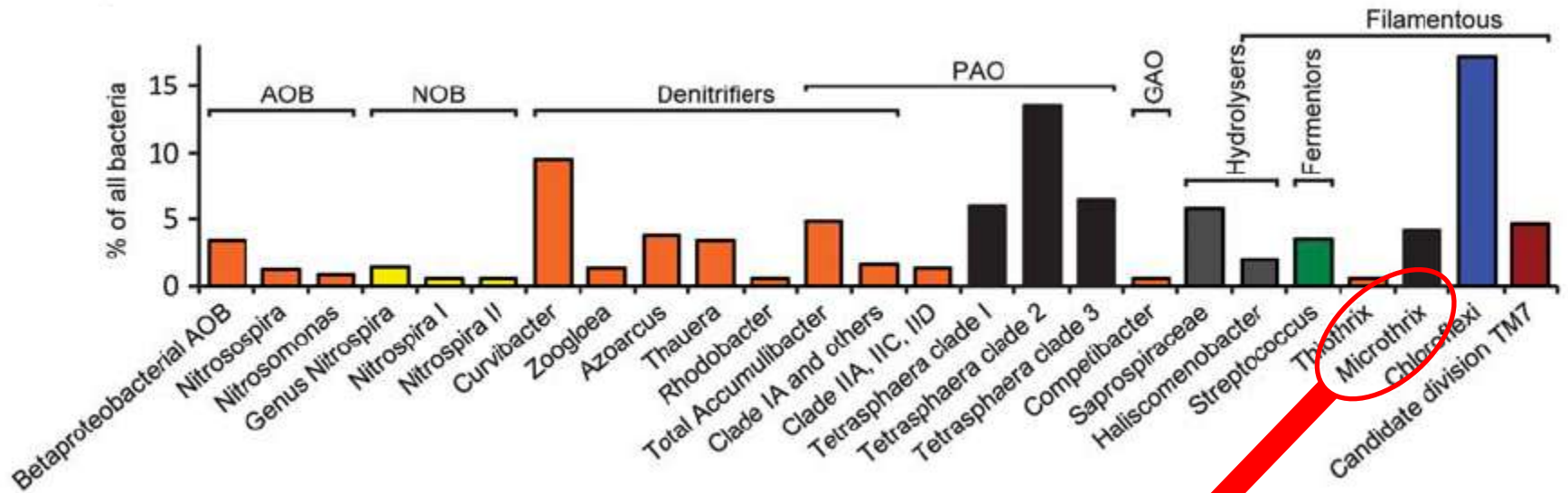
From: Shokralla, S., Spall, J. I. and Gibson, J. F. and Hajibabaei, M. (2012) Next-generation sequencing technologies for environmental DNA research. *Molecular Ecology*. 21, 1794–1805.

# Analysis of bacteria in activated sludge

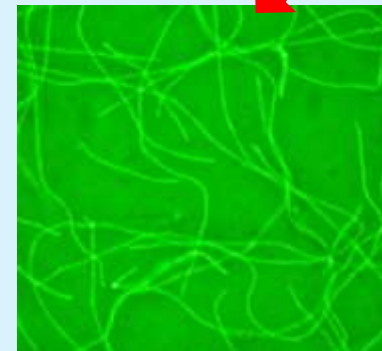


Albertsen, M., Benedicte, L., Hansen, S., Saunders, A. M., Nielsen, P. H. and Nielsen, K.L. (2012) A metagenome of a full-scale microbial community carrying out enhanced biological phosphorus removal. *The ISME Journal*. 6, 1094–1106.

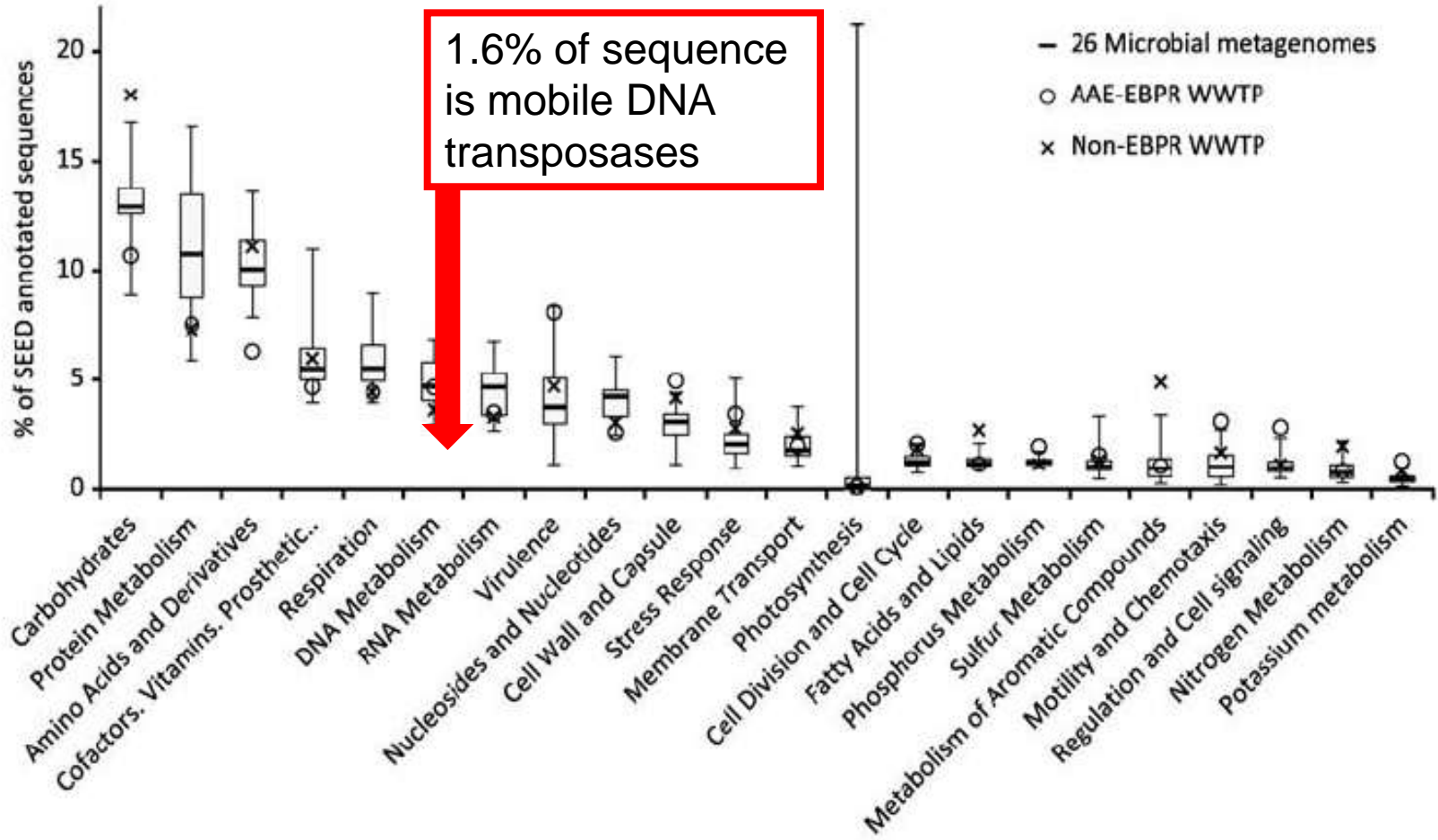
# The complete microbial community



AOB, ammonia-oxidizing bacteria;  
 GAO, glycogen-accumulating organism;  
 NOB, nitrite-oxidizing bacteria;  
 PAO, polyphosphate-accumulating organism.



# Metabolic pathways represented





## The GREY Box

