

# The Evolution of Multicellular Complexity

**Tomislav Domazet-Lošo**

Associate professor, Department for Molecular Biology  
Ruđer Bošković Institute and  
Catholic University of Croatia, Zagreb, Croatia



**17. 12. 2018. u 13:00 sati**

O- 269, Department of Biotechnology  
University of Rijeka, R. Matejčić 2

Host: Predrag Šustar and Igor Jurak  
Project: ThUMB, HRZZ-IP-2018-01-3378

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## **The Evolution of Multicellular Complexity**

**Izv. prof. dr. sc. Tomislav Domazet-Lošo**

### **Abstract**

The evolutionary life cycle of genes is powered by the process of gene birth and death. This mechanism directly impacts the genome content by generating gains and losses of entire gene families; a process whose dynamics within the phylogeny of eukaryotes is largely unclear. To trace gene family gain-and-loss profiles one can in principle use phylostratigraphic approach. In this talk, I will show how we get a comprehensive and synchronized estimate of gene family gain-and-loss events across phylogeny of eukaryotes using hundreds of eukaryotic and prokaryotic genomes. These results allowed us to estimate rates of gene family turnover in evolutionary time and to reconstruct the ancestral genomes at critical points of multicellular evolution. To achieve these goals, we deployed novel computational strategy within the phylostratigraphic framework. Our next step is to link the gain-and-loss patterns to the evolution of phenotypes