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TEMASEK LIFESCIENCES LABORATORY

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19 May 2023 (Fri), 4pm
Seminar Rm 05-41 (Level 5)

Hosted by: Dr Zhang Dan

1+1=1 The formula of zygotic specification

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Despite extensive conservation of sexual reproduction, very little is known on how gametes switch fate to become zygotes in unicellular organisms. In this talk, I will present our results that identify striking similarities between zygotes of higher eukaryotes and fission yeast, which we now use to study conserved developmental principles. Firstly, I will show how selection for rapid zygotic activation led fission yeast to evolve asymmetries between parental genomes and parent-of-origin effects that are typical in mammals and angiosperms. Furthermore, I will show that early development in fungi, as in animals, does not require massive changes in transcription – instead, development relies on factors deposited in one of the gametes before fertilization. Finally, I will show our data that supports an emerging model that changes in the RNA processing, and not transcription, drive the transition of gametes into zygotes. Our work establishes a fungal model system to study zygotic fate establishment.

After undergraduate studies at University of Belgrade in Serbia, Dr Aleksandar obtained a PhD from the National University of Singapore under mentorship of Snezhana Oliferenko at the Temasek Life Sciences Laboratory . He then moved to Sophie Martin's group where he discovered how fungal zygotes prevent re-fertilization. Currently he is an Assistant Professor at the University of Lausanne in Switzerland and continues to study the mechanisms of zygotic specification and development.

Recent Publications:

1. Gamete fusion triggers bipartite transcription factor assembly to block re-fertilization. **Vještica A**, Merlini L, Nkosi PJ, Martin SG. Nature. 2018. 560(7718):397-400
2. Cell cycle-dependent and independent mating blocks ensure fungal zygote survival and ploidy maintenance. **Vještica A**, Bérard M, Liu G, Merlini L, Nkosi PJ, and Martin SG. PLoS Biol. 2021 Jan 6;19(1):e3001067
3. Optogenetics reveals Cdc42 local activation by scaffold-mediated positive feedback and Ras GTPase. Lamas I, Merlini L, **Vještica A**, Vincenzetti V, Martin SG. PLOS Biol. 2020;18(1):e3000600.