Project Proposal

Project Description (*max 500 words*)

Cybergenetics deals with the application of Engineering to Biology to build "biological circuits" to enable novel functions in the cells for a variety of biomedical and biotechnological applications [https://sites.google.com/site/dibernardogroup/cdc2019-tutorial]. Within the context of cybergenetics, the aim of this project is to design, model and build an engineered budding yeast strain able to spontaneously self-synchronise its cell cycle so that all of the cells will bud at the same time. If successful, it will be the first demonstration of a unicellular organism engineered to behave as a multicellular organism and paving the way for engineering more complex collective behaviours.
The project will make use of techniques such as optogenetics and microfluidics [1–3] in addition to control engineering and synthetic biology[4] approaches (http:\\dibernardo.tigem.it).

Supervisor(s), Lab/Group details, other additional info.
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References

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2. Perrino, G., Fiore, D., Napolitano, S., di Bernardo, M. & Di Bernardo, D. Towards feedback control of the cell-cycle across a population of yeast cells. in *European Control Conference* (2019).
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