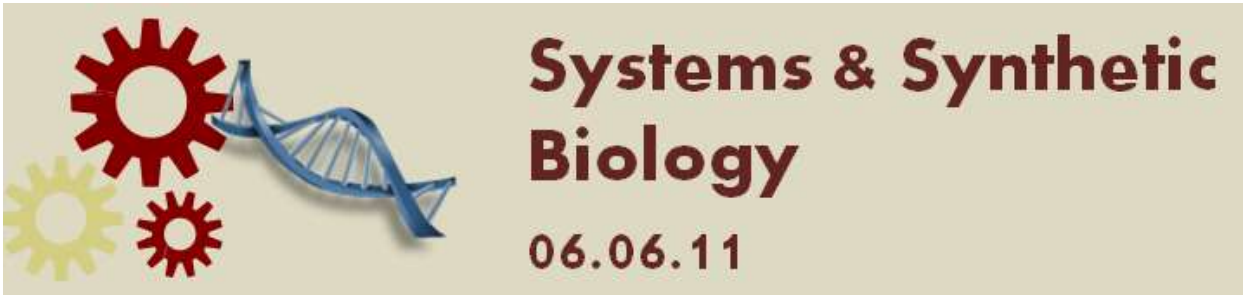
FIFTH ANNUAL WORKSHOP ON THE BUSINESS-GOVERNMENT INTERFACE



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Title: SYNBIOBACTHER – Engineering "therapeutic" bacteria

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Abstract (200 words)

Over 1.2 million persons will be diagnosed with breast cancer worldwide per year. Ultrasound treatment is not always successful, as sometimes it just heats the tumour without destroying it. If it would be possible to link this treatment with the expression/release of a therapeutic agent, the joint effect could be more effective. Some efforts have been made in this direction, although to date the results have not been very encouraging; potential reasons include lack of precise control over administration of the drug. Therefore, the purpose of this project is to overcome this barrier through the use of synthetic biology strategies to engineer a model bacterium to trigger release of a therapeutic agent concurrent with ultrasound treatment.
The specific plan is to engineer the existing heat shock response machinery from *Escherichia coli* to trigger the synthesis and release of curcumin *in situ*. Curcumin has an anti-proliferative capability and an anticarcinogenic and chemopreventive effect. Although curcumin has some attractive properties as a novel drug, it has a poor bioavailability, requiring repetitive oral doses to achieve sufficient concentration inside the cells for therapeutic activity. Hence, the possibility of synthesizing curcumin *in situ* in a controlled way, as proposed in this project, provides a powerful alternative.