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Synthetic biology manipulations in 3D printed wet-ware

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In our laboratory we have been developing new approaches to discover the 'transition-to-evolvability' in chemistry. This is because if we can discover or engineer an abiotic system that can evolve (we could define this as an inorganic chemical cell -iCHELL) we might be able to suggest that synthetic biology can exist in many chemical forms, of which the terrestrial biology found on planet earth is one subset. It could even help us establish the idea that evolvability is the key signature that defines living from non-living systems. This problem is rather vast since our aim is to compress a planet sized reaction vessel and a 400 M year run-time into a laboratory over a few years! Not only does this extraordinary problem require new radical chemical approaches[1], it also requires the development of some radical new technological solutions[2-3]. In this talk I will cover both aspects with an emphasis on how some of our new approaches can be applied to both 'inorganic' and 'organic' synthetic biology with a special emphasis on rapid fabrication of systems for synthetic biology that allows the 'plug and play' of synthetic biology in new fluidic formats, see Figure [1-2].

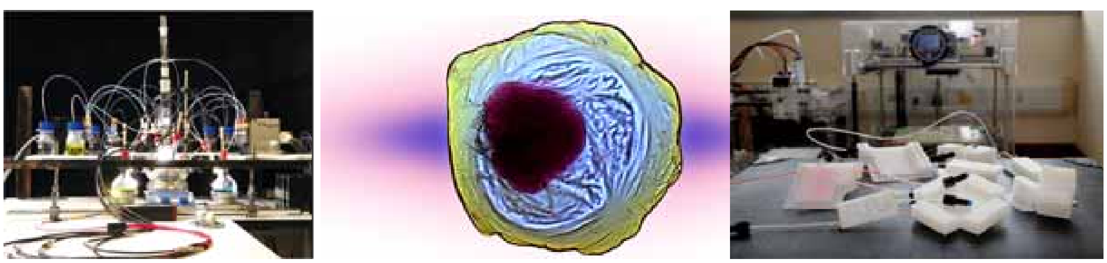

Figure. Images depicting our different approaches and technologies required for our quest: Networks, iCHELLs and 3D printing of chemical reactionware and biochemical bioware.

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