



Evonetix partner with LioniX International to enable DNA synthesis at scale

- *Collaboration will focus on the development of a bespoke silicon array to enable high-throughput production of high-fidelity gene-length DNA*
- *DNA synthesis at this level will allow applications in the rapidly growing field of synthetic biology to become a reality*

CAMBRIDGE, UK, and ENSCHEDE, The Netherlands, 01 October 2018 – EVONETIX LTD

(‘Evonetix’), the Cambridge-based company pioneering an innovative approach to scalable and high-fidelity gene synthesis, and LioniX International, a leading global provider of customised microsystem solutions in scalable production volumes, will collaborate to scale up production of prototype microelectromechanical systems (MEMs) for DNA synthesis. LioniX International will use common silicon processing techniques and materials to manufacture a novel thermally addressable silicon array, which will enable Evonetix to control *de novo* DNA synthesis using its unique synergistic thermal control chemistry to deliver high-throughput assembly of high-fidelity gene-length DNA at scale.

LioniX International will use semiconductor microfabrication techniques to manufacture the thermally addressable silicon array, capable of independent thermal control of multiple reaction sites. Evonetix will use this array to control a synergistic synthesis chemistry, optimised to have reaction rates that are highly dependent on temperature, at each of the 10,000 miniaturised reaction sites, allowing for massive parallelism in the DNA synthesis process and therefore a very high throughput.

Dr Matthew Hayes, Chief Technology Officer at Evonetix, said: “We are excited to be working with LioniX International to develop our silicon array that will be a crucial enabler of Evonetix’s revolutionary DNA synthesis technology. Most existing technologies physically isolate the different oligonucleotides during synthesis in a well. In contrast, our array operates in a continuous flow of liquid with virtual wells made by independently controlled temperature islands. The extremely low effective volume of these virtual wells minimises reagent consumption and therefore cost, whilst the flexibility afforded by the lack of physical boundaries enables innovative synthesis and assembly processes, which are ultimately the key to our ability to synthesise long DNA fragments.”

Bi-directional heat control will ensure a continuous flow of heat within the liquid and deliver the steep temperature gradients that localise the virtual wells. This will be provided via the use of resistive heaters that pump heat into the liquid and a cooled substrate that removes heat through a thermal insulator with controlled thermal resistance.

Dr Andrew Ferguson, Head of Physics at Evonetix, said: “The key innovation in this approach is the realisation of a thermal insulator that provides a controlled, anisotropic thermal resistance. We have engineered a novel structured material that achieves this and can be manufactured by LioniX International using a modified MEMs process.”

Albert Prak, Group Leader MEMs at LioniX International, said: “We’re delighted to be working with Evonetix to develop this technology and have been able to use our MEMs and microfluidic processing expertise to realise a demanding and innovative design. We have been able to assist Evonetix with both process design and prototype manufacture.”

For further information about Evonetix gene synthesis platform: <https://www.evonetix.com/technology/>

For further information about LioniX International's customised microsystem solutions:
<https://www.lionix-international.com/>

ENDS

Photos: For high-resolution images please contact michelle.ricketts@zymecommunications.com



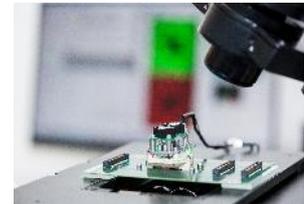
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*Evonetix's thermally
addressable silicon
array*

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Notes to Editors

About Evonetix Ltd

Evonetix is revolutionising gene synthesis with the aim of producing DNA at scale to enable many applications in the rapidly growing field of synthetic biology, across a wide range of industries, from pharmaceuticals to industrial biotech, specialty chemicals, renewables, bioremediation, agriculture and potentially also digital data storage.

The Company's platform is based upon a novel silicon array and unique synergistic thermal control chemistry, capable of synthesising oligonucleotides in parallel, at each of the 10,000 miniaturised reaction sites. The technology is compatible with both chemical and enzymatic gene synthesis and allows for exquisite control at each site of synthesis. It uses a process of error detection throughout assembly to yield high-fidelity long DNA molecules, including challenging sequences with high-GC content or repeats. Thus, Evonetix's approach permits massive parallelism in *de novo* DNA synthesis and enables high-throughput on-chip assembly of high-fidelity gene-length DNA at scale.

Evonetix is based in Cambridge, UK and was founded in 2015 by Cambridge Consultants Ltd and Providence Investment Company Limited. The Company raised £9 million in a series A financing, co-

led by DCVC and Draper Esprit, and has been awarded Innovate UK co-funding for a £1.3 million gene synthesis project.

For further information see www.evonetix.com

About LioniX International

LioniX International is a leading global provider of customized microsystem solutions in scalable production volumes. We provide customized solutions for OEM's and System Integrators, from design to fully assembled modules, by vertical integration and in scalable production volumes. We maintain our technology leadership secured by a strong IP position.

LioniX International develops customized MEMS solutions and produces them in small to medium volumes. We offer flexibility in design as well as in process. We are prepared to leave the standard processing routes and develop customized process variations and combinations to achieve manufacturable solutions meeting your specification requirements.

Our customer base consists of OEM's, system integrators and startups looking for a MEMS solution. Our MEMS activities are driven by state of the art technology and as such our customers are within the MEMS hot areas, such as bioMEMS, Microfluidics, Physical and Chemical Sensors, and Optofluidics.

Our chips drive your business

www.lionix-international.com

About synthetic biology

With the huge increase in DNA sequence information available to mankind over the past ten years, there now exists an unprecedented opportunity to, for example, engineer metabolic pathways and organisms, improve industrial processes, create new processes and engineer genomes with new or improved traits. This opportunity, known as synthetic biology, is estimated to grow rapidly over the coming years, reaching \$40 billion in value in the mid-2020s. Synthetic biology will have a massive impact across many industries and will be fundamental to helping us manage the Earth's resources.

However, only a highly disruptive technology is likely to achieve the significant improvements in DNA synthesis required to enable and facilitate these opportunities. Evonetix believes that, by providing high-fidelity DNA at scale, without the need for post-synthesis error correction, it will be well placed to capture a significant part of the growing multibillion-dollar synthetic biology opportunity.