First ever biological amplifier

Submitted by synbio on Thu, 10/09/2014 - 01:00

SynthSys PI, Dr Baojun Wang, is amongst the team of scientists who have made an amplifier to boost biological signals, using DNA and harmless E. coli bacteria.

Baojun says “One potential use of this technology would be to deploy microscopic sensors equipped with our bio-amplifier component into a water network. Swarms of the sensors could then detect harmful or dangerous toxins that might be hazardous to our health. The bio-amplifiers in the sensors enable us to detect even minute amounts of dangerous toxins, which would be of huge benefit to water quality controllers.”

See full report by Imperial College Science News

The results of the study are published in the journal *Nucleic Acids Research*.

REFERENCE: Baojun Wang, Mauricio Barahona and Martin Buck. ‘Engineering modular and tunable genetic amplifiers for scaling transcriptional signals in cascaded gene networks’. Nucleic Acids Research. July 2014. DOI: 10.1093/nar/gku593

'Arabidopsis cell expansion is controlled by a photothermal switch' newly published

Submitted by synbio on Fri, 09/26/2014 - 01:00

Congratulations to Henrik Johansson, Harriet J. Jones, Julia Foreman,, Joseph R. Hemsted,, Kelly Stewart,, Ramon Grima & Karen J. Halliday for their newly published paper in Nature Communications

Paper at http://www.nature.com/ncomms/index.html

SynthSys researchers develop PaperClip: a new DNA assembly method

Submitted by synbio on Wed, 09/10/2014 - 01:00

Congratulations to Maryia Trubitsyna, Gracjan Michlewski, Yizhi Cai, Alistair Elfick and Chris French whose paper has been newly published in Nucleic Acids Research.

'PaperClip: rapid multi-part DNA assembly from existing libraries' available below.

Link:

Read Paper

'Transcription factor binding predicts histone modifications in human cell lines'

Submitted by synbio on Tue, 09/09/2014 - 01:00

Congratulations to SynthSys PI, Guido Sanguinetti, co-author on newly published paper in PNAS

Significance:"The regulation of gene expression is fundamental to biology and is classically predicated on binding of transcription fac-tor proteins to DNA. This view is challenged by large-scale studies correlating gene expression with posttranslational modifications of the histone proteins with which DNA is complexed in cells. Here, we show through a large-scale com-putational study that histone modifications can be predicted with remarkable accuracy from transcription factor-binding profiles, recapitulating known interactions between transcrip-tion factors and chromatin-modifying enzymes. Our results demonstrate that associations between gene expression and histone modifications do not necessarily imply a direct regu-latory role for these modifications, but can be explained equally well as an indirect effect of interactions between transcription factors and chromatin-modifying enzymes"
Link:
PNAS Paper

Neonatal sepsis studies published in Nature Communications

Submitted by synbio on Thu, 08/28/2014 - 01:00

Babies suffering from bacterial infections like sepsis could benefit from better treatment, thanks to a ground-breaking study.
SynthSys PI, Professor Peter Ghazal, is amongst the Edinburgh team who have identified a signal consisting of 52 molecular characters - like a biological tweet - that is specific to bacterial infection.

The findings could help develop a test for bacterial infection in newborns, using a single drop of blood.

Using blood samples from newborn babies in Edinburgh, the study investigated thousands of signals written in biological code known as messenger RNAs.Through meticulous code-breaking the scientists were able to decipher with close to 100 per cent accuracy the signals generated by an infant's genome that specifically tell if they are suffering from sepsis.

Professor Ghazal explains the research

Nature Communications Paper

BGI announces flagship project with Edinburgh Genome Foundry

Submitted by synbio on Mon, 07/14/2014 - 01:00

BGI announces flagship project with Edinburgh Genome Foundry to synthesize the largest synthetic eukaryotic chromosome in the UK.

BGI, one of the world's largest genomics research centers, and the University of Edinburgh, UK have signed a collaboration agreement to pursue an ambitious synthetic biology "construction" project worth up to £1Million. The two institutes will team up to synthesize synthetic yeast chromosome VII in the Edinburgh Genome Foundry, recently funded by the UK's Biotechnology and Biological Sciences Research Council and co-directed by Prof. Susan Rosser and Dr. Patrick Yizhi Cai.

Faculty members from Centre for Synthetic and Systems Biology (SynthSys) at the University of Edinburgh and at BGI will work together on synthesizing chromosome VII as part of the International Synthetic Yeast Project (Sc2.0).The Sc2.0 PROJECT, initiated by Johns Hopkins University School of Medicine, is the first synthetic eukaryotic genome project. The goal is to recreate the chromosome of yeast, a widely applied industrial microbe, so that it can be manipulated for useful purposes. The two parties will join forces to create an internationally competitive and innovative research team in the field of synthetic biology and work towards a breakthrough in the technology of artificially constructed yeast genome. In the collaboration agreement, the two parties will work towards gaining strategic advantages in automated synthesis of genomes, meeting the demands for cultivating new synthetic biology industries. Synthesized chromosome VII genome's success various functions will be developed to be widely used in the production of chemicals, energy and food to maintain and enhance human health and the environment.

Dr Patrick Cai, a Chancellor's Fellow at the University of Edinburgh, is leading the Sc2.0 project at Edinburgh and Yue Shen, BGI's Synthetic Biology Unit leader, is currently studying for a PhD in Dr. Cai's lab. Both institutes will benefit from this working relationship to accelerate the research of synthetic yeast.

The University of Edinburgh and BGI signed a memorandum of understanding with the aim to enhance collaborations between three genomics facilities in Edinburgh and BGI earlier this year. This is not the only collaboration between the University of Edinburgh and a Chinese Institute. In June 2014, the University signed a Memorandum of Understanding with Tianjin University around research and teaching in synthetic and systems biology.

Professor Peter Swain, Director of SynthSys says, "As in the UK, synthetic biology is a key area of investment for China and there is a substantial interest in collaboration and knowledge exchange that we are keen to participate in. We are thrilled to be working with the genomics giant BGI on such a landmark project in synthetic biology. "

"Synthetic biology is a new emerging research field, which provides a unique opportunity for researchers to answer many fundamental questions in the life sciences.. When biological researchers are transitioning from the DNA sequence of an organism to a synthetic genome,

researchers will face more challenges and opportunities with synthetic biology," stated Professor Huanming Yang, Chairman of BGI.

Edinburgh's new Plant Science Network launched

Submitted by synbio on Thu, 07/03/2014 - 01:00

A new network assembling expertise in food security, environmental sustainability and related policy across the Capital was launched at the Royal Botanic Garden Edinburgh on Wednesday 25th June 2014. The network has been established in recognition that a diverse set of expertise is required to solve some of the most pressing challenges to our planet. EPS will become an active forum to stimulate interdisciplinary research collaborations, new training opportunities and to raise the profile of the world-leading plant and social science research ongoing in and around the Capital.

Dr Karen Halliday of SynthSys, Director of the EPS, says, "Edinburgh has the largest concentration of plant scientists in Scotland, if not the UK, and we have a great opportunity to further raise the importance of our research to solving many of the world's problems. We are passionate about plants and want to help ensure everyone understands their importance to our planet."

The Launch, which was attended by over 100 people, enjoyed a fantastic venue at the Royal Botanic Garden and a diverse programme of speakers.

Ian Bainbridge (Scottish National Heritage) introduced the event and identified the challenges for plant science and explored Scotland's unique plant environment; Joyce Tait (Institute for Innovation in the Life Sciences, Innogen) focused on governance and the battle for hearts and minds when it comes to public engagement especially around new technologies. Gerry Saddler (Science and Advice for Scottish Agriculture) explained their role in supporting Scottish arable agriculture. Guest speaker Dave Hughes from the agrochemical company Syngenta explained why plant science is critical for global food security; Huw Jones from the UK Knowledge Transfer Network told delegates how important collaboration is in today's research environment and outlined relevant funding opportunities.

The EPS was formally launched by Professor Lesley Yellowlees, CBE FRSE, Head of the College of Science and Engineering at the University of Edinburgh and President of the Royal Society of Chemistry and Professor Ian Graham, Head of the Department of Biology, University of York and Chair of Biochemical Genetics in the Centre for Novel Agricultural Products (CNAP), who provided an inspiring talk on the future for plant science.

Edinburgh graduates ran a "two minute thesis" competition during the event to highlight the wealth of young talent in the region. Thanks to all participants and congratulations to the prize winners

1st prize - Kim Davie (SASA)
2nd prize - Marta Piotrowska (SRUC)
3rd prize - Karina Banda (RBGE).
During the event the new EPS website was showcased www.edinburghplantscience.com
You can also follow news and EPS activity on Twitter **@EdinPlantSci**

DARPA funding for SynthSys PI

Submitted by synbio on Mon, 06/30/2014 - 01:00

Professor Vincent Danos has been awarded a ~$2M grant from US Defense Advanced Research Projects Agency (DARPA) for a 42-month project "Executable Biology" within the DARPA Big Mechanism Programme.

DARPA's funding of the "The Big Mechanism Program" stems from the recognition that complex systems such as ecosystems, brains and economic and social systems have many components and processes but often these are studied piecemeal. It then becomes very difficult to build complete, explanatory models of complicated systems.

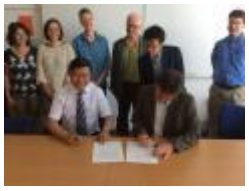
Although the focus of the Big Mechanism program is cancer biology the goal of the program is to develop technologies for a new kind of science in which research is integrated more or less immediately—automatically or semi-automatically—into causal, explanatory models of unprecedented completeness and consistency.

Twelve projects were funded representing a diverse set of skills from language semantics, to text-mining, to mathematical modelling. All the projects should fit together consort to build an end-to-end system for reading, assembling and modelling to better understand causation in signalling pathways that are implicated in cancer biology. Danos is working with Walter Fontana, Professor of Systems Biology at Harvard Medical School, and will be using Kappa, a rule-based language.

Link:
DARPA Big Mechanism Programme

SynthSys and Tianjin University to collaborate in synthetic and systems biology

Submitted by synbio on Wed, 06/18/2014 - 01:00



June 18th, 2014 The University of Edinburgh and Tianjin University today signed a memorandum of understanding outlining their intention to establish research and teaching collaborations in mutually interesting areas of synthetic and systems biology.

Faculty members in the National Key Laboratory for Systems Bioengineering (Ministry of Education, China) and the Centre for Synthetic Biology (both located in the University of Tianjin) will actively participate in the academic exchanges and research collaborations with the members of the Centre for Synthetic and Systems Biology (SynthSys), School of Biological Sciences at the University of Edinburgh. They are keen to identify opportunities for exchanges of personnel and joint research and development with an emphasis on systems and synthetic biology, engineering microorganisms and microbial consortia, genomics engineering, *in vitro* synthetic biology, and their applications in the production of chemicals, nutraceuticals and drugs, biomedicine, energy and the environment.

In addition, the Institutes are discussing the possibility of setting up a joint synthetic biology program that could offer education and training at different levels, from Bachelor to PhD degree, which would be taught by both faculties in Tianjin and Edinburgh.

The two universities are already actively engaged in collaborative research: Dr Patrick Cai, founding co-director of Edinburgh Genome Foundry and a Principal Investigator in SynthSys and Professor Yingjin Yuan, Director of the Key Laboratory of Systems Bioengineering, Ministry of Education and Vice President for Research at Tianjin University work together on the international synthetic yeast genome project (Sc2.0).

Professor Peter Swain, Director of SynthSys says, “Tianjin University has one of the strongest biochemical engineering programs in China, which complements well Edinburgh’s world leading expertise in systems and synthetic biology. We look forward very much to deepening our collaboration with Tianjin University.”

OpenPlant ERASynBio Summer School

Submitted by synbio on Mon, 05/19/2014 - 01:00

Introduction to Synthetic Biology in plant systems

14th - 20th September 2014, John Innes Centre, Norwich, UK

The OpenPlant consortia (John Innes Centre and University of Cambridge) and Synthetic Biology ERA-NET (ERASynBio) are looking for PhD students and early career postdoctoral researchers to attend an advanced summer school on synthetic biology in complex systems.

Training will be provided in: DNA assembly, genome editing, metabolic engineering, transformation, new plant systems, genomic resources, software modelling, instrumentation, biotechnology and social impact.

Training, travel and subsistence costs will be paid for by ERASynBio.

Details of speaker, mentors and the application process will to be announced soon shortly on the websites of ERASynBio (www.erasynbio.eu) and OpenPlant (www.openplant.org).

New insights into gene expression control

Submitted by synbio on Fri, 05/09/2014 - 01:00

The characteristics of any cell (phenotype) in a genetically identical population is determined by the level of expression of individual genes. Ramon Grima and colleagues at SynthSys have developed a general modelling framework for quantifying switching between a number of different phenotypes due to noise at the transcriptional, translational, post-transcriptional and post-translational levels. The results shed light on how cells encode decisions, how they retain memory of their environment, as well as postulating new mechanisms for generating and controlling intracellular oscillations. The paper was published in PNAS.

Sustainability Silver Award

Submitted by synbio on Mon, 04/28/2014 - 01:00

Congratulations to SynthSys Lab (2.18) for achieving the Edinburgh Sustainability Silver Award. SynthSys members Eliane Salvo-Chirnside and Katalin Kis attended the award ceremony at Teviot Place on 22nd April 2014.

Thanks to everyone for their hard work and continuing commitment!

More info on the awards at http://www.ed.ac.uk/about/sustainability/what-we-do/awards/about
and this year's winners at http://www.ed.ac.uk/about/sustainability/what-we-do/awards/previous-winners/

Newly published book “Synthetic aesthetics”

Submitted by synbio on Wed, 04/23/2014 - 01:00

SynthSys members, Dr Jane Calvert and Dr Pablo Schyfter (both social scientists) and Professor Alistair Elfick (an engineer) are co-authors of a newly published book “Synthetic aesthetics” published by the MIT Press and launched today in London at an event at the V&A.

In this book, synthetic biologists, artists, designers, and social scientists investigate synthetic biology and design. After chapters that introduce the science and set the terms of the discussion, the book follows six boundary-crossing collaborations between artists and designers and synthetic biologists from around the world, helping us understand what it might mean to ‘design nature.’ These collaborations have resulted in biological computers that calculate form; speculative packaging that builds its own contents; algae that feeds on circuit boards; and a sampling of human cheeses. They raise questions about the scientific process, our relationship to designed matter, unintended consequences and the ownership of life.

The other co-authors include Alexandra Daisy Ginsberg is a London-based artist, designer, and writer and Drew Endy a bioengineer at Stanford University and President of the BioBricks Foundation.

Copies of the book can be purchased via Amazon.

SynthSys wins £1.8M for Genome Foundry

Submitted by synbio on Wed, 04/02/2014 - 01:00

SynthSys has been awarded up to £1.8M to build a "Genome Foundry" to pioneer developments in medicine and other key areas of research. The Edinburgh Genome Foundry will build and study DNA to inform the development of products with applications in health, agriculture and biofuels.

The Foundry's researchers will seek to create and modify long strands of DNA – up to 1 mega base pairs – that can be used to equip cells or organisms with new or improved functions. This could lead to advances such as programming stem cells for use in personalised medicines, developing bacteria that can detect disease in the gut, or altering the DNA of biofuel crops to enable a higher yield.

Researchers at the Foundry will design and manufacture genetic material on an unprecedented scale, using highly automated robotics. They will be able to design and build large, complex pieces of DNA code quickly at relatively low cost. Scientists will seek to build on their research through collaborations with academic partners around the world and to develop commercial applications with industry.

The Foundry, to be established in newly refurbished labs within the University of Edinburgh's School of Biological Sciences, will be supported by £1.8 million from the Biotechnology and Biological Sciences Research Council.

Professor Susan Rosser, Chair in Synthetic Biology at the School of Biological Sciences and lead investigator on the bid says: "This further strengthens Edinburgh's position as a leading centre for synthetic biology in the UK. Being able to build DNA on a large scale accelerates our ability to understand how cells and organisms operate."

Dr Patrick Yizhi Cai, co-director of the Foundry says: "We are thrilled to develop and host the Edinburgh Genome Foundry, the first of its kind in the world. This is a great example of how interdisciplinary research and technology innovation can accelerate discoveries that benefit society." The Foundry will help support the synthesis of other yeast chromosomes as part of the international Synthetic Yeast (Sc2.0) project in which Dr Cai is involved. The Sc2.0 team published the completion of the first synthetic chromosome (SynIII) last week in *Science* magazine (see previous news stories).

Link:
BBSRC News

SynthSys PI in world first

Submitted by synbio on Mon, 03/31/2014 - 01:00

Edinburgh scientists have helped build a fully functioning yeast chromosome from scratch. An international team of scientists redesigned a chromosome found in brewer's yeast using computer software, and rebuilt it by piecing together a series of short segments they made in the lab. Dr Patrick Yizhi Cai of SynthSys and a co-author on the paper says: Our Synthetic and Systems Biology Institute is really at the forefront of synthetic genomics, and we are glad to be part of this landmark paper. The synthetic structure was shown to function like an ordinary chromosome when it was transplanted into living yeast cells, which survived and grew as normal. The study marks the first time that scientists have rebuilt a chromosome from a class of complex organisms -known as eukaryotes - which includes animals, plants and humans. Researchers have previously recreated chromosomes found in bacteria and viruses.

The paper was published in Science. For full article go to http://www.ed.ac.uk/news/2014/chromosome-310314

Link:
Science paper

Second UK–Korea Workshop on Synthetic Biology

Submitted by synbio on Tue, 03/18/2014 - 00:00

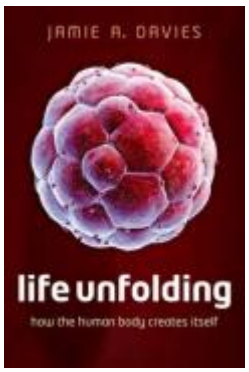
The Second UK–Korea Workshop on Synthetic Biology took place on the 20th of February 2014 in KAIST (the Korea Advanced Institute for Science and Technology) in Daejeon, South Korea. Alistair Elfick, Patrick Cai, Gary Loake, Jane Calvert, Robin Williams (STIS, Edinburgh), John Heap (Imperial) and Max Ryadnov (National Physical Laboratory) all gave talks at the workshop, which also included talks by Korean professors Byung Kwan Cho (on directed evolution of the reduced *E. coli* genome), Dong-Myung Kim (on cell free systems), Duhee Bang (on high-throughput DNA synthesis) and Ki Jun Jeong (on the engineering of *Corynebacterium glutamicum*).

The UK team had a fun-packed three days in Korea, which also included a tour of the impressive gene synthesis company Bioneer, and the labs at KAIST (currently the world's biggest open plan laboratory space, until the Crick Institute steals the crown.)

"We were incredibly well looked after, particularly in a culinary sense: a 'small lunch' included at least 17 dishes, seated on heated wooden floorboards. We even had our own tour bus with tassels and coloured disco lights (which we failed to divert to take us to the border with North Korea). We'd all be happy to talk about the huge investment in synthetic biology in South Korea, and/or the delights of Kimchi."
Jane Calvert

Jamie Davies: Life Unfolding

Submitted by synbio on Tue, 03/18/2014 - 00:00



Congratulations to Jamie Davies of SynthSys whose book, 'L**ife Unfolding: How the Human Body Creates Itself**,' was published on 27th Feb 2014 by Oxford University Press.

Jamie says, "This book is an attempt to explain, in a clear and accessible way, how complex human bodies build themselves from the relative simplicity of a fertilized egg. The emphasis is on a systems approach – on illustrating how appropriately arranged feedback can allow small, dumb units such as molecules or cells, which carry very limited information, to organize at a scale vastly larger than themselves.

The book begins, as is conventional, with a fertilized egg, considers how one cell becomes many; how a lump of identical cells can use geometrical tricks to create internal differences; how symmetries are broken and axes made; how events in time and space can be integrated to divide up the body; how cellular conversations make fine structure; how cells navigate; how the body's plumbing responds to its need; how organs form; how male and female bodies arise from the same basic starting material; how the brain wires itself; how your left leg is the same size and your right one; how we recruit some bacteria as friends and resist others as enemies; how we maintain ourselves and why we cannot do so forever. Throughout, the ideas of systems biology, and issues such as self-organization, and robustness in the face of noise, are emphasized (though in a completely non-mathematical way). The book also emphasizes deep parallels between apparently very different aspects of the body, such as learning in the brain and in the immune system.

Writing it was interesting, and I learned a lot myself (there is nothing like having to explain something to indicate weaknesses in one's own knowledge!). The hardest part - and the part about which I still worry most - is deciding how much something can be simplified before it is distorted to the point of being wrong. I had more or less finished the book before I approached a publisher, because I did not want to be pressured by a deadline (which would have happened if I had got a publisher interested at the beginning). I chose my ideal publisher by a simple method – I looked at my own favourite 'public engagement' books, and saw which name came up most often on their spines. Fortunately, that publisher – Oxford University Press – was interested and they have been a pleasure to work with from start to finish.

European Congress on Biotechnology

Submitted by synbio on Thu, 02/27/2014 - 00:00

Registration now open. Visit www.ECB16.com

The Volunteering website is also now open for applications.

Conference Flyer

Volunteeering

https://meeting.tfigroup.com/tfi/frontend/reg/thome.csp?pageID=333637&eventID=864&eventID=864

The aim of the website is to explain to students the roles which are to be filled (home page), capture all the necessary details (registration page) and also share with them information about the ECB16 as a congress and the venue (as per the respective pages).

The deadline for applications is Friday 30 May 2014, after which date all received applications will be reviewed and volunteers contacted to confirm their volunteering duty and role.

Industrial Biotechnology Innovation Centre for Scotland

Submitted by synbio on Mon, 02/10/2014 - 00:00

Just before Christmas last year, the Scottish Funding Council (SFC) confirmed funding of £10m to seed the establishment of the Industrial Biotechnology Innovation Centre (IBioIC). This will form the basis of an expected £45m spend on research projects and skills development in Industrial Biotechnology aimed at bringing these technologies to the market while making a substantive impact on the Scottish economy. IBioIC has 13 academic partners across Scotland including the University of Edinburgh and will be initially based at Strathclyde.

A launch event for IBioIC took place at the Edinburgh Centre for Carbon Innovation (ECCI) on Wednesday 5th February. Guest Speaker was John Swinney MSP (see photo), Cabinet Secretary for Finance, Employment and Sustainable Growth.

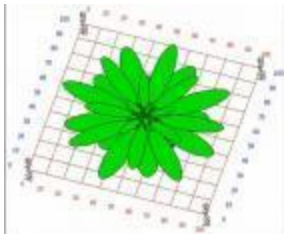
The proceedings were opened by Professor Sir Tim O'Shea, Principal of the University of Edinburgh and also included presentations from Ian Shott, Chairman of IBioIC and the three main founding industry partners GSK (Dr Dave Tudor), Ineos (Dr Ian Little) and Ingenza (Dr Ian Archer). The event was closed by Professor Sir Jim McDonald, Principal of the University of Strathclyde. Everyone recognised the massive opportunity that Industrial Biotechnology presented and highlighted the unique cross-institution, multi-industry partner ethos that IBioIC embodies.

Over 100 people, and several high profile speakers, attended the event which demonstrates the strong national support for the initiative. The launch event was well covered in the media with attendance from both STV and BBC Scotland News and a host of print and internet news sites.

IBioIC research work programmes will be industry-led and designed to improve the technology readiness of Industrial Biotechnology. Initially these work programmes will be run as Exemplar Projects to demonstrate feasibility of the processes and outcomes. The first call for Exemplar Projects is now open (deadline 28th Feb). Further information on the Cen

Yin Hoon Chew's newly published paper - Digital Arabidopsis plant!

Submitted by synbio on Sun, 02/09/2014 - 00:00



'Multiscale digital Arabidopsis predicts individual organ and whole-organism growth' has been newly published in Pnas.

Congratulations to Yin Hoon Chew & co-authors, including Karen Halliday and Andrew Millar.

Significance: "Plants respond to environmental change by triggering biochemical and developmental networks across multiple scales. Multiscale models that link genetic input to the whole-plant scale and beyond might therefore improve biological understanding and yield prediction. We report a modular approach to build such models, validated by a framework model of *Arabidopsis thaliana* comprising four existing mathematical models. Our model brings together gene dynamics, carbon partitioning, organ growth, shoot architecture, and development in response to environmental signals. It predicted the biomass of each leaf in independent data, demonstrated flexible control of photosynthesis across photoperiods, and predicted the pleiotropic phenotype of a developmentally misregulated transgenic line. Systems biology, crop science, and ecology might thus be linked productively in a community-based approach to modeling"

Paper at http://www.pnas.org/content/early/2014/08/27/1410238111

Gordon Plotkin receives the EATCS Award 2014

Submitted by synbio on Tue, 02/04/2014 - 00:00

Congratulations to Gordon Plotkin from the School of Informatics who has been given the European Association for Theoretical Computer Science Award for "his lifetime contribution of a research corpus of exceptional depth and influence across a broad range of areas within theoretical computer science."

Link:
See announcement

Autodesk supports Genome Engineering at Edinburgh

Submitted by synbio on Mon, 02/03/2014 - 00:00

Autodesk Inc., a Fortune 1000 company that develops software used globally to unlock creativity and solve broad challenges, is investing in genome engineering at the School of Biological Sciences at the University of Edinburgh. Autodesk is financing a three-year PhD stipend for Wei Liu, an international student in the lab of Dr Patrick Cai's group, to conduct research in the area of synthetic biology and genome engineering. Wei will focus on developing novel DNA assembly methods to help construct the synthesis of the largest synthetic chromosome in the UK – yeast chromosome VII that is one million base pairs in length.

The funding continues support for Dr Cai who is also an Autodesk Distinguished Scholar and a Chancellor's Fellow in the Centre for Synthetic and Systems Biology (SynthSys). SynthSys' remit is to extend understanding of genetic and chemical regulation in biological systems and to use this understanding to solve the challenges facing industrial biotechnology, clinical medicine, and agriculture. Synthetic genome engineering is core to that vision and an area Dr Cai's lab is exploring on an industrial scale.

Dr Cai comments: "Autodesk is a world leader in design software, and as synthetic biologists we see biology as a perfect venue for design tools to play an essential role. We look forward to learning from Autodesk's general design expertise to develop new tools to facilitate genome engineering and the automation of biological design."

Carlos Olguin, Head of the Bio/Nano/Programmable Matter Group at Autodesk says: "Autodesk, and in particular the bio/nano/programmable matter group, is thrilled to see Dr Cai's work become more central to the synthetic biology discourse in UK and beyond. An important aspect of synthetic biology is to be able to re-engineer the entire genome of an organism so that we can more predictably engineer in additional desirably functionality. We are excited about the ramifications of our ongoing collaboration with Dr. Cai on genome engineering and automation, including our studentship support, as they will result in helping more scientists and to-be-scientists explore and accelerate the field of synthetic biology."

Everyone—from design professionals, engineers and architects to digital artists, students and hobbyists—uses Autodesk software to unlock their creativity. The Californian company's products are used by more than 145 million consumers and 12 million businesses globally.

Chancellor's Fellowships

Submitted by synbio on Mon, 01/13/2014 - 00:00

As part of a University-wide recruitment programme, the School of Biological Sciences seeks to appoint **new Chancellor's Fellows** as an investment in the future of teaching and research. These prestigious Fellowship awards are aimed at early-career individuals of the highest potential who have begun to establish a reputation for the highest quality research at the forefront of their discipline and who have a commitment to learning and teaching at university level. We expect to appoint at least three Fellows. Substantial mentoring and development support will be available through and beyond the Fellowship period.

We will be particularly pleased to receive applications from candidates whose research interests cross two or more of these priority areas. Exceptional candidates with research interests in other areas of biological sciences will also be considered.

Chemical and synthetic biology, biochemistry and industrial biotechnology: We seek researchers with a strong interdisciplinary background and research interests in understanding and using biochemical pathways, protein, metabolic or morphological engineering to create or manipulate materials, pharmaceutical or agricultural products.

Mathematical biology, computational biology and modelling: We seek interdisciplinary researchers whose primary interest is in applying mathematical and computational methods to understand living systems, processes and populations. Areas of particular interest include systems biology and metabolic networks, quantitative genetics, and infection dynamics.

Other areas of interest include **Epigenetics and Infection biology, Evolutionary medicine and Global Health**.

How to Apply: Informal enquiries are welcomed and should be directed to the Head of School, Professor David Gray, at the email address given below. hossbs@ed.ac.uk

For further information and to apply, please visit the link below.

Link:
Further Information