

Axol Bioscience

achieves its pluri-potential



Michelle Ricketts

AXOL BIOSCIENCE

Building on 60 years of continuous R&D at Chesterford Research Park, this leading life science location is now home to innovative biotech and pharmaceutical companies that have amassed an impressive record for producing cutting-edge technology and ground-breaking scientific discoveries. One of the Park's most recent arrivals is Axol Bioscience, specialists in the supply of human cell culture products and services

Axol Bioscience was founded in 2012 by Jonathan Milner, PhD and Yichen Shi, PhD. Dr Shi was motivated to carry out stem cell research after having read the Nobel Prize-winning publication by Yamanaka *et al.* (2007) describing how somatic cells could be reprogrammed into induced pluripotent stem cells (iPSCs). Dr Shi completed his PhD in neuroscience and stem cell biology at the Gurdon Institute, University of Cambridge where he successfully identified an alternate means of differentiating these stem cells into functional neurons.

During this time he met Dr Milner, an alumni of the institute and experienced biotech entrepreneur with a background in genetic research who also co-founded Abcam, a global leader in the supply of protein research tools. Together their passion for cell biology, quality services and entrepreneurial spirit lead to the creation of Axol. They identified the need for innovative human cell culture products that benefit disease modelling and drug discovery. Initially, they created a platform offering customers a reliable resource of commercially available iPSC-derived neural cells, with the aim of gradually expanding this range to include all 200 cell types of the human body.



George Gibbons, Production Manager, generates iPSCs



The Axol Bioscience Team at Science Village, Chesterford Research Park

Axol began making cells in a communal lab and relied heavily on customers and collaborators to characterise these. These early adopters of products enabled Axol to grow. Soon after they were approached by a large pharmaceutical company to generate a number of iPSC-derived neural cell lines and having successfully completed the project they gained a good reputation amongst industry members. Since then the company has grown significantly due to its reputation as a high-quality supplier of cell culture products gaining traction amongst the scientific community. This has meant an increase in the manufacture of existing products as well as the acquisition and commercialisation of novel technologies.

Today, Axol Bioscience is a biotechnology company that specialises in the supply of human cell culture products and services. This includes a growing range of primary and iPSC-derived cells complete with complementary culture media and supplements. Axol's current iPSC-derived neural cell

range includes highly validated neural stem cells, cortical neurons, dopaminergic neuron precursors and astrocytes from healthy and disease backgrounds including Alzheimer's and Huntington's diseases.

Axol's cardiovascular range comprises of iPSC-derived cardiomyocytes from healthy donors, which beat spontaneously in culture and exhibit several cardiac-selective markers. The primary cell product range includes fibroblasts, haematopoietic, epithelial, mesenchymal and muscle cells. The most recent additions are the uncultured hepatocytes, assay-ready expanded (ARE) hepatocytes and liver sinusoidal epithelial cells.

Axol also offers a complete suite of custom services including custom donor cell sourcing, reprogramming and characterisation services. It specialises in directed differentiation of iPSCs to generate pure populations of functional cell types including cardiomyocytes, endothelial cells, and cerebral cortical, dopaminergic and sensory neural cells. Axol can also produce isogenic and reporter cell lines for disease modelling and drug discovery using CRISPR/Cas9 and iPSC technologies to edit the genome of disease-relevant cell types to create cellular models of genetic conditions.

In addition to expanding its range of product and service offerings, Axol has appointed a host of experts from academia and industry to ensure continued success. This includes Chief Scientific Officer, Xianmin Zeng, PhD, an Associate Professor at the Buck Institute for Research on Aging who is an expert in the development of stem cell disease models for neurodegenerative disorders and Chief Business Officer, Sanj Kumar who with more than 20 years' experience in leading



Axol Bioscience offices in the Science Village at Chesterford Research Park

biotechnology companies, is helping to create and execute the company's commercial strategy.

Axol also announced several advisory board members earlier this year namely, Darrin Disley, PhD and Chris Torrance, PhD of Horizon Discovery; Steve Rees, PhD of AstraZeneca; Chas Bountra, PhD at the University of Oxford; Paul Andrews, PhD from the National Phenotypic Screening Centre and Maria-

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Dr Yichen Shi, CEO and Co-Founder of Axol Biosciences

Grazia Spillantini, PhD at the University of Cambridge. These individuals will guide Axol in ensuring its commercially available human primary and iPSC-derived cells continue to enable the development of pathophysiologically-relevant systems for disease modelling and drug discovery.

Further to these appointments and increasing its product range, Axol has also raised over £1 million through the equity crowdfunding platform, SyndicateRoom. Yichen Shi, Axol's CEO commented: "With this funding, we will diversify our product portfolio, increase our operations to meet industry demand and grow our customer base. We hope to ultimately revolutionise the drug discovery market by providing a comprehensive platform of human cells from healthy and patient donors to enable improved efficiency of the screening process and reduce animal testing."

With expansion a priority, Axol moved to the Science Village, Chesterford Research Park, in November 2015. The Science Village is an ideal HQ for both established and start-up companies which need flexible, high quality and prestigious self-contained accommodation. The innovative, energy efficient building offers individual R&D suites ranging from 1,515 sq. ft. to 1,993 sq. ft., plus excellent scalability by combining spaces for larger occupation. The fully fitted accommodation, served by high speed data connectivity and Cat 6 cabling is also supported by a backup generator. Each suite enjoys demountable benching, two sinks and two fume hoods (with space for a third if required), housed within a dedicated room. An open-plan write-up/admin area, plus a self-contained single office/meeting room completes the layout, in addition to which, each suite is supported by its own independent, dedicated external plant area.

Axol chose Chesterford Research Park to consolidate its production and office space and ensure the organisation could continue unhindered in the pursuit of novel products that fulfil customer needs. At the time Yichen Shi commented of the move: "Chesterford stood out due to its location within the cluster, convenient access to major road, rail and air routes and proximity to some of the biggest pharma players in the industry."

Since the move, Axol have been able to accommodate several new staff members and the integrated open-plan offices and adjacent laboratory space is proving particularly advantageous, allowing the team to work alongside one another to bring state-of-the-art products to market. This also enhances the team's ability to support the needs of Axol's customers, which at present include Janssen Pharmaceutica, University of Cambridge, Harvard University,

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Kings College London, University of Oxford and Aston University, among others.

Chesterford Research Park attracts leading R&D companies, like Axol, by providing state-of-the-art laboratory and office space within the most unique and idyllic surroundings. This supportive and nurturing environment not only attracts the right people and businesses, it also enables them to interact. The Park plays a pivotal role in this process and in doing so continues to attract innovative, ambitious companies, intent on delivering the ground-breaking, scientific discoveries of the future.

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