

Annual Report

for the year ended 31st March 2020



John Innes Centre

Unlocking Nature's Diversity

Registered charity number: 223852
Registered company number: 00511709

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Cover image: Water droplet on *Streptomyces coelicolor*

John Innes Centre (JIC) is a company limited by guarantee and a registered charity. The Annual Report provides information on the legal purposes of the charity, the activities it undertakes and its main achievements. The financial statements have been prepared in accordance with the Charities Act 2011, the Companies Act 2006, the Memorandum and Articles of Association, and Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) (effective 1 January 2015).

Trustees' Report including the Strategic Report

The Board of Trustees of the John Innes Centre (Governing Council) presents its Annual Report and Financial Statements for the year ended 31 March 2020. The Annual Report provides details of the John Innes Centre's objectives, achievements, scientific and financial performance in the year, future plans, risk management and its governance and management structure.

About us

The John Innes Centre (JIC) is a world-leading international centre of excellence in plant science and microbiology. Our mission is to generate knowledge of plants and microbes through fundamental research. We use this knowledge to benefit agriculture, the environment, human health and well-being, to train excellent scientists for the future and to engage with policy makers and the public.

Our strategy

Healthy Plants, Healthy People, Healthy Planet (HP³) is our strategy for achieving a safer, healthier and more sustainable future through the power of plant and microbial science.

In collaboration with world-leading academic partners we are uniquely positioned to lead the fundamental scientific advances needed to address three intertwined, era-defining challenges: feeding the world; combating global health threats and climate change.

Delivery

To date the knowledge generated by the John Innes Centre has resulted in many innovative and practical solutions to global challenges. This is the result of ground-breaking research, combined with collaboration to develop specific and applied scientific solutions. We have addressed societal problems and aided economic development in the UK and globally.

The task of the Governing Council is to ensure that the John Innes Centre retains its position as the key national and international centre of scientific excellence in plant and microbial science.



Dr Will West
Chair – Governing Council & Remuneration Committee

Healthy Plants, Healthy People, Healthy Planet

Facing the world's major social and environmental challenges

Plant and microbial science has a key role to play in helping us face the world's major social and environmental challenges



FOOD SECURITY

Growing populations, coupled with the effects of climate and the emergence of new, plant-damaging pathogens, are putting the volume of available food under increasing strain.

At current growth rates, there will be an additional 2.1 billion mouths to feed by 2050. It is crucial that crop yields are protected and increased to meet this demand.



HEALTH AND WELL-BEING

The dual challenges of obesity and malnutrition affect every country in the world, increasing rates of chronic health conditions and placing unnecessary strain on public services.

Food quality has a direct and causal link to the health and wellbeing of populations. We need to find ways to increase the nutritional value of the most widely consumed foods.



CLIMATE CHANGE

Never before has climate change been more firmly on the global agenda, but the effects of increasingly volatile temperatures are already impacting food availability and crop yields.

Intensive, commercialised agriculture is also one of the most resource-intensive industries on the planet, with many of its key operations and resources either using or being derived from fossil fuels.

Achievements and Highlights

Professor Dale Sanders FRS, Director of the John Innes Centre



It is clear that we live in exceptional times. Our world is changing. From the climate emergency to a global pandemic. Responding to these challenges demands a global scientific community united by a common purpose.

With this in mind we have developed a future strategy for the John Innes Centre, entitled "Healthy Plants, Healthy People, Healthy Planet". This articulates our vision for the future of plant and microbial science and outlines our mission to respond to the challenges that humanity and our environment face. A world with a rapidly changing climate, facing massive losses in biodiversity, a growing global population to feed and the urgent need to decarbonise agricultural practices requires science to play its role in delivering solutions.

The John Innes Centre continues to uncover and understand the fundamental biological mechanisms which can begin to provide the solutions so desperately needed.

Our Institute Strategic Programmes are founded on discovery science and aim to deliver strategic impact. This year we passed the mid-point of the five-year funding cycle. I am proud to report that all four ISPs were rated as Excellent in the mid-term reviews, a truly remarkable achievement. I would like to extend my gratitude to everyone involved.

At the start of 2020 Professor Dame Caroline

Unprecedented situations call for new ways of thinking. This is a critical moment to come together to achieve a collective goal.

Dean FRS was awarded the prestigious Wolf Prize in recognition of her pioneering discoveries and significant breakthroughs in the field of biology. The Wolf Prize is awarded annually to prominent scientists and artists for their unique contribution to humanity, it is sometimes considered to be equivalent to the 'Nobel Prize in Agriculture'. This prize recognises Caroline's contribution to our understanding of how plants sense and remember winter, and how this is critically important to agriculture in the face of a changing climate.

This recognition highlights the importance of institutes and the role of discovery science in society. Without the continuity of support provided by funding to allow curiosity-led research to be explored over many decades, the prospects for delivering societal impact and real-world solutions would be much diminished.

The John Innes Centre closed its doors

amidst uncertain times two weeks before the end of the 2019/20 financial year. In mid-March 2020 the spread of COVID-19 meant we took steps to ensure the safety of our people, and the local community.

Unprecedented situations call for new ways of thinking. This is a critical moment to come together to achieve a collective goal. For those of us in the scientific community, the aim is to unite to safely unwind from the lockdown, and to learn as much as possible from this pandemic, so we are ready when the next one emerges.

The synergy across the research institutes on the Norwich Research Park and the co-location with the Norfolk and Norwich University Hospital and the University of East Anglia means we have an exceptional bioscience resource here in Norwich with the critical mass to respond rapidly and appropriately.

Institute Strategic Programmes (2017–2022)

Molecules from Nature

The scientific challenge:

To provide a new level of understanding of the nature, origins and functions of the vast array of chemicals produced by plants and microbes.

The strategic challenge:

To use this knowledge for the discovery and engineering of new molecules that drive advances in health, medicine and sustainable manufacturing and agricultural practices.



Genes in the Environment

The scientific challenge:

To obtain a deep understanding of how the environment influences plant growth and development.

The strategic challenge:

To use this knowledge to enable the breeding of crop plants that are more resilient to a wider range of growing conditions, to improve the stability of crop yields and improve security of global food supplies.

Plant Health

The Plant Health ISP is a cross-institute programme between the John Innes Centre and The Sainsbury Laboratory in Norwich.

The scientific challenge:

To understand the molecular dialogue between plants, pests and microbes, establishing how they communicate with each other and how they have evolved in relation to one another.

The strategic challenge:

To influence the interactions between plants and associated organisms to increase future crop productivity and enhance agricultural sustainability.



Designing Future Wheat

The Designing Future Wheat programme is coordinated by the John Innes Centre, and spans eight research institutes and universities.

The scientific challenge:

To develop a new wheat germplasm containing the next generation of key traits.

The strategic challenge:

Accelerating plant breeding by understanding the underlying genetics.

Science Spotlights

Key role for calcium release in root development

Researchers at the John Innes Centre have discovered that calcium plays a key role in primary root development. Using genetics and cell biology approaches, the team reveal that calcium can be released by the nuclei of the root apical meristem – the region of the growing root.

Using genetic approaches, the team could modulate nuclear calcium signatures to obtain longer or shorter roots in *Arabidopsis thaliana*.

They also report a role for nuclear calcium release in modulating the plant growth hormone auxin.

“Discovering the additional role of nuclear calcium release may help us improve plant growth and translate the discovery into agronomically relevant species,” said Dr Myriam Charpentier. Nuclear calcium signatures are associated with root development’ appeared in the journal *Nature Communications*.

Myriam Charpentier, Elaine Barclay

DOI: 10.1038/s41467-019-12845-8



Dramatic transition in *Streptomyces* life cycle explained in new discovery

Streptomyces bacteria, our primary source of antibiotics, are produced in the transition from vegetative growth to sporulation.

Research by Professor Mark Buttner's lab shows that the signalling molecule c-di-GMP binds BldD, a master repressor of gene activity, to control the initiation of development in these soil-dwelling bacteria.

In a new study, featured in *Molecular Cell*, experiments using the model species *Streptomyces venezuelae* show that c-di-GMP also intervenes later in development to control the differentiation of the reproductive hyphae into spores.

It does this by mediating an interaction between the major sporulation sigma factor in *Streptomyces*, WhiG, and the anti-sigma factor RsiG.

A sigma factor is a protein needed for the initiation of transcription, the process of turning DNA into RNA. Anti-sigma factors bind to the sigma and inhibit activity until the time is appropriate.

The study, carried out by Professor Buttner's group in collaboration with Professor Maria Schumacher at Duke University, Unites States, shows that RsiG and c-di-GMP bind and hide sigma WhiG, preventing its target genes being expressed and therefore stopping the reproductive hyphae turning into spores. It is the first instance of c-di-GMP binding to a sigma factor and affecting its functionality. The paper 'c-di-GMP arms an anti- σ to control progression of multicellular differentiation in *Streptomyces*' appears in the journal *Molecular Cell*.

Mark Buttner, Matthew Bush, Govind Chandra, Neil Holmes, Kim Findlay

DOI: 10.1016/j.molcel.2019.11.006

Discovery could pave the way for disease-resistant rice crops

Researchers have uncovered an unusual protein activity in rice that can be explored to give crops an edge in the evolutionary arms race against rice blast disease.

Magnaporthe oryzae, the fungus that leads to rice blast disease, creates lesions on rice plants that reduce the yield and quality of grain.

Researchers from Professor

Banfield's group with colleagues in Japan reported in the *Journal of Biological Chemistry* that a particular rice immune receptor – from a class of receptors that typically recognise only single pathogenic proteins – can perform a dual role by triggering immune reactions in response to two separate fungal proteins. The genes that encode this receptor could become a

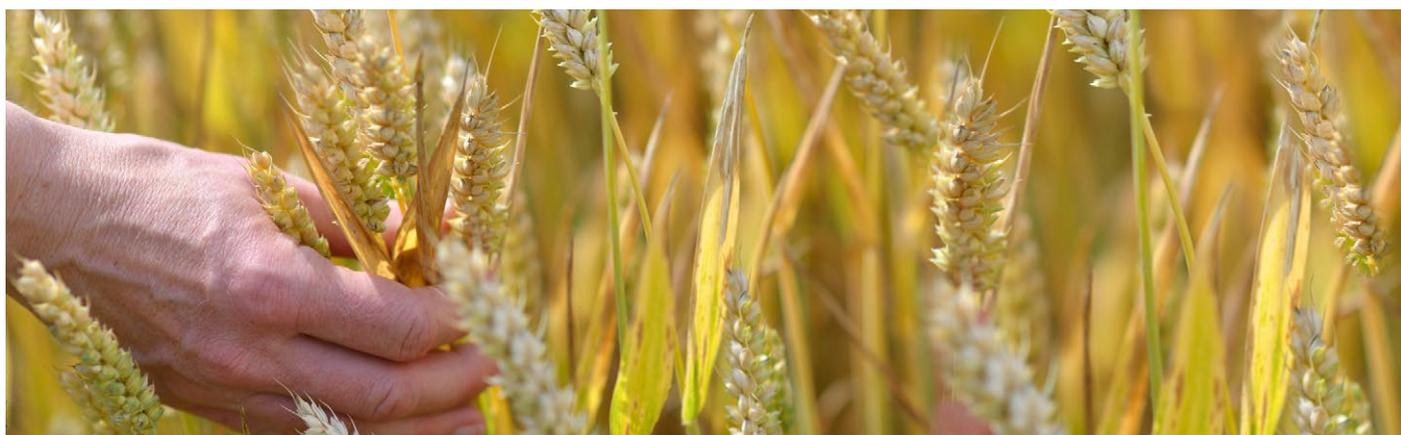
template for engineering new receptors that can each detect multiple fungal proteins, and thereby improve disease resistance in rice crops. Gene-editing technologies could be used to insert enhanced versions of receptors into plants. 'Cross-reactivity of a rice NLR immune receptor to distinct effectors from the rice blast pathogen *Magnaporthe oryzae*



provides partial disease resistance' was published in the *Journal of Biological Chemistry*.

Mark Banfield

DOI: 10.1074/jbc.RA119.007730



Detoxification enzyme discovery could be used to target major crop contaminant

Plants have evolved detoxification defence systems against an array of environmental or pathogen-produced contaminants. Detoxification systems offer a potentially rich repertoire for agricultural and medical applications, but examples of recruiting them for metabolic engineering are rare. Researchers used transcriptome analysis, virus-induced gene silencing and biochemical assays to isolate genes encoding a detoxification

enzyme found in cotton. The enzyme named SPG has evolved to synthesise defence compounds in the cytosol, the liquid element of the plant cell. The study shows that SPG can degrade the mycotoxin DON which is produced by the pathogenic fungus *Fusarium graminearum*. Enzymes that can degrade these mycotoxins are badly needed. The research team proposes that detoxification enzymes are a valuable source of new catalytic

functions and that SPG, a standalone enzyme catalysing complex reactions, has the potential for toxin degradation, crop engineering and design of novel aromatics.

This study in *Nature Chemical Biology* by researchers from the Chinese Academy of Sciences, ShanghaiTech University with input from Professor Cathie Martin's group.

Cathie Martin

DOI: 10.1038/s41589-019-0446-8



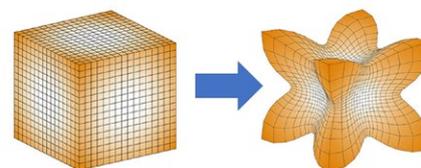
Vernalization study defines additional phase in universal epigenetic mechanism

In many plants the timing of flowering is controlled by a range of environmental and molecular signals. One such signal, prolonged cold, aligns flowering with spring. The mechanistic understanding of this process – vernalization – has contributed to the field of epigenetics, the study of how the environment affects genes. An important factor in vernalization is the transcription factor gene *Flowering Locus C* (FLC). Researchers in the groups of Professors Caroline Dean and Martin Howard study natural variation in this process in *Arabidopsis thaliana*.

Previous work had shown that Single Nucleotide Polymorphisms (SNPs) – these are single base changes in DNA – affect how much cold is required to silence FLC expression. A new study analyses those SNPs and shows how they work in combination to affect the plant's memory of winter. Studying the silencing in the context of these SNPs defined an additional phase in the sequence of events involved in the Polycomb silencing mechanism.

The findings have implications for the understanding of flowering time across plants with a broad range of reproductive strategies. 'Non-coding SNPs influence a distinct phase of Polycomb silencing to destabilise long-term epigenetic memory at *Arabidopsis* FLC', appears in *Genes & Development*.

DOI:10.1101/gad.333245.119



New tool reveals how the different shapes of organisms grow

Researchers have developed a new tool to explain how tissue growth leads to the range of forms we see in nature.

By understanding the principles of tissue growth, we can provide knowledge that can feed into many different applications, for example, improving the shape of crops and organ regeneration. Using the new tool, Dr Richard Kennaway and Professor Enrico Coen found a major difference between the growth of sheet tissues and bulk tissues.

Sheet tissue is thin in one direction but may be curved in space.

Bulk tissue is thick in all three dimensions like an apple.

It is much more constrained and less easily deformed.

Previous theories of growth start with a tissue sheet and have shown how they are deformed to create the shapes we see around us. This new framework is more general and shows how the tissue sheet itself is formed from a combination of a growth rate, that may vary in different regions of the tissue, and a single directionality, called a polarity field. Polarity fields are important for coordinating growth.

The study 'Volumetric finite-element modelling of biological growth' appeared in the journal *Open Biology*.

Enrico Coen and Richard Kennaway

DOI: 10.1098/rsob.190057

Science Communication and Engagement

Sharing ground-breaking science to a wide range of audiences

The communications and engagement programme works to inspire the next generation of scientists, showcasing the breadth of work carried out at the JIC and to ensure that our research programmes are shaped by public views and opinions. This provides opportunities to showcase our work with different audiences and to engage in dialogue with younger people, in schools, with families and with adult groups.

Staff and students attended a number of national, local and regional events including New Scientist Live, the British Science Festival, the Royal Norfolk Show, Spring Fling and Norwich Science Festival.



British Science Festival

In 2019 a small team travelled to Coventry to take part in the British Science Festival. This landmark national event has taken place since 1831, and visits a different city across the UK each year. The Festival sees an academic programme run alongside a public engagement event and the John Innes Centre took part in an adult event exploring work on peas.

"Keep your finger on the pulse" introduced the wide range of legumes and their uses, from everyday foods, to the production of bioplastics. In order to engage with this audience we worked with a graduate designer from Norwich University of Arts to produce a leaflet introducing the basic concepts and importance of pea genetics. Images from this booklet have been used on social media and on our website, accompanying stories from across the JIC.

Year 10 science camp

In July a group of 15 young scientists spent a week at the John Innes Centre learning about our work and developing their own science knowledge. The students were selected from a large number of applicants to join the Year 10 Science Camp. This work experience event offers the chance for teenagers to meet technicians and scientists, and to find out about life in a research setting. Over the week the students conducted experiments in the Chris Lamb Training Suite to supplement and support their school science lessons, and to ignite their curiosity. This year's theme was leaves and the group conducted experiments exploring leaf structure, pigmentation and photosynthesis. For two of the five days the students were split between different departments and shadowed staff working across the JIC. The week ended with a poster presentation session, where the students showcased what they had learnt and experienced to teachers and parents.

The Innes Lecture: From Farm Field to Gene bank

The 2019 Innes lecture saw invited speaker Helen Anne Curry from the University of Cambridge give an interesting talk about the practice of seed keeping and its development from farmers retaining good seed for future years, to one of active selection and breeding and through to the preservation of biodiversity.



In the nineteenth century, seed keeping began to move off the farm, slowly at first, and then more dramatically. Over time, Government plant breeders and private seed companies took on the tasks of maintaining varieties and selecting seeds for sale. Today, seed keeping on farms is undertaken only by growers who exist outside the agricultural mainstream either by necessity or by choice.

Although this change brought about gains in productivity, it also generated new concerns. When farmers stopped selecting and storing seed, the diversity of crops in cultivation dwindled. Modern seed banks such as the Germplasm Resource Unit located at the John Innes Centre keep vast numbers of varieties of crops, including wild species as well as commonly cultivated species.

Collaboration with Norwich University of the Arts

In 2019 we began a collaboration with the Illustration course at Norwich University of the Arts to bring together illustration students and scientists to explore research topics. We hosted 20 second-year students who chose from four briefs corresponding to the ISPs, and they heard from early-career researchers about current research in these areas.

Over two months the students developed ideas inspired by the research, which culminated in a fantastic exhibition held in Norwich City Centre. The illustrations are now used in communications work, particularly on the website and on social media. The artwork has been especially successful in growing JIC's Instagram following, which reaches a younger audience than our other social media channels. Additionally, the experience changed the students' perception of science, with one commenting: "At school I didn't like science, I found it difficult, but I've loved learning about science in this way."



Working with Industry



Vegetable breeding in Kathmandu Valley, Nepal

Dr Chris Ridout has been working with CN Seeds (CNS) and Sarba Shrestha Seeds (SSS) to establish a stable supply of quality vegetable seeds for Nepal. Supported by the BBSRC iFLIP programme, SSS have established a 'Model Farm' in Kathmandu Valley to be a hub for knowledge exchange where farmers can evaluate both local and commercial varieties, supplied by CNS, while learning new cultivation methods. In partnership with CNS and JIC, SSS have initiated a breeding programme to use marker assisted selection to integrate quality traits into Nepalese varieties. JIC training has enabled SSS to implement protocols for disease-free seed production safeguarding the quality of future supplies.

Engineering insect resistance

Professor Anne Osbourn, together with Syngenta has been resolving how the tropical tree, *Melia azedarach* (Chinaberry) makes limonoids to defend against insect feeding. Limonoids are bee friendly yet potent anti-feedants, repellent and egg-laying deterrents. Using genome mining techniques, Hannah Hodgson, a PhD student, has identified the three genes required to make melianol. Understanding how melianol is made has made it possible to use metabolic engineering to make limonoids in plant expression systems. This is a major step towards developing insect-resistant crops, which could reduce the reliance on chemical applications for crop protection. The technology has been patented and additional pharmaceutical applications are being explored.



Preparing for invasive pests

JIC's Entomology Platform is supporting Tropic Bioscience to evaluate their Gene Editing induced Gene Silencing - GEiGS™ - platform for the control of a beetle species, a known serious pest that has spread in the EU, and is on the current DEFRA pest alert. Darrell Bean and Susannah Gill from the Entomology Team have assisted Tropic Bioscience researchers to import and establish a colony of the pest which is maintained under licence at JIC. The team has co-developed an artificial diet which has accelerated feeding trials used to pre-test GEiGS™ constructs. The evaluation is expected to provide further validation of the GEiGS™ platform and how it can be effectively used for the development of disease- and pest-resistant crops.

Integrating gene sequencing technologies into pathogen surveillance activities

Dr Diane Saunders has been working with the UK cereal pathogen virulence survey (UKCPVS) led by NIAB and funded by AHDB to utilise new gene sequencing technologies to rapidly type strains of the yellow rust pathogen across the UK. Wheat yellow rust is a substantial threat to wheat production and can lead to complete crop loss in susceptible cultivars if left untreated. Ultimately integration of the technology into the UKCPVS will provide breeders, growers and agronomists with the latest information regarding the yellow rust strains present in-country to inform management decisions on how to effectively manage the threat of emergent populations and the best wheat varieties to deploy in the field.



Awards and Science Achievements



International honour for Professor Dame Caroline Dean

Professor Dame Caroline Dean FRS has been awarded the prestigious Wolf Prize in recognition of her pioneering discoveries in a long and distinguished career at the John Innes Centre.

Professor Dean received the 2020 Wolf Prize in Agriculture for her ground-breaking work on flowering time control and epigenetic basis of

vernalisation – the process by which plants delay flowering until they have experienced a period of prolonged cold. John Innes Centre Director Professor Dale Sanders FRS said, “Caroline’s work has provided many significant breakthroughs of profound importance in the field of biology. She is an outstanding scientist and

a fantastic role model and I take great pleasure in congratulating her on receiving this prestigious award. The Wolf prize recognises Caroline’s contribution to our understanding of how plants sense and remember winter, and how this is critically important to agriculture in the face of a changing climate.”



Innovator of the Year award recognises impact of international collaboration in wheat disease diagnostics

Dr Diane Saunders was named the 2019 BBSRC Innovator of the Year for international impact following her group’s work on developing genomics-based approaches for rapid point-of-care fungal disease diagnostics.

Their latest advancement known as MARPLE (Mobile And Real-time PLant disEase) Diagnostics was the result of a collaboration with Dr Dave Hodson of CIMMYT and Dr Tadessa Daba the Ethiopian Institute of Agricultural Research.

MARPLE Diagnostics provides the means for the first time to identify wheat rust strains at field sites within just two days. Since trials in late 2018, the suitcase-sized lab is already being used by partners on the ground in Ethiopia. Dr Saunders said, “I’m delighted to receive this award on behalf of the incredible team and international community we have supporting this project. I hope this continues to strengthen our work with CIMMYT and EIAR and ultimately improve crop protection for farmers.”

Queen’s Birthday Honours recognition for Professor Michael Bevan FRS

Professor Michael Bevan FRS was honoured after being appointed as an Officer of the Order of the British Empire (OBE) for services to plant genomics.

Over a distinguished career in research Professor Bevan has made world-leading contributions to our understanding plant genetics and genomics. Professor Dale Sanders FRS, Director of the John Innes Centre said, “I am delighted that Mike’s exceptional and sustained contributions to plant sciences have been recognised in this way. The technologies and biological insights that he has developed have provided invaluable resource for the global plant science research community and brought wider societal benefit through his work on the wheat genome.”



Professor Anne Osbourn elected as Fellow of the Royal Society

Professor Anne Osbourn was elected as a Fellow of the Royal Society (FRS) in honour of her exceptional contribution to science, becoming the 30th Fellow in the 109-year history of the John Innes Centre.

The honour reflects Professor Osbourn’s distinguished contributions to microbial and plant biology through pioneering work on plant pathogens and the role of gene clusters in natural product biosynthesis in plants.

“This is a great honour and very fulfilling,” she said. “I didn’t start out aiming to get recognition of this kind, I’ve just followed what I feel is important and interesting and done things I believe in. That’s sufficient for me in itself, but it’s gratifying that my work has attracted the recognition of the Royal Society.” This follows December 2019 when Professor Osbourn was awarded an Order of the British Empire (OBE) for services to plant science.

New Appointments

Group Leaders joining Institute Strategic Programmes (ISPs)

Dr Richard Smith

Dr Smith joins as a Group Leader in the Genes in the Environment ISP. Richard's research group uses mathematical and computer simulation techniques to investigate questions in plant development. Working in close collaboration with experimental biologists, they develop cellular-level simulation models of hormone signalling and patterning in plant tissue. These involve a biochemical aspect, genes, proteins, hormones, combined with growing, changing geometry as cells divide and tissues grow. The group is interested in the interaction between these two processes: how genes control physical properties of cells resulting in growth, and how the resulting change in geometry and physical forces feeds back on signalling and gene regulation. They are researching methods to quantify mechanical properties in plant tissues to help construct biophysically based simulation models of plant growth.



Dr Antony Dodd

Dr Dodd joins as a Group Leader in the Genes in the Environment ISP. Antony's research group investigates the adaptation of plants to fluctuating environments, focusing on circadian regulation and signal transduction. The daily cycles in environmental conditions impacting the functioning of plants has led to the evolution of circadian rhythms, which produce a biological measure of the time of day. Circadian regulation has an incredibly pervasive influence upon the functioning of plants, influencing fitness, growth rates, metabolism, seasonal control of development, and responses to abiotic and biotic stress. Therefore, circadian rhythms make an important contribution to crop performance. The Dodd group investigates fundamental and more applied aspects of circadian regulation and signal transduction.



Dr Simon Aspland

Dr Aspland joins as the Head of Commercialisation in the Knowledge Exchange and Commercialisation team. The role helps to enhance commercial partnerships including contract research, improving access to translational grants, launching and supporting John Innes Centre-affiliated spinouts and commercialisation of intellectual property.



Darryl Playford

Mr Playford joins as Field Experimentation Manager, and is responsible for the management of the Dorothea de Winton Field Station and the Field Experimentation Team. The team delivers accurate field experiments to our researchers and our collaborators through the facilities at Church Farm, Bawburgh and at Morley.



Dr Victor Sorio-Carrasco

Dr Sorio-Carrasco joins the John Innes Centre as lead of the entomology facility from University of Sheffield. The Entomology Facility has a high containment insectary and holds Defra licences for working with exotic species and plant pathogens. Dr Sorio-Carrasco aims to expand the capacities of the entomology facility by using genomic approaches to assist the diagnose and tracking of population dynamics of pests, the genetic mapping of relevant invertebrate traits, and the development of new pest control methods using evolutionary approaches and gene editing tools.

New Fellowships

Royal Society Newton Advanced Fellowship

This programme, for early to mid-career international researchers, allows for continued development of research strengths and provides more formalised training and development in collaboration with a UK partner.

Dr Evangelos Tatsis, CEPAMS Group Leader in Shanghai, works to determine how plants make structurally diverse chemical compounds.

The plants of the *Scutellaria* genus, commonly known as skullcaps, are widely used in Traditional Chinese Medicine (TCM). The extracts from roots of the Chinese skullcap, *Scutellaria baicalensis*, are used as an anticancer medicine. The extracts from aerial parts of barbed skullcap, *Scutellaria barbata*, are used in TCM for the treatment of metastatic cancers. Chemical analysis has shown that these two extracts are totally different chemical compounds.

Dr Tatsis aims to identify compounds from the barbed skullcap with anticancer activity, and to understand how plants synthesize these compounds. This work will open opportunities for the development of new anticancer drugs.

The Fellowship will strengthen the relationship between CAS



and JIC and will contribute to the nurturing UK-China research collaboration as part of the strongest UK-China partnership in the life-sciences, CEPAMS.

EMBO Long term Fellowship

The Long term Fellowships are awarded for up to two years and support post-doctoral research visits to laboratories in Europe and across the world. International Exchange is a key feature of the application process.

Dr Yalin Liu, in the laboratory of Dr Xiaohui Feng, is working to understand the molecular mechanism underlying the thermosensitivity of male reproduction. Temperature sensitivity of male reproduction is an important issue for studies in both male germ development and plant breeding.

The tissues of whole flower buds contain several different types of cells, which makes it difficult to identify the thermosensitive cells. The Feng lab discovered that tapetum cells, the innermost layer of the anther wall, that have direct contact with the developing gametophytes, are particularly sensitive to heat.

Dr Liu investigates the genetic basis of tapetal thermosensitivity, aiming to uncover how tapetal defects caused by heat causes male sterility at high temperature.



The Marie Skłodowska-Curie Actions

This programme supports researchers at all stages of their careers, regardless of age and nationality. Researchers working across all disciplines are eligible for funding, and they encourage individuals to work in other countries.

Dr Rafael Tavares is exploring crop yield, which primarily depends of stem height and inflorescence structure. Mutations that reduce stem growth have been used widely to improve crop yields but also have undesired side effects. Like all shoot organs, the stem is initiated within a region of the shoot apical meristem (SAM) called the rib meristem (RM) that provides cells for internodes.

As organs enlarge, specialised domains of restricted growth known as the boundaries within SAM, define the base of shoots and many aspects of plant architecture. The coordinated growth of different meristem regions relies on a tight interplay of local transcriptional networks and inter-regional hormone signalling. As part of Sablowski group, Dr Tavares is focused on understanding how specific boundary genes and hormone signalling control stem growth with the objective of developing more precise genetic tools to increase plant productivity by modifying plant height and shape.



Organisational Achievements

Dorothea de Winton Field Station opens doors to a future of smart farming

The Dorothea de Winton Field Station was officially opened in May 2019. The £4.3m facility in Bawburgh near Norwich was officially opened by National Farmers' Union President Minette Batters.

"It is wonderful to see this centre out in the field," she said. "We need to make sure that farmers, scientists, technicians, agronomists are delivering from the lab and glasshouse into the field. The future is smart, evidence-based farming and this development enables that."

The state-of-the-art building features laboratories and cutting-edge facilities used in genetic research to make major crops more nutritious, disease resistant and climate resilient. It is a key component in a smart-farming revolution.

It will enable scientists to take genetic improvements seen in labs and glasshouses and trial them in a realistic commercial farm setting. Major crops trialled in the 20 hectares of trial plots surrounding the building include wheat, pea, barley and oilseed rape.

Most of the funding for the building comes from the Biotechnology and Biological Sciences (BBSRC) with a £0.5 million contribution made by the John Innes Foundation.



It is wonderful to see this centre out in the field... The future is smart, evidence-based farming and this development enables that



Plants for the Future: John Innes Centre joins European Technology Platform

For more than 100 years our success has relied upon our international faculty, international collaborations and international outlook. On 29 October 2019, we became a Member of the Plants for the Future European Technology Platform. By joining the Platform we strengthen our links to peers, industry and farmers, and we reaffirm our intention to remain an integral part of a pan-continental European Research Area.

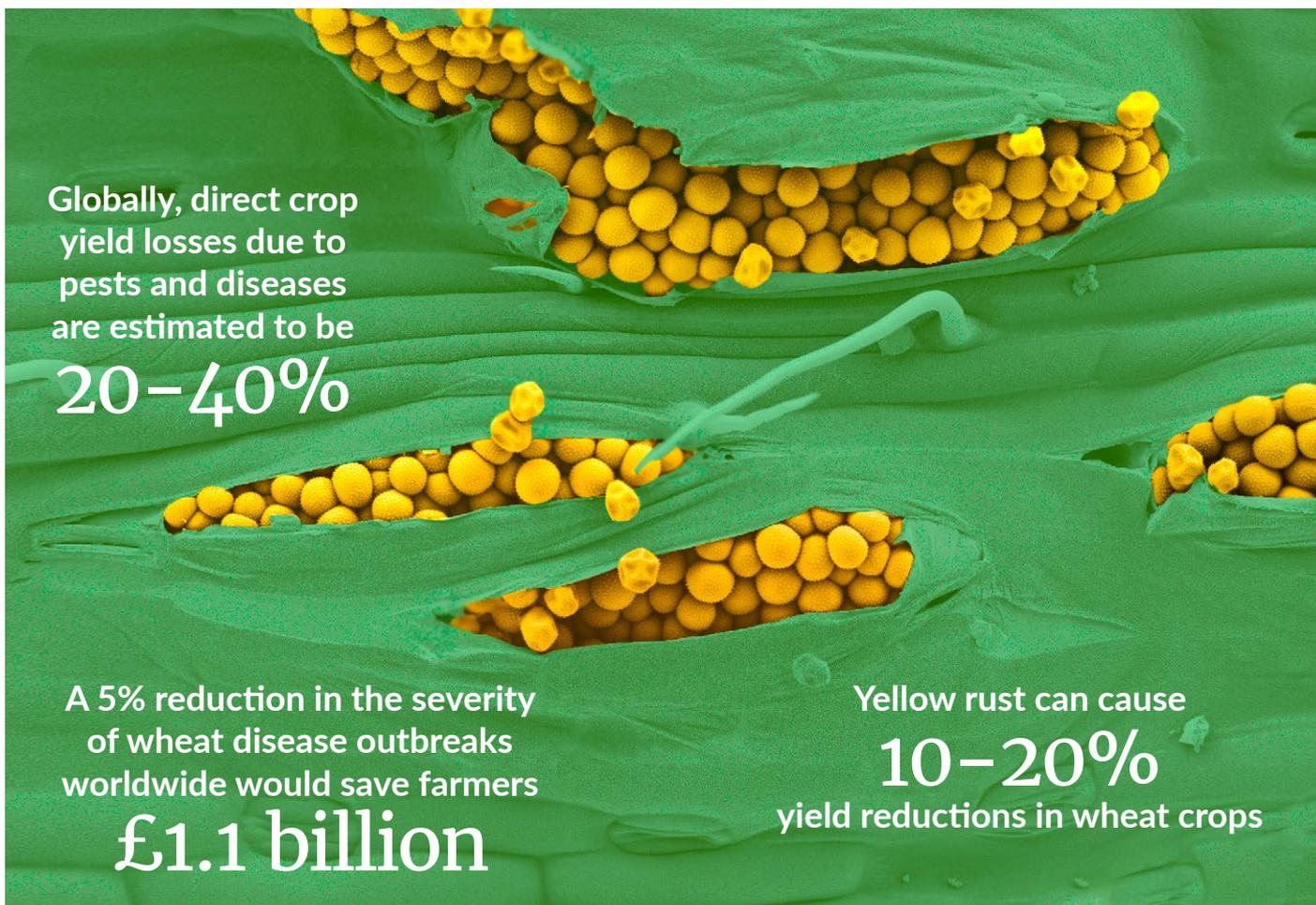
The European Technology Platforms (ETP) exist to inform the research and innovation agendas of their members, of European countries and of the European institutions.

John Innes Centre Director, Professor Dale Sanders FRS said, "Plants sustain life on our planet, feed our species and fuel our economies. At a time of global challenge and European uncertainty, we must not lose sight of the importance of collaboration to the future well-being of our economies and societies."





2020 is the International Year of Plant Health, a once-in-a-lifetime opportunity to raise global awareness on how protecting plant health can help end hunger, reduce poverty, protect the environment, and boost economic development



Globally, direct crop yield losses due to pests and diseases are estimated to be **20–40%**

A 5% reduction in the severity of wheat disease outbreaks worldwide would save farmers **£1.1 billion**

Yellow rust can cause **10–20%** yield reductions in wheat crops

Funding and Investment

Innovative wheat genome research awarded five-year European funding

An ambitious research project to improve global wheat production has been awarded European funding. The project led by Professor Cristobal Uauy will engineer useful genetic variation in wheat's huge and notoriously complex genome.

The resulting plant material will be made available to breeders to help to increase productivity in the world's most widely grown crop. The European Research Council (ERC) Consolidator grants recognise high-risk, high impact

research and allow project leaders to build up teams to address some of the most urgent questions facing humanity. Professor Uauy's grant is worth €2m over five years.

"We are delighted and excited to receive this funding because it will help us to address the urgent need for increasing crop yields," says Professor Uauy. "Despite the need for a 50% increase in crop production by 2050 our current rates of yield increase are insufficient to reach this goal."



Doctoral Training Partnership secures funding to train the bioscientists of the future

The Norwich Research Park Biosciences Doctoral Training Partnership (NRPDTP) has been awarded £12 million to train the next generation of bioscientists. The NRPDTP is one of 12 successful partnerships announced as part of a £170 million award from the Biotechnology and Biological Sciences Research Council (BBSRC, a part of UK Research and Innovation).

The John Innes Centre is the lead organisation of the NRPDTP alongside full partners the University of East Anglia (UEA), Quadram Institute Bioscience, Earlham Institute and The Sainsbury Laboratory – all based at Norwich Research Park.

NRPDTP director Professor Dave Evans of the John Innes Centre said, "We are delighted to receive this funding which reflects the important role played by Norwich Research Park and its partners in the UK's world-leading bioscience sector."

"This award will enable the delivery of a high-quality doctoral training programme to enable our PhD candidates to gain the attributes required for the highly-skilled workforce of the future."



Pioneering research investigates health impact of a plant-based diet

A new Wellcome Trust cross-disciplinary PhD programme draws together the world-class research expertise of the Norwich Research Park in a collaboration that includes the University of East Anglia (UEA), John Innes Centre, Quadram Institute and Earlham Institute.

Edesia: Plants, Food and Health PhD programme, co-led by the John Innes Centre, aims to advance understanding of plant-based nutrition from crop to clinic, initiating a step-change in nutritional research in the UK. The programme aims to investigate how a plant-based diet could prevent chronic illness.

The £5m award means that 25 PhD students – five each year over a five-year period – will work to unravel the complex inter-relationship between plant-based foods, metabolism, the gut microbiota and health outcomes.

Co-director of the programme Professor Cathie Martin FRS said, "The loss of plant-based, unrefined foods from the human diet means more people are burdened with nutritional insecurity and associated chronic illnesses."

"Understanding how plant-based foods promote and protect health will underpin effective future dietary recommendations, food choices and food production. If we want to improve the health of future societies world-wide we need more evidence and this programme will start to address that."

International Collaboration

AfriPlantSci 2019

The 2nd AfriPlantSci summer school took place in Kilifi, Kenya in 2019. The summer school is the product of a collaboration between Pwani University (PU) and the John Innes Centre (JIC), under the umbrella of the Alliance for Accelerated Crop Improvement in Africa (ACACIA) of which JIC and the Biosciences East and Central Africa – International Livestock Research Institute (BeCA-ILRI) are co-founders.

This year's course covered a broad range of science with guest lecturers focusing on recent results, combined with practical experience of the latest techniques in plant health research. The plant health focus explored the huge impact of pest and pathogens on crop yields and methods to mitigate these.

Each year the course recruits PhD and Masters students from across Africa to work with

researchers and students from the UK. The course drew 23 participants from 11 African countries representing 14 institutes.

Lectures covered topics including evolutionary genomics and plant abiotic stresses, plant transformation and gene editing, bioinformatics for field pathogenomics and insect-mediated plant disease.

A series of workshops provided the participants with core skills to advance their research careers. These included making a career plan, formulating scientific questions and crafting proposals, speaking with impact, gender responsive research, research ethics, manuscript writing and researcher job applications.

A large proportion of the training was led by JIC faculty, post-docs and technical staff with

additional trainers from PU, African Women in Agricultural Research and Development (AWARD) and the University of Nottingham.

Dr Anne Edwards, John Innes Centre, commented on the experience, "I realised how completely applied African Research is, how outputs are targeted specifically at smallholder farmers and how much engagement goes on between scientists and farmers."

As part of their Professional Internship for PhD Students (PIPS) placements, six PhD students from the Norwich Research Park Doctoral training programme (NRP DTP) contributed towards the workshop through delivering various activities at the summer school. Their open approach to supporting the summer school participants was





appreciated, as Frejus Sodedji from the University of Abomey-calavi says, "[The PIPS students] were very open, I learnt from each one of them and they have positively impacted my life. During the different practicals they assisted me, always ready to answer my questions and help me to seek clearance from the scientists whenever needed. They have also shared with me their experiences."

Virginia Gichuru, Pwani University commented, "I must say the PIPs were so open and helpful and I thank them for that. The main scientists were all so willing to help even after the course... I have also learnt from the participants and identified those I can work with in future."

As well as building skills, the summer school aims to encourage future collaborations and build lasting partnerships between UK and African researchers. Alongside the teaching the summer school provides the opportunity for UK staff and students to improve their understanding the challenges in African agricultural science.

PIPs placement student, James Canham said, "In future collaborations, it is vital to understand the factors (social, cultural, technical) that will impact on the project whether positive or negative. It is important to understand what they perceive as challenges and their appetite as well as capacity to tackle them."



■ ■ The plant health focus explored the huge impact of pest and pathogens on crop yields and methods to mitigate these. ■ ■

Future Plans

Objectives, activities and plans for future periods

JIC's principal objectives for the year ending 31 March 2021 are as follows:

- To continue a world-leading research and innovation programme by publishing ground-breaking scientific research, winning research funding, and recruiting and retaining the brightest and the best staff and students.
- To further evolve the John Innes Centre long term science vision, seeking and reflecting public opinion into science strategy.
- To secure funding for new Institute research facilities through our ambitious science vision and high profile campaign, Healthy Plants, Healthy People, Healthy Planet, enhancing JIC's global visibility.
- To increase commercial collaborations by improving the processes JIC uses to translate its research and alignment of this research to pressing societal and commercial unmet needs ultimately leading to increased industry derived income.
- To diversify our funding through access to the Global Challenges Research Fund and other new funding opportunities.
- To build on international research initiatives; the Centre for Excellence of Plant and Microbial Science (CEPAMS) and the Alliance for Accelerated Crop Improvement in Africa (ACACIA), by initiating and delivering high quality research and impact.
- To build on the Athena SWAN Gold Award and Technician Commitment by continuing to embed inclusivity and diversity into JIC culture and spreading best practice through beacon activities.

Key Performance Indicators

JIC's key performance indicators are:

- submission levels and success rates for research grant proposals;
- publications in relevant scientific journals;
- recruitment and retention of high quality staff and students;
- annual research income vs budget; and
- unrestricted reserves vs budget.

Details of publications and recruitment in the year are provided in the Achievements and Highlights section. Details of grant submissions, success rates, research income and reserves are provided in the Financial section.

Going Concern

The financial statements have been prepared on a going concern basis which the Trustees consider to be appropriate for the following reasons:

The Trustees have prepared cash flow forecasts for the period to March 2024 which indicate that, taking account of reasonable possible downsides and that the anticipated impact of COVID-19 on the operations and its financial resources, the Institute will have sufficient funds to meet its liabilities as they fall due for that period.

The Institute is reliant on its strategic programme funding from BBSRC, which was £13.7m in the year (2019: £13.7m). BBSRC has confirmed continued strategic funding of £13.2m for the year to March 2021 plus provisional funding at this level for a further two years to March 2023 subject to the next government spending review. The Institute fully expects its funding for the two years to March 2023 to be confirmed in early 2021 based on feedback from BBSRC.

Like most research organisations, the Institute's activities have been impacted by covid-19 measures. From late March 2020 until early-May 2020, the Institute's facilities were closed to all staff and students, except for essential work and activity supporting covid-19-related testing and research. During this period, JIC staff and students have been able to operate effectively from home and, with facilities being re-opened progressively since then, the Institute has been able to successfully maintain its research programmes and projects with minimal financial impact. The Institute has considered the potential financial impact of continued restrictions for the next 12 months, including the potential for a second lockdown. Taking into account experience to date, business continuity arrangements and financial projections, the Institute considers the risk of a significant financial impact from covid-19 to be low.

The Institute has prepared income, reserves and cash flow forecasts to March 2024. The forecasts indicate that the Institute will have significant cash headroom over the period, with cash balances of at least £30m for the 12 months from the signing date of this Annual Report.

Consequently, the Trustees are confident that the Institute will have sufficient funds to continue to meet its liabilities as they fall due for at least 12 months from the date of approval of the financial statements and therefore have been prepared the financial statements on a going concern basis.

Financial Review

Income

Total incoming resources for the year were £47.9m (2019: £49.6m). The decrease in the year was due to lower capital grant income. Income excluding capital funds was £40.4m (£39.8m), £0.8m above the budget for the year.

An analysis of grant income by principal sponsor is included in the notes to the financial statements. JIC's principal sponsor is the Biotechnology and Biological Sciences Research Council (BBSRC), which contributed 73% of total incoming resources (2019: 75%). Other major sources of funding were the European Union and charitable organisations.

Expenditure

Recurrent expenditure for the year amounted to £44.7m (2019: £45.7m). Staff costs accounted for £16.7m (37%) (2019: £17.1m; 37%) of expenditure.

Net Movement in Reserves

JIC recorded a net increase in unrestricted reserves of £1.5m (2019: £0.6m). Restricted reserves increased by £1.4m (2019: £5.3m) principally due to £7.5m of capital funding (2019: £7.7m).

Subsidiaries and Related Parties

Subsidiary companies contributed an operating profit of £96,000 (2019: £329,000), while JIC's share of associates' results was a profit of £228,000 (2019: loss of £41,000). The share of associates' results in the year relates to JIC's 33% interest in Plant Bioscience Limited and 45% interest in Leaf Systems International Limited ("LSI").

JIC invested a further £0.35m in LSI shares during the year, bringing its total investment to £1.6m. The value of JIC's investment in LSI has been fully written down at March 2020 to reflect the early stage of LSI's development and current trading position.

Capital expenditure

Capital expenditure in the year was £6.0m (2019: £8.9m). Investment has continued from the previous year in state-of-the-art scientific equipment, energy-efficient plant infrastructure, well-found laboratory equipment and enhanced plant growth facilities.

Cash

Group cash at March 2020 was £41.1m (2019: £38.4m). JIC deposits its cash with UK registered financial institutions that meet its credit rating policy and subject to agreed counter-party limits. Investment income from cash deposits in the year was £354,000 (2019: £296,000), up on last year due to higher deposit rates.

Reserves position

Total group reserves increased by £2.9m in the year to £109.9m (2019: £5.9m to £107.0m).

Restricted reserves increased by £1.4m in the year to £83.8m. Reserves of £10.0m relate to restricted designated capital reserves in connection with funding received from BBSRC to be used for future capital projects. Reserves of £0.3m relate to restricted designated general reserves in respect of ring-fenced strategic funding from BBSRC. The remaining £73.5m of restricted reserves related to the value of fixed assets.

Unrestricted reserves increased by £1.5m in the year to £26.1m (2019: £24.6m), £3.3m above the budget for the year. Reserves of £9.5m relate to unrestricted designated reserves for planned capital and strategic investments. The remaining unrestricted reserves include general reserves of £6.8m and designated fixed assets reserves of £9.8m.

Reserves policy

JIC's reserves are held to support financial solvency, manage uncertainty and fund future activities. The level of reserves required by JIC is therefore determined by reference to:

- Future operational and capital expenditure requirements in the March 2024 Business Plan;
- Potential financial risks identified in the Business Plan and Risk Register;
- Potential funding required for strategic investments not included in the Business Plan;
- Working capital / liquidity requirements.

Unrestricted reserves that have been designated by the Governing Council for specific purposes are shown in separate designated reserves. At March 2020, £9.5m of unrestricted reserves were designated for planned capital and strategic investments (2019: £8.3m).

General unrestricted reserves at March 2020 were £6.8m, slightly above the minimum general reserves target of £6.0m set by the Governing Council.

Grant proposals and awards

During the year, JIC researchers submitted grant proposals with a sponsor value of £34.9m (2019: £38.5m) and were awarded grants with a value of £13.7m (2019: £17.9m). The success rate for grant awards in the year was 42% by value (2019: 29%).

Stakeholder Engagement

– Section 172 Statement

The Trustee Directors consider that the decisions they have made during the financial year have satisfied the requirements of s172(1) of the Companies Act 2006 and that they have acted in good faith to promote the success of JIC as a whole, and in doing so having regard to the stakeholders and matters outlined in s172(1).

The Governing Council has the ultimate responsibility for the strategy of JIC and delivery of its charitable objectives. The table below sets out JIC's most significant stakeholders, why they are considered important and how the Institute engages.

Stakeholders	Why they are important	How we engage with them
Our staff and students	<ul style="list-style-type: none"> We are committed to providing a supportive, inspirational and dynamic environment for our staff and students to meet future scientific and societal challenges. We value the diversity of our staff, and are committed to the creation of a positive environment which is fair, welcoming and inclusive and where everyone is treated with dignity and respect. We are committed to the development of all our staff and students and providing equal opportunities that encourage flexible working, career development and work-life balance. 	<ul style="list-style-type: none"> During the year, regular communications to employees have been provided on matters affecting them, including factors affecting the Charity's progress, and have been consulted on decisions that impact them. All groups of Staff and Students have representation on the Inclusivity & Diversity Committee that meets 4 times a year to ensure an inclusive research culture. Students' progress is monitored on a regular basis and employees undertake an annual appraisal where their training needs, work-life balance and career development are discussed.
Our members	<ul style="list-style-type: none"> JIC's corporate members are: UK Research and Innovation (UKRI); John Innes Foundation (JIF) the University of East Anglia (UEA). Our members are key strategic partners that oversee our delivery against charitable objectives. 	<ul style="list-style-type: none"> The Members each nominate one Governing Council member and appoint one "observer" to attend Governing Council meetings, enabling them to participate in key decisions. An Annual Members' meeting is held to review progress against objectives.
Norwich Research Park	<ul style="list-style-type: none"> JIC is one of 4 independent, world-class research institutes based at the Norwich Research Park. The Institutes work closely together to create a unique centre of excellence in plant and microbial sciences, big data science and genomics, and food and health. 	<ul style="list-style-type: none"> The Institute Directors of the 4 institutes meet regularly to discuss common strategic and operational matters. JIC, the other Institutes, UKRI, UEA, JIF and the N&NU Hospital Trust are members of Anglia Innovation Partnership LLP, an organisation established to promote collaborative solutions to global challenges in food and health.
UK Research and Innovation	<ul style="list-style-type: none"> JIC is strategically funded, along with 7 other institutes, by the Biotechnology and Biological Sciences Research Council (BBSRC), part of UKRI. BBSRC supports JIC via strategic 5-year funding programmes, competitively won project grants and capital funding for infrastructure and technology investments. 	<ul style="list-style-type: none"> UKRI nominates a Governing Council member and appoints an "observer" to attend Governing Council meetings. JIC holds regular meetings with BBSRC to review progress of the Institute's mission and science programmes, including strategic and financial plans.
Research partners	<ul style="list-style-type: none"> JIC is an international centre of plant and microbial research. Our success is built on our collaborations and our international outlook. JIC is home to a range of state-of-the-art facilities and technology platforms to support scientists across the UK. 	<ul style="list-style-type: none"> An extensive programme of engagement with our new collaborative vision, Healthy Plants, Healthy People, Healthy Planet (HP3) is ongoing and involves discussion, input and views from stakeholders from industry, government and research partners, locally, nationally and internationally. JIC has strategic partnerships with research and academic institutions in the UK and worldwide, including Europe, China, Africa, Brazil and India.
Industry	<ul style="list-style-type: none"> JIC works closely with industry and the private sector to provide access to our capabilities, and to deliver sophisticated interdisciplinary research and product development at pace. 	<ul style="list-style-type: none"> JIC maintains a dialogue with industry, with regular consultations and knowledge exchange. JIC supports industry through collaborative and sponsored research and access to its facilities and platform services. JIC is proactive in identifying and responding to industry need. JIC protects its innovations and promotes their commercialisation and adoption by Industry. JIF nominates an industry representative as an "observer" to attend Governing Council meetings.
Community & the environment	<ul style="list-style-type: none"> Public views are at the heart of our research strategy and engaging with the public is an important part of our mission statement. 	<ul style="list-style-type: none"> JIC staff and students are trained in public engagement and communications and are supported to attend events, use digital media and to discuss and engage the public with our research. Examples of this can be seen on P10. JIC hosts and attends community events – online, locally and nationally, to showcase, debate and discuss the nature of our research. JIC scientists are engaged in policy discussions at a national level surrounding the use of genetic technologies for crop improvement. JIC is investing heavily in more energy efficient facilities to reduce utilities consumption and waste.
Suppliers	<ul style="list-style-type: none"> JIC seeks to maintain and develop strong, open, collaborative relationships with our supply chain. 	<ul style="list-style-type: none"> JIC holds regular meetings with suppliers about purchasing relationships and ethical behaviours such as adherence to Modern Slavery principles.

Risk Assessment and Management

Governing Council is responsible for ensuring there are effective and adequate risk management and internal control systems in place to manage the major risks to which the Charity is exposed.

The Audit Committee agrees an annual risk-based internal audit plan taking into account major risks and controls identified by management and the Trustees. It receives reports from internal auditors and external stakeholders on the effectiveness of internal controls, progress against the internal audit plan and progress on recommendations made in reports. Governing Council reviews a full risk report annually, including a 'heat map' tracking major risks. The Science and Impact Advisory Board (SIAB) assess the science quality and vision section of the risk register.

Principal risks and uncertainties

Risk area	Description of Risk	Management of Risk
Future BBSRC research funding	<ul style="list-style-type: none"> BBSRC strategic funding is reduced as a result of poor performance or public sector spending pressures. 	<ul style="list-style-type: none"> Regular monitoring of scientific performance, including consideration from the Science and Impact Advisory Board. Regular communication with BBSRC to report performance and ensure strategic alignment of research programmes. Monitoring of performance of competitive grant submissions.
Staff retention and recruitment	<ul style="list-style-type: none"> JIC is unable to retain or attract suitably skilled staff to enable it to sustain its scientific performance. In addition to scientific impact, this risk area could also have an impact on the level of funding the institute is able to attract. 	<ul style="list-style-type: none"> Strategy and action plans in place, overseen by Strategic Human Resources Group. Career development programmes in place to support high potential staff. Recruitment strategy and processes in place, including attractive support arrangements.
COVID-19	<ul style="list-style-type: none"> Loss of research activity due to staff becoming ill, or not being able to attend work due to the COVID-19. Loss of income or additional costs incurred as a result of the impact of Covid-19 on activity. Failure of supply chain. 	<ul style="list-style-type: none"> Building has been reopened subject to strict H&S/risk management protocols. Business Continuity Group established to implement policies and oversee arrangements. UKRI funding received to mitigate impact on grants and studentships.
Estates	<ul style="list-style-type: none"> JIC's ageing estate facilities do not adequately support the delivery of its scientific objectives. Funding is inadequate to sustain and improve facilities necessary to support scientific objectives. Estates maintenance and infrastructure costs are too high, threatening long-term financial sustainability and the competitiveness of JIC's science. 	<ul style="list-style-type: none"> Plans for Next Generation Infrastructure are being developed to replace ageing buildings with flexible research infrastructure capable of integrating multidisciplinary teams and harnessing developments in technology. Regular communication with BBSRC on Estates Strategy and potential funding requirements. Facilities management systems enhanced. Continued investment in energy efficiency.
Technology investment	<ul style="list-style-type: none"> JIC is unable to keep pace with developments in technology underpinning its science. Funding is inadequate to sustain and improve technology facilities. 	<ul style="list-style-type: none"> 5-year investment plan developed. Funding opportunities identified and pursued for technology investments.
Compliance with sponsor funding requirements	<ul style="list-style-type: none"> JIC fails to comply with sponsor grant requirements resulting in a material financial impact. 	<ul style="list-style-type: none"> JIC undertakes regular reviews of its grant compliance processes for sponsors and the UKRI internal auditors.
Major site incident	<ul style="list-style-type: none"> A major incident disrupts scientific research programmes or administrative systems. 	<ul style="list-style-type: none"> Business Continuity and Disaster recovery plans in place and tested periodically. Review of compliance with health & safety and relevant regulations from government agencies and internal auditors. Insurance arrangements in place.
Impact of leaving EU	<ul style="list-style-type: none"> JIC is not able to access EU programme funding or participate in EU research collaborations. JIC is not able to recruit or retain researchers from EU member countries. 	<ul style="list-style-type: none"> Regular dialogue with BBSRC and other key stakeholders on risks and emerging issues with respect to potential changes in arrangements. JIC has established strategic collaborations with European partners outside of formal funding frameworks

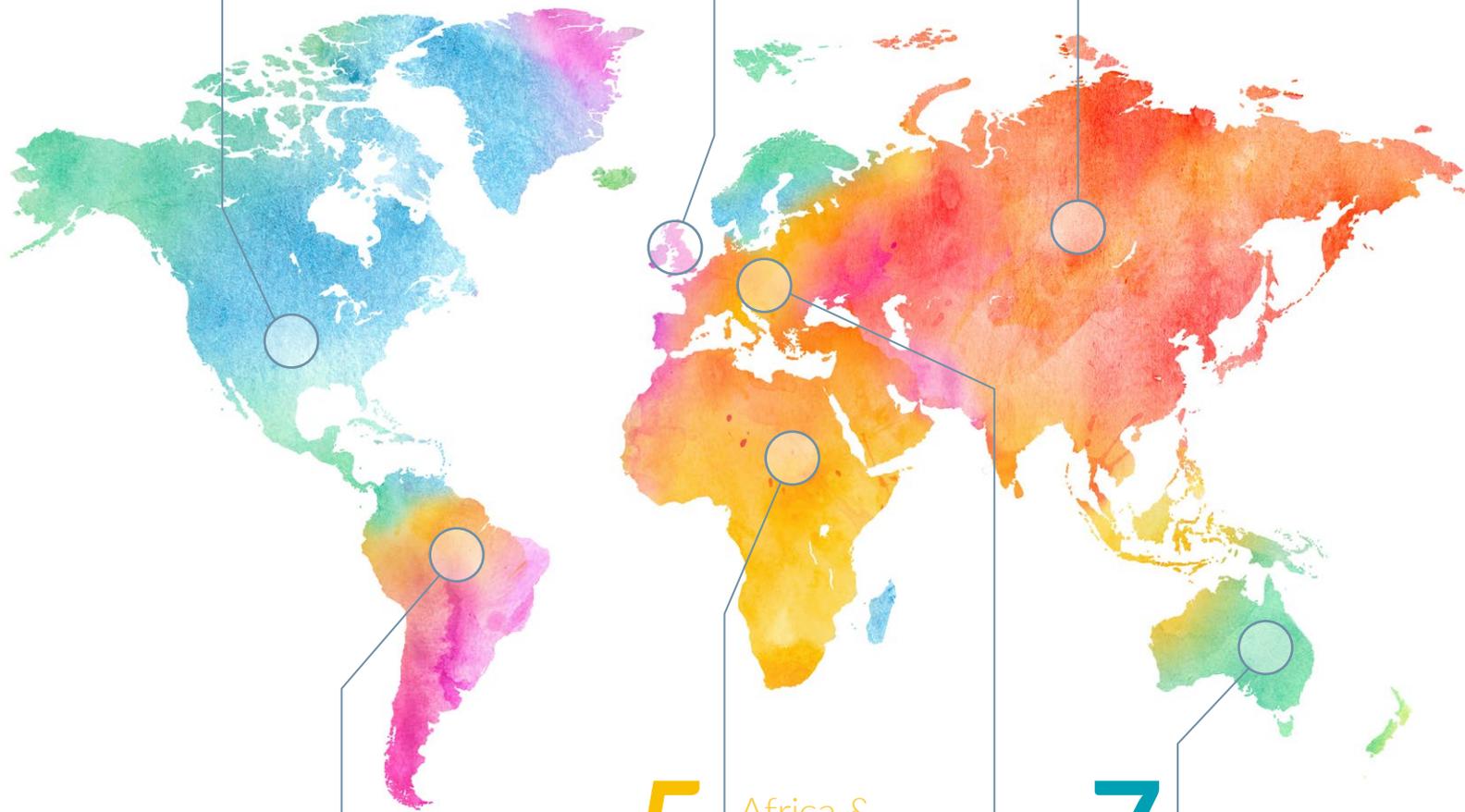
International Origins of JIC staff

Snapshot figures reflecting those 368 staff who declared their country of origin, excludes visiting workers.

10 North America

219 UK

60 Asia (Including Russia & Turkey)



5 South America

5 Africa & Middle East

7 Australasia

62 Europe (exc. UK)

41 Nationalities of staff at JIC

Structure, Governance and Management

Members

The Members of JIC are:

- UK Research and Innovation - Biotechnology and Biological Sciences Research Council ("BBSRC");
- John Innes Foundation ("JIF"); and
- University of East Anglia ("UEA").

The Members each have the right to nominate one Governing Council member and appoint one "observer" to attend Governing Council meetings. Details of member appointments are provided in the table below. The Members are all guarantors of JIC, a company limited by guarantee and a registered charity, of an amount not exceeding £1, and for a year after resignation.

Organisation and governance

JIC is incorporated in the England and Wales and is a company limited by guarantee (registered number 00511709) and a registered charity (number 223852). JIC is governed by its Memorandum and Articles of Association, adopted 27 September 2011, and its Institute Grant Agreement with BBSRC by whom it is strategically funded.

Governing Council (Board of Trustees)

The Governing Council comprises of at least the Chair, three science and three non-science Trustees. The Trustees who served during the year and up to the date of signing these financial statements were as follows:

Trustees	Appointment status	Role	Changes during period
<i>At date of Annual Report:</i>			
Dr W H L West	Independent	Chair	-
Prof J C Murrell	UEA appointment	Science	-
Ms J K Midura	Independent	Non-science	-
Dr D J Keith	Independent	Science	-
Mr R J Maskell	Independent	Non-science	-
Prof N J Talbot	Independent	Science	-
Mr J H Innes	Independent	Non-Science	-
Prof J P Armitage	Independent	Science	Appointed 20 October 2020
Dr J Vincent	JIF appointment	Science	Appointed 21 July 2020
<i>Served during the year:</i>			
Mr K R Norman	JIF appointment	Non-science	Resigned 3 June 2020
Prof O Leyser	BBSRC appointment	Science	Resigned 3 June 2020

The Governing Council has the ultimate responsibility for the strategy of JIC. Strategy is developed under advice from SIAB and the JIC Strategy Committee.

The Governing Council is supported by an Audit Committee to oversee financial management and risk and a Remuneration Committee to consider senior staff remuneration. The full Governing Council meets five times a year, the Audit Committee twice a year and the Remuneration Committee at least once a year and otherwise as required.

The Governing Council is also supported by a Science and Impact Advisory Board which comprises international experts in science and application of science, chaired in the year by Prof Ottoline Leyser.

The Science and Impact Advisory Board is responsible for providing strategic and scientific advice to the Director of JIC and the Governing Council on issues relevant to the JIC's Mission and Science Programme. This includes ensuring that the JIC Science Programme maximises JIC's potential for knowledge transfer, outreach and engagement with research users, stakeholders and the general public in addition to helping in the identification and development of new scientific funding opportunities to support the development of the JIC Science Programmes.

Recruitment, induction and training of Trustees

Governing Council vacancies are advertised as necessary. The Institute will also approach individuals thought to have the right skills.

New Governing Council members are invited to spend time with members of the Executive Team. This is a chance to learn about the Institute and identify opportunities to get more involved with JIC's work.

In addition to the five formal meetings, all Trustees receive regular presentations from JIC's scientists and briefings on key issues facing the organisation.

Trustee remuneration

None of the Trustees received any remuneration in the year in respect of their role as trustee directors. During the year Prof Ottoline Leyser received £nil (2019: £5,000) in the role of chair of JIC's Science and Impact Advisory Board.

Key Management Personnel

The Trustees delegate management of the day to day activities of the charitable company to the Director of the Institute, Prof Dale Sanders, and the executive Strategy Committee.

Strategy Committee

JIC's executive Strategy Committee advises the Director at strategic and operational levels on major issues that affect the Institute with respect to research, appointments, new initiatives, business plan and infrastructure, particularly where such issues involve more than one of these areas.

Its membership is as follows:

- Director (Chair);
- Institute Strategic Programme Leaders;
- Heads of Departments Representative;
- Finance Director;
- Head of HR;
- Head of Research Grants & Contracts;
- Head of Policy and International;
- Head of Commercialisation;
- Head of Communications and Engagement;
- Capital Projects Manager;
- Head of Directorate;
- Faculty Representative Project Leader.

Strategy Committee is supported by a number of other executive committees and groups including: Research Committee; Finance Committee; Heads of Departments Committee; KEC Strategy Committee; Strategic HR Committee; Inclusivity & Diversity Committee; and Health & Safety Committee.

Employees

JIC is a dynamic, multinational community of about 400 scientists and post graduate students. JIC's reputation for scientific excellence is international and it attracts some of the best scientists and brightest students internationally. JIC is committed to the training of the next generation of scientists. Activities include an undergraduate summer school (jointly with The Sainsbury Laboratory and Earlham Institute) that gives students the unique opportunity to spend the summer on site. There are two different routes to a PhD: the prestigious rotation studentships and the NRP Doctoral Training Programme. We host Post-Doctoral scientists and independent Fellows from around the world.

JIC staff that joined before 1 October 2011 were employed by BBSRC up to 1 October 2017, when they transferred employment to the Institute under TUPE.

Transferred employees retain their membership of the Research Councils Pension Scheme (RCPS), where applicable, with JIC becoming an admitted employer in the scheme. The RCPS is a defined benefit scheme funded from annual grant-in-aid on a pay-as-you-go basis. The RCPS Pension Scheme is a multi-employer scheme and JIC is unable to identify its share of the underlying assets and liabilities. JIC therefore accounts for the scheme as if it were a wholly defined contribution scheme. As a result, the amount charged to the income and expenditure account represents the contributions payable to the scheme in respect of the accounting period. Liabilities for the payment of future benefits are the responsibility of the RCPS and accordingly are not included in these Financial Statements.

JIC has recruited all new staff from October 2011 on its own terms and conditions, covering basic pay and allowances, contractual payments, tax, NI, pension contributions and redundancy. Such staff are eligible to join a defined contribution scheme.

Equality and Diversity

It is the Charity's policy to provide equal opportunities to job applicants and employees of any race, nationality, ethnic origin, marital status, religion or belief, gender, disability, sexual orientation, age or employment status. The Charity does not condone or tolerate any form of discrimination in its recruitment or employment practices. All employees and applicants are treated on merit, fairly, with respect and dignity, recognised as individuals and valued for the contribution they make, provided fair and equal access to training, development, reward and progression opportunities and are accountable for the impact of their own behaviour and actions. All the Charity's policies follow these principles.

JIC is aware of its statutory duty to support the employment of disabled persons where possible, both in recruitment and by retention of employees who become disabled whilst in the employment of the charitable company, as well as generally through training and career development.

In 2017, JIC became the first research institute to be awarded a 'Gold' Athena SWAN award. The Athena SWAN charter recognises and celebrates good practice in recruiting, retaining and promoting women in science, technology, engineering, maths and medicine (STEMM) in higher education.

This award recognises JIC's culture that embraces the principles of flexibility that provide for family-friendly working practices, while at the same time demonstrating a commitment to career advancement for all employees.

JIC's ability to attract the best researchers and students internationally creates a vibrant, dynamic and intellectually nurturing environment for both training and scientific discovery and is a primary driver of our scientific effectiveness. JIC recognises the value of a diverse workforce and, although Athena SWAN is focused on gender equality, we believe that a fair and equitable working environment is key to both a productive workforce and delivery of JIC strategy, and that initiatives put in place to address gender inequality ultimately benefit all staff. JIC is a member of Stonewall Diversity champion programme.

During the year, regular communications to employees have been provided on matters affecting them, including factors affecting the Charity's progress, and they have been consulted on decisions affecting them.

Related Parties

Subsidiaries

JIC's subsidiaries in the year were as follows:

- John Innes Enterprises Limited (contract research);
- Norwich Biosciences Limited (intellectual property management);
- Norwich Research Limited (dormant);
- JIC NRP Capital Limited (dormant).

Associates

JIC's associates in the year were as follows:

- NBI Partnership Limited;
- Plant Bioscience Limited;
- Leaf Systems International Limited.

NBI Partnership Limited

JIC has a 25% interest in NBI Partnership Limited ("NBIP"). NBIP supplies support and administrative services to JIC and the three other research organisations based on the Norwich Research Park (Quadram Bioscience Institute, Earlham Institute and The Sainsbury Laboratory). NBIP fully recharges its costs to the four research organisations and accordingly it generates no profit or loss.

Plant Bioscience Limited

JIC owns one third of the share capital of Plant Bioscience Limited ("PBL"). PBL manages the intellectual property rights of the charitable company and other organisations.

Leaf Systems International Limited

JIC owns 45% of the voting share capital and at 31 March 2020 had invested £1,630,000 in non-voting share capital of Leaf Systems International Limited ("LSI"). LSI is a commercial research and development company specialising in the expression and production of proteins, metabolites and complex natural products. During the year, JIC invested £350,000 in the non-voting share capital of LSI.

BBSRC

BBSRC is a member of the charitable company.

JIC is strategically funded, along with seven other institutes, by BBSRC. BBSRC supports JIC via strategic 5-year funding programmes, competitively won project grants and capital funding for infrastructure and technology investments. The principal terms and conditions under which BBSRC provides its funding are set out in the Institute Grant Agreement. Key conditions include:

- BBSRC and the Institute shall meet at least annually to review and discuss the implementation and progress of the Institute's business, including strategic and financial plans.
- The Institute shall submit a draft Business Plan, covering a period of at least five years, for discussion.
- The Institute will demonstrate appropriate plans for the maintenance, renewal and development of the estate through a rolling 10 year Institute Estates Strategy covering capital projects, long term and routine maintenance.

BBSRC is part of UK Research and Innovation (UKRI), an organisation that brings together the UK's seven research councils.

John Innes Foundation

The John Innes Foundation ("JIF") is a member of the charitable company. JIC occupies land and buildings which are owned by JIF, with the principal research buildings leased at a peppercorn rent. In addition, JIF also sponsors the training of a number of students. Studentship grants in the year were £381,000 (2019: £346,000). Further details are provided in note 23 to the financial statements.

Anglia Innovation Partnership LLP (formerly Norwich Research Partners LLP)

JIC is a member of Anglia Innovation Partnership LLP through its 100% subsidiary, JIC NRP Capital Limited. Anglia Innovation Partnership LLP is responsible for the management and development of the Norwich Research Park (NRP) estate and for the furtherance of the NRP Enterprise Vision.

JIC is entitled to receive a share of certain profits generated by Anglia Innovation Partnership LLP, however it has no liability for losses or in the event of insolvency. Anglia Innovation Partnership LLP has not yet generated any profits.

University of East Anglia

University of East Anglia ("UEA") is a member of the charitable company. The majority of PhD students at JIC are registered with UEA.

Statement of responsibilities of the trustees of John Innes Centre in respect of the Trustees' Annual Report and financial statements

The trustees are responsible for preparing the Trustees' Annual Report and the financial statements in accordance with applicable law and regulations.

Company law requires the trustees to prepare financial statements for each financial year. Under that law they are required to prepare the group and parent company financial statements in accordance with UK Accounting Standards and applicable law (UK Generally Accepted Accounting Practice), including FRS 102 The Financial Reporting Standard applicable in the UK and Republic of Ireland.

Under company law the trustees must not approve the financial statements unless they are satisfied that they give a true and fair view of the state of affairs of the group and charitable company and of the group's excess of income over expenditure for that period. In preparing each of the group and charitable company financial statements, the trustees are required to:

- select suitable accounting policies and then apply them consistently;
- make judgements and estimates that are reasonable and prudent;
- state whether applicable UK Accounting Standards have been followed, subject to any material departures disclosed and explained in the financial statements; and
- assess the group's and the charitable company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern; and
- use the going concern basis of accounting unless they either intend to liquidate the group or the charitable company or to cease operations, or have no realistic alternative but to do so.

The trustees are responsible for keeping adequate accounting records that are sufficient to show and explain the charitable company's transactions and disclose with reasonable accuracy at any time the financial position of the charitable company and enable them to ensure that its financial statements comply with the Companies Act 2006. They are responsible for such internal control as they determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error, and have general

responsibility for taking such steps as are reasonably open to them to safeguard the assets of the group and to prevent and detect fraud and other irregularities.

The trustees are responsible for the maintenance and integrity of the corporate and financial information included on the charitable company's website. Legislation in the UK governing the preparation and dissemination of financial statements may differ from legislation in other jurisdictions.

Insurance disclosure

The Institute maintains liability insurance for its Trustees, with an annual aggregate cover limit for all claims against them in that capacity. The Trustees have also been granted a qualifying third party provision under section 233 of Companies Act 2006. Neither the Institute's indemnity nor insurance provides cover in the event that a Governor is proved to have acted fraudulently or dishonestly.

Public benefit

The Trustees are satisfied they have complied with their duty in section 4 of the Charities Act 2011 to have due regard to public benefit guidance published by the Charities Commission. Based on this guidance, and as described in this Trustees' report, the Trustees believe the activities of JIC to be charitable in nature.

Independent auditor

KPMG LLP have been appointed as auditors and a resolution has been passed by the Board, concerning their appointment as auditors.

Approval of the Trustees' report

The Trustees' Report and Strategic Report were approved by Governing Council on 20 October 2020.

Will West, Chairman

Independent Auditor's report

To the Members of John Innes Centre

Opinion

We have audited the financial statements of John Innes Centre ("the charitable company") for the year ended 31 March 2020 which comprise the Group Statement of Financial Activities, The Group and Parent Charitable Company Balance Sheets, The Group Charitable Cash Flow Statement and related notes, including the accounting policies in note 1.

In our opinion the financial statements:

- give a true and fair view of the state of the group's and the charitable company's affairs as at 31 March 2020 and of the group's incoming resources and application of resources, including its income and expenditure, for the year then ended;
- have been properly prepared in accordance with UK accounting standards, including FRS 102 The Financial Reporting Standard applicable in the UK and Republic of Ireland; and
- have been prepared in accordance with the requirements of the Companies Act 2006.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (UK) ("ISAs (UK)") and applicable law. Our responsibilities are described below. We have fulfilled our ethical responsibilities under, and are independent of the group in accordance with, UK ethical requirements including the FRC Ethical Standard. We believe that the audit evidence we have obtained is a sufficient and appropriate basis for our opinion.

Going concern

The trustees have prepared the financial statements on the going concern basis as they do not intend to liquidate the group or the charitable company or to cease their operations, and as they have concluded that the group and charitable company's financial position means that this is realistic. They have also concluded that there are no material uncertainties that could have cast significant doubt over their ability to continue as a going concern for at least a year from the date of approval of the financial statements ("the going concern period").

We are required to report to you if we have concluded that the use of the going concern basis of accounting is inappropriate or there is an undisclosed material uncertainty that may cast significant doubt over the use of that basis for a period of at least a year from the date of approval of the financial statements. In our evaluation of the trustees' conclusions, we considered the inherent risks to the group's business model and analysed how those risks might affect the group and charitable company's financial resources or ability to continue operations over the going concern period. We have nothing to report in these respects.

However, as we cannot predict all future events or conditions and as subsequent events may result in outcomes that are inconsistent with judgements that were reasonable at the time they were made, the absence of reference to a material uncertainty in this auditor's report is not a guarantee that the group or the charitable company will continue in operation.

Other information

The trustees are responsible for the other information, which comprises Trustees' report incorporating the strategic review. Our opinion on the financial statements does not cover the other information and, accordingly, we do not express an audit opinion or, except as explicitly stated below, any form of assurance conclusion thereon.

Our responsibility is to read the other information and, in doing so, consider whether, based on our financial statements audit work, the information therein is materially misstated or inconsistent with the financial statements or our audit knowledge. Based solely on that work:

- we have not identified material misstatements in the other information;
- in our opinion the information given in the Trustees' Annual Report, which constitutes the strategic report and the directors' report for the financial year, is consistent with the financial statements; and
- in our opinion those reports have been prepared in accordance with the Companies Act 2006.

Matters on which we are required to report by exception

Under the Companies Act 2006 we are required to report to you if, in our opinion:

- the charitable company has not kept adequate accounting records or returns adequate for our audit have not been received from branches not visited by us; or
- the charitable company financial statements are not in agreement with the accounting records and returns; or
- certain disclosures of trustees' remuneration specified by law are not made; or
- we have not received all the information and explanations we require or our audit

We have nothing to report in these respects.

Independent Auditor's report (continued)

Trustees' responsibilities

As explained more fully in their statement set out on page 28, the trustees (who are also the directors of the charitable company for the purposes of company law) are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view; such internal control as they determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error; assessing the group's and the charitable company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern; and using the going concern basis of accounting unless they either intend to liquidate the group or the charitable company or to cease operations, or have no realistic alternative but to do so.

Auditor's responsibilities

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue our opinion in an auditor's report. Reasonable assurance is a high level of assurance, but does not guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

A fuller description of our responsibilities is provided on the FRC's website at www.frc.org.uk/auditorsresponsibilities.

The purpose of our audit work and to whom we owe our responsibilities

This report is made solely to the charitable company's members, as a body, in accordance with Chapter 3 of Part 16 of the Companies Act 2006. Our audit work has been undertaken so that we might state to the charitable company's members those matters we are required to state to them in an auditor's report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the charitable company and its members as a body, for our audit work, for this report, or for the opinions we have formed.

Stephanie Beavis (Senior Statutory Auditor)

for and on behalf of KPMG LLP, Statutory Auditor
Chartered Accountants
Dragonfly House
2 Gilders Way
Norwich
NR3 1UB

[Date]

Consolidated statement of financial activities

For the year ended 31 March 2020

Incorporating an income and expenditure account

	Note	Unrestricted funds £000	Restricted general funds £000	Restricted capital funds £000	Total 2020 £000	Total 2019 £000
Income						
<i>Income from charitable activities</i>						
Grant income		-	36,241	-	36,241	36,308
Capital and maintenance grants		-	325	7,499	7,824	9,769
Other charitable income		668	-	-	668	521
<i>Income from other trading activities</i>						
Trading income		331	-	-	331	467
Rental income		368	-	-	368	320
<i>Investment income</i>						
		361	-	-	361	303
<i>Other income</i>						
		2,093	-	-	2,093	1,910
Total income	2	3,821	36,566	7,499	47,886	49,598
Expenditure						
Charitable activities	3	(1,373)	(35,939)	(6,586)	(43,898)	(44,821)
Raising funds	3	(442)	-	-	(442)	(396)
Trading expenditure	3	(235)	-	-	(235)	(138)
Other resources expended	3	(164)	-	-	(164)	(327)
Total expenditure		(2,214)	(35,939)	(6,586)	(44,739)	(45,682)
Net income for the year		1,607	627	913	3,147	3,916
<i>Associates and Minority interest</i>						
Share of operating result of associates	12	228	-	-	228	(41)
<i>Transfers and revaluation</i>						
Capital transfers		(842)	-	842	-	-
Other transfers	20	513	(513)	-	-	-
(Loss)/Gains on revaluation of tangible fixed assets	10	-	-	(504)	(504)	2,046
Net income and net movement in funds for the year		1,506	114	1,251	2,871	5,921
Funds brought forward		24,591	230	82,235	107,056	101,135
Funds carried forward	20	26,097	344	83,486	109,927	107,056

The Consolidated Statement of Financial Activities ("SoFA") includes all gains and losses recognised in the year. All incoming resources and expenditure relates to continuing activities.

The notes on pages 35 to 50 form part of these financial statements

Note of consolidated operating surplus/(deficit) on a historical cost basis

For the year ended 31 March 2020

	Note	Total 2020 £000	Total 2019 £000
Operating surplus		3,147	3,916
Share of operating result of associates	12	228	(41)
Operating surplus after share of operating results of associates		3,375	3,875
Difference between historical cost depreciation and actual depreciation charge for the year calculated on the revalued amount		891	694
Operating surplus after share of operating results of associates, on a historical cost basis		4,266	4,569

The notes on pages 35 to 50 form part of these financial statements.

Consolidated and charitable company balance sheets

As at 31 March 2020

	Note	Group 2020 £000	Group 2019 £000	Company 2020 £000	Company 2019 £000
Fixed Assets					
Tangible assets	10	81,735	81,779	81,989	82,040
Intangible assets	11	12	61	12	61
Investments	12	-	-	1	1,281
<i>Investments in associates</i>					
Share of total assets		3,944	4,030	-	-
Share of total liabilities		(2,395)	(1,980)	-	-
	12	1,549	2,050	-	-
Total fixed assets		83,296	83,890	82,002	83,382
<i>Current assets</i>					
Stocks	13	266	214	266	214
Debtors	14	9,864	6,892	9,765	6,847
Cash at bank and in hand	15	41,112	38,442	40,821	37,925
		51,242	45,548	50,852	44,986
<i>Current liabilities</i>					
Creditors: amounts falling due within one year	16	(24,327)	(22,098)	(24,270)	(21,986)
Total net current assets		26,915	23,450	26,582	23,000
Total assets less current liabilities		110,211	107,340	108,584	106,382
Provisions for liabilities and charges	18	(284)	(284)	(284)	(284)
Total net assets	19	109,927	107,056	108,300	106,098
The funds of the charity					
<i>Unrestricted funds</i>					
Fixed assets reserve	20	9,834	9,693	9,305	9,389
Designated capital reserve	20	9,488	8,344	9,488	8,344
General reserve	20	6,775	6,554	6,442	6,104
Total unrestricted funds		26,097	24,591	25,235	23,837
<i>Restricted funds</i>					
General reserve	20	344	230	344	230
Fixed assets reserve	20	51,749	52,871	50,984	52,667
Designated capital reserve	20	10,024	8,038	10,024	8,038
Revaluation reserve	20	21,713	21,326	21,713	21,326
Total restricted funds		83,830	82,465	83,065	82,261
Total Charity funds		109,927	107,056	108,300	106,098
Capital employed	20	109,927	107,056	108,300	106,098

The financial statements on pages 31 to 50 were approved by the Governing Council on 20 October 2020 and were signed on its behalf by:

Will West, Chairman

Company registration number: 00511709

Consolidated statement of cash flows

For the year ended 31 March 2020

	Total 2020	Total 2019
	£000	£000
Cash flows from operating activities		
Net income and net movement in funds for the year	3,081	5,921
Share of operating result of associates	(228)	41
Revaluation of tangible fixed assets	294	(2,046)
Net income for the year	3,147	3,916
Interest receivable	(361)	(303)
Depreciation	5,507	4,899
Impairment of investment	1,079	-
Capital grants receivable	(7,499)	(7,689)
Loss on disposal of tangible assets	13	184
(Increase)/Decrease in stocks	(52)	15
(Increase)/Decrease in debtors	(2,972)	9,876
Increase/(Decrease) in creditors	2,229	(7,951)
Net cash provided by operating activities	1,091	2,947
Cash flows from investing activities:		
Interest received	361	303
Purchase of tangible assets	(6,011)	(8,865)
Investment in associate	(350)	(650)
Capital grants received	7,499	7,689
Proceeds from sale of tangible assets	80	10
Net cash (used in)/provided by investing activities	1,579	(1,513)
Change in cash and cash equivalents in the reporting period	2,670	1,434
Cash and cash equivalents at the beginning of the period	38,442	37,008
Total cash and cash equivalents at the end of the year	41,112	38,442

The notes on pages 35 to 50 form part of these financial statements.

Notes to the accounts

1. ACCOUNTING POLICIES

a. Basis of preparation

The group accounts have been prepared under the historical cost convention with items recognised at cost or transaction value unless otherwise stated in the relevant note(s) to these accounts.

The accounts have been prepared in accordance with the Statement of Recommended Practice: Accounting and Reporting by Charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) issued on 16 July 2014 and with the Financial Reporting Standard applicable in the United Kingdom and Republic of Ireland (FRS 102) and with the Charities Act 2011.

The charity constitutes a public benefit entity as defined by FRS102.

The principal accounting policies adopted in these financial statements, which have been consistently applied, are as follows:

b. Basis of consolidation

The consolidated financial statements incorporate the financial statements of JIC and all its subsidiary undertakings in accordance with Financial Reporting Standard ("FRS") 102 "Accounting for Subsidiary Undertakings", and associated entities which are accounted for using the equity method.

Associates are entities over which JIC has significant influence but not control. Under the equity method, the investment is initially recognised at cost, and the carrying amount is increased or decreased to recognise JIC's share of the profit or loss of the associate after the date of acquisition. JIC's share of post-acquisition operating result is recognised in the statement of financial activities. Determination is made at each balance sheet date whether there is any evidence that the investment in the associate is impaired. If this is the case, the amount of impairment is calculated as the difference between the recoverable amount of the associate and its carrying value, and this amount is recognised adjacent to share of operating result of associates in the statement of financial activities.

JIC is one of four members of NBI Partnership Limited ("NBIP"). The group accounts for NBIP as an associate, although in practice the company makes no profit or loss and has net assets of NIL, therefore has no impact on the Group financial statements.

The financial statements of all group undertakings and associates are made up to 31 March 2020.

A separate income and expenditure account has not been presented for JIC as this is exempted by Section 408 of the Companies Act 2006. The surplus of JIC was £2,202,000 (2019: £5,996,000).

c. Going concern

The Trustees have prepared cash flow forecasts for the period to March 2024 which indicate that, taking account of reasonable possible downsides and that the anticipated impact of COVID-19 on the operations and its financial resources, the Institute will have sufficient funds to meet its liabilities as they fall due for that period.

The Institute is reliant on its strategic programme funding from BBSRC, which was £13.7m in the year (2019:£13.7m). BBSRC has confirmed continued strategic funding of £13.2m for the year to March 2021 plus provisional funding at this level for a further two years to March 2023 subject to the next government spending review. The Institute fully expects its funding for the two years to March 2023 to be confirmed in early 2021 based on feedback from BBSRC.

Like most research organisations, the Institute's activities have been impacted by covid-19 measures. From late March 2020 until early-May 2020, the Institute's facilities were closed to all staff and students, except for essential work and activity supporting covid-19-related testing and research. During this period, JIC staff and students have been able to operate effectively from home and, with facilities being re-opened progressively since then, the Institute has been able to successfully maintain its research programmes and projects with minimal financial impact. The Institute has considered the potential financial impact of continued restrictions for the next 12 months, including the potential for a second lockdown. Taking into account experience to date, business continuity arrangements and financial projections, the Institute considers the risk of a significant financial impact from covid-19 to be low.

The Institute has prepared income, reserves and cash flow forecasts to March 2024. The forecasts indicate that the Institute will have significant cash headroom over the period, with cash balances of at least £30m for the 12 months from the signing date of this Annual Report.

Consequently, the Trustees are confident that in Institute will have sufficient funds to continue to meet its liabilities as they fall due for at least 12 months from the date of approval of the financial statements and therefore have been prepared the financial statements on a going concern basis.

d. Income

Charitable grant income represents grants received and receivable in the year from outside granting bodies.

Grants that provide core funding are recognised in the year in which entitlement passes. Grant funding received to train students and undertake research is recognised in the year in which the obligation is fulfilled. Grant funding is released to match expenditure incurred during the year together with any related contributions towards overhead costs.

Other charitable income represents non-grant revenue from providing scientific research services to other academic institutions and other services. Revenue is recognised in the year in which the obligation is fulfilled.

Trading income, which includes rent, other letting income and other income, relates to the non-charitable services undertaken by Norwich Biosciences Limited and John Innes Enterprises Limited, subsidiary companies of JIC, and is recognised in accordance with the terms of the contracts entered into, reflecting the point at which the obligations of the companies have been satisfied.

Investment income relates to interest receivable from treasury deposits and related party loans. The interest is recognised in the year in which it is earned.

1. Accounting Policies (continued)

Other income includes site infrastructure charges, UEA tuition fee income and miscellaneous income. Revenue is recognised in the year in which the obligation is fulfilled.

Capital grants are recognised in the consolidated statement of financial activities ("SoFA") when entitlement passes.

e. Expenditure

Charitable activity expenditure represents the full cost of the research performed. It includes the cost of direct staff, consumable stocks and indirect costs apportioned on the basis of use.

Raising funds represents the cost of obtaining funds for research. The cost of obtaining funds includes an estimate of the time/salary cost of project leaders preparing and reviewing grant application forms.

Governance costs represent the necessary cost of compliance with statutory and constitutional requirements and any other costs which are not direct charitable expenditure.

Support costs have been allocated to charitable activity expenditure, costs of generating funds and governance costs based upon activity or headcount as indicated in note 4 to the financial statements.

Other expenditure relates to expenditure maintaining capital assets that does not meet the capitalisation policy.

Trading expenditure relates to the costs of undertaking the non-charitable services performed by subsidiary companies of JIC, and is recognised in the period in which it is incurred.

f. Restricted funds

Where research at JIC is funded by grants with conditions attached to them, these are shown as restricted. Capital grants received and receivable together with other restricted funds received and receivable and used to purchase tangible assets are included within restricted funds.

From April 2018 the strategic programme grants from the UK Research and Innovation - Biotechnology and Biological Sciences Research Council ("BBSRC") are shown as restricted.

A restricted fixed assets reserve has been established representing the net book value of fixed assets purchased from capital grants.

Restricted reserves include a designated capital reserve of £10,024,000 (2019: £8,038,000) in connection with funding received from BBSRC, which is to be used on future capital projects to be agreed with BBSRC.

g. Unrestricted funds

Research grants that do not contain conditions for the final receipt of funds have been treated as unrestricted. Funds received for non-specified purposes have also been included as unrestricted.

A fixed assets reserve has been established within unrestricted reserves representing the net book value of fixed assets funded from unrestricted reserves.

Unrestricted reserves that have been designated by the Governing Council for specific purposes are shown in separate designated reserves.

h. Capital transfers

A transfer from unrestricted to restricted reserves equal to the depreciation charge for assets purchased from unrestricted reserves is made as a capital transfer.

i. Other Transfers

A transfer from restricted to unrestricted reserves is made following the completion of performance conditions in connection with restricted non-capital grant activity.

j. Revalue depreciation transfer

A transfer from the restricted fixed asset reserve to the revaluation reserve is made in relation to the differences in the historic cost and revalued depreciated costs.

k. Designated capital transfers

A transfer from the unrestricted general reserve to the unrestricted designated reserve is made in relation to the expenditure which had been designated by Governing Council for use in the financial projections to March 2022.

l. Centre funded capital

Capital expenditure funded from unrestricted reserves is shown as a transfer from the unrestricted designated capital reserve or general reserve to the unrestricted fixed asset reserve.

m. Tangible assets and depreciation

Tangible assets are shown at cost or valuation less accumulated depreciation. The cost of tangible assets is their purchase cost, together with any incidental costs of acquisition. Depreciation is calculated using the straight line method to write off the cost or valuation of assets, less any estimated residual value, over their estimated useful lives at the following rates:

Leasehold land and buildings - over lease term or useful life, if shorter;

Freehold land - not depreciated;

Freehold buildings - 50 years straight line;

Plant, machinery and equipment - estimated economic life;

Scientific equipment - 5 to 15 years straight line;

Computer equipment - 3 years straight line;

Motor vehicles - 4 years straight line;

Combined heat and power scheme - 20 years straight line.

The leasehold buildings have been depreciated over their estimated economic life. The Trustees have determined that land is not subject to depreciation. Assets in the course of construction are not depreciated until the asset is in full use.

JIC includes in its financial statements leasehold land and buildings owned by third parties, which it occupies and enjoys through extended peppercorn leases, at their fair value. The Trustees consider that in substance, the risks and rewards of ownership of the assets have passed to the Institute, and as such follow a policy of recognising the assets on the balance sheet reflects its continuing occupancy of these assets for the foreseeable future.

1. Accounting Policies (continued)

n. Revaluation of tangible fixed assets

Leasehold land and buildings are revalued by an external surveyor on a depreciated replacement cost basis every five years. The valuation is updated in the interim period using indexation tables. Gains on revaluation are credited to the revaluation reserve. Losses, except in cases of a clear consumption of economic benefit, are charged to the operating result for the period, to the extent they are not offset by previous gains. In cases of a clear consumption of economic benefit, losses are charged to unrestricted or restricted reserves as applicable, irrespective of whether they are offset by previous gains.

o. Intangible fixed assets and amortisation

Computer Software development costs are recognised as intangible fixed assets at cost less amortisation and any provision for impairment. Intangible assets are amortised over the estimated life of the asset acquired less any residual value.

Amortisation is calculated to write off the cost or valuation less the estimated residual value of intangible assets by equal instalments over their estimated useful economic lives as follows:

Computer Software	3 to 5 years
-------------------	--------------

Intangible assets under construction are not amortised until the asset is in full use.

p. Fixed asset investments

The consolidated balance sheet includes the group's share of each associate's gross assets and liabilities. The share of each associate's net income is reported in JIC's consolidated statement of financial activities.

q. Stocks

Stocks are stated at the lower of cost and net realisable value. Provision is made, where necessary, for slow moving or obsolete stock.

r. Debtors

Debtors are non-interest bearing and are stated at their nominal value, as reduced by appropriate allowances for estimated irrecoverable amounts.

s. Cash balances held as grant co-ordinator

Cash balances held on behalf of the European Union in the charitable company's capacity as grant co-ordinator are included within cash on the charitable company's balance sheet, and are disclosed in note 24 to the financial statements.

t. Trade creditors

Trade creditors are non-interest bearing and are stated at their nominal value.

u. Loans

Loans are stated on the balance sheet at amortised cost.

v. Provisions

A provision is recognised in the financial statements where there is a legal or constructive obligation to transfer economic benefit to a third party.

w. Staff and Pensions

JIC staff that joined before 1 October 2011 were employed by BBSRC up to 1 October 2017, when they transferred employment to the Institute under TUPE.

Transferred employees retain their membership of the Research Councils Pension Scheme (RCPS), where applicable, with JIC becoming an admitted employer in the scheme. The RCPS is a defined benefit scheme funded from annual grant-in-aid on a pay-as-you-go basis. The RCPS Pension Scheme is a multi-employer scheme and JIC is unable to identify its share of the underlying assets and liabilities. JIC therefore accounts for the scheme as if it were a wholly defined contribution scheme. As a result, the amount charged to the income and expenditure account represents the contributions payable to the scheme in respect of the accounting period.

Liabilities for the payment of future benefits are the responsibility of the RCPS and accordingly are not included in these Financial Statements.

JIC has recruited all new staff from October 2011 on its own terms and conditions, covering basic pay and allowances, contractual payments, tax, NI, and liabilities for pension contributions and redundancy. Such staff are eligible to join a defined contribution scheme.

x. Termination benefits

Redundancy payments are recognised as a liability and an expense only when the event is demonstrably committed to by either: a. termination of the employment of an employee or group of employees before the normal retirement date, or b. provision of termination benefits as a result of an offer made in order to encourage voluntary redundancy.

y. Operating leases

Rental costs are charged to the statement of financial activities on a straight line basis over the life of the lease.

z. Foreign currency transactions

The functional and reporting currency is pounds sterling. Transactions in foreign currencies are recorded at the rate of exchange ruling at the date of the transaction. Assets and liabilities denominated in foreign currencies are translated at year end exchange rates. All gains and losses are taken to the statement of financial activities in the year to which they relate.

aa. Financial instruments

Financial assets and financial liabilities are recognised upon becoming a party to the contractual provisions of the instrument.

The group only enters into basic financial instrument transactions that result in financial assets and liabilities such as trade and other accounts receivable and payable.

ab. Judgements in applying accounting policies and key sources of estimation

Preparation of the financial statements require management to make significant judgements and estimates. The items in the financial statements where these judgements and estimates have been made include:

- Depreciation, which has been charged in line with the accounting policy above. The amount of depreciation charged and net book value of the assets is included in Note 10.

- Leasehold land and buildings are held at a revalued amount. The valuation is performed by an external surveyor on a depreciated replacement cost basis every five years. The valuation is updated in the interim period using indexation tables.

2. Analysis of Incoming Resources

	Research activities	Student activities	Other activities	Total 2020	Total 2019
	£000	£000	£000	£000	£000
Grant income					
BBSRC	23,918	3,315	-	27,233	28,066
Other government departments	959	104	-	1,063	947
European Union	2,937	43	-	2,980	3,380
Industrial partners	161	169	-	330	381
John Innes Foundation	136	381	-	517	396
Other charities	2,463	505	-	2,968	2,008
Universities	23	12	-	35	59
Other grants	1,063	52	-	1,115	1,071
Total grant income	31,660	4,581	-	36,241	36,308
Capital and maintenance grants					
BBSRC					
Repairs & maintenance	-	-	-	-	4
Capital expenditure	7,824	-	-	7,824	9,265
John Innes Foundation					
Capital expenditure	-	-	-	-	500
Total capital grants	7,824	-	-	7,824	9,769
Other charitable income					
Scientific services	-	-	449	449	433
Miscellaneous income	-	-	219	219	88
Total other charitable income	-	-	668	668	521
Trading income					
John Innes Enterprises Limited	-	-	253	253	424
Norwich Biosciences Limited	-	-	78	78	43
Total trading income	-	-	331	331	467
Rental income					
Conferencing Facilities	-	-	241	241	237
Hill House	-	-	127	127	83
Total rental income	-	-	368	368	320
Investment income					
Interest receivable on cash deposits	-	-	354	354	296
Interest receivable on loan to related party	-	-	7	7	7
Total investment income	-	-	361	361	303
Other generated income					
Site infrastructure recharges	-	-	935	935	809
Other	-	-	1,158	1,158	1,101
Total other generated income	-	-	2,093	2,093	1,910
Total income	39,484	4,581	3,821	47,886	49,598

Included within income is income for restricted general funds of £36,566k (2019: £38,370k), and income for restricted capital funds of £7,499k (2019: £7,689k). All other income is unrestricted.

3. Analysis of Resources Expended

	Note	Research activities £000	Student activities £000	Other activities £000	Total 2020 £000	Total 2019 £000
Direct charitable expenditure:						
Staff costs		13,318	-	-	13,318	14,281
Direct costs		11,097	4,534	-	15,631	15,650
Depreciation and impairment		6,586	-	-	6,586	4,899
Governance costs	4	-	-	59	59	75
Support costs	4	6,796	1,508	-	8,304	9,916
Expenditure on charitable activities		37,797	6,042	59	43,898	44,821
Raising funds	4	-	-	442	442	396
Trading expenditure		-	-	235	235	138
Other resources expended		-	-	164	164	327
Total expenditure		37,797	6,042	900	44,739	45,682

Included within expenditure is restricted general expenditure of £35,939k (2019: £36,998k), and restricted capital resources expended (depreciation) of £6,586k (2019: £4,899k). All other expenditure is unrestricted.

Analysis of governance costs	Total 2020 £000	Total 2019 £000
Staff costs	23	25
Travel costs	4	9
Other costs	32	41
Total governance costs	59	75

4. Allocation of Support Costs, Governance and Raising Funds

	Research activities £000	Student activities £000	Raising funds £000	Governance costs £000	Total 2020 £000	Total 2019 £000	Basis of Allocation
Governing Council and SIAB	-	-	-	27	27	34	Headcount
Lab management	410	91	-	-	501	493	Headcount
Institute management	425	94	-	-	519	560	Headcount
Scientific services	3	1	-	-	4	222	Headcount
Facilities management and utilities*	4,005	889	-	-	4,894	5,994	Headcount
Finance and Purchasing*	545	121	-	-	666	789	Headcount
Computing and Library*	632	140	-	-	772	771	Headcount
Human Resources*	285	63	-	-	348	314	Headcount
Contracts services*	-	-	300	-	300	263	Activity
Other support services	491	109	142	32	774	947	Activity
Total support costs	6,796	1,508	442	59	8,805	10,387	

* includes services supplied by NBI Partnership Limited (see note 23).

Scientific services costs are shown net of recharges to science projects.

5. Taxation

John Innes Centre ("JIC") is an exempt charity within the meaning of the Charities Act 2011 and as such is a charity within the meaning of section 506(1) of the Income and Corporation Taxes Act 1988 and is not subject to corporation tax in respect of its charitable activities.

The trading activities of the subsidiary companies are subject to corporation tax; however profits in the year are gifted to the charitable company resulting in a £nil (2019: £nil) tax charge payable.

Unutilised losses of £79,000 (2019: £79,000) have been carried forward within the subsidiary companies for offset against future taxable profits. A deferred tax asset has not been recognised due to uncertainty over utilisation of these losses.

6. Operating Surplus

Operating surplus is stated after charging/(crediting):

	Total 2020	Total 2019
	£000	£000
Audit services:		
Fees payable to the charitable company's auditors for the audit of charitable company and consolidated financial statements	25	25
Fees payable for the audit of the charitable company's subsidiaries pursuant to legislation	4	4
Non-audit services:		
Non audit fees payable to the charitable company's auditors	-	12
Depreciation	5,507	4,899
Impairment of investment in associate	1,079	-
Loss on disposal of tangible assets	13	184
Hire of plant and equipment	54	30
Rent of land and buildings	21	72
(Profit)/Loss on foreign exchange translations	(7)	25

7. Net Income from Trading Activities of Subsidiaries

Profit and loss account	John Innes Enterprises Limited	Norwich Biosciences Limited	JIC NRP Capital Limited	Norwich Research Limited	Total 2020	Total 2019
	£000	£000	£000	£000	£000	£000
Turnover	253	78	-	-	331	467
Cost of sales	(208)	(27)	-	-	(235)	(138)
Gross profit	45	51	-	-	96	329
Administrative expenses	-	-	-	-	-	-
Operating profit	45	51	-	-	96	329
Interest received	-	-	-	-	-	-
Operating profit for the year	45	51	-	-	96	329

In addition to the above, £225,742 (2019: £155,029) in Gift Aid was paid to the charitable company in the year.

8. Remuneration of Members of the Governing Council

None of the members of the Governing Council received any remuneration from the group during the current or prior year for their duties as Trustees. During the year, Professor O Leyser, Trustee of JIC, received £nil (2019: £5,000) as chair of JIC's Science Impact Advisory Board ("SIAB").

Attendance expenses incurred by 3 (2019: 4) Trustees whilst carrying out their duties amounted to £421 during the year (2019: £875).

9. Employee Information

The monthly average number of persons employed by or deployed to the group and charitable company during the year, analysed by category, was as follows:

Group and charitable company	2020	2019
	Number	Number
Scientific	354	358
Office management and services	38	42
Total	392	400

The aggregate payroll costs of these persons were:

Group and charitable company	Note	2020	2019
		£000	£000
Wages and salaries		13,300	13,513
Redundancy costs		95	118
Social security costs		1,307	1,360
Other pension costs	22	2,016	2,120
Total		16,718	17,111

An analysis of the number of staff who fall within staff cost bands (excluding pension cost) from £60,000 upwards is provided below:

Group and charitable company	2020	2019
	Number	Number
£60,000 - £69,999	14	9
£70,000 - £79,999	6	9
£80,000 - £89,999	8	8
£90,000 - £99,999	5	4
£100,000 - £109,999	4	5
£110,000 - £119,999	2	1
£120,000 - £129,999	1	3
£140,000 - £149,999	-	1
£150,000 - £159,999	1	-
£180,000 - £189,999	1	1
Total	42	41

The number of staff with emoluments greater than £60,000 who were also members of the Research Councils' Pension Schemes was 23 (2019: 24). Twelve staff (2019: Fourteen) with emoluments greater than £60,000 are members of a defined contribution pension scheme.

Staff that joined prior to 1 October 2011 were employed by BBSRC up to 1 October 2017, when these employees transferred employment to the Institute under TUPE. Transferred employees retain their membership of the Research Councils Pension Scheme, where applicable, with JIC becoming an admitted employer in the scheme.

Staff that joined after 1 October 2011 are employed under JIC terms & conditions.

The key management personnel of the parent charity, JIC, comprise of the Trustees and the members of the strategy committee.

The key management personnel of the group comprise those of the charity and the key management personnel of the wholly owned subsidiaries, John Innes Enterprises Ltd, Norwich Biosciences Ltd, Norwich Research Ltd and JIC NRP Capital Ltd. All the subsidiaries key management personnel are the same as the parent company. No staff costs were recharged in respect of this. The employee costs (salaries, social security costs and pension costs) of the key management personnel for the group and charitable company were £1,487,433 (2019: £1,355,564).

10. Tangible Assets

Group	Freehold land and buildings	Long leasehold land and buildings	Plant, machinery and equipment	Assets under construction	Total
	£000	£000	£000	£000	£000
Cost/Valuation					
At 1 April 2019	3,771	68,714	36,040	1,383	109,908
Transfers	-	262	1,120	(1,382)	-
Additions	-	430	2,487	3,094	6,011
Revaluation	-	(504)	-	-	(504)
Disposals	(2)	-	(1,221)	(1)	(1,224)
At 31 March 2020	3,769	68,902	38,426	3,094	114,191
Accumulated Depreciation					
At 1 April 2019	-	7,029	21,100	-	28,129
Charge for the year	-	2,909	2,549	-	5,458
Disposals	-	-	(1,131)	-	(1,131)
At 31 March 2020	-	9,938	22,518	-	32,456
Net book value at 31 March 2020	3,769	58,964	15,908	3,094	81,735
Net book value at 31 March 2019	3,771	61,685	14,940	1,383	81,779
Charitable company					
	Freehold land and buildings	Long leasehold land and buildings	Plant, machinery and equipment	Assets under construction	Total
	£000	£000	£000	£000	£000
Cost/Valuation					
At 1 April 2019	3,771	68,975	36,040	1,383	110,169
Transfers	-	262	1,120	(1,382)	-
Additions	-	433	2,487	3,094	6,014
Revaluation	-	(504)	-	-	(504)
Disposals	(2)	-	(1,221)	(1)	(1,224)
At 31 March 2020	3,769	69,166	38,426	3,094	114,455
Accumulated Depreciation					
At 1 April 2019	-	7,029	21,100	-	28,129
Charge for the year	-	2,919	2,549	-	5,468
Disposals	-	-	(1,131)	-	(1,131)
At 31 March 2020	-	9,948	22,518	-	32,466
Net book value at 31 March 2020	3,769	59,218	15,908	3,094	81,989
Net book value at 31 March 2019	3,771	61,946	14,940	1,383	82,040

Assets under construction represent capital items which are not yet in full economic use.

JIC includes in its financial statements land and buildings owned by third parties, which it occupies and enjoys through extended peppercorn leases, at their full value. The Trustees consider that in substance, the risks and rewards of ownership of the assets have passed to the Institute, and as such a policy of recognising the assets on the balance sheet reflects its continuing occupancy of these assets for the foreseeable future.

The group and charitable company's leasehold land and buildings were revalued by an external surveyor (Powis Hughes Chartered Surveyors, RICS) on a depreciated replacement cost basis at 31 March 2017. These values have been updated at 31 March 2020 using indexation tables.

Leasehold land and buildings on an historical cost basis would be recorded at a net book value of £39,506,000 (2019: £40,839,000).

All of the charitable company's assets at 31 March 2020 are used for direct charitable purposes.

11. Intangible Assets

Group and Charitable company	Software development	Total
	£000	£000
Cost		
At 1 April 2019	147	147
Additions	-	-
At 31 March 2020	147	147
Accumulated Depreciation		
At 1 April 2019	86	86
Charge for the year	49	49
At 31 March 2020	135	135
Net book value at 31 March 2020	12	12
Net book value at 31 March 2019	61	61

12. Investments

Subsidiaries

The following are the operating subsidiary undertakings in which the charitable company has an interest:

Subsidiary Undertaking	Registration Number	Country of registration	Principal activity	Class and percentage of shares held
John Innes Enterprises Limited	02549904	England	Contract research	100% ordinary shares
Norwich Biosciences Limited	03076575	England	Management of intellectual property	100% ordinary shares
Norwich Research Limited	02814101	England	Dormant	100% ordinary shares
JIC NRP Capital Limited	06145922	England	Member of Anglia Innovation Partnership LLP	100% ordinary shares

The registered address for all the subsidiaries is John Innes Centre, Norwich Research Park, Colney, Norwich, NR4 7UH.

The charitable company's investment in subsidiary undertakings at cost amounts to £1,248 (2019: £1,248) and accumulated impairment of £244 (2019: £244) has been recognised against cost.

JIC NRP Capital Limited is a member of Anglia Innovation Partnership LLP (formerly Norwich Research Partners LLP), which is responsible for the management and development of the Norwich Research Park (NRP) estate and for the furtherance of the NRP Enterprise Vision. The company did not trade during the year.

The net income from trading activities of the subsidiaries during the year is shown in note 7.

Associates

The charitable company has an investment in Plant Bioscience Limited ("PBL"), a company registered in England and Wales, representing 33% (2019: 33%) of the ordinary £1 issued share capital. Plant Bioscience Limited manages the intellectual property rights of the charitable company and other organisations. This company is deemed to be an associate of the group and has therefore been included in the consolidated financial statements on that basis.

The charitable company has a 25% interest in NBI Partnership Limited ("NBIP"). NBIP supplies support and administrative services to JIC and the other Norwich Institutes (Quadram Bioscience Institute, Earlham Institute and The Sainsbury Laboratory) on a not-for-profit basis. NBIP fully recharges its costs to the four research organisations and accordingly it generates no profit or loss.

During the year, JIC invested a further £350,000 in the non-voting share capital of Leaf Systems International Limited ("LSI"). At 31 March 2020 JIC had a total investment of 45% voting share capital and £1,630,000 non-voting share capital. LSI is a commercial research and development company specialising in the expression and production of proteins, metabolites and complex natural products. The value of JIC's investment in LSI has been fully written down at March 2020 to reflect the early stage of LSI's development and current trading position.

12. Investments (continued)

Investments – Company

The movement in the value of investments during the year was as follows:

	Total 2020	Total 2019
	£000	£000
Valuation		
At beginning of year	1,281	631
Acquisition	350	650
Impairment provision	(1,630)	-
At end of year	1	1,281
Historical cost		
As at 1 April 2018 and 31 March 2019	1,631	1,281

Investments – Group

The Group's share of the operating results of associates was as follows:

Group	Leaf Systems International £000	Plant Bioscience Limited £000	Total 2020	Total 2019
	£000	£000	£000	£000
Associates, share of:				
Turnover	205	1,727	1,932	1,479
Operating (loss)/profit	(254)	457	203	(2)
Movement in opening balance	69	(44)	25	(39)
Share of result for the year	(185)	413	228	(41)

The Group's investment in associates is represented as follows:

Group	Leaf Systems International Limited A shares £000	Leaf Systems International Limited B shares £000	Plant Bioscience Limited £000	Total 2020	Total 2019
	£000	£000	£000	£000	£000
<i>Associates: Share of net assets</i>					
At beginning of year	(366)	1,280	1,136	2,050	1,441
Additions	-	350	-	350	650
Impairment provision	-	(1,079)	-	(1,079)	-
Share of result for the year	(185)	-	413	228	(41)
At end of year	(551)	551	1,549	1,549	2,050
<i>Represented by:</i>					
Share of total assets	935	551	2,458	3,944	4,030
Share of total liabilities	(1,486)	-	(909)	(2,395)	(1,980)
Share of net assets	(551)	551	1,549	1,549	2,050

The Trustees consider the value of investments included in the financial statements to be supported by their underlying assets.

13. Stocks

Group and charitable company	Total 2020 £000	Total 2019 £000
Raw materials and consumables	266	214
Total	266	214

There is no material difference between the valuation of stock and its replacement cost.

14. Debtors

	Note	Group 2020 £000	Group 2019 £000	Company 2020 £000	Company 2019 £000
<i>Grants receivable:</i>					
from government bodies	23	2,049	1,596	2,049	1,596
from other sources		2,366	1,566	2,366	1,566
Trade debtors		1,267	489	1,261	201
Amounts owed by subsidiary undertakings		-	-	32	369
Amounts owed by other related parties	23	782	1,038	782	1,038
Other debtors		1,060	546	958	473
Prepayments and accrued income		2,340	1,657	2,317	1,604
Total amounts falling due within one year		9,864	6,892	9,765	6,847

Grants receivable from government bodies includes £642,509 in relation to capital funding receivable from BBSRC (2019: £1,272,785).

15. Cash at Bank and in Hand

	Group 2020 £000	Group 2019 £000	Company 2020 £000	Company 2019 £000
Cash at bank	41,109	38,439	40,818	37,924
Cash in hand	3	3	3	1
Total	41,112	38,442	40,821	37,925

16. Creditors: Amounts Falling Due within One Year

	Note	Group 2020 £000	Group 2019 £000	Company 2020 £000	Company 2019 £000
<i>Grants received in advance:</i>					
from government bodies	23	5,163	3,954	5,163	3,954
from other sources		4,980	6,769	4,957	6,715
Trade creditors		3,053	2,196	3,052	2,181
Amounts owed to subsidiary undertakings		-	-	20	9
Amounts owed to other related parties	23	1,190	1,119	1,190	1,119
Other creditors		2,557	2,458	2,557	2,458
Taxation and social security		350	404	350	352
Accruals and deferred income		7,034	5,198	6,981	5,198
Total amounts falling due within one year		24,327	22,098	24,270	21,986

17. Reconciliation of Movement in Grants Receivable

Group and charitable company	Note	Total 2020 £000	Total 2019 £000
Grants receivable	14	4,415	3,162
Grants received in advance	16	(10,143)	(10,723)
Net grants received in advance		(5,728)	(7,561)
Net grants received in advance at beginning of year		(7,561)	(1,464)
Grant monies received during the year		(42,232)	(52,174)
Grant money released to SOFA during the year		44,065	46,077
Net grants received in advance		(5,728)	(7,561)

18. Provisions for liabilities and charges

Group and charitable company	Total 2020 £000	Total 2019 £000
Restructuring provision at beginning of year	284	284
Charge in the year	-	-
Utilised	-	-
Provision at end of year	284	284

The restructuring provision relates to future compensation payments due under the redundancy scheme in connection with the restructuring of science programmes and the administration and support functions. Although the restructuring provision has not been discounted, it is stated at the present value of future amounts payable since inflationary increases linked to the redundancy settlements have similarly been excluded from the provision.

19. Analysis of Net Assets Between Funds

	Fixed assets £000	Net current assets £000	Creditors over one year and provisions £000	Total 2020 £000
Group				
<i>Unrestricted:</i>				
Fixed assets reserve	9,834	-	-	9,834
Designated capital reserve	-	9,488	-	9,488
General	-	7,059	(284)	6,775
<i>Restricted:</i>				
General reserve	-	344	-	344
Fixed assets reserve	51,749	-	-	51,749
Designated capital reserve	-	10,024	-	10,024
Revaluation reserve	21,713	-	-	21,713
Net assets	83,296	26,915	(284)	109,927
Charitable company				
<i>Unrestricted:</i>				
Fixed assets reserve	9,305	-	-	9,305
Designated reserves	-	9,488	-	9,488
General	-	6,726	(284)	6,442
<i>Restricted:</i>				
General reserve	-	344	-	344
Fixed assets reserve	50,984	-	-	50,984
Designated reserves	-	10,024	-	10,024
Revaluation reserve	21,713	-	-	21,713
Net assets	82,002	26,582	(284)	108,300

The unrestricted fixed assets reserve relates to the net book value of fixed assets purchased from unrestricted funds. The restricted fixed assets reserve relates to the net book value of fixed assets purchased from capital grants.

The designated capital reserves are not endowment funds. The unrestricted designated capital reserve relates to funds designated by Governing Council for use in relation to planned capital investments in the financial projections to March 2022. The restricted capital reserve relates to funding received from BBSRC to be used in connection with future estates rebuild costs with the agreement of BBSRC.

The restricted general reserve relates to ring fenced strategic funding received from BBSRC. This funding has performance conditions attached and is transferred to the general reserve once the conditions have been met.

20. Analysis of Funds Movements

	Unrestricted fixed assets	Unrestricted designated capital	Unrestricted general	Restricted general	Restricted fixed assets	Restricted designated capital	Revaluation reserve	Total 2020
	£000	£000	£000	£000	£000	£000	£000	£000
Group								
At 1 April 2019	9,693	8,344	6,554	230	52,871	8,038	21,326	107,056
Total income and expenditure for the year	-	-	1,607	627	913	-	-	3,147
Associates	228	-	-	-	-	-	-	228
Revaluation of tangible assets	-	-	-	-	-	-	(504)	(504)
Revalue depreciation transfer	-	-	-	-	(891)	-	891	-
Capital transfers	(842)	-	-	-	842	-	-	-
Designated capital transfers	-	-	-	-	-	-	-	-
Centre funded capital	755	(674)	(81)	-	-	-	-	-
Other transfers	-	1,818	(1,305)	(513)	(1,986)	1,986	-	-
At 31 March 2019	9,834	9,488	6,775	344	51,749	10,024	21,713	109,927
Charitable company								
At 1 April 2019	9,389	8,344	6,104	230	52,667	8,038	21,326	106,098
Total income and expenditure for the year	-	-	1,727	627	352	-	-	2,706
Revaluation of tangible assets	-	-	-	-	-	-	(504)	(504)
Revalue depreciation transfer	-	-	-	-	(891)	-	891	-
Capital transfers	(842)	-	-	-	842	-	-	-
Designated capital transfers	-	-	-	-	-	-	-	-
Centre funded capital	758	(674)	(84)	-	-	-	-	-
Other transfers	-	1,818	(1,305)	(513)	(1,986)	1,986	-	-
At 31 March 2020	9,305	9,488	6,442	344	50,984	10,024	21,713	108,300

The revalue depreciation transfers have been made to reflect differences in the historical cost and revalued depreciation costs.

Capital transfers relate to fund movements in connection with fixed assets and depreciation; ensuring assets are appropriately reflected in separate reserves.

The designated reserve transfer relates to costs incurred in the year that have been set against the designated strategic reserve.

Centre funded capital transfers relate to capital expenditure funded from the unrestricted designated capital reserve and general reserve.

Where research at JIC is funded by grants with performance conditions attached to them these are shown in the Restricted general fund. When the conditions have been met the remaining contribution to core funding is transferred to general reserves, shown in other transfers above.

21. Commitments

Group and charitable company	Total 2020	Total 2019
	£000	£000
Capital commitments at the end of the financial year for which no provision has been made:		
Contracted	2,231	1,439
Amounts due under other operating leases for plant and machinery:		
Expiring in less than one year	41	10
Expiring between one and two years	36	5
Expiring between two and five years	80	2
	157	17

22. Pension Schemes

JIC staff that joined before 1 October 2011 were employed by BBSRC up to 1 October 2017, when they transferred employment to the Institute under TUPE.

Transferred employees retain their membership of the Research Councils Pension Scheme (RCPS), where applicable, with JIC becoming an admitted employer in the scheme. The RCPS is a defined benefit scheme funded from annual grant-in-aid on a pay-as-you-go basis. The RCPS Pension Scheme is a multi-employer scheme and JIC is unable to identify its share of the underlying assets and liabilities. JIC therefore accounts for the scheme as if it were a wholly defined contribution scheme. As a result, the amount charged to the income and expenditure account represents the contributions payable to the scheme in respect of the accounting period. Liabilities for the payment of future benefits are the responsibility of the RCPS and accordingly are not included in these Financial Statements. The employer contribution rate during the year was 26% (2019: 26%).

JIC employees that joined after 30 September 2011 are eligible to join a defined contribution scheme.

The total pension charge for the year was £2,016,424 (2019: £2,119,685), with outstanding contributions at the year-end of £83,849 (2019: £79,927).

23. Related Party Transactions

The charitable company has taken advantage of the exemption under FRS102, not to disclose transactions and balances with its wholly owned subsidiaries.

BBSRC

JIC is strategically funded by BBSRC. Grants received from BBSRC are detailed in note 2. At 31 March 2020, BBSRC owed JIC £1,830,332 (2019: £1,108,646).

During the year BBSRC paid JIC £232,155 (2019: £811) compensation for redundancy and salary costs incurred in restructuring and £182,586 (2019: £7,346) for other costs.

In April 2018, BBSRC became part of UK Research and Innovation (UKRI), a new organisation that brings together the UK's seven research councils, Innovate UK and Research England.

Plant Bioscience Limited

PBL is 33% directly owned by JIC. PBL has been accounted for as an associate within the consolidated financial statements. Services provided to JIC by PBL in the year to 31 March 2020 amounted to £60,771 (2019: £57,484). During the year, PBL paid JIC £37,215 (2019: £36,328) in rent and £567 (2019: £1,778) in student sponsorship and research grants. At 31 March 2020, PBL owed JIC £nil (2019: £nil) and JIC owed PBL £6,134 (2019: £nil).

Leaf Systems International Limited

During the year, JIC invested £350,000 in the non-voting share capital of Leaf Systems International Limited. LSI has been accounted for as an associate within the consolidated financial statements. JIC paid LSI £89,556 (2019: £656,835) for services in the year ended 31 March 2020. During the year, LSI paid JIC £21,714 (2019: £30,459) for costs incurred by JIC on behalf of LSI. At 31 March 2020, LSI owed JIC £2,758 (2019: £1,871).

NBI Partnership Limited

JIC is one of the four guarantors of NBI Partnership Ltd ("NBIP"), a company limited by guarantee. JIC has provided short-term loans to NBIP to enable NBIP to manage its cash requirements. Interest is payable on the loan at 2% and during the year JIC charged £6,980 (2019: £6,700) in respect of interest due. At 31 March 2020, JIC had a loan balance with NBIP of £349,000 (2019: £335,000).

JIC was charged £4,495,308 (2019: £4,309,127) for services by NBIP under a cost sharing agreement. As at 31 March 2020, JIC owed NBIP £406,676 (2019: £405,589). NBIP paid JIC £53,858 (2019: £53,838) for services and, as at 31 March 2020, NBIP owed JIC £8,538 (2019: £1,993).

Anglia Innovation Partnership LLP (formerly NRP LLP)

JIC is a member of Anglia Innovation Partnership LLP through its 100% subsidiary, JIC NRP Capital Limited. Anglia Innovation Partnership LLP is responsible for the management and development of the Norwich Research Park (NRP) estate and for the furtherance of the NRP Enterprise Vision. During the year, JIC received services totalling £1,046 (2019: £643), and was charged £144,253 (2019: £144,792) for estate costs. As at 31 March 2020, JIC owed Anglia Innovation Partnership LLP £81,292 (2019: £144,792).

JIC invoiced Anglia Innovation Partnership LLP for services totalling £129,202 (2019: £88,889). As at 31 March 2020 Anglia Innovation Partnership LLP owed JIC £nil (2019: £8,237).

23. Related Party Transactions (continued)

University of East Anglia

UEA is a member of the charitable company and it nominates one Governor to the Governing Council.

The majority of PhD students carrying out research at JIC are registered with UEA. During the year UEA provided student services of £452,186 (2019: £650,667) and other services amounting to £56,835 (2019: £27,079) to JIC. At 31 March 2020, JIC owed UEA £548,259 for student fees and other costs (2019: £552,045) and £65,769 for other services (2019: £16,328).

During the year, JIC received £417,811 (2019: £448,759) in student payments from UEA and provided £182,881 (2019: £253,999) of other services. At 31 March 2020, UEA owed JIC £391,152 (2019: £690,248) for student fees and services.

John Innes Foundation

JIF is a member of the charitable company and it nominates one Governor to the Governing Council of JIC. The following transactions took place during the year:

	Total 2020	Total 2019
	£000	£000
<i>Paid to JIC:</i>		
Grants for studentships	381	346
Grants for research project	107	36
Contribution to salary costs	19	12
Contribution to women of the future	2	2
Contribution to field trials station	8	500
	517	896

At 31 March 2020, JIF owed JIC £30,692 (2019: £968).

24. Cash Held as Grant Co-Ordinator

JIC holds cash of £1,157,004 (2019: £1,628,713) on behalf of the various institutions in its capacity as project co-ordinator on a number of projects. JIC acts as an intermediary only and does not control the risks and rewards associated with the cash. An equal balance is held in other creditors.

25. Ultimate Parent Undertaking and Controlling Party

The Trustees consider that there is no ultimate parent undertaking and controlling party. JIC is the parent undertaking of the smallest and largest group of undertakings to consolidate these financial statements.

26. Contingent Liability

JIC receives grant income from funding bodies, such as the BBSRC and the European Union, that routinely undertake retrospective financial audits of costs claimed. Such audits may from time to time give rise to adjustments to grant income receivable. No general provision is made for such potential audit adjustments in the financial statements.

Charity information

Directors and Trustees

Dr W H L West	Chair – Governing Council & Remuneration Committee
Mr J H Innes	Chair – Audit Committee
Dr D J Keith	
Mr R J Maskell	
Ms J K Midura	
Prof J C Murrell	
Prof N Talbot	
Prof J P Armitage	Chair – Science and Impact Advisory Board
Prof J Vincent	

Director of the Institute Prof D Sanders

Company Secretary Mr D Foreman

Key Management Personnel

Prof D Sanders
 Prof M Banfield
 Prof C Domoney
 Prof B Wilkinson
 Dr C Thomas
 Mr C Darby
 Prof G Moore
 Prof L Ostergaard
 Prof M Howard
 Mr D Foreman
 Mr B Morrison
 Ms A O'Halleron
 Dr S Aspland
 Dr F Perry
 Mr J Tebbutt

Registered charity number 223852

Registered company number 00511709

Registered office and principal office of the charity

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Solicitors

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Birketts
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