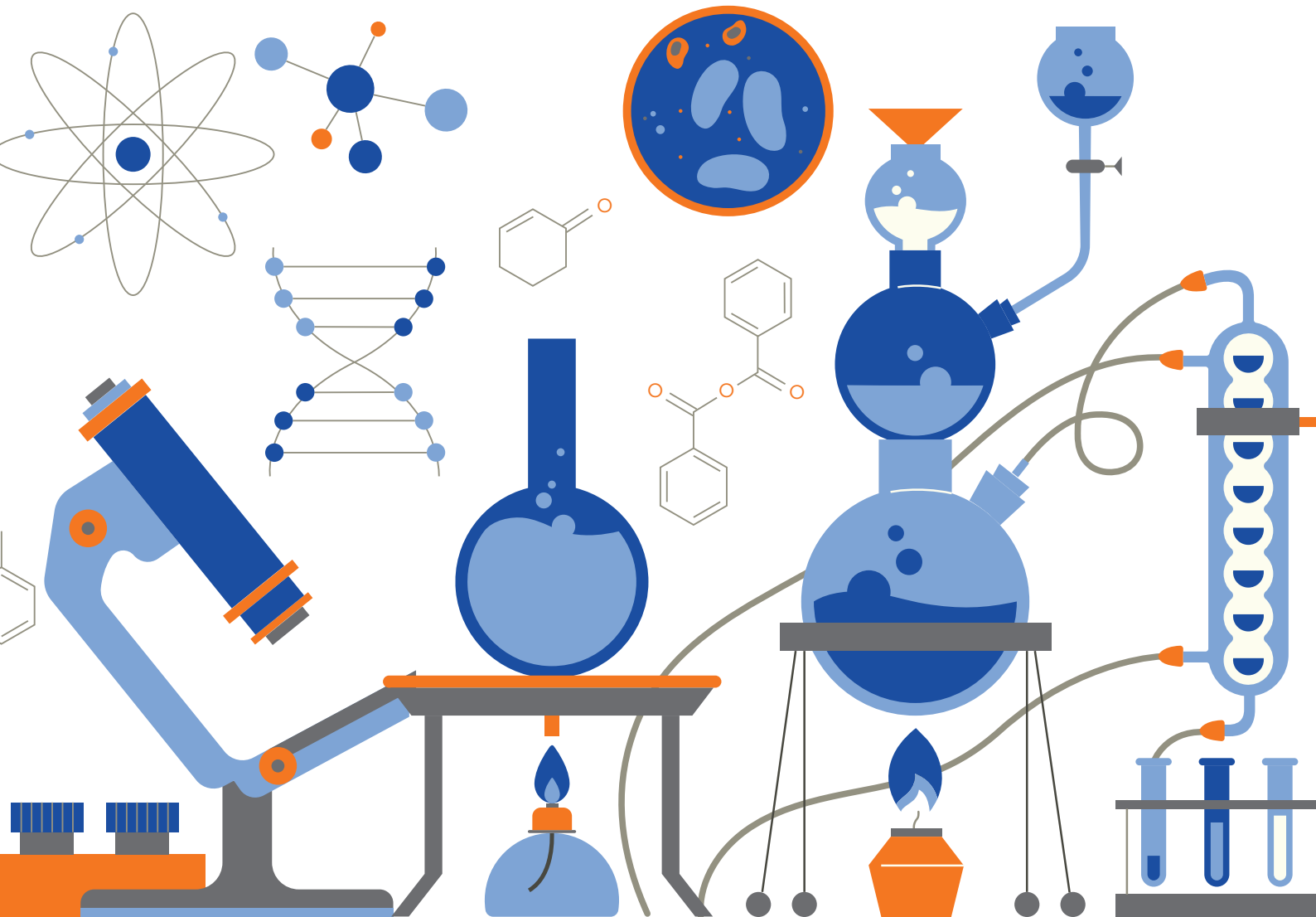
JKR

JOHN KEELLS RESEARCH

COMPANY PROFILE

www.johnkeellsresearch.com



JOHN KEELLS HOLDINGS PLC

John Keells Holdings PLC (JKH) is the largest conglomerate listed on the Colombo Stock Exchange.

With a heritage of over 150 years, through innovation and strategic partnerships, the John Keells Group of companies have become leaders in many key industry verticals.

The Group operates in the industry groups of Transportation, Consumer Foods, Retail, Leisure, Property, Financial Services and Other, including Plantation Services and IT, making it a driver and an integral part of the Sri Lankan economy.

The company has been ranked as Sri Lanka's Most Respected Entity for the 19th year due to its commitments to community outreach, environmental sustainability and Diversity, Equity and Inclusion (DE&I). It has also been ranked by Transparency International Sri Lanka as joint-first for Most Transparent Entity in Sri Lanka, due to its robust governance framework. JKH is a full member of the World Economic Forum and is a member of the Global Compact of the United Nations-sponsored International Corporate Citizenship Initiative.

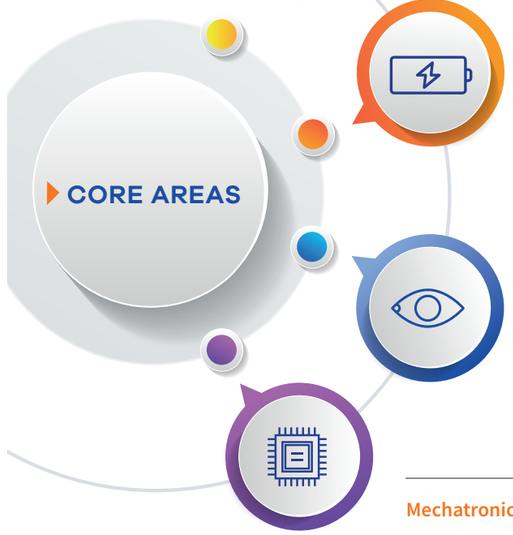
JOHN KEELLS RESEARCH

John Keells Research (JKR) is the R&D and Innovation arm of John Keells Holdings PLC, the largest listed conglomerate in Sri Lanka.

JKR was set up and operates with the mandate of creating value through invention, innovation and intellectual property for the John Keells Group, our partner companies and Sri Lanka.

The multidisciplinary team at JKR works towards the vision of becoming the leading scientific and technological incubator in the region thus supporting the John Keells Group and JKR's commercial partners enhance their competitive advantage by meeting their R&D and Innovation requirements.

The objective of scientific research undertaken by John Keells Research is to develop Intellectual Property which will create value and hence a commercial opportunity to be leveraged.



Composites

Leveraging the synergy of combination of multiple materials leads to the development of innovative composite materials that have unique and valuable properties. Under this core area, the multidisciplinary team at JKR is committed to creating novel and innovative materials to overcome the limitations of the current state of the art, thus either enhancing existing products or creating entirely new possibilities.

Energy Storage

The development of technically and economically viable energy storage and conversion technologies is vital if the global energy demand is to be met in a sustainable manner. The team at JKR strives to innovate in this space by contributing towards the development of the technologies that will power the next generation of batteries, super-capacitors, fuel cells, etc.

Biomaterials

As we continue to approach irreversible climate change, shifting to sustainable manufacturing strategies is of utmost importance. Developments in synthetic biology, sustainable biotechnology, and the burgeoning bio-economy are poised to play a key role in a more sustainable future and the JKR team strives to develop technologies that create a positive impact.

Mechatronics

Technologies that combine mechanics, electronics and computing have started to revolutionize almost every industry around the world from agriculture to high-tech manufacturing. The JKR team's work in this field focuses on equipping local and regional industries with technologies that enhance their competitive advantage.

KEY MILESTONES

2013

John Keells Research (JKR), the research and development arm of the Group was established

2014

The entire genome of **"Goda Vee"**, a rice variety was sequenced by **The Human Genetics Unit** of University of Colombo and **JKR**.

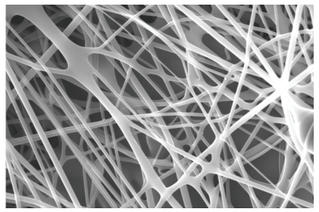
2015

JKR partnered with the **University of Maine, USA** to develop reinforcing fibers using **agricultural waste.**

2016

The article titled **"Whole genome sequencing and analysis of Godawee, a salt tolerant indica rice variety"**, was published in the **Journal of Rice Research**.

2017



JKR filed for its **first patent** in India for the developed **novel composite nanomaterial** which could be used in **energy storage** in collaboration with **the National Metallurgical Lab of the Council for Scientific and Industrial Research (CSIR-NML) in India**.

JKR filed a patent application in Taiwan and a **Patent Corporation Treaty (PCT)** application, which permits patent protection internationally.

2018

JKR was selected to participate in a project titled **"Enabling IP Environment"** conducted by **WIPO**; the only **private sector-based research group** to be selected to participate in this programme, globally.

2019

JKR completed the development of a **natural rubber-graphite composite** with **enhanced thermal conductivity** and a **shorter curing time** with potential for use in products such as **solid rubber tires**.

Designed and fabricated a **multispectral camera**, which complements its existing drone and artificial intelligence-based multispectral image analysis project on inspecting infrastructure.

2022

JKR entered into its first technology License agreement with **4ever Skin Naturals (PVT)** Ltd to commercialize JKR' s proprietary **Silmetic™** technology. The technology will be exclusively utilized by 4EVER to develop a range of **antibacterial skin care products**.

2023

JKR signed a license agreement with **OREL Group** to incorporate JKR's **antibacterial thermoplastic additive** technology, trademarked as **Germslay™**, into a range of **antibacterial switches** under the Orange Electric brand.

2024

JKR entered into a technology transfer agreement with **Ansell Global** for a **process of regenerating** a chemical that is contaminated during the rubber glove manufacturing process.

ENGAGING WITH JOHN KEELLS RESEARCH

JKR works in partnership with local and regional/global companies in a wide range of industries to co-develop technically and commercially viable solutions to industry challenges and meet R&D and innovation requirements.

The process below is our template for engaging with potential clients, however, we are happy to structure our engagement to fit client requirements.

Approach & Pitch to Client Company

- Pitch JKR as a provider of innovative solutions to industry challenges that are technically and commercially viable.
- Company and JKR can choose to engage based on synergies between company requirements and JKR capabilities

NDA

Identify Requirements

JKR will work closely with the client company to:

1. Clearly identify and define the challenge
2. Identify technical and financial (cost) parameters that potential solutions must meet

Challenge Statement

Proposal by JKR and Commitment from Client

If within JKR capabilities, JKR will submit a proposal containing the following:

1. Proposed methodology
2. JKR/Company responsibilities
3. Timeline
4. Financial Proposal

Co-development Agreement /MTA

R&D to solve the challenge

- R&D conducted by JKR with updates and feedback to client company every 2 weeks.
- Company to undertake testing of solution

Technology Development Report

IP Status Evaluation & Protection

- IP Status of technology to be evaluated and protected by JKR.
- Company will be given rights to IP in their field of use and geography JKR to retain right to other fields of use/geographies.
- Company to have first right of refusal.

Patent/ Trade Secret Documentation

Scale-up, Optimization & Testing

- Scale-up, optimization and testing by company with JKR support.
- If company requires JKR to undertake scale-up would be separate project.

Sign off by Client Company

Technology Transfer

Finalize and agree to the tech transfer terms. In keeping with principles of the Co-development agreement

1. Rights by Fields of Use and Geography to Company
2. Technology Transfer Fee + Royalty to JKR

Technology Transfer Agreement

Commercial Deployment

- Company to deploy solution by manufacturing and selling products that incorporate the technology to solve the challenge

Market Entry

TECHNOLOGIES ON OFFER

Silver Nanoparticle Suspension:

This is a novel methodology to synthesize a stable silver nanoparticle suspension, trademarked as Silmetic™ that can be incorporated into various products such as cosmetics, pharmaceuticals, textiles, etc.to give an enhanced antimicrobial effect. Currently this technology is being licensed to 4Ever Skin Naturals to be incorporated into their cosmetic products in Sri Lanka. This technology is available for collaborations with other local (outside of the cosmetic space) and international industrial partners who are interested in introducing silver nanoparticles in their products.

Antibacterial Additives for Thermoplastics:

An antibacterial additive that is added into thermoplastics at the extruding stage which ensures long-lasting antibacterial activity. This application can be used in many applications with different polymer composites to given an extended advantage according to industrial requirements. This technology is readily available for technology transfers.

Derivatives of Sri Lankan Vein Graphite:

Sri Lankan Vein Graphite has been processed to create additives that can be used with a range of products such as paint, latex and carbon to increase the structural and mechanical properties of the final products. This technology is available for collaborations with industrial partners who are interested in enhancing the efficiency of their products.

Alternative Protein:

An alternative form of protein that has young jackfruit as the main ingredient and other plant-based proteins that provide textural, nutritional benefits and a versatile cooking and eating experience that are comparable to those of animal derived products. This product is ready for collaborations with interested technology and manufacturing partners.

Nutrient Film Technique:

A miniaturized farming platform with NFT (Nutrient Film Technique) and automated environmental controlling system which controls light condition, temperature, humidity, water level, and acidity (pH), electrical conductivity and the nutrient supply.

KEY PARTNERS

Ansell

Elephant House™

KEELLS KREST

OREL CORPORATION

4ever® SKIN NATURALS By Chandhani Bandara

S&D CHEMICALS ASSOCIATES For a Sustainable Future

LEADERSHIP

Daminda Gamlath

President John Keells Holdings PLC

Daminda Gamlath is the President of the Consumer Foods industry group of JKH. He was the Sector Financial Controller for the Information Technology sector and then the Consumer Foods sector before he was appointed as the Head of Beverages in 2013 and the Sector Head in 2017. His experience involves many fields, including Finance and Management for over 18 years. Daminda holds a B.Sc. in Engineering from the University of Moratuwa, an MBA from the University of Colombo and is a passed finalist of the Chartered Institute of Management Accountants (UK).

Thilina Weerasekera

Head of John Keells Research

Thilina holds an MBA from the University of Wales and a BSc in Chemical Engineering from Iowa State University. His experience includes over 10 years of R&D, IP Management and Business Development within the John Keells Group and several stints as an Innovation Consultant for companies in Sri Lanka and the United States.

Dr. Thusitha Wickramasinghe

Principal Scientific Advisor

Thusitha Wickramasinghe specializes in bioanalytical chemistry and is a senior lecturer at the Department of Biochemistry and Clinical Chemistry, Faculty of Medicine, University of Kelaniya. He obtained his bachelor's with specialization in chemistry from the University of Colombo in 2001 and his doctorate from the University of Arizona in 2009. He served as a post-doctoral fellow at Karolinska Institute, Sweden before joining the University of Kelaniya in 2013. His research interests include therapeutic drug monitoring, aptamer development and molecular diagnostics.

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